

# **PROGRESS REPORT 2019**

**Volume 3**

## **CROP PRODUCTION**

## **AGRONOMY**

**ALL INDIA CO-ORDINATED RICE  
IMPROVEMENT PROGRAMME  
(AICRIP)**



**ICAR- INDIAN INSTITUTE OF RICE RESEARCH  
RAJENDRANAGAR, HYDERABAD – 500030**

**website: <http://www.icar-iirr.org>**

**email: [director.iirr@icar.gov.in](mailto:director.iirr@icar.gov.in)**



***Correct Citation:***

Indian Institute of Rice Research 2020. Progress Report 2019, Volume – 3, Crop Production (Agronomy, Soil Science and Plant Physiology), All India Co ordinate Rice Improvement Programme (ICAR). Pp.1-343.

# AGRONOMY



## 4. AGRONOMY

### CONTENTS

| S.No.       | Title                                                                                               |                                                                                                                    | Page Nos. |       |
|-------------|-----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|-----------|-------|
|             |                                                                                                     |                                                                                                                    | Text      | Table |
|             | <b>SUMMARY</b>                                                                                      |                                                                                                                    | 4.1       | -     |
| <b>4.1.</b> | <b>NUTRIENT MANAGEMENT TRIALS - NMTs</b>                                                            |                                                                                                                    |           |       |
|             | <b>Nutrient response trials on selected AVT-2 rice cultures under high and low input management</b> |                                                                                                                    |           |       |
| 4.1a        | AVT-2 E (H)                                                                                         |                                                                                                                    | 4.15      | 4.17  |
| 4.1b        | AVT-2 M (H)                                                                                         |                                                                                                                    | 4.16      | 4.20  |
| 4.1c        | AVT 2-E-TP                                                                                          |                                                                                                                    | 4.26      | 4.27  |
| 4.1d        | AVT 2 – IME (TP)                                                                                    |                                                                                                                    | 4.41      | 4.42  |
| 4.1e        | AVT 2 – IM (TP)                                                                                     |                                                                                                                    | 4.60      | 4.61  |
| 4.1f        | AVT 2-L                                                                                             |                                                                                                                    | 4.75      | 4.76  |
| 4.1g        | AVT 2-MS                                                                                            |                                                                                                                    | 4.86      | 4.87  |
| 4.1h        | AVT 2-Boro                                                                                          |                                                                                                                    | -         | -     |
| 4.1i        | AVT 2-AL&ISTVT                                                                                      |                                                                                                                    | 4.95      | 4.96  |
| 4.1j        | AVT 2- RSL                                                                                          |                                                                                                                    | 4.100     | 4.101 |
| 4.1k        | AVT 2-BT                                                                                            |                                                                                                                    | 4.106     | 4.107 |
| 4.1l        | AVT 2-Biofortified                                                                                  |                                                                                                                    | 4.119     | 4.120 |
| 4.1m        | (i) AVT-2 NIL Bl& BLB                                                                               |                                                                                                                    | 4.129     | 4.130 |
|             | (ii) Herbicide resistant mutants                                                                    |                                                                                                                    | 4.134     | 4.137 |
|             | (iii) Nitrogen use efficiency                                                                       |                                                                                                                    | 4.158     | 4.163 |
|             | (iv) Phosphorus use efficiency                                                                      |                                                                                                                    | 4.172     | 4.175 |
| 4.1 n       | GYEI                                                                                                |                                                                                                                    | 4.187     | 4.189 |
| <b>4.2</b>  | <b>CULTURAL MANAGEMENT TRIALS</b>                                                                   |                                                                                                                    |           |       |
| 4.2.1       | CMT 2.1                                                                                             | Development of package of practices for mechanized transplanting                                                   | 4.199     | 4.201 |
| 4.2.2       | CMT 2.2                                                                                             | Developing suitable package of practices for dry DSR                                                               | 4.205     | 4.208 |
|             | CMT 2.2(R)                                                                                          | Nutrient and weed management for higher productivity in different rice establishment methods                       | 4.206     | 4.218 |
| 4.2.3       | CMT 2.3                                                                                             | Developing suitable package of practices for wet DSR                                                               | 4.221     | 4.224 |
| 4.2.4       | CMT 2.4                                                                                             | Evaluation of IRON coated seed for direct seeded rice for enhancing the crop establishment as well as productivity | 4.237     | 4.239 |
| 4.2.5       | CMT 2.5                                                                                             | Yield maximization of rice through Site Specific Nutrient Management                                               | 4.251     | 4.252 |
|             | CMT 2.5(R)                                                                                          | Management practices for enhancing grain yield                                                                     | 4.251     | 4.253 |

|            |                                                         |                                                                                                                                                       |       |       |
|------------|---------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|
|            |                                                         | with green manure and nutrient management in rainfed upland rice                                                                                      |       |       |
| 4.2.6      | CMT 2.6                                                 | Water management for enhancing water used efficiency and weed control efficiency in different rice establishment methods (Kharif)                     | 4.254 | 4.256 |
|            |                                                         | Rabi                                                                                                                                                  | 4.261 | 4.263 |
| <b>4.3</b> | <b>WEED MANAGAEMENT TRIAL - WMT</b>                     |                                                                                                                                                       |       |       |
| 4.3.1      | WMT 3.1                                                 | Testing Thiobencarb 80 Ec against weeds of puddle Direct Seeded Rice                                                                                  | 4.265 | 4.288 |
| 4.3.2      | WMT 3.2                                                 | Long term trail on weed dynamics in mono or double cropped rice system under different establishment methods                                          | 4.283 | 4.287 |
| 4.3.3      | WMT 3.3                                                 | Evaluation of cultivars for weed competitiveness under direct seeded rice systems                                                                     | 4.317 | 4.320 |
| 4.3.4      | WMT 3.4                                                 | Integrated Pest Management – (Collaborative trial with Entomology and Pathology)                                                                      | 4.330 | 4.333 |
| <b>4.4</b> | <b>RESOURCE CONSERVATION TECHNOLOGIES (RCT) in RBCS</b> |                                                                                                                                                       |       |       |
| 4.4.1      | RCT 1                                                   | Conservation Agriculture / System based Management practices in rice and rice based cropping systems ( crop diversification) for higher profitability | 4.335 | 4.337 |
| 4.4.2      | CA/SM Rabi                                              | Enhancing productivity of rice-pulse system under different crop establishment methods                                                                | 4.347 | 4.348 |
| 4.4.3      | RCT 2                                                   | Technology to enhance the productivity of cultivars suitable for late planting situation                                                              | 4.349 | 4.351 |
| 4.4.4      | RCT 3                                                   | Exploration of rice fallows (Rice/Sorghum, Rice-oilseed, Rice-pulse)<br>IIRR ad IMR collaborative project                                             | 4.355 | 4.356 |

***Annexure I to V***

|     |                                                                                       |     |  |
|-----|---------------------------------------------------------------------------------------|-----|--|
| I   | <b>Major weeds observed during Kharif 2019</b>                                        | i   |  |
| II  | <b>Weather parameters at different centres during crop growth period, kharif 2019</b> | ii  |  |
| III | <b>Details of herbicide and product/material manufacturers</b>                        | iii |  |
| IV  | <b>Abbreviations</b>                                                                  | iv  |  |
| V   | <b>List of Co-operators</b>                                                           | v   |  |
|     | <b>Acknowledgement</b>                                                                | xiv |  |

## 4. AGRONOMY

### SUMMARY

AICRP experiments conducted by Agronomists, Soil scientists and Physiologists at different locations during *rabi* 2018-19 and *kharif* 2019 for understanding the response of rice crop to management practices, resource conservation and climatic variations for developing efficient crop and resource management technologies that maximize the productivity and ensure high profitability to double the farmers income on sustainable basis are compiled in this report. Agronomists conducted 236 experiments at 49 locations consisting of evaluation of promising cultivars (94 cultures) belonging to 16 groups viz., early hill (irrigated), medium hill (irrigated), early (TP), irrigated mid early, irrigated medium, late, medium slender, alkaline & inland saline, rain fed shallow lowland, basmati, bio-fortified, NIL (BL & BLB), herbicide resistant mutant, Nitrogen and Phosphorous use efficiency trials in transplanted situation, for their response to integrated nutrient management at 50,100 and 150% Recommended dose of fertilizer(RDF). In addition, six trials on cultural management, four trials each on weed management, four trials on rice based cropping systems and climate resilient agriculture and five collaborative trials (Soil science, Entomology, and Plant Breeding) were also conducted to develop cost effective technologies in rice and rice based cropping systems.

#### 4.1. NUTRIENT MANAGEMENT TRIALS (NMT)

Development of high yielding and improved varieties and hybrids is one of the major components of rice production technology. In rice growing regions, nutrient management is also most important yield limiting factor for production. Adaptation of cultivars with high Nutrient use efficiency in two different planting situations and nutrient management is a potential strategy in optimizing nutrient requirement, lowering cost of cultivation and reducing environmental pollution. Optimization of nutrient use not only enhances grain yield through better nutrient use efficiency but also reduces the cost of cultivation. In order to find out the production potential of promising cultivars and their response to varying levels of nutrients and to identify the optimum dose, the effect on late planted rice situations and efficient N and P cultivars, Nutrient management trials (NMTs) were constituted and conducted during *kharif* 2019. A total of 94 AVT-2 entries belonging to 16 categories were evaluated at different locations under different levels of nutrients, i.e., 50 or 100 and 150 % of recommended dose of nutrients along with standard and local cultivars to identify stable and efficient genotypes.

## 4.1 Nutrient response trials on selected AVT-2 rice cultures under high and low input management

### 4.1(a) AVT-2 EH (Irrigated)

IET 26562 was evaluated at four locations (**Almora, Khudwani, Malan and Upper Shillong**) under two recommended doses of fertiliser (50% and 100% RFD). Application of 100% RFD recorded higher yield at **Almora, Khudwani and Malan** (3.51, 5.78 and 4.61 t/ha) with higher nutrient response. Average yield of the locations popular varieties like VL Dhan 86, Vivek Dhan-86 were found promising except. IER 26565 at **Almora**

### 4.1(b) AVT-2 MH (Irrigated)

Different cultivars three cultures viz., IET 26579, IET 26594, IET 25838 were evaluated at five locations (**Almora, Khudwani, Malan, Upper Shillong and Wangbal**) under two recommended fertilizer dose (50 and 100% RFD) under medium hill conditions. Application of 100% RFD recorded significantly higher yield at **Khudwani** (5.55 t/ha), **Malan** (4.57 t/ha) and **Upper Shilong** (2.07 t/ha). Nutrient response (kg grain / kg N) was higher at 100% RDF. IET 25838 and IET 26579 were found to be promising at **Almora** and **Malan** respectively.

### 4.1(c) NMT Early (Transplanted)

The trial conducted at thirteen locations (**Chiplima, Faizabad, Ghagraghat, Jagdalpur, Mandya, Nagina, Puducherry, Ranchi, Rewa, Sabour, Vadgaon, Varanasi and Maruteru**) under two recommended doses of fertiliser (50% and 100% RDF) with 5 AVT-2 entries compared with standard, popular and local varieties. Mean over the locations, the performance of IET 25713 (5.13 t/ha) followed by IET 26477 (5.05 t/ha) were better over other entries, popular varieties local check. The application of 100% NPK recorded higher grain yield and also exhibited higher nutrient recovery.

### 4.1(d) NMT IME (Transplanted)

Promising AVT-2 cultures of medium duration were evaluated (IET 24952 and IET 25745) for their response to nutrients on grain yield at seventeen different locations viz., **Aduthurai, Chinsura, Chiplita, Dhangain, Faizabad, Gangavathi, Karjat, Kanpur, Kota, Mandya, Nagina, Navsari, Nawagam, Pantnagar, Pattambi, Puducherry and Varanasi** under two different doses of fertiliser (100% and 150% RDF). IET cultures viz., IET 24950 (5.50 t/ha) followed by IET 25745 (5.22 t/ha) were performed better and recorded higher mean grain yield over the locations compared to other cultures.

### 4.1(e) NMT IM (Transplanted)

AVT-2 entries (IET 27263, IET 26418 and IET 26420) of medium duration were evaluated for their response to nutrients and grain yield at thirteen different locations viz., **Chinsurah, Chiplita, Coimbatore, Dhangain, Faizabad, Jagdalpur, Karjat, Kaul,**

**Kota, Nagina, Pantnagar, Titabar and Maruteru** under two different levels of nutrient input (100% and 150% RDF). Application of 150% RDF recorded higher grain yields and also exhibited higher nutrient recovery at all the locations. IET 27263 and IET 26420 were found to be promising and recorded higher mean grain yield and nutrient response.

#### 4.1(f) NMT Late

AVT- 2 entries IET 26927, IET 26974, IET 25948 and IET 26948 were evaluated for its response to nutrients on grain yield at nine different locations i.e., **Aduthurai, Chinsurah, Chiplima, Dhangain, Karjat, Mandya, Maruteru, Nagina and Pusa** under two different fertiliser levels (100% and 150% RDF). The application of 150% RDF had higher grain yields and also exhibited higher nutrient recovery at most of the locations. IET 26974, IET 26948 and IET 25948 found to be promising in terms of grain yield at most of the locations.

#### 4.1(g) NMT MS

Five entries (IET 26549, IET 27136, IET 25802, IET 25798 and IET 24990) of medium slender group were evaluated for their response to levels of nutrients on grain yield at seven different locations i.e., **Dhangain, Karjat, Kaul, Mandya, Nagina, Raipur and Maruteru** under two levels of RDF (100% and 150% RDF). Application of 150% RDF recorded higher grain yields at **Dhangain** (6.48 t/ha), **Karjat** (3.91 t/ha), **Mandya** (7.37 t/ha), and **Raipur** (6.40 t/ha). Higher nutrient response was also recorded with 150% RDF application. Average over the locations, higher mean grain yield of 5.98 t/ha was recorded with 150% RDF and was 8.5% higher than yield obtained with 100% RDF. Grain yield differences among the tested varieties were found significant at all the locations. Entries like IET 25802, IET 25798 and IET 26549 were found to be promising with higher mean grain yield.

#### 4.1(i) NMT AL and ISTVT

Saline tolerant culture (IET 27077) was evaluated for its response to different levels of nutrients on grain yield at four different locations i.e. **Kanpur, Lucknow, Navsari and Rajendranagar** under two recommended doses of fertiliser (100% and 150% RDF). Application of 150% RDF recorded higher grain yields at **Kanpur** (2.77 t/ha), **Lucknow** (5.25 t/ha) and nutrient response. Application of 150% RDF with IET 27077 was found to exhibit significant interaction and found to be promising entry and recorded higher grain yield.

#### 4.1(j) NMT RSL

AVT-2 entry (IET 26692) was evaluated for its response to levels nutrients on grain yield at five locations i.e. **Faizabad, Chinsurah, Dhangain, Ghaghraghat and Pusa** under two levels of RDF (100% and 150% RDF). In this trial, Application of 150% RDF recorded higher grain yields at **Chinsurah** (4.73 t/ha) and **Ghaghraghat** (3.44 t/ha) and also exhibited higher nutrient recovery. Significantly higher mean maximum grain yield was recorded by IET 26692 at most of the locations.

#### 4.1(k) NMT BT

Basmati cultures (IET 26995 and IET 26999 at twelve different locations i.e., **Chatha, Dhangain, Faizabad, Kanpur, Kaul, Kota, Ludhiana, Nagina, Navsari, Pantnagar, Raipur** and **Rewa** under two different doses of RFD (100 and 150%). The application of 150% RFD was found to be promising and also exhibited higher nutrient recovery. IET cultures IET 26999 and IET 26995 were found to be promising over rest of the entries at most of locations.

#### 4.1 (l) NMT Biofortified

AVT-2 entry (IET 27179) was evaluated for their response to different levels of nutrients (100% and 150% RDF) on grain yield from thirteen different locations viz., **Chinsurah, Coimbatore, IIRR, Kaul, Mandya, Maruteru, Nagina, Nawagam, Pantnagar, Raipur, Rajendranagar Rewa and Varanasi**. Application of 150% RDF recorded significantly higher grain yields at **Chinsurah, Mandya, Nawagam, Raipur, Rajendrnagara** and **Rewa** with higher nutrient response. Mean over the locations, IET 27179 (4.70 t/ha) performed better check (Kalanamak) and found to be promising and recorded higher mean grain.

#### 4.1(m-i) NMT NIL (Bl & BLB)

AVT-2 NIL lines (IET 27285, IET 27294, IET 7280, IET 27286 and IET 28014) were evaluated at two different nutrient management (100 and 150% RDF) at four locations (**IIRR, Jagdalpur, Pantnagar** and **Nellore**). Application of 150% of RDF was promising at most of the location and IET 27280 (5.88 t/ha) followed by IET 27285 (4.97 t/ha) were found promising over rest of the cultures.

#### 4.1(m-ii) NMT Herbicide tolerant genotypes

The present investigation to study the herbicide tolerance in elite genotypes for their efficacy in Basmati growing areas of the country was taken up at six locations viz., **ICAR-IARI, ICAR-IIRR, Kaul, Ludhiana, Nagina** and **Pantnagar** during kharif 2019. The trial was conducted in replicated split plot design with weed control treatments (T1–Imazethapyr 10%SL post-emergence application; T2–Pendimethelin 30% EC pre-emergence application followed by Bispyribacsodium 10% SC post-emergence application; T3–Weed free check) in main plots and genotypes (G1–IET 28812, G2–IET 28813, G3–IET 28814, G4–IET 28815, G5–Pusa Basmati 1121, G6– Pusa Basmatia1509) in sub plots. The data on crop growth parameters, yield attributes, yield and weed parameters were recorded in the crop season and results are presented.

The results of one season study of HT genotypes showed that at all the locations, irrespective of genotypes tested, weed free check has resulted is significantly high crop growth, yield attributes and grain yield. The herbicide treatment of standard pre and post-emergence application of Pendimethalin and Bispyribacsodium resulted in higher yield, yield attributes and growth parameters. Till 60 days after herbicide application, application of

Imazethapyr resulted in lower weed parameters at five out of six locations. At these locations, after 60 DAHA also, another weed flush might have appeared and resulted in lower crop growth, and grain yield etc. in the treatment of Imazethapyr application. Among the test genotypes, IET 28812 and 28813 were superior at three locations; IET 28814 and 28815 at two locations; IET 28812, 28813, 28814 and 28815 were comparable at one location. At majority of the test locations, weed population and biomass at 30, 45 & 60 days after herbicide application were lower with IET 28812 and 28813. The genotypes IET 28812 and IET 28813 with no or low phytotoxicity to Imazethapyr have contributed to higher crop growth and grain yield with standard pre and post-emergence application of Pendimethalin, Bispyribacsodium.

#### 4.1(m-iii) NMT Nitrogen use efficiency

The trial is constituted to evaluate the identified cultures and cultivars with the following objective: 1) To study the comparative performance of elite lines and cultivars under different levels of nitrogen. The trial was conducted at 4 locations (**ICAR-IIRR, Ludhiana, Ranchi and Maruteru**). Split plot design was adopted with 3 main plots of nitrogen levels (N<sub>1</sub>- No nitrogen, N<sub>2</sub>: 50 % of recommended N dose (P and K is constant) and M<sub>3</sub>: 100 % of recommended dose of N (P and K constant).

Trials conducted at 4 locations revealed that the following cultivars/entries to be high grain yielding and nitrogen use efficient.

| High grain yielding entries/cultivars under without application of nitrogen (0 kg/ha)                                                                                                                                                                                                    | High grain yielding entries/cultivars under 50% of recommended nitrogen dose                                                                                                                                                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IET 27730 (3.32 t/ha),<br>IET 28081 (3.07 t/ha),<br>IET 28830 (2.95 t/ha),<br>IET 28080 (2.94 t/ha),<br>IET 28084 (2.93 t/ha),<br>IET 28828 (2.33 t/ha),<br>IET 28832 (2.24 t/ha),<br>IET 28831 (3.0 t/ha),<br>IET 28832 (2.71 t/ha),<br>IET 28079 (2.68 t/ha),<br>IET 28086 (2.58 t/ha) | IET 28087 (5.81 t/ha),<br>IET 27730 (5.26 t/ha),<br>IET 28080 (5.03 t/ha),<br>IET 28831 (4.47 t/ha),<br>IET 28081 (4.38 t/ha),<br>IET 28830 (4.37 t/ha),<br>IET 28827 (4.98 t/ha),<br>IET 28084 (4.98 t/ha),<br>IET 28088 (4.84 t/ha),<br>IET 28828 (4.81 t/ha),<br>IET 28086 (4.78 t/ha),<br>IET 28079 (5.52 t/ha) |
| High grain yielding entries/cultivars under 100% of recommended nitrogen dose                                                                                                                                                                                                            | High grain yielding entries/cultivars under 150% of recommended nitrogen dose                                                                                                                                                                                                                                       |
| IET 28080 (7.31 t/ha),<br>IET 28084 (7.29 t/ha),<br>IET 27730 (7.29 t/ha),<br>IET 28088 (7.24 t/ha),<br>IET 28087 (5.93 t/ha),<br>IET 28827 (5.51 t/ha),<br>IET 27730 (4.82 t/ha),<br>IET 28831 (4.62 t/ha),<br>IET 27730 (6.96 t/ha),<br>IET 28831 (6.52 t/ha)                          | IET 28827 (8.75 t/ha),<br>IET 28084 (8.03 t/ha),<br>IET 28088 (7.99 t/ha),<br>IET 28080 (7.55 t/ha),<br>IET 27730 (7.49 t/ha)                                                                                                                                                                                       |

#### 4.1(m-iii) NMT Phosphorus tolerance Cultures

The trial is constituted to evaluate the identified cultures and cultivars with the following objectives: 1) To study the comparative performance of elite lines and cultivars in different levels of Phosphorus and 2) To identify the elite lines for tolerance to low P soil conditions. The trial was conducted at 3 locations (**ICAR-IIRR, Ludhiana and Nellore**). Split plot design was adopted with 3 main plots of phosphorus levels (P<sub>1</sub>- No Phosphorus (Control) (N and K Constant), P<sub>2</sub>: 50 %of recommended P dose (N and K is constant) and P<sub>3</sub>: 100 % of recommended dose of P (N and K constant). Subplots consist of 36 advanced cultures.

Trials conducted at 3 locations revealed that the following cultivars/entries to be high grain yielding and phosphorus use efficient.

| Location             | High grain yielding entries/cultivars under low phosphorus condition                                                                                   | High grain yielding entries/cultivars under recommended phosphorus dose                         |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| <b>ICAR-IIRR</b>     | IET 28061 (3.73 t/ha),<br>IET 28065 (3.49 t/ha),<br>IET 28076 (3.44 t/ha),<br>IET 28776 (3.34 t/ha),<br>IET 27641 (3.32 t/ha)<br>IET 28075 (3.32 t/ha) | IET 28061 (5.41 t/ha),<br>IET 28816 (5.15 t/ha),<br>IET 28066 (5.0 t/ha)                        |
| <b>PAU, Ludhiana</b> | IET 28816 (3.84 t/ha),<br>IET 28066 (3.77 t/ha)                                                                                                        | IET 28066 (4.2 t/ha),<br>IET 28816 (3.9 t/ha),<br>IET 28075 (3.88 t/ha)<br>IET 28061 (3.7 t/ha) |
| <b>Nellore, AP</b>   | IET 28070 (5.9 t/ha),<br>IET 28818 (5.57 t/ha),                                                                                                        | IET 28070 (6.4 t/ha)<br>IET 28816 (5.77 t/ha)                                                   |

#### 4.2 CULTURAL MANAGEMENT TRIAL (CMT)

##### 4.2.1. Development of package of practices for mechanized transplanting

The trial was conducted at 7 locations (**Aduthurai, Chiplima, Gangavathi, Puducherry, ARI Rajendranagar, Ranchi and Warangal**). Split plot design was adopted with 3 main plots of crop establishments {M<sub>1</sub>: Normal Planting time Mechanical Transplanting (15 days seedlings and recommended spacing); M<sub>2</sub>: Normal Planting time Mechanical Transplanting (21 days seedling and recommended spacing); M<sub>3</sub>: Delayed Planting time (15 days late) Mechanical Transplanting (15 days seedlings and recommended spacing); M<sub>4</sub>: Manual transplanting – Normal time (25 days old seedlings) and M<sub>5</sub>: Manual transplanting – Delayed sowing time (25 days old seedlings) and 3 subplots consists of local latest released rice varieties.

Mechanical transplanting of 15 days seedlings at normal sowing time resulted the highest grain yield (5.87 t/ha) at five locations out of seven locations. Among cultivars ADT-

53, Arize Gold, GGV-0501, TKM-13 and Naveen found promising with higher grain yield at **Aduthurai, Chiplima, Gangavathi, Puducherry and Ranchi** respectively

#### 4.2.2. Developing suitable package of practices for dry DSR

The trial was conducted at 14 locations (**Arundhatinagar, Chatha, Gangavathi, Jagdalpur, Kota, Mandya, Nagina, Nawagam, Pantnagar, Ragolu, Tuljapur, Ranchi, Ludhiana and Pusa**). Split plot design was adopted with 2 main plots of sowing time (M<sub>1</sub>: Normal sowing time and M<sub>2</sub>: Delayed sowing by 30 days). Four subplots consist of S<sub>1</sub>: Broadcasting of seeds; S<sub>2</sub>: Manual line sowing of seed (20-25 cm row spacing sown) in solid row); S<sub>3</sub>: Mechanized line sowing of seeds (Dribbler, Happy Seeder or any Drum Seeder) and S<sub>4</sub>: Any improved system in that particular location.

Multi-location trial revealed that normal date of sowing at most of the locations and resulted in higher grain yield. However, average reduction of 14% in grain yield recorded due to 13 day in sowing. Similarly, mechanized line sowing (4.11 t/ha) found to be the best among all establishment methods. Local practices such as at **Chatha** (dibbling SRI), **Ragolu** (semi dry rice, 20 x 15 cm) **and Ranchi** (Rice + Sesbania was broadcasted, Sesbania was broadcasted at the rate of 40 kg/ha and then rice was sown in lines 20 cm apart, at 25<sup>th</sup> DAS *sesbania* was uprooted and placed in between rice rows) also showing better results.

#### 4.2.2(R). Nutrient and Weed management for higher productivity in different rice establishment methods

The experiment was conducted during *rabi* 2018-19 in split-split design with four replications. Treatments consisting of five crop establishment methods {Mechanical Transplanting method (All the principles as per the SRI); M<sub>2</sub>: Direct seeding (Use of Drum seeder/ dibbling of sprouted seed at 25 x 25 cm) *fb*. SRI principles (saturation method of water management, weeding with cono-weeder and fertilizer management); M<sub>3</sub>: Normal Transplanting (20 x 15 cm with flooding water management, 3-4 seedlings transplanted at 25-30 days old seedlings); M<sub>4</sub>: SRI; M<sub>5</sub>: Aerobic rice and M<sub>6</sub>: Semi dry rice} were assessed for their system productivity performance at 2 locations (**Mandya and Puducherry**).

At red sandy loam soils of **Mandya**, cowpea was grown in 2018-19 *rab* season. Main plots and sub plots effect on grain yield was non-significant. Rice equivalent yield of rice-cowpea system was highest (11.66 t/ha) under direct seeding followed by SRI principles. Similarly, application of 150% RDF in this system produced highest system productivity (12.0 t/ha). In clay loam soils of **Puducherry**, rice was grown in *rabi* season. In *rabi* season, mechanical transplanting resulted the highest rice grain yield (6.89 t/ha). Among nutrient managements practices LCC based nitrogen application resulted the highest yield (7.07 t/ha). The highest rice-rice system productivity was recorded under mechanical transplanting with LCC based N management (13.64 t/ha). Lower weed population at active tillering stage was also recorded under mechanical transplanting and LCC based N management.

#### 4.2.3. Developing suitable package of practices for wet DSR

The trial was conducted at 16 locations (**Aduthurai, Chatha, Chiplitima, Coimbatore, Karjat, Kota, Mandya, Navsari, Nawagam, Puducherry, Rajendranagar, Ranchi, Rewa, Titabar, Warangal and Pusa**). Split plot design was adopted with 2 main plots of sowing time (M<sub>1</sub>: Normal sowing time and M<sub>2</sub>: Delayed sowing by 30 days). Four subplots consist of S<sub>1</sub>: Broadcasting of seeds; S<sub>2</sub>: Manual line sowing of seed (20-25 cm row spacing sown in solid row); S<sub>3</sub>: Mechanized line sowing of seeds (Dribbler, Happy Seeder or any Drum Seeder), S<sub>4</sub>: Any improved system in that particular location and S<sub>5</sub>: Normal Transplanting.

Delay of sowing time significantly reduced grain yield of wet DSR at most of the locations and average yield reduction was 16% across the locations. Among crop establishment methods transplanting method resulted in the highest grain yield at **Chiplitima** (4.78 t/ha), **Coimbatore** (6.13 t/ha), **Puducherry** (6.26 t/ha), **Ranchi** (5.01 t/ha), **Titabar** (3.98 t/ha), **Warangal** (6.27 t/ha) and **Pusa** (4.32 t/ha). Multi-location trials revealed that locally practiced establishment methods sown at normal time were found to be superior in resulting higher grain yield.

#### 4.2.4. Evaluation of IRON coated seed for direct seeded rice for enhancing the crop establishment as well as productivity

In order to enhance the productivity of DSR, iron coating of seeds was done and evaluated at 5 locations consequently viz., IIRR, Coimbatore, Karjat and Raipur with 4 date of sowings with one week interval as main plots and five establishment methods (T1- Iron coated seed, seed rate 25 kg/ha, broadcasting in 1-2mm water level condition (Direct sowing) T2- Iron coated seed, seed rate 25 kg/ha, broadcasting in wet Condition (Direct sowing) T3 – Un-coated seed, seed rate 25 kg/ha, broadcasting in 1-2mm water level condition (Direct sowing) T4 – Un-coated seed, seed rate 25 kg/ha, broadcasting in wet condition (Direct sowing) T5 – Normal transplanting 21-25 days after sowing as subplots in 3 replications. Among the date of the sowing, 1st date of sowing (6.21 t/ha at Chiplitima, 5.67 t/ha at IIRR, 3.81 t/ha at Karjat) gave significantly higher grain yield and over 15 days delay reduced mean grain yield reduced yield by 8.1%, 21% and 30% respectively. There is a significant increase of grain yield to the tune of 5.72 to 9.85% due to iron coating of seeds which facilitated better system of establishment and growth. The results are in conformity with previous year. Effect of iron seed coating on insect pest incidence (ESCP indicated low pest incidence across the locations in different treatments. Stem borer incidence was at par in different seed coated treatments (0.5 – 10.6% DH & 3.9 – 16.6% WE) and also in different sowings (0.1 – 10.8% DH & 4.1 - 16.4% WE). However, gall midge (9.2 – 13.9% SS) and BPH incidence (11-19/hoppers hill) was found low in seed coated treatments compared to normal transplanting (24.6% SS & 33/hill) and T3 treatment with uncoated seed (22.6%SS & 32/hill).

#### 4.2.5. Yield maximization in farmers' field using Nutrient Expert

To validate NE<sup>®</sup> tool, this collaborative trial was constituted along with IPNI during *kharif* 2014 and continued in *kharif* 2019 at 2 locations viz. **Chinsurah, and Titabar**. This year the trial was conducted in farmers' field. The treatments were as follows: T<sub>1</sub> – Recommended fertilizer recommendation of that region, T<sub>2</sub> – SSNM based on Nutrient Expert (Varies for each location), T<sub>3</sub> – Farmers fertilizer practice and T<sub>4</sub>: Absolute control (Without NPK). SSNM based on Nutrient Expert treatment resulted in highest yield at **Chinsurah** (5.28 t/ha) and **Titabar** (5.76 t/ha).

#### 4.2.5(R). Management practices for enhancing grain yield with green manure and nutrient management in rain fed upland rice

The present investigation was taken up to study the effect of phosphorus and greenmanure on productivity of rice at one location (**Pattambi**). Experiment was laid out in factorial RBD design {M<sub>1</sub>: Rice alone, M<sub>2</sub>: Rice + GM (Sunhemp/Dhaincha/Green leafmanuring) and 5 subplots of phosphorus treatment (S<sub>1</sub>: 0 kg P<sub>2</sub>O<sub>5</sub>/ha, S<sub>2</sub>: 20 kg P<sub>2</sub>O<sub>5</sub>/ha, S<sub>3</sub>: 40 kg P<sub>2</sub>O<sub>5</sub>/ha, S<sub>4</sub>: Optional and S<sub>5</sub>: Farmers practice.

In red lateritic soils of **Pattambi** the highest grain yield (5.08 t/ha) was observed under rice + green manure crop without phosphorus application to soil as compared to other treatments.

#### 4.2.6. Water management for enhancing water use efficiency and weed control efficiency in different rice establishment methods

The trial was conducted at 5 locations (**Chatha, Faizabad, Mandya, Pusa, and Varanasi**). Split plot design was adopted with 3 main plots of irrigation management {I<sub>1</sub>: Flooding throughout crop growth (3 + / - 2 cm), I<sub>2</sub>: Saturation maintenance upto PI and (3 + / - 2 cm) after PI and I<sub>3</sub>: Alternate wetting and drying (irrigation at 5 -7 days interval with 5 cm/ha of water (5 cm irrigation at 3 DADPW) up to PI and (3 + / - 2 cm) after PI} and 6 subplots of crop establishment methods {T<sub>1</sub>: Mechanical Transplanting method on puddled soil (crop management methods same as for puddled transplanted rice), T<sub>2</sub>: Direct wet seeding on puddled soil (Use of Drum seeder/ dibbling of sprouted seed at 25 x 25 cm) fb crop management practices as per direct wet seeded rice, T<sub>3</sub>: Normal hand transplanting (20 x15 cm with flooding water management, 3-4 seedlings transplanted at 25-30 days old seedlings), T<sub>4</sub>: Aerobic rice T<sub>5</sub>: Direct broadcast dry seeding on well prepared unpuddled soil fb crop management practices for direct dry drill seeded rice and T<sub>6</sub>: Optional- Location specific} and replicated thrice.

Grain yield across all the centers revealed that **alternate wetting and drying** resulted the highest grain yield among irrigation management treatments. Higher cost of cultivation was recorded under flooding throughout crop growth at **Mandya** (Rs. 56717/-) and **Varanasi** (Rs. 32943/-). Similarly, water input was saved due to adoption of alternate wetting and

drying was 49.0 cm at Varanasi and 66.9 cm at **Mandya**. Among the crop establishment methods during *rabi* season, mechanical transplanting recorded as significant. Water input was significantly reduced in AWD method 1593 mm/ha as compared to saturation and flooding throughout crop growth 1603 and 1613 mm/ha respectively. Lower weed population and dry weight were observed in alternate wetting and drying treated plots in **Puduchery**.

### 4.3. WEED MANAGEMENT TRIAL

#### 4.3.1 Evaluation of Bio efficiency of Thiobencarb in wet direct sown rice :

With the objective of evaluating the bio efficiency of thiobencarb at different doses in wet direct sown rice in comparison to the promising pre and post emergence herbicides at different locations viz., **ICAR-Indian Institute of Rice Research Hyderabad, Malan, Puducherry and Raipur**, the experiments conducted during kharif 2019, revealed that, the systemic post emergence herbicide thiobencarb @5 l /ha applied at 20 days after sowing was found superior, resulting in higher weed control efficiency; higher grain yields; and the performance was comparable to hand weeding twice, standard post emergence herbicide bispyribacsodium @ 300 ml/ha.

The multi-locational two consecutive seasons study (kharif 2018 and kharif 2019) results showed that, the systemic post emergence herbicide thiobencarb @5 l/ha has contributed to higher weed control efficiency; higher grain yields; and the performance was comparable to hand weeding twice and standard post emergence herbicide bispyribacsodium@ 300 ml/ha.

#### 4.3.2 Long term trial on weed dynamics in mono or double cropped rice system under different establishment methods

With the objective of assessing the weed dynamics in different establishment methods on a long term basis of minimum five years, the trial was initiated during *kharif* 2019. The trial was conducted at 12 locations viz., **Aduthurai, Chiplima, Gangavathi, Ghaghraghat, Jadgalpur, Malan, Moncompu, Nawagam, Pantnagar, Puducheery, Varanasi and Titabar** in replicated split plot design. Though allotted, the trial was not conducted by **Chinsurah, Cuttack, Karaikal, Kota, Nagina, Prabhani, Pattambi, Pusa, Ranchi, Rewa, Tuljapur**. The treatments consisted of 3 main plots M1 – Mechanised planting/transplanting, M2 – Puddled direct seeding, M3 – Unpuddled dry direct seeding and four sub plots T1 – Weed free, T2 – Weedy check, T3 – Mechanical weeding using weeder and T4 – Chemical weed control of pre and post emergence herbicide application. The results of data on growth parameters, yield attributes, grain yield, weed parameters reveal that at ten out of twelve locations, mechanical transplanting recorded lower weed population, dry weed biomass at maximum tillering stage, panicle initiation and heading stages of rice crop which in turn reflected in increased crop growth parameters, yield attributes and yield of rice. At two locations, puddle/un-puddled direct seeding has contributed to lower weed population and biomass,. Among the weed control treatments, six out of twelve locations reported superiority of chemical weed control by pre and post emergence herbicide application and effective in

controlling weeds and more resources were made available for improved crop growth and yield. At four locations, the performance of mechanical weeding using weeder and chemical weed control were comparable. At two locations, mechanical weeding using weeder resulted in significantly higher crop growth, yield attributes and grain yield. The results clearly indicate the necessity of adopting improved agronomic management technologies for reducing weed problems and for improving production potential of puddled and un-puddled direct seeding systems. The performance of mechanical weeding in different establishment methods is indicating the scope and potential of mechanical weeding methods and can be further exploited in view of scarce resources and changing climate.

#### 4.3.3 Evaluation of cultivars for weed competitiveness under direct seeded rice system

With the objective of evaluating the performance of recently released high yielding varieties for weed competitive ability and yield performance, multilocal trial was conducted at five locations viz., **Chinsurah, Ghaghraghat, Malan, Nellore and Tuljapur** during kharif 2019. At **Monompu, Pantnagar, Pattambi and Parbhani**, the trial was conducted with different technical programme cannot fit in this trial report. The treatments consisted of four weed control treatments (T1-Weed free, T2-Weedy check, T3-Mechanical weeding using weeder and T4-Chemical weed control (pre & post emergence herbicide application)) as main plots and three varieties (V1 – DRR Dhan 50, V2 – DRR Dhan 52 and V3 - Latest released state variety) as sub plot treatments in replicated split plot design. The results of the data recorded on crop growth, yield attributes, yield and weed parameters indicated that, the trend in usual relative dominance of weed groups varied from the earlier order of grasses-BLW-sedges to sedges-BLW-grasses and/or BLW-grasses-sedges. At majority of the locations, in clay loam and clay soils, chemical weed control using pre and post emergence herbicides was found superior and in sandy loam soils, mechanical weeding using weeder showed superior performance. Varietal performance varied among the test locations. DRR Dhan 50 at two locations, DRR Dhan 52 at two locations, local high yielding varieties at two locations showed superior performance with lower weed population, weed biomass, higher crop growth parameters, yield attributes and grain yield.

#### 4.3.4 Integrated Pest Management–(Collaborative trial with Entomology and Pathology)

IPM special trial was conducted with an aim to manage pests (including insects, diseases and weeds) in a holistic way in farmers' fields involving them in a participatory way and allowing them to select IPM practices from a basket of options available. During *Kharif* 2019, the trial was conducted at 11 locations viz. **Chatha, Chinsurah, Gangavathi, Malan, Mandya, Nagina, Navsari, Puducherry, Raipur, Titabar and Vadagaon**. The data and results of weed parameters during critical period of crop weed competition and grain yields showed that across the locations, weeds, insect pests, and disease incidence was low in IPM plots. The mean weed population was considerably reduced by 9 to 71% at 30 DAT, 4 to 79% at 60 DAT; resulting in reduction of the mean weed biomass by 5 to 70% at 30 DAT, 5 to 81% at 60 DAT respectively. The mean grain yield advantage in IPM implemented plots compared to farmers practice is 2 to 52% among the test locations.

#### 4.4. RESOURCE CONSERVATION TECHNOLOGIES (RCTs) IN RBCS

##### 4.4.1 Conservation Agriculture/system base management practices in rice and rice based cropping systems (crop diversification) to utilise the resources and enhancing the profitability and productivity

Conservation Agriculture (CA) systems are developed for the intensive rice-based cropping systems that one be evaluated in different rice-based cropping systems. In general, Rice-based cropping systems are characterised by key edaphic influence of puddling soil for transplanting which destroys the soil structure through intensive tillage and removal or burning of crop residue before sowing of next crop that limits the recycling of organic matter of soils. To address this issue the trial on conservation agriculture system management practices in rice and rice based cropping system are conducted at 5 location viz. **Vadagaon, Ghaghraghat, Karjat, Rajendranagar and Titabar**. Main plot treatments comprises of three crop establishment methods (M1 – Transplanting, M2 – Wet seeding (line sowing under puddle condition) and M3: Aerobic rice – Dry rice cultivation). The sub plot treatment consists of 3 different residue/straw management (S1 – No residue, S2 – 15 cm height of rice straw retention and S3 – 30 cm height of rice straw retention). Among the crop establishment methods, transplanting method gave better yields at most of the locations viz., **Rajendranagar** (5.62 t/ha), **Karjat** (8.68 t/ha) due to reduced weed competition. The REY of system productivity was higher at three locations due to rice- residue incorporation in **Vadagaon, Rajendranagar and Karjat**.

At **Karjat**, the incidence crossed ETL in M3 - aerobic rice (10.2% DH) and S1- No residue sub-plot (10.9% DH), at 60 DAT. There were no significant differences among the treatments in pest incidence at both vegetative and reproductive stages. At **Jagdarpur**, due to low pest incidence all the treatments were on par and no trends were discernible.

##### 4.4.2 (Rabi) Enhancing productivity of rice-pulse system under different crop establishment methods

This trial was initiated with a view to evaluate pulses in different rice establishment methods to realize the production potential of alternate systems of crop establishment was conducted at **Mandya** during *kharif* 2018 and *rabi* 2018-19. The results revealed that higher average higher system productivity (10.65 t/ha) was recorded under rice-cowpea system as compared to rice-rice system (7.65 t/ha). Rice fallow pulse increases grain yield significantly over rice-rice system for the past two years of study.

##### 4.4.3 Evaluation of promising cultivars for late planting and management for higher productivity and mitigate the effect climate change

The trial to evaluate promising cultivars for late transplanting was conducted at **Aduthurai** with five cultivars, **Mandya** with fifteen cultivars at different dates of planting

while at **Gangavathi** two fertilizer doses were tested with eleven cultivars planted very late situation (4<sup>th</sup> September, 2019).

The results indicated that, there is no difference in grain yield due to delay in planting. However, the yield reduction was 16 and 53% due to 15 and 30 days delay in planting at **Mandya**. The results indicate that AD 17037, ADT 53 at **Aduthurai**, Indiraero-1, MTU 1010, Co-51, IR 64, GNV-1089 at **Gangavathi** and KMP 175, Samleshwari, CR Dhan 201, Co-51 and CTH-3 at **Mandya** were found promising with better yields.

#### **4.4.4. Assessing the performance and yielding ability of *kharif* sorghum hybrids in Rice-Sorghum sequence cropping system**

In rice fallows, sorghum cultivation was found to be high yield potential with reduced inputs and labour. New promising Sorghum hybrids having high yield potential were tested in rice fallows where in rice cultivated as Transplanted, Wet DSR and Dry DSR method. The trial conducted at **Chinsurah**, **Mandya** and **Ragolu** during 2019. Mean over the locations, transplanting method gave comparable yields with wet DSR methods (2.50 t/ha to 6.80 t/ha) at **Chinsurah** and **Mandya**. The data of Sorghum hybrids (9) are yet to be received and analysed to know the performance in rice fallows. .



# NUTRIENT MANAGEMENT TRIALS





## NUTRIENT MANAGEMENT TRIALS (NMT)

Agronomists conducted 236 experiments at 49 locations consisting of evaluation of promising cultivars were (94 cultures) belonging to 16 groups viz., early hill (irrigated), medium hill (irrigated), early (TP), irrigated mid early, irrigated medium, late, medium slender, alkaline & inland saline, rainfed shallow lowland, basmati, biofortified, NIL (BL & BLB), herbicide resistant mutant, Nitrogen and Phosphorous use efficiency in transplanted situation, for their response to integrated nutrient management at 50,100 and 150% Recommended dose of fertilizer(RDF). In addition, six trials on cultural management, four trials on weed management, four trials on rice based cropping systems and five collaborative trials (Soil science, Entomology and Plant Breeding) were also conducted to develop cost effective technologies in different rice and rice based cropping systems.

### NMT 1 (a) Early hill EH (Irrigated)

Cultivar IET 26565 was evaluated with Shalimar Rice 3, Vivekdhan 86, VL Dhan 86 and local check at four locations (**Almora, Khudwani, Malan and Upper Shillong**) under two different recommended doses of fertilizer (50% and 100% RFD). The data received from four locations are summarized and presented in **Table 4.1(a)**.

Different doses of fertilizer exhibited varying differences in grain yield and yield attributes at all the four locations. Application of 100% RFD recorded higher yield at **Almora, Khudwani** and **Malan** (3.51, 5.78 and 4.61 t/ha) and was found significantly superior to 50% RFD at **Khudwani** and **Malan** however at **Almora** the yield difference was not significant. Interaction effects of N doses and varieties was non-significant at all locations. Averaged across the locations, Nutrient response (kg grain / kg N) was higher at 100% RFD compared to 50% RFD.

Average yield of the locations with different varieties ranged from 3.21 to 3.62 t/ha in **Almora**, 3.52 to 7.13 t/ha in **Khudwani**, 2.70 to 5.25 t/ha in **Malan**, IET entries did not mature and no grain formation at **Upper Shillong**. Grain yield of varieties differed significantly at all locations with different doses of RFD. Among the varieties tested, local check Shalimar Rice-3 (7.13 t/ha) at **Khudwani** and Shalimar Rice-3 (5.25 t/ha) at **Malan** was found promising over other varieties. Among the cultures, IET 26565 (3.62 t/ha) at **Almora** was found promising. Mean over the four locations, Vivek dhan 86 was found promising over other tested varieties.

In this trial, nutrient management with 100% RFD was found to be promising and also exhibited higher nutrient recovery at all the locations. Popular variety like VL Dhan 86, Vivek Dhan-86, were found to be promising except IET 26565 at **Almora**.

**NMT 1 (b) Medium hill MH (Irrigated)**

Different cultivars (IET 26579, IET 26594 and IET 25838) were evaluated in comparison with local checks at five locations (**Almora, Khudwani, Malan, Upper Shillong and Wangbal**) under two recommended fertilizer dose (50 and 100% RFD) under medium hill conditions. The data received from four locations are summarized and presented in **Table 4.1(b)**.

Application of 100% RFD gave significantly higher grain **Khudwani, Malan** and **Upper Shillong** indicating better response of cultivars to higher nitrogen application. Application of 100% RFD recorded significantly higher yield at **Khudwani** (5.55 t/ha), **Malan** (4.57 t/ha) and **Upper Shillong** (2.07 t/ha). Interaction effects of varieties and N levels were not significant at all the locations except **Almora** and **Khudwani**. Nutrient response (kg grain / kg N) was higher at 100 % RDF as compared to 50% RFD at all the locations.

Grain yield differences among cultivars were significant at all the locations. Average yield of the locations ranged from 3.56 to 3.95 t/ha at **Almora**, 1.67 to 6.92 t/ha in **Khudwani**, 3.72 to 5.31 t/ha at **Malan** and 1.25 to 2.28 t/ha at **Upper Shillong** and 2.55 to 3.53 t/ha. Mean grain yield was provided from **Wangbal**. Among the varieties tested, IET 25838 at **Almora** (3.95 t/ha), IET 26579 (5.31 t/ha) at **Malan** found promising over other varieties. At **Khudwani**, Shalimar rice 1 (6.92 t/ha) recorded higher yield. Vivek Dhan 62 was found to be promising at **Malan** (4.53 t/ha) and **Upper Shillong** (2.73 t/ha), whereas MEG-1 (2.28 t/ha) was superior to other entry at **Upper Shillong**.

In this trial, integrated agronomic management with 100% RFD was found to be promising and also exhibited higher nutrient recovery. Popular varieties like VL Dhan 65, Vivek Dhan 62, and Shalimar rice 1 were found to be promising. Among the cultures, IET 25838 at **Almora**, IET 26579 at **Malan** were found promising in recording higher grain yield.

Table-4.1(a): Summary of data on grain yield and ancillary character of selected NMT- early hill (irrigated) cultures grown under transplanted conditions at graded levels of recommended nutrient(NPK) doses, kharif 2019.

| Fertilizer-levels         | Varieties | ALMORA             |      |                              |                    |              |                        |                                                           | KHUDWANI           |      |                              |                    |              |                        |                                                           |
|---------------------------|-----------|--------------------|------|------------------------------|--------------------|--------------|------------------------|-----------------------------------------------------------|--------------------|------|------------------------------|--------------------|--------------|------------------------|-----------------------------------------------------------|
|                           |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test Wt(g)   | Days for 50% flowering | Nutrient res. (kg grain/kg Nutrient) (Base level 50% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test Wt(g)   | Days for 50% flowering | Nutrient res. (kg grain/kg Nutrient) (Base level 50% RDF) |
| F1 - 50% RFD              | V1        | 3.59               | 2    | 255                          | 3.24               | 25.53        | 93                     |                                                           | 3.4                | 7    | 298                          | 2.16               | 26.43        | 114                    |                                                           |
|                           | V2        |                    |      |                              |                    |              |                        |                                                           | 5.31               | 4    | 331                          | 2.5                | 28.62        | 94                     |                                                           |
|                           | V3        | 3.46               | 4    | 245                          | 2.62               | 25.60        | 84                     |                                                           | 3.3                | 8    | 302                          | 2.18               | 26.14        | 114                    |                                                           |
|                           | V4        | 3.06               | 6    | 271                          | 2.92               | 25.67        | 82                     |                                                           | 5.93               | 3    | 347                          | 2.66               | 30.26        | 98                     |                                                           |
|                           | V5        |                    |      |                              |                    |              |                        |                                                           | 4.08               | 5    | 326                          | 2.3                | 26.02        | 115                    | 6.48                                                      |
| F2 - 100% RFD             | V1        | 3.64               | 1    | 275                          | 3.84               | 26.37        | 84                     | 0.50                                                      | 6.97               | 2    | 386                          | 3.06               | 28.3         | 95                     | 15.81                                                     |
|                           | V2        |                    |      |                              |                    |              |                        |                                                           |                    |      |                              |                    |              |                        |                                                           |
|                           | V3        | 3.55               | 3    | 267                          | 2.81               | 25.89        | 83                     | 0.90                                                      |                    |      |                              |                    |              |                        |                                                           |
|                           | V4        | 3.35               | 5    | 299                          | 2.57               | 25.30        | 85                     | 2.90                                                      | 3.73               | 6    | 338                          | 2.44               | 27.01        | 107                    | 4.10                                                      |
|                           | V5        |                    |      |                              |                    |              |                        |                                                           | 8.32               | 1    | 410                          | 3.23               | 30.36        | 99                     | 22.76                                                     |
| <b>Interaction</b>        |           |                    |      |                              |                    |              |                        |                                                           |                    |      |                              |                    |              |                        |                                                           |
| <i>N at same V</i>        |           | NS                 |      | NS                           | 0.19               | NS           | 2.94                   |                                                           | NS                 |      | NS                           | NS                 | NS           | 2.78                   |                                                           |
| <i>V at same N</i>        |           | NS                 |      | NS                           | 0.33               | NS           | 3.81                   |                                                           | NS                 |      | NS                           | NS                 | NS           | 3.69                   |                                                           |
| <b>Means of N levels:</b> |           |                    |      |                              |                    |              |                        |                                                           |                    |      |                              |                    |              |                        |                                                           |
| F1                        |           | 3.37               | 2    | 257                          | 2.93               | 25.60        | 86                     |                                                           | 4.49               | 2    | 319                          | 2.38               | 27.86        | 105                    |                                                           |
| F2                        |           | 3.51               | 1    | 280                          | 3.07               | 25.85        | 84                     | 1.43                                                      | 5.78               | 1    | 365                          | 2.76               | 27.92        | 104                    | 12.29                                                     |
| <b>C.D.(0.05)</b>         |           | NS                 |      | 20.46                        | NS                 | NS           | NS                     |                                                           | 0.84               |      | NS                           | NS                 | NS           | NS                     |                                                           |
| <b>C.V.(%)</b>            |           | 5.76               |      | 3.76                         | 6.28               | 1.67         | 2.20                   |                                                           | 9.37               |      | 10.25                        | 9.45               | 5.31         | 1.95                   |                                                           |
| <b>Mean of varieties:</b> |           |                    |      |                              |                    |              |                        |                                                           |                    |      |                              |                    |              |                        |                                                           |
| V1                        |           | 3.62               | 1    | 265                          | 3.54               | 25.95        | 89                     | 0.50                                                      | 3.74               | 3    | 312                          | 2.23               | 26.23        | 114                    | 6.48                                                      |
| V2                        |           |                    |      |                              |                    |              |                        |                                                           | 6.14               | 2    | 358                          | 2.78               | 28.46        | 95                     | 15.81                                                     |
| V3                        |           | 3.51               | 2    | 256                          | 2.72               | 25.75        | 83                     | 0.90                                                      |                    |      |                              |                    |              |                        |                                                           |
| V4                        |           | 3.21               | 3    | 285                          | 2.75               | 25.49        | 84                     | 2.90                                                      | 3.52               | 4    | 320                          | 2.31               | 26.58        | 111                    | 4.10                                                      |
| V5                        |           |                    |      |                              |                    |              |                        |                                                           | 7.13               | 1    | 378                          | 2.95               | 30.31        | 99                     | 22.76                                                     |
| <b>C.D.(0.05)</b>         |           | 0.31               |      | 5.19                         | 0.13               | NS           | 2.08                   |                                                           | 0.8                |      | 36.89                        | 0.27               | 1.13         | 1.97                   |                                                           |
| <b>C.V.(%)</b>            |           | 6.78               |      | 1.45                         | 3.35               | 3.67         | 1.84                   |                                                           | 12.41              |      | 8.57                         | 8.37               | 3.22         | 1.50                   |                                                           |
| <b>Expt. Mean</b>         |           | <b>3.44</b>        |      | <b>269</b>                   | <b>3.00</b>        | <b>25.73</b> | <b>85</b>              |                                                           | <b>5.13</b>        |      | <b>342</b>                   | <b>2.57</b>        | <b>27.89</b> | <b>104</b>             |                                                           |
| Soil type                 |           | -                  |      |                              |                    |              |                        |                                                           | Sandy clay loam    |      |                              |                    |              |                        |                                                           |
| pH                        |           | 7.30               |      |                              |                    |              |                        |                                                           | 6.80               |      |                              |                    |              |                        |                                                           |

Table 4.1(a): Contd.

|                           |           | ALMORA             |      |                  |                    |            |                        |                                                           | KHUDWANI                      |      |                  |                    |            |                        |                                                           |
|---------------------------|-----------|--------------------|------|------------------|--------------------|------------|------------------------|-----------------------------------------------------------|-------------------------------|------|------------------|--------------------|------------|------------------------|-----------------------------------------------------------|
| Fertilizer-levels         | Varieties | Grain Yield (t/ha) | Rank | Panicle/m² (No.) | Panicle Weight (g) | Test Wt(g) | Days for 50% flowering | Nutrient res. (kg grain/kg Nutrient) (Base level 50% RDF) | Grain Yield (t/ha)            | Rank | Panicle/m² (No.) | Panicle Weight (g) | Test Wt(g) | Days for 50% flowering | Nutrient res. (kg grain/kg Nutrient) (Base level 50% RDF) |
| Fertilizer levels (kg/ha) |           |                    |      |                  |                    |            |                        |                                                           |                               |      |                  |                    |            |                        |                                                           |
| F1                        |           | 50:30:20           |      |                  |                    |            |                        |                                                           | 60:30:15                      |      |                  |                    |            |                        |                                                           |
| F2                        |           | 100:60:40          |      |                  |                    |            |                        |                                                           | 120:60:30                     |      |                  |                    |            |                        |                                                           |
| Varieties                 |           |                    |      |                  |                    |            |                        |                                                           |                               |      |                  |                    |            |                        |                                                           |
| V1                        |           | IET 26565          |      |                  |                    |            |                        |                                                           | IET 26565                     |      |                  |                    |            |                        |                                                           |
| V2                        |           | -                  |      |                  |                    |            |                        |                                                           | Shalimar Rice-3               |      |                  |                    |            |                        |                                                           |
| V3                        |           | Vivekdhan-86       |      |                  |                    |            |                        |                                                           | -                             |      |                  |                    |            |                        |                                                           |
| V4                        |           | VL Dhan-86         |      |                  |                    |            |                        |                                                           | VL Dhan-86                    |      |                  |                    |            |                        |                                                           |
| V5                        |           | -                  |      |                  |                    |            |                        |                                                           | Local Check (Shalimar Rice-4) |      |                  |                    |            |                        |                                                           |
| Available NPK in Soil     |           | 278:11.47:214      |      |                  |                    |            |                        |                                                           | 212:12.5:216                  |      |                  |                    |            |                        |                                                           |

Table 4.1(a) (Contd...)

| Table 4.1(a) (Contd...)   |             |                      |      |                              |                    |            |                        |                                                           |                                       |      |                              |            |                                                           |               |      |  |      |    |
|---------------------------|-------------|----------------------|------|------------------------------|--------------------|------------|------------------------|-----------------------------------------------------------|---------------------------------------|------|------------------------------|------------|-----------------------------------------------------------|---------------|------|--|------|----|
| Fertilizer-levels         | Varieties   | MALAN                |      |                              |                    |            |                        |                                                           | UPPER SHILLONG                        |      |                              |            |                                                           | Over All Mean | Rank |  |      |    |
|                           |             | Grain Yield (t/ha)   | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test Wt(g) | Days for 50% flowering | Nutrient res. (kg grain/kg Nutrient) (Base level 50% RDF) | Grain Yield (t/ha)                    | Rank | Panicle/m <sup>2</sup> (No.) | Test Wt(g) | Nutrient res. (kg grain/kg Nutrient) (Base level 50% RDF) |               |      |  |      |    |
| F1 - 50% RFD              | V1          | 4.23                 | 6    | 228                          | 2.84               | 28.59      | 88                     |                                                           | No grain formation found in IET entry |      |                              |            |                                                           | 3.74          | 8    |  |      |    |
|                           | V2          | 2.56                 | 8    | 161                          | 2.71               | 26.73      | 76                     |                                                           |                                       |      |                              |            |                                                           |               |      |  | 3.94 | 7  |
|                           | V3          | 4.71                 | 3    | 240                          | 2.73               | 29.15      | 87                     |                                                           |                                       |      |                              |            |                                                           |               |      |  | 4.09 | 6  |
|                           | V4          |                      |      |                              |                    |            |                        |                                                           |                                       |      |                              |            |                                                           |               |      |  | 3.18 | 10 |
| F2 - 100% RFD             | V5          | 4.38                 | 5    | 214                          | 2.35               | 29.23      | 91                     |                                                           |                                       |      |                              |            |                                                           |               |      |  | 5.16 | 2  |
|                           | V1          | 5.18                 | 2    | 238                          | 3.64               | 28.88      | 90                     | 11.18                                                     |                                       |      |                              |            |                                                           |               |      |  | 4.30 | 5  |
|                           | V2          | 2.83                 | 7    | 170                          | 2.95               | 26.58      | 75                     | 3.18                                                      |                                       |      |                              |            |                                                           |               |      |  | 4.90 | 3  |
|                           | V3          | 5.78                 | 1    | 251                          | 3.10               | 28.72      | 88                     | 12.59                                                     |                                       |      |                              |            |                                                           |               |      |  | 4.67 | 4  |
|                           | V4          |                      |      |                              |                    |            |                        |                                                           |                                       |      |                              |            |                                                           |               |      |  | 3.54 | 9  |
|                           | V5          | 4.65                 | 4    | 226                          | 2.62               | 29.18      | 91                     | 3.18                                                      |                                       |      |                              |            |                                                           |               |      |  | 6.49 | 1  |
|                           | N at same V | NS                   |      | NS                           | NS                 | NS         | NS                     |                                                           |                                       |      |                              |            |                                                           |               |      |  |      |    |
|                           | V at same N | NS                   |      | NS                           | NS                 | NS         | NS                     |                                                           |                                       |      |                              |            |                                                           |               |      |  |      |    |
| Means of N levels:        |             |                      |      |                              |                    |            |                        |                                                           |                                       |      |                              |            |                                                           |               |      |  |      |    |
|                           | F1          | 3.97                 | 2    | 211                          | 2.66               | 28.43      | 85                     |                                                           |                                       |      |                              | 3.94       | 2                                                         |               |      |  |      |    |
|                           | F2          | 4.61                 | 1    | 221                          | 3.08               | 28.34      | 86                     | 7.53                                                      |                                       |      |                              | 4.63       | 1                                                         |               |      |  |      |    |
|                           | C.D.(0.05)  | 0.24                 |      | 8.43                         | 0.37               | NS         | NS                     |                                                           |                                       |      |                              |            |                                                           |               |      |  |      |    |
|                           | C.V.(%)     | 3.22                 |      | 2.22                         | 7.35               | 1.05       | 0.83                   |                                                           |                                       |      |                              |            |                                                           |               |      |  |      |    |
| Mean of varieties:        |             |                      |      |                              |                    |            |                        |                                                           |                                       |      |                              |            |                                                           |               |      |  |      |    |
|                           | V1          | 4.71                 | 2    | 233                          | 3.24               | 28.74      | 90.00                  | 11.18                                                     |                                       |      |                              | 4.02       | 4                                                         |               |      |  |      |    |
|                           | V2          | 2.70                 | 4    | 166                          | 2.83               | 26.66      | 75.00                  | 3.18                                                      |                                       |      |                              | 4.42       | 2                                                         |               |      |  |      |    |
|                           | V3          | 5.25                 | 1    | 246                          | 2.92               | 28.94      | 87.67                  | 12.59                                                     |                                       |      |                              | 4.38       | 3                                                         |               |      |  |      |    |
|                           | V4          |                      |      |                              |                    |            |                        |                                                           |                                       |      |                              | 3.36       | 5                                                         |               |      |  |      |    |
|                           | V5          | 4.52                 | 3    | 220                          | 2.49               | 29.21      | 91.00                  | 3.18                                                      |                                       |      |                              | 5.82       | 1                                                         |               |      |  |      |    |
|                           | C.D.(0.05)  | 0.28                 |      | 7.96                         | 0.25               | 0.59       | 1.26                   |                                                           |                                       |      |                              |            |                                                           |               |      |  |      |    |
|                           | C.V.(%)     | 5.25                 |      | 2.93                         | 6.96               | 1.64       | 1.17                   |                                                           |                                       |      |                              |            |                                                           |               |      |  |      |    |
|                           | Expt. Mean  | 4.29                 |      | 216                          | 2.87               | 28.38      | 86                     |                                                           |                                       |      |                              |            |                                                           |               |      |  |      |    |
|                           | Soil type   | Silty Clay Loam      |      |                              |                    |            |                        |                                                           |                                       |      |                              |            |                                                           |               |      |  |      |    |
|                           | pH          | 5.60                 |      |                              |                    |            |                        |                                                           |                                       |      |                              |            |                                                           |               |      |  |      |    |
| Fertilizer levels (kg/ha) |             |                      |      |                              |                    |            |                        |                                                           |                                       |      |                              |            |                                                           |               |      |  |      |    |
|                           | F1          | 45:20:20             |      |                              |                    |            |                        |                                                           |                                       |      |                              |            |                                                           |               |      |  |      |    |
|                           | F2          | 90:40:40             |      |                              |                    |            |                        |                                                           |                                       |      |                              |            |                                                           |               |      |  |      |    |
| Varieties                 |             |                      |      |                              |                    |            |                        |                                                           |                                       |      |                              |            |                                                           |               |      |  |      |    |
|                           | V1          | IET 26565            |      |                              |                    |            |                        |                                                           |                                       |      |                              |            |                                                           |               |      |  |      |    |
|                           | V2          | Shalimar Rice-3      |      |                              |                    |            |                        |                                                           |                                       |      |                              |            |                                                           |               |      |  |      |    |
|                           | V3          | Vivekdhan-86         |      |                              |                    |            |                        |                                                           |                                       |      |                              |            |                                                           |               |      |  |      |    |
|                           | V4          | -                    |      |                              |                    |            |                        |                                                           |                                       |      |                              |            |                                                           |               |      |  |      |    |
|                           | V5          | HPR1068(Local Check) |      |                              |                    |            |                        |                                                           |                                       |      |                              |            |                                                           |               |      |  |      |    |
| Available NPK (kg/ha)     |             | 301:44.8:225         |      |                              |                    |            |                        |                                                           |                                       |      |                              |            |                                                           |               |      |  |      |    |

Table-4.1(b): Summary of data on grain yield and ancillary character of selected NMT- medium hill (irrigated) cultures grown under transplanted conditions at graded levels of recommended nutrient(NPK) doses, kharif 2018.

| Fertilizer-levels         | Varieties | ALMORA             |      |                              |                    |              |                        |                                                           | KHUDWANI           |      |                               |                    |              |                        |                                                           |
|---------------------------|-----------|--------------------|------|------------------------------|--------------------|--------------|------------------------|-----------------------------------------------------------|--------------------|------|-------------------------------|--------------------|--------------|------------------------|-----------------------------------------------------------|
|                           |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test Wt(g)   | Days for 50% flowering | Nutrient res. (kg grain/kg Nutrient) (Base level 50% RDF) | Grain Yield (t/ha) | Rank | Panicle /m <sup>2</sup> (No.) | Panicle Weight (g) | Test Wt(g)   | Days for 50% flowering | Nutrient res. (kg grain/kg Nutrient) (Base level 50% RDF) |
| F1 - 50% RFD              | V1        | 3.48               | 8    | 258                          | 3.67               | 25.43        | 101                    |                                                           | 4.71               | 7    | 339                           | 2.30               | 28.99        | 114                    |                                                           |
|                           | V2        | 3.71               | 5    | 268                          | 3.79               | 26.39        | 109                    |                                                           | 5.04               | 6    | 362                           | 2.20               | 26.48        | 108                    |                                                           |
|                           | V3        | 4.05               | 1    | 267                          | 3.75               | 24.05        | 102                    |                                                           | 5.06               | 5    | 374                           | 2.53               | 26.78        | 116                    |                                                           |
|                           | V4        |                    |      |                              |                    |              |                        |                                                           | 4.41               | 8    | 300                           | 2.71               | 26.37        | 111                    |                                                           |
|                           | V5        | 3.55               | 7    | 276                          | 3.63               | 25.64        | 103                    |                                                           | 1.87               | 11   | 193                           | 1.85               | 30.66        | 118                    |                                                           |
|                           | V6        |                    |      |                              |                    |              |                        |                                                           | 5.63               | 4    | 373                           | 2.74               | 26.37        | 99                     |                                                           |
| F2 - 100% RFD             | V1        | 4.05               | 1    | 259                          | 3.88               | 26.59        | 105                    | 5.70                                                      | 4.27               | 9    | 339                           | 2.30               | 27.37        | 116                    | -4.19                                                     |
|                           | V2        | 3.81               | 4    | 281                          | 3.68               | 25.05        | 109                    | 1.00                                                      | 7.65               | 3    | 418                           | 2.51               | 26.26        | 110                    | 24.86                                                     |
|                           | V3        | 3.84               | 3    | 273                          | 3.84               | 26.38        | 104                    | -2.10                                                     | 7.76               | 2    | 424                           | 2.55               | 28.68        | 118                    | 25.71                                                     |
|                           | V4        |                    |      |                              |                    |              |                        |                                                           | 3.96               | 10   | 305                           | 3.47               | 30.76        | 113                    | -4.29                                                     |
|                           | V5        | 3.57               | 6    | 259                          | 3.71               | 25.63        | 105                    | 0.20                                                      | 1.47               | 12   | 229                           | 2.43               | 0.00         | 100                    | -3.81                                                     |
|                           | V6        |                    |      |                              |                    |              |                        |                                                           | 8.21               | 1    | 384                           | 3.27               | 0.00         | 100                    | 24.57                                                     |
| <b>Interaction</b>        |           |                    |      |                              |                    |              |                        |                                                           |                    |      |                               |                    |              |                        |                                                           |
| <i>N at same V</i>        |           | 0.24               |      | NS                           | NS                 | NS           | NS                     |                                                           | 0.72               |      | NS                            | NS                 | 1.52         | 3.04                   |                                                           |
| <i>V at same N</i>        |           | 0.26               |      | NS                           | NS                 | NS           | NS                     |                                                           | 0.78               |      | NS                            | NS                 | 1.96         | 3.00                   |                                                           |
| <b>Means of N levels:</b> |           |                    |      |                              |                    |              |                        |                                                           |                    |      |                               |                    |              |                        |                                                           |
| F1                        |           | 3.70               | 2    | 267                          | 3.71               | 25.38        | 104                    |                                                           | 4.45               | 2    | NS                            | 0.19               | 1.77         | NS                     |                                                           |
| F2                        |           | 3.82               | 1    | 268                          | 3.78               | 25.91        | 106                    | 1.20                                                      | 5.55               | 1    | 6.29                          | 5.24               | 5.32         | 0.92                   | 10.48                                                     |
| <b>C.D.(0.05)</b>         |           | NS                 |      | NS                           | NS                 | NS           | NS                     |                                                           | 0.54               |      | NS                            |                    | 0.03         |                        |                                                           |
| <b>C.V.(%)</b>            |           | 3.18               |      | 4.13                         | 2.96               | 1.93         | 2.56                   |                                                           | 7.48               |      | 12.87                         |                    | 0.07         |                        |                                                           |
| <b>Mean of varieties:</b> |           |                    |      |                              |                    |              |                        |                                                           |                    |      |                               |                    |              |                        |                                                           |
| V1                        |           | 3.77               | 2    | 259                          | 3.78               | 26.01        | 103                    | 5.70                                                      | 4.49               | 4    | 339                           | 2.30               | 28.18        | 115                    | -4.19                                                     |
| V2                        |           | 3.76               | 3    | 275                          | 3.74               | 25.72        | 109                    | 1.00                                                      | 6.35               | 3    | 390                           | 2.36               | 26.37        | 109                    | 24.86                                                     |
| V3                        |           | 3.95               | 1    | 270                          | 3.80               | 25.22        | 103                    | -2.10                                                     | 6.41               | 2    | 399                           | 2.54               | 27.73        | 117                    | 25.71                                                     |
| V4                        |           |                    |      |                              |                    |              |                        |                                                           | 4.19               | 5    | 303                           | 3.09               | 28.57        | 112                    | -4.29                                                     |
| V5                        |           | 3.56               | 4    | 268                          | 3.67               | 25.64        | 104                    | 0.20                                                      | 1.67               | 6    | 211                           | 2.14               | 15.33        | 109                    | -3.81                                                     |
| V6                        |           |                    |      |                              |                    |              |                        |                                                           | 6.92               | 1    | 379                           | 3.01               | 13.19        | 99                     | 24.57                                                     |
| <b>C.D.(0.05)</b>         |           | 0.17               |      | NS                           | NS                 | NS           | 2.14                   |                                                           | 0.51               |      | 31.81                         | 0.35               | 1.08         | 2.15                   |                                                           |
| <b>C.V.(%)</b>            |           | 3.56               |      | 7.62                         | 2.76               | 4.10         | 1.62                   |                                                           | 8.46               |      | 7.84                          | 11.22              | 3.84         | 1.62                   |                                                           |
| <b>Expt. Mean</b>         |           | <b>3.76</b>        |      | <b>268</b>                   | <b>3.74</b>        | <b>25.65</b> | <b>105</b>             |                                                           | <b>5.00</b>        |      | <b>337</b>                    | <b>2.57</b>        | <b>23.23</b> | <b>110</b>             |                                                           |
| Soil type                 |           | -                  |      |                              |                    |              |                        |                                                           | Sandy clay loam    |      |                               |                    |              |                        |                                                           |
| pH                        |           | 7.30               |      |                              |                    |              |                        |                                                           | 6.90               |      |                               |                    |              |                        |                                                           |

Table 4.1(b): Contd.

|                           |           | ALMORA             |      |                  |                    |            |                        |                                                           | KHUDWANI                      |      |                   |                    |            |                        |                                                           |
|---------------------------|-----------|--------------------|------|------------------|--------------------|------------|------------------------|-----------------------------------------------------------|-------------------------------|------|-------------------|--------------------|------------|------------------------|-----------------------------------------------------------|
| Fertilizer-levels         | Varieties | Grain Yield (t/ha) | Rank | Panicle/m² (No.) | Panicle Weight (g) | Test Wt(g) | Days for 50% flowering | Nutrient res. (kg grain/kg Nutrient) (Base level 50% RDF) | Grain Yield (t/ha)            | Rank | Panicle /m² (No.) | Panicle Weight (g) | Test Wt(g) | Days for 50% flowering | Nutrient res. (kg grain/kg Nutrient) (Base level 50% RDF) |
| Fertilizer levels (kg/ha) |           |                    |      |                  |                    |            |                        |                                                           |                               |      |                   |                    |            |                        |                                                           |
| F1                        |           | 50:30:20           |      |                  |                    |            |                        |                                                           | 60:30:15                      |      |                   |                    |            |                        |                                                           |
| F2                        |           | 100:60:40          |      |                  |                    |            |                        |                                                           | 120:60:30                     |      |                   |                    |            |                        |                                                           |
| Varieties                 |           |                    |      |                  |                    |            |                        |                                                           |                               |      |                   |                    |            |                        |                                                           |
| V1                        |           | IET 26579          |      |                  |                    |            |                        |                                                           | IET 26579                     |      |                   |                    |            |                        |                                                           |
| V2                        |           | IET 26594          |      |                  |                    |            |                        |                                                           | IET 26594                     |      |                   |                    |            |                        |                                                           |
| V3                        |           | IET 25838          |      |                  |                    |            |                        |                                                           | IET 25838                     |      |                   |                    |            |                        |                                                           |
| V4                        |           | -                  |      |                  |                    |            |                        |                                                           | Vivekdhan-62                  |      |                   |                    |            |                        |                                                           |
| V5                        |           | V L Dhan-65 (N)    |      |                  |                    |            |                        |                                                           | V L Dhan-65 (N)               |      |                   |                    |            |                        |                                                           |
| V6                        |           | -                  |      |                  |                    |            |                        |                                                           | Local check - Shalimar Rice 1 |      |                   |                    |            |                        |                                                           |
| Available NPK in Soil     |           | 311:12.18:234      |      |                  |                    |            |                        |                                                           | 205:11.5:212                  |      |                   |                    |            |                        |                                                           |

Table 4.1(b) (Contd...)

| Fertilizer-levels  | Varieties | MALAN              |      |                              |                    |            |                        |                                                           | UPPER SHILLONG     |      |                              |                    |                                                           |
|--------------------|-----------|--------------------|------|------------------------------|--------------------|------------|------------------------|-----------------------------------------------------------|--------------------|------|------------------------------|--------------------|-----------------------------------------------------------|
|                    |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test Wt(g) | Days for 50% flowering | Nutrient res. (kg grain/kg Nutrient) (Base level 50% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Nutrient res. (kg grain/kg Nutrient) (Base level 50% RDF) |
| F1 - 50% RDF       | V1        | 4.89               | 3    | 217                          | 2.59               | 25.76      | 88                     |                                                           | 0.90               | 4    | 105                          | 1.79               |                                                           |
|                    | V2        | 4.52               | 6    | 248                          | 2.49               | 26.71      | 88                     |                                                           |                    |      |                              |                    |                                                           |
|                    | V3        | 3.59               | 11   | 243                          | 2.70               | 27.17      | 92                     |                                                           |                    |      |                              |                    |                                                           |
|                    | V4        | 3.56               | 12   | 178                          | 2.56               | 27.15      | 93                     |                                                           |                    |      |                              |                    |                                                           |
|                    | V5        | 4.65               | 5    | 220                          | 2.81               | 25.37      | 94                     |                                                           |                    |      |                              |                    |                                                           |
|                    | V6        | 3.60               | 10   | 214                          | 2.18               | 26.97      | 87                     |                                                           |                    |      |                              |                    |                                                           |
| F2 - 100% RDF      | V1        | 5.72               | 1    | 288                          | 2.86               | 29.51      | 88                     | 9.76                                                      | 2.03               | 2    | 144                          | 2.17               |                                                           |
|                    | V2        | 4.87               | 4    | 272                          | 2.75               | 26.99      | 86                     | 4.12                                                      | 1.60               | 3    | 136                          | 2.85               | 8.75                                                      |
|                    | V3        | 4.05               | 7    | 261                          | 2.91               | 29.71      | 92                     | 5.41                                                      |                    |      |                              |                    |                                                           |
|                    | V4        | 3.88               | 9    | 185                          | 2.81               | 27.46      | 94                     | 3.76                                                      |                    |      |                              |                    |                                                           |
|                    | V5        | 4.96               | 2    | 260                          | 2.88               | 25.50      | 94                     | 3.65                                                      |                    |      |                              |                    |                                                           |
|                    | V6        | 3.94               | 8    | 231                          | 2.30               | 27.65      | 87                     | 4.00                                                      | 2.53               | 1    | 182                          | 3.33               | 6.25                                                      |
| Interaction        |           |                    |      |                              |                    |            |                        |                                                           |                    |      |                              |                    |                                                           |
| N at same V        |           | NS                 |      | 9.11                         | NS                 | 1.05       | NS                     |                                                           | NS                 |      | NS                           | NS                 |                                                           |
| V at same N        |           | NS                 |      | 9.48                         | NS                 | 1.58       | NS                     |                                                           | NS                 |      | NS                           | NS                 |                                                           |
| Means of N levels: |           |                    |      |                              |                    |            |                        |                                                           |                    |      |                              |                    |                                                           |
| F1                 |           | 4.14               | 2    | 220                          | 2.56               | 26.52      | 85                     |                                                           | 1.47               | 2    | 124                          | 1.98               |                                                           |
| F2                 |           | 4.57               | 1    | 250                          | 2.75               | 27.80      | 86                     | 5.12                                                      | 2.07               | 1    | 159                          | 3.09               | 7.50                                                      |
| C.D.(0.05)         |           | 0.32               |      | 5.80                         | 0.08               | NS         | NS                     |                                                           | 0.12               |      | 9.38                         | 0.21               |                                                           |
| C.V.(%)            |           | 5.15               |      | 1.72                         | 2.10               | 4.15       | 0.92                   |                                                           | 2.83               |      | 2.67                         | 3.26               |                                                           |
| Mean of varieties: |           |                    |      |                              |                    |            |                        |                                                           |                    |      |                              |                    |                                                           |
| V1                 |           | 5.31               | 1    | 253                          | 2.73               | 27.64      | 88                     | 9.76                                                      |                    |      |                              |                    |                                                           |
| V2                 |           | 4.70               | 3    | 260                          | 2.62               | 26.85      | 86                     | 4.12                                                      | 1.25               | 2    | 120                          | 2.32               | 8.75                                                      |
| V3                 |           | 3.82               | 4    | 252                          | 2.81               | 28.44      | 92                     | 5.41                                                      |                    |      |                              |                    |                                                           |
| V4                 |           | 3.72               | 6    | 182                          | 2.69               | 27.31      | 94                     | 3.76                                                      |                    |      |                              |                    |                                                           |
| V5                 |           | 4.81               | 2    | 240                          | 2.85               | 25.44      | 94                     | 3.65                                                      |                    |      |                              |                    |                                                           |
| V6                 |           | 3.77               | 5    | 223                          | 2.24               | 27.31      | 87                     | 4.00                                                      | 2.28               | 1    | 163                          | 2.75               | 6.25                                                      |
| C.D.(0.05)         |           | 0.17               |      | 6.44                         | 0.11               | 0.75       | 1.34                   |                                                           | 0.07               |      | 9.64                         | 0.24               |                                                           |
| C.V.(%)            |           | 3.24               |      | 2.28                         | 3.48               | 2.28       | 1.24                   |                                                           | 3.65               |      | 6.64                         | 9.26               |                                                           |
| Expt. Mean         |           | 4.35               |      | 235                          | 2.65               | 27.16      | 90                     |                                                           | 1.77               |      | 142                          | 2.54               |                                                           |
| Soil type          |           | Silty Clay Loam    |      |                              |                    |            |                        |                                                           | -                  |      |                              |                    |                                                           |
| pH                 |           | 5.80               |      |                              |                    |            |                        |                                                           | -                  |      |                              |                    |                                                           |

Table 4.1(b) (Contd...)

| Fertilizer-levels         | Varieties | MALAN                 |      |                  |                    |            |                        |                                                           | UPPER SHILLONG      |      |                  |                    |                                                           |
|---------------------------|-----------|-----------------------|------|------------------|--------------------|------------|------------------------|-----------------------------------------------------------|---------------------|------|------------------|--------------------|-----------------------------------------------------------|
|                           |           | Grain Yield (t/ha)    | Rank | Panicle/m² (No.) | Panicle Weight (g) | Test Wt(g) | Days for 50% flowering | Nutrient res. (kg grain/kg Nutrient) (Base level 50% RDF) | Grain Yield (t/ha)  | Rank | Panicle/m² (No.) | Panicle Weight (g) | Nutrient res. (kg grain/kg Nutrient) (Base level 50% RDF) |
| Fertilizer levels (kg/ha) |           |                       |      |                  |                    |            |                        |                                                           |                     |      |                  |                    |                                                           |
| F1                        |           | 45:20:20              |      |                  |                    |            |                        |                                                           | 30:30:20            |      |                  |                    |                                                           |
| F2                        |           | 90:40:40              |      |                  |                    |            |                        |                                                           | 60:60:40            |      |                  |                    |                                                           |
| Varieties                 |           |                       |      |                  |                    |            |                        |                                                           |                     |      |                  |                    |                                                           |
| V1                        |           | IET 26579             |      |                  |                    |            |                        |                                                           | -                   |      |                  |                    |                                                           |
| V2                        |           | IET 26594             |      |                  |                    |            |                        |                                                           | IET 26594           |      |                  |                    |                                                           |
| V3                        |           | IET 25838             |      |                  |                    |            |                        |                                                           | -                   |      |                  |                    |                                                           |
| V4                        |           | Vivekdhan-62          |      |                  |                    |            |                        |                                                           | -                   |      |                  |                    |                                                           |
| V5                        |           | V L Dhan-65 (N)       |      |                  |                    |            |                        |                                                           | -                   |      |                  |                    |                                                           |
| V6                        |           | Local Check(HPR 2143) |      |                  |                    |            |                        |                                                           | Local Check (MEG-1) |      |                  |                    |                                                           |
| Available NPK in Soil     |           | 324:42.5:355          |      |                  |                    |            |                        |                                                           | NA:6.72:246         |      |                  |                    |                                                           |

Table 4.1(b) (Contd...)

| Fertilizer-levels         | Varieties | WANGBAL            |      |                              |                    |                                                           | Over All Mean | Rank |
|---------------------------|-----------|--------------------|------|------------------------------|--------------------|-----------------------------------------------------------|---------------|------|
|                           |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Nutrient res. (kg grain/kg Nutrient) (Base level 50% RDF) |               |      |
| F1 - 50% RFD              | V1        | 3.75               | 4    | 295                          | 7.20               |                                                           | 4.21          | 4    |
|                           | V2        | 5.00               | 1    | 350                          | 7.10               |                                                           | 3.83          | 9    |
|                           | V3        | 3.13               | 5    | 280                          | 7.50               |                                                           | 3.96          | 7    |
|                           | V4        |                    |      |                              |                    |                                                           | 3.99          | 6    |
|                           | V5        | 5.00               | 1    | 260                          | 7.20               |                                                           | 3.77          | 10   |
|                           | V6        |                    |      |                              |                    |                                                           | 3.75          | 11   |
| F2 - 100% RFD             | V1        | 2.29               | 7    | 280                          | 7.00               | -16.20                                                    | 4.08          | 5    |
|                           | V2        | 4.17               | 3    | 280                          | 7.00               | -9.26                                                     | 4.42          | 3    |
|                           | V3        | 2.50               | 6    | 280                          | 7.20               | -6.94                                                     | 4.54          | 2    |
|                           | V4        |                    |      |                              |                    |                                                           | 3.92          | 8    |
|                           | V5        | 1.88               | 8    | 285                          | 7.30               | -34.72                                                    | 2.97          | 12   |
|                           | V6        |                    |      |                              |                    |                                                           | 4.89          | 1    |
| <b>Interaction</b>        |           |                    |      |                              |                    |                                                           |               |      |
| <i>N at same V</i>        |           |                    |      |                              |                    |                                                           |               |      |
| <i>V at same N</i>        |           |                    |      |                              |                    |                                                           |               |      |
| <b>Means of N levels:</b> |           |                    |      |                              |                    |                                                           |               |      |
|                           | F1        | 4.22               | 1    | 296                          | 7.25               |                                                           | 3.59          | 2    |
|                           | F2        | 2.71               | 2    | 281                          | 7.13               | -16.78                                                    | 3.74          | 1    |
| <b>C.D.(0.05)</b>         |           |                    |      |                              |                    |                                                           |               |      |
| <b>C.V.(%)</b>            |           |                    |      |                              |                    |                                                           |               |      |
| <b>Mean of varieties:</b> |           |                    |      |                              |                    |                                                           |               |      |
|                           | V1        | 3.02               | 3    | 288                          | 7.10               | -16.20                                                    | 4.15          | 3    |
|                           | V2        | 4.58               | 1    | 315                          | 7.05               | -9.26                                                     | 4.13          | 4    |
|                           | V3        | 2.81               | 4    | 280                          | 7.35               | -6.94                                                     | 4.25          | 2    |
|                           | V4        |                    |      |                              |                    |                                                           | 3.95          | 5    |
|                           | V5        | 3.44               | 2    | 273                          | 7.25               | -34.72                                                    | 3.37          | 6    |
|                           | V6        |                    |      |                              |                    |                                                           | 4.32          | 1    |
| <b>C.D.(0.05)</b>         |           |                    |      |                              |                    |                                                           |               |      |
| <b>C.V.(%)</b>            |           |                    |      |                              |                    |                                                           |               |      |
| <b>Expt. Mean</b>         |           | <b>3.46</b>        |      | <b>289</b>                   | <b>7.19</b>        |                                                           |               |      |
| Soil type                 |           | Silty Clay Loam    |      |                              |                    |                                                           |               |      |
| pH                        |           | 5.60               |      |                              |                    |                                                           |               |      |

Table 4.1(b) (Contd...)

| Fertilizer-levels         | Varieties             | WANGBAL            |      |                              |                    |                                                           | Over All Mean | Rank |
|---------------------------|-----------------------|--------------------|------|------------------------------|--------------------|-----------------------------------------------------------|---------------|------|
|                           |                       | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Nutrient res. (kg grain/kg Nutrient) (Base level 50% RDF) |               |      |
| Fertilizer levels (kg/ha) |                       |                    |      |                              |                    |                                                           |               |      |
|                           | F1                    | 40:30:20           |      |                              |                    |                                                           |               |      |
|                           | F2                    | 80:60:40           |      |                              |                    |                                                           |               |      |
|                           | Varieties             |                    |      |                              |                    |                                                           |               |      |
|                           | V1                    | IET 26579          |      |                              |                    |                                                           |               |      |
|                           | V2                    | IET 26594          |      |                              |                    |                                                           |               |      |
|                           | V3                    | IET 25838          |      |                              |                    |                                                           |               |      |
|                           | V4                    | -                  |      |                              |                    |                                                           |               |      |
|                           | V5                    | V L Dhan-65 (N)    |      |                              |                    |                                                           |               |      |
|                           | V6                    | -                  |      |                              |                    |                                                           |               |      |
|                           | Available NPK in Soil | -                  |      |                              |                    |                                                           |               |      |

**NMT 1(c) Early (Transplanted)**

Five AVT-2 entries (IET 26767, IET 26803, IET 26477, IET 24914, and IET 25713) were evaluated for their response to low and optimum level of nutrients on grain yield in comparison to standard varieties i.e. Sahbhagidhan, Vandana, Govind, NDR-97, Varalu, CR Dhan 201 and local checks at thirteen locations viz. **Chiplima, Faizabad (100:60:40), Ghaghraghat (120:60:40), Jagdalpur (80:50:30), Mandya (100:50:50), Nagina (120:60:40), Puducherry (120:40:40), Ranchi (60:30:20) Rewa (100:60:40), Sabour (100:40:20), Vadgaon (100:50:50), Varanasi (120:60:60) and Maruteru (90:60:60)** The experiments were arranged in a split plot design at all the locations. The treatments were two levels of fertilizer input (50% and 100% RDF) as main plot and varieties assigned to sub plots. The data received from these locations are summarized and presented in **Table 4.1(c)**.

Different doses of RDF (50% and 100%) exhibited significant differences in grain yield at most of the locations except **Ghagharaghat, Jagdalpur, Mandya, Ranchi and Sabour**. Grain yield increased with increasing level of input from 50% to 100% RFD. Application of 100% NPK recorded significantly higher yield at **Faizabad** (3.98 t/ha), **Chiplima** (3.83 t/h), **Nagina** (4.33 t/ha), **Puducherry** (6.87 t/ha), **Rewa** (5.17 t/ha) and **Maruteru** (5.18 t/ha). Nutrient response (kg grain / kg nutrient) was higher at 100 % RDF at **Chiplima** (5.30), **Mandya** (7.10), **Nagina** (16.52), Ranchi (6.73) **Rewa** (6.93) and **Maruteru** (5.95 t/ha) compared to 50% NPK. Negative nutrient response (kg grain /kg NPK) at 100% NPK was recorded at **Jagdalpur** (-1.83)

Grain yield differences among the tested genotypes were significant at all the locations except **Chiplima** and **Maruteru**. Significant mean maximum yield was recorded by IET 25713 at **Faizabad** (4.69 t/ha), **Jagdalpur** (10.29 t/ha), **Vadgaon** (4.70 t/ha) and **Varanasi**; IET 24914 at **Mandya** (6.96 t/ha), IET 26767 at **Nagina** (3.89 t/ha) and **Puducherry** (7.17 t/ha); IET 26477 at **Sabour** (5.21 t/ha). Mean over the locations, the performance of IET 25713 (5.13 t/ha) followed by IET 26477 (5.05 t/ha) were promising over Sahbhagidhan (4.41 t/ha) and Govind (4.13 t/ha). Interaction effects of nutrient levels x cultivars on grain yield was non-significant at all locations.

In this trial, recommended input of nutrients (100% RDF) was found to be promising with 13.52% higher grain yield and also exhibited higher nutrient efficiency. IET 25713 and IET 26477 recorded higher grain yield of 5.13 and 5.05 t/ha, respectively were the promising entries as compared to standard and local checks.

Table 4.1(C): Summary of data on grain yield and ancillary characters of selected NMT Early (TP) cultures grown under transplanted conditions at low and medium recommended fertilizer doses, kharif 2019.

| F-levels                    | Varieties | CHIPLIMA           |      |                              |                    |                 |                    |                                                       | FAIZABAD           |      |                              |                    |                 |                    |                                                       |
|-----------------------------|-----------|--------------------|------|------------------------------|--------------------|-----------------|--------------------|-------------------------------------------------------|--------------------|------|------------------------------|--------------------|-----------------|--------------------|-------------------------------------------------------|
|                             |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test weight (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test weight (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) |
| F1: Low input (50% NPK)     | V1        | 3.56               | 10   | 193                          | 6.20               | 24.67           | 99                 |                                                       | 4.22               | 6    | 256                          | 3.29               | 23.77           | 85                 |                                                       |
|                             | V2        | -                  |      | -                            | -                  | -               | -                  |                                                       | -                  |      | -                            | -                  | -               | -                  |                                                       |
|                             | V3        | 3.55               | 11   | 164                          | 6.87               | 26.33           | 93                 |                                                       | 4.52               | 3    | 253                          | 3.56               | 23.97           | 84                 |                                                       |
|                             | V4        | 3.19               | 14   | 180                          | 6.27               | 25.33           | 94                 |                                                       | 4.15               | 7    | 255                          | 3.23               | 22.60           | 85                 |                                                       |
|                             | V5        | 3.53               | 12   | 176                          | 8.40               | 23.00           | 98                 |                                                       | 4.51               | 4    | 255                          | 3.31               | 23.40           | 85                 |                                                       |
|                             | V6        | 3.85               | 4    | 205                          | 4.77               | 30.67           | 99                 |                                                       | 2.90               | 16   | 257                          | 2.90               | 20.40           | 81                 |                                                       |
|                             | V7        | -                  |      | -                            | -                  | -               | -                  |                                                       | -                  |      | -                            | -                  | -               | -                  |                                                       |
|                             | V8        | 3.08               | 16   | 174                          | 4.47               | 24.33           | 87                 |                                                       | 3.16               | 14   | 253                          | 2.82               | 21.43           | 79                 |                                                       |
|                             | V9        | -                  |      | -                            | -                  | -               | -                  |                                                       | -                  |      | -                            | -                  | -               | -                  |                                                       |
|                             | V10       | 3.32               | 13   | 220                          | 4.10               | 25.33           | 86                 |                                                       | 3.33               | 12   | 257                          | 2.65               | 22.33           | 83                 |                                                       |
|                             | V11       | -                  |      | -                            | -                  | -               | -                  |                                                       | -                  |      | -                            | -                  | -               | -                  |                                                       |
|                             | V12       | 3.15               | 15   | 184                          | 4.63               | 24.67           | 85                 |                                                       | 3.26               | 13   | 255                          | 3.62               | 23.63           | 81                 |                                                       |
| F2: Medium input (100% NPK) | V1        | 3.77               | 5    | 231                          | 6.84               | 22.00           | 100                | 2.63                                                  | 4.45               | 5    | 266                          | 3.24               | 25.67           | 85                 | 2.30                                                  |
|                             | V2        | -                  |      | -                            | -                  | -               | -                  |                                                       | -                  |      | -                            | -                  | -               | -                  |                                                       |
|                             | V3        | 3.89               | 3    | 208                          | 7.30               | 23.67           | 94                 | 4.25                                                  | 4.55               | 2    | 267                          | 4.13               | 26.23           | 87                 | 0.30                                                  |
|                             | V4        | 3.74               | 7    | 196                          | 7.73               | 23.33           | 94                 | 6.88                                                  | 4.08               | 8    | 267                          | 3.65               | 23.47           | 86                 | -0.70                                                 |
|                             | V5        | 3.75               | 6    | 196                          | 9.33               | 25.67           | 101                | 2.75                                                  | 4.87               | 1    | 264                          | 3.09               | 24.43           | 86                 | 3.60                                                  |
|                             | V6        | 4.08               | 1    | 238                          | 5.39               | 25.00           | 100                | 2.88                                                  | 3.13               | 15   | 263                          | 3.00               | 22.40           | 81                 | 2.30                                                  |
|                             | V7        | -                  |      | -                            | -                  | -               | -                  |                                                       | -                  |      | -                            | -                  | -               | -                  |                                                       |
|                             | V8        | 3.69               | 9    | 249                          | 5.50               | 24.33           | 88                 | 7.63                                                  | 3.43               | 10   | 268                          | 3.01               | 24.57           | 77                 | 2.70                                                  |
|                             | V9        | -                  |      | -                            | -                  | -               | -                  |                                                       | -                  |      | -                            | -                  | -               | -                  |                                                       |
|                             | V10       | 3.97               | 2    | 243                          | 5.03               | 25.67           | 88                 | 8.13                                                  | 3.39               | 11   | 257                          | 2.78               | 23.77           | 83                 | 0.60                                                  |
|                             | V11       | -                  |      | -                            | -                  | -               | -                  |                                                       | -                  |      | -                            | -                  | -               | -                  |                                                       |
|                             | V12       | 3.73               | 8    | 209                          | 4.40               | 23.33           | 86                 | 7.25                                                  | 3.92               | 9    | 266                          | 3.53               | 25.60           | 85                 | 6.60                                                  |
| Interaction F at same V     |           | NS                 |      | NS                           | NS                 | 1.53            | NS                 |                                                       | NS                 |      | 3.12                         | NS                 | 0.57            | NS                 |                                                       |
| V at same F                 |           | NS                 |      | NS                           | NS                 | 1.55            | NS                 |                                                       | NS                 |      | 3.29                         | NS                 | 0.54            | NS                 |                                                       |
| F1                          |           | 3.40               | 2    | 187                          | 5.71               | 25.54           | 93                 |                                                       | 3.76               | 2    | 255                          | 3.17               | 22.69           | 83                 |                                                       |
| F2                          |           | 3.83               | 1    | 221                          | 6.44               | 24.13           | 94                 | 5.30                                                  | 3.98               | 1    | 265                          | 3.30               | 24.52           | 84                 | 2.21                                                  |
| C.D.(0.05)                  |           | 0.28               |      | 16.28                        | 0.06               | 0.78            | 0.47               |                                                       | 0.19               |      | 1.94                         | NS                 | 0.11            | NS                 |                                                       |
| C.V.(%)                     |           | 6.33               |      | 6.42                         | 0.81               | 2.53            | 0.41               |                                                       | 3.88               |      | 0.60                         | 18.29              | 0.37            | 2.94               |                                                       |

Table 4.1(C): Contd.

| N-<br>levels       | Varieties               | CHIPLIMA                 |      |                                     |                          |                        |                          |                                                             | FAIZABAD                  |          |                                 |                          |                       |                          |                                                             |
|--------------------|-------------------------|--------------------------|------|-------------------------------------|--------------------------|------------------------|--------------------------|-------------------------------------------------------------|---------------------------|----------|---------------------------------|--------------------------|-----------------------|--------------------------|-------------------------------------------------------------|
|                    |                         | Grain<br>Yield<br>(t/ha) | Rank | Panicle<br>/m <sup>2</sup><br>(No.) | Panicle<br>Weight<br>(g) | Test<br>weig<br>ht (g) | Days<br>50%<br>flowering | Nutri. res. (kg<br>grain/kg Nutri.) (Base<br>level 50% RDF) | Grain<br>Yield<br>(t/ha)  | Ran<br>k | Panicle/m <sup>2</sup><br>(No.) | Panicle<br>Weight<br>(g) | Test<br>weight<br>(g) | Days<br>50%<br>flowering | Nutri. res. (kg grain/kg<br>Nutri.) (Base level 50%<br>RDF) |
| Mean of varieties: |                         |                          |      |                                     |                          |                        |                          |                                                             |                           |          |                                 |                          |                       |                          |                                                             |
|                    | V1                      | 3.67                     | 3    | 212                                 | 6.52                     | 23.34                  | 100                      | 2.63                                                        | 4.34                      | 3        | 261                             | 3.27                     | 24.72                 | 85                       | 2.30                                                        |
|                    | V2                      | -                        |      | -                                   | -                        | -                      | -                        |                                                             | -                         |          | -                               | -                        | -                     | -                        |                                                             |
|                    | V3                      | 3.72                     | 2    | 186                                 | 7.09                     | 25.00                  | 94                       | 4.25                                                        | 4.54                      | 2        | 260                             | 3.85                     | 25.10                 | 86                       | 0.30                                                        |
|                    | V4                      | 3.47                     | 6    | 188                                 | 7.00                     | 24.33                  | 94                       | 6.88                                                        | 4.12                      | 4        | 261                             | 3.44                     | 23.04                 | 85                       | -0.70                                                       |
|                    | V5                      | 3.64                     | 5    | 186                                 | 8.87                     | 24.34                  | 100                      | 2.75                                                        | 4.69                      | 1        | 260                             | 3.20                     | 23.92                 | 86                       | 3.60                                                        |
|                    | V6                      | 3.97                     | 1    | 222                                 | 5.08                     | 27.84                  | 99                       | 2.88                                                        | 3.02                      | 8        | 260                             | 2.95                     | 21.40                 | 81                       | 2.30                                                        |
|                    | V7                      | -                        |      | -                                   | -                        | -                      | -                        |                                                             | -                         |          | -                               | -                        | -                     | -                        |                                                             |
|                    | V8                      | 3.39                     | 8    | 211                                 | 4.99                     | 24.33                  | 88                       | 7.63                                                        | 3.30                      | 7        | 261                             | 2.92                     | 23.00                 | 78                       | 2.70                                                        |
|                    | V9                      | -                        |      | -                                   | -                        | -                      | -                        |                                                             | -                         |          | -                               | -                        | -                     | -                        |                                                             |
|                    | V10                     | 3.65                     | 4    | 232                                 | 4.57                     | 25.50                  | 87                       | 8.13                                                        | 3.36                      | 6        | 257                             | 2.72                     | 23.05                 | 83                       | 0.60                                                        |
|                    | V11                     | -                        |      | -                                   | -                        | -                      | -                        |                                                             | -                         |          | -                               | -                        | -                     | -                        |                                                             |
|                    | V12                     | 3.44                     | 7    | 196                                 | 4.52                     | 24.00                  | 85                       | 7.25                                                        | 3.59                      | 5        | 261                             | 3.58                     | 24.62                 | 83                       | 6.60                                                        |
|                    | C.D.(0.05)              | NS                       |      | 16.73                               | 0.43                     | 1.08                   | 1.05                     |                                                             | 0.24                      |          | 2.21                            | 0.34                     | 0.40                  | 1.75                     |                                                             |
|                    | C.V. (%)                | 8.87                     |      | 6.93                                | 6.02                     | 3.68                   | 0.95                     |                                                             | 5.17                      |          | 0.72                            | 8.94                     | 1.45                  | 1.77                     |                                                             |
|                    | Expt. Mean              | 3.62                     |      | 204                                 | 6.08                     | 24.83                  | 93                       |                                                             | 3.87                      |          | 260                             | 3.24                     | 23.60                 | 83                       |                                                             |
|                    | Soil type               | Sandy Loam               |      |                                     |                          |                        |                          |                                                             | -                         |          |                                 |                          |                       |                          |                                                             |
|                    | pH                      | 7.12                     |      |                                     |                          |                        |                          |                                                             | 7.60                      |          |                                 |                          |                       |                          |                                                             |
|                    | N - levels (kg/ha)      |                          |      |                                     |                          |                        |                          |                                                             |                           |          |                                 |                          |                       |                          |                                                             |
|                    | F1                      | 40:20:20                 |      |                                     |                          |                        |                          |                                                             | 50:30:20                  |          |                                 |                          |                       |                          |                                                             |
|                    | F2                      | 80:40:40                 |      |                                     |                          |                        |                          |                                                             | 100:60:40                 |          |                                 |                          |                       |                          |                                                             |
|                    | Recomd N:P:K (kg/ha)    | 80:40:40                 |      |                                     |                          |                        |                          |                                                             | 100:60:40                 |          |                                 |                          |                       |                          |                                                             |
|                    | Varieties               |                          |      |                                     |                          |                        |                          |                                                             |                           |          |                                 |                          |                       |                          |                                                             |
|                    | V1                      | IET 26767                |      |                                     |                          |                        |                          |                                                             | IET 26767                 |          |                                 |                          |                       |                          |                                                             |
|                    | V2                      | -                        |      |                                     |                          |                        |                          |                                                             | -                         |          |                                 |                          |                       |                          |                                                             |
|                    | V3                      | IET 26477                |      |                                     |                          |                        |                          |                                                             | IET 26477                 |          |                                 |                          |                       |                          |                                                             |
|                    | V4                      | IET 24914                |      |                                     |                          |                        |                          |                                                             | IET 24914                 |          |                                 |                          |                       |                          |                                                             |
|                    | V5                      | IET 25713                |      |                                     |                          |                        |                          |                                                             | IET 25713                 |          |                                 |                          |                       |                          |                                                             |
|                    | V6                      | NC- Sahbhagidhan         |      |                                     |                          |                        |                          |                                                             | NC- Sahbhagidhan          |          |                                 |                          |                       |                          |                                                             |
|                    | V7                      | -                        |      |                                     |                          |                        |                          |                                                             | -                         |          |                                 |                          |                       |                          |                                                             |
|                    | V8                      | ZC-Govind (NW)           |      |                                     |                          |                        |                          |                                                             | ZC-Govind (NW)            |          |                                 |                          |                       |                          |                                                             |
|                    | V9                      | -                        |      |                                     |                          |                        |                          |                                                             | -                         |          |                                 |                          |                       |                          |                                                             |
|                    | V10                     | Varalu                   |      |                                     |                          |                        |                          |                                                             | Varalu                    |          |                                 |                          |                       |                          |                                                             |
|                    | V11                     | -                        |      |                                     |                          |                        |                          |                                                             | -                         |          |                                 |                          |                       |                          |                                                             |
|                    | V12                     | Khandagiri (Local Check) |      |                                     |                          |                        |                          |                                                             | Barani Deep (Local check) |          |                                 |                          |                       |                          |                                                             |
|                    | Available N:P:K (kg/ha) | 118.75:40.08:116.93      |      |                                     |                          |                        |                          |                                                             | 200:24:234                |          |                                 |                          |                       |                          |                                                             |

Table 4.1(C): Contd.

| F-levels                    | Varieties | GHAGHRAGHAT        |      |                              |                    |                                                       | JAGDALPUR          |      |                              |                    |                 |                                                       |
|-----------------------------|-----------|--------------------|------|------------------------------|--------------------|-------------------------------------------------------|--------------------|------|------------------------------|--------------------|-----------------|-------------------------------------------------------|
|                             |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test weight (g) | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) |
| F1: Low input (50% NPK)     | V1        | 3.47               | 14   | 190                          | 3.20               |                                                       | 7.26               | 14   | 355                          | 3.39               | 26.93           |                                                       |
|                             | V2        | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -               |                                                       |
|                             | V3        | 3.86               | 5    | 225                          | 3.50               |                                                       | 11.04              | 2    | 314                          | 5.35               | 29.32           |                                                       |
|                             | V4        | 3.94               | 3    | 186                          | 3.47               |                                                       | 8.55               | 7    | 273                          | 3.89               | 30.63           |                                                       |
|                             | V5        | 3.61               | 11   | 213                          | 3.38               |                                                       | 8.95               | 5    | 279                          | 4.67               | 29.98           |                                                       |
|                             | V6        | 3.22               | 15   | 181                          | 2.57               |                                                       | 9.13               | 4    | 340                          | 2.61               | 29.78           |                                                       |
|                             | V7        | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -               |                                                       |
|                             | V8        | 2.69               | 18   | 147                          | 2.60               |                                                       | 7.47               | 13   | 250                          | 3.09               | 27.32           |                                                       |
|                             | V9        | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -               |                                                       |
|                             | V10       | 3.11               | 16   | 154                          | 3.18               |                                                       | 8.43               | 9    | 259                          | 3.49               | 22.90           |                                                       |
|                             | V11       | 4.03               | 1    | 164                          | 2.48               |                                                       | -                  |      | -                            | -                  | -               |                                                       |
|                             | V12       | 3.74               | 7    | 196                          | 3.42               |                                                       | 8.31               | 10   | 329                          | 3.70               | 31.01           |                                                       |
| F2: Medium input (100% NPK) | V1        | 3.64               | 10   | 205                          | 3.30               | 1.55                                                  | 9.15               | 3    | 333                          | 3.06               | 27.33           | 23.63                                                 |
|                             | V2        | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -               |                                                       |
|                             | V3        | 3.72               | 8    | 227                          | 3.57               | -1.27                                                 | 8.46               | 8    | 293                          | 5.85               | 32.47           | -32.25                                                |
|                             | V4        | 4.02               | 2    | 205                          | 3.53               | 0.73                                                  | 8.66               | 6    | 298                          | 4.92               | 29.24           | 1.37                                                  |
|                             | V5        | 3.67               | 9    | 220                          | 3.45               | 0.55                                                  | 11.62              | 1    | 288                          | 5.00               | 30.40           | 33.38                                                 |
|                             | V6        | 3.57               | 12   | 197                          | 2.71               | 3.18                                                  | 7.83               | 12   | 330                          | 2.73               | 29.09           | -16.25                                                |
|                             | V7        | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -               |                                                       |
|                             | V8        | 3.01               | 17   | 167                          | 2.92               | 2.91                                                  | 7.05               | 16   | 312                          | 3.47               | 29.11           | -5.25                                                 |
|                             | V9        | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -               |                                                       |
|                             | V10       | 3.53               | 13   | 176                          | 3.34               | 3.82                                                  | 7.26               | 14   | 301                          | 2.72               | 22.66           | -14.63                                                |
|                             | V11       | 3.84               | 6    | 190                          | 2.57               | -1.73                                                 | -                  |      | -                            | -                  | -               |                                                       |
|                             | V12       | 3.92               | 4    | 202                          | 3.50               | 1.64                                                  | 7.94               | 11   | 332                          | 3.22               | 31.14           | -4.63                                                 |
| Interaction                 |           |                    |      |                              |                    |                                                       |                    |      |                              |                    |                 |                                                       |
| F at same V                 |           | NS                 |      | NS                           | NS                 |                                                       | NS                 |      | NS                           | NS                 | NS              |                                                       |
| V at same F                 |           | NS                 |      | NS                           | NS                 |                                                       | NS                 |      | NS                           | NS                 | NS              |                                                       |
| F1                          |           | 3.52               | 2    | 184                          | 3.09               |                                                       | 8.64               | 1    | 300                          | 3.77               | 28.48           |                                                       |
| F2                          |           | 3.66               | 1    | 199                          | 3.21               | 1.26                                                  | 8.50               | 2    | 311                          | 3.87               | 28.93           | -1.83                                                 |
| C.D.(0.05)                  |           | NS                 |      | NS                           | NS                 |                                                       | NS                 |      | NS                           | NS                 | NS              |                                                       |
| C.V.(%)                     |           | 6.25               |      | 7.54                         | 5.74               |                                                       | 8.15               |      | 11.68                        | 22.86              | 4.10            |                                                       |

Table 4.1(C): Contd.

| N-<br>levels       | Varieties               | GHAGHRAGHAT              |      |                                 |                       |                                                             | JAGDALPUR                |      |                                 |                          |                       |                                                             |
|--------------------|-------------------------|--------------------------|------|---------------------------------|-----------------------|-------------------------------------------------------------|--------------------------|------|---------------------------------|--------------------------|-----------------------|-------------------------------------------------------------|
|                    |                         | Grain<br>Yield<br>(t/ha) | Rank | Panicle/m <sup>2</sup><br>(No.) | Panicle<br>Weight (g) | Nutri. res. (kg<br>grain/kg Nutri.) (Base<br>level 50% RDF) | Grain<br>Yield<br>(t/ha) | Rank | Panicle/m <sup>2</sup><br>(No.) | Panicle<br>Weight<br>(g) | Test<br>weight<br>(g) | Nutri. res. (kg grain/kg<br>Nutri.) (Base level<br>50% RDF) |
| Mean of varieties: |                         |                          |      |                                 |                       |                                                             |                          |      |                                 |                          |                       |                                                             |
|                    | V1                      | 3.56                     | 6    | 198                             | 3.25                  | 1.55                                                        | 8.21                     | 5    | 344                             | 3.23                     | 27.13                 | 23.63                                                       |
|                    | V2                      | -                        |      | -                               | -                     |                                                             | -                        |      | -                               | -                        | -                     |                                                             |
|                    | V3                      | 3.79                     | 4    | 226                             | 3.54                  | -1.27                                                       | 9.75                     | 2    | 303                             | 5.60                     | 30.90                 | -32.25                                                      |
|                    | V4                      | 3.98                     | 1    | 196                             | 3.50                  | 0.73                                                        | 8.61                     | 3    | 286                             | 4.41                     | 29.94                 | 1.37                                                        |
|                    | V5                      | 3.64                     | 5    | 216                             | 3.42                  | 0.55                                                        | 10.29                    | 1    | 284                             | 4.84                     | 30.19                 | 33.38                                                       |
|                    | V6                      | 3.40                     | 7    | 189                             | 2.64                  | 3.18                                                        | 8.48                     | 4    | 335                             | 2.67                     | 29.44                 | -16.25                                                      |
|                    | V7                      | -                        |      | -                               | -                     |                                                             | -                        |      | -                               | -                        | -                     |                                                             |
|                    | V8                      | 2.85                     | 9    | 157                             | 2.76                  | 2.91                                                        | 7.26                     | 8    | 281                             | 3.28                     | 28.22                 | -5.25                                                       |
|                    | V9                      | -                        |      | -                               | -                     |                                                             | -                        |      | -                               | -                        | -                     |                                                             |
|                    | V10                     | 3.32                     | 8    | 165                             | 3.26                  | 3.82                                                        | 7.85                     | 7    | 280                             | 3.11                     | 22.78                 | -14.63                                                      |
|                    | V11                     | 3.94                     | 2    | 177                             | 2.53                  | -1.73                                                       | -                        |      | -                               | -                        | -                     |                                                             |
|                    | V12                     | 3.83                     | 3    | 199                             | 3.46                  | 1.64                                                        | 8.13                     | 6    | 331                             | 3.46                     | 31.08                 | -4.63                                                       |
|                    | C.D.(0.05)              | 0.52                     |      | 22.21                           | 0.16                  |                                                             | 1.43                     |      | NS                              | 0.87                     | 2.09                  |                                                             |
|                    | C.V. (%)                | 12.38                    |      | 9.95                            | 4.40                  |                                                             | 14.14                    |      | 17.83                           | 19.34                    | 6.14                  |                                                             |
|                    | Expt. Mean              | 3.59                     |      | 191                             | 3.15                  |                                                             | 8.57                     |      | 305                             | 3.82                     | 28.71                 |                                                             |
|                    | Soil type               | Sandy Loam               |      |                                 |                       |                                                             | -                        |      |                                 |                          |                       |                                                             |
|                    | pH                      | 8.06                     |      |                                 |                       |                                                             | 6.50                     |      |                                 |                          |                       |                                                             |
|                    | N - levels (kg/ha)      |                          |      |                                 |                       |                                                             |                          |      |                                 |                          |                       |                                                             |
|                    | F1                      | 60:30:20                 |      |                                 |                       |                                                             | 40:25:15                 |      |                                 |                          |                       |                                                             |
|                    | F2                      | 120:60:40                |      |                                 |                       |                                                             | 80:50:30                 |      |                                 |                          |                       |                                                             |
|                    | Recommd N:P:K (kg/ha)   | 120:60:40                |      |                                 |                       |                                                             | 80:50:30                 |      |                                 |                          |                       |                                                             |
|                    | Varieties               |                          |      |                                 |                       |                                                             |                          |      |                                 |                          |                       |                                                             |
|                    | V1                      | IET 26767                |      |                                 |                       |                                                             | IET 26767                |      |                                 |                          |                       |                                                             |
|                    | V2                      | -                        |      |                                 |                       |                                                             | -                        |      |                                 |                          |                       |                                                             |
|                    | V3                      | IET 26477                |      |                                 |                       |                                                             | IET 26477                |      |                                 |                          |                       |                                                             |
|                    | V4                      | IET 24914                |      |                                 |                       |                                                             | IET 24914                |      |                                 |                          |                       |                                                             |
|                    | V5                      | IET 25713                |      |                                 |                       |                                                             | IET 25713                |      |                                 |                          |                       |                                                             |
|                    | V6                      | NC- Sahbhagidhan         |      |                                 |                       |                                                             | NC- Sahbhagidhan         |      |                                 |                          |                       |                                                             |
|                    | V7                      | -                        |      |                                 |                       |                                                             | -                        |      |                                 |                          |                       |                                                             |
|                    | V8                      | ZC-Govind (NW)           |      |                                 |                       |                                                             | ZC-Govind (NW)           |      |                                 |                          |                       |                                                             |
|                    | V9                      | -                        |      |                                 |                       |                                                             | -                        |      |                                 |                          |                       |                                                             |
|                    | V10                     | Varalu                   |      |                                 |                       |                                                             | Varalu                   |      |                                 |                          |                       |                                                             |
|                    | V11                     | CR Dhan 201 (W&S)        |      |                                 |                       |                                                             | -                        |      |                                 |                          |                       |                                                             |
|                    | V12                     | NDR 359 (Local check)    |      |                                 |                       |                                                             | Samleswari (Local Check) |      |                                 |                          |                       |                                                             |
|                    | Available N:P:K (kg/ha) | -                        |      |                                 |                       |                                                             | 246:15:312               |      |                                 |                          |                       |                                                             |

Table 4.1(C): Contd.

| N-levels    | Varieties | MANDYA             |      |                              |                    |                 |                    |                                                       | NAGINA             |      |                              |                    |                 |                    |                                                       |
|-------------|-----------|--------------------|------|------------------------------|--------------------|-----------------|--------------------|-------------------------------------------------------|--------------------|------|------------------------------|--------------------|-----------------|--------------------|-------------------------------------------------------|
|             |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test weight (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test weight (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) |
| F1          | V1        | 5.51               | 12   | 311                          | 3.60               | 26.31           | 89                 |                                                       | 2.83               | 9    | 255                          | 3.57               | 26.67           | 91                 |                                                       |
|             | V2        | -                  |      | -                            | -                  | -               | -                  |                                                       | 2.51               | 12   | 233                          | 3.36               | 26.30           | 95                 |                                                       |
|             | V3        | 6.46               | 6    | 310                          | 4.49               | 28.49           | 98                 |                                                       | 2.58               | 10   | 233                          | 3.47               | 26.37           | 96                 |                                                       |
|             | V4        | 6.81               | 4    | 298                          | 4.59               | 28.74           | 98                 |                                                       | 2.58               | 10   | 241                          | 3.18               | 26.30           | 98                 |                                                       |
|             | V5        | 5.70               | 11   | 305                          | 3.89               | 29.21           | 98                 |                                                       | 2.22               | 16   | 228                          | 3.52               | 26.27           | 96                 |                                                       |
|             | V6        | 5.17               | 14   | 323                          | 2.80               | 28.79           | 88                 |                                                       | 2.46               | 13   | 226                          | 2.92               | 26.39           | 87                 |                                                       |
|             | V7        | -                  |      | -                            | -                  | -               | -                  |                                                       | -                  |      | -                            | -                  | -               | -                  |                                                       |
|             | V8        | 4.88               | 16   | 317                          | 2.91               | 29.98           | 87                 |                                                       | 2.44               | 15   | 206                          | 2.96               | 26.40           | 84                 |                                                       |
|             | V9        | -                  |      | -                            | -                  | -               | -                  |                                                       | -                  |      | -                            | -                  | -               | -                  |                                                       |
|             | V10       | 5.72               | 10   | 325                          | 3.76               | 21.30           | 91                 |                                                       | 2.45               | 14   | 212                          | 2.98               | 27.07           | 98                 |                                                       |
|             | V11       | -                  |      | -                            | -                  | -               | -                  |                                                       | -                  |      | -                            | -                  | -               | -                  |                                                       |
|             | V12       | 5.22               | 13   | 314                          | 3.38               | 16.40           | 98                 |                                                       | -                  |      | -                            | -                  | -               | -                  |                                                       |
| F2          | V1        | 6.27               | 7    | 295                          | 3.88               | 28.85           | 90                 | 7.60                                                  | 4.95               | 1    | 323                          | 3.60               | 26.69           | 93                 | 19.27                                                 |
|             | V2        | -                  |      | -                            | -                  | -               | -                  |                                                       | 4.21               | 6    | 291                          | 3.36               | 26.39           | 95                 | 15.45                                                 |
|             | V3        | 7.00               | 2    | 309                          | 4.61               | 28.13           | 97                 | 5.40                                                  | 4.25               | 4    | 302                          | 3.48               | 26.42           | 97                 | 15.18                                                 |
|             | V4        | 7.14               | 1    | 317                          | 4.65               | 29.37           | 98                 | 3.30                                                  | 4.25               | 4    | 292                          | 3.20               | 26.36           | 97                 | 15.18                                                 |
|             | V5        | 6.84               | 3    | 315                          | 4.07               | 31.60           | 98                 | 11.40                                                 | 4.37               | 3    | 290                          | 3.52               | 26.31           | 87                 | 19.55                                                 |
|             | V6        | 6.55               | 5    | 347                          | 2.88               | 27.97           | 88                 | 13.80                                                 | 4.39               | 2    | 285                          | 2.95               | 26.42           | 86                 | 17.55                                                 |
|             | V7        | -                  |      | -                            | -                  | -               | -                  |                                                       | -                  |      | -                            | -                  | -               | -                  |                                                       |
|             | V8        | 4.89               | 15   | 335                          | 3.30               | 28.70           | 88                 | 0.10                                                  | 4.09               | 8    | 292                          | 2.98               | 26.41           | 85                 | 15.00                                                 |
|             | V9        | -                  |      | -                            | -                  | -               | -                  |                                                       | -                  |      | -                            | -                  | -               | -                  |                                                       |
|             | V10       | 6.26               | 8    | 292                          | 3.88               | 21.60           | 90                 | 5.40                                                  | 4.10               | 7    | 273                          | 2.98               | 26.42           | 98                 | 15.00                                                 |
|             | V11       | -                  |      | -                            | -                  | -               | -                  |                                                       | -                  |      | -                            | -                  | -               | -                  |                                                       |
|             | V12       | 6.25               | 9    | 321                          | 3.39               | 15.49           | 98                 | 10.30                                                 | -                  |      | -                            | -                  | -               | -                  |                                                       |
| Interaction |           |                    |      |                              |                    |                 |                    |                                                       |                    |      |                              |                    |                 |                    |                                                       |
| F at same V |           | NS                 |      | NS                           | NS                 | NS              | NS                 |                                                       | 0.23               |      | NS                           | NS                 | NS              | 1.34               |                                                       |
| V at same F |           | NS                 |      | NS                           | NS                 | NS              | NS                 |                                                       | 0.24               |      | NS                           | NS                 | NS              | 1.31               |                                                       |
| F1          |           | 5.68               | 2    | 313                          | 3.68               | 26.15           | 93                 |                                                       | 2.51               | 2    | 229                          | 3.25               | 26.47           | 93                 |                                                       |
| F2          |           | 6.40               | 1    | 316                          | 3.83               | 26.46           | 93                 | 7.16                                                  | 4.33               | 1    | 294                          | 3.26               | 26.43           | 92                 | 16.52                                                 |
| C.D.(0.05)  |           | NS                 |      | NS                           | NS                 | NS              | NS                 |                                                       | 0.14               |      | 18.03                        | 0.00               | NS              | 0.47               |                                                       |
| C.V.(%)     |           | 12.06              |      | 3.06                         | 4.17               | 2.40            | 0.96               |                                                       | 3.39               |      | 5.55                         | 0.08               | 1.15            | 0.41               |                                                       |

Table 4.1(C): Contd.

| N-<br>levels       | Varieties          | MANDYA                        |      |                                 |                          |                       |                          |                                                             | NAGINA                   |      |                                 |                          |                       |                          |                                                             |
|--------------------|--------------------|-------------------------------|------|---------------------------------|--------------------------|-----------------------|--------------------------|-------------------------------------------------------------|--------------------------|------|---------------------------------|--------------------------|-----------------------|--------------------------|-------------------------------------------------------------|
|                    |                    | Grain<br>Yield<br>(t/ha)      | Rank | Panicle/m <sup>2</sup><br>(No.) | Panicle<br>Weight<br>(g) | Test<br>weight<br>(g) | Days<br>50%<br>flowering | Nutri. res. (kg<br>grain/kg Nutri.) (Base<br>level 50% RDF) | Grain<br>Yield<br>(t/ha) | Rank | Panicle/m <sup>2</sup><br>(No.) | Panicle<br>Weight<br>(g) | Test<br>weight<br>(g) | Days<br>50%<br>flowering | Nutri. res. (kg grain/kg<br>Nutri.) (Base level<br>50% RDF) |
| Mean of varieties: |                    |                               |      |                                 |                          |                       |                          |                                                             |                          |      |                                 |                          |                       |                          |                                                             |
|                    | V1                 | 5.89                          | 5    | 303                             | 3.74                     | 27.58                 | 90                       | 7.60                                                        | 3.89                     | 1    | 289                             | 3.59                     | 26.68                 | 92                       | 19.27                                                       |
|                    | V2                 | -                             |      | -                               | -                        | -                     | -                        |                                                             | 3.36                     | 5    | 262                             | 3.36                     | 26.35                 | 95                       | 15.45                                                       |
|                    | V3                 | 6.73                          | 2    | 310                             | 4.55                     | 28.31                 | 98                       | 5.40                                                        | 3.42                     | 3    | 268                             | 3.48                     | 26.40                 | 97                       | 15.18                                                       |
|                    | V4                 | 6.98                          | 1    | 308                             | 4.62                     | 29.06                 | 98                       | 3.30                                                        | 3.42                     | 3    | 266                             | 3.19                     | 26.33                 | 98                       | 15.18                                                       |
|                    | V5                 | 6.27                          | 3    | 310                             | 3.98                     | 30.41                 | 98                       | 11.40                                                       | 3.30                     | 6    | 259                             | 3.52                     | 26.29                 | 92                       | 19.55                                                       |
|                    | V6                 | 5.86                          | 6    | 335                             | 2.84                     | 28.38                 | 88                       | 13.80                                                       | 3.43                     | 2    | 256                             | 2.94                     | 26.41                 | 87                       | 17.55                                                       |
|                    | V7                 | -                             |      | -                               | -                        | -                     | -                        |                                                             | -                        |      | -                               | -                        | -                     | -                        |                                                             |
|                    | V8                 | 4.89                          | 8    | 326                             | 3.11                     | 29.34                 | 88                       | 0.10                                                        | 3.27                     | 8    | 249                             | 2.97                     | 26.41                 | 85                       | 15.00                                                       |
|                    | V9                 | -                             |      | -                               | -                        | -                     | -                        |                                                             | -                        |      | -                               | -                        | -                     | -                        |                                                             |
|                    | V10                | 5.99                          | 4    | 309                             | 3.82                     | 21.45                 | 91                       | 5.40                                                        | 3.28                     | 7    | 243                             | 2.98                     | 26.75                 | 98                       | 15.00                                                       |
|                    | V11                | -                             |      | -                               | -                        | -                     | -                        |                                                             | -                        |      | -                               | -                        | -                     | -                        |                                                             |
|                    | V12                | 5.74                          | 7    | 317                             | 3.39                     | 15.95                 | 98                       | 10.30                                                       | -                        |      | -                               | -                        | -                     | -                        |                                                             |
|                    | C.D.(0.05)         | 0.74                          |      | NS                              | 0.45                     | 1.30                  | 0.81                     |                                                             | 0.16                     |      | 13.69                           | 0.01                     | NS                    | 0.95                     |                                                             |
|                    | C.V. (%)           | 10.40                         |      | 9.98                            | 10.14                    | 4.19                  | 0.73                     |                                                             | 4.06                     |      | 4.43                            | 0.30                     | 1.08                  | 0.86                     |                                                             |
|                    | Expt. Mean         | 6.04                          |      | 315                             | 3.76                     | 26.31                 | 93                       |                                                             | 3.42                     |      | 261                             | 3.25                     | 26.45                 | 93                       |                                                             |
|                    | Soil type          | Red Sandy loam                |      |                                 |                          |                       |                          |                                                             |                          |      |                                 |                          |                       |                          |                                                             |
|                    | pH                 | 6.99                          |      |                                 |                          |                       |                          |                                                             |                          |      |                                 |                          |                       |                          |                                                             |
|                    | N - levels (kg/ha) |                               |      |                                 |                          |                       |                          |                                                             |                          |      |                                 |                          |                       |                          |                                                             |
|                    | F1                 | 50:25:25                      |      |                                 |                          |                       |                          |                                                             |                          |      |                                 |                          |                       |                          |                                                             |
|                    | F2                 | 100:50:50                     |      |                                 |                          |                       |                          |                                                             |                          |      |                                 |                          |                       |                          |                                                             |
| Recomd             | N:P:K (kg/ha)      | 100:50:50                     |      |                                 |                          |                       |                          |                                                             |                          |      |                                 |                          |                       |                          |                                                             |
|                    | Varieties          |                               |      |                                 |                          |                       |                          |                                                             |                          |      |                                 |                          |                       |                          |                                                             |
|                    | V1                 | IET 26767                     |      |                                 |                          |                       |                          |                                                             |                          |      |                                 |                          |                       |                          |                                                             |
|                    | V2                 | -                             |      |                                 |                          |                       |                          |                                                             |                          |      |                                 |                          |                       |                          |                                                             |
|                    | V3                 | IET 26477                     |      |                                 |                          |                       |                          |                                                             |                          |      |                                 |                          |                       |                          |                                                             |
|                    | V4                 | IET 24914                     |      |                                 |                          |                       |                          |                                                             |                          |      |                                 |                          |                       |                          |                                                             |
|                    | V5                 | IET 25713                     |      |                                 |                          |                       |                          |                                                             |                          |      |                                 |                          |                       |                          |                                                             |
|                    | V6                 | NC- Sahbhagidhan              |      |                                 |                          |                       |                          |                                                             |                          |      |                                 |                          |                       |                          |                                                             |
|                    | V7                 | -                             |      |                                 |                          |                       |                          |                                                             |                          |      |                                 |                          |                       |                          |                                                             |
|                    | V8                 | ZC-Govind (NW)                |      |                                 |                          |                       |                          |                                                             |                          |      |                                 |                          |                       |                          |                                                             |
|                    | V9                 | -                             |      |                                 |                          |                       |                          |                                                             |                          |      |                                 |                          |                       |                          |                                                             |
|                    | V10                | Varalu                        |      |                                 |                          |                       |                          |                                                             |                          |      |                                 |                          |                       |                          |                                                             |
|                    | V11                | -                             |      |                                 |                          |                       |                          |                                                             |                          |      |                                 |                          |                       |                          |                                                             |
|                    | V12                | Gangavathi sona (Local Check) |      |                                 |                          |                       |                          |                                                             |                          |      |                                 |                          |                       |                          |                                                             |
| Available          | N:P:K (kg/ha)      | 348:115:287                   |      |                                 |                          |                       |                          |                                                             |                          |      |                                 |                          |                       |                          |                                                             |
|                    |                    | 21:18:209                     |      |                                 |                          |                       |                          |                                                             |                          |      |                                 |                          |                       |                          |                                                             |

Table 4.1(C): Contd.

| N-levels    | Varieties | PUDUCHERRY         |      |                              |                    |                 |                                                       | RANCHI             |      |                              |                    |                    |                                                       |
|-------------|-----------|--------------------|------|------------------------------|--------------------|-----------------|-------------------------------------------------------|--------------------|------|------------------------------|--------------------|--------------------|-------------------------------------------------------|
|             |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test weight (g) | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) |
| F1          | V1        | 6.94               | 4    | 352                          | 4.88               | 24.7            |                                                       | 3.68               | 9    | 225                          | 3.10               | 67                 |                                                       |
|             | V2        | -                  |      | -                            | -                  | -               |                                                       | -                  |      | -                            | -                  | -                  |                                                       |
|             | V3        | 6.59               | 10   | 325                          | 5.24               | 25.41           |                                                       | 3.35               | 13   | 210                          | 3.02               | 74                 |                                                       |
|             | V4        | 6.85               | 7    | 331                          | 5.71               | 25.1            |                                                       | 4.02               | 3    | 240                          | 3.15               | 75                 |                                                       |
|             | V5        | 6.90               | 6    | 345                          | 5.37               | 24.21           |                                                       | 3.52               | 11   | 206                          | 2.97               | 73                 |                                                       |
|             | V6        | 6.48               | 13   | 290                          | 3.64               | 24.22           |                                                       | 3.91               | 5    | 242                          | 3.15               | 80                 |                                                       |
|             | V7        | -                  |      | -                            | -                  | -               |                                                       | -                  |      | -                            | -                  | -                  |                                                       |
|             | V8        | 6.39               | 14   | 302                          | 3.05               | 24.7            |                                                       | 3.23               | 15   | 192                          | 3.00               | 70                 |                                                       |
|             | V9        | -                  |      | -                            | -                  | -               |                                                       | -                  |      | -                            | -                  | -                  |                                                       |
|             | V10       | 6.25               | 16   | 277                          | 3.5                | 20.73           |                                                       | 3.01               | 16   | 184                          | 2.76               | 64                 |                                                       |
|             | V11       | -                  |      | -                            | -                  | -               |                                                       | -                  |      | -                            | -                  | -                  |                                                       |
|             | V12       | 6.27               | 15   | 289                          | 3.51               | 17.56           |                                                       | 3.32               | 14   | 205                          | 2.85               | 63                 |                                                       |
| F2          | V1        | 7.40               | 1    | 379                          | 5.99               | 24.76           | 4.60                                                  | 4.02               | 3    | 246                          | 3.13               | 70                 | 6.18                                                  |
|             | V2        | -                  |      | -                            | -                  | -               |                                                       | -                  |      | -                            | -                  | -                  |                                                       |
|             | V3        | 6.91               | 5    | 349                          | 6.15               | 25.69           | 3.20                                                  | 3.89               | 6    | 235                          | 3.09               | 78                 | 9.82                                                  |
|             | V4        | 7.00               | 3    | 351                          | 6.95               | 25.42           | 1.50                                                  | 4.21               | 2    | 254                          | 3.17               | 79                 | 3.45                                                  |
|             | V5        | 7.18               | 2    | 362                          | 5.98               | 23.94           | 2.80                                                  | 3.72               | 8    | 225                          | 3.02               | 76                 | 3.64                                                  |
|             | V6        | 6.54               | 12   | 352                          | 4.31               | 24.81           | 0.60                                                  | 4.34               | 1    | 261                          | 3.22               | 84                 | 7.82                                                  |
|             | V7        | -                  |      | -                            | -                  | -               |                                                       | -                  |      | -                            | -                  | -                  |                                                       |
|             | V8        | 6.69               | 8    | 346                          | 3.38               | 25.18           | 3.00                                                  | 3.78               | 7    | 228                          | 3.10               | 74                 | 10.00                                                 |
|             | V9        | -                  |      | -                            | -                  | -               |                                                       | -                  |      | -                            | -                  | -                  |                                                       |
|             | V10       | 6.57               | 11   | 327                          | 4.32               | 20.47           | 3.20                                                  | 3.42               | 12   | 211                          | 2.85               | 69                 | 7.45                                                  |
|             | V11       | -                  |      | -                            | -                  | -               |                                                       | -                  |      | -                            | -                  | -                  |                                                       |
|             | V12       | 6.65               | 9    | 348                          | 4.3                | 17.8            | 3.80                                                  | 3.62               | 10   | 220                          | 2.97               | 67                 | 5.45                                                  |
| Interaction |           |                    |      |                              |                    |                 |                                                       |                    |      |                              |                    |                    |                                                       |
| F at same V |           | NS                 |      | NS                           | NS                 | NS              |                                                       | NS                 |      | NS                           | NS                 | NS                 |                                                       |
| V at same F |           | NS                 |      | NS                           | NS                 | NS              |                                                       | NS                 |      | NS                           | NS                 | NS                 |                                                       |
| F1          |           | 6.58               | 2    | 314                          | 4.36               | 23.33           |                                                       | 3.51               | 2    | 213                          | 3.00               | 71                 |                                                       |
| F2          |           | 6.87               | 1    | 352                          | 5.17               | 23.51           | 2.84                                                  | 3.88               | 1    | 235                          | 3.07               | 75                 | 6.73                                                  |
| C.D.(0.05)  |           | 0.13               |      | 13.13                        | 0.25               | NS              |                                                       | NS                 |      | NS                           | 0.03               | 1.08               |                                                       |
| C.V.(%)     |           | 1.55               |      | 3.18                         | 4.3                | 0.92            |                                                       | 8.51               |      | 8.01                         | 0.89               | 1.19               |                                                       |

Table 4.1(C): Contd.

| N-levels           | Varieties               | PUDUCHERRY          |      |                              |                    |                 |                                                       | RANCHI                |      |                              |                    |                    |                                                       |
|--------------------|-------------------------|---------------------|------|------------------------------|--------------------|-----------------|-------------------------------------------------------|-----------------------|------|------------------------------|--------------------|--------------------|-------------------------------------------------------|
|                    |                         | Grain Yield (t/ha)  | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test weight (g) | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) | Grain Yield (t/ha)    | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) |
| Mean of varieties: |                         |                     |      |                              |                    |                 |                                                       |                       |      |                              |                    |                    |                                                       |
|                    | V1                      | 7.17                | 1    | 366                          | 5.44               | 24.73           | 4.60                                                  | 3.85                  | 3    | 236                          | 3.12               | 68.67              | 6.18                                                  |
|                    | V2                      | -                   |      | -                            | -                  | -               |                                                       | -                     |      | -                            | -                  | -                  |                                                       |
|                    | V3                      | 6.75                | 4    | 337                          | 5.70               | 25.55           | 3.20                                                  | 3.62                  | 4    | 223                          | 3.06               | 76.33              | 9.82                                                  |
|                    | V4                      | 6.93                | 3    | 341                          | 6.33               | 25.26           | 1.50                                                  | 4.12                  | 2    | 247                          | 3.16               | 77.00              | 3.45                                                  |
|                    | V5                      | 7.04                | 2    | 353                          | 5.68               | 24.08           | 2.80                                                  | 3.62                  | 4    | 216                          | 3.00               | 74.50              | 3.64                                                  |
|                    | V6                      | 6.51                | 6    | 321                          | 3.98               | 24.52           | 0.60                                                  | 4.13                  | 1    | 252                          | 3.19               | 82.33              | 7.82                                                  |
|                    | V7                      | -                   |      | -                            | -                  | -               |                                                       | -                     |      | -                            | -                  | -                  |                                                       |
|                    | V8                      | 6.54                | 5    | 324                          | 3.22               | 24.94           | 3.00                                                  | 3.51                  | 6    | 210                          | 3.05               | 72.00              | 10.00                                                 |
|                    | V9                      | -                   |      | -                            | -                  | -               |                                                       | -                     |      | -                            | -                  | -                  |                                                       |
|                    | V10                     | 6.41                | 8    | 302                          | 3.91               | 20.60           | 3.20                                                  | 3.22                  | 8    | 198                          | 2.81               | 66.67              | 7.45                                                  |
|                    | V11                     | -                   |      | -                            | -                  | -               |                                                       | -                     |      | -                            | -                  | -                  |                                                       |
|                    | V12                     | 6.46                | 7    | 318                          | 3.91               | 17.68           | 3.80                                                  | 3.47                  | 7    | 213                          | 2.91               | 65.00              | 5.45                                                  |
|                    | C.D.(0.05)              | 0.35                |      | 21.79                        | 0.35               | 0.95            |                                                       | 0.43                  |      | 25.65                        | 0.12               | 0.77               |                                                       |
|                    | C.V. (%)                | 4.38                |      | 5.54                         | 6.25               | 3.42            |                                                       | 9.91                  |      | 9.68                         | 3.30               | 0.90               |                                                       |
|                    | Expt. Mean              | 6.73                |      | 333                          | 4.77               | 23.42           |                                                       | 3.69                  |      | 224                          | 3.03               | 72.81              |                                                       |
|                    | Soil type               | Clay loam           |      |                              |                    |                 |                                                       | Sandy Loam            |      |                              |                    |                    |                                                       |
|                    | pH                      | 5.83                |      |                              |                    |                 |                                                       | 5.90                  |      |                              |                    |                    |                                                       |
|                    | N - levels (kg/ha)      |                     |      |                              |                    |                 |                                                       |                       |      |                              |                    |                    |                                                       |
|                    | F1                      | 60:20:20            |      |                              |                    |                 |                                                       | 30:15:10              |      |                              |                    |                    |                                                       |
|                    | F2                      | 120:40:40           |      |                              |                    |                 |                                                       | 60:30:20              |      |                              |                    |                    |                                                       |
|                    | Recomnd N:P:K (kg/ha)   | 120:40:40           |      |                              |                    |                 |                                                       | 60:30:20              |      |                              |                    |                    |                                                       |
|                    | Varieties               |                     |      |                              |                    |                 |                                                       |                       |      |                              |                    |                    |                                                       |
|                    | V1                      | IET 26767           |      |                              |                    |                 |                                                       | IET 26767             |      |                              |                    |                    |                                                       |
|                    | V2                      | -                   |      |                              |                    |                 |                                                       | -                     |      |                              |                    |                    |                                                       |
|                    | V3                      | IET 26477           |      |                              |                    |                 |                                                       | IET 26477             |      |                              |                    |                    |                                                       |
|                    | V4                      | IET 24914           |      |                              |                    |                 |                                                       | IET 24914             |      |                              |                    |                    |                                                       |
|                    | V5                      | IET 25713           |      |                              |                    |                 |                                                       | IET 25713             |      |                              |                    |                    |                                                       |
|                    | V6                      | NC- Sahbhagidhan    |      |                              |                    |                 |                                                       | NC- Sahbhagidhan      |      |                              |                    |                    |                                                       |
|                    | V7                      | -                   |      |                              |                    |                 |                                                       | -                     |      |                              |                    |                    |                                                       |
|                    | V8                      | ZC-Govind (NW)      |      |                              |                    |                 |                                                       | ZC-Govind (NW)        |      |                              |                    |                    |                                                       |
|                    | V9                      | -                   |      |                              |                    |                 |                                                       | -                     |      |                              |                    |                    |                                                       |
|                    | V10                     | Varalu              |      |                              |                    |                 |                                                       | Varalu                |      |                              |                    |                    |                                                       |
|                    | V11                     | -                   |      |                              |                    |                 |                                                       | -                     |      |                              |                    |                    |                                                       |
|                    | V12                     | Co 51 (Local Check) |      |                              |                    |                 |                                                       | BVD 110 (Local Check) |      |                              |                    |                    |                                                       |
|                    | Available N:P:K (kg/ha) | 123:25:143          |      |                              |                    |                 |                                                       | 212:34:157            |      |                              |                    |                    |                                                       |

Table 4.1(C): Contd.

| N-levels    | Varieties | REWA               |      |                              |                    |                 |                    |                                                       | SABOUR             |      |                              |                    |                    |                                                       |
|-------------|-----------|--------------------|------|------------------------------|--------------------|-----------------|--------------------|-------------------------------------------------------|--------------------|------|------------------------------|--------------------|--------------------|-------------------------------------------------------|
|             |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test weight (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) |
| F1          | V1        | 4.53               | 19   | 257                          | 2.40               | 22.83           | 73                 |                                                       | 3.97               | 8    | 199                          | 5.71               | 85                 |                                                       |
|             | V2        | 4.67               | 17   | 256                          | 2.53               | 21.00           | 67                 |                                                       | -                  |      | -                            | -                  | -                  |                                                       |
|             | V3        | 4.70               | 15   | 274                          | 2.37               | 23.23           | 73                 |                                                       | 4.88               | 3    | 246                          | 9.45               | 75                 |                                                       |
|             | V4        | 4.97               | 13   | 255                          | 2.50               | 21.47           | 80                 |                                                       | -                  |      | -                            | -                  | -                  |                                                       |
|             | V5        | 4.43               | 21   | 266                          | 2.43               | 24.97           | 82                 |                                                       | -                  |      | -                            | -                  | -                  |                                                       |
|             | V6        | 3.97               | 23   | 256                          | 2.47               | 24.87           | 81                 |                                                       | 4.15               | 7    | 230                          | 5.60               | 85                 |                                                       |
|             | V7        | 4.10               | 22   | 273                          | 2.43               | 22.87           | 72                 |                                                       | -                  |      | -                            | -                  | -                  |                                                       |
|             | V8        | 5.10               | 10   | 268                          | 2.40               | 23.93           | 79                 |                                                       | 3.11               | 10   | 222                          | 7.55               | 89                 |                                                       |
|             | V9        | 4.77               | 14   | 269                          | 2.40               | 25.10           | 80                 |                                                       | -                  |      | -                            | -                  | -                  |                                                       |
|             | V10       | 3.93               | 24   | 267                          | 2.33               | 24.87           | 81                 |                                                       | -                  |      | -                            | -                  | -                  |                                                       |
|             | V11       | 4.50               | 20   | 270                          | 2.53               | 23.13           | 77                 |                                                       | -                  |      | -                            | -                  | -                  |                                                       |
|             | V12       | 5.27               | 5    | 268                          | 2.43               | 24.97           | 83                 |                                                       | 4.72               | 4    | 242                          | 7.95               | 89                 |                                                       |
| F2          | V1        | 5.17               | 7    | 299                          | 2.90               | 23.37           | 76                 | 6.40                                                  | 4.17               | 6    | 217                          | 8.68               | 85                 | 2.50                                                  |
|             | V2        | 5.13               | 8    | 297                          | 2.90               | 21.57           | 72                 | 4.60                                                  | -                  |      | -                            | -                  | -                  |                                                       |
|             | V3        | 5.13               | 8    | 300                          | 2.97               | 23.80           | 78                 | 4.30                                                  | 5.53               | 1    | 259                          | 12.02              | 76                 | 8.13                                                  |
|             | V4        | 5.47               | 3    | 302                          | 3.37               | 22.03           | 86                 | 5.00                                                  | -                  |      | -                            | -                  | -                  |                                                       |
|             | V5        | 5.30               | 4    | 306                          | 3.10               | 25.47           | 87                 | 8.70                                                  | -                  |      | -                            | -                  | -                  |                                                       |
|             | V6        | 5.07               | 11   | 302                          | 3.30               | 25.40           | 87                 | 11.00                                                 | 4.61               | 5    | 244                          | 7.63               | 85                 | 5.75                                                  |
|             | V7        | 4.70               | 15   | 298                          | 3.37               | 23.47           | 80                 | 6.00                                                  | -                  |      | -                            | -                  | -                  |                                                       |
|             | V8        | 5.57               | 2    | 298                          | 3.30               | 24.80           | 84                 | 4.70                                                  | 3.41               | 9    | 237                          | 9.35               | 89                 | 3.75                                                  |
|             | V9        | 5.20               | 6    | 301                          | 3.17               | 25.10           | 88                 | 4.30                                                  | -                  |      | -                            | -                  | -                  |                                                       |
|             | V10       | 4.57               | 18   | 304                          | 2.80               | 25.50           | 88                 | 6.40                                                  | -                  |      | -                            | -                  | -                  |                                                       |
|             | V11       | 5.07               | 11   | 303                          | 3.03               | 23.80           | 84                 | 5.70                                                  | -                  |      | -                            | -                  | -                  |                                                       |
|             | V12       | 5.63               | 1    | 303                          | 3.33               | 25.57           | 91                 | 3.60                                                  | 5.14               | 2    | 257                          | 10.48              | 89                 | 5.25                                                  |
| Interaction |           | NS                 |      | NS                           | NS                 | NS              | NS                 |                                                       | NS                 |      | NS                           | NS                 | NS                 |                                                       |
| F at same V |           | NS                 |      | NS                           | NS                 | NS              | NS                 |                                                       | NS                 |      | NS                           | NS                 | NS                 |                                                       |
| V at same F |           | NS                 |      | NS                           | NS                 | NS              | NS                 |                                                       | NS                 |      | NS                           | NS                 | NS                 |                                                       |
| F1          |           | 4.58               | 2    | 265                          | 2.44               | 23.60           | 77                 |                                                       | 4.17               | 2    | 228                          | 7.25               | 85                 |                                                       |
| F2          |           | 5.17               | 1    | 301                          | 3.13               | 24.16           | 83                 | 6.93                                                  | 4.57               | 1    | 242                          | 9.63               | 85                 | 5.08                                                  |
| C.D.(0.05)  |           | 0.16               |      | 7.35                         | 0.02               | 0.14            | 0.67               |                                                       | NS                 |      | NS                           | NS                 | NS                 |                                                       |
| C.V.(%)     |           | 3.14               |      | 2.56                         | 0.73               | 0.58            | 0.82               |                                                       | 13.05              |      | 6.19                         | 23.60              | 0.37               |                                                       |

Table 4.1(C): Contd.

| N-<br>levels       | Varieties               | REWA                  |      |                                 |                          |                       |                          |                                                                | SABOUR                       |      |                                 |                          |                       |                                                                |
|--------------------|-------------------------|-----------------------|------|---------------------------------|--------------------------|-----------------------|--------------------------|----------------------------------------------------------------|------------------------------|------|---------------------------------|--------------------------|-----------------------|----------------------------------------------------------------|
|                    |                         | Grain Yield<br>(t/ha) | Rank | Panicle/m <sup>2</sup><br>(No.) | Panicle<br>Weight<br>(g) | Test<br>weight<br>(g) | Days<br>50%<br>flowering | Nutri. res. (kg<br>grain/kg Nutri.)<br>(Base level 50%<br>RDF) | Grain<br>Yield<br>(t/ha)     | Rank | Panicle/m <sup>2</sup><br>(No.) | Panicle<br>Weight<br>(g) | Days 50%<br>flowering | Nutri. res. (kg<br>grain/kg Nutri.)<br>(Base level 50%<br>RDF) |
| Mean of varieties: |                         |                       |      |                                 |                          |                       |                          |                                                                |                              |      |                                 |                          |                       |                                                                |
|                    | V1                      | 4.85                  | 8    | 278                             | 2.65                     | 23.10                 | 75                       | 6.40                                                           | 4.07                         | 4    | 208                             | 7.20                     | 85                    | 2.50                                                           |
|                    | V2                      | 4.90                  | 6    | 277                             | 2.72                     | 21.29                 | 70                       | 4.60                                                           | -                            |      | -                               | -                        | -                     |                                                                |
|                    | V3                      | 4.92                  | 5    | 287                             | 2.67                     | 23.52                 | 76                       | 4.30                                                           | 5.21                         | 1    | 252                             | 10.74                    | 76                    | 8.13                                                           |
|                    | V4                      | 5.22                  | 3    | 279                             | 2.94                     | 21.75                 | 83                       | 5.00                                                           | -                            |      | -                               | -                        | -                     |                                                                |
|                    | V5                      | 4.87                  | 7    | 286                             | 2.77                     | 25.22                 | 84                       | 8.70                                                           | -                            |      | -                               | -                        | -                     |                                                                |
|                    | V6                      | 4.52                  | 10   | 279                             | 2.89                     | 25.14                 | 84                       | 11.00                                                          | 4.38                         | 3    | 237                             | 6.62                     | 85                    | 5.75                                                           |
|                    | V7                      | 4.40                  | 11   | 286                             | 2.90                     | 23.17                 | 76                       | 6.00                                                           | -                            |      | -                               | -                        | -                     |                                                                |
|                    | V8                      | 5.34                  | 2    | 283                             | 2.85                     | 24.37                 | 81                       | 4.70                                                           | 3.26                         | 5    | 230                             | 8.45                     | 89                    | 3.75                                                           |
|                    | V9                      | 4.99                  | 4    | 285                             | 2.79                     | 25.10                 | 84                       | 4.30                                                           | -                            |      | -                               | -                        | -                     |                                                                |
|                    | V10                     | 4.25                  | 12   | 285                             | 2.57                     | 25.19                 | 85                       | 6.40                                                           | -                            |      | -                               | -                        | -                     |                                                                |
|                    | V11                     | 4.79                  | 9    | 287                             | 2.78                     | 23.47                 | 80                       | 5.70                                                           | -                            |      | -                               | -                        | -                     |                                                                |
|                    | V12                     | 5.45                  | 1    | 285                             | 2.88                     | 25.27                 | 87                       | 3.60                                                           | 4.93                         | 2    | 250                             | 9.22                     | 89                    | 5.25                                                           |
|                    | C.D.(0.05)              | 0.33                  |      | NS                              | 0.20                     | 0.46                  | 2.30                     |                                                                | 0.78                         |      | 26.20                           | 1.49                     | 0.68                  |                                                                |
|                    | C.V. (%)                | 5.84                  |      | 2.75                            | 6.20                     | 1.65                  | 2.48                     |                                                                | 14.64                        |      | 9.10                            | 14.38                    | 0.66                  |                                                                |
|                    | Expt. Mean              | 4.87                  |      | 283                             | 2.78                     | 23.88                 | 80                       |                                                                | 4.37                         |      | 235                             | 8.44                     | 85                    |                                                                |
|                    | Soil type               | Clay                  |      |                                 |                          |                       |                          |                                                                | -                            |      |                                 |                          |                       |                                                                |
|                    | pH                      | 6.20                  |      |                                 |                          |                       |                          |                                                                | 7.80                         |      |                                 |                          |                       |                                                                |
|                    | N - levels (kg/ha)      |                       |      |                                 |                          |                       |                          |                                                                |                              |      |                                 |                          |                       |                                                                |
|                    | F1                      | 50:30:20              |      |                                 |                          |                       |                          |                                                                | 50:20:10                     |      |                                 |                          |                       |                                                                |
|                    | F2                      | 100:60:40             |      |                                 |                          |                       |                          |                                                                | 100:40:20                    |      |                                 |                          |                       |                                                                |
|                    | Recomnd N:P:K (kg/ha)   | 100:60:40             |      |                                 |                          |                       |                          |                                                                | 100:40:20                    |      |                                 |                          |                       |                                                                |
|                    | Varieties               |                       |      |                                 |                          |                       |                          |                                                                |                              |      |                                 |                          |                       |                                                                |
|                    | V1                      | IET 26767             |      |                                 |                          |                       |                          |                                                                | IET 26767                    |      |                                 |                          |                       |                                                                |
|                    | V2                      | IET 26803             |      |                                 |                          |                       |                          |                                                                | -                            |      |                                 |                          |                       |                                                                |
|                    | V3                      | IET 26477             |      |                                 |                          |                       |                          |                                                                | IET 26477                    |      |                                 |                          |                       |                                                                |
|                    | V4                      | IET 24914             |      |                                 |                          |                       |                          |                                                                | -                            |      |                                 |                          |                       |                                                                |
|                    | V5                      | IET 25713             |      |                                 |                          |                       |                          |                                                                | -                            |      |                                 |                          |                       |                                                                |
|                    | V6                      | NC- Sahbhagidhan      |      |                                 |                          |                       |                          |                                                                | NC- Sahbhagidhan             |      |                                 |                          |                       |                                                                |
|                    | V7                      | Vandana               |      |                                 |                          |                       |                          |                                                                | -                            |      |                                 |                          |                       |                                                                |
|                    | V8                      | ZC-Govind (NW)        |      |                                 |                          |                       |                          |                                                                | ZC-Govind (NW)               |      |                                 |                          |                       |                                                                |
|                    | V9                      | Narendra 97 E         |      |                                 |                          |                       |                          |                                                                | -                            |      |                                 |                          |                       |                                                                |
|                    | V10                     | Varalu                |      |                                 |                          |                       |                          |                                                                | -                            |      |                                 |                          |                       |                                                                |
|                    | V11                     | CR Dhan 201 (W&S)     |      |                                 |                          |                       |                          |                                                                | -                            |      |                                 |                          |                       |                                                                |
|                    | V12                     | IR 36 (Local check)   |      |                                 |                          |                       |                          |                                                                | Sabour Harshit (Local check) |      |                                 |                          |                       |                                                                |
|                    | Available N:P:K (kg/ha) | 302:20:416            |      |                                 |                          |                       |                          |                                                                | 155:27:193                   |      |                                 |                          |                       |                                                                |

Table 4.1(C): Contd.

| N-levels    | Varieties | VADGAON            |      |                              |                    |                 |                    |                                                       | VARANASI           |      |                              |                    |                 |                    |                                                       |
|-------------|-----------|--------------------|------|------------------------------|--------------------|-----------------|--------------------|-------------------------------------------------------|--------------------|------|------------------------------|--------------------|-----------------|--------------------|-------------------------------------------------------|
|             |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test weight (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test weight (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) |
| F1          | V1        | 3.64               | 12   | 213                          | 3.28               | 23.58           | 83                 |                                                       | 3.89               | 5    | 198                          | 3.57               | 26.04           | 94                 |                                                       |
|             | V2        | -                  |      | -                            | -                  | -               | -                  |                                                       | -                  |      | -                            | -                  | -               | -                  |                                                       |
|             | V3        | 3.76               | 11   | 220                          | 3.38               | 22.53           | 81                 |                                                       | 3.75               | 6    | 177                          | 3.28               | 26.68           | 92                 |                                                       |
|             | V4        | 3.81               | 10   | 222                          | 3.42               | 24.03           | 84                 |                                                       | 2.80               | 11   | 232                          | 1.86               | 23.58           | 88                 |                                                       |
|             | V5        | 3.96               | 9    | 237                          | 3.59               | 22.75           | 81                 |                                                       | 3.73               | 7    | 204                          | 3.11               | 27.62           | 92                 |                                                       |
|             | V6        | 3.31               | 16   | 193                          | 2.98               | 22.36           | 79                 |                                                       | 1.62               | 15   | 276                          | 1.70               | 24.26           | 88                 |                                                       |
|             | V7        | 3.45               | 13   | 202                          | 3.10               | 23.32           | 83                 |                                                       | -                  |      | -                            | -                  | -               | -                  |                                                       |
|             | V8        | 3.38               | 14   | 198                          | 3.05               | 22.88           | 80                 |                                                       | 1.53               | 16   | 207                          | 2.19               | 21.10           | 73                 |                                                       |
|             | V9        | -                  |      | -                            | -                  | -               | -                  |                                                       | -                  |      | -                            | -                  | -               | -                  |                                                       |
|             | V10       | -                  |      | -                            | -                  | -               | -                  |                                                       | 2.09               | 12   | 190                          | 2.62               | 20.40           | 84                 |                                                       |
|             | V11       | -                  |      | -                            | -                  | -               | -                  |                                                       | -                  |      | -                            | -                  | -               | -                  |                                                       |
|             | V12       | 3.35               | 15   | 196                          | 3.01               | 22.61           | 81                 |                                                       | 2.97               | 9    | 187                          | 3.07               | 26.90           | 92                 |                                                       |
| F2          | V1        | 4.97               | 4    | 313                          | 4.47               | 24.48           | 86                 | 13.30                                                 | 4.33               | 2    | 239                          | 3.29               | 28.30           | 94                 | 3.67                                                  |
|             | V2        | -                  |      | -                            | -                  | -               | -                  |                                                       | -                  |      | -                            | -                  | -               | -                  |                                                       |
|             | V3        | 5.03               | 3    | 317                          | 4.52               | 23.92           | 84                 | 12.70                                                 | 3.95               | 4    | 200                          | 3.62               | 26.12           | 92                 | 1.67                                                  |
|             | V4        | 5.09               | 2    | 325                          | 4.58               | 24.25           | 85                 | 12.80                                                 | 3.29               | 8    | 296                          | 2.27               | 25.12           | 87                 | 4.08                                                  |
|             | V5        | 5.43               | 1    | 342                          | 4.89               | 23.69           | 83                 | 14.70                                                 | 4.91               | 1    | 246                          | 3.66               | 28.40           | 91                 | 9.83                                                  |
|             | V6        | 4.59               | 7    | 290                          | 4.14               | 23.26           | 81                 | 12.80                                                 | 1.67               | 13   | 317                          | 1.79               | 25.44           | 88                 | 0.42                                                  |
|             | V7        | 4.73               | 5    | 298                          | 4.26               | 23.58           | 83                 | 12.80                                                 | -                  |      | -                            | -                  | -               | -                  |                                                       |
|             | V8        | 4.69               | 6    | 295                          | 4.22               | 23.57           | 83                 | 13.10                                                 | 1.64               | 14   | 274                          | 2.19               | 24.08           | 72                 | 0.92                                                  |
|             | V9        | -                  |      | -                            | -                  | -               | -                  |                                                       | -                  |      | -                            | -                  | -               | -                  |                                                       |
|             | V10       | -                  |      | -                            | -                  | -               | -                  |                                                       | 2.83               | 10   | 191                          | 2.71               | 20.80           | 84                 | 6.17                                                  |
|             | V11       | -                  |      | -                            | -                  | -               | -                  |                                                       | -                  |      | -                            | -                  | -               | -                  |                                                       |
|             | V12       | 4.59               | 7    | 289                          | 4.13               | 23.55           | 81                 | 12.40                                                 | 4.16               | 3    | 215                          | 3.25               | 26.32           | 92                 | 9.92                                                  |
| Interaction |           |                    |      |                              |                    |                 |                    |                                                       |                    |      |                              |                    |                 |                    |                                                       |
| F at same V |           | NS                 |      | NS                           | NS                 | NS              | NS                 |                                                       | 0.43               |      | 14.24                        | NS                 | 1.11            | NS                 |                                                       |
| V at same F |           | NS                 |      | NS                           | NS                 | NS              | NS                 |                                                       | 0.43               |      | 13.56                        | NS                 | 1.38            | NS                 |                                                       |
| F1          |           | 3.58               | 2    | 210                          | 3.23               | 23.01           | 81                 |                                                       | 2.80               | 2    | 209                          | 2.68               | 24.57           | 88                 |                                                       |
| F2          |           | 4.89               | 1    | 309                          | 4.40               | 23.79           | 83                 | 13.08                                                 | 3.35               | 1    | 247                          | 2.85               | 25.57           | 88                 | 4.58                                                  |
| C.D.(0.05)  |           | 0.29               |      | 19.81                        | 0.27               | NS              | NS                 |                                                       | 0.22               |      | 3.24                         | 0.08               | NS              | NS                 |                                                       |
| C.V.(%)     |           | 5.49               |      | 6.15                         | 5.79               | 4.69            | 3.88               |                                                       | 5.74               |      | 1.15                         | 2.31               | 3.75            | 0.44               |                                                       |

Table 4.1(C): Contd.

| N-<br>levels       | Varieties               | VADGAON                   |      |                                 |                          |                       |                       |                                                                | VARANASI                 |      |                                 |                          |                       |                       |                                                                |
|--------------------|-------------------------|---------------------------|------|---------------------------------|--------------------------|-----------------------|-----------------------|----------------------------------------------------------------|--------------------------|------|---------------------------------|--------------------------|-----------------------|-----------------------|----------------------------------------------------------------|
|                    |                         | Grain<br>Yield<br>(t/ha)  | Rank | Panicle/m <sup>2</sup><br>(No.) | Panicle<br>Weight<br>(g) | Test<br>weight<br>(g) | Days 50%<br>flowering | Nutri. res. (kg<br>grain/kg Nutri.)<br>(Base level<br>50% RDF) | Grain<br>Yield<br>(t/ha) | Rank | Panicle/m <sup>2</sup><br>(No.) | Panicle<br>Weight<br>(g) | Test<br>weight<br>(g) | Days 50%<br>flowering | Nutri. res. (kg<br>grain/kg Nutri.)<br>(Base level 50%<br>RDF) |
| Mean of varieties: |                         |                           |      |                                 |                          |                       |                       |                                                                |                          |      |                                 |                          |                       |                       |                                                                |
|                    | V1                      | 4.31                      | 4    | 263                             | 3.88                     | 24.03                 | 84                    | 13.30                                                          | 4.11                     | 2    | 218                             | 3.43                     | 27.17                 | 94                    | 3.67                                                           |
|                    | V2                      | -                         |      | -                               | -                        | -                     | -                     |                                                                | -                        |      | -                               | -                        | -                     | -                     |                                                                |
|                    | V3                      | 4.40                      | 3    | 268                             | 3.95                     | 23.23                 | 82                    | 12.70                                                          | 3.85                     | 3    | 188                             | 3.45                     | 26.40                 | 92                    | 1.67                                                           |
|                    | V4                      | 4.45                      | 2    | 274                             | 4.00                     | 24.14                 | 84                    | 12.80                                                          | 3.05                     | 5    | 264                             | 2.07                     | 24.35                 | 88                    | 4.08                                                           |
|                    | V5                      | 4.70                      | 1    | 290                             | 4.24                     | 23.22                 | 82                    | 14.70                                                          | 4.32                     | 1    | 225                             | 3.39                     | 28.01                 | 92                    | 9.83                                                           |
|                    | V6                      | 3.95                      | 8    | 241                             | 3.56                     | 22.81                 | 80                    | 12.80                                                          | 1.65                     | 7    | 296                             | 1.75                     | 24.85                 | 88                    | 0.42                                                           |
|                    | V7                      | 4.09                      | 5    | 250                             | 3.68                     | 23.45                 | 83                    | 12.80                                                          | -                        |      | -                               | -                        | -                     | -                     |                                                                |
|                    | V8                      | 4.04                      | 6    | 247                             | 3.64                     | 23.23                 | 81                    | 13.10                                                          | 1.59                     | 8    | 240                             | 2.19                     | 22.59                 | 73                    | 0.92                                                           |
|                    | V9                      | -                         |      | -                               | -                        | -                     | -                     |                                                                | -                        |      | -                               | -                        | -                     | -                     |                                                                |
|                    | V10                     | -                         |      | -                               | -                        | -                     | -                     |                                                                | 2.46                     | 6    | 191                             | 2.67                     | 20.60                 | 84                    | 6.17                                                           |
|                    | V11                     | -                         |      | -                               | -                        | -                     | -                     |                                                                | -                        |      | -                               | -                        | -                     | -                     |                                                                |
|                    | V12                     | 3.97                      | 7    | 242                             | 3.57                     | 23.08                 | 81                    | 12.40                                                          | 3.57                     | 4    | 201                             | 3.16                     | 26.61                 | 92                    | 9.92                                                           |
|                    | C.D.(0.05)              | 0.18                      |      | 10.74                           | 0.16                     | NS                    | NS                    |                                                                | 0.30                     |      | 10.07                           | 0.23                     | 0.79                  | 0.56                  |                                                                |
|                    | C.V. (%)                | 3.52                      |      | 3.50                            | 3.48                     | 3.37                  | 3.11                  |                                                                | 8.28                     |      | 3.74                            | 7.19                     | 2.65                  | 0.54                  |                                                                |
|                    | Expt. Mean              | 4.24                      |      | 259                             | 3.81                     | 23.40                 | 82                    |                                                                | 3.07                     |      | 228                             | 2.76                     | 25.07                 | 88                    |                                                                |
|                    | Soil type               | -                         |      |                                 |                          |                       |                       |                                                                | Sandy loam               |      |                                 |                          |                       |                       |                                                                |
|                    | pH                      | 7.60                      |      |                                 |                          |                       |                       |                                                                | 7.32                     |      |                                 |                          |                       |                       |                                                                |
|                    | N - levels (kg/ha)      |                           |      |                                 |                          |                       |                       |                                                                |                          |      |                                 |                          |                       |                       |                                                                |
|                    | F1                      | 50:25:25                  |      |                                 |                          |                       |                       |                                                                | 60:30:30                 |      |                                 |                          |                       |                       |                                                                |
|                    | F2                      | 100:50:50                 |      |                                 |                          |                       |                       |                                                                | 120:60:60                |      |                                 |                          |                       |                       |                                                                |
|                    | Recomnd N:P:K (kg/ha)   | 100:50:50                 |      |                                 |                          |                       |                       |                                                                | 120:60:60                |      |                                 |                          |                       |                       |                                                                |
|                    | Varieties               |                           |      |                                 |                          |                       |                       |                                                                |                          |      |                                 |                          |                       |                       |                                                                |
|                    | V1                      | IET 26767                 |      |                                 |                          |                       |                       |                                                                | IET 26767                |      |                                 |                          |                       |                       |                                                                |
|                    | V2                      | -                         |      |                                 |                          |                       |                       |                                                                | -                        |      |                                 |                          |                       |                       |                                                                |
|                    | V3                      | IET 26477                 |      |                                 |                          |                       |                       |                                                                | IET 26477                |      |                                 |                          |                       |                       |                                                                |
|                    | V4                      | IET 24914                 |      |                                 |                          |                       |                       |                                                                | IET 24914                |      |                                 |                          |                       |                       |                                                                |
|                    | V5                      | IET 25713                 |      |                                 |                          |                       |                       |                                                                | IET 25713                |      |                                 |                          |                       |                       |                                                                |
|                    | V6                      | NC- Sahbhagidhan          |      |                                 |                          |                       |                       |                                                                | NC- Sahbhagidhan         |      |                                 |                          |                       |                       |                                                                |
|                    | V7                      | Vandana                   |      |                                 |                          |                       |                       |                                                                | -                        |      |                                 |                          |                       |                       |                                                                |
|                    | V8                      | ZC-Govind (NW)            |      |                                 |                          |                       |                       |                                                                | ZC-Govind (NW)           |      |                                 |                          |                       |                       |                                                                |
|                    | V9                      | -                         |      |                                 |                          |                       |                       |                                                                | -                        |      |                                 |                          |                       |                       |                                                                |
|                    | V10                     | -                         |      |                                 |                          |                       |                       |                                                                | Varalu                   |      |                                 |                          |                       |                       |                                                                |
|                    | V11                     | -                         |      |                                 |                          |                       |                       |                                                                | -                        |      |                                 |                          |                       |                       |                                                                |
|                    | V12                     | Phule Radha (Local check) |      |                                 |                          |                       |                       |                                                                | HUR 1309 (Local Check)   |      |                                 |                          |                       |                       |                                                                |
|                    | Available N:P:K (kg/ha) | 172:18:234                |      |                                 |                          |                       |                       |                                                                | 241:153:190              |      |                                 |                          |                       |                       |                                                                |

Table 4.1(C): Contd.

| N-levels    | Varieties | MARUTERU           |      |                              |                    |                 |                    |                                                       | Over all mean | Rank |
|-------------|-----------|--------------------|------|------------------------------|--------------------|-----------------|--------------------|-------------------------------------------------------|---------------|------|
|             |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test weight (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) |               |      |
| F1          | V1        | 4.91               | 7    | 342                          | 3.54               | 20.24           | 74                 |                                                       | 4.49          | 16   |
|             | V2        | 4.73               | 10   | 331                          | 3.41               | 19.42           | 78                 |                                                       | 3.97          | 22   |
|             | V3        | 4.68               | 11   | 329                          | 3.37               | 19.21           | 81                 |                                                       | 4.90          | 8    |
|             | V4        | 4.43               | 13   | 314                          | 3.19               | 18.24           | 80                 |                                                       | 4.68          | 12   |
|             | V5        | 4.86               | 8    | 339                          | 3.5                | 19.34           | 76                 |                                                       | 4.66          | 13   |
|             | V6        | 4.39               | 14   | 312                          | 3.16               | 23.11           | 79                 |                                                       | 4.20          | 20   |
|             | V7        | -                  |      | -                            | -                  | -               | -                  |                                                       | 3.78          | 24   |
|             | V8        | 4.26               | 15   | 305                          | 3.07               | 20.42           | 76                 |                                                       | 3.90          | 23   |
|             | V9        | -                  |      | -                            | -                  | -               | -                  |                                                       | 4.77          | 9    |
|             | V10       | 4.2                | 16   | 301                          | 3.02               | 18.51           | 76                 |                                                       | 4.17          | 21   |
|             | V11       | -                  |      | -                            | -                  | -               | -                  |                                                       | 4.27          | 19   |
|             | V12       | -                  |      | -                            | -                  | -               | -                  |                                                       | 4.51          | 15   |
| F2          | V1        | 5.72               | 1    | 384                          | 4.12               | 20.54           | 76                 | 7.71                                                  | 5.23          | 2    |
|             | V2        | 5.47               | 2    | 370                          | 3.94               | 19.63           | 80                 | 7.05                                                  | 4.94          | 7    |
|             | V3        | 5.39               | 4    | 371                          | 3.89               | 19.42           | 82                 | 6.76                                                  | 5.21          | 3    |
|             | V4        | 5.05               | 5    | 350                          | 3.64               | 18.44           | 82                 | 5.90                                                  | 5.17          | 5    |
|             | V5        | 5.47               | 2    | 374                          | 3.94               | 19.84           | 76                 | 5.81                                                  | 5.59          | 1    |
|             | V6        | 4.95               | 6    | 344                          | 3.56               | 23.24           | 81                 | 5.33                                                  | 4.72          | 10   |
|             | V7        | -                  |      | -                            | -                  | -               | -                  |                                                       | 4.72          | 11   |
|             | V8        | 4.75               | 9    | 333                          | 3.42               | 20.71           | 78                 | 4.67                                                  | 4.36          | 18   |
|             | V9        | -                  |      | -                            | -                  | -               | -                  |                                                       | 5.20          | 4    |
|             | V10       | 4.66               | 12   | 327                          | 3.36               | 18.54           | 78                 | 4.38                                                  | 4.60          | 14   |
|             | V11       | -                  |      | -                            | -                  | -               | -                  |                                                       | 4.46          | 17   |
|             | V12       | -                  |      | -                            | -                  | -               | -                  |                                                       | 5.05          | 6    |
| Interaction |           |                    |      |                              |                    |                 |                    |                                                       |               |      |
| F at same V |           | NS                 |      | NS                           | NS                 | NS              | NS                 |                                                       |               |      |
| V at same F |           | NS                 |      | NS                           | NS                 | NS              | NS                 |                                                       |               |      |
| F1          |           | 4.56               | 2    | 322                          | 3.28               | 19.81           | 78                 |                                                       | 4.41          | 2    |
| F2          |           | 5.18               | 1    | 357                          | 3.73               | 20.05           | 79                 | 5.95                                                  | 4.97          | 1    |
| C.D.(0.05)  |           | 0.27               |      | 15.85                        | 0.33               | NS              | NS                 |                                                       |               |      |
| C.V.(%)     |           | 4.55               |      | 3.76                         | 7.64               | 1.61            | 2.49               |                                                       |               |      |

Table 4.1(C): Contd.

| N-levels           | Varieties                       | MARUTERU           |      |                              |                    |                 |                    |                                                       | Over all mean | Rank |
|--------------------|---------------------------------|--------------------|------|------------------------------|--------------------|-----------------|--------------------|-------------------------------------------------------|---------------|------|
|                    |                                 | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test weight (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) |               |      |
| Mean of varieties: |                                 |                    |      |                              |                    |                 |                    |                                                       |               |      |
|                    | V1                              | 5.32               | 1    | 363                          | 3.83               | 20.39           | 75                 | 7.71                                                  | 4.86          | 5    |
|                    | V2                              | 5.10               | 3    | 351                          | 3.68               | 19.53           | 79                 | 7.05                                                  | 4.45          | 8    |
|                    | V3                              | 5.04               | 4    | 350                          | 3.63               | 19.32           | 82                 | 6.76                                                  | 5.05          | 2    |
|                    | V4                              | 4.74               | 5    | 332                          | 3.42               | 18.34           | 81                 | 5.90                                                  | 4.92          | 4    |
|                    | V5                              | 5.17               | 2    | 357                          | 3.72               | 19.59           | 76                 | 5.81                                                  | 5.13          | 1    |
|                    | V6                              | 4.67               | 6    | 328                          | 3.36               | 23.18           | 80                 | 5.33                                                  | 4.46          | 7    |
|                    | V7                              | -                  | -    | -                            | -                  | -               | -                  | -                                                     | 4.25          | 11   |
|                    | V8                              | 4.51               | 7    | 319                          | 3.25               | 20.57           | 77                 | 4.67                                                  | 4.13          | 12   |
|                    | V9                              | -                  | -    | -                            | -                  | -               | -                  | -                                                     | 4.99          | 3    |
|                    | V10                             | 4.43               | 8    | 314                          | 3.19               | 18.53           | 77                 | 4.38                                                  | 4.38          | 9    |
|                    | V11                             | -                  | -    | -                            | -                  | -               | -                  | -                                                     | 4.36          | 10   |
|                    | V12                             | -                  | -    | -                            | -                  | -               | -                  | -                                                     | 4.78          | 6    |
|                    | C.D.(0.05)                      | NS                 |      | 21.43                        | 0.28               | 0.45            | 1.8                |                                                       |               |      |
|                    | C.V. (%)                        | 13.31              |      | 5.34                         | 6.73               | 1.91            | 1.94               |                                                       |               |      |
|                    | Expt. Mean                      | 4.87               |      | 339                          | 3.51               | 19.93           | 78                 |                                                       | 4.69          |      |
|                    | Soil type                       | Delta alluvial     |      |                              |                    |                 |                    |                                                       |               |      |
|                    | pH                              | 7.16               |      |                              |                    |                 |                    |                                                       |               |      |
|                    | N - levels (kg/ha)              |                    |      |                              |                    |                 |                    |                                                       |               |      |
|                    | F1                              | 45:30:30           |      |                              |                    |                 |                    |                                                       |               |      |
|                    | F2                              | 90:60:60           |      |                              |                    |                 |                    |                                                       |               |      |
|                    | Recommended N:P:K (kg/ha)       | 90:60:60           |      |                              |                    |                 |                    |                                                       |               |      |
|                    | Varieties                       |                    |      |                              |                    |                 |                    |                                                       |               |      |
|                    | V1                              | IET 26767          |      |                              |                    |                 |                    |                                                       |               |      |
|                    | V2                              | IET 26803          |      |                              |                    |                 |                    |                                                       |               |      |
|                    | V3                              | IET 26477          |      |                              |                    |                 |                    |                                                       |               |      |
|                    | V4                              | IET 24914          |      |                              |                    |                 |                    |                                                       |               |      |
|                    | V5                              | IET 25713          |      |                              |                    |                 |                    |                                                       |               |      |
|                    | V6                              | NC- Sahbhagidhan   |      |                              |                    |                 |                    |                                                       |               |      |
|                    | V7                              | -                  |      |                              |                    |                 |                    |                                                       |               |      |
|                    | V8                              | ZC-Govind (NW)     |      |                              |                    |                 |                    |                                                       |               |      |
|                    | V9                              | -                  |      |                              |                    |                 |                    |                                                       |               |      |
|                    | V10                             | Varalu             |      |                              |                    |                 |                    |                                                       |               |      |
|                    | V11                             | -                  |      |                              |                    |                 |                    |                                                       |               |      |
|                    | V12                             | -                  |      |                              |                    |                 |                    |                                                       |               |      |
|                    | Available N:P:K of soil (kg/ha) | 151:36:257         |      |                              |                    |                 |                    |                                                       |               |      |

**NMT 1(d) IME (Transplanted)**

AVT-2 IME cultures (IET 24950, and IET 25745) were evaluated at seventeen locations viz., **Aduthurai (150:60:60)**, **Chinsurah (80:40:40)**, **Chiplima (80:40:40)**, **Dhangain (120:60:40)**, **Faizabad (120:60:40)**, **Gangavathi (150:75:75)**, **Kanpur (120:60:60)**, **Karjat (100:50:50)**, **Kota (120:60:40)**, **Mandya (100:50:50)**, **Nagina (120:60:40)**, **Navsari (100:30:0)**, **Nawagam (100:25:0)**, **Pantnagar (120:60:40)**, **Pattambi (90:45:45)**, **Puducherry (120:40:40)** and **Varanasi (120:60:40)** in comparison to high yielding standard checks (IR 64, PR 113, Lalat, Karjat 7, MTU 1010, HC-US 312 and local check) under two recommended dose of fertiliser (50 or 100% and 150% RDF). The details and data received from these locations are summarized and presented in **Table 4.1(d)**.

Application of different nutrient levels significantly influenced the grain yield at most of the locations and the maximum increase in grain yield was observed with 150% RDF except at **Chinsurah, Nagina, Navsari, Nawagam, Pantnagar and Varanasi**. Application of 100 or 150% RDF recorded significantly higher grain yields at **Aduthurai (4.58 t/ha)**, **Chiplima (4.60 t/ha)**, **Dhangain (4.23 t/ha)**, **Faizabad (4.37 t/ha)**, **Kanpur (2.83 t/ha)**, **Kota (6.41 t/ha)**, **Mandya (5.68 t/ha)** and **Pattambi (5.19 t/ha)** and **Puducherry (7.05 t/ha)** except at **Karjat**. Nutrient response (kg grain/kg nutrient was found to be higher with the application of 100% RDF at **Aduthurai (9.60)**, **Chiplima (8.05)**, **Dhangain (20.33)**, **Faizabad (2.34)**, **Gangavathi (1.46)**, **Mandya (4.90)** and **Puducherry (3.26)**.

Grain yield differences among the tested varieties were found to be significant at all the locations. Highest grain yield was recorded by IET 24950 at **Aduthurai (4.65 t/ha)**, **Dhangain (4.90 t/ha)**, **Faizabad (5.67 t/ha)**, **Gangavathi (9.96 t/ha)**, **Kanpur (2.99 t/ha)**, **Kota (6.99 t/ha)**, **Nagina (4.70 t/ha)**, **Pantnagar (4.96 t/ha)**, **Puducherry (7.34 t/ha)** and **Varanasi (7.11 t/ha)**. While, IET 25745 at **Chinsurah (5.90 t/ha)**, **Chiplima (4.70 t/ha)**, **Karjat (3.88 t/ha)**, **Mandya (5.54 t/ha)**, **Navsari (4.11 t/ha)** and **Nawagam (6.49 t/ha)**. Mean over the locations performance, IET 24950 (5.50 t/ha) recorded higher yields. Interaction effects among RDF x varieties was found to be non-significant at all the locations except at **Gangavathi, Karjat, Pattambi and Varanasi**.

In this trial, mean over the locations, nutrient management with higher RDF application recorded better yield over 50 or 100% RDF. IET 24950 (5.50 t/ha) and IET 25745 (5.22 t/ha) performed better and recorded higher mean grain yield over the locations as compared to other cultures.

Table 4.1(d): Summary of data on grain yield and ancillary characters of selected AVT -2 IME cultures grown under upland conditions at grade level of recommended fertilizer doses, kharif 2019.

| N-levels                    | Varieties | ADUTHURAI          |      |                              |                    |                                                       | CHINSURAH          |      |                              |                    |                        |                                                       |
|-----------------------------|-----------|--------------------|------|------------------------------|--------------------|-------------------------------------------------------|--------------------|------|------------------------------|--------------------|------------------------|-------------------------------------------------------|
|                             |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Days for 50% Flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) |
| F1: Low input (50% NPK)     | V1        | 4.23               | 6    | 273                          | 3.79               |                                                       | 5.60               | 3    | 275                          | 3.80               | 89                     |                                                       |
|                             | V2        | 3.80               | 8    | 281                          | 3.56               |                                                       | 5.40               | 4    | 258                          | 3.72               | 90                     |                                                       |
|                             | V3        | 3.60               | 10   | 315                          | 2.67               |                                                       | 3.69               | 8    | 248                          | 3.25               | 83                     |                                                       |
|                             | V4        | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -                      |                                                       |
|                             | V5        | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -                      |                                                       |
|                             | V6        | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -                      |                                                       |
|                             | V7        | 3.77               | 9    | 303                          | 2.62               |                                                       | 3.56               | 9    | 282                          | 3.14               | 80                     |                                                       |
|                             | V8        | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -                      |                                                       |
|                             | V9        | 3.90               | 7    | 310                          | 2.65               |                                                       | 3.54               | 10   | 282                          | 2.59               | 82                     |                                                       |
| F2: Medium input (100% NPK) | V1        | 5.07               | 1    | 285                          | 3.83               | 11.20                                                 | 6.10               | 2    | 313                          | 4.14               | 91                     | 7.14                                                  |
|                             | V2        | 4.53               | 2    | 291                          | 3.66               | 9.73                                                  | 6.39               | 1    | 303                          | 4.06               | 91                     | 14.14                                                 |
|                             | V3        | 4.37               | 5    | 322                          | 2.78               | 10.27                                                 | 4.65               | 5    | 282                          | 3.42               | 83                     | 13.71                                                 |
|                             | V4        | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -                      |                                                       |
|                             | V5        | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -                      |                                                       |
|                             | V6        | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -                      |                                                       |
|                             | V7        | 4.43               | 4    | 320                          | 2.77               | 8.80                                                  | 4.21               | 6    | 308                          | 3.23               | 80                     | 9.29                                                  |
|                             | V8        | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -                      |                                                       |
|                             | V9        | 4.50               | 3    | 325                          | 2.73               | 8.00                                                  | 3.85               | 7    | 317                          | 3.34               | 82                     | 4.43                                                  |
| F3: High input (150% NPK)   | V1        | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -                      |                                                       |
|                             | V2        | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -                      |                                                       |
|                             | V3        | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -                      |                                                       |
|                             | V4        | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -                      |                                                       |
|                             | V5        | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -                      |                                                       |
|                             | V6        | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -                      |                                                       |
|                             | V7        | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -                      |                                                       |
|                             | V8        | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -                      |                                                       |
|                             | V9        | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -                      |                                                       |
| Interaction                 |           |                    |      |                              |                    |                                                       |                    |      |                              |                    |                        |                                                       |
| N at same V                 |           | NS                 |      | NS                           | NS                 |                                                       | NS                 |      | NS                           | NS                 | NS                     |                                                       |
| V at same N                 |           | NS                 |      | NS                           | NS                 |                                                       | NS                 |      | NS                           | NS                 | NS                     |                                                       |
| <b>Means of F levels:</b>   |           |                    |      |                              |                    |                                                       |                    |      |                              |                    |                        |                                                       |
| F1                          |           | 3.86               | 2    | 296                          | 3.06               |                                                       | 4.36               | 2    | 269                          | 3.30               | 85                     |                                                       |
| F2                          |           | 4.58               | 1    | 309                          | 3.15               | 9.60                                                  | 5.04               | 1    | 304                          | 3.64               | 85                     | 9.74                                                  |
| F3                          |           | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -                      |                                                       |
| C.D.(0.05)                  |           | 0.05               |      | 3.94                         | 0.08               |                                                       | NS                 |      | 14.45                        | NS                 | 0.50                   |                                                       |
| C.V.(%)                     |           | 0.75               |      | 0.83                         | 1.64               |                                                       | 14.25              |      | 3.21                         | 8.97               | 0.37                   |                                                       |

Table 4.1(d): Contd.

| N-<br>levels                 | Varieties            | ADUTHURAI             |      |                                 |                          |                                                                | CHINSURAH                |      |                                 |                          |                              |                                                                |
|------------------------------|----------------------|-----------------------|------|---------------------------------|--------------------------|----------------------------------------------------------------|--------------------------|------|---------------------------------|--------------------------|------------------------------|----------------------------------------------------------------|
|                              |                      | Grain Yield<br>(t/ha) | Rank | Panicle/m <sup>2</sup><br>(No.) | Panicle<br>Weight<br>(g) | Nutri. res. (kg<br>grain/kg Nutri.)<br>(Base level<br>50% RDF) | Grain<br>Yield<br>(t/ha) | Rank | Panicle/m <sup>2</sup><br>(No.) | Panicle<br>Weight<br>(g) | Days for<br>50%<br>Flowering | Nutri. res. (kg<br>grain/kg Nutri.)<br>(Base level 50%<br>RDF) |
| Mean of varieties:           |                      |                       |      |                                 |                          |                                                                |                          |      |                                 |                          |                              |                                                                |
|                              | V1                   | 4.65                  | 1    | 279                             | 3.81                     | 11.20                                                          | 5.85                     | 2    | 294                             | 3.97                     | 90                           | 7.14                                                           |
|                              | V2                   | 4.17                  | 3    | 286                             | 3.61                     | 9.73                                                           | 5.90                     | 1    | 281                             | 3.89                     | 91                           | 14.14                                                          |
|                              | V3                   | 3.99                  | 5    | 319                             | 2.73                     | 10.27                                                          | 4.17                     | 3    | 265                             | 3.34                     | 83                           | 13.71                                                          |
|                              | V4                   | -                     |      | -                               | -                        |                                                                | -                        |      | -                               | -                        | -                            |                                                                |
|                              | V5                   | -                     |      | -                               | -                        |                                                                | -                        |      | -                               | -                        | -                            |                                                                |
|                              | V6                   | -                     |      | -                               | -                        |                                                                | -                        |      | -                               | -                        | -                            |                                                                |
|                              | V7                   | 4.10                  | 4    | 312                             | 2.70                     | 8.80                                                           | 3.89                     | 4    | 295                             | 3.19                     | 80                           | 9.29                                                           |
|                              | V8                   | -                     |      | -                               | -                        |                                                                | -                        |      | -                               | -                        | -                            |                                                                |
|                              | V9                   | 4.20                  | 2    | 318                             | 2.69                     | 8.00                                                           | 3.70                     | 5    | 300                             | 2.97                     | 82                           | 4.43                                                           |
|                              | C.D.(0.05)           | 0.16                  |      | 2.80                            | 0.05                     |                                                                | 0.37                     |      | 22.65                           | 0.29                     | 0.59                         |                                                                |
|                              | C.V.(%)              | 3.09                  |      | 0.76                            | 1.32                     |                                                                | 6.44                     |      | 6.46                            | 6.79                     | 0.57                         |                                                                |
| Expt. Mean                   |                      | 4.22                  |      | 302                             | 3.11                     |                                                                | 4.70                     |      | 287                             | 3.47                     | 85                           |                                                                |
| Soil type                    | Clay                 |                       |      |                                 |                          |                                                                | Clay loam                |      |                                 |                          |                              |                                                                |
| pH                           | 8.20                 |                       |      |                                 |                          |                                                                | 7.85                     |      |                                 |                          |                              |                                                                |
| N - levels (kg/ha)           |                      |                       |      |                                 |                          |                                                                |                          |      |                                 |                          |                              |                                                                |
| F1                           | 75:60:60             |                       |      |                                 |                          |                                                                | 35:17.5:17.5             |      |                                 |                          |                              |                                                                |
| F2                           | 150:60:60            |                       |      |                                 |                          |                                                                | 70:35:35                 |      |                                 |                          |                              |                                                                |
| F3                           | -                    |                       |      |                                 |                          |                                                                | -                        |      |                                 |                          |                              |                                                                |
| Recommended N:P:K<br>(kg/ha) | 150:60:60            |                       |      |                                 |                          |                                                                | 70:35:35                 |      |                                 |                          |                              |                                                                |
| Varieties                    |                      |                       |      |                                 |                          |                                                                |                          |      |                                 |                          |                              |                                                                |
| V1                           | IET 24950            |                       |      |                                 |                          |                                                                | IET 24950                |      |                                 |                          |                              |                                                                |
| V2                           | IET 25745            |                       |      |                                 |                          |                                                                | IET 25745                |      |                                 |                          |                              |                                                                |
| V3                           | NC- IR 64            |                       |      |                                 |                          |                                                                | NC- IR 64                |      |                                 |                          |                              |                                                                |
| V4                           | -                    |                       |      |                                 |                          |                                                                | -                        |      |                                 |                          |                              |                                                                |
| V5                           | -                    |                       |      |                                 |                          |                                                                | -                        |      |                                 |                          |                              |                                                                |
| V6                           | -                    |                       |      |                                 |                          |                                                                | -                        |      |                                 |                          |                              |                                                                |
| V7                           | MTU 1010 (C & S)     |                       |      |                                 |                          |                                                                | MTU 1010 (C & S)         |      |                                 |                          |                              |                                                                |
| V8                           | -                    |                       |      |                                 |                          |                                                                | -                        |      |                                 |                          |                              |                                                                |
| V9                           | ADT 53 (Local check) |                       |      |                                 |                          |                                                                | Ajit (Local check)       |      |                                 |                          |                              |                                                                |
| Available N:P:K (kg/ha)      | 268:24:322           |                       |      |                                 |                          |                                                                | 530:119:364              |      |                                 |                          |                              |                                                                |

Table 4.1(d): Contd.

| N-levels                    | Varieties | CHIPLIMA           |      |                              |                    |            |                        |                                                       | DHANGAIN           |      |                              |                    |                        |                                                       |
|-----------------------------|-----------|--------------------|------|------------------------------|--------------------|------------|------------------------|-------------------------------------------------------|--------------------|------|------------------------------|--------------------|------------------------|-------------------------------------------------------|
|                             |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test wt(g) | Days for 50% Flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Days for 50% Flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) |
| F1: Low input (50% NPK)     | V1        | 4.14               | 7    | 196                          | 7.14               | 23.67      | 102                    |                                                       | 4.07               | 5    | 297                          | 5.07               | 90                     |                                                       |
|                             | V2        | 4.38               | 4    | 209                          | 6.73               | 24.67      | 102                    |                                                       | 3.87               | 6    | 287                          | 4.48               | 89                     |                                                       |
|                             | V3        | 3.78               | 9    | 230                          | 3.90               | 23.67      | 101                    |                                                       | 2.43               | 14   | 260                          | 2.43               | 83                     |                                                       |
|                             | V4        | -                  |      | -                            | -                  | -          | -                      |                                                       | -                  |      | -                            | -                  | -                      |                                                       |
|                             | V5        | 3.69               | 10   | 227                          | 3.87               | 23.67      | 95                     |                                                       | 2.63               | 12   | 275                          | 2.88               | 100                    |                                                       |
|                             | V6        | -                  |      | -                            | -                  | -          | -                      |                                                       | -                  |      | -                            | -                  | -                      |                                                       |
|                             | V7        | -                  |      | -                            | -                  | -          | -                      |                                                       | 2.70               | 11   | 275                          | 3.16               | 81                     |                                                       |
|                             | V8        | -                  |      | -                            | -                  | -          | -                      |                                                       | 2.83               | 10   | 282                          | 3.63               | 92                     |                                                       |
|                             | V9        | 3.79               | 8    | 210                          | 4.45               | 30.33      | 97                     |                                                       | 2.53               | 13   | 268                          | 2.83               | 94                     |                                                       |
| F2: Medium input (100% NPK) | V1        | 5.01               | 2    | 216                          | 7.67               | 25.00      | 102                    | 10.88                                                 | 5.73               | 1    | 310                          | 5.10               | 90                     | 27.67                                                 |
|                             | V2        | 5.02               | 1    | 198                          | 7.83               | 28.67      | 102                    | 8.00                                                  | 5.57               | 2    | 306                          | 4.98               | 89                     | 28.33                                                 |
|                             | V3        | 4.41               | 3    | 246                          | 4.40               | 31.00      | 101                    | 7.88                                                  | 3.17               | 9    | 267                          | 2.88               | 83                     | 12.33                                                 |
|                             | V4        | -                  |      | -                            | -                  | -          | -                      |                                                       | -                  |      | -                            | -                  | -                      |                                                       |
|                             | V5        | 4.25               | 6    | 264                          | 4.87               | 24.67      | 95                     | 7.00                                                  | 3.37               | 7    | 280                          | 3.43               | 100                    | 12.33                                                 |
|                             | V6        | -                  |      | -                            | -                  | -          | -                      |                                                       | -                  |      | -                            | -                  | -                      |                                                       |
|                             | V7        | -                  |      | -                            | -                  | -          | -                      |                                                       | 4.23               | 4    | 284                          | 3.47               | 81                     | 25.50                                                 |
|                             | V8        | -                  |      | -                            | -                  | -          | -                      |                                                       | 4.30               | 3    | 289                          | 3.70               | 92                     | 24.50                                                 |
|                             | V9        | 4.31               | 5    | 238                          | 4.76               | 24.67      | 96                     | 6.50                                                  | 3.23               | 8    | 278                          | 3.29               | 94                     | 11.67                                                 |
| F3: High input (150% NPK)   | V1        | -                  |      | -                            | -                  | -          | -                      |                                                       | -                  |      | -                            | -                  | -                      |                                                       |
|                             | V2        | -                  |      | -                            | -                  | -          | -                      |                                                       | -                  |      | -                            | -                  | -                      |                                                       |
|                             | V3        | -                  |      | -                            | -                  | -          | -                      |                                                       | -                  |      | -                            | -                  | -                      |                                                       |
|                             | V4        | -                  |      | -                            | -                  | -          | -                      |                                                       | -                  |      | -                            | -                  | -                      |                                                       |
|                             | V5        | -                  |      | -                            | -                  | -          | -                      |                                                       | -                  |      | -                            | -                  | -                      |                                                       |
|                             | V6        | -                  |      | -                            | -                  | -          | -                      |                                                       | -                  |      | -                            | -                  | -                      |                                                       |
|                             | V7        | -                  |      | -                            | -                  | -          | -                      |                                                       | -                  |      | -                            | -                  | -                      |                                                       |
|                             | V8        | -                  |      | -                            | -                  | -          | -                      |                                                       | -                  |      | -                            | -                  | -                      |                                                       |
|                             | V9        | -                  |      | -                            | -                  | -          | -                      |                                                       | -                  |      | -                            | -                  | -                      |                                                       |
| Interaction                 |           |                    |      |                              |                    |            |                        |                                                       |                    |      |                              |                    |                        |                                                       |
| N at same V                 |           | NS                 |      | NS                           | NS                 | 1.60       | NS                     |                                                       | NS                 |      | NS                           | NS                 | NS                     |                                                       |
| V at same N                 |           | NS                 |      | NS                           | NS                 | 1.63       | NS                     |                                                       | NS                 |      | NS                           | NS                 | NS                     |                                                       |
| <b>Means of F levels:</b>   |           |                    |      |                              |                    |            |                        |                                                       |                    |      |                              |                    |                        |                                                       |
| F1                          |           | 3.96               | 2    | 214                          | 5.22               | 25.20      | 99                     |                                                       | 3.01               | 2    | 278                          | 3.50               | 90                     |                                                       |
| F2                          |           | 4.60               | 1    | 232                          | 5.91               | 26.80      | 99                     | 8.05                                                  | 4.23               | 1    | 288                          | 3.84               | 90                     | 20.33                                                 |
| F3                          |           | -                  |      | -                            | -                  | -          | -                      |                                                       | -                  |      | -                            | -                  | -                      |                                                       |
| C.D.(0.05)                  |           | 0.43               |      | 15.17                        | 0.67               | 0.99       | NS                     |                                                       | 0.48               |      | NS                           | NS                 | NS                     |                                                       |
| C.V.(%)                     |           | 6.35               |      | 4.32                         | 7.62               | 2.43       | 0.37                   |                                                       | 9.92               |      | 4.72                         | 38.96              | 0.30                   |                                                       |

Table 4.1(d): Contd.

| N-levels           | Varieties               | CHIPLIMA                |      |                              |                    |            |                        |                                                       | DHANGAIN                 |      |                              |                    |                        |                                                       |
|--------------------|-------------------------|-------------------------|------|------------------------------|--------------------|------------|------------------------|-------------------------------------------------------|--------------------------|------|------------------------------|--------------------|------------------------|-------------------------------------------------------|
|                    |                         | Grain Yield (t/ha)      | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test wt(g) | Days for 50% Flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) | Grain Yield (t/ha)       | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Days for 50% Flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) |
| Mean of varieties: |                         |                         |      |                              |                    |            |                        |                                                       |                          |      |                              |                    |                        |                                                       |
|                    | V1                      | 4.58                    | 2    | 206                          | 7.41               | 24.34      | 102                    | 10.88                                                 | 4.90                     | 1    | 304                          | 5.09               | 90                     | 27.67                                                 |
|                    | V2                      | 4.70                    | 1    | 203                          | 7.28               | 26.67      | 102                    | 8.00                                                  | 4.72                     | 2    | 296                          | 4.73               | 89                     | 28.33                                                 |
|                    | V3                      | 4.10                    | 3    | 238                          | 4.15               | 27.34      | 101                    | 7.88                                                  | 2.80                     | 7    | 263                          | 2.66               | 83                     | 12.33                                                 |
|                    | V4                      | -                       | -    | -                            | -                  | -          | -                      | -                                                     | -                        | -    | -                            | -                  | -                      | -                                                     |
|                    | V5                      | 3.97                    | 5    | 246                          | 4.37               | 24.17      | 95                     | 7.00                                                  | 3.00                     | 5    | 278                          | 3.16               | 100                    | 12.33                                                 |
|                    | V6                      | -                       | -    | -                            | -                  | -          | -                      | -                                                     | -                        | -    | -                            | -                  | -                      | -                                                     |
|                    | V7                      | -                       | -    | -                            | -                  | -          | -                      | -                                                     | 3.47                     | 4    | 280                          | 3.32               | 81                     | 25.50                                                 |
|                    | V8                      | -                       | -    | -                            | -                  | -          | -                      | -                                                     | 3.57                     | 3    | 285                          | 3.67               | 92                     | 24.50                                                 |
|                    | V9                      | 4.05                    | 4    | 224                          | 4.61               | 27.50      | 97                     | 6.50                                                  | 2.88                     | 6    | 273                          | 3.06               | 94                     | 11.67                                                 |
|                    | C.D.(0.05)              | 0.37                    |      | 28.30                        | 0.52               | 1.13       | 0.56                   |                                                       | 0.42                     |      | 14.52                        | 0.80               | 0.71                   |                                                       |
|                    | C.V.(%)                 | 7.12                    |      | 10.36                        | 7.64               | 3.56       | 0.46                   |                                                       | 9.79                     |      | 4.31                         | 18.29              | 0.67                   |                                                       |
|                    | Expt. Mean              | 4.28                    |      | 223                          | 5.56               | 26.00      | 99                     |                                                       | 3.62                     |      | 283                          | 3.67               | 90                     |                                                       |
|                    | Soil type               | Sandy loam              |      |                              |                    |            |                        |                                                       | Loamy                    |      |                              |                    |                        |                                                       |
|                    | pH                      | 7.12                    |      |                              |                    |            |                        |                                                       | 6.80                     |      |                              |                    |                        |                                                       |
|                    | N - levels (kg/ha)      |                         |      |                              |                    |            |                        |                                                       |                          |      |                              |                    |                        |                                                       |
|                    | F1                      | 40:20:20                |      |                              |                    |            |                        |                                                       | 60:60:40                 |      |                              |                    |                        |                                                       |
|                    | F2                      | 80:40:40                |      |                              |                    |            |                        |                                                       | 120:60:40                |      |                              |                    |                        |                                                       |
|                    | F3                      | -                       |      |                              |                    |            |                        |                                                       | -                        |      |                              |                    |                        |                                                       |
|                    |                         | 80:40:40                |      |                              |                    |            |                        |                                                       | 120:60:40                |      |                              |                    |                        |                                                       |
|                    | Recomnd N:P:K (kg/ha)   |                         |      |                              |                    |            |                        |                                                       |                          |      |                              |                    |                        |                                                       |
|                    | Varieties               |                         |      |                              |                    |            |                        |                                                       |                          |      |                              |                    |                        |                                                       |
|                    | V1                      | IET 24950               |      |                              |                    |            |                        |                                                       | IET 24950                |      |                              |                    |                        |                                                       |
|                    | V2                      | IET 25745               |      |                              |                    |            |                        |                                                       | IET 25745                |      |                              |                    |                        |                                                       |
|                    | V3                      | NC- IR 64               |      |                              |                    |            |                        |                                                       | NC- IR 64                |      |                              |                    |                        |                                                       |
|                    | V4                      | -                       |      |                              |                    |            |                        |                                                       | -                        |      |                              |                    |                        |                                                       |
|                    | V5                      | Lalat (E & NE)          |      |                              |                    |            |                        |                                                       | Lalat (E & NE)           |      |                              |                    |                        |                                                       |
|                    | V6                      | -                       |      |                              |                    |            |                        |                                                       | -                        |      |                              |                    |                        |                                                       |
|                    | V7                      | -                       |      |                              |                    |            |                        |                                                       | MTU 1010 (C & S)         |      |                              |                    |                        |                                                       |
|                    | V8                      | -                       |      |                              |                    |            |                        |                                                       | HC- US 312               |      |                              |                    |                        |                                                       |
|                    | V9                      | Mandakini (Local check) |      |                              |                    |            |                        |                                                       | R.Bhagwati (Local check) |      |                              |                    |                        |                                                       |
|                    | Available N:P:K (kg/ha) | 119:40:117              |      |                              |                    |            |                        |                                                       | 154:14:183               |      |                              |                    |                        |                                                       |

Table 4.1(d): Contd.

| N-levels                    | Varieties | FAIZABAD           |      |                              |                    |            |                        |                                                       | GANGAVATHI         |      |                              |                    |            |                        |                                                       |
|-----------------------------|-----------|--------------------|------|------------------------------|--------------------|------------|------------------------|-------------------------------------------------------|--------------------|------|------------------------------|--------------------|------------|------------------------|-------------------------------------------------------|
|                             |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test wt(g) | Days for 50% Flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test wt(g) | Days for 50% Flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) |
| F1: Low input (50% NPK)     | V1        | 5.40               | 3    | 256                          | 3.23               | 25.4       | 96                     |                                                       | 9.54               | 4    | 308                          | 3.86               | 26.4       | 96                     |                                                       |
|                             | V2        | 5.24               | 4    | 255                          | 4.02               | 25.7       | 98                     |                                                       | 8.00               | 14   | 349                          | 2.59               | 23.3       | 91                     |                                                       |
|                             | V3        | 3.13               | 15   | 255                          | 3.25               | 23.0       | 98                     |                                                       | 8.17               | 13   | 348                          | 3.30               | 24.1       | 95                     |                                                       |
|                             | V4        | 3.49               | 12   | 257                          | 3.35               | 23.2       | 97                     |                                                       | 9.29               | 5    | 377                          | 3.28               | 24.9       | 103                    |                                                       |
|                             | V5        | 3.63               | 10   | 256                          | 3.01               | 23.2       | 97                     |                                                       | 8.78               | 9    | 385                          | 2.22               | 24.7       | 92                     |                                                       |
|                             | V6        | 3.00               | 16   | 257                          | 2.24               | 21.3       | 90                     |                                                       | 8.27               | 10   | 462                          | 1.83               | 25.7       | 92                     |                                                       |
|                             | V7        | 4.05               | 8    | 258                          | 2.23               | 23.6       | 87                     |                                                       | 9.69               | 3    | 345                          | 2.79               | 27.0       | 89                     |                                                       |
|                             | V8        | -                  | -    | -                            | -                  | -          | -                      |                                                       | -                  | -    | -                            | -                  | -          | -                      |                                                       |
|                             | V9        | 4.74               | 7    | 256                          | 3.16               | 24.6       | 96                     |                                                       | 7.90               | 15   | 372                          | 2.32               | 21.5       | 103                    |                                                       |
| F2: Medium input (100% NPK) | V1        | 5.93               | 1    | 257                          | 3.67               | 26.3       | 98                     | 4.42                                                  | 10.37              | 1    | 308                          | 3.76               | 26.8       | 95                     | 5.53                                                  |
|                             | V2        | 5.50               | 2    | 256                          | 3.30               | 26.5       | 98                     | 2.17                                                  | 8.89               | 7    | 360                          | 2.28               | 25.8       | 89                     | 5.93                                                  |
|                             | V3        | 3.16               | 14   | 255                          | 3.24               | 24.6       | 97                     | 0.25                                                  | 8.85               | 8    | 392                          | 3.13               | 22.5       | 96                     | 4.53                                                  |
|                             | V4        | 3.62               | 11   | 257                          | 3.44               | 24.6       | 96                     | 1.08                                                  | 8.20               | 12   | 360                          | 2.82               | 28.2       | 103                    | -7.27                                                 |
|                             | V5        | 3.71               | 9    | 258                          | 2.97               | 24.6       | 98                     | 0.67                                                  | 8.21               | 11   | 420                          | 2.16               | 20.8       | 92                     | -3.80                                                 |
|                             | V6        | 3.20               | 13   | 259                          | 2.69               | 22.5       | 93                     | 1.67                                                  | 7.83               | 16   | 432                          | 1.92               | 24.5       | 92                     | -2.93                                                 |
|                             | V7        | 4.77               | 6    | 259                          | 3.14               | 23.9       | 89                     | 6.00                                                  | 10.11              | 2    | 373                          | 2.26               | 25.4       | 90                     | 2.80                                                  |
|                             | V8        | -                  | -    | -                            | -                  | -          | -                      |                                                       | -                  | -    | -                            | -                  | -          | -                      |                                                       |
|                             | V9        | 5.04               | 5    | 260                          | 3.25               | 24.8       | 96                     | 2.50                                                  | 8.93               | 6    | 392                          | 2.68               | 21.8       | 101                    | 6.87                                                  |
| F3: High input (150% NPK)   | V1        | -                  | -    | -                            | -                  | -          | -                      |                                                       | -                  | -    | -                            | -                  | -          | -                      |                                                       |
|                             | V2        | -                  | -    | -                            | -                  | -          | -                      |                                                       | -                  | -    | -                            | -                  | -          | -                      |                                                       |
|                             | V3        | -                  | -    | -                            | -                  | -          | -                      |                                                       | -                  | -    | -                            | -                  | -          | -                      |                                                       |
|                             | V4        | -                  | -    | -                            | -                  | -          | -                      |                                                       | -                  | -    | -                            | -                  | -          | -                      |                                                       |
|                             | V5        | -                  | -    | -                            | -                  | -          | -                      |                                                       | -                  | -    | -                            | -                  | -          | -                      |                                                       |
|                             | V6        | -                  | -    | -                            | -                  | -          | -                      |                                                       | -                  | -    | -                            | -                  | -          | -                      |                                                       |
|                             | V7        | -                  | -    | -                            | -                  | -          | -                      |                                                       | -                  | -    | -                            | -                  | -          | -                      |                                                       |
|                             | V8        | -                  | -    | -                            | -                  | -          | -                      |                                                       | -                  | -    | -                            | -                  | -          | -                      |                                                       |
|                             | V9        | -                  | -    | -                            | -                  | -          | -                      |                                                       | -                  | -    | -                            | -                  | -          | -                      |                                                       |
| Interaction                 |           |                    |      |                              |                    |            |                        |                                                       |                    |      |                              |                    |            |                        |                                                       |
| N at same V                 |           | 0.22               |      | NS                           | NS                 | 0.34       | NS                     |                                                       | 0.87               |      | NS                           | NS                 | 1.4        | NS                     |                                                       |
| V at same N                 |           | 0.22               |      | NS                           | NS                 | 0.38       | NS                     |                                                       | 1.02               |      | NS                           | NS                 | 1.7        | NS                     |                                                       |
| Means of F levels:          |           |                    |      |                              |                    |            |                        |                                                       |                    |      |                              |                    |            |                        |                                                       |
| F1                          |           | 4.09               | 2    | 256                          | 3.06               | 23.8       | 95                     |                                                       | 8.71               | 2    | 368                          | 2.77               | 24.7       | 95                     |                                                       |
| F2                          |           | 4.37               | 1    | 257                          | 3.21               | 24.7       | 96                     | 2.34                                                  | 8.92               | 1    | 379                          | 2.63               | 24.5       | 95                     | 1.46                                                  |
| F3                          |           | -                  | -    | -                            | -                  | -          | -                      |                                                       | -                  | -    | -                            | -                  | -          | -                      |                                                       |
| C.D.(0.05)                  |           | 0.07               |      | NS                           | NS                 | 0.26       | NS                     |                                                       | NS                 |      | NS                           | 0.13               | NS         | NS                     |                                                       |
| C.V.(%)                     |           | 1.41               |      | 0.65                         | 23.48              | 0.87       | 1.44                   |                                                       | 7.30               |      | 7.60                         | 3.89               | 4.10       | 1.06                   |                                                       |

Table 4.1(d): Contd.

| N-levels                | Varieties  | FAIZABAD               |      |                              |                    |            |                        |                                                       | GANGAVATHI              |      |                              |                    |            |                        |                                                       |
|-------------------------|------------|------------------------|------|------------------------------|--------------------|------------|------------------------|-------------------------------------------------------|-------------------------|------|------------------------------|--------------------|------------|------------------------|-------------------------------------------------------|
|                         |            | Grain Yield (t/ha)     | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test wt(g) | Days for 50% Flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) | Grain Yield (t/ha)      | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test wt(g) | Days for 50% Flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) |
| Mean of varieties:      |            |                        |      |                              |                    |            |                        |                                                       |                         |      |                              |                    |            |                        |                                                       |
|                         | V1         | 5.67                   | 1    | 256                          | 3.45               | 25.9       | 97                     | 4.42                                                  | 9.96                    | 1    | 308                          | 3.81               | 26.6       | 96                     | 5.53                                                  |
|                         | V2         | 5.37                   | 2    | 256                          | 3.66               | 26.1       | 98                     | 2.17                                                  | 8.45                    | 6    | 354                          | 2.44               | 24.6       | 90                     | 5.93                                                  |
|                         | V3         | 3.15                   | 7    | 255                          | 3.25               | 23.8       | 98                     | 0.25                                                  | 8.51                    | 4    | 370                          | 3.22               | 23.3       | 95                     | 4.53                                                  |
|                         | V4         | 3.56                   | 6    | 257                          | 3.40               | 23.9       | 97                     | 1.08                                                  | 8.75                    | 3    | 368                          | 3.05               | 26.5       | 103                    | -7.27                                                 |
|                         | V5         | 3.67                   | 5    | 257                          | 2.99               | 23.9       | 98                     | 0.67                                                  | 8.50                    | 5    | 402                          | 2.19               | 22.8       | 92                     | -3.80                                                 |
|                         | V6         | 3.10                   | 8    | 258                          | 2.47               | 21.9       | 91                     | 1.67                                                  | 8.05                    | 8    | 447                          | 1.88               | 25.1       | 92                     | -2.93                                                 |
|                         | V7         | 4.41                   | 4    | 258                          | 2.69               | 23.8       | 88                     | 6.00                                                  | 9.90                    | 2    | 359                          | 2.53               | 26.2       | 89                     | 2.80                                                  |
|                         | V8         | -                      | -    | -                            | -                  | -          | -                      | -                                                     | -                       | -    | -                            | -                  | -          | -                      | -                                                     |
|                         | V9         | 4.89                   | 3    | 258                          | 3.21               | 24.7       | 96                     | 2.50                                                  | 8.42                    | 7    | 382                          | 2.50               | 21.6       | 102                    | 6.87                                                  |
|                         | C.D.(0.05) | 0.16                   |      | NS                           | 0.64               | 0.24       | 1.69                   |                                                       | 0.61                    |      | 35.30                        | 0.26               | 1.01       | 2.59                   |                                                       |
|                         | C.V.(%)    | 3.16                   |      | 1.07                         | 17.15              | 0.84       | 1.50                   |                                                       | 5.89                    |      | 7.99                         | 8.24               | 3.48       | 2.31                   |                                                       |
| Expt. Mean              |            | 4.23                   |      | 257                          | 3.14               | 24.2       | 95                     |                                                       | 8.81                    |      | 374                          | 2.70               | 24.6       | 95                     |                                                       |
|                         | Soil type  | Sandy loam             |      |                              |                    |            |                        |                                                       | Black clay              |      |                              |                    |            |                        |                                                       |
|                         | pH         | 7.60                   |      |                              |                    |            |                        |                                                       | -                       |      |                              |                    |            |                        |                                                       |
| N - levels (kg/ha)      |            |                        |      |                              |                    |            |                        |                                                       |                         |      |                              |                    |            |                        |                                                       |
|                         | F1         | 60:30:30               |      |                              |                    |            |                        |                                                       | 75:37.5:37.5            |      |                              |                    |            |                        |                                                       |
|                         | F2         | 120:60:60              |      |                              |                    |            |                        |                                                       | 150:75:75               |      |                              |                    |            |                        |                                                       |
|                         | F3         | -                      |      |                              |                    |            |                        |                                                       | -                       |      |                              |                    |            |                        |                                                       |
| Recomnd N:P:K (kg/ha)   |            | 120:60:60              |      |                              |                    |            |                        |                                                       | 150:75:75               |      |                              |                    |            |                        |                                                       |
| Varieties               |            |                        |      |                              |                    |            |                        |                                                       |                         |      |                              |                    |            |                        |                                                       |
|                         | V1         | IET 24950              |      |                              |                    |            |                        |                                                       | IET 24950               |      |                              |                    |            |                        |                                                       |
|                         | V2         | IET 25745              |      |                              |                    |            |                        |                                                       | IET 25745               |      |                              |                    |            |                        |                                                       |
|                         | V3         | NC- IR 64              |      |                              |                    |            |                        |                                                       | NC- IR 64               |      |                              |                    |            |                        |                                                       |
|                         | V4         | ZC- PR 113 (N)         |      |                              |                    |            |                        |                                                       | ZC- PR 113 (N)          |      |                              |                    |            |                        |                                                       |
|                         | V5         | Lalat (E & NE)         |      |                              |                    |            |                        |                                                       | Lalat (E & NE)          |      |                              |                    |            |                        |                                                       |
|                         | V6         | Karjat 7 (W)           |      |                              |                    |            |                        |                                                       | Karjat 7 (W)            |      |                              |                    |            |                        |                                                       |
|                         | V7         | MTU 1010 (C & S)       |      |                              |                    |            |                        |                                                       | MTU 1010 (C & S)        |      |                              |                    |            |                        |                                                       |
|                         | V8         | -                      |      |                              |                    |            |                        |                                                       | -                       |      |                              |                    |            |                        |                                                       |
|                         | V9         | NDR 2065 (Local check) |      |                              |                    |            |                        |                                                       | GNV-10-89 (Local check) |      |                              |                    |            |                        |                                                       |
| Available N:P:K (kg/ha) |            | 200:24:234             |      |                              |                    |            |                        |                                                       | -                       |      |                              |                    |            |                        |                                                       |

Table 4.1(d): Contd.

| N-levels                    | Varieties | KANPUR             |      |                              |                    |            |                        |                                                       | KARJAT             |      |                              |                    |            |                        |                                                       |
|-----------------------------|-----------|--------------------|------|------------------------------|--------------------|------------|------------------------|-------------------------------------------------------|--------------------|------|------------------------------|--------------------|------------|------------------------|-------------------------------------------------------|
|                             |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test wt(g) | Days for 50% Flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test wt(g) | Days for 50% Flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) |
| F1: Low input (50% NPK)     | V1        | -                  | -    | -                            | -                  | -          | -                      | -                                                     | 3.96               | 2    | 148                          | 2.67               | 26.30      | 93                     | -                                                     |
|                             | V2        | -                  | -    | -                            | -                  | -          | -                      | -                                                     | 4.81               | 1    | 131                          | 3.67               | 29.37      | 97                     | -                                                     |
|                             | V3        | -                  | -    | -                            | -                  | -          | -                      | -                                                     | 3.58               | 3    | 139                          | 2.57               | 27.17      | 86                     | -                                                     |
|                             | V4        | -                  | -    | -                            | -                  | -          | -                      | -                                                     | -                  | -    | -                            | -                  | -          | -                      | -                                                     |
|                             | V5        | -                  | -    | -                            | -                  | -          | -                      | -                                                     | -                  | -    | -                            | -                  | -          | -                      | -                                                     |
|                             | V6        | -                  | -    | -                            | -                  | -          | -                      | -                                                     | 3.12               | 5    | 164                          | 1.90               | 24.97      | 84                     | -                                                     |
|                             | V7        | -                  | -    | -                            | -                  | -          | -                      | -                                                     | 3.18               | 4    | 133                          | 2.39               | 28.60      | 84                     | -                                                     |
|                             | V8        | -                  | -    | -                            | -                  | -          | -                      | -                                                     | -                  | -    | -                            | -                  | -          | -                      | -                                                     |
|                             | V9        | -                  | -    | -                            | -                  | -          | -                      | -                                                     | -                  | -    | -                            | -                  | -          | -                      | -                                                     |
| F2: Medium input (100% NPK) | V1        | 2.75               | 5    | 320                          | 2.65               | 23.84      | 81                     | -                                                     | 2.64               | 9    | 157                          | 2.78               | 26.43      | 95                     | -13.20                                                |
|                             | V2        | 2.07               | 7    | 279                          | 2.61               | 20.84      | 81                     | -                                                     | 2.95               | 6    | 143                          | 3.78               | 29.50      | 98                     | -18.60                                                |
|                             | V3        | 2.59               | 6    | 373                          | 2.01               | 15.28      | 77                     | -                                                     | 2.75               | 8    | 155                          | 2.56               | 27.47      | 87                     | -8.30                                                 |
|                             | V4        | -                  | -    | -                            | -                  | -          | -                      | -                                                     | -                  | -    | -                            | -                  | -          | -                      | -                                                     |
|                             | V5        | -                  | -    | -                            | -                  | -          | -                      | -                                                     | -                  | -    | -                            | -                  | -          | -                      | -                                                     |
|                             | V6        | -                  | -    | -                            | -                  | -          | -                      | -                                                     | 2.58               | 10   | 172                          | 2.08               | 25.81      | 85                     | -5.40                                                 |
|                             | V7        | 1.88               | 8    | 281                          | 1.79               | 22.60      | 77                     | -                                                     | 2.93               | 7    | 143                          | 2.57               | 29.27      | 86                     | -2.50                                                 |
|                             | V8        | -                  | -    | -                            | -                  | -          | -                      | -                                                     | -                  | -    | -                            | -                  | -          | -                      | -                                                     |
|                             | V9        | 0.93               | 10   | 225                          | 1.18               | 15.38      | 74                     | -                                                     | -                  | -    | -                            | -                  | -          | -                      | -                                                     |
| F3: High input (150% NPK)   | V1        | 3.22               | 1    | 330                          | 3.39               | 24.09      | 82                     | 3.92                                                  | -                  | -    | -                            | -                  | -          | -                      | -                                                     |
|                             | V2        | 3.12               | 3    | 311                          | 3.32               | 21.35      | 81                     | 8.75                                                  | -                  | -    | -                            | -                  | -          | -                      | -                                                     |
|                             | V3        | 3.13               | 2    | 297                          | 2.29               | 16.62      | 71                     | 4.50                                                  | -                  | -    | -                            | -                  | -          | -                      | -                                                     |
|                             | V4        | -                  | -    | -                            | -                  | -          | -                      | -                                                     | -                  | -    | -                            | -                  | -          | -                      | -                                                     |
|                             | V5        | -                  | -    | -                            | -                  | -          | -                      | -                                                     | -                  | -    | -                            | -                  | -          | -                      | -                                                     |
|                             | V6        | -                  | -    | -                            | -                  | -          | -                      | -                                                     | -                  | -    | -                            | -                  | -          | -                      | -                                                     |
|                             | V7        | 2.88               | 4    | 226                          | 2.15               | 24.00      | 74                     | 8.33                                                  | -                  | -    | -                            | -                  | -          | -                      | -                                                     |
|                             | V8        | -                  | -    | -                            | -                  | -          | -                      | -                                                     | -                  | -    | -                            | -                  | -          | -                      | -                                                     |
|                             | V9        | 1.79               | 9    | 240                          | 1.39               | 16.11      | 71                     | 7.17                                                  | -                  | -    | -                            | -                  | -          | -                      | -                                                     |
| Interaction                 |           |                    |      |                              |                    |            |                        |                                                       |                    |      |                              |                    |            |                        |                                                       |
| N at same V                 |           | NS                 |      | 5.50                         | 0.04               | 0.28       | NS                     |                                                       | 0.13               |      | 2.13                         | NS                 | NS         | NS                     |                                                       |
| V at same N                 |           | NS                 |      | 6.82                         | 0.05               | 0.33       | NS                     |                                                       | 0.13               |      | 2.06                         | NS                 | NS         | NS                     |                                                       |
| <b>Means of F levels:</b>   |           |                    |      |                              |                    |            |                        |                                                       |                    |      |                              |                    |            |                        |                                                       |
| F1                          |           | -                  | -    | -                            | -                  | -          | -                      | -                                                     | 3.73               | 1    | 143                          | 2.64               | 27.28      | 89                     | -                                                     |
| F2                          |           | 2.04               | 2    | 296                          | 2.05               | 19.59      | 78                     | -                                                     | 2.77               | 2    | 154                          | 2.75               | 27.70      | 90                     | -9.60                                                 |
| F3                          |           | 2.83               | 1    | 281                          | 2.51               | 20.43      | 76                     | 6.53                                                  | -                  | -    | -                            | -                  | -          | -                      | -                                                     |
| C.D.(0.05)                  |           | 0.56               |      | 6.02                         | 0.03               | 0.27       | 1.72                   |                                                       | 0.07               |      | 0.99                         | NS                 | 0.20       | 0.29                   |                                                       |
| C.V.(%)                     |           | 14.67              |      | 1.33                         | 0.77               | 0.85       | 1.43                   |                                                       | 1.36               |      | 0.43                         | 3.93               | 0.47       | 0.20                   |                                                       |

Table 4.1(d): Contd.

| N-levels                | Varieties  | KANPUR               |      |                              |                    |            |                        |                                                       | KARJAT                  |      |                              |                    |            |                        |                                                       |
|-------------------------|------------|----------------------|------|------------------------------|--------------------|------------|------------------------|-------------------------------------------------------|-------------------------|------|------------------------------|--------------------|------------|------------------------|-------------------------------------------------------|
|                         |            | Grain Yield (t/ha)   | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test wt(g) | Days for 50% Flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) | Grain Yield (t/ha)      | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test wt(g) | Days for 50% Flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) |
| Mean of varieties:      |            |                      |      |                              |                    |            |                        |                                                       |                         |      |                              |                    |            |                        |                                                       |
|                         | V1         | 2.99                 | 1    | 325                          | 3.02               | 23.97      | 82                     | 3.92                                                  | 3.30                    | 2    | 153                          | 2.73               | 26.37      | 94                     | -13.20                                                |
|                         | V2         | 2.60                 | 3    | 295                          | 2.97               | 21.10      | 81                     | 8.75                                                  | 3.88                    | 1    | 137                          | 3.73               | 29.44      | 97                     | -18.60                                                |
|                         | V3         | 2.86                 | 2    | 335                          | 2.15               | 15.95      | 74                     | 4.50                                                  | 3.17                    | 3    | 147                          | 2.57               | 27.32      | 87                     | -8.30                                                 |
|                         | V4         | -                    |      | -                            | -                  | -          | -                      |                                                       | -                       |      | -                            | -                  | -          | -                      |                                                       |
|                         | V5         | -                    |      | -                            | -                  | -          | -                      |                                                       | -                       |      | -                            | -                  | -          | -                      |                                                       |
|                         | V6         | -                    |      | -                            | -                  | -          | -                      |                                                       | 2.85                    | 5    | 168                          | 1.99               | 25.39      | 85                     | -5.40                                                 |
|                         | V7         | 2.38                 | 4    | 254                          | 1.97               | 23.30      | 75                     | 8.33                                                  | 3.06                    | 4    | 138                          | 2.48               | 28.94      | 85                     | -2.50                                                 |
|                         | V8         | -                    |      | -                            | -                  | -          | -                      |                                                       | -                       |      | -                            | -                  | -          | -                      |                                                       |
|                         | V9         | 1.36                 | 5    | 233                          | 1.29               | 15.75      | 72                     | 7.17                                                  | -                       |      | -                            | -                  | -          | -                      |                                                       |
|                         | C.D.(0.05) | 0.19                 |      | 3.89                         | 0.03               | 0.20       | 2.08                   |                                                       | 0.09                    |      | 1.51                         | 0.09               | 0.28       | 0.64                   |                                                       |
|                         | C.V.(%)    | 6.30                 |      | 1.10                         | 1.13               | 0.81       | 2.22                   |                                                       | 2.36                    |      | 0.83                         | 2.87               | 0.84       | 0.59                   |                                                       |
| Expt. Mean              |            | 2.44                 |      | 288                          | 2.28               | 20.01      | 77                     |                                                       | 3.25                    |      | 149                          | 2.70               | 27.49      | 90                     |                                                       |
|                         | Soil type  | Sandy clay loam      |      |                              |                    |            |                        |                                                       | -                       |      |                              |                    |            |                        |                                                       |
|                         | pH         | 7.89                 |      |                              |                    |            |                        |                                                       | -                       |      |                              |                    |            |                        |                                                       |
| N - levels (kg/ha)      |            |                      |      |                              |                    |            |                        |                                                       |                         |      |                              |                    |            |                        |                                                       |
|                         | F1         | -                    |      |                              |                    |            |                        |                                                       | 50:25:25                |      |                              |                    |            |                        |                                                       |
|                         | F2         | 120:60:60            |      |                              |                    |            |                        |                                                       | 100:50:50               |      |                              |                    |            |                        |                                                       |
|                         | F3         | 180:90:90            |      |                              |                    |            |                        |                                                       | -                       |      |                              |                    |            |                        |                                                       |
|                         |            | 120:60:60            |      |                              |                    |            |                        |                                                       | 100:50:50               |      |                              |                    |            |                        |                                                       |
| Recomnd N:P:K (kg/ha)   |            |                      |      |                              |                    |            |                        |                                                       |                         |      |                              |                    |            |                        |                                                       |
| Varieties               |            |                      |      |                              |                    |            |                        |                                                       |                         |      |                              |                    |            |                        |                                                       |
|                         | V1         | IET 24950            |      |                              |                    |            |                        |                                                       | IET 24950               |      |                              |                    |            |                        |                                                       |
|                         | V2         | IET 25745            |      |                              |                    |            |                        |                                                       | IET 25745               |      |                              |                    |            |                        |                                                       |
|                         | V3         | NC- IR 64            |      |                              |                    |            |                        |                                                       | NC- IR 64               |      |                              |                    |            |                        |                                                       |
|                         | V4         | -                    |      |                              |                    |            |                        |                                                       | ZC- PR 113 (N)          |      |                              |                    |            |                        |                                                       |
|                         | V5         | -                    |      |                              |                    |            |                        |                                                       | Lalat (E & NE)          |      |                              |                    |            |                        |                                                       |
|                         | V6         | -                    |      |                              |                    |            |                        |                                                       | Karjat 7 (W)            |      |                              |                    |            |                        |                                                       |
|                         | V7         | MTU 1010 (C & S)     |      |                              |                    |            |                        |                                                       | MTU 1010 (C & S)        |      |                              |                    |            |                        |                                                       |
|                         | V8         | -                    |      |                              |                    |            |                        |                                                       | -                       |      |                              |                    |            |                        |                                                       |
|                         | V9         | Ramraj (Local check) |      |                              |                    |            |                        |                                                       | GNV-10-89 (Local check) |      |                              |                    |            |                        |                                                       |
| Available N:P:K (kg/ha) |            | 238:18:172           |      |                              |                    |            |                        |                                                       | -                       |      |                              |                    |            |                        |                                                       |

Table 4.1(d): Contd.

| N-levels                    | Varieties | KOTA               |      |                              |                    |                                                       | MANDYA             |      |                              |                    |            |                                                       |
|-----------------------------|-----------|--------------------|------|------------------------------|--------------------|-------------------------------------------------------|--------------------|------|------------------------------|--------------------|------------|-------------------------------------------------------|
|                             |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test wt(g) | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) |
| F1: Low input (50% NPK)     | V1        | 6.45               | 4    | 291                          | 4.76               |                                                       | 5.69               | 4    | 270                          | 5.02               | 25.12      |                                                       |
|                             | V2        | 4.72               | 12   | 226                          | 3.18               |                                                       | 6.47               | 2    | 279                          | 4.73               | 29.45      |                                                       |
|                             | V3        | 5.60               | 8    | 263                          | 3.52               |                                                       | 4.52               | 9    | 270                          | 4.19               | 23.16      |                                                       |
|                             | V4        | 6.05               | 6    | 276                          | 3.90               |                                                       | -                  |      | -                            | -                  | -          |                                                       |
|                             | V5        | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -          |                                                       |
|                             | V6        | 5.30               | 10   | 248                          | 3.41               |                                                       | -                  |      | -                            | -                  | -          |                                                       |
|                             | V7        | -                  |      | -                            | -                  |                                                       | 4.88               | 7    | 288                          | 3.37               | 24.22      |                                                       |
|                             | V8        | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -          |                                                       |
|                             | V9        | 5.06               | 11   | 242                          | 3.33               |                                                       | 4.40               | 10   | 264                          | 4.36               | 22.70      |                                                       |
| F2: Medium input (100% NPK) | V1        | 7.53               | 1    | 319                          | 5.58               | 9.82                                                  | 6.12               | 3    | 311                          | 5.17               | 25.10      | 4.30                                                  |
|                             | V2        | 5.51               | 9    | 243                          | 3.45               | 7.18                                                  | 6.61               | 1    | 292                          | 5.00               | 30.30      | 1.40                                                  |
|                             | V3        | 6.49               | 3    | 288                          | 3.81               | 8.09                                                  | 5.21               | 6    | 332                          | 4.21               | 24.17      | 6.90                                                  |
|                             | V4        | 6.86               | 2    | 300                          | 4.24               | 7.36                                                  | -                  |      | -                            | -                  | -          |                                                       |
|                             | V5        | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -          |                                                       |
|                             | V6        | 6.17               | 5    | 265                          | 3.72               | 7.91                                                  | -                  |      | -                            | -                  | -          |                                                       |
|                             | V7        | -                  |      | -                            | -                  |                                                       | 5.64               | 5    | 295                          | 3.45               | 24.88      | 7.60                                                  |
|                             | V8        | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -          |                                                       |
|                             | V9        | 5.92               | 7    | 260                          | 3.56               | 7.82                                                  | 4.83               | 8    | 276                          | 4.37               | 23.73      | 4.30                                                  |
| F3: High input (150% NPK)   | V1        | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -          |                                                       |
|                             | V2        | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -          |                                                       |
|                             | V3        | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -          |                                                       |
|                             | V4        | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -          |                                                       |
|                             | V5        | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -          |                                                       |
|                             | V6        | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -          |                                                       |
|                             | V7        | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -          |                                                       |
|                             | V8        | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -          |                                                       |
|                             | V9        | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -          |                                                       |
| Interaction                 |           |                    |      |                              |                    |                                                       |                    |      |                              |                    |            |                                                       |
| N at same V                 |           | NS                 |      | NS                           | NS                 |                                                       | NS                 |      | NS                           | NS                 | NS         |                                                       |
| V at same N                 |           | NS                 |      | NS                           | NS                 |                                                       | NS                 |      | NS                           | NS                 | NS         |                                                       |
| <b>Means of F levels:</b>   |           |                    |      |                              |                    |                                                       |                    |      |                              |                    |            |                                                       |
| F1                          |           | 5.53               | 2    | 258                          | 3.68               |                                                       | 5.19               | 2    | 274                          | 4.33               | 24.93      |                                                       |
| F2                          |           | 6.41               | 1    | 279                          | 4.06               | 8.03                                                  | 5.68               | 1    | 301                          | 4.44               | 25.64      | 4.90                                                  |
| F3                          |           | -                  |      | -                            | -                  |                                                       | -                  |      | -                            | -                  | -          |                                                       |
| C.D.(0.05)                  |           | 0.34               |      | 17.60                        | 0.31               |                                                       | 0.18               |      | NS                           | NS                 | NS         |                                                       |
| C.V.(%)                     |           | 3.98               |      | 4.57                         | 5.57               |                                                       | 2.08               |      | 15.96                        | 2.94               | 5.57       |                                                       |

Table 4.1(d): Contd.

| N-levels                  | Varieties  | KOTA                |      |                              |                    |                                                       | MANDYA                |      |                              |                    |            |                                                       |
|---------------------------|------------|---------------------|------|------------------------------|--------------------|-------------------------------------------------------|-----------------------|------|------------------------------|--------------------|------------|-------------------------------------------------------|
|                           |            | Grain Yield (t/ha)  | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) | Grain Yield (t/ha)    | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test wt(g) | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) |
| Mean of varieties:        |            |                     |      |                              |                    |                                                       |                       |      |                              |                    |            |                                                       |
|                           | V1         | 6.99                | 1    | 305                          | 5.17               | 9.82                                                  | 5.91                  | 2    | 290                          | 5.10               | 25.11      | 4.30                                                  |
|                           | V2         | 5.12                | 6    | 235                          | 3.32               | 7.18                                                  | 6.54                  | 1    | 285                          | 4.87               | 29.88      | 1.40                                                  |
|                           | V3         | 6.05                | 3    | 276                          | 3.67               | 8.09                                                  | 4.87                  | 4    | 301                          | 4.20               | 23.67      | 6.90                                                  |
|                           | V4         | 6.46                | 2    | 288                          | 4.07               | 7.36                                                  | -                     | -    | -                            | -                  | -          | -                                                     |
|                           | V5         | -                   | -    | -                            | -                  | -                                                     | -                     | -    | -                            | -                  | -          | -                                                     |
|                           | V6         | 5.74                | 4    | 257                          | 3.57               | 7.91                                                  | -                     | -    | -                            | -                  | -          | -                                                     |
|                           | V7         | -                   | -    | -                            | -                  | -                                                     | 5.26                  | 3    | 292                          | 3.41               | 24.55      | 7.60                                                  |
|                           | V8         | -                   | -    | -                            | -                  | -                                                     | -                     | -    | -                            | -                  | -          | -                                                     |
|                           | V9         | 5.49                | 5    | 251                          | 3.45               | 7.82                                                  | 4.62                  | 5    | 270                          | 4.37               | 23.22      | 4.30                                                  |
|                           | C.D.(0.05) | 0.42                |      | 15.32                        | 0.37               |                                                       | 0.54                  |      | NS                           | 0.29               | 2.09       |                                                       |
|                           | C.V.(%)    | 5.85                |      | 4.74                         | 7.87               |                                                       | 8.19                  |      | 9.37                         | 5.40               | 6.76       |                                                       |
| Expt. Mean                |            | 5.97                |      | 268                          | 3.87               |                                                       | 5.44                  |      | 288                          | 4.39               | 25.28      |                                                       |
|                           | Soil type  | Clay loam           |      |                              |                    |                                                       | Sandy loam            |      |                              |                    |            |                                                       |
|                           | pH         | 7.80                |      |                              |                    |                                                       | 6.89                  |      |                              |                    |            |                                                       |
| N - levels (kg/ha)        |            |                     |      |                              |                    |                                                       |                       |      |                              |                    |            |                                                       |
|                           | F1         | 60:30:20            |      |                              |                    |                                                       | 50:25:25              |      |                              |                    |            |                                                       |
|                           | F2         | 120:60:40           |      |                              |                    |                                                       | 100:50:50             |      |                              |                    |            |                                                       |
|                           | F3         | -                   |      |                              |                    |                                                       | -                     |      |                              |                    |            |                                                       |
| Recommended N:P:K (kg/ha) |            | 120:60:40           |      |                              |                    |                                                       | 100:50:50             |      |                              |                    |            |                                                       |
| Varieties                 |            |                     |      |                              |                    |                                                       |                       |      |                              |                    |            |                                                       |
|                           | V1         | IET 24950           |      |                              |                    |                                                       | IET 24950             |      |                              |                    |            |                                                       |
|                           | V2         | IET 25745           |      |                              |                    |                                                       | IET 25745             |      |                              |                    |            |                                                       |
|                           | V3         | NC- IR 64           |      |                              |                    |                                                       | NC- IR 64             |      |                              |                    |            |                                                       |
|                           | V4         | ZC- PR 113 (N)      |      |                              |                    |                                                       | -                     |      |                              |                    |            |                                                       |
|                           | V5         | -                   |      |                              |                    |                                                       | -                     |      |                              |                    |            |                                                       |
|                           | V6         | Karjat 7 (W)        |      |                              |                    |                                                       | -                     |      |                              |                    |            |                                                       |
|                           | V7         | -                   |      |                              |                    |                                                       | MTU 1010 (C & S)      |      |                              |                    |            |                                                       |
|                           | V8         | -                   |      |                              |                    |                                                       | -                     |      |                              |                    |            |                                                       |
|                           | V9         | Ratna (Local check) |      |                              |                    |                                                       | KMP-175 (Local check) |      |                              |                    |            |                                                       |
| Available N:P:K (kg/ha)   |            | 318:60:523          |      |                              |                    |                                                       | 352:103:265           |      |                              |                    |            |                                                       |

Table 4.1(d): Contd.

| N-levels                    | Varieties | NAGINA             |      |                              |                    |            |                        |                                                       | NAVSARI            |      |                              |                    |            |                        |                                                       |
|-----------------------------|-----------|--------------------|------|------------------------------|--------------------|------------|------------------------|-------------------------------------------------------|--------------------|------|------------------------------|--------------------|------------|------------------------|-------------------------------------------------------|
|                             |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test wt(g) | Days for 50% Flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test wt(g) | Days for 50% Flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) |
| F1: Low input (50% NPK)     | V1        | 4.65               | 2    | 323                          | 3.44               | 26.43      | 98                     |                                                       | 3.34               | 7    | 270                          | 4.32               | 24.93      | 99                     |                                                       |
|                             | V2        | 4.61               | 4    | 316                          | 3.38               | 26.41      | 85                     |                                                       | 4.13               | 1    | 256                          | 4.71               | 27.34      | 100                    |                                                       |
|                             | V3        | 4.29               | 7    | 302                          | 3.46               | 26.42      | 104                    |                                                       | 2.58               | 16   | 269                          | 3.06               | 23.64      | 91                     |                                                       |
|                             | V4        | -                  |      | -                            | -                  | -          | -                      |                                                       | 2.64               | 15   | 253                          | 3.50               | 28.82      | 101                    |                                                       |
|                             | V5        | -                  |      | -                            | -                  | -          | -                      |                                                       | 3.11               | 11   | 281                          | 2.79               | 28.38      | 98                     |                                                       |
|                             | V6        | -                  |      | -                            | -                  | -          | -                      |                                                       | 2.24               | 18   | 301                          | 3.19               | 22.71      | 90                     |                                                       |
|                             | V7        | 4.20               | 8    | 292                          | 3.39               | 26.41      | 105                    |                                                       | 3.30               | 9    | 272                          | 3.64               | 25.35      | 94                     |                                                       |
|                             | V8        | -                  |      | -                            | -                  | -          | -                      |                                                       | 2.89               | 12   | 259                          | 4.85               | 21.74      | 98                     |                                                       |
|                             | V9        | -                  |      | -                            | -                  | -          | -                      |                                                       | 3.46               | 5    | 265                          | 4.36               | 31.97      | 91                     |                                                       |
| F2: Medium input (100% NPK) | V1        | 4.75               | 1    | 345                          | 3.47               | 26.48      | 99                     | 0.91                                                  | 3.48               | 4    | 285                          | 4.80               | 24.13      | 100                    | 2.15                                                  |
|                             | V2        | 4.65               | 2    | 328                          | 3.40               | 26.41      | 87                     | 0.36                                                  | 4.08               | 2    | 265                          | 4.36               | 28.17      | 101                    | -0.77                                                 |
|                             | V3        | 4.37               | 5    | 314                          | 3.49               | 26.43      | 106                    | 0.73                                                  | 2.66               | 14   | 249                          | 3.10               | 22.27      | 92                     | 1.23                                                  |
|                             | V4        | -                  |      | -                            | -                  | -          | -                      |                                                       | 2.76               | 13   | 257                          | 3.36               | 28.07      | 102                    | 1.85                                                  |
|                             | V5        | -                  |      | -                            | -                  | -          | -                      |                                                       | 3.31               | 8    | 249                          | 2.80               | 28.02      | 99                     | 3.08                                                  |
|                             | V6        | -                  |      | -                            | -                  | -          | -                      |                                                       | 2.47               | 17   | 309                          | 2.70               | 22.92      | 90                     | 3.54                                                  |
|                             | V7        | 4.36               | 6    | 311                          | 3.48               | 26.43      | 108                    | 1.45                                                  | 3.46               | 5    | 264                          | 4.09               | 25.58      | 95                     | 2.46                                                  |
|                             | V8        | -                  |      | -                            | -                  | -          | -                      |                                                       | 3.17               | 10   | 253                          | 4.24               | 22.31      | 99                     | 4.31                                                  |
|                             | V9        | -                  |      | -                            | -                  | -          | -                      |                                                       | 3.68               | 3    | 255                          | 4.49               | 31.19      | 92                     | 3.38                                                  |
| F3: High input (150% NPK)   | V1        | -                  |      | -                            | -                  | -          | -                      |                                                       | -                  |      | -                            | -                  | -          | -                      |                                                       |
|                             | V2        | -                  |      | -                            | -                  | -          | -                      |                                                       | -                  |      | -                            | -                  | -          | -                      |                                                       |
|                             | V3        | -                  |      | -                            | -                  | -          | -                      |                                                       | -                  |      | -                            | -                  | -          | -                      |                                                       |
|                             | V4        | -                  |      | -                            | -                  | -          | -                      |                                                       | -                  |      | -                            | -                  | -          | -                      |                                                       |
|                             | V5        | -                  |      | -                            | -                  | -          | -                      |                                                       | -                  |      | -                            | -                  | -          | -                      |                                                       |
|                             | V6        | -                  |      | -                            | -                  | -          | -                      |                                                       | -                  |      | -                            | -                  | -          | -                      |                                                       |
|                             | V7        | -                  |      | -                            | -                  | -          | -                      |                                                       | -                  |      | -                            | -                  | -          | -                      |                                                       |
|                             | V8        | -                  |      | -                            | -                  | -          | -                      |                                                       | -                  |      | -                            | -                  | -          | -                      |                                                       |
|                             | V9        | -                  |      | -                            | -                  | -          | -                      |                                                       | -                  |      | -                            | -                  | -          | -                      |                                                       |
| Interaction N at same V     |           | NS                 |      | NS                           | 0.02               | NS         | NS                     |                                                       | NS                 |      | NS                           | NS                 | NS         | NS                     |                                                       |
| V at same N                 |           | NS                 |      | NS                           | 0.02               | NS         | NS                     |                                                       | NS                 |      | NS                           | NS                 | NS         | NS                     |                                                       |
| <b>Means of F levels:</b>   |           |                    |      |                              |                    |            |                        |                                                       |                    |      |                              |                    |            |                        |                                                       |
| F1                          |           | 4.44               | 2    | 308                          | 3.42               | 26.42      | 98                     |                                                       | 3.08               | 2    | 269                          | 3.82               | 26.10      | 96                     |                                                       |
| F2                          |           | 4.53               | 1    | 324                          | 3.46               | 26.44      | 100                    | 0.86                                                  | 3.23               | 1    | 265                          | 3.77               | 25.85      | 97                     | 2.36                                                  |
| F3                          |           | -                  |      | -                            | -                  | -          | -                      |                                                       | -                  |      | -                            | -                  | -          | -                      |                                                       |
| C.D.(0.05)                  |           | NS                 |      | 12.93                        | 0.01               | 0.02       | NS                     |                                                       | NS                 |      | NS                           | NS                 | NS         | NS                     |                                                       |
| C.V.(%)                     |           | 1.39               |      | 2.33                         | 0.16               | 0.04       | 0.83                   |                                                       | 8.59               |      | 7.41                         | 7.54               | 6.34       | 1.07                   |                                                       |

Table 4.1(d): Contd.

| N-levels                  | Varieties        | NAGINA             |      |                              |                    |            |                        |                                                       | NAVSARI             |      |                              |                    |            |                        |                                                       |
|---------------------------|------------------|--------------------|------|------------------------------|--------------------|------------|------------------------|-------------------------------------------------------|---------------------|------|------------------------------|--------------------|------------|------------------------|-------------------------------------------------------|
|                           |                  | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test wt(g) | Days for 50% Flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) | Grain Yield (t/ha)  | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test wt(g) | Days for 50% Flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) |
| Mean of varieties:        |                  |                    |      |                              |                    |            |                        |                                                       |                     |      |                              |                    |            |                        |                                                       |
|                           | V1               | 4.70               | 1    | 334                          | 3.46               | 26.46      | 99                     | 0.91                                                  | 3.41                | 3    | 278                          | 4.56               | 24.53      | 100                    | 2.15                                                  |
|                           | V2               | 4.63               | 2    | 322                          | 3.39               | 26.41      | 86                     | 0.36                                                  | 4.11                | 1    | 260                          | 4.54               | 27.76      | 101                    | -0.77                                                 |
|                           | V3               | 4.33               | 3    | 308                          | 3.48               | 26.43      | 105                    | 0.73                                                  | 2.62                | 8    | 259                          | 3.08               | 22.96      | 92                     | 1.23                                                  |
|                           | V4               | -                  |      | -                            | -                  | -          | -                      |                                                       | 2.70                | 7    | 255                          | 3.43               | 28.45      | 102                    | 1.85                                                  |
|                           | V5               | -                  |      | -                            | -                  | -          | -                      |                                                       | 3.21                | 5    | 265                          | 2.80               | 28.20      | 99                     | 3.08                                                  |
|                           | V6               | -                  |      | -                            | -                  | -          | -                      |                                                       | 2.36                | 9    | 305                          | 2.95               | 22.82      | 90                     | 3.54                                                  |
|                           | V7               | 4.28               | 4    | 302                          | 3.44               | 26.42      | 107                    | 1.45                                                  | 3.38                | 4    | 268                          | 3.87               | 25.47      | 95                     | 2.46                                                  |
|                           | V8               | -                  |      | -                            | -                  | -          | -                      |                                                       | 3.03                | 6    | 256                          | 4.55               | 22.03      | 99                     | 4.31                                                  |
|                           | V9               | -                  |      | -                            | -                  | -          | -                      |                                                       | 3.57                | 2    | 260                          | 4.43               | 31.58      | 92                     | 3.38                                                  |
|                           | C.D.(0.05)       | 0.13               |      | 10.43                        | 0.01               | 0.02       | 0.81                   |                                                       | 0.41                |      | 12.99                        | 0.34               | 2.06       | 1.46                   |                                                       |
|                           | C.V.(%)          | 2.23               |      | 2.62                         | 0.30               | 0.07       | 0.65                   |                                                       | 11.15               |      | 4.16                         | 7.76               | 6.81       | 1.29                   |                                                       |
| Expt. Mean                |                  | 4.49               |      | 316                          | 3.44               | 26.43      | 99                     |                                                       | 3.15                |      | 267                          | 3.80               | 25.97      | 96                     |                                                       |
| Soil type                 | -                |                    |      |                              |                    |            |                        |                                                       | Clay                |      |                              |                    |            |                        |                                                       |
| pH                        | 7.70             |                    |      |                              |                    |            |                        |                                                       | 7.88                |      |                              |                    |            |                        |                                                       |
| N - levels (kg/ha)        |                  |                    |      |                              |                    |            |                        |                                                       |                     |      |                              |                    |            |                        |                                                       |
| F1                        | 60:30:20         |                    |      |                              |                    |            |                        |                                                       | 50:15:0             |      |                              |                    |            |                        |                                                       |
| F2                        | 120:60:40        |                    |      |                              |                    |            |                        |                                                       | 100:30:0            |      |                              |                    |            |                        |                                                       |
| F3                        | -                |                    |      |                              |                    |            |                        |                                                       | -                   |      |                              |                    |            |                        |                                                       |
| Recommended N:P:K (kg/ha) | 120:60:40        |                    |      |                              |                    |            |                        |                                                       | 100:30:0            |      |                              |                    |            |                        |                                                       |
| Varieties                 |                  |                    |      |                              |                    |            |                        |                                                       |                     |      |                              |                    |            |                        |                                                       |
| V1                        | IET 24950        |                    |      |                              |                    |            |                        |                                                       | IET 24950           |      |                              |                    |            |                        |                                                       |
| V2                        | IET 25745        |                    |      |                              |                    |            |                        |                                                       | IET 25745           |      |                              |                    |            |                        |                                                       |
| V3                        | NC- IR 64        |                    |      |                              |                    |            |                        |                                                       | NC- IR 64           |      |                              |                    |            |                        |                                                       |
| V4                        | -                |                    |      |                              |                    |            |                        |                                                       | ZC- PR 113 (N)      |      |                              |                    |            |                        |                                                       |
| V5                        | -                |                    |      |                              |                    |            |                        |                                                       | Lalat (E & NE)      |      |                              |                    |            |                        |                                                       |
| V6                        | -                |                    |      |                              |                    |            |                        |                                                       | Karjat 7 (W)        |      |                              |                    |            |                        |                                                       |
| V7                        | MTU 1010 (C & S) |                    |      |                              |                    |            |                        |                                                       | MTU 1010 (C & S)    |      |                              |                    |            |                        |                                                       |
| V8                        | -                |                    |      |                              |                    |            |                        |                                                       | HC- US 312          |      |                              |                    |            |                        |                                                       |
| V9                        | -                |                    |      |                              |                    |            |                        |                                                       | GNR-3 (Local check) |      |                              |                    |            |                        |                                                       |
| Available N:P:K (kg/ha)   | 21:18:209        |                    |      |                              |                    |            |                        |                                                       | 154:149:331         |      |                              |                    |            |                        |                                                       |

Table 4.1(d): Contd.

| N-levels                    | Varieties | NAWAGAM            |      |                              |                    |            |                        |                                                       | PANTNAGAR          |      |                              |                    |            |                        |                                                       |
|-----------------------------|-----------|--------------------|------|------------------------------|--------------------|------------|------------------------|-------------------------------------------------------|--------------------|------|------------------------------|--------------------|------------|------------------------|-------------------------------------------------------|
|                             |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test wt(g) | Days for 50% Flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test wt(g) | Days for 50% Flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) |
| F1: Low input (50% NPK)     | V1        | 5.78               | 6    | 205                          | 4.78               | 21.53      | 103                    |                                                       | -                  |      | -                            | -                  | -          | -                      |                                                       |
|                             | V2        | 6.20               | 2    | 241                          | 5.88               | 24.13      | 105                    |                                                       | -                  |      | -                            | -                  | -          | -                      |                                                       |
|                             | V3        | 5.17               | 7    | 193                          | 3.20               | 28.20      | 102                    |                                                       | -                  |      | -                            | -                  | -          | -                      |                                                       |
|                             | V4        | -                  |      | -                            | -                  | -          | -                      |                                                       | -                  |      | -                            | -                  | -          | -                      |                                                       |
|                             | V5        | -                  |      | -                            | -                  | -          | -                      |                                                       | -                  |      | -                            | -                  | -          | -                      |                                                       |
|                             | V6        | -                  |      | -                            | -                  | -          | -                      |                                                       | -                  |      | -                            | -                  | -          | -                      |                                                       |
|                             | V7        | 4.20               | 10   | 219                          | 3.16               | 21.87      | 100                    |                                                       | -                  |      | -                            | -                  | -          | -                      |                                                       |
|                             | V8        | -                  |      | -                            | -                  | -          | -                      |                                                       | -                  |      | -                            | -                  | -          | -                      |                                                       |
|                             | V9        | 4.42               | 9    | 179                          | 4.76               | 15.13      | 109                    |                                                       | -                  |      | -                            | -                  | -          | -                      |                                                       |
| F2: Medium input (100% NPK) | V1        | 6.11               | 3    | 232                          | 4.49               | 21.87      | 107                    | 5.28                                                  | 4.72               | 3    | 256                          | 2.05               | 25.02      | 85                     |                                                       |
|                             | V2        | 6.78               | 1    | 272                          | 5.45               | 22.67      | 108                    | 9.28                                                  | 4.53               | 5    | 250                          | 2.01               | 21.76      | 81                     |                                                       |
|                             | V3        | 5.04               | 8    | 265                          | 3.53               | 23.80      | 105                    | -2.08                                                 | 3.73               | 10   | 238                          | 1.76               | 24.54      | 75                     |                                                       |
|                             | V4        | -                  |      | -                            | -                  | -          | -                      |                                                       | -                  |      | -                            | -                  | -          | -                      |                                                       |
|                             | V5        | -                  |      | -                            | -                  | -          | -                      |                                                       | -                  |      | -                            | -                  | -          | -                      |                                                       |
|                             | V6        | -                  |      | -                            | -                  | -          | -                      |                                                       | -                  |      | -                            | -                  | -          | -                      |                                                       |
|                             | V7        | 5.82               | 5    | 275                          | 3.17               | 22.40      | 100                    | 25.92                                                 | 4.06               | 9    | 258                          | 1.76               | 22.70      | 75                     |                                                       |
|                             | V8        | -                  |      | -                            | -                  | -          | -                      |                                                       | -                  |      | -                            | -                  | -          | -                      |                                                       |
|                             | V9        | 5.85               | 4    | 230                          | 5.34               | 16.00      | 108                    | 22.88                                                 | 4.49               | 7    | 250                          | 1.59               | 26.02      | 75                     |                                                       |
| F3: High input (150% NPK)   | V1        | -                  |      | -                            | -                  | -          | -                      |                                                       | 5.19               | 1    | 274                          | 2.43               | 25.59      | 76                     | 4.27                                                  |
|                             | V2        | -                  |      | -                            | -                  | -          | -                      |                                                       | 5.01               | 2    | 270                          | 2.30               | 22.17      | 89                     | 4.36                                                  |
|                             | V3        | -                  |      | -                            | -                  | -          | -                      |                                                       | 4.60               | 4    | 231                          | 2.48               | 24.93      | 79                     | 7.91                                                  |
|                             | V4        | -                  |      | -                            | -                  | -          | -                      |                                                       | -                  |      | -                            | -                  | -          | -                      |                                                       |
|                             | V5        | -                  |      | -                            | -                  | -          | -                      |                                                       | -                  |      | -                            | -                  | -          | -                      |                                                       |
|                             | V6        | -                  |      | -                            | -                  | -          | -                      |                                                       | -                  |      | -                            | -                  | -          | -                      |                                                       |
|                             | V7        | -                  |      | -                            | -                  | -          | -                      |                                                       | 4.43               | 8    | 271                          | 1.85               | 23.07      | 75                     | 3.36                                                  |
|                             | V8        | -                  |      | -                            | -                  | -          | -                      |                                                       | -                  |      | -                            | -                  | -          | -                      |                                                       |
|                             | V9        | -                  |      | -                            | -                  | -          | -                      |                                                       | 4.52               | 6    | 246                          | 2.02               | 26.51      | 80                     | 0.27                                                  |
| Interaction N at same V     |           | NS                 |      | NS                           | NS                 | NS         | NS                     |                                                       | NS                 |      | NS                           | NS                 | NS         | 4.29                   |                                                       |
| V at same N                 |           | NS                 |      | NS                           | NS                 | NS         | NS                     |                                                       | NS                 |      | NS                           | NS                 | NS         | 5.20                   |                                                       |
| <b>Means of F levels:</b>   |           |                    |      |                              |                    |            |                        |                                                       |                    |      |                              |                    |            |                        |                                                       |
| F1                          |           | 5.15               | 2    | 207                          | 4.36               | 22.17      | 104                    |                                                       |                    |      |                              |                    |            |                        |                                                       |
| F2                          |           | 5.92               | 1    | 255                          | 4.40               | 21.35      | 106                    | 12.26                                                 | 4.31               | 2    | 250                          | 1.83               | 24.01      | 78                     |                                                       |
| F3                          |           | -                  |      | -                            | -                  | -          | -                      |                                                       | 4.75               | 1    | 258                          | 2.22               | 24.45      | 80                     | 4.04                                                  |
| C.D.(0.05)                  |           | NS                 |      | NS                           | NS                 | NS         | 0.50                   |                                                       | NS                 |      | NS                           | 0.05               | NS         | NS                     |                                                       |
| C.V.(%)                     |           | 8.82               |      | 14.01                        | 17.19              | 16.81      | 0.30                   |                                                       | 8.03               |      | 4.17                         | 1.63               | 1.60       | 3.60                   |                                                       |

Table 4.1(d): Contd.

| N-levels           | Varieties               | NAWAGAM              |      |                              |                    |            |                        |                                                       | PANTNAGAR                  |      |                              |                    |            |                        |                                                       |
|--------------------|-------------------------|----------------------|------|------------------------------|--------------------|------------|------------------------|-------------------------------------------------------|----------------------------|------|------------------------------|--------------------|------------|------------------------|-------------------------------------------------------|
|                    |                         | Grain Yield (t/ha)   | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test wt(g) | Days for 50% Flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) | Grain Yield (t/ha)         | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test wt(g) | Days for 50% Flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) |
| Mean of varieties: |                         |                      |      |                              |                    |            |                        |                                                       |                            |      |                              |                    |            |                        |                                                       |
|                    | V1                      | 5.95                 | 2    | 218                          | 4.64               | 21.70      | 105                    | 5.28                                                  | 4.96                       | 1    | 265                          | 2.24               | 25.31      | 81                     | 4.27                                                  |
|                    | V2                      | 6.49                 | 1    | 256                          | 5.67               | 23.40      | 107                    | 9.28                                                  | 4.77                       | 2    | 260                          | 2.16               | 21.97      | 85                     | 4.36                                                  |
|                    | V3                      | 5.11                 | 4    | 229                          | 3.37               | 26.00      | 104                    | -2.08                                                 | 4.17                       | 5    | 235                          | 2.12               | 24.74      | 77                     | 7.91                                                  |
|                    | V4                      | -                    |      | -                            | -                  | -          | -                      |                                                       | -                          |      | -                            | -                  | -          | -                      |                                                       |
|                    | V5                      | -                    |      | -                            | -                  | -          | -                      |                                                       | -                          |      | -                            | -                  | -          | -                      |                                                       |
|                    | V6                      | -                    |      | -                            | -                  | -          | -                      |                                                       | -                          |      | -                            | -                  | -          | -                      |                                                       |
|                    | V7                      | 5.01                 | 5    | 247                          | 3.17               | 22.14      | 100                    | 25.92                                                 | 4.25                       | 4    | 264                          | 1.81               | 22.89      | 75                     | 3.36                                                  |
|                    | V8                      | -                    |      | -                            | -                  | -          | -                      |                                                       | -                          |      | -                            | -                  | -          | -                      |                                                       |
|                    | V9                      | 5.14                 | 3    | 205                          | 5.05               | 15.57      | 109                    | 22.88                                                 | 4.51                       | 3    | 248                          | 1.81               | 26.27      | 78                     | 0.27                                                  |
|                    | C.D.(0.05)              | 0.57                 |      | 34.35                        | 0.64               | 3.01       | 1.67                   |                                                       | 0.24                       |      | NS                           | 0.22               | 1.07       | 3.03                   |                                                       |
|                    | C.V.(%)                 | 8.39                 |      | 12.15                        | 11.87              | 11.29      | 1.30                   |                                                       | 4.25                       |      | 7.28                         | 8.83               | 3.62       | 3.14                   |                                                       |
|                    | Expt. Mean              | 5.54                 |      | 231                          | 4.38               | 21.76      | 105                    |                                                       | 4.53                       |      | 254                          | 2.03               | 24.23      | 79                     |                                                       |
|                    | Soil type               | Clay loam            |      |                              |                    |            |                        |                                                       | Silt loam                  |      |                              |                    |            |                        |                                                       |
|                    | pH                      | 7.63                 |      |                              |                    |            |                        |                                                       | 7.60                       |      |                              |                    |            |                        |                                                       |
|                    | N - levels (kg/ha)      |                      |      |                              |                    |            |                        |                                                       |                            |      |                              |                    |            |                        |                                                       |
|                    | F1                      | 50:12.5              |      |                              |                    |            |                        |                                                       | -                          |      |                              |                    |            |                        |                                                       |
|                    | F2                      | 100:25:0             |      |                              |                    |            |                        |                                                       | 120:60:40                  |      |                              |                    |            |                        |                                                       |
|                    | F3                      | -                    |      |                              |                    |            |                        |                                                       | 180:90:60                  |      |                              |                    |            |                        |                                                       |
|                    | Recomnd N:P:K (kg/ha)   | 100:25:0             |      |                              |                    |            |                        |                                                       | 120:60:60                  |      |                              |                    |            |                        |                                                       |
|                    | Varieties               |                      |      |                              |                    |            |                        |                                                       |                            |      |                              |                    |            |                        |                                                       |
|                    | V1                      | IET 24950            |      |                              |                    |            |                        |                                                       | IET 24950                  |      |                              |                    |            |                        |                                                       |
|                    | V2                      | IET 25745            |      |                              |                    |            |                        |                                                       | IET 25745                  |      |                              |                    |            |                        |                                                       |
|                    | V3                      | NC- IR 64            |      |                              |                    |            |                        |                                                       | NC- IR 64                  |      |                              |                    |            |                        |                                                       |
|                    | V4                      | -                    |      |                              |                    |            |                        |                                                       | -                          |      |                              |                    |            |                        |                                                       |
|                    | V5                      | -                    |      |                              |                    |            |                        |                                                       | -                          |      |                              |                    |            |                        |                                                       |
|                    | V6                      | -                    |      |                              |                    |            |                        |                                                       | -                          |      |                              |                    |            |                        |                                                       |
|                    | V7                      | MTU 1010 (C & S)     |      |                              |                    |            |                        |                                                       | MTU 1010 (C & S)           |      |                              |                    |            |                        |                                                       |
|                    | V8                      | -                    |      |                              |                    |            |                        |                                                       | -                          |      |                              |                    |            |                        |                                                       |
|                    | V9                      | GAR-13 (Local check) |      |                              |                    |            |                        |                                                       | Pant Dhan 12 (Local check) |      |                              |                    |            |                        |                                                       |
|                    | Available N:P:K (kg/ha) | -                    |      |                              |                    |            |                        |                                                       | 230:22:215                 |      |                              |                    |            |                        |                                                       |

Table 4.1(d): Contd.

| N-levels                    | Varieties | PATTAMBI           |      |                              |                    |                        |                                                       | PUDUCHERRY         |      |                    |            |                                                       |
|-----------------------------|-----------|--------------------|------|------------------------------|--------------------|------------------------|-------------------------------------------------------|--------------------|------|--------------------|------------|-------------------------------------------------------|
|                             |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Days for 50% Flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) | Grain Yield (t/ha) | Rank | Panicle Weight (g) | Test wt(g) | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) |
| F1: Low input (50% NPK)     | V1        | 4.87               | 8    | 105                          | 4.48               | 87                     |                                                       | 7.27               | 2    | 4.52               | 22.98      |                                                       |
|                             | V2        | 2.55               | 12   | 82                           | 3.37               | 101                    |                                                       | 7.01               | 4    | 4.12               | 23.10      |                                                       |
|                             | V3        | 4.69               | 9    | 170                          | 5.00               | 87                     |                                                       | 6.48               | 9    | 3.57               | 22.80      |                                                       |
|                             | V4        |                    |      |                              |                    |                        |                                                       | -                  |      | -                  | -          |                                                       |
|                             | V5        |                    |      |                              |                    |                        |                                                       | -                  |      | -                  | -          |                                                       |
|                             | V6        |                    |      |                              |                    |                        |                                                       | -                  |      | -                  | -          |                                                       |
|                             | V7        | 7.10               | 2    | 197                          | 5.48               | 57                     |                                                       | 6.23               | 10   | 3.33               | 18.70      |                                                       |
|                             | V8        |                    |      |                              |                    |                        |                                                       | -                  |      | -                  | -          |                                                       |
|                             | V9        | 2.11               | 14   | 187                          | 4.98               | 57                     |                                                       | 6.65               | 8    | 3.84               | 16.69      |                                                       |
| F2: Medium input (100% NPK) | V1        | 5.70               | 6    | 114                          | 4.77               | 91                     | 18.44                                                 | 7.41               | 1    | 4.75               | 23.21      | 1.40                                                  |
|                             | V2        | 3.50               | 11   | 112                          | 3.38               | 99                     | 21.11                                                 | 7.27               | 2    | 4.31               | 23.33      | 2.60                                                  |
|                             | V3        | 6.19               | 5    | 170                          | 5.00               | 89                     | 33.33                                                 | 6.92               | 6    | 3.99               | 22.80      | 4.40                                                  |
|                             | V4        |                    |      |                              |                    |                        |                                                       | -                  |      | -                  | -          |                                                       |
|                             | V5        |                    |      |                              |                    |                        |                                                       | -                  |      | -                  | -          |                                                       |
|                             | V6        |                    |      |                              |                    |                        |                                                       | -                  |      | -                  | -          |                                                       |
|                             | V7        | 7.07               | 3    | 189                          | 5.48               | 57                     | -0.67                                                 | 6.68               | 7    | 3.67               | 19.01      | 4.50                                                  |
|                             | V8        |                    |      |                              |                    |                        |                                                       | -                  |      | -                  | -          |                                                       |
|                             | V9        | 2.20               | 13   | 212                          | 5.78               | 60                     | 2.00                                                  | 6.99               | 5    | 4.19               | 16.98      | 3.40                                                  |
| F3: High input (150% NPK)   | V1        | 5.17               | 7    | 108                          | 4.45               | 100                    | 3.33                                                  | -                  |      | -                  | -          |                                                       |
|                             | V2        | 4.13               | 10   | 115                          | 5.10               | 100                    | 17.56                                                 | -                  |      | -                  | -          |                                                       |
|                             | V3        | 6.79               | 4    | 158                          | 4.83               | 88                     | 23.33                                                 | -                  |      | -                  | -          |                                                       |
|                             | V4        |                    |      |                              |                    |                        |                                                       | -                  |      | -                  | -          |                                                       |
|                             | V5        |                    |      |                              |                    |                        |                                                       | -                  |      | -                  | -          |                                                       |
|                             | V6        |                    |      |                              |                    |                        |                                                       | -                  |      | -                  | -          |                                                       |
|                             | V7        | 7.79               | 1    | 187                          | 5.13               | 60                     | 7.67                                                  | -                  |      | -                  | -          |                                                       |
|                             | V8        |                    |      |                              | 0.00               |                        |                                                       | -                  |      | -                  | -          |                                                       |
|                             | V9        | 2.07               | 15   | 192                          | 5.38               | 60                     | -0.44                                                 | -                  |      | -                  | -          |                                                       |
| Interaction                 |           |                    |      |                              |                    |                        |                                                       |                    |      |                    |            |                                                       |
| N at same V                 |           | 0.78               |      | NS                           | NS                 | 2.71                   |                                                       | NS                 |      | NS                 | NS         |                                                       |
| V at same N                 |           | 0.70               |      | NS                           | NS                 | 2.56                   |                                                       | NS                 |      | NS                 | NS         |                                                       |
| <b>Means of F levels:</b>   |           |                    |      |                              |                    |                        |                                                       |                    |      |                    |            |                                                       |
| F1                          |           | 4.26               | 3    | 148                          | 4.66               | 78                     |                                                       | 6.73               | 2    | 3.88               | 20.85      |                                                       |
| F2                          |           | 4.93               | 2    | 159                          | 4.88               | 79                     | 14.84                                                 | 7.05               | 1    | 4.18               | 21.07      | 3.26                                                  |
| F3                          |           | 5.19               | 1    | 152                          | 4.15               | 82                     | 10.29                                                 | -                  |      | -                  | -          |                                                       |
| C.D.(0.05)                  |           | 0.16               |      | NS                           | NS                 | 1.40                   |                                                       | 0.18               |      | 0.02               | 0.03       |                                                       |
| C.V.(%)                     |           | 5.04               |      | 17.51                        | 19.66              | 2.73                   |                                                       | 1.65               |      | 0.27               | 0.08       |                                                       |

Table 4.1(d): Contd.

| N-levels           | Varieties                       | PATTAMBI           |      |                              |                    |                        |                                                | PUDUCHERRY          |      |                    |            |                                                       |
|--------------------|---------------------------------|--------------------|------|------------------------------|--------------------|------------------------|------------------------------------------------|---------------------|------|--------------------|------------|-------------------------------------------------------|
|                    |                                 | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Days for 50% Flowering | N res. (kg grain/kg N) (Base level 30 kg N/ha) | Grain Yield (t/ha)  | Rank | Panicle Weight (g) | Test wt(g) | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) |
| Mean of varieties: |                                 |                    |      |                              |                    |                        |                                                |                     |      |                    |            |                                                       |
|                    | V1                              | 5.25               | 3    | 109                          | 4.57               | 93                     | 10.89                                          | 7.34                | 1    | 4.64               | 23.10      | 1.40                                                  |
|                    | V2                              | 3.39               | 4    | 103                          | 3.95               | 100                    | 19.33                                          | 7.14                | 2    | 4.22               | 23.22      | 2.60                                                  |
|                    | V3                              | 5.89               | 2    | 166                          | 4.94               | 88                     | 28.33                                          | 6.70                | 4    | 3.78               | 22.80      | 4.40                                                  |
|                    | V4                              |                    |      |                              |                    |                        |                                                | -                   |      | -                  | -          |                                                       |
|                    | V5                              |                    |      |                              |                    |                        |                                                | -                   |      | -                  | -          |                                                       |
|                    | V6                              |                    |      |                              |                    |                        |                                                | -                   |      | -                  | -          |                                                       |
|                    | V7                              | 7.32               | 1    | 191                          | 5.36               | 58                     | 3.50                                           | 6.46                | 5    | 3.50               | 18.86      | 4.50                                                  |
|                    | V8                              |                    |      |                              |                    |                        |                                                | -                   |      | -                  | -          |                                                       |
|                    | V9                              | 2.13               | 5    | 197                          | 5.38               | 59                     | 0.78                                           | 6.82                | 3    | 4.02               | 16.84      | 3.40                                                  |
|                    | C.D.(0.05)                      | 0.45               |      | 23.36                        | 0.92               | 1.56                   |                                                | 0.36                |      | 0.27               | 1.14       |                                                       |
|                    | C.V.(%)                         | 9.62               |      | 15.67                        | 19.40              | 2.02                   |                                                | 4.29                |      | 5.39               | 4.44       |                                                       |
|                    | Expt. Mean                      | 4.80               |      | 153                          | 4.84               | 79                     |                                                | 6.89                |      | 4.03               | 20.96      |                                                       |
|                    | Soil type                       | Sandy Loam         |      |                              |                    |                        |                                                | Clay loam           |      |                    |            |                                                       |
|                    | pH                              | 5.60               |      |                              |                    |                        |                                                | 5.80                |      |                    |            |                                                       |
|                    | N - levels (kg/ha)              |                    |      |                              |                    |                        |                                                |                     |      |                    |            |                                                       |
|                    | F1                              | 45:45:45           |      |                              |                    |                        |                                                | 60:20:20            |      |                    |            |                                                       |
|                    | F2                              | 90:45:45           |      |                              |                    |                        |                                                | 120:40:40           |      |                    |            |                                                       |
|                    | F3                              | 135:45:45          |      |                              |                    |                        |                                                | -                   |      |                    |            |                                                       |
|                    | Recomnd N:P:K (kg/ha)           | 90:45:45           |      |                              |                    |                        |                                                | 120:40:40           |      |                    |            |                                                       |
|                    | Varieties                       |                    |      |                              |                    |                        |                                                |                     |      |                    |            |                                                       |
|                    | V1                              | IET 24950          |      |                              |                    |                        |                                                | IET 24950           |      |                    |            |                                                       |
|                    | V2                              | IET 25745          |      |                              |                    |                        |                                                | IET 25745           |      |                    |            |                                                       |
|                    | V3                              | NC- IR 64          |      |                              |                    |                        |                                                | NC- IR 64           |      |                    |            |                                                       |
|                    | V4                              | -                  |      |                              |                    |                        |                                                | -                   |      |                    |            |                                                       |
|                    | V5                              | -                  |      |                              |                    |                        |                                                | -                   |      |                    |            |                                                       |
|                    | V6                              | -                  |      |                              |                    |                        |                                                | -                   |      |                    |            |                                                       |
|                    | V7                              | MTU 1010 (C & S)   |      |                              |                    |                        |                                                | MTU 1010 (C & S)    |      |                    |            |                                                       |
|                    | V8                              | -                  |      |                              |                    |                        |                                                | -                   |      |                    |            |                                                       |
|                    | V9                              | Jaya (Local check) |      |                              |                    |                        |                                                | Co 52 (Local check) |      |                    |            |                                                       |
|                    | Available N:P:K of soil (kg/ha) | 200:21:89          |      |                              |                    |                        |                                                | 123:25:143          |      |                    |            |                                                       |

Table 4.1(d): Contd.

| N-levels                    | Varieties | VARANASI           |      |                              |                    |            |                        | Over all Mean | Rank |
|-----------------------------|-----------|--------------------|------|------------------------------|--------------------|------------|------------------------|---------------|------|
|                             |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test wt(g) | Days for 50% Flowering |               |      |
| F1: Low input (50% NPK)     | V1        | 5.90               | 4    | 211                          | 4.88               | 26.82      | 96                     | 5.39          | 2    |
|                             | V2        | 6.07               | 3    | 191                          | 4.34               | 27.98      | 98                     | 5.15          | 6    |
|                             | V3        | 3.04               | 10   | 194                          | 3.24               | 22.98      | 74                     | 4.32          | 19   |
|                             | V4        | -                  |      | -                            | -                  | -          | -                      | 5.37          | 4    |
|                             | V5        | -                  |      | -                            | -                  | -          | -                      | 4.37          | 18   |
|                             | V6        | -                  |      | -                            | -                  | -          | -                      | 4.39          | 17   |
|                             | V7        | 3.08               | 9    | 303                          | 2.25               | 21.60      | 72                     | 4.61          | 11   |
|                             | V8        | -                  |      | -                            | -                  | -          | -                      | 2.86          | 22   |
|                             | V9        | 5.88               | 5    | 243                          | 2.65               | 22.02      | 93                     | 4.49          | 15   |
| F2: Medium input (100% NPK) | V1        | 8.31               | 1    | 216                          | 5.52               | 25.84      | 95                     | 17.85         | 1    |
|                             | V2        | 7.48               | 2    | 244                          | 5.16               | 27.44      | 94                     | 10.44         | 3    |
|                             | V3        | 3.12               | 8    | 219                          | 3.19               | 23.98      | 74                     | 0.59          | 13   |
|                             | V4        | -                  |      | -                            | -                  | -          | -                      | 5.36          | 5    |
|                             | V5        | -                  |      | -                            | -                  | -          | -                      | 4.57          | 12   |
|                             | V6        | -                  |      | -                            | -                  | -          | -                      | 4.45          | 16   |
|                             | V7        | 3.25               | 7    | 317                          | 2.17               | 20.26      | 72                     | 1.26          | 8    |
|                             | V8        | -                  |      | -                            | -                  | -          | -                      | 3.74          | 21   |
|                             | V9        | 5.03               | 6    | 285                          | 2.59               | 23.24      | 94                     | -6.30         | 10   |
| F3: High input (150% NPK)   | V1        | -                  |      | -                            | -                  | -          | -                      | 4.53          | 14   |
|                             | V2        | -                  |      | -                            | -                  | -          | -                      | 4.09          | 20   |
|                             | V3        | -                  |      | -                            | -                  | -          | -                      | 4.84          | 9    |
|                             | V4        | -                  |      | -                            | -                  | -          | -                      |               |      |
|                             | V5        | -                  |      | -                            | -                  | -          | -                      |               |      |
|                             | V6        | -                  |      | -                            | -                  | -          | -                      |               |      |
|                             | V7        | -                  |      | -                            | -                  | -          | -                      | 5.03          | 7    |
|                             | V8        | -                  |      | -                            | -                  | -          | -                      |               |      |
|                             | V9        | -                  |      | -                            | -                  | -          | -                      | 2.79          | 23   |
| Interaction                 |           |                    |      |                              |                    |            |                        |               |      |
| N at same V                 |           | 0.38               |      | 15.34                        | NS                 | NS         | 0.91                   |               |      |
| V at same N                 |           | 1.26               |      | 16.38                        | NS                 | NS         | 0.84                   |               |      |
| <b>Means of F levels:</b>   |           |                    |      |                              |                    |            |                        |               |      |
| F1                          |           | 4.79               | 2    | 228                          | 3.47               | 24.28      | 87                     | 4.73          | 2    |
| F2                          |           | 5.44               | 1    | 256                          | 3.73               | 24.15      | 86                     | 4.94          | 1    |
| F3                          |           | -                  |      | -                            | -                  | -          | -                      | 4.26          | 3    |
| C.D.(0.05)                  |           | NS                 |      | 11.36                        | NS                 | NS         | 0.29                   |               |      |
| C.V.(%)                     |           | 20.71              |      | 2.99                         | 10.80              | 2.22       | 0.21                   |               |      |

Table 4.1(d): Contd.

| N-levels                        | Varieties  | VARANASI               |      |                              |                    |            |                        |                                                       | Over all Mean | Rank |
|---------------------------------|------------|------------------------|------|------------------------------|--------------------|------------|------------------------|-------------------------------------------------------|---------------|------|
|                                 |            | Grain Yield (t/ha)     | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test wt(g) | Days for 50% Flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 50% RDF) |               |      |
| Mean of varieties:              |            |                        |      |                              |                    |            |                        |                                                       |               |      |
|                                 | V1         | 7.11                   | 1    | 213                          | 5.20               | 26.33      | 95                     | 17.85                                                 | 5.50          | 1    |
|                                 | V2         | 6.78                   | 2    | 217                          | 4.75               | 27.71      | 96                     | 10.44                                                 | 5.22          | 3    |
|                                 | V3         | 3.08                   | 5    | 206                          | 3.22               | 23.48      | 74                     | 0.59                                                  | 4.44          | 7    |
|                                 | V4         | -                      |      | -                            | -                  | -          | -                      |                                                       | 5.36          | 2    |
|                                 | V5         | -                      |      | -                            | -                  | -          | -                      |                                                       | 4.47          | 6    |
|                                 | V6         | -                      |      | -                            | -                  | -          | -                      |                                                       | 4.42          | 8    |
|                                 | V7         | 3.17                   | 4    | 310                          | 2.21               | 20.93      | 72                     | 1.26                                                  | 4.69          | 4    |
|                                 | V8         | -                      |      | -                            | -                  | -          | -                      |                                                       | 3.30          | 9    |
|                                 | V9         | 5.46                   | 3    | 264                          | 2.62               | 22.63      | 94                     | -6.30                                                 | 4.48          | 5    |
|                                 | C.D.(0.05) | 0.27                   |      | 10.85                        | 0.42               | 1.10       | 0.64                   |                                                       |               |      |
|                                 | C.V.(%)    | 4.26                   |      | 3.66                         | 9.58               | 3.72       | 0.61                   |                                                       |               |      |
| Expt. Mean                      |            | 5.12                   |      | 242                          | 3.60               | 24.22      | 86                     |                                                       | 4.79          |      |
|                                 | Soil type  | Sandy loam             |      |                              |                    |            |                        |                                                       |               |      |
|                                 | pH         | 7.31                   |      |                              |                    |            |                        |                                                       |               |      |
| N - levels (kg/ha)              |            |                        |      |                              |                    |            |                        |                                                       |               |      |
|                                 | F1         | 150:60:60              |      |                              |                    |            |                        |                                                       |               |      |
|                                 | F2         | 225:90:90              |      |                              |                    |            |                        |                                                       |               |      |
|                                 | F3         | -                      |      |                              |                    |            |                        |                                                       |               |      |
| Recommended N:P:K (kg/ha)       |            | 120:60:40              |      |                              |                    |            |                        |                                                       |               |      |
| Varieties                       |            |                        |      |                              |                    |            |                        |                                                       |               |      |
|                                 | V1         | IET 24950              |      |                              |                    |            |                        |                                                       |               |      |
|                                 | V2         | IET 25745              |      |                              |                    |            |                        |                                                       |               |      |
|                                 | V3         | NC- IR 64              |      |                              |                    |            |                        |                                                       |               |      |
|                                 | V4         | -                      |      |                              |                    |            |                        |                                                       |               |      |
|                                 | V5         | -                      |      |                              |                    |            |                        |                                                       |               |      |
|                                 | V6         | -                      |      |                              |                    |            |                        |                                                       |               |      |
|                                 | V7         | MTU 1010 (C & S)       |      |                              |                    |            |                        |                                                       |               |      |
|                                 | V8         | -                      |      |                              |                    |            |                        |                                                       |               |      |
|                                 | V9         | HUBR 2-1 (Local check) |      |                              |                    |            |                        |                                                       |               |      |
| Available N:P:K of soil (kg/ha) |            | 246:18:188             |      |                              |                    |            |                        |                                                       |               |      |

**NMT 1(e) IM(Transplanted)**

Three AVT-2 entries (IET 27263, IET 26418 and IET 26420) of medium duration were evaluated for their response to nutrients on grain yield at thirteen different locations viz., **Chinsurah (120:60:60), Chiplima (80:40:40), Coimbatore (150:50:50), Dhangain (120:60:40), Faizabad (120:60:60), Jagdalpur (100:60:40), Karjat (100:60:60), Kaul (150:60:60), Kota(120:60:40), Nagina (120:60:40), Pantnagar (120:60:40), Titabar (60:20:40) and Maruteru (90:60:60)** under two different levels of nutrient input (100% and 150% RDF). The details and data received from these locations are summarized and presented in Table 4.1 (e).

Application of different nutrient levels significantly influenced the grain yield at all the locations and the maximum increase in grain yield was observed with 150% RDF except **Coimbatore, Faizabad, Kaul, Kota** and **Nagina**. Application of 150% RDF recorded higher grain yields at **Chinsurah** (4.15 t/ha), **Chiplima** (4.95 t/ha), **Dhangain** (5.91 t/ha), **Jagdalpur** (5.65 t/ha), **Karjat** (4.22 t/ha), **Pantnagar** (4.64 t/ha), **Titabar** (5.28 t/ha) and **Maruteru** (5.39 t/ha). Higher nutrient response was recorded with 150% RDF at **Chinsurah** (4.23), **Chiplima** (7.54), **Dhangain** (13.14), **Jagdalpur** (8.91), **Karjat** (6.91), **Pantnagar** (5.35), **Titabar** (7.88) and **Maruteru** (2.46) indicating higher nutrient requirement at these locations.

Grain yield differences among the tested varieties were found to be significant at all the locations. Highest grain yield was recorded by IET 27263 at **Coimbatore** (6.18 t/ha), **Dhangain** (7.21 t/ha), **Faizabad** (6.03 t/ha), **Jagdalpur** (5.92 t/ha), **Kaul** (6.03 t/ha), **Pantnagar** (4.76 t/ha), **Maruteru** (5.60 t/ha) and **Titabar** (5.79 t/ha). At **Chiplima** (6.166 t/ha), **Kota** 98.37 t/ha), **Nagina** (4.62 t/ha) IET 26420 recorded higher grain yield. Mean over the locations IET 27263 (5.66 t/ha) and IET 26420 (5.44 t/ha) over local checks. Interaction effects among RDF x varieties was found to be non-significant at all the locations except at **Karjat** where significant interaction was noted. Significant interaction for grain yield was noted with application of 150% RDF with IET cultures at **Karjat**.

In this trial, mean over the locations nutrient management with 150% RDF was found to be promising and IET 27263 and IET 26420 were found to be promising on the basis of overall mean grain yield.

Table 4.1 (e): Summary of data on grain yield and ancillary characters of selected Irrigated Medium (Transplanted) cultures grown under transplanted conditions at low and medium recommended fertilizer doses, kharif 2019.

| F-<br>levels | Varieties | CHINSURAH                |      |                                 |                   |                       |                                                                 | CHIPLIMA                 |      |                                 |                   |                |                       | Nutri. res. (kg<br>grain/kg<br>Nutri.) (Base<br>level 100%<br>RDF) |
|--------------|-----------|--------------------------|------|---------------------------------|-------------------|-----------------------|-----------------------------------------------------------------|--------------------------|------|---------------------------------|-------------------|----------------|-----------------------|--------------------------------------------------------------------|
|              |           | Grain<br>Yield<br>(t/ha) | Rank | Panicle/m <sup>2</sup><br>(No.) | Panicle<br>wt (g) | Days 50%<br>flowering | Nutri. res. (kg<br>grain/kg Nutri.)<br>(Base level<br>100% RDF) | Grain<br>Yield<br>(t/ha) | Rank | Panicle/m <sup>2</sup><br>(No.) | Panicle<br>wt (g) | Test wt<br>(g) | Days 50%<br>flowering |                                                                    |
| F1           | V1        | 4.13                     | 5    | 289                             | 3.19              | 97                    |                                                                 | 4.65                     | 8    | 172                             | 7.73              | 23.0           | 106                   |                                                                    |
|              | V2        | 3.40                     | 11   | 271                             | 3.16              | 99                    |                                                                 | 5.10                     | 7    | 192                             | 5.07              | 29.0           | 106                   |                                                                    |
|              | V3        | 3.87                     | 9    | 264                             | 3.12              | 100                   |                                                                 | 5.92                     | 2    | 203                             | 4.80              | 27.0           | 111                   |                                                                    |
|              | V4        | -                        |      | -                               | -                 | -                     |                                                                 | -                        |      | -                               | -                 | -              | -                     |                                                                    |
|              | V5        | -                        |      | -                               | -                 | -                     |                                                                 | -                        |      | -                               | -                 | -              | -                     |                                                                    |
|              | V6        | 3.37                     | 12   | 258                             | 3.08              | 77                    |                                                                 | 3.26                     | 12   | 162                             | 6.23              | 26.7           | 99                    |                                                                    |
|              | V7        | 4.14                     | 4    | 272                             | 2.71              | 85                    |                                                                 | 3.02                     | 14   | 200                             | 5.77              | 32.0           | 107                   |                                                                    |
|              | V8        | 3.96                     | 7    | 302                             | 3.26              | 91                    |                                                                 | 3.16                     | 13   | 210                             | 4.60              | 32.3           | 99                    |                                                                    |
|              | V9        | -                        |      | -                               | -                 | -                     |                                                                 | 5.34                     | 6    | 224                             | 5.57              | 23.7           | 108                   |                                                                    |
| F2           | V1        | 4.27                     | 3    | 318                             | 3.43              | 98                    | 1.75                                                            | 5.60                     | 5    | 158                             | 7.93              | 28.7           | 109                   | 11.88                                                              |
|              | V2        | 3.76                     | 10   | 316                             | 3.72              | 99                    | 4.50                                                            | 5.68                     | 4    | 199                             | 5.30              | 29.7           | 108                   | 7.25                                                               |
|              | V3        | 4.06                     | 6    | 304                             | 3.87              | 100                   | 2.37                                                            | 6.39                     | 1    | 223                             | 6.03              | 25.7           | 112                   | 5.88                                                               |
|              | V4        | -                        |      | -                               | -                 | -                     |                                                                 | -                        |      | -                               | -                 | -              | -                     |                                                                    |
|              | V5        | -                        |      | -                               | -                 | -                     |                                                                 | -                        |      | -                               | -                 | -              | -                     |                                                                    |
|              | V6        | 3.92                     | 8    | 289                             | 3.19              | 77                    | 6.88                                                            | 3.45                     | 11   | 195                             | 6.30              | 26.3           | 100                   | 2.38                                                               |
|              | V7        | 4.42                     | 2    | 320                             | 3.67              | 86                    | 3.50                                                            | 4.09                     | 9    | 222                             | 5.33              | 28.3           | 108                   | 13.38                                                              |
|              | V8        | 4.47                     | 1    | 317                             | 3.34              | 92                    | 6.38                                                            | 3.65                     | 10   | 210                             | 4.20              | 31.0           | 102                   | 6.13                                                               |
|              | V9        | -                        |      | -                               | -                 | -                     |                                                                 | 5.81                     | 3    | 235                             | 5.60              | 28.7           | 109                   | 5.88                                                               |
| Interaction  |           |                          |      |                                 |                   |                       |                                                                 |                          |      |                                 |                   |                |                       |                                                                    |
| F at same V  |           | NS                       |      | NS                              | NS                | NS                    |                                                                 | NS                       |      | NS                              | NS                | 3.14           | NS                    |                                                                    |
| V at same F  |           | NS                       |      | NS                              | NS                | NS                    |                                                                 | NS                       |      | NS                              | NS                | 4.03           | NS                    |                                                                    |
| F1           |           | 3.81                     | 2    | 276                             | 3.09              | 92                    |                                                                 | 4.35                     | 2    | 195                             | 5.68              | 27.67          | 105                   |                                                                    |
| F2           |           | 4.15                     | 1    | 311                             | 3.54              | 92                    | 4.23                                                            | 4.95                     | 1    | 206                             | 5.81              | 28.33          | 107                   | 7.54                                                               |
| C.D.(0.05)   |           | 0.28                     |      | 11.98                           | NS                | NS                    |                                                                 | 0.41                     |      | 9.91                            | NS                | NS             | NS                    |                                                                    |
| C.V.(%)      |           | 4.89                     |      | 2.85                            | 10.53             | 0.83                  |                                                                 | 6.66                     |      | 3.73                            | 8.63              | 9.61           | 1.77                  |                                                                    |

Table 4.1 (e): Contd.

| F-<br>levels       | Varieties                          | CHINSURAH                |      |                                 |                   |                       |                                                                 | CHIPLIMA                 |      |                                 |                   |                |                       |                                                                 |
|--------------------|------------------------------------|--------------------------|------|---------------------------------|-------------------|-----------------------|-----------------------------------------------------------------|--------------------------|------|---------------------------------|-------------------|----------------|-----------------------|-----------------------------------------------------------------|
|                    |                                    | Grain<br>Yield<br>(t/ha) | Rank | Panicle/m <sup>2</sup><br>(No.) | Panicle<br>wt (g) | Days 50%<br>flowering | Nutri. res. (kg<br>grain/kg Nutri.)<br>(Base level<br>100% RDF) | Grain<br>Yield<br>(t/ha) | Rank | Panicle/m <sup>2</sup><br>(No.) | Panicle<br>wt (g) | Test wt<br>(g) | Days 50%<br>flowering | Nutri. res. (kg<br>grain/kg Nutri.)<br>(Base level<br>100% RDF) |
| Mean of varieties: |                                    |                          |      |                                 |                   |                       |                                                                 |                          |      |                                 |                   |                |                       |                                                                 |
|                    | V1                                 | 4.20                     | 3    | 303                             | 3.31              | 98                    | 1.75                                                            | 5.13                     | 4    | 165                             | 7.83              | 25.8           | 107                   | 11.88                                                           |
|                    | V2                                 | 3.58                     | 6    | 293                             | 3.44              | 99                    | 4.50                                                            | 5.39                     | 3    | 195                             | 5.19              | 29.3           | 107                   | 7.25                                                            |
|                    | V3                                 | 3.97                     | 4    | 284                             | 3.50              | 100                   | 2.37                                                            | 6.16                     | 1    | 213                             | 5.42              | 26.3           | 112                   | 5.88                                                            |
|                    | V4                                 | -                        |      | -                               | -                 | -                     |                                                                 | -                        |      | -                               | -                 | -              | -                     |                                                                 |
|                    | V5                                 | -                        |      | -                               | -                 | -                     |                                                                 | -                        |      | -                               | -                 | -              | -                     |                                                                 |
|                    | V6                                 | 3.65                     | 5    | 274                             | 3.14              | 77                    | 6.88                                                            | 3.36                     | 7    | 179                             | 6.27              | 26.5           | 100                   | 2.38                                                            |
|                    | V7                                 | 4.28                     | 1    | 296                             | 3.19              | 85                    | 3.50                                                            | 3.56                     | 5    | 211                             | 5.55              | 30.2           | 108                   | 13.38                                                           |
|                    | V8                                 | 4.22                     | 2    | 310                             | 3.30              | 91                    | 6.38                                                            | 3.41                     | 6    | 210                             | 4.40              | 31.7           | 101                   | 6.13                                                            |
|                    | V9                                 | -                        |      | -                               | -                 | -                     |                                                                 | 5.58                     | 2    | 229                             | 5.59              | 26.2           | 109                   | 5.88                                                            |
|                    | C.D.(0.05)                         | 0.33                     |      | 15.23                           | NS                | 0.70                  |                                                                 | 0.43                     |      | 14.37                           | 0.48              | 2.22           | 1.09                  |                                                                 |
|                    | C.V. (%)                           | 6.93                     |      | 4.31                            | 7.45              | 0.63                  |                                                                 | 7.72                     |      | 6.02                            | 7.06              | 6.65           | 0.86                  |                                                                 |
|                    | Expt. Mean                         | 3.98                     |      | 293                             | 3.31              | 92                    |                                                                 | 4.65                     |      | 200                             | 5.75              | 28.0           | 106                   |                                                                 |
|                    | Soil type                          | Clay Loam                |      |                                 |                   |                       |                                                                 | Sandy loam               |      |                                 |                   |                |                       |                                                                 |
|                    | pH                                 | 7.85                     |      |                                 |                   |                       |                                                                 | 7.12                     |      |                                 |                   |                |                       |                                                                 |
|                    | N - levels (kg/ha)                 |                          |      |                                 |                   |                       |                                                                 |                          |      |                                 |                   |                |                       |                                                                 |
|                    | F1                                 | 80:40:40                 |      |                                 |                   |                       |                                                                 | 80:40:40                 |      |                                 |                   |                |                       |                                                                 |
|                    | F2                                 | 120:60:60                |      |                                 |                   |                       |                                                                 | 120:60:60                |      |                                 |                   |                |                       |                                                                 |
|                    | Recommended<br>N:P:K (kg/ha)       | 80:40:40                 |      |                                 |                   |                       |                                                                 | 80:40:40                 |      |                                 |                   |                |                       |                                                                 |
|                    | Varieties                          |                          |      |                                 |                   |                       |                                                                 |                          |      |                                 |                   |                |                       |                                                                 |
|                    | V1                                 | IET 27263                |      |                                 |                   |                       |                                                                 | IET 27263                |      |                                 |                   |                |                       |                                                                 |
|                    | V2                                 | IET 26418                |      |                                 |                   |                       |                                                                 | IET 26418                |      |                                 |                   |                |                       |                                                                 |
|                    | V3                                 | IET 26420                |      |                                 |                   |                       |                                                                 | IET 26420                |      |                                 |                   |                |                       |                                                                 |
|                    | V4                                 | -                        |      |                                 |                   |                       |                                                                 | -                        |      |                                 |                   |                |                       |                                                                 |
|                    | V5                                 | -                        |      |                                 |                   |                       |                                                                 | -                        |      |                                 |                   |                |                       |                                                                 |
|                    | V6                                 | NDR 8002 (E&C)           |      |                                 |                   |                       |                                                                 | NDR 8002 (E&C)           |      |                                 |                   |                |                       |                                                                 |
|                    | V7                                 | Jaya (NE & S)            |      |                                 |                   |                       |                                                                 | Jaya (NE & S)            |      |                                 |                   |                |                       |                                                                 |
|                    | V8                                 | Akshayadhan (W)          |      |                                 |                   |                       |                                                                 | Akshayadhan (W)          |      |                                 |                   |                |                       |                                                                 |
|                    | V9                                 | -                        |      |                                 |                   |                       |                                                                 | Pratikshya (Local Check) |      |                                 |                   |                |                       |                                                                 |
|                    | Available N:P:K of<br>soil (kg/ha) | 530:119:364              |      |                                 |                   |                       |                                                                 | 119:40:117               |      |                                 |                   |                |                       |                                                                 |

Table 4.1 (e): Contd.

| F-levels    | Varieties | COIMBATORE         |      |                              |                |             |                    |                                                        | DHANGAIN           |      |                              |                |                    |                                                        |
|-------------|-----------|--------------------|------|------------------------------|----------------|-------------|--------------------|--------------------------------------------------------|--------------------|------|------------------------------|----------------|--------------------|--------------------------------------------------------|
|             |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
| F1          | V1        | 5.94               | 3    | 259                          | 4.66           | 25.4        | 102                |                                                        | 6.62               | 3    | 290                          | 5.16           | 107                |                                                        |
|             | V2        | 4.78               | 10   | 230                          | 3.05           | 23.4        | 98                 |                                                        | 5.43               | 7    | 269                          | 3.99           | 110                |                                                        |
|             | V3        | 5.20               | 8    | 236                          | 3.31           | 24.3        | 107                |                                                        | 6.18               | 4    | 277                          | 4.08           | 110                |                                                        |
|             | V4        | -                  |      | -                            | -              | -           | -                  |                                                        | -                  |      | -                            | -              | -                  |                                                        |
|             | V5        | -                  |      | -                            | -              | -           | -                  |                                                        | -                  |      | -                            | -              | -                  |                                                        |
|             | V6        | 4.20               | 12   | 263                          | 4.07           | 26.1        | 93                 |                                                        | 5.22               | 9    | 267                          | 3.72           | 84                 |                                                        |
|             | V7        | 4.09               | 14   | 293                          | 4.10           | 24.6        | 92                 |                                                        | 3.92               | 14   | 261                          | 2.26           | 94                 |                                                        |
|             | V8        | 4.93               | 9    | 277                          | 3.49           | 24.5        | 102                |                                                        | 4.43               | 11   | 266                          | 3.49           | 89                 |                                                        |
|             | V9        | 5.78               | 4    | 249                          | 5.09           | 13.8        | 102                |                                                        | 4.03               | 13   | 265                          | 3.14           | 106                |                                                        |
| F2          | V1        | 6.42               | 1    | 302                          | 4.17           | 25.6        | 102                | 3.84                                                   | 7.80               | 1    | 294                          | 5.50           | 109                | 19.67                                                  |
|             | V2        | 5.38               | 7    | 237                          | 3.22           | 24.0        | 98                 | 4.80                                                   | 6.15               | 5    | 279                          | 4.08           | 113                | 12.00                                                  |
|             | V3        | 5.72               | 5    | 309                          | 4.06           | 24.6        | 107                | 4.16                                                   | 7.18               | 2    | 284                          | 4.38           | 112                | 16.67                                                  |
|             | V4        | -                  |      | -                            | -              | -           | -                  |                                                        | -                  |      | -                            | -              | -                  |                                                        |
|             | V5        | -                  |      | -                            | -              | -           | -                  |                                                        | -                  |      | -                            | -              | -                  |                                                        |
|             | V6        | 4.40               | 11   | 314                          | 3.77           | 26.3        | 94                 | 1.60                                                   | 6.12               | 6    | 279                          | 3.97           | 87                 | 15.00                                                  |
|             | V7        | 4.18               | 13   | 255                          | 4.39           | 24.7        | 92                 | 0.72                                                   | 4.13               | 12   | 264                          | 3.43           | 97                 | 3.50                                                   |
|             | V8        | 5.42               | 6    | 255                          | 3.98           | 24.8        | 102                | 3.92                                                   | 5.27               | 8    | 278                          | 3.51           | 92                 | 14.00                                                  |
|             | V9        | 5.99               | 2    | 271                          | 4.66           | 13.7        | 103                | 1.68                                                   | 4.70               | 10   | 273                          | 3.48           | 109                | 11.17                                                  |
| Interaction |           |                    |      |                              |                |             |                    |                                                        |                    |      |                              |                |                    |                                                        |
| F at same V |           | NS                 |      | NS                           | NS             | NS          | NS                 |                                                        | NS                 |      | NS                           | NS             | NS                 |                                                        |
| V at same F |           | NS                 |      | NS                           | NS             | NS          | NS                 |                                                        | NS                 |      | NS                           | NS             | NS                 |                                                        |
| F1          |           | 4.99               | 2    | 258                          | 3.97           | 23.14       | 99                 |                                                        | 5.12               | 2    | 271                          | 3.69           | 100                |                                                        |
| F2          |           | 5.36               | 1    | 277                          | 4.04           | 23.39       | 100                | 4.63                                                   | 5.91               | 1    | 279                          | 4.05           | 103                | 13.14                                                  |
| C.D.(0.05)  |           | NS                 |      | NS                           | NS             | NS          | NS                 |                                                        | 0.75               |      | NS                           | 0.27           | 0.20               |                                                        |
| C.V.(%)     |           | 14.77              |      | 30.21                        | 11.91          | 1.02        | 0.27               |                                                        | 10.29              |      | 2.90                         | 5.30           | 0.15               |                                                        |

Table 4.1 (e): Contd.

| F-<br>levels                       | Varieties  | COIMBATORE               |      |                                 |                   |                |                          |                                                                 | DHANGAIN                 |      |                                 |                   |                          |                                                                 |
|------------------------------------|------------|--------------------------|------|---------------------------------|-------------------|----------------|--------------------------|-----------------------------------------------------------------|--------------------------|------|---------------------------------|-------------------|--------------------------|-----------------------------------------------------------------|
|                                    |            | Grain<br>Yield<br>(t/ha) | Rank | Panicle/m <sup>2</sup><br>(No.) | Panicle<br>wt (g) | Test wt<br>(g) | Days<br>50%<br>flowering | Nutri. res. (kg<br>grain/kg Nutri.)<br>(Base level<br>100% RDF) | Grain<br>Yield<br>(t/ha) | Rank | Panicle/m <sup>2</sup><br>(No.) | Panicle<br>wt (g) | Days<br>50%<br>flowering | Nutri. res. (kg<br>grain/kg Nutri.)<br>(Base level 100%<br>RDF) |
| Mean of varieties:                 |            |                          |      |                                 |                   |                |                          |                                                                 |                          |      |                                 |                   |                          |                                                                 |
|                                    | V1         | 6.18                     | 1    | 280                             | 4.42              | 25.5           | 102                      | 3.84                                                            | 7.21                     | 1    | 292                             | 5.33              | 108                      | 19.67                                                           |
|                                    | V2         | 5.08                     | 5    | 234                             | 3.14              | 23.7           | 98                       | 4.80                                                            | 5.79                     | 3    | 274                             | 4.04              | 111                      | 12.00                                                           |
|                                    | V3         | 5.46                     | 3    | 272                             | 3.69              | 24.5           | 107                      | 4.16                                                            | 6.68                     | 2    | 280                             | 4.23              | 111                      | 16.67                                                           |
|                                    | V4         | -                        |      | -                               | -                 | -              | -                        |                                                                 | -                        |      | -                               | -                 | -                        |                                                                 |
|                                    | V5         | -                        |      | -                               | -                 | -              | -                        |                                                                 | -                        |      | -                               | -                 | -                        |                                                                 |
|                                    | V6         | 4.30                     | 6    | 289                             | 3.92              | 26.2           | 94                       | 1.60                                                            | 5.67                     | 4    | 273                             | 3.85              | 85                       | 15.00                                                           |
|                                    | V7         | 4.14                     | 7    | 274                             | 4.25              | 24.7           | 92                       | 0.72                                                            | 4.03                     | 7    | 263                             | 2.85              | 95                       | 3.50                                                            |
|                                    | V8         | 5.18                     | 4    | 266                             | 3.74              | 24.6           | 102                      | 3.92                                                            | 4.85                     | 5    | 272                             | 3.50              | 91                       | 14.00                                                           |
|                                    | V9         | 5.89                     | 2    | 260                             | 4.88              | 13.8           | 102                      | 1.68                                                            | 4.37                     | 6    | 269                             | 3.31              | 108                      | 11.17                                                           |
|                                    | C.D.(0.05) | 0.39                     |      | NS                              | 0.97              | 0.26           | 0.42                     |                                                                 | 0.42                     |      | 10.73                           | 0.90              | 0.70                     |                                                                 |
|                                    | C.V. (%)   | 6.33                     |      | 16.86                           | 20.39             | 0.92           | 0.35                     |                                                                 | 6.37                     |      | 3.28                            | 19.51             | 0.58                     |                                                                 |
|                                    | Expt. Mean | 5.17                     |      | 268                             | 4.00              | 23.27          | 100                      |                                                                 | 5.51                     |      | 275                             | 3.87              | 101                      |                                                                 |
|                                    | Soil type  | Clay Loam                |      |                                 |                   |                |                          |                                                                 | Loamy                    |      |                                 |                   |                          |                                                                 |
|                                    | pH         | 7.96                     |      |                                 |                   |                |                          |                                                                 | 6.80                     |      |                                 |                   |                          |                                                                 |
| N - levels (kg/ha)                 |            |                          |      |                                 |                   |                |                          |                                                                 |                          |      |                                 |                   |                          |                                                                 |
|                                    | F1         | 150:50:50                |      |                                 |                   |                |                          |                                                                 | 120:60:40                |      |                                 |                   |                          |                                                                 |
|                                    | F2         | 225:75:75                |      |                                 |                   |                |                          |                                                                 | 180:60:40                |      |                                 |                   |                          |                                                                 |
| Recommended<br>N:P:K (kg/ha)       |            | 150:50:50                |      |                                 |                   |                |                          |                                                                 | 120:60:40                |      |                                 |                   |                          |                                                                 |
| Varieties                          |            |                          |      |                                 |                   |                |                          |                                                                 |                          |      |                                 |                   |                          |                                                                 |
|                                    | V1         | IET 27263                |      |                                 |                   |                |                          |                                                                 | IET27263                 |      |                                 |                   |                          |                                                                 |
|                                    | V2         | IET 26418                |      |                                 |                   |                |                          |                                                                 | IET26418                 |      |                                 |                   |                          |                                                                 |
|                                    | V3         | IET 26420                |      |                                 |                   |                |                          |                                                                 | IET26420                 |      |                                 |                   |                          |                                                                 |
|                                    | V4         | -                        |      |                                 |                   |                |                          |                                                                 |                          |      |                                 |                   |                          |                                                                 |
|                                    | V5         | -                        |      |                                 |                   |                |                          |                                                                 |                          |      |                                 |                   |                          |                                                                 |
|                                    | V6         | NDR 8002 (E&C)           |      |                                 |                   |                |                          |                                                                 | NDR 8002                 |      |                                 |                   |                          |                                                                 |
|                                    | V7         | Jaya (NE & S)            |      |                                 |                   |                |                          |                                                                 | Jaya                     |      |                                 |                   |                          |                                                                 |
|                                    | V8         | Akshayadhan (W)          |      |                                 |                   |                |                          |                                                                 | Akshayadhan (W)          |      |                                 |                   |                          |                                                                 |
|                                    | V9         | Co 52 (Local Check)      |      |                                 |                   |                |                          |                                                                 | R. Sweta (LC)            |      |                                 |                   |                          |                                                                 |
| Available N:P:K of<br>soil (kg/ha) |            | 272:26:537               |      |                                 |                   |                |                          |                                                                 | 154:14:183               |      |                                 |                   |                          |                                                                 |

Table 4.1 (e): Contd.

| F-<br>levels | Varieties | FAIZABAD                 |      |                   |                |                          |                                                                | JAGDALPUR                |      |                                 |                   |                |                          |                                                                 |
|--------------|-----------|--------------------------|------|-------------------|----------------|--------------------------|----------------------------------------------------------------|--------------------------|------|---------------------------------|-------------------|----------------|--------------------------|-----------------------------------------------------------------|
|              |           | Grain<br>Yield<br>(t/ha) | Rank | Panicle<br>wt (g) | Test<br>wt (g) | Days<br>50%<br>flowering | Nutri. res. (kg<br>grain/kg Nutri.)<br>(Base level 50%<br>RDF) | Grain<br>Yield<br>(t/ha) | Rank | Panicle/m <sup>2</sup><br>(No.) | Panicle<br>wt (g) | Test<br>wt (g) | Days<br>50%<br>flowering | Nutri. res. (kg<br>grain/kg Nutri.)<br>(Base level 100%<br>RDF) |
| F1           | V1        | 5.44                     | 6    | 4.83              | 25.5           | 105                      |                                                                | 5.11                     | 8    | 252                             | 3.96              | 28.6           | 80                       |                                                                 |
|              | V2        | 5.40                     | 7    | 4.41              | 23.5           | 108                      |                                                                | 4.51                     | 13   | 324                             | 3.82              | 26.1           | 82                       |                                                                 |
|              | V3        | 5.61                     | 5    | 3.60              | 21.9           | 107                      |                                                                | 5.16                     | 7    | 290                             | 3.16              | 25.9           | 80                       |                                                                 |
|              | V4        | 5.24                     | 8    | 3.83              | 21.6           | 97                       |                                                                | -                        |      | -                               | -                 | -              | -                        |                                                                 |
|              | V5        | -                        |      | -                 | -              | -                        |                                                                | -                        |      | -                               | -                 | -              | -                        |                                                                 |
|              | V6        | 5.01                     | 11   | 3.30              | 21.5           | 95                       |                                                                | 4.60                     | 12   | 286                             | 3.51              | 26.0           | 62                       |                                                                 |
|              | V7        | 3.99                     | 15   | 3.58              | 21.5           | 97                       |                                                                | 4.72                     | 11   | 374                             | 3.24              | 26.8           | 78                       |                                                                 |
|              | V8        | 3.23                     | 16   | 3.63              | 21.5           | 99                       |                                                                | 5.04                     | 9    | 232                             | 3.36              | 26.1           | 75                       |                                                                 |
|              | V9        | 4.68                     | 13   | 3.16              | 23.0           | 97                       |                                                                | 4.19                     | 14   | 287                             | 3.11              | 26.9           | 68                       |                                                                 |
| F2           | V1        | 6.62                     | 1    | 5.31              | 26.9           | 105                      | 19.67                                                          | 6.73                     | 1    | 257                             | 4.01              | 29.2           | 82                       | 16.20                                                           |
|              | V2        | 6.45                     | 2    | 4.61              | 28.3           | 107                      | 17.50                                                          | 6.21                     | 2    | 336                             | 3.87              | 26.6           | 83                       | 17.00                                                           |
|              | V3        | 5.63                     | 4    | 3.08              | 22.5           | 107                      | 0.33                                                           | 5.74                     | 3    | 303                             | 3.20              | 26.5           | 81                       | 5.80                                                            |
|              | V4        | 5.93                     | 3    | 3.78              | 22.3           | 97                       | 11.50                                                          | -                        |      | -                               | -                 | -              | -                        |                                                                 |
|              | V5        | -                        |      | -                 | -              | -                        |                                                                | -                        |      | -                               | -                 | -              | -                        |                                                                 |
|              | V6        | 5.14                     | 10   | 3.27              | 21.5           | 95                       | 2.17                                                           | 5.29                     | 6    | 286                             | 3.68              | 26.3           | 64                       | 6.90                                                            |
|              | V7        | 4.84                     | 12   | 3.15              | 22.3           | 97                       | 14.17                                                          | 5.31                     | 5    | 397                             | 3.38              | 27.2           | 80                       | 5.90                                                            |
|              | V8        | 4.11                     | 14   | 3.73              | 21.4           | 99                       | 14.67                                                          | 5.50                     | 4    | 240                             | 3.53              | 26.6           | 76                       | 4.60                                                            |
|              | V9        | 5.24                     | 8    | 4.37              | 22.4           | 98                       |                                                                | 4.79                     | 10   | 316                             | 3.22              | 28.0           | 70                       | 6.00                                                            |
| Interaction  |           |                          |      |                   |                |                          |                                                                |                          |      |                                 |                   |                |                          |                                                                 |
| F at same V  |           | NS                       |      | NS                | 1.17           | NS                       |                                                                | NS                       |      | NS                              | NS                | NS             | NS                       |                                                                 |
| V at same F  |           | NS                       |      | NS                | 1.17           | NS                       |                                                                | NS                       |      | NS                              | NS                | NS             | NS                       |                                                                 |
| F1           |           | 4.83                     | 2    | 3.79              | 22.5           | 101                      |                                                                | 4.76                     | 2    | 292                             | 3.45              | 26.6           | 75                       |                                                                 |
| F2           |           | 5.50                     | 1    | 3.91              | 23.4           | 101                      | 8.38                                                           | 5.65                     | 1    | 305                             | 3.56              | 27.2           | 77                       | 8.91                                                            |
| C.D.(0.05)   |           | NS                       |      | NS                | 0.52           | NS                       |                                                                | 0.10                     |      | 2.66                            | NS                | 0.25           | NS                       |                                                                 |
| C.V.(%)      |           | 11.39                    |      | 18.57             | 1.83           | 1.03                     |                                                                | 1.49                     |      | 0.67                            | 2.60              | 0.69           | 1.61                     |                                                                 |

Table 4.1 (e): Contd.

| F-<br>levels       | Varieties                          | FAIZABAD                 |      |                   |                |                          |                                                                | JAGDALPUR                |      |                                 |                   |                |                          |                                                                 |
|--------------------|------------------------------------|--------------------------|------|-------------------|----------------|--------------------------|----------------------------------------------------------------|--------------------------|------|---------------------------------|-------------------|----------------|--------------------------|-----------------------------------------------------------------|
|                    |                                    | Grain<br>Yield<br>(t/ha) | Rank | Panicle<br>wt (g) | Test<br>wt (g) | Days<br>50%<br>flowering | Nutri. res. (kg<br>grain/kg Nutri.)<br>(Base level 50%<br>RDF) | Grain<br>Yield<br>(t/ha) | Rank | Panicle/m <sup>2</sup><br>(No.) | Panicle<br>wt (g) | Test<br>wt (g) | Days<br>50%<br>flowering | Nutri. res. (kg<br>grain/kg Nutri.)<br>(Base level 100%<br>RDF) |
| Mean of varieties: |                                    |                          |      |                   |                |                          |                                                                |                          |      |                                 |                   |                |                          |                                                                 |
|                    | V1                                 | 6.03                     | 1    | 5.07              | 26.2           | 105                      | 19.67                                                          | 5.92                     | 1    | 255                             | 3.99              | 28.9           | 81                       | 16.20                                                           |
|                    | V2                                 | 5.93                     | 2    | 4.51              | 25.9           | 107                      | 17.50                                                          | 5.36                     | 3    | 330                             | 3.85              | 26.3           | 83                       | 17.00                                                           |
|                    | V3                                 | 5.62                     | 3    | 3.34              | 22.2           | 107                      | 0.33                                                           | 5.45                     | 2    | 296                             | 3.18              | 26.2           | 80                       | 5.80                                                            |
|                    | V4                                 | 5.59                     | 4    | 3.81              | 21.9           | 97                       | 11.50                                                          | -                        |      | -                               | -                 | -              | -                        |                                                                 |
|                    | V5                                 | -                        |      | -                 | -              | -                        |                                                                | -                        |      | -                               | -                 | -              | -                        |                                                                 |
|                    | V6                                 | 5.08                     | 5    | 3.29              | 21.5           | 95                       | 2.17                                                           | 4.95                     | 6    | 286                             | 3.60              | 26.2           | 63                       | 6.90                                                            |
|                    | V7                                 | 4.42                     | 7    | 3.37              | 21.9           | 97                       | 14.17                                                          | 5.02                     | 5    | 386                             | 3.31              | 27.0           | 79                       | 5.90                                                            |
|                    | V8                                 | 3.67                     | 8    | 3.68              | 21.5           | 99                       | 14.67                                                          | 5.27                     | 4    | 236                             | 3.45              | 26.4           | 76                       | 4.60                                                            |
|                    | V9                                 | 4.96                     | 6    | 3.77              | 22.7           | 97                       |                                                                | 4.49                     | 7    | 302                             | 3.17              | 27.4           | 69                       | 6.00                                                            |
|                    | C.D.(0.05)                         | 0.59                     |      | 0.78              | 0.83           | 0.83                     |                                                                | 0.59                     |      | 60.15                           | 0.50              | NS             | 0.78                     |                                                                 |
|                    | C.V. (%)                           | 9.65                     |      | 17.13             | 3.04           | 0.69                     |                                                                | 9.57                     |      | 16.90                           | 11.95             | 9.11           | 0.86                     |                                                                 |
|                    | Expt. Mean                         | 5.16                     |      | 3.85              | 22.97          | 101                      |                                                                | 5.21                     |      | 299                             | 3.50              | 26.90          | 76                       |                                                                 |
|                    | Soil type                          | Sandy loam               |      |                   |                |                          |                                                                | -                        |      |                                 |                   |                |                          |                                                                 |
|                    | pH                                 | 7.60                     |      |                   |                |                          |                                                                | 6.50                     |      |                                 |                   |                |                          |                                                                 |
|                    | N - levels (kg/ha)                 |                          |      |                   |                |                          |                                                                |                          |      |                                 |                   |                |                          |                                                                 |
|                    | F1                                 | 120:60:60                |      |                   |                |                          |                                                                | 100:60:40                |      |                                 |                   |                |                          |                                                                 |
|                    | F2                                 | 180:60:60                |      |                   |                |                          |                                                                | 150:90:60                |      |                                 |                   |                |                          |                                                                 |
|                    | Recommended<br>N:P:K (kg/ha)       | 120:60:60:25             |      |                   |                |                          |                                                                | 100:60:40                |      |                                 |                   |                |                          |                                                                 |
|                    | Varieties                          |                          |      |                   |                |                          |                                                                |                          |      |                                 |                   |                |                          |                                                                 |
|                    | V1                                 | IET 27263                |      |                   |                |                          |                                                                | IET 27263                |      |                                 |                   |                |                          |                                                                 |
|                    | V2                                 | IET 26418                |      |                   |                |                          |                                                                | IET 26418                |      |                                 |                   |                |                          |                                                                 |
|                    | V3                                 | IET 26420                |      |                   |                |                          |                                                                | IET 26420                |      |                                 |                   |                |                          |                                                                 |
|                    | V4                                 | NC-NDR 359               |      |                   |                |                          |                                                                | -                        |      |                                 |                   |                |                          |                                                                 |
|                    | V5                                 | -                        |      |                   |                |                          |                                                                | -                        |      |                                 |                   |                |                          |                                                                 |
|                    | V6                                 | NDR 8002 (E&C)           |      |                   |                |                          |                                                                | NDR 8002 (E&C)           |      |                                 |                   |                |                          |                                                                 |
|                    | V7                                 | Jaya (NE & S)            |      |                   |                |                          |                                                                | Jaya (NE & S)            |      |                                 |                   |                |                          |                                                                 |
|                    | V8                                 | Akshayadhan (W)          |      |                   |                |                          |                                                                | Akshayadhan (W)          |      |                                 |                   |                |                          |                                                                 |
|                    | V9                                 | NDR 3112 1 (Local Check) |      |                   |                |                          |                                                                | Samleswari (Local Check) |      |                                 |                   |                |                          |                                                                 |
|                    | Available N:P:K of<br>soil (kg/ha) | 200:24:234               |      |                   |                |                          |                                                                | 248:14:296               |      |                                 |                   |                |                          |                                                                 |

Table 4.1 (e): Contd.

| F-levels    | Varieties | KAUL               |      |                              |                |             |                                                        | KARJAT             |      |                              |                |             |                    |                                                        |
|-------------|-----------|--------------------|------|------------------------------|----------------|-------------|--------------------------------------------------------|--------------------|------|------------------------------|----------------|-------------|--------------------|--------------------------------------------------------|
|             |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
| F1          | V1        | 5.97               | 4    | 212                          | 3.09           | 26.5        |                                                        | 4.33               | 7    | 135                          | 2.34           | 25.4        | 101                |                                                        |
|             | V2        | 5.63               | 6    | 221                          | 2.81           | 26.3        |                                                        | 3.75               | 10   | 156                          | 2.03           | 23.6        | 101                |                                                        |
|             | V3        | 5.47               | 8    | 227                          | 2.68           | 24.3        |                                                        | 4.35               | 5    | 149                          | 2.35           | 26.3        | 104                |                                                        |
|             | V4        | -                  |      | -                            | -              | -           |                                                        | -                  |      | -                            | -              | -           | -                  |                                                        |
|             | V5        | -                  |      | -                            | -              | -           |                                                        | -                  |      | -                            | -              | -           | -                  |                                                        |
|             | V6        | -                  |      | -                            | -              | -           |                                                        | 2.89               | 12   | 161                          | 1.57           | 24.5        | 88                 |                                                        |
|             | V7        | -                  |      | -                            | -              | -           |                                                        | 3.28               | 11   | 127                          | 1.77           | 23.7        | 95                 |                                                        |
|             | V8        | -                  |      | -                            | -              | -           |                                                        | 1.50               | 14   | 67                           | 0.81           | 25.4        | 98                 |                                                        |
|             | V9        | 6.75               | 2    | 285                          | 2.64           | 25.7        |                                                        | 4.57               | 4    | 170                          | 2.47           | 24.4        | 92                 |                                                        |
| F2          | V1        | 6.09               | 3    | 218                          | 3.12           | 26.8        | 0.89                                                   | 5.09               | 2    | 159                          | 2.75           | 26.2        | 102                | 7.60                                                   |
|             | V2        | 5.66               | 5    | 228                          | 2.77           | 26.0        | 0.22                                                   | 4.25               | 8    | 163                          | 2.30           | 24.6        | 101                | 5.00                                                   |
|             | V3        | 5.63               | 6    | 232                          | 2.70           | 24.1        | 1.19                                                   | 4.88               | 3    | 162                          | 2.64           | 27.3        | 105                | 5.30                                                   |
|             | V4        | -                  |      | -                            | -              | -           |                                                        | -                  |      | -                            | -              | -           | -                  |                                                        |
|             | V5        | -                  |      | -                            | -              | -           |                                                        | -                  |      | -                            | -              | -           | -                  |                                                        |
|             | V6        | -                  |      | -                            | -              | -           |                                                        | 4.35               | 5    | 167                          | 2.35           | 25.3        | 88                 | 14.60                                                  |
|             | V7        | -                  |      | -                            | -              | -           |                                                        | 4.00               | 9    | 143                          | 2.16           | 25.5        | 97                 | 7.20                                                   |
|             | V8        | -                  |      | -                            | -              | -           |                                                        | 1.76               | 13   | 73                           | 0.95           | 25.8        | 98                 | 2.60                                                   |
|             | V9        | 6.83               | 1    | 288                          | 2.64           | 25.9        | 0.59                                                   | 5.18               | 1    | 192                          | 2.80           | 25.4        | 93                 | 6.10                                                   |
| Interaction |           |                    |      |                              |                |             |                                                        |                    |      |                              |                |             |                    |                                                        |
| F at same V |           | NS                 |      | NS                           | NS             | NS          |                                                        | 0.11               |      | 3.86                         | 0.06           | NS          | NS                 |                                                        |
| V at same F |           | NS                 |      | NS                           | NS             | NS          |                                                        | 0.10               |      | 4.03                         | 0.06           | NS          | NS                 |                                                        |
| F1          |           | 5.96               | 2    | 236                          | 2.81           | 25.69       |                                                        | 3.52               | 2    | 138                          | 1.91           | 24.77       | 97                 |                                                        |
| F2          |           | 6.05               | 1    | 241                          | 2.81           | 25.69       | 0.72                                                   | 4.22               | 1    | 151                          | 2.28           | 25.73       | 98                 | 6.91                                                   |
| C.D.(0.05)  |           | NS                 |      | NS                           | NS             | NS          |                                                        | 0.04               |      | 2.36                         | 0.02           | 0.36        | NS                 |                                                        |
| C.V.(%)     |           | 7.07               |      | 7.90                         | 2.52           | 6.94        |                                                        | 0.74               |      | 1.23                         | 0.80           | 1.07        | 0.63               |                                                        |

Table 4.1 (e): Contd.

| F-<br>levels       | Varieties                          | KAUL                     |      |                     |                   |                |                                                                 | KARJAT                   |      |                     |                   |                |                          |                                                                 |
|--------------------|------------------------------------|--------------------------|------|---------------------|-------------------|----------------|-----------------------------------------------------------------|--------------------------|------|---------------------|-------------------|----------------|--------------------------|-----------------------------------------------------------------|
|                    |                                    | Grain<br>Yield<br>(t/ha) | Rank | Panicle/m²<br>(No.) | Panicle<br>wt (g) | Test<br>wt (g) | Nutri. res. (kg<br>grain/kg Nutri.)<br>(Base level<br>100% RDF) | Grain<br>Yield<br>(t/ha) | Rank | Panicle/m²<br>(No.) | Panicle<br>wt (g) | Test wt<br>(g) | Days<br>50%<br>flowering | Nutri. res. (kg<br>grain/kg Nutri.)<br>(Base level<br>100% RDF) |
| Mean of varieties: |                                    |                          |      |                     |                   |                |                                                                 |                          |      |                     |                   |                |                          |                                                                 |
|                    | V1                                 | 6.03                     | 2    | 215                 | 3.11              | 26.65          | 0.89                                                            | 4.71                     | 2    | 147                 | 2.55              | 25.80          | 102                      | 7.60                                                            |
|                    | V2                                 | 5.65                     | 3    | 225                 | 2.79              | 26.14          | 0.22                                                            | 4.00                     | 4    | 159                 | 2.17              | 24.13          | 101                      | 5.00                                                            |
|                    | V3                                 | 5.55                     | 4    | 229                 | 2.69              | 24.19          | 1.19                                                            | 4.62                     | 3    | 155                 | 2.50              | 26.80          | 104                      | 5.30                                                            |
|                    | V4                                 | -                        |      | -                   | -                 | -              |                                                                 | -                        |      | -                   | -                 | -              | -                        |                                                                 |
|                    | V5                                 | -                        |      | -                   | -                 | -              |                                                                 | -                        |      | -                   | -                 | -              | -                        |                                                                 |
|                    | V6                                 | -                        |      | -                   | -                 | -              |                                                                 | 3.62                     | 6    | 164                 | 1.96              | 24.89          | 88                       | 14.60                                                           |
|                    | V7                                 | -                        |      | -                   | -                 | -              |                                                                 | 3.64                     | 5    | 135                 | 1.97              | 24.62          | 96                       | 7.20                                                            |
|                    | V8                                 | -                        |      | -                   | -                 | -              |                                                                 | 1.63                     | 7    | 70                  | 0.88              | 25.60          | 98                       | 2.60                                                            |
|                    | V9                                 | 6.79                     | 1    | 286                 | 2.64              | 25.80          | 0.59                                                            | 4.88                     | 1    | 181                 | 2.64              | 24.90          | 93                       |                                                                 |
|                    | C.D.(0.05)                         | 0.63                     |      | 29.08               | 0.21              | NS             |                                                                 | 0.08                     |      | 2.73                | 0.04              | 0.36           | 0.58                     |                                                                 |
|                    | C.V. (%)                           | 8.31                     |      | 9.68                | 6.02              | 7.85           |                                                                 | 1.65                     |      | 1.59                | 1.61              | 1.20           | 0.50                     |                                                                 |
|                    | Expt. Mean                         | 6.00                     |      | 239                 | 2.81              | 25.69          |                                                                 | 3.87                     |      | 144                 | 2.09              | 25.25          | 97                       |                                                                 |
|                    | Soil type                          | Clay Loam                |      |                     |                   |                |                                                                 | -                        |      |                     |                   |                |                          |                                                                 |
|                    | pH                                 | 8.10                     |      |                     |                   |                |                                                                 | -                        |      |                     |                   |                |                          |                                                                 |
|                    | N - levels (kg/ha)                 |                          |      |                     |                   |                |                                                                 |                          |      |                     |                   |                |                          |                                                                 |
|                    | F1                                 | 150:60:60                |      |                     |                   |                |                                                                 | 100:50:50                |      |                     |                   |                |                          |                                                                 |
|                    | F2                                 | 225:90:90                |      |                     |                   |                |                                                                 | 150:75:75                |      |                     |                   |                |                          |                                                                 |
|                    | Recommended<br>N:P:K (kg/ha)       | 150:60:60:25             |      |                     |                   |                |                                                                 | 100:50:50                |      |                     |                   |                |                          |                                                                 |
|                    | Varieties                          |                          |      |                     |                   |                |                                                                 |                          |      |                     |                   |                |                          |                                                                 |
|                    | V1                                 | IET 27263                |      |                     |                   |                |                                                                 | IET 27263                |      |                     |                   |                |                          |                                                                 |
|                    | V2                                 | IET 26418                |      |                     |                   |                |                                                                 | IET 26418                |      |                     |                   |                |                          |                                                                 |
|                    | V3                                 | IET 26420                |      |                     |                   |                |                                                                 | IET 26420                |      |                     |                   |                |                          |                                                                 |
|                    | V4                                 | -                        |      |                     |                   |                |                                                                 | -                        |      |                     |                   |                |                          |                                                                 |
|                    | V5                                 | -                        |      |                     |                   |                |                                                                 | -                        |      |                     |                   |                |                          |                                                                 |
|                    | V6                                 | -                        |      |                     |                   |                |                                                                 | NDR 8002 (E&C)           |      |                     |                   |                |                          |                                                                 |
|                    | V7                                 | -                        |      |                     |                   |                |                                                                 | Jaya (NE & S)            |      |                     |                   |                |                          |                                                                 |
|                    | V8                                 | -                        |      |                     |                   |                |                                                                 | Akshayadhan (W)          |      |                     |                   |                |                          |                                                                 |
|                    | V9                                 | HKR 127 (Local Check)    |      |                     |                   |                |                                                                 | Karjat -3 (Local Check)  |      |                     |                   |                |                          |                                                                 |
|                    | Available N:P:K of<br>soil (kg/ha) | 160:16:420               |      |                     |                   |                |                                                                 | -                        |      |                     |                   |                |                          |                                                                 |

Table 4.1 (e): Contd.

| F-levels    | Varieties | KOTA               |      |                              |                |                                                        | NAGINA             |      |                              |                |             |                    |                                                        |
|-------------|-----------|--------------------|------|------------------------------|----------------|--------------------------------------------------------|--------------------|------|------------------------------|----------------|-------------|--------------------|--------------------------------------------------------|
|             |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
| F1          | V1        | 7.38               | 5    | 332                          | 5.18           |                                                        | 4.39               | 7    | 274                          | 2.64           | 23.7        | 115                |                                                        |
|             | V2        | 5.63               | 12   | 284                          | 3.67           |                                                        | 4.46               | 6    | 268                          | 2.61           | 23.8        | 117                |                                                        |
|             | V3        | 8.24               | 2    | 370                          | 5.59           |                                                        | 4.54               | 4    | 288                          | 2.69           | 23.9        | 113                |                                                        |
|             | V4        | 7.15               | 7    | 321                          | 5.09           |                                                        | -                  |      | -                            | -              | -           | -                  |                                                        |
|             | V5        | -                  |      | -                            | -              |                                                        | -                  |      | -                            | -              | -           | -                  |                                                        |
|             | V6        | -                  |      | -                            | -              |                                                        | 4.32               | 8    | 242                          | 2.40           | 22.2        | 114                |                                                        |
|             | V7        | 6.90               | 8    | 312                          | 4.90           |                                                        | 4.09               | 10   | 258                          | 2.16           | 23.2        | 106                |                                                        |
|             | V8        | 6.05               | 10   | 289                          | 4.25           |                                                        | 4.01               | 12   | 262                          | 2.48           | 23.5        | 98                 |                                                        |
|             | V9        | -                  |      | -                            | -              |                                                        | -                  |      | -                            | -              | -           | -                  |                                                        |
| F2          | V1        | 7.62               | 3    | 341                          | 5.26           | 2.18                                                   | 4.65               | 2    | 284                          | 2.72           | 23.8        | 112                | 2.36                                                   |
|             | V2        | 5.83               | 11   | 291                          | 3.88           | 1.82                                                   | 4.63               | 3    | 280                          | 2.63           | 23.9        | 117                | 1.55                                                   |
|             | V3        | 8.49               | 1    | 377                          | 5.63           | 2.27                                                   | 4.69               | 1    | 292                          | 2.77           | 24.0        | 114                | 1.36                                                   |
|             | V4        | 7.47               | 4    | 330                          | 5.17           | 2.91                                                   | -                  |      | -                            | -              | -           | -                  |                                                        |
|             | V5        | -                  |      | -                            | -              |                                                        | -                  |      | -                            | -              | -           | -                  |                                                        |
|             | V6        | -                  |      | -                            | -              |                                                        | 4.50               | 5    | 263                          | 2.50           | 22.2        | 116                | 1.64                                                   |
|             | V7        | 7.23               | 6    | 317                          | 4.69           | 3.00                                                   | 4.16               | 9    | 270                          | 2.16           | 22.6        | 107                | 0.64                                                   |
|             | V8        | 6.30               | 9    | 295                          | 4.43           | 2.27                                                   | 4.08               | 11   | 255                          | 2.50           | 23.7        | 98                 | 0.64                                                   |
|             | V9        | -                  |      | -                            | -              |                                                        | -                  |      | -                            | -              | -           | -                  |                                                        |
| Interaction |           |                    |      |                              |                |                                                        |                    |      |                              |                |             |                    |                                                        |
| F at same V |           | NS                 |      | NS                           | NS             |                                                        | NS                 |      | NS                           | 0.02           | 0.28        | NS                 |                                                        |
| V at same F |           | NS                 |      | NS                           | NS             |                                                        | NS                 |      | NS                           | 0.02           | 0.33        | NS                 |                                                        |
| F1          |           | 6.89               | 2    | 318                          | 4.78           |                                                        | 4.30               | 2    | 265                          | 2.50           | 23.37       | 111                |                                                        |
| F2          |           | 7.16               | 1    | 325                          | 4.84           | 2.41                                                   | 4.45               | 1    | 274                          | 2.55           | 23.37       | 111                | 1.36                                                   |
| C.D.(0.05)  |           | NS                 |      | NS                           | NS             |                                                        | NS                 |      | 3.11                         | 0.01           | NS          | NS                 |                                                        |
| C.V.(%)     |           | 3.88               |      | 5.63                         | 7.75           |                                                        | 3.67               |      | 0.80                         | 0.40           | 0.80        | 0.94               |                                                        |

Table 4.1 (e): Contd.

| F-<br>levels       | Varieties                          | KOTA                     |      |                                 |                   |                                                                 | NAGINA                   |      |                                 |                   |                |                       |                                                                 |
|--------------------|------------------------------------|--------------------------|------|---------------------------------|-------------------|-----------------------------------------------------------------|--------------------------|------|---------------------------------|-------------------|----------------|-----------------------|-----------------------------------------------------------------|
|                    |                                    | Grain<br>Yield<br>(t/ha) | Rank | Panicle/m <sup>2</sup><br>(No.) | Panicle<br>wt (g) | Nutri. res. (kg<br>grain/kg Nutri.)<br>(Base level 100%<br>RDF) | Grain<br>Yield<br>(t/ha) | Rank | Panicle/m <sup>2</sup><br>(No.) | Panicle<br>wt (g) | Test<br>wt (g) | Days 50%<br>flowering | Nutri. res. (kg<br>grain/kg Nutri.)<br>(Base level 100%<br>RDF) |
| Mean of varieties: |                                    |                          |      |                                 |                   |                                                                 |                          |      |                                 |                   |                |                       |                                                                 |
|                    | V1                                 | 7.50                     | 2    | 337                             | 5.22              | 2.18                                                            | 4.52                     | 3    | 279                             | 2.68              | 23.76          | 114                   | 2.36                                                            |
|                    | V2                                 | 5.73                     | 6    | 288                             | 3.78              | 1.82                                                            | 4.55                     | 2    | 274                             | 2.62              | 23.83          | 117                   | 1.55                                                            |
|                    | V3                                 | 8.37                     | 1    | 374                             | 5.61              | 2.27                                                            | 4.62                     | 1    | 290                             | 2.73              | 23.94          | 114                   | 1.36                                                            |
|                    | V4                                 | 7.31                     | 3    | 326                             | 5.13              | 2.91                                                            | -                        |      | -                               | -                 | -              | -                     |                                                                 |
|                    | V5                                 | -                        |      | -                               | -                 |                                                                 | -                        |      | -                               | -                 | -              | -                     |                                                                 |
|                    | V6                                 | -                        |      | -                               | -                 |                                                                 | 4.41                     | 4    | 253                             | 2.45              | 22.19          | 115                   | 1.64                                                            |
|                    | V7                                 | 7.07                     | 4    | 315                             | 4.80              | 3.00                                                            | 4.13                     | 5    | 264                             | 2.16              | 22.92          | 106                   | 0.64                                                            |
|                    | V8                                 | 6.18                     | 5    | 292                             | 4.34              | 2.27                                                            | 4.05                     | 6    | 259                             | 2.49              | 23.60          | 98                    | 0.64                                                            |
|                    | V9                                 | -                        |      | -                               | -                 |                                                                 | -                        |      | -                               | -                 | -              | -                     |                                                                 |
|                    | C.D.(0.05)                         | 0.51                     |      | 15.48                           | 0.36              |                                                                 | 0.13                     |      | 14.95                           | 0.02              | 0.20           | 2.34                  |                                                                 |
|                    | C.V. (%)                           | 6.03                     |      | 4.00                            | 6.26              |                                                                 | 2.53                     |      | 4.60                            | 0.56              | 0.71           | 1.76                  |                                                                 |
|                    | Expt. Mean                         | 7.02                     |      | 322                             | 4.81              |                                                                 | 4.38                     |      | 270                             | 2.52              | 23.37          | 111                   |                                                                 |
|                    | Soil type                          | Clay loam                |      |                                 |                   |                                                                 | -                        |      |                                 |                   |                |                       |                                                                 |
|                    | pH                                 | 7.80                     |      |                                 |                   |                                                                 | 7.70                     |      |                                 |                   |                |                       |                                                                 |
|                    | N - levels (kg/ha)                 |                          |      |                                 |                   |                                                                 |                          |      |                                 |                   |                |                       |                                                                 |
|                    | F1                                 | 120:60:40                |      |                                 |                   |                                                                 | 120:60:40                |      |                                 |                   |                |                       |                                                                 |
|                    | F2                                 | 180:90:60                |      |                                 |                   |                                                                 | 180:90:60                |      |                                 |                   |                |                       |                                                                 |
|                    | Recommended<br>N:P:K (kg/ha)       | 120:60:40                |      |                                 |                   |                                                                 | 120:60:40:25             |      |                                 |                   |                |                       |                                                                 |
|                    | Varieties                          |                          |      |                                 |                   |                                                                 |                          |      |                                 |                   |                |                       |                                                                 |
|                    | V1                                 | IET 27263                |      |                                 |                   |                                                                 | IET 26027                |      |                                 |                   |                |                       |                                                                 |
|                    | V2                                 | IET 26418                |      |                                 |                   |                                                                 | IET 25997                |      |                                 |                   |                |                       |                                                                 |
|                    | V3                                 | IET 26420                |      |                                 |                   |                                                                 | IET 25785                |      |                                 |                   |                |                       |                                                                 |
|                    | V4                                 | NC-NDR 359               |      |                                 |                   |                                                                 | NC- NDR 359              |      |                                 |                   |                |                       |                                                                 |
|                    | V5                                 | -                        |      |                                 |                   |                                                                 | -                        |      |                                 |                   |                |                       |                                                                 |
|                    | V6                                 | -                        |      |                                 |                   |                                                                 | -                        |      |                                 |                   |                |                       |                                                                 |
|                    | V7                                 | Jaya (NE & S)            |      |                                 |                   |                                                                 | Jaya (NE & S)            |      |                                 |                   |                |                       |                                                                 |
|                    | V8                                 | Akshayadhan (W)          |      |                                 |                   |                                                                 | Akshayadhan (W)          |      |                                 |                   |                |                       |                                                                 |
|                    | V9                                 | -                        |      |                                 |                   |                                                                 | -                        |      |                                 |                   |                |                       |                                                                 |
|                    | Available N:P:K of<br>soil (kg/ha) | 318:60:523               |      |                                 |                   |                                                                 | 21:18.3:209              |      |                                 |                   |                |                       |                                                                 |

Table 4.1 (e): Contd.

| F-levels    | Varieties | PANTNAGAR          |      |                              |                |             |                    |                                                        | TITABAR            |      |                              |                |             |                    |                                                        |
|-------------|-----------|--------------------|------|------------------------------|----------------|-------------|--------------------|--------------------------------------------------------|--------------------|------|------------------------------|----------------|-------------|--------------------|--------------------------------------------------------|
|             |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
| F1          | V1        | 4.49               | 5    | 242                          | 2.19           | 27.9        | 107                |                                                        | 5.46               | 3    | 213                          | 6.02           | 21.4        | 109                |                                                        |
|             | V2        | 3.56               | 11   | 223                          | 2.00           | 23.1        | 108                |                                                        | 5.12               | 7    | 199                          | 5.11           | 21.2        | 109                |                                                        |
|             | V3        | 3.42               | 12   | 222                          | 1.81           | 23.4        | 113                |                                                        | 4.83               | 11   | 218                          | 5.06           | 21.1        | 109                |                                                        |
|             | V4        | 4.36               | 6    | 234                          | 2.16           | 24.2        | 100                |                                                        | -                  |      | -                            | -              | -           | -                  |                                                        |
|             | V5        | 4.29               | 7    | 241                          | 2.05           | 27.5        | 100                |                                                        | 4.41               | 15   | 216                          | 5.57           | 17.5        | 99                 |                                                        |
|             | V6        | -                  |      | -                            | -              | -           | -                  |                                                        | 4.47               | 14   | 186                          | 5.24           | 20.5        | 88                 |                                                        |
|             | V7        | -                  |      | -                            | -              | -           | -                  |                                                        | 4.17               | 16   | 198                          | 4.88           | 19.7        | 94                 |                                                        |
|             | V8        | -                  |      | -                            | -              | -           | -                  |                                                        | 4.94               | 9    | 217                          | 5.98           | 22.8        | 98                 |                                                        |
|             | V9        | 4.18               | 9    | 232                          | 2.17           | 24.9        | 99                 |                                                        | 5.05               | 8    | 200                          | 5.40           | 19.0        | 101                |                                                        |
| F2          | V1        | 5.02               | 1    | 257                          | 2.40           | 28.1        | 108                | 4.82                                                   | 6.11               | 1    | 262                          | 6.61           | 21.8        | 112                | 10.83                                                  |
|             | V2        | 4.28               | 8    | 240                          | 2.23           | 23.9        | 108                | 6.55                                                   | 5.83               | 2    | 226                          | 6.05           | 21.6        | 112                | 11.83                                                  |
|             | V3        | 4.13               | 10   | 243                          | 1.95           | 23.7        | 110                | 6.45                                                   | 5.16               | 6    | 254                          | 5.58           | 21.4        | 111                | 5.50                                                   |
|             | V4        | 4.94               | 2    | 253                          | 2.42           | 25.4        | 99                 | 5.27                                                   | -                  |      | -                            | -              | -           | -                  |                                                        |
|             | V5        | 4.80               | 3    | 253                          | 2.32           | 27.8        | 101                | 4.64                                                   | 4.78               | 12   | 236                          | 6.12           | 19.9        | 102                | 6.17                                                   |
|             | V6        | -                  |      | -                            | -              | -           | -                  |                                                        | 4.90               | 10   | 224                          | 6.12           | 23.2        | 90                 | 7.17                                                   |
|             | V7        | -                  |      | -                            | -              | -           | -                  |                                                        | 4.59               | 13   | 219                          | 5.22           | 21.4        | 99                 | 7.00                                                   |
|             | V8        | -                  |      | -                            | -              | -           | -                  |                                                        | 5.46               | 3    | 254                          | 6.61           | 23.9        | 101                | 8.67                                                   |
|             | V9        | 4.66               | 4    | 245                          | 2.28           | 25.0        | 100                | 4.36                                                   | 5.40               | 5    | 242                          | 6.35           | 19.3        | 104                | 5.83                                                   |
| Interaction |           |                    |      |                              |                |             |                    |                                                        |                    |      |                              |                |             |                    |                                                        |
| F at same V |           | NS                 |      | NS                           | NS             | NS          | NS                 |                                                        | NS                 |      | NS                           | NS             | NS          | NS                 |                                                        |
| V at same F |           | NS                 |      | NS                           | NS             | NS          | NS                 |                                                        | NS                 |      | NS                           | NS             | NS          | NS                 |                                                        |
| F1          |           | 4.05               | 2    | 232                          | 2.06           | 25.15       | 105                |                                                        | 4.81               | 2    | 206                          | 5.41           | 20.41       | 101                |                                                        |
| F2          |           | 4.64               | 1    | 249                          | 2.27           | 25.65       | 104                | 5.35                                                   | 5.28               | 1    | 240                          | 6.08           | 21.56       | 104                | 7.88                                                   |
| C.D.(0.05)  |           | 0.16               |      | NS                           | 0.16           | NS          | NS                 |                                                        | 0.18               |      | 4.46                         | 0.62           | 0.25        | 0.47               |                                                        |
| C.V.(%)     |           | 2.64               |      | 6.17                         | 5.30           | 4.43        | 0.58               |                                                        | 2.83               |      | 1.61                         | 8.68           | 0.97        | 0.37               |                                                        |

Table 4.1 (e): Contd.

| F-<br>levels       | Varieties                    | PANTNAGAR                  |      |                                 |                   |                |                       |                                                                 | TITABAR               |      |                                 |                   |                |                       |                                                                 |
|--------------------|------------------------------|----------------------------|------|---------------------------------|-------------------|----------------|-----------------------|-----------------------------------------------------------------|-----------------------|------|---------------------------------|-------------------|----------------|-----------------------|-----------------------------------------------------------------|
|                    |                              | Grain Yield<br>(t/ha)      | Rank | Panicle/m <sup>2</sup><br>(No.) | Panicle<br>wt (g) | Test<br>wt (g) | Days 50%<br>flowering | Nutri. res. (kg<br>grain/kg Nutri.)<br>(Base level<br>100% RDF) | Grain Yield<br>(t/ha) | Rank | Panicle/m <sup>2</sup><br>(No.) | Panicle<br>wt (g) | Test<br>wt (g) | Days 50%<br>flowering | Nutri. res. (kg<br>grain/kg Nutri.)<br>(Base level 100%<br>RDF) |
| Mean of varieties: |                              |                            |      |                                 |                   |                |                       |                                                                 |                       |      |                                 |                   |                |                       |                                                                 |
|                    | V1                           | 4.76                       | 1    | 250                             | 2.30              | 27.96          | 108                   | 4.82                                                            | 5.79                  | 1    | 237                             | 6.32              | 21.61          | 110                   | 10.83                                                           |
|                    | V2                           | 3.92                       | 5    | 231                             | 2.12              | 23.47          | 108                   | 6.55                                                            | 5.48                  | 2    | 213                             | 5.58              | 21.40          | 111                   | 11.83                                                           |
|                    | V3                           | 3.78                       | 6    | 232                             | 1.88              | 23.55          | 112                   | 6.45                                                            | 5.00                  | 5    | 236                             | 5.32              | 21.24          | 110                   | 5.50                                                            |
|                    | V4                           | 4.65                       | 2    | 244                             | 2.29              | 24.80          | 100                   | 5.27                                                            | -                     | -    | -                               | -                 | -              | -                     | -                                                               |
|                    | V5                           | 4.55                       | 3    | 247                             | 2.19              | 27.68          | 101                   | 4.64                                                            | 4.60                  | 7    | 226                             | 5.85              | 18.71          | 101                   | 6.17                                                            |
|                    | V6                           | -                          | -    | -                               | -                 | -              | -                     | -                                                               | 4.69                  | 6    | 205                             | 5.68              | 21.86          | 89                    | 7.17                                                            |
|                    | V7                           | -                          | -    | -                               | -                 | -              | -                     | -                                                               | 4.38                  | 8    | 209                             | 5.05              | 20.56          | 96                    | 7.00                                                            |
|                    | V8                           | -                          | -    | -                               | -                 | -              | -                     | -                                                               | 5.20                  | 4    | 236                             | 6.30              | 23.39          | 100                   | 8.67                                                            |
|                    | V9                           | 4.42                       | 4    | 239                             | 2.23              | 24.95          | 99                    | 4.36                                                            | 5.23                  | 3    | 221                             | 5.88              | 19.14          | 103                   | 5.83                                                            |
|                    | C.D.(0.05)                   | 0.36                       |      | 10.39                           | 0.12              | 1.64           | 1.54                  |                                                                 | 0.17                  |      | 18.48                           | 0.45              | 1.15           | 0.73                  |                                                                 |
|                    | C.V. (%)                     | 6.79                       |      | 3.59                            | 4.61              | 5.36           | 1.22                  |                                                                 | 2.83                  |      | 7.02                            | 6.60              | 4.63           | 0.60                  |                                                                 |
|                    | Expt. Mean                   | 4.34                       |      | 240                             | 2.17              | 25.40          | 104                   |                                                                 | 5.04                  |      | 223                             | 5.75              | 20.99          | 102                   |                                                                 |
|                    | Soil type                    | Silt Loam                  |      |                                 |                   |                |                       |                                                                 | Silty Clay Loam       |      |                                 |                   |                |                       |                                                                 |
|                    | pH                           | 7.60                       |      |                                 |                   |                |                       |                                                                 | 5.20                  |      |                                 |                   |                |                       |                                                                 |
|                    | N - levels (kg/ha)           |                            |      |                                 |                   |                |                       |                                                                 |                       |      |                                 |                   |                |                       |                                                                 |
|                    | F1                           | 120:60:40                  |      |                                 |                   |                |                       |                                                                 | 60:20:40              |      |                                 |                   |                |                       |                                                                 |
|                    | F2                           | 180:90:60                  |      |                                 |                   |                |                       |                                                                 | 90:30:60              |      |                                 |                   |                |                       |                                                                 |
|                    | Recommended N:P:K<br>(kg/ha) | 120:60:40                  |      |                                 |                   |                |                       |                                                                 | 60:20:40              |      |                                 |                   |                |                       |                                                                 |
|                    | Varieties                    |                            |      |                                 |                   |                |                       |                                                                 |                       |      |                                 |                   |                |                       |                                                                 |
|                    | V1                           | IET 27263                  |      |                                 |                   |                |                       |                                                                 | IET 27263             |      |                                 |                   |                |                       |                                                                 |
|                    | V2                           | IET 26418                  |      |                                 |                   |                |                       |                                                                 | IET 26418             |      |                                 |                   |                |                       |                                                                 |
|                    | V3                           | IET 26420                  |      |                                 |                   |                |                       |                                                                 | IET 26420             |      |                                 |                   |                |                       |                                                                 |
|                    | V4                           | NC-NDR 359                 |      |                                 |                   |                |                       |                                                                 | -                     |      |                                 |                   |                |                       |                                                                 |
|                    | V5                           | ZC- Pant Dhan-19 (N)       |      |                                 |                   |                |                       |                                                                 | ZC- Pant Dhan-19 (N)  |      |                                 |                   |                |                       |                                                                 |
|                    | V6                           | -                          |      |                                 |                   |                |                       |                                                                 | NDR 8002 (E&C)        |      |                                 |                   |                |                       |                                                                 |
|                    | V7                           | -                          |      |                                 |                   |                |                       |                                                                 | Jaya (NE & S)         |      |                                 |                   |                |                       |                                                                 |
|                    | V8                           | -                          |      |                                 |                   |                |                       |                                                                 | Akshayadhan (W)       |      |                                 |                   |                |                       |                                                                 |
|                    | V9                           | Pant Dhan 26 (Local Check) |      |                                 |                   |                |                       |                                                                 | Numoli (Local Check)  |      |                                 |                   |                |                       |                                                                 |
|                    | Available N:P:K (kg/ha)      | 230:22:215                 |      |                                 |                   |                |                       |                                                                 | 508:20:130            |      |                                 |                   |                |                       |                                                                 |

Table 4.1 (e): Contd.

| F-levels           | Varieties | MARUTERU           |      |                              |                |             |                    |                                                        | Over all mean | Rank |
|--------------------|-----------|--------------------|------|------------------------------|----------------|-------------|--------------------|--------------------------------------------------------|---------------|------|
|                    |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |               |      |
| F1                 | V1        | 5.47               | 3    | 295                          | 3.86           | 18.54       | 107                |                                                        | 5.34          | 7    |
|                    | V2        | 5.13               | 8    | 273                          | 3.64           | 18.55       | 104                |                                                        | 4.76          | 11   |
|                    | V3        | 5.28               | 5    | 282                          | 3.78           | 19.2        | 105                |                                                        | 5.24          | 8    |
|                    | V4        | -                  |      | -                            | -              | -           | -                  |                                                        | 5.58          | 4    |
|                    | V5        | -                  |      | -                            | -              | -           | -                  |                                                        | 4.35          | 15   |
|                    | V6        | 4.6                | 12   | 260                          | 3.51           | 17.12       | 107                |                                                        | 4.19          | 18   |
|                    | V7        | 4.86               | 11   | 263                          | 3.46           | 20.14       | 104                |                                                        | 4.29          | 16   |
|                    | V8        | 5.02               | 10   | 268                          | 3.57           | 19.42       | 106                |                                                        | 4.21          | 17   |
|                    | V9        | -                  |      | -                            | -              | -           | -                  |                                                        | 4.95          | 9    |
| F2                 | V1        | 5.73               | 1    | 300                          | 3.92           | 18.63       | 108                | 1.93                                                   | 5.98          | 2    |
|                    | V2        | 5.39               | 4    | 291                          | 3.71           | 18.25       | 107                | 1.93                                                   | 5.35          | 6    |
|                    | V3        | 5.71               | 2    | 298                          | 3.8            | 19.17       | 108                | 3.19                                                   | 5.65          | 3    |
|                    | V4        | -                  |      | -                            | -              | -           | -                  |                                                        | 6.11          | 1    |
|                    | V5        | -                  |      | -                            | -              | -           | -                  |                                                        | 4.79          | 10   |
|                    | V6        | 5.22               | 6    | 278                          | 3.66           | 17.15       | 108                | 4.59                                                   | 4.73          | 13   |
|                    | V7        | 5.12               | 9    | 270                          | 3.51           | 23.92       | 105                | 1.93                                                   | 4.73          | 12   |
|                    | V8        | 5.18               | 7    | 274                          | 3.58           | 19.43       | 107                | 1.19                                                   | 4.65          | 14   |
|                    | V9        | -                  |      | -                            | -              | -           | -                  |                                                        | 5.40          | 5    |
| Interaction        |           |                    |      |                              |                |             |                    |                                                        |               |      |
| <i>F at same V</i> |           | NS                 |      | NS                           | NS             | 0.52        | NS                 |                                                        |               |      |
| <i>V at same F</i> |           | NS                 |      | NS                           | NS             | 0.53        | NS                 |                                                        |               |      |
| F1                 |           | 5.06               | 2    | 274                          | 3.64           | 18.83       | 106                |                                                        | 4.80          | 2    |
| F2                 |           | 5.39               | 1    | 285                          | 3.70           | 19.43       | 107                | 2.46                                                   | 5.28          | 1    |
| <i>C.D.(0.05)</i>  |           | 0.08               |      | NS                           | NS             | 0.29        | NS                 |                                                        |               |      |
| <i>C.V.(%)</i>     |           | 1.04               |      | 7.17                         | 6.37           | 1.06        | 1.41               |                                                        |               |      |

Table 4.1 (e): Contd.

| F-levels           | Varieties                       | MARUTERU           |      |                              |             |       |             |                    | Over all mean | Rank |
|--------------------|---------------------------------|--------------------|------|------------------------------|-------------|-------|-------------|--------------------|---------------|------|
|                    |                                 | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle (g) | wt    | Test wt (g) | Days 50% flowering |               |      |
| Mean of varieties: |                                 |                    |      |                              |             |       |             |                    |               |      |
|                    | V1                              | 5.60               | 1    | 298                          | 3.89        | 18.59 | 108         | 1.93               | 5.66          | 2    |
|                    | V2                              | 5.26               | 3    | 282                          | 3.68        | 18.40 | 106         | 1.93               | 5.05          | 5    |
|                    | V3                              | 5.50               | 2    | 290                          | 3.79        | 19.19 | 107         | 3.19               | 5.44          | 3    |
|                    | V4                              | -                  |      | -                            | -           | -     | -           |                    | 5.85          | 1    |
|                    | V5                              | -                  |      | -                            | -           | -     | -           |                    | 4.57          | 6    |
|                    | V6                              | 4.91               | 6    | 269                          | 3.59        | 17.14 | 108         | 4.59               | 4.46          | 8    |
|                    | V7                              | 4.99               | 5    | 267                          | 3.49        | 22.03 | 105         | 1.93               | 4.51          | 7    |
|                    | V8                              | 5.10               | 4    | 271                          | 3.58        | 19.43 | 107         | 1.19               | 4.43          | 9    |
|                    | V9                              | -                  |      | -                            | -           | -     | -           |                    | 5.18          | 4    |
|                    | C.D.(0.05)                      | 0.46               |      | NS                           | NS          | 0.37  | 1.43        |                    |               |      |
|                    | C.V. (%)                        | 7.32               |      | 7.88                         | 7.46        | 1.6   | 1.12        |                    |               |      |
|                    | Expt. Mean                      | 5.23               |      | 279                          | 3.67        |       | 106         |                    | 5.04          |      |
|                    | Soil type                       | Delta alluvial     |      |                              |             |       |             |                    |               |      |
|                    | pH                              | 7.16               |      |                              |             |       |             |                    |               |      |
|                    | N - levels (kg/ha)              |                    |      |                              |             |       |             |                    |               |      |
|                    | F1                              | 90:60:60           |      |                              |             |       |             |                    |               |      |
|                    | F2                              | 135:90:90          |      |                              |             |       |             |                    |               |      |
|                    | Recommended N:P:K (kg/ha)       | 90:60:60           |      |                              |             |       |             |                    |               |      |
|                    | Varieties                       |                    |      |                              |             |       |             |                    |               |      |
|                    | V1                              | IET27263           |      |                              |             |       |             |                    |               |      |
|                    | V2                              | IET26418           |      |                              |             |       |             |                    |               |      |
|                    | V3                              | IET26420           |      |                              |             |       |             |                    |               |      |
|                    | V4                              | -                  |      |                              |             |       |             |                    |               |      |
|                    | V5                              | -                  |      |                              |             |       |             |                    |               |      |
|                    | V6                              | NDR 8002           |      |                              |             |       |             |                    |               |      |
|                    | V7                              | Jaya               |      |                              |             |       |             |                    |               |      |
|                    | V8                              | Akshaydhan (W)     |      |                              |             |       |             |                    |               |      |
|                    | V9                              | -                  |      |                              |             |       |             |                    |               |      |
|                    | Available N:P:K of soil (kg/ha) | 151:36:257         |      |                              |             |       |             |                    |               |      |

### NMT 1(f) Late

Four AVT-2 Late entries (IET 26927, IET 26974, IET 25948 and IET 26948) were evaluated for its response to levels nutrients on grain yield at nine locations i.e. **Aduthurai (150:60:60)**, **Chinsurah (80:40:40)**, **Chiplima (80:40:40)**, **Dhangain (80:40:40)**, **Karjat (150:50:50)**, **Mandya (100:50:50)**, **Nagina (120:60:40)**, **Pusa (120:60:40)** and **Maruteru (90:60:60)** under two levels of RDF (100% and 150% RDF). The details and data received from these locations are summarized and presented in Table 4.1.1 (f).

Fertilizer levels application significantly influenced the grain yield at all locations except Chiplima, Maruteru and Mandya locations and the maximum grain yield was recorded at all the locations with 150% RDF. Application of 150% RDF had higher grain yields at **Aduthurai** (5.29 t/ha), **Chinsurah** (5.43 t/ha), **Dhangain** (6.68 t/ha), **Karjat** (3.67 t/ha), **Nagina** (4.54 t/ha) and **Pusa** (3.82 t/ha). Higher nutrient response (kg grain/kg nutrient) was with 150% RDF over 100% RDF at **Aduthurai** (2.79), **Chinsurah**(2.88), **Dhangain** (4.34), **Karjat** (2.64), **Nagina** (1.48) and **Pusa** (5.57).

Grain yield differences among the tested varieties were found to be significant at all the locations. Significantly higher mean maximum grain yield was recorded by IET 26927 at **Aduthurai** (5.70 t/ha), **Chiplima** (6.72 t/ha) and **Nagina** (4.69 t/ha) while, IET 26974 at **Chinsurah** (5.75 t/ha), **Mandya** (8.40 t/ha) and **Aduthurai** (7.21 t/ha). Higher grain yield was with IET 25948 at **Dhangain** (7.43 t/ha) and IET 26948 at **Karjat** (4.28 t/ha). Interaction effects among RDF x varieties was found to be non-significant at all the location except **Karjat**. Mean over the locations the performance of IET 26974 (5.61 t/ha) and IET 26948 (5.52 t/ha) and IET 25948 (5.51 t/ha) was promising over other cultures.

In this trial, 150% RDF was found to be promising with 7.3% increased grain yield and also exhibited higher nutrient recovery efficiency. IET cultures were found to be promising in terms of higher grain yield at most of the locations (IET 26974, IET 26948 and IET 25948).

Table 4.1 (f): Summary of data on grain yield and ancillary characters of selected late cultures grown under transplanted conditions at low and medium recommended fertilizer doses, kharif 2019.

| F-levels    | Varieties | ADUTHURAI          |      |                              |               |                                                        | CHINSURAH          |      |                              |               |                    |                                                        |
|-------------|-----------|--------------------|------|------------------------------|---------------|--------------------------------------------------------|--------------------|------|------------------------------|---------------|--------------------|--------------------------------------------------------|
|             |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt(g) | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt(g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
| F1          | V1        | 5.53               | 2    | 319                          | 3.70          |                                                        | 5.13               | 14   | 264                          | 3.19          | 116                |                                                        |
|             | V2        | 4.90               | 10   | 333                          | 3.27          |                                                        | 5.69               | 2    | 313                          | 3.16          | 111                |                                                        |
|             | V3        | 4.83               | 13   | 292                          | 3.02          |                                                        | 5.17               | 12   | 299                          | 2.93          | 110                |                                                        |
|             | V4        | 4.80               | 14   | 328                          | 2.78          |                                                        | 5.55               | 6    | 258                          | 3.12          | 112                |                                                        |
|             | V5        | 4.73               | 15   | 331                          | 2.71          |                                                        | 4.46               | 16   | 286                          | 3.07          | 111                |                                                        |
|             | V6        | 4.73               | 15   | 348                          | 2.80          |                                                        | 5.15               | 13   | 315                          | 3.21          | 112                |                                                        |
|             | V7        | 4.90               | 10   | 337                          | 2.81          |                                                        | 5.28               | 9    | 328                          | 3.44          | 110                |                                                        |
|             | V8        | 4.90               | 10   | 346                          | 2.92          |                                                        | 5.18               | 11   | 322                          | 3.23          | 110                |                                                        |
| F2          | V1        | 5.87               | 1    | 330                          | 3.86          | 2.52                                                   | 5.47               | 8    | 318                          | 2.93          | 116                | 4.25                                                   |
|             | V2        | 5.37               | 3    | 342                          | 3.39          | 3.48                                                   | 5.81               | 1    | 316                          | 3.22          | 111                | 1.50                                                   |
|             | V3        | 5.10               | 9    | 303                          | 3.16          | 2.00                                                   | 5.50               | 7    | 272                          | 2.71          | 110                | 4.13                                                   |
|             | V4        | 5.13               | 7    | 337                          | 2.89          | 2.44                                                   | 5.57               | 5    | 304                          | 3.20          | 112                | 0.25                                                   |
|             | V5        | 5.13               | 7    | 340                          | 2.80          | 2.96                                                   | 4.60               | 15   | 280                          | 2.91          | 111                | 1.75                                                   |
|             | V6        | 5.17               | 6    | 358                          | 2.88          | 3.26                                                   | 5.60               | 4    | 351                          | 3.53          | 112                | 5.62                                                   |
|             | V7        | 5.23               | 5    | 347                          | 2.92          | 2.44                                                   | 5.65               | 3    | 356                          | 3.57          | 111                | 4.63                                                   |
|             | V8        | 5.33               | 4    | 355                          | 3.02          | 3.19                                                   | 5.25               | 10   | 325                          | 3.18          | 111                | 0.88                                                   |
| Interaction |           |                    |      |                              |               |                                                        |                    |      |                              |               |                    |                                                        |
| F at same V |           | NS                 |      | NS                           | NS            |                                                        | NS                 |      | NS                           | NS            | NS                 |                                                        |
| V at same F |           | NS                 |      | NS                           | NS            |                                                        | NS                 |      | NS                           | NS            | NS                 |                                                        |
| F1          |           | 4.92               | 2    | 329                          | 3.00          |                                                        | 5.20               | 2    | 298                          | 3.17          | 111                |                                                        |
| F2          |           | 5.29               | 1    | 339                          | 3.12          | 2.79                                                   | 5.43               | 1    | 315                          | 3.16          | 112                | 2.88                                                   |
| C.D.(0.05)  |           | 0.11               |      | 3.53                         | 0.04          |                                                        | 0.22               |      | 14.6                         | NS            | 0.36               |                                                        |
| C.V.(%)     |           | 1.77               |      | 0.85                         | 1.08          |                                                        | 3.32               |      | 3.83                         | 8.97          | 0.26               |                                                        |

Table 4.1 (f): Contd.

| F-levels           | Varieties                       | ADUTHURAI          |      |                              |               |                                                        | CHINSURAH          |      |                              |               |                    |                                                        |
|--------------------|---------------------------------|--------------------|------|------------------------------|---------------|--------------------------------------------------------|--------------------|------|------------------------------|---------------|--------------------|--------------------------------------------------------|
|                    |                                 | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt(g) | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt(g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
| Mean of varieties: |                                 |                    |      |                              |               |                                                        |                    |      |                              |               |                    |                                                        |
|                    | V1                              | 5.70               | 1    | 324                          | 3.78          | 2.52                                                   | 5.30               | 6    | 291                          | 3.06          | 116                | 4.25                                                   |
|                    | V2                              | 5.14               | 2    | 338                          | 3.33          | 3.48                                                   | 5.75               | 1    | 315                          | 3.19          | 111                | 1.50                                                   |
|                    | V3                              | 4.97               | 5    | 298                          | 3.09          | 2.00                                                   | 5.34               | 5    | 285                          | 2.82          | 110                | 4.13                                                   |
|                    | V4                              | 4.97               | 5    | 333                          | 2.84          | 2.44                                                   | 5.56               | 2    | 281                          | 3.16          | 112                | 0.25                                                   |
|                    | V5                              | 4.93               | 8    | 335                          | 2.76          | 2.96                                                   | 4.53               | 8    | 283                          | 2.99          | 111                | 1.75                                                   |
|                    | V6                              | 4.95               | 7    | 353                          | 2.84          | 3.26                                                   | 5.38               | 4    | 333                          | 3.37          | 112                | 5.62                                                   |
|                    | V7                              | 5.07               | 4    | 342                          | 2.87          | 2.44                                                   | 5.47               | 3    | 342                          | 3.51          | 111                | 4.63                                                   |
|                    | V8                              | 5.12               | 3    | 350                          | 2.97          | 3.19                                                   | 5.22               | 7    | 323                          | 3.21          | 111                | 0.88                                                   |
|                    | C.D.(0.05)                      | 0.14               |      | 4.12                         | 0.05          |                                                        | 0.33               |      | 22.6                         | 0.33          | 0.57               |                                                        |
|                    | C.V. (%)                        | 2.4                |      | 1.04                         | 1.4           |                                                        | 5.32               |      | 6.23                         | 8.73          | 0.43               |                                                        |
|                    | Expt. Mean                      | 5.10               |      | 334                          | 3.06          |                                                        | 5.32               |      | 307                          | 3.16          | 112                |                                                        |
|                    | Soil type                       | Clay               |      |                              |               |                                                        | Clay Loam          |      |                              |               |                    |                                                        |
|                    | pH                              | 8.30               |      |                              |               |                                                        | 7.85               |      |                              |               |                    |                                                        |
|                    | N - levels (kg/ha)              |                    |      |                              |               |                                                        |                    |      |                              |               |                    |                                                        |
|                    | F1                              | 150:60:60          |      |                              |               |                                                        | 80:40:40           |      |                              |               |                    |                                                        |
|                    | F2                              | 225:90:90          |      |                              |               |                                                        | 120:60:60          |      |                              |               |                    |                                                        |
|                    | Recommended N:P:K (kg/ha)       | 150:60:60          |      |                              |               |                                                        | 80:40:40           |      |                              |               |                    |                                                        |
|                    | Varieties                       |                    |      |                              |               |                                                        |                    |      |                              |               |                    |                                                        |
|                    | V1                              | IET 26927          |      |                              |               |                                                        | IET 26927          |      |                              |               |                    |                                                        |
|                    | V2                              | IET 26974          |      |                              |               |                                                        | IET 26974          |      |                              |               |                    |                                                        |
|                    | V3                              | IET 25948          |      |                              |               |                                                        | IET 25948          |      |                              |               |                    |                                                        |
|                    | V4                              | IET 26948          |      |                              |               |                                                        | IET 26948          |      |                              |               |                    |                                                        |
|                    | V5                              | Samba Masuri       |      |                              |               |                                                        | Samba Masuri       |      |                              |               |                    |                                                        |
|                    | V6                              | Swarna             |      |                              |               |                                                        | Swarna             |      |                              |               |                    |                                                        |
|                    | V7                              | Pushyami           |      |                              |               |                                                        | Pushyami           |      |                              |               |                    |                                                        |
|                    | V8                              | LC - CR 1009       |      |                              |               |                                                        | LC - Sujala        |      |                              |               |                    |                                                        |
|                    | Available N:P:K of soil (kg/ha) | 28.5:72.5:132      |      |                              |               |                                                        | 530:119:364        |      |                              |               |                    |                                                        |

Table 4.1 (f): Contd.

| F-levels           | Varieties | CHIPLIMA           |      |                              |               |            |                    |                                                        | DHANGAIN           |      |                              |               |                    |                                                        |
|--------------------|-----------|--------------------|------|------------------------------|---------------|------------|--------------------|--------------------------------------------------------|--------------------|------|------------------------------|---------------|--------------------|--------------------------------------------------------|
|                    |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt(g) | Test wt(g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt(g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
| F1                 | V1        | 6.52               | 5    | 250                          | 4.60          | 23.67      | 120                |                                                        | 4.13               | 16   | 233                          | 3.05          | 116                |                                                        |
|                    | V2        | 5.85               | 11   | 243                          | 5.13          | 24.33      | 109                |                                                        | 5.85               | 12   | 252                          | 3.16          | 108                |                                                        |
|                    | V3        | 5.98               | 9    | 245                          | 7.20          | 26.00      | 108                |                                                        | 7.17               | 4    | 292                          | 5.82          | 110                |                                                        |
|                    | V4        | 6.14               | 7    | 258                          | 5.93          | 25.00      | 112                |                                                        | 6.95               | 7    | 279                          | 4.18          | 116                |                                                        |
|                    | V5        | 5.34               | 14   | 217                          | 4.73          | 17.67      | 111                |                                                        | 5.40               | 14   | 251                          | 3.11          | 108                |                                                        |
|                    | V6        | -                  |      | -                            | -             | -          | -                  |                                                        | 6.97               | 6    | 279                          | 4.66          | 116                |                                                        |
|                    | V7        | 5.39               | 12   | 229                          | 5.80          | 22.67      | 113                |                                                        | 6.80               | 9    | 266                          | 3.91          | 113                |                                                        |
|                    | V8        | 5.36               | 13   | 223                          | 6.13          | 25.67      | 106                |                                                        | 6.37               | 11   | 263                          | 3.30          | 112                |                                                        |
| F2                 | V1        | 6.91               | 2    | 266                          | 3.13          | 23.33      | 121                | 4.88                                                   | 5.00               | 15   | 254                          | 3.12          | 116                | 7.91                                                   |
|                    | V2        | 6.61               | 4    | 244                          | 6.20          | 24.33      | 110                | 9.50                                                   | 6.50               | 10   | 280                          | 3.39          | 109                | 5.91                                                   |
|                    | V3        | 6.62               | 3    | 260                          | 6.33          | 25.00      | 110                | 8.00                                                   | 7.68               | 1    | 302                          | 6.02          | 111                | 4.64                                                   |
|                    | V4        | 6.92               | 1    | 268                          | 7.40          | 27.33      | 113                | 9.75                                                   | 7.23               | 3    | 280                          | 4.61          | 118                | 2.55                                                   |
|                    | V5        | 6.15               | 6    | 245                          | 4.33          | 19.00      | 112                | 10.13                                                  | 5.77               | 13   | 262                          | 3.37          | 110                | 3.36                                                   |
|                    | V6        | -                  |      | -                            | -             | -          | -                  |                                                        | 7.33               | 2    | 297                          | 5.21          | 118                | 3.27                                                   |
|                    | V7        | 6.03               | 8    | 237                          | 6.27          | 22.67      | 115                | 8.00                                                   | 7.10               | 5    | 282                          | 4.29          | 115                | 2.73                                                   |
|                    | V8        | 5.96               | 10   | 244                          | 6.47          | 27.33      | 108                | 7.50                                                   | 6.85               | 8    | 281                          | 3.48          | 114                | 4.36                                                   |
| Interaction        |           |                    |      |                              |               |            |                    |                                                        |                    |      |                              |               |                    |                                                        |
| <i>F at same V</i> |           | NS                 |      | NS                           | NS            | NS         | NS                 |                                                        | NS                 |      | NS                           | NS            | NS                 |                                                        |
| <i>V at same F</i> |           | NS                 |      | NS                           | NS            | NS         | NS                 |                                                        | NS                 |      | NS                           | NS            | NS                 |                                                        |
| F1                 |           | 5.80               | 2    | 238                          | 5.65          | 23.57      | 111                |                                                        | 6.21               | 2    | 264                          | 3.90          | 112                |                                                        |
| F2                 |           | 6.46               | 1    | 252                          | 5.73          | 24.14      | 113                | 8.25                                                   | 6.68               | 1    | 280                          | 4.19          | 114                | 4.34                                                   |
| <i>C.D.(0.05)</i>  |           | NS                 |      | NS                           | NS            | NS         | 1.08               |                                                        | 0.34               |      | NS                           | NS            | 0.62               |                                                        |
| <i>C.V.(%)</i>     |           | 13.54              |      | 9.75                         | 12.32         | 2.96       | 0.73               |                                                        | 4.23               |      | 6.93                         | 15.92         | 0.44               |                                                        |

Table 4.1 (f): Contd.

| F-<br>levels       | Varieties                          | CHIPLIMA                 |      |                     |                  |               |                          |                                                                    | DHANGAIN                 |      |                     |                  |                          |                                                                 |
|--------------------|------------------------------------|--------------------------|------|---------------------|------------------|---------------|--------------------------|--------------------------------------------------------------------|--------------------------|------|---------------------|------------------|--------------------------|-----------------------------------------------------------------|
|                    |                                    | Grain<br>Yield<br>(t/ha) | Rank | Panicle/m²<br>(No.) | Panicle<br>wt(g) | Test<br>wt(g) | Days<br>50%<br>flowering | Nutri. res. (kg<br>grain/kg<br>Nutri.) (Base<br>level 100%<br>RDF) | Grain<br>Yield<br>(t/ha) | Rank | Panicle/m²<br>(No.) | Panicle<br>wt(g) | Days<br>50%<br>flowering | Nutri. res. (kg<br>grain/kg Nutri.)<br>(Base level<br>100% RDF) |
| Mean of varieties: |                                    |                          |      |                     |                  |               |                          |                                                                    |                          |      |                     |                  |                          |                                                                 |
|                    | V1                                 | 6.72                     | 1    | 258                 | 3.87             | 23.50         | 120                      | 4.88                                                               | 4.57                     | 8    | 244                 | 3.09             | 116                      | 7.91                                                            |
|                    | V2                                 | 6.23                     | 4    | 244                 | 5.67             | 24.33         | 110                      | 9.50                                                               | 6.18                     | 6    | 266                 | 3.28             | 108                      | 5.91                                                            |
|                    | V3                                 | 6.30                     | 3    | 252                 | 6.77             | 25.50         | 109                      | 8.00                                                               | 7.43                     | 1    | 297                 | 5.92             | 111                      | 4.64                                                            |
|                    | V4                                 | 6.53                     | 2    | 263                 | 6.67             | 26.17         | 112                      | 9.75                                                               | 7.09                     | 3    | 280                 | 4.40             | 117                      | 2.55                                                            |
|                    | V5                                 | 5.75                     | 5    | 231                 | 4.53             | 18.34         | 112                      | 10.13                                                              | 5.59                     | 7    | 257                 | 3.24             | 109                      | 3.36                                                            |
|                    | V6                                 | -                        | -    | -                   | -                | -             | -                        | -                                                                  | 7.15                     | 2    | 288                 | 4.94             | 117                      | 3.27                                                            |
|                    | V7                                 | 5.71                     | 6    | 233                 | 6.04             | 22.67         | 114                      | 8.00                                                               | 6.95                     | 4    | 274                 | 4.10             | 114                      | 2.73                                                            |
|                    | V8                                 | 5.66                     | 7    | 234                 | 6.30             | 26.50         | 107                      | 7.50                                                               | 6.61                     | 5    | 272                 | 3.39             | 113                      | 4.36                                                            |
|                    | C.D.(0.05)                         | 0.39                     |      | 19.24               | 0.92             | 1.19          | 0.69                     |                                                                    | 0.58                     |      | 14.54               | 1.27             | 0.71                     |                                                                 |
|                    | C.V. (%)                           | 5.33                     |      | 6.59                | 13.55            | 4.17          | 0.52                     |                                                                    | 7.58                     |      | 4.52                | 26.5             | 0.53                     |                                                                 |
|                    | Expt. Mean                         | 6.13                     |      | 245                 | 5.69             | 24            | 112                      |                                                                    | 6.44                     |      | 272                 | 4.04             | 113                      |                                                                 |
|                    | Soil type                          | Sandy loam               |      |                     |                  |               |                          |                                                                    | Loamy                    |      |                     |                  |                          |                                                                 |
|                    | pH                                 | 7.12                     |      |                     |                  |               |                          |                                                                    | 6.80                     |      |                     |                  |                          |                                                                 |
|                    | N - levels (kg/ha)                 |                          |      |                     |                  |               |                          |                                                                    |                          |      |                     |                  |                          |                                                                 |
|                    | F1                                 | 80:40:40                 |      |                     |                  |               |                          |                                                                    | 120:60:40                |      |                     |                  |                          |                                                                 |
|                    | F2                                 | 120:60:60                |      |                     |                  |               |                          |                                                                    | 180:60:40                |      |                     |                  |                          |                                                                 |
|                    | Recommended N:P:K<br>(kg/ha)       | 80:40:40                 |      |                     |                  |               |                          |                                                                    | 120:60:40                |      |                     |                  |                          |                                                                 |
|                    | Varieties                          |                          |      |                     |                  |               |                          |                                                                    |                          |      |                     |                  |                          |                                                                 |
|                    | V1                                 | IET 26927                |      |                     |                  |               |                          |                                                                    | IET 26927                |      |                     |                  |                          |                                                                 |
|                    | V2                                 | IET 26974                |      |                     |                  |               |                          |                                                                    | IET 26974                |      |                     |                  |                          |                                                                 |
|                    | V3                                 | IET 25948                |      |                     |                  |               |                          |                                                                    | IET 25948                |      |                     |                  |                          |                                                                 |
|                    | V4                                 | IET 26948                |      |                     |                  |               |                          |                                                                    | IET 26948                |      |                     |                  |                          |                                                                 |
|                    | V5                                 | Samba Masuri             |      |                     |                  |               |                          |                                                                    | Samba Masuri             |      |                     |                  |                          |                                                                 |
|                    | V6                                 | -                        |      |                     |                  |               |                          |                                                                    | Swarna                   |      |                     |                  |                          |                                                                 |
|                    | V7                                 | Pushyami                 |      |                     |                  |               |                          |                                                                    | Pushyami                 |      |                     |                  |                          |                                                                 |
|                    | V8                                 | LC - Subarna             |      |                     |                  |               |                          |                                                                    | LC - R. Mahsuri-<br>1    |      |                     |                  |                          |                                                                 |
|                    | Available N:P:K of soil<br>(kg/ha) | 118.75:40.008:116.928    |      |                     |                  |               |                          |                                                                    | 154:14.4:183             |      |                     |                  |                          |                                                                 |

Table 4.1 (f): Contd.

| F-<br>levels       | Varieties | KARJAT                   |      |                                 |                  |                       |                                                                 | MANDYA                   |      |                                 |                  |               |                          |                                                                 |
|--------------------|-----------|--------------------------|------|---------------------------------|------------------|-----------------------|-----------------------------------------------------------------|--------------------------|------|---------------------------------|------------------|---------------|--------------------------|-----------------------------------------------------------------|
|                    |           | Grain<br>Yield<br>(t/ha) | Rank | Panicle/m <sup>2</sup><br>(No.) | Panicle<br>wt(g) | Days 50%<br>flowering | Nutri. res. (kg<br>grain/kg Nutri.)<br>(Base level<br>100% RDF) | Grain<br>Yield<br>(t/ha) | Rank | Panicle/m <sup>2</sup><br>(No.) | Panicle<br>wt(g) | Test<br>wt(g) | Days<br>50%<br>flowering | Nutri. res. (kg<br>grain/kg Nutri.)<br>(Base level<br>100% RDF) |
| F1                 | V1        | 3.26                     | 10   | 131                             | 1.60             | 107                   |                                                                 | 5.36                     | 13   | 353                             | 4.50             | 25.12         | 121                      |                                                                 |
|                    | V2        | 3.50                     | 9    | 112                             | 1.72             | 103                   |                                                                 | 7.71                     | 3    | 326                             | 5.09             | 22.04         | 107                      |                                                                 |
|                    | V3        | 3.73                     | 6    | 107                             | 1.83             | 104                   |                                                                 | 8.06                     | 2    | 368                             | 6.00             | 32.72         | 112                      |                                                                 |
|                    | V4        | 4.14                     | 2    | 112                             | 2.03             | 106                   |                                                                 | 6.66                     | 8    | 324                             | 3.79             | 22.34         | 114                      |                                                                 |
|                    | V5        | 2.79                     | 15   | 137                             | 1.37             | 107                   |                                                                 | 6.02                     | 10   | 347                             | 3.11             | 16.58         | 111                      |                                                                 |
|                    | V6        | 3.61                     | 7    | 114                             | 1.77             | 100                   |                                                                 | 4.89                     | 16   | 397                             | 2.62             | 20.88         | 112                      |                                                                 |
|                    | V7        | 2.77                     | 16   | 102                             | 1.36             | 105                   |                                                                 | 6.61                     | 9    | 320                             | 4.87             | 22.11         | 107                      |                                                                 |
|                    | V8        | 2.93                     | 14   | 145                             | 1.44             | 97                    |                                                                 | 5.26                     | 14   | 349                             | 3.26             | 16.86         | 112                      |                                                                 |
| F2                 | V1        | 3.80                     | 5    | 136                             | 1.87             | 109                   | 4.32                                                            | 5.68                     | 12   | 333                             | 3.96             | 26.56         | 120                      | 3.20                                                            |
|                    | V2        | 3.60                     | 8    | 117                             | 1.77             | 103                   | 0.80                                                            | 9.09                     | 1    | 326                             | 5.26             | 22.39         | 108                      | 13.80                                                           |
|                    | V3        | 4.12                     | 3    | 115                             | 2.02             | 105                   | 3.12                                                            | 7.29                     | 5    | 368                             | 5.32             | 32.09         | 111                      | -7.70                                                           |
|                    | V4        | 4.41                     | 1    | 122                             | 2.17             | 107                   | 2.16                                                            | 7.37                     | 4    | 379                             | 3.88             | 22.86         | 114                      | 7.10                                                            |
|                    | V5        | 3.12                     | 13   | 144                             | 1.53             | 107                   | 2.64                                                            | 6.67                     | 7    | 386                             | 3.03             | 17.23         | 111                      | 6.50                                                            |
|                    | V6        | 4.00                     | 4    | 125                             | 1.96             | 101                   | 3.12                                                            | 5.10                     | 15   | 374                             | 3.44             | 21.68         | 112                      | 2.10                                                            |
|                    | V7        | 3.13                     | 12   | 109                             | 1.54             | 105                   | 2.88                                                            | 6.78                     | 6    | 332                             | 5.62             | 22.93         | 107                      | 1.70                                                            |
|                    | V8        | 3.19                     | 11   | 155                             | 1.56             | 99                    | 2.08                                                            | 5.85                     | 11   | 401                             | 2.90             | 16.67         | 112                      | 5.90                                                            |
| Interaction        |           |                          |      |                                 |                  |                       |                                                                 |                          |      |                                 |                  |               |                          |                                                                 |
| <i>F at same V</i> |           | 0.11                     |      | 1.8                             | 0.05             | 0.73                  |                                                                 | NS                       |      | NS                              | NS               | NS            | NS                       |                                                                 |
| <i>V at same F</i> |           | 0.14                     |      | 1.69                            | 0.07             | 1.01                  |                                                                 | NS                       |      | NS                              | NS               | NS            | NS                       |                                                                 |
|                    | F1        | 3.34                     | 2    | 120                             | 1.64             | 104                   |                                                                 | 6.32                     | 2    | 348                             | 4.16             | 22.33         | 112                      |                                                                 |
|                    | F2        | 3.67                     | 1    | 128                             | 1.80             | 105                   | 2.64                                                            | 6.73                     | 1    | 362                             | 4.18             | 22.80         | 112                      | 4.08                                                            |
| <i>C.D.(0.05)</i>  |           | 0.12                     |      | 0.18                            | 0.06             | NS                    |                                                                 | NS                       |      | NS                              | NS               | NS            | NS                       |                                                                 |
| <i>C.V.(%)</i>     |           | 2.64                     |      | 0.12                            | 3.03             | 0.73                  |                                                                 | 8.06                     |      | 4.89                            | 6.07             | 2.61          | 0.26                     |                                                                 |

Table 4.1 (f): Contd.

| F-<br>levels       | Varieties               | KARJAT                   |      |                                 |                  |                       |                                                                 | MANDYA                |      |                                 |                  |               |                          |                                                                 |
|--------------------|-------------------------|--------------------------|------|---------------------------------|------------------|-----------------------|-----------------------------------------------------------------|-----------------------|------|---------------------------------|------------------|---------------|--------------------------|-----------------------------------------------------------------|
|                    |                         | Grain<br>Yield<br>(t/ha) | Rank | Panicle/m <sup>2</sup><br>(No.) | Panicle<br>wt(g) | Days 50%<br>flowering | Nutri. res. (kg<br>grain/kg Nutri.)<br>(Base level<br>100% RDF) | Grain Yield<br>(t/ha) | Rank | Panicle/m <sup>2</sup><br>(No.) | Panicle<br>wt(g) | Test<br>wt(g) | Days<br>50%<br>flowering | Nutri. res. (kg<br>grain/kg Nutri.)<br>(Base level<br>100% RDF) |
| Mean of varieties: |                         |                          |      |                                 |                  |                       |                                                                 |                       |      |                                 |                  |               |                          |                                                                 |
|                    | V1                      | 3.53                     | 5    | 134                             | 1.74             | 108                   | 4.32                                                            | 5.52                  | 7    | 343                             | 4.23             | 25.84         | 121                      | 3.20                                                            |
|                    | V2                      | 3.55                     | 4    | 115                             | 1.75             | 103                   | 0.80                                                            | 8.40                  | 1    | 326                             | 5.18             | 22.22         | 108                      | 13.80                                                           |
|                    | V3                      | 3.93                     | 2    | 111                             | 1.93             | 105                   | 3.12                                                            | 7.68                  | 2    | 368                             | 5.66             | 32.41         | 112                      | -7.70                                                           |
|                    | V4                      | 4.28                     | 1    | 117                             | 2.10             | 107                   | 2.16                                                            | 7.02                  | 3    | 351                             | 3.84             | 22.60         | 114                      | 7.10                                                            |
|                    | V5                      | 2.96                     | 7    | 140                             | 1.45             | 107                   | 2.64                                                            | 6.35                  | 5    | 367                             | 3.07             | 16.91         | 111                      | 6.50                                                            |
|                    | V6                      | 3.81                     | 3    | 120                             | 1.87             | 101                   | 3.12                                                            | 5.00                  | 8    | 385                             | 3.03             | 21.28         | 112                      | 2.10                                                            |
|                    | V7                      | 2.95                     | 8    | 106                             | 1.45             | 105                   | 2.88                                                            | 6.70                  | 4    | 326                             | 5.25             | 22.52         | 107                      | 1.70                                                            |
|                    | V8                      | 3.06                     | 6    | 150                             | 1.50             | 98                    | 2.08                                                            | 5.56                  | 6    | 375                             | 3.08             | 16.77         | 112                      | 5.90                                                            |
|                    | C.D.(0.05)              | 0.08                     |      | 1.28                            | 0.04             | 0.52                  |                                                                 | 1.13                  |      | 40.37                           | 0.62             | 1.23          | 0.72                     |                                                                 |
|                    | C.V. (%)                | 1.92                     |      | 0.87                            | 1.9              | 0.42                  |                                                                 | 14.64                 |      | 9.61                            | 12.53            | 4.6           | 0.54                     |                                                                 |
|                    | Expt. Mean              | 3.51                     |      | 124                             | 1.72             | 104                   |                                                                 | 6.53                  |      | 355                             | 4.17             | 22.6          | 112                      |                                                                 |
|                    | Soil type               | -                        |      |                                 |                  |                       |                                                                 | Red Sandy Loam        |      |                                 |                  |               |                          |                                                                 |
|                    | pH                      | -                        |      |                                 |                  |                       |                                                                 | 6.75                  |      |                                 |                  |               |                          |                                                                 |
|                    | N - levels (kg/ha)      |                          |      |                                 |                  |                       |                                                                 |                       |      |                                 |                  |               |                          |                                                                 |
|                    | F1                      | 150:50:50                |      |                                 |                  |                       |                                                                 | 100:50:50             |      |                                 |                  |               |                          |                                                                 |
|                    | F2                      | 225:75:75                |      |                                 |                  |                       |                                                                 | 150:75:75             |      |                                 |                  |               |                          |                                                                 |
|                    | Recomnd N:P:K (kg/ha)   | 150:50:50                |      |                                 |                  |                       |                                                                 | 100:50:50             |      |                                 |                  |               |                          |                                                                 |
|                    | Varieties               |                          |      |                                 |                  |                       |                                                                 |                       |      |                                 |                  |               |                          |                                                                 |
|                    | V1                      | IET 26927                |      |                                 |                  |                       |                                                                 | IET 26927             |      |                                 |                  |               |                          |                                                                 |
|                    | V2                      | IET 26974                |      |                                 |                  |                       |                                                                 | IET 26974             |      |                                 |                  |               |                          |                                                                 |
|                    | V3                      | IET 25948                |      |                                 |                  |                       |                                                                 | IET 25948             |      |                                 |                  |               |                          |                                                                 |
|                    | V4                      | IET 26948                |      |                                 |                  |                       |                                                                 | IET 26948             |      |                                 |                  |               |                          |                                                                 |
|                    | V5                      | Samba Masuri             |      |                                 |                  |                       |                                                                 | Samba Masuri          |      |                                 |                  |               |                          |                                                                 |
|                    | V6                      | Swarna                   |      |                                 |                  |                       |                                                                 | Swarna                |      |                                 |                  |               |                          |                                                                 |
|                    | V7                      | Pushyami                 |      |                                 |                  |                       |                                                                 | Pushyami              |      |                                 |                  |               |                          |                                                                 |
|                    | V8                      | LC - Karjat 2            |      |                                 |                  |                       |                                                                 | LC - BPT 5204         |      |                                 |                  |               |                          |                                                                 |
|                    | Available N:P:K (kg/ha) | -                        |      |                                 |                  |                       |                                                                 | 398:105:280           |      |                                 |                  |               |                          |                                                                 |

Table 4.1 (f): Contd.

| F-levels    | Varieties | NAGINA             |      |                              |               |            |                    |                                                        | PUSA               |      |                              |                                                        |
|-------------|-----------|--------------------|------|------------------------------|---------------|------------|--------------------|--------------------------------------------------------|--------------------|------|------------------------------|--------------------------------------------------------|
|             |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt(g) | Test wt(g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
| F1          | V1        | 4.62               | 4    | 322                          | 3.64          | 26.74      | 122                |                                                        | 3.06               | 14   | 258                          |                                                        |
|             | V2        | 4.53               | 6    | 324                          | 3.60          | 26.69      | 120                |                                                        | 3.18               | 12   | 264                          |                                                        |
|             | V3        | 4.47               | 7    | 322                          | 3.56          | 25.90      | 123                |                                                        | 3.01               | 16   | 263                          |                                                        |
|             | V4        | 4.46               | 8    | 320                          | 3.59          | 26.70      | 120                |                                                        | 3.32               | 10   | 265                          |                                                        |
|             | V5        | 4.23               | 15   | 301                          | 3.48          | 26.42      | 114                |                                                        | 3.13               | 13   | 261                          |                                                        |
|             | V6        | 4.19               | 16   | 294                          | 3.20          | 26.36      | 113                |                                                        | 3.31               | 11   | 263                          |                                                        |
|             | V7        | 4.24               | 14   | 293                          | 2.95          | 26.42      | 116                |                                                        | 3.02               | 15   | 259                          |                                                        |
|             | V8        | 4.28               | 13   | 295                          | 3.52          | 26.31      | 116                |                                                        | 3.65               | 7    | 271                          |                                                        |
| F2          | V1        | 4.76               | 1    | 298                          | 3.65          | 27.10      | 124                | 1.27                                                   | 3.47               | 9    | 271                          | 3.73                                                   |
|             | V2        | 4.72               | 2    | 343                          | 3.61          | 26.70      | 120                | 1.73                                                   | 3.71               | 4    | 272                          | 4.82                                                   |
|             | V3        | 4.59               | 5    | 325                          | 3.58          | 25.92      | 127                | 1.09                                                   | 3.70               | 5    | 270                          | 6.27                                                   |
|             | V4        | 4.64               | 3    | 324                          | 3.56          | 26.70      | 120                | 1.64                                                   | 3.78               | 3    | 272                          | 4.18                                                   |
|             | V5        | 4.44               | 9    | 314                          | 3.50          | 26.43      | 115                | 1.91                                                   | 3.69               | 6    | 269                          | 5.09                                                   |
|             | V6        | 4.39               | 11   | 305                          | 3.21          | 26.38      | 114                | 1.82                                                   | 4.08               | 2    | 278                          | 7.00                                                   |
|             | V7        | 4.37               | 12   | 309                          | 2.96          | 26.44      | 116                | 1.18                                                   | 3.48               | 8    | 267                          | 4.18                                                   |
|             | V8        | 4.41               | 10   | 322                          | 3.52          | 26.32      | 117                | 1.18                                                   | 4.67               | 1    | 287                          | 9.27                                                   |
| Interaction |           |                    |      |                              |               |            |                    |                                                        |                    |      |                              |                                                        |
| F at same V |           | NS                 |      | NS                           | NS            | NS         | NS                 |                                                        | NS                 |      | NS                           |                                                        |
| V at same F |           | NS                 |      | NS                           | NS            | NS         | NS                 |                                                        | NS                 |      | NS                           |                                                        |
|             | F1        | 4.38               | 2    | 309                          | 3.44          | 26.44      | 118                |                                                        | 3.21               | 2    | 263                          |                                                        |
|             | F2        | 4.54               | 1    | 317                          | 3.45          | 26.50      | 119                | 1.48                                                   | 3.82               | 1    | 273                          | 5.57                                                   |
| C.D.(0.05)  |           | 0.09               |      | NS                           | NS            | NS         | NS                 |                                                        | 0.27               |      | NS                           |                                                        |
| C.V.(%)     |           | 1.57               |      | 3.84                         | 0.43          | 0.6        | 1.12               |                                                        | 6.19               |      | 9.77                         |                                                        |

Table 4.1 (f): Contd.

| F-<br>levels       | Varieties                          | NAGINA                |      |                                 |                  |               |                       |                                                                 | PUSA                  |      |                                 |                                                                 |
|--------------------|------------------------------------|-----------------------|------|---------------------------------|------------------|---------------|-----------------------|-----------------------------------------------------------------|-----------------------|------|---------------------------------|-----------------------------------------------------------------|
|                    |                                    | Grain Yield<br>(t/ha) | Rank | Panicle/m <sup>2</sup><br>(No.) | Panicle<br>wt(g) | Test<br>wt(g) | Days 50%<br>flowering | Nutri. res. (kg<br>grain/kg Nutri.)<br>(Base level<br>100% RDF) | Grain Yield (t/ha)    | Rank | Panicle/m <sup>2</sup><br>(No.) | Nutri. res. (kg<br>grain/kg Nutri.)<br>(Base level<br>100% RDF) |
| Mean of varieties: |                                    |                       |      |                                 |                  |               |                       |                                                                 |                       |      |                                 |                                                                 |
|                    | V1                                 | 4.69                  | 1    | 310                             | 3.65             | 26.92         | 123                   | 1.27                                                            | 3.27                  | 7    | 264                             | 3.73                                                            |
|                    | V2                                 | 4.63                  | 2    | 333                             | 3.61             | 26.70         | 120                   | 1.73                                                            | 3.45                  | 4    | 268                             | 4.82                                                            |
|                    | V3                                 | 4.53                  | 4    | 324                             | 3.57             | 25.91         | 125                   | 1.09                                                            | 3.36                  | 6    | 267                             | 6.27                                                            |
|                    | V4                                 | 4.55                  | 3    | 322                             | 3.58             | 26.70         | 120                   | 1.64                                                            | 3.55                  | 3    | 269                             | 4.18                                                            |
|                    | V5                                 | 4.34                  | 5    | 307                             | 3.49             | 26.43         | 115                   | 1.91                                                            | 3.41                  | 5    | 265                             | 5.09                                                            |
|                    | V6                                 | 4.29                  | 7    | 300                             | 3.21             | 26.37         | 114                   | 1.82                                                            | 3.70                  | 2    | 271                             | 7.00                                                            |
|                    | V7                                 | 4.31                  | 6    | 301                             | 2.96             | 26.43         | 116                   | 1.18                                                            | 3.25                  | 8    | 263                             | 4.18                                                            |
|                    | V8                                 |                       |      |                                 |                  |               |                       |                                                                 | 4.16                  | 1    | 279                             | 9.27                                                            |
|                    | C.D.(0.05)                         | 0.11                  |      | 18.74                           | 0.01             | 0.17          | 1.61                  |                                                                 | 0.28                  |      | NS                              |                                                                 |
|                    | C.V. (%)                           | 2.08                  |      | 5.06                            | 0.32             | 0.55          | 1.15                  |                                                                 | 6.63                  |      | 4.07                            |                                                                 |
|                    | Expt. Mean                         | 4.48                  |      | 314                             | 3.44             | 26.49         | 119                   |                                                                 | 3.52                  |      | 268                             |                                                                 |
|                    | Soil type                          | -                     |      |                                 |                  |               |                       |                                                                 | -                     |      |                                 |                                                                 |
|                    | pH                                 | 7.70                  |      |                                 |                  |               |                       |                                                                 | -                     |      |                                 |                                                                 |
|                    | N - levels (kg/ha)                 |                       |      |                                 |                  |               |                       |                                                                 |                       |      |                                 |                                                                 |
|                    | F1                                 | 120:60:40             |      |                                 |                  |               |                       |                                                                 | 120:60:40             |      |                                 |                                                                 |
|                    | F2                                 | 180:90:60             |      |                                 |                  |               |                       |                                                                 | 180:90:60             |      |                                 |                                                                 |
|                    | Recommended N:P:K<br>(kg/ha)       | 120:60:40             |      |                                 |                  |               |                       |                                                                 | 120:60:40             |      |                                 |                                                                 |
|                    | Varieties                          |                       |      |                                 |                  |               |                       |                                                                 |                       |      |                                 |                                                                 |
|                    | V1                                 | IET 26927             |      |                                 |                  |               |                       |                                                                 | IET 26927             |      |                                 |                                                                 |
|                    | V2                                 | IET 26974             |      |                                 |                  |               |                       |                                                                 | IET 26974             |      |                                 |                                                                 |
|                    | V3                                 | IET 25948             |      |                                 |                  |               |                       |                                                                 | IET 25948             |      |                                 |                                                                 |
|                    | V4                                 | IET 26948             |      |                                 |                  |               |                       |                                                                 | IET 26948             |      |                                 |                                                                 |
|                    | V5                                 | Samba Masuri          |      |                                 |                  |               |                       |                                                                 | Samba Masuri          |      |                                 |                                                                 |
|                    | V6                                 | Swarna                |      |                                 |                  |               |                       |                                                                 | Swarna                |      |                                 |                                                                 |
|                    | V7                                 | Pushyami              |      |                                 |                  |               |                       |                                                                 | Pushyami              |      |                                 |                                                                 |
|                    | V8                                 | LC - NDR 8002         |      |                                 |                  |               |                       |                                                                 | LC - Rajendra Mahsuri |      |                                 |                                                                 |
|                    | Available N:P:K of soil<br>(kg/ha) | 21:18.33:209          |      |                                 |                  |               |                       |                                                                 | -                     |      |                                 |                                                                 |

Table 4.1 (f): Contd.

| F-levels           | Varieties | MARUTERU           |      |                              |               |            |                    |                                                        | Over all mean | Rank |
|--------------------|-----------|--------------------|------|------------------------------|---------------|------------|--------------------|--------------------------------------------------------|---------------|------|
|                    |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt(g) | Test wt(g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |               |      |
| F1                 | V1        | 6.38               | 4    | 290                          | 5.64          | 20.21      | 116                |                                                        | 4.89          | 13   |
|                    | V2        | 7.03               | 2    | 299                          | 5.71          | 22.41      | 118                |                                                        | 5.36          | 5    |
|                    | V3        | 6.2                | 6    | 286                          | 5.53          | 20.19      | 115                |                                                        | 5.40          | 4    |
|                    | V4        | 6.02               | 7    | 283                          | 4.23          | 20.14      | 114                |                                                        | 5.34          | 6    |
|                    | V5        | 5.1                | 14   | 288                          | 3.97          | 14.72      | 112                |                                                        | 4.58          | 16   |
|                    | V6        | 5.67               | 10   | 290                          | 4.31          | 18.5       | 111                |                                                        | 4.82          | 14   |
|                    | V7        | 5.52               | 11   | 277                          | 5.31          | 20.2       | 113                |                                                        | 4.95          | 12   |
|                    | V8        | -                  |      | -                            | -             | -          | -                  |                                                        | 4.74          | 15   |
| F2                 | V1        | 6.5                | 3    | 295                          | 5.76          | 20.25      | 119                | 0.89                                                   | 5.27          | 8    |
|                    | V2        | 7.38               | 1    | 295                          | 5.88          | 22.4       | 120                | 2.59                                                   | 5.87          | 1    |
|                    | V3        | 5.98               | 8    | 288                          | 5.65          | 20.2       | 117                | -1.63                                                  | 5.62          | 3    |
|                    | V4        | 6.25               | 5    | 290                          | 5.53          | 20.16      | 116                | 1.70                                                   | 5.70          | 2    |
|                    | V5        | 5.26               | 12   | 291                          | 4.29          | 14.78      | 114                | 1.19                                                   | 4.98          | 11   |
|                    | V6        | 5.11               | 13   | 278                          | 4.01          | 18.7       | 112                | -4.15                                                  | 5.10          | 10   |
|                    | V7        | 5.84               | 9    | 290                          | 4.41          | 20.22      | 115                | 2.37                                                   | 5.29          | 7    |
|                    | V8        | -                  |      | -                            | -             | -          | -                  |                                                        | 5.19          | 9    |
| Interaction        |           |                    |      |                              |               |            |                    |                                                        |               |      |
| <i>F at same V</i> |           | NS                 |      | NS                           | 0.22          | NS         | NS                 |                                                        |               |      |
| <i>V at same F</i> |           | NS                 |      | NS                           | 0.25          | NS         | NS                 |                                                        |               |      |
|                    | F1        | 5.99               | 2    | 288                          | 4.96          | 19.48      | 114                |                                                        | 5.04          | 2    |
|                    | F2        | 6.05               | 1    | 290                          | 5.08          | 19.53      | 116                | 0.42                                                   | 5.41          | 1    |
| <i>C.D.(0.05)</i>  |           | NS                 |      | NS                           | NS            | NS         | NS                 |                                                        |               |      |
| <i>C.V.(%)</i>     |           | 10.69              |      | 5.94                         | 2.94          | 0.64       | 1.75               |                                                        |               |      |

Table 4.1 (f): Contd.

| F-levels | Varieties                       | MARUTERU           |      |                              |               |              |                    |                                                        | Over all mean | Rank |
|----------|---------------------------------|--------------------|------|------------------------------|---------------|--------------|--------------------|--------------------------------------------------------|---------------|------|
|          |                                 | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt(g) | Test wt(g)   | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |               |      |
|          | Mean of varieties:              |                    |      |                              |               |              |                    |                                                        |               |      |
|          | V1                              | 6.44               | 2    | 293                          | 5.70          | 20.23        | 118                | 0.89                                                   | 5.08          | 5    |
|          | V2                              | 7.21               | 1    | 297                          | 5.80          | 22.41        | 119                | 2.59                                                   | 5.61          | 1    |
|          | V3                              | 6.09               | 4    | 287                          | 5.59          | 20.20        | 116                | -1.63                                                  | 5.51          | 3    |
|          | V4                              | 6.14               | 3    | 287                          | 4.88          | 20.15        | 115                | 1.70                                                   | 5.52          | 2    |
|          | V5                              | 5.18               | 7    | 290                          | 4.13          | 14.75        | 113                | 1.19                                                   | 4.78          | 8    |
|          | V6                              | 5.39               | 6    | 284                          | 4.16          | 18.60        | 112                | -4.15                                                  | 4.96          | 7    |
|          | V7                              | 5.68               | 5    | 284                          | 4.86          | 20.21        | 114                | 2.37                                                   | 5.12          | 4    |
|          | V8                              | -                  |      | -                            | -             | -            | -                  |                                                        | 5.05          | 6    |
|          | C.D.(0.05)                      | 0.41               |      | NS                           | 0.15          | 0.79         | 3.7                |                                                        |               |      |
|          | C.V. (%)                        | 5.72               |      | 10.25                        | 2.55          | 3.4          | 2.7                |                                                        |               |      |
|          | <b>Expt. Mean</b>               | <b>6.02</b>        |      | <b>289</b>                   | <b>5.02</b>   | <b>19.51</b> | <b>115</b>         |                                                        | <b>5.23</b>   |      |
|          | Soil type                       | Delta alluvial     |      |                              |               |              |                    |                                                        |               |      |
|          | pH                              | 7.16               |      |                              |               |              |                    |                                                        |               |      |
|          | <b>N - levels (kg/ha)</b>       |                    |      |                              |               |              |                    |                                                        |               |      |
|          | F1                              | 90:60:60           |      |                              |               |              |                    |                                                        |               |      |
|          | F2                              | 135:90:90          |      |                              |               |              |                    |                                                        |               |      |
|          | Recommended N:P:K (kg/ha)       | 90:60:60           |      |                              |               |              |                    |                                                        |               |      |
|          | <b>Varieties</b>                |                    |      |                              |               |              |                    |                                                        |               |      |
|          | V1                              | IET 26927          |      |                              |               |              |                    |                                                        |               |      |
|          | V2                              | IET 26974          |      |                              |               |              |                    |                                                        |               |      |
|          | V3                              | IET 25948          |      |                              |               |              |                    |                                                        |               |      |
|          | V4                              | IET 26948          |      |                              |               |              |                    |                                                        |               |      |
|          | V5                              | Samba Masuri       |      |                              |               |              |                    |                                                        |               |      |
|          | V6                              | Swarna             |      |                              |               |              |                    |                                                        |               |      |
|          | V7                              | Pushyami           |      |                              |               |              |                    |                                                        |               |      |
|          | V8                              | -                  |      |                              |               |              |                    |                                                        |               |      |
|          | Available N:P:K of soil (kg/ha) | 151:36:257         |      |                              |               |              |                    |                                                        |               |      |

**NMT 1(g) MS**

Five entries (IET 26549, IET 27136, IET 25802, IET 25798 and IET 24990) of medium slender group were evaluated for their response to levels of nutrients on grain yield at seven different locations i.e., **Dhangain (120:60:40)**, **Karjat (100:50:50)**, **Kaul (150:60:60)**, **Mandya (100:50:50)**, **Nagina (120:60:40)**, **Raipur (120:60:40)** and **Maruteru (90:60:60)** under two levels of RDF (100% and 150% RDF). The details and data received from these locations are summarized and presented in Table 4.1 (g).

RDF doses significantly influenced the grain yield at four locations (**Dhangain**, **Karjat**, **Mandya** and **Raipur**) and the maximum increase in grain yield was observed with 150% RDF at most of the location except at **Nagina**, **Kaul** and **Maruteru**. Application of 150% RDF recorded higher green yield at **Dhangain** (6.48 t/ha), **Karjat** (3.91 t/ha), **Mandya** (7.37 t/ha) and **Raipur** (6.40 t/ha). Average over the locations, higher mean grain yield of 5.98 t/ha was recorded with 150% RDF and was 8.5% higher than yield obtained with 100% RDF. Higher nutrient response was recorded with 150% RDF at Dhangain (8.34), **Karjat** (5.92), **Mandya** (7.00) and **Raipur** (6.83).

Grain yield differences among the tested varieties were found significant at all the locations. Significantly higher mean maximum grain yield was recorded by IET 25802 at **Kaul** (8.84 t/ha) and **Nagina** (5.11 t/ha) while IET 24990 at **Maruteru** (6.08 t/ha). The interaction effect between fertilizer levels and varieties was found to be non-significant at all the locations except **Raipur**. Mean over the locations, cultivar IET 25802 (6.24 t/ha) was found to be high yielder followed by IET 25798 (5.94 t/ha) and IET 26549 (5.91 t/ha).

In this trial, application of 150% RDF was found to be promising and also exhibited higher nutrient recovery. Entries like IET 25802, IET 25798 and IET 26549 were found to be promising with better yields over other test entries.

Table 4.1(g): Summary of data on grain yield and ancillary characters of selected NMT MS cultures grown under transplanted conditions at low and medium recommended fertilizer doses, kharif 2019.

| F-levels    | Varieties | DHANGAIN           |      |                              |                |                    |                                                        | KARJAT             |      |                              |                |             |                    |                                                        |
|-------------|-----------|--------------------|------|------------------------------|----------------|--------------------|--------------------------------------------------------|--------------------|------|------------------------------|----------------|-------------|--------------------|--------------------------------------------------------|
|             |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
| F1          | V1        | 6.03               | 8    | 290                          | 4.19           | 104                |                                                        | 3.07               | 17   | 201                          | 1.86           | 25.37       | 103                |                                                        |
|             | V2        | 5.38               | 12   | 275                          | 4.08           | 101                |                                                        | 3.16               | 15   | 208                          | 1.90           | 24.33       | 99                 |                                                        |
|             | V3        | 5.98               | 9    | 286                          | 4.08           | 101                |                                                        | 3.41               | 14   | 214                          | 2.04           | 24.90       | 104                |                                                        |
|             | V4        | 5.12               | 15   | 260                          | 3.34           | 88                 |                                                        | 3.12               | 16   | 196                          | 1.86           | 25.80       | 94                 |                                                        |
|             | V5        | 5.17               | 14   | 285                          | 3.37           | 103                |                                                        | 4.08               | 5    | 187                          | 2.44           | 24.60       | 99                 |                                                        |
|             | V6        | -                  |      | -                            | -              | -                  |                                                        | -                  |      | -                            | -              | -           | -                  |                                                        |
|             | V7        | 6.37               | 4    | 291                          | 5.29           | 99                 |                                                        | 3.62               | 9    | 204                          | 2.15           | 23.67       | 97                 |                                                        |
|             | V8        | 5.07               | 16   | 279                          | 3.08           | 95                 |                                                        | 4.19               | 3    | 197                          | 2.48           | 23.30       | 96                 |                                                        |
|             | V9        | 5.37               | 13   | 277                          | 3.37           | 104                |                                                        | 3.69               | 8    | 226                          | 2.19           | 22.80       | 102                |                                                        |
|             | V10       | -                  |      | -                            | -              | -                  |                                                        | 2.60               | 18   | 183                          | 1.53           | 22.27       | 110                |                                                        |
| F2          | V1        | 7.25               | 2    | 296                          | 5.04           | 106                | 11.09                                                  | 3.62               | 9    | 204                          | 2.19           | 25.53       | 103                | 6.88                                                   |
|             | V2        | 6.30               | 5    | 286                          | 4.48           | 103                | 8.36                                                   | 3.62               | 9    | 210                          | 2.18           | 24.53       | 100                | 5.75                                                   |
|             | V3        | 6.88               | 3    | 295                          | 4.57           | 103                | 8.18                                                   | 3.93               | 6    | 216                          | 2.35           | 25.13       | 105                | 6.50                                                   |
|             | V4        | 6.12               | 7    | 267                          | 3.72           | 92                 | 9.09                                                   | 3.50               | 13   | 198                          | 2.09           | 26.07       | 95                 | 4.75                                                   |
|             | V5        | 6.20               | 6    | 292                          | 4.07           | 105                | 9.36                                                   | 4.42               | 2    | 190                          | 2.65           | 24.90       | 101                | 4.25                                                   |
|             | V6        | -                  |      | -                            | -              | -                  |                                                        | -                  |      | -                            | -              | -           | -                  |                                                        |
|             | V7        | 7.58               | 1    | 300                          | 5.37           | 101                | 11.00                                                  | 4.12               | 4    | 207                          | 2.45           | 23.87       | 99                 | 6.25                                                   |
|             | V8        | 5.88               | 10   | 294                          | 3.33           | 96                 | 7.36                                                   | 4.61               | 1    | 200                          | 2.73           | 23.53       | 97                 | 5.25                                                   |
|             | V9        | 5.62               | 11   | 289                          | 3.08           | 106                | 2.27                                                   | 3.86               | 7    | 230                          | 2.30           | 23.07       | 103                | 2.13                                                   |
|             | V10       | -                  |      | -                            | -              | -                  |                                                        | 3.52               | 12   | 187                          | 2.07           | 22.50       | 111                | 11.50                                                  |
| Interaction |           |                    |      |                              |                |                    |                                                        |                    |      |                              |                |             |                    |                                                        |
| F at same V |           | NS                 |      | NS                           | NS             | NS                 |                                                        | NS                 |      | NS                           | NS             | NS          | 0.84               |                                                        |
| V at same F |           | NS                 |      | NS                           | NS             | NS                 |                                                        | NS                 |      | NS                           | NS             | NS          | 0.81               |                                                        |
|             | F1        | 5.56               | 2    | 280                          | 3.85           | 99                 |                                                        | 3.44               | 2    | 202                          | 2.05           | 24.12       | 100                |                                                        |
|             | F2        | 6.48               | 1    | 290                          | 4.21           | 102                | 8.34                                                   | 3.91               | 1    | 205                          | 2.33           | 24.35       | 102                | 5.92                                                   |
| C.D.(0.05)  |           | 0.04               |      | NS                           | NS             | 0.31               |                                                        | 0.05               |      | 0.84                         | 0.03           | 0.06        | 0.16               |                                                        |
| C.V.(%)     |           | 0.55               |      | 6.06                         | 19.86          | 0.25               |                                                        | 1.18               |      | 0.35                         | 1.26           | 0.19        | 0.13               |                                                        |

Table 4.1(g): Contd.

| F-levels           | Varieties               | DHANGAIN           |      |                  |                |                    |                                                        | KARJAT             |      |                  |                |             |                    |                                                        |
|--------------------|-------------------------|--------------------|------|------------------|----------------|--------------------|--------------------------------------------------------|--------------------|------|------------------|----------------|-------------|--------------------|--------------------------------------------------------|
|                    |                         | Grain Yield (t/ha) | Rank | Panicle/m² (No.) | Panicle wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) | Grain Yield (t/ha) | Rank | Panicle/m² (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
| Mean of varieties: |                         |                    |      |                  |                |                    |                                                        |                    |      |                  |                |             |                    |                                                        |
|                    | V1                      | 6.64               | 2    | 293              | 4.62           | 105                | 11.09                                                  | 3.35               | 7    | 202              | 2.03           | 25.45       | 103                | 6.88                                                   |
|                    | V2                      | 5.84               | 4    | 280              | 4.28           | 102                | 8.36                                                   | 3.39               | 6    | 209              | 2.04           | 24.43       | 100                | 5.75                                                   |
|                    | V3                      | 6.43               | 3    | 291              | 4.33           | 102                | 8.18                                                   | 3.67               | 5    | 215              | 2.20           | 25.02       | 104                | 6.50                                                   |
|                    | V4                      | 5.62               | 6    | 264              | 3.53           | 90                 | 9.09                                                   | 3.31               | 8    | 197              | 1.98           | 25.94       | 95                 | 4.75                                                   |
|                    | V5                      | 5.69               | 5    | 289              | 3.72           | 104                | 9.36                                                   | 4.25               | 2    | 189              | 2.55           | 24.75       | 100                | 4.25                                                   |
|                    | V6                      | -                  |      | -                | -              | -                  |                                                        | -                  |      | -                | -              | -           | -                  | 0.00                                                   |
|                    | V7                      | 6.98               | 1    | 295              | 5.33           | 100                | 11.00                                                  | 3.87               | 3    | 206              | 2.30           | 23.77       | 98                 | 6.25                                                   |
|                    | V8                      | 5.48               | 8    | 287              | 3.21           | 96                 | 7.36                                                   | 4.40               | 1    | 199              | 2.61           | 23.42       | 97                 | 5.25                                                   |
|                    | V9                      | 5.50               | 7    | 283              | 3.23           | 105                | 2.27                                                   | 3.78               | 4    | 228              | 2.25           | 22.94       | 103                | 2.13                                                   |
|                    | V10                     | -                  |      | -                | -              | -                  |                                                        | 3.06               | 9    | 185              | 1.80           | 22.39       | 111                | 11.50                                                  |
|                    | C.D.(0.05)              | 0.56               |      | 15.37            | 1.13           | 0.7                |                                                        | 0.17               |      | 1.77             | 0.1            | 0.24        | 0.6                |                                                        |
|                    | C.V. (%)                | 7.85               |      | 4.56             | 23.75          | 0.59               |                                                        | 3.92               |      | 0.75             | 3.88           | 0.83        | 0.51               |                                                        |
|                    | Expt. Mean              | 6.02               |      | 285              | 4.03           | 100                |                                                        | 3.67               |      | 203              | 2.19           | 24.23       | 101                |                                                        |
|                    | Soil type               | Loamy              |      |                  |                |                    |                                                        | -                  |      |                  |                |             |                    |                                                        |
|                    | pH                      | 6.80               |      |                  |                |                    |                                                        | -                  |      |                  |                |             |                    |                                                        |
|                    | N - levels (kg/ha)      |                    |      |                  |                |                    |                                                        |                    |      |                  |                |             |                    |                                                        |
|                    | F1                      | 120:60:40          |      |                  |                |                    |                                                        | 100:50:50          |      |                  |                |             |                    |                                                        |
|                    | F2                      | 180:60:40          |      |                  |                |                    |                                                        | 150:75:75          |      |                  |                |             |                    |                                                        |
|                    | Recomnd N:P:K (kg/ha)   | 120:60:40          |      |                  |                |                    |                                                        | 100:50:50          |      |                  |                |             |                    |                                                        |
|                    | Varieties               |                    |      |                  |                |                    |                                                        |                    |      |                  |                |             |                    |                                                        |
|                    | V1                      | IET 26549          |      |                  |                |                    |                                                        | IET 26549          |      |                  |                |             |                    |                                                        |
|                    | V2                      | IET 27136          |      |                  |                |                    |                                                        | IET 27136          |      |                  |                |             |                    |                                                        |
|                    | V3                      | IET 25802          |      |                  |                |                    |                                                        | IET 25802          |      |                  |                |             |                    |                                                        |
|                    | V4                      | IET 25798          |      |                  |                |                    |                                                        | IET 25798          |      |                  |                |             |                    |                                                        |
|                    | V5                      | IET 24990          |      |                  |                |                    |                                                        | IET 24990          |      |                  |                |             |                    |                                                        |
|                    | V6                      | DRRH 3             |      |                  |                |                    |                                                        | DRRH 3             |      |                  |                |             |                    |                                                        |
|                    | V7                      | 27 P 63            |      |                  |                |                    |                                                        | 27 P 63            |      |                  |                |             |                    |                                                        |
|                    | V8                      | KRH 4              |      |                  |                |                    |                                                        | KRH 4              |      |                  |                |             |                    |                                                        |
|                    | V9                      | WGL 14             |      |                  |                |                    |                                                        | WGL 14             |      |                  |                |             |                    |                                                        |
|                    | V10                     | -                  |      |                  |                |                    |                                                        | LC - Karjat 184    |      |                  |                |             |                    |                                                        |
|                    | Available N:P:K (kg/ha) | 154:14.4:183       |      |                  |                |                    |                                                        | -                  |      |                  |                |             |                    |                                                        |

Table 4.1(g): Contd.

| F-levels           | Varieties | KAUL               |      |                              |                |             |                                                        | MANDYA             |      |                              |                |             |                    |                                                        |
|--------------------|-----------|--------------------|------|------------------------------|----------------|-------------|--------------------------------------------------------|--------------------|------|------------------------------|----------------|-------------|--------------------|--------------------------------------------------------|
|                    |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
| F1                 | V1        | 6.9                | 10   | 330                          | 2.35           | 19.53       |                                                        | 7.56               | 3    | 382                          | 3.92           | 18.77       | 104                |                                                        |
|                    | V2        | 7.06               | 6    | 343                          | 2.24           | 23.97       |                                                        | 7.03               | 9    | 370                          | 3.59           | 18.37       | 99                 |                                                        |
|                    | V3        | 8.76               | 2    | 327                          | 2.99           | 23.10       |                                                        | 7.07               | 8    | 318                          | 4.88           | 24.02       | 109                |                                                        |
|                    | V4        | 8.55               | 4    | 322                          | 2.97           | 25.40       |                                                        | 6.15               | 15   | 322                          | 4.22           | 24.53       | 92                 |                                                        |
|                    | V5        | 5.69               | 14   | 274                          | 2.35           | 21.07       |                                                        | 6.25               | 13   | 345                          | 3.37           | 18.47       | 105                |                                                        |
|                    | V6        | -                  |      | -                            | -              | -           |                                                        | 6.23               | 14   | 413                          | 3.52           | 20.31       | 95                 |                                                        |
|                    | V7        | 7                  | 7    | 255                          | 3.04           | 24.50       |                                                        | -                  |      | -                            | -              | -           | -                  |                                                        |
|                    | V8        | 6.74               | 11   | 317                          | 2.40           | 19.37       |                                                        | 6.04               | 16   | 348                          | 3.94           | 17.94       | 105                |                                                        |
|                    | V9        | 4.54               | 16   | 267                          | 1.91           | 19.70       |                                                        | 7.03               | 9    | 327                          | 4.17           | 18.85       | 99                 |                                                        |
|                    | V10       | -                  |      | -                            | -              | -           |                                                        | -                  |      | -                            | -              | -           | -                  |                                                        |
| F2                 | V1        | 6.94               | 9    | 339                          | 2.27           | 19.50       | 0.30                                                   | 8.11               | 2    | 436                          | 3.96           | 18.09       | 105                | 5.50                                                   |
|                    | V2        | 7.09               | 5    | 342                          | 2.27           | 24.27       | 0.22                                                   | 7.22               | 6    | 385                          | 3.77           | 19.51       | 99                 | 1.90                                                   |
|                    | V3        | 8.91               | 1    | 337                          | 2.98           | 22.97       | 1.11                                                   | 7.30               | 4    | 360                          | 4.67           | 23.98       | 109                | 2.30                                                   |
|                    | V4        | 8.61               | 3    | 323                          | 2.93           | 25.10       | 0.44                                                   | 7.16               | 7    | 303                          | 4.01           | 23.97       | 93                 | 10.10                                                  |
|                    | V5        | 5.74               | 13   | 274                          | 2.37           | 21.13       | 0.37                                                   | 6.50               | 12   | 308                          | 3.53           | 20.09       | 104                | 2.50                                                   |
|                    | V6        | -                  |      | -                            | -              | -           |                                                        | 7.26               | 5    | 377                          | 4.17           | 19.93       | 95                 | 10.30                                                  |
|                    | V7        | 6.73               | 12   | 260                          | 3.02           | 24.20       | -2.00                                                  | -                  |      | -                            | -              | -           | -                  |                                                        |
|                    | V8        | 6.96               | 8    | 320                          | 2.39           | 19.40       | 1.63                                                   | 6.74               | 11   | 347                          | 3.69           | 18.21       | 105                | 7.00                                                   |
|                    | V9        | 4.66               | 15   | 267                          | 1.95           | 19.60       | 0.89                                                   | 8.67               | 1    | 362                          | 3.88           | 18.61       | 99                 | 16.40                                                  |
|                    | V10       | -                  |      | -                            | -              | -           |                                                        |                    |      |                              |                |             |                    |                                                        |
| Interaction        |           |                    |      |                              |                |             |                                                        |                    |      |                              |                |             |                    |                                                        |
| <i>F at same V</i> |           | NS                 |      | NS                           | NS             | NS          |                                                        | NS                 |      | NS                           | NS             | NS          | NS                 |                                                        |
| <i>V at same F</i> |           | NS                 |      | NS                           | NS             | NS          |                                                        | NS                 |      | NS                           | NS             | NS          | NS                 |                                                        |
| F1                 |           | 6.91               | 2    | 304                          | 2.53           | 22.08       |                                                        | 6.67               | 2    | 353                          | 3.95           | 20.16       | 101                |                                                        |
| F2                 |           | 6.96               | 1    | 308                          | 2.52           | 22.02       | 0.37                                                   | 7.37               | 1    | 360                          | 3.96           | 20.30       | 101                | 7.00                                                   |
| <i>C.D.(0.05)</i>  |           | NS                 |      | NS                           | NS             | NS          |                                                        | 0.37               |      | NS                           | NS             | NS          | NS                 |                                                        |
| <i>C.V.(%)</i>     |           | 2.2                |      | 10.45                        | 5.15           | 6.6         |                                                        | 4.26               |      | 2.24                         | 7.16           | 6.75        | 0.66               |                                                        |

Table 4.1(g): Contd.

| F-levels           | Varieties               | KAUL               |      |                              |                |             |                                                        | MANDYA             |      |                              |                |             |                    |                                                        |
|--------------------|-------------------------|--------------------|------|------------------------------|----------------|-------------|--------------------------------------------------------|--------------------|------|------------------------------|----------------|-------------|--------------------|--------------------------------------------------------|
|                    |                         | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
| Mean of varieties: |                         |                    |      |                              |                |             |                                                        |                    |      |                              |                |             |                    |                                                        |
|                    | V1                      | 6.92               | 4    | 335                          | 2.31           | 19.52       | 0.30                                                   | 7.84               | 2    | 409                          | 3.94           | 18.43       | 105                | 5.50                                                   |
|                    | V2                      | 7.08               | 3    | 343                          | 2.26           | 24.12       | 0.22                                                   | 7.13               | 4    | 377                          | 3.68           | 18.94       | 99                 | 1.90                                                   |
|                    | V3                      | 8.84               | 1    | 332                          | 2.99           | 23.04       | 1.11                                                   | 7.19               | 3    | 339                          | 4.78           | 24.00       | 109                | 2.30                                                   |
|                    | V4                      | 8.58               | 2    | 323                          | 2.95           | 25.25       | 0.44                                                   | 6.66               | 6    | 312                          | 4.12           | 24.25       | 93                 | 10.10                                                  |
|                    | V5                      | 5.72               | 7    | 274                          | 2.36           | 21.10       | 0.37                                                   | 6.38               | 8    | 327                          | 3.45           | 19.28       | 104                | 2.50                                                   |
|                    | V6                      | -                  |      | -                            | -              | -           |                                                        | 6.75               | 5    | 395                          | 3.85           | 20.12       | 95                 | 10.30                                                  |
|                    | V7                      | 6.87               | 5    | 258                          | 3.03           | 24.35       | -2.00                                                  | -                  |      | -                            | -              | -           | -                  |                                                        |
|                    | V8                      | 6.85               | 6    | 318                          | 2.40           | 19.39       | 1.63                                                   | 6.39               | 7    | 347                          | 3.82           | 18.08       | 105                | 7.00                                                   |
|                    | V9                      | 4.60               | 8    | 267                          | 1.93           | 19.65       | 0.89                                                   | 7.85               | 1    | 344                          | 4.03           | 18.73       | 99                 | 16.40                                                  |
|                    | V10                     | -                  |      | -                            | -              | -           |                                                        |                    |      |                              |                |             |                    |                                                        |
|                    | C.D.(0.05)              | 0.8                |      | 37.02                        | 0.17           | 2.27        |                                                        | 0.68               |      | 49.35                        | 0.38           | 2           | 0.73               |                                                        |
|                    | C.V. (%)                | 9.76               |      | 10.23                        | 5.75           | 8.72        |                                                        | 8.24               |      | 11.71                        | 8.13           | 8.36        | 0.61               |                                                        |
|                    | Expt. Mean              | 6.93               |      | 306                          | 2.53           | 22.05       |                                                        | 7.02               |      | 356                          | 3.96           | 20.23       | 101                |                                                        |
|                    | Soil type               | Clay loam          |      |                              |                |             |                                                        | Red sandy loam     |      |                              |                |             |                    |                                                        |
|                    | pH                      | 8.10               |      |                              |                |             |                                                        | 6.54               |      |                              |                |             |                    |                                                        |
|                    | N - levels (kg/ha)      |                    |      |                              |                |             |                                                        |                    |      |                              |                |             |                    |                                                        |
|                    | F1                      | 150:60:60          |      |                              |                |             |                                                        | 100:50:50          |      |                              |                |             |                    |                                                        |
|                    | F2                      | 225:90:90          |      |                              |                |             |                                                        | 150:75:75          |      |                              |                |             |                    |                                                        |
|                    | Recomnd N:P:K (kg/ha)   | 150:60:60          |      |                              |                |             |                                                        | 100:50:50          |      |                              |                |             |                    |                                                        |
|                    | Varieties               |                    |      |                              |                |             |                                                        |                    |      |                              |                |             |                    |                                                        |
|                    | V1                      | IET 26549          |      |                              |                |             |                                                        | IET 26549          |      |                              |                |             |                    |                                                        |
|                    | V2                      | IET 27136          |      |                              |                |             |                                                        | IET 27136          |      |                              |                |             |                    |                                                        |
|                    | V3                      | IET 25802          |      |                              |                |             |                                                        | IET 25802          |      |                              |                |             |                    |                                                        |
|                    | V4                      | IET 25798          |      |                              |                |             |                                                        | IET 25798          |      |                              |                |             |                    |                                                        |
|                    | V5                      | IET 24990          |      |                              |                |             |                                                        | IET 24990          |      |                              |                |             |                    |                                                        |
|                    | V6                      | -                  |      |                              |                |             |                                                        | DRRH 3             |      |                              |                |             |                    |                                                        |
|                    | V7                      | 27 P 63            |      |                              |                |             |                                                        | -                  |      |                              |                |             |                    |                                                        |
|                    | V8                      | KRH 4              |      |                              |                |             |                                                        | KRH 4              |      |                              |                |             |                    |                                                        |
|                    | V9                      | WGL 14             |      |                              |                |             |                                                        | WGL 14             |      |                              |                |             |                    |                                                        |
|                    | V10                     | LC - Karjat 184    |      |                              |                |             |                                                        | -                  |      |                              |                |             |                    |                                                        |
|                    | Available N:P:K (kg/ha) | 160:16:420         |      |                              |                |             |                                                        | 361:98:273         |      |                              |                |             |                    |                                                        |

Table 4.1(g): Contd.

| F-levels    | Varieties | NAGINA             |      |                              |                |             |                    |                                                        | RAIPUR             |      |                              |                |             |                    |                                                        |
|-------------|-----------|--------------------|------|------------------------------|----------------|-------------|--------------------|--------------------------------------------------------|--------------------|------|------------------------------|----------------|-------------|--------------------|--------------------------------------------------------|
|             |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
| F1          | V1        | 4.85               | 7    | 321                          | 3.16           | 26.34       | 113                |                                                        | 5.57               | 12   | 280                          | 3.27           | 17.03       | 100                |                                                        |
|             | V2        | 4.69               | 10   | 312                          | 3.36           | 26.38       | 104                |                                                        | 4.39               | 16   | 271                          | 3.80           | 19.31       | 98                 |                                                        |
|             | V3        | 5.00               | 4    | 297                          | 3.36           | 26.39       | 112                |                                                        | 6.54               | 7    | 215                          | 5.35           | 22.57       | 98                 |                                                        |
|             | V4        | 4.83               | 9    | 306                          | 3.48           | 26.42       | 91                 |                                                        | 5.79               | 9    | 268                          | 3.85           | 22.63       | 85                 |                                                        |
|             | V5        | 4.85               | 7    | 299                          | 3.20           | 26.36       | 107                |                                                        | 5.79               | 9    | 249                          | 4.49           | 17.40       | 97                 |                                                        |
|             | V6        | 4.54               | 14   | 290                          | 3.52           | 26.31       | 109                |                                                        | 5.80               | 8    | 264                          | 3.73           | 18.07       | 95                 |                                                        |
|             | V7        | -                  |      | -                            | -              | -           | -                  |                                                        | -                  |      | -                            | -              | -           | -                  |                                                        |
|             | V8        | 4.56               | 13   | 320                          | 3.42           | 26.20       | 102                |                                                        | 6.82               | 3    | 259                          | 4.73           | 21.00       | 91                 |                                                        |
|             | V9        | 4.37               | 16   | 318                          | 3.38           | 26.28       | 107                |                                                        | 4.46               | 15   | 271                          | 3.08           | 16.43       | 100                |                                                        |
|             | V10       | -                  |      | -                            | -              | -           | -                  |                                                        | -                  |      | -                            | -              | -           | -                  |                                                        |
| F2          | V1        | 5.13               | 2    | 338                          | 3.16           | 26.36       | 114                | 2.55                                                   | 5.59               | 11   | 284                          | 3.38           | 17.60       | 100                | 0.18                                                   |
|             | V2        | 4.95               | 5    | 317                          | 3.38           | 26.39       | 106                | 2.36                                                   | 5.54               | 13   | 274                          | 3.97           | 19.36       | 97                 | 10.45                                                  |
|             | V3        | 5.21               | 1    | 311                          | 3.43           | 26.40       | 114                | 1.91                                                   | 6.78               | 4    | 255                          | 5.69           | 22.60       | 98                 | 2.18                                                   |
|             | V4        | 4.92               | 6    | 337                          | 3.50           | 26.43       | 95                 | 0.82                                                   | 7.46               | 1    | 271                          | 4.09           | 22.87       | 85                 | 15.18                                                  |
|             | V5        | 5.08               | 3    | 313                          | 3.21           | 26.38       | 108                | 2.09                                                   | 6.73               | 5    | 253                          | 4.52           | 17.48       | 97                 | 8.55                                                   |
|             | V6        | 4.62               | 11   | 336                          | 3.52           | 26.32       | 109                | 0.73                                                   | 6.66               | 6    | 271                          | 4.14           | 18.13       | 94                 | 7.82                                                   |
|             | V7        | -                  |      | -                            | -              | -           | -                  |                                                        | -                  |      | -                            | -              | -           | -                  |                                                        |
|             | V8        | 4.61               | 12   | 330                          | 3.46           | 26.27       | 104                | 0.45                                                   | 7.01               | 2    | 311                          | 4.80           | 21.10       | 90                 | 1.73                                                   |
|             | V9        | 4.47               | 15   | 321                          | 3.45           | 26.29       | 108                | 0.91                                                   | 5.40               | 14   | 289                          | 3.45           | 16.73       | 100                | 8.55                                                   |
|             | V10       | -                  |      | -                            | -              | -           | -                  |                                                        | -                  |      | -                            | -              | -           | -                  |                                                        |
| Interation  |           |                    |      |                              |                |             |                    |                                                        |                    |      |                              |                |             |                    |                                                        |
| F at same V |           | NS                 |      | NS                           | 0.03           | NS          | NS                 |                                                        | 0.61               |      | NS                           | NS             | NS          | NS                 |                                                        |
| V at same F |           | NS                 |      | NS                           | 0.04           | NS          | NS                 |                                                        | 0.64               |      | NS                           | NS             | NS          | NS                 |                                                        |
| F1          |           | 4.71               | 2    | 308                          | 3.36           | 26.34       | 106                |                                                        | 5.65               | 2    | 259                          | 4.04           | 19.31       | 96                 |                                                        |
| F2          |           | 4.87               | 1    | 326                          | 3.39           | 26.36       | 107                | 1.48                                                   | 6.40               | 1    | 276                          | 4.26           | 19.48       | 95                 | 6.83                                                   |
| C.D.(0.05)  |           | NS                 |      | 12.74                        | NS             | NS          | 0.31               |                                                        | 0.34               |      | 8.59                         | 0.19           | NS          | 0.18               |                                                        |
| C.V.(%)     |           | 3.18               |      | 3.24                         | 0.77           | 0.13        | 0.23               |                                                        | 4.6                |      | 2.58                         | 3.59           | 3.18        | 0.15               |                                                        |

Table 4.1(g): Contd.

| F-levels           | Varieties               | NAGINA             |      |                  |                |             |                    |                                                        | RAIPUR             |      |                  |                |             |                    |                                                        |
|--------------------|-------------------------|--------------------|------|------------------|----------------|-------------|--------------------|--------------------------------------------------------|--------------------|------|------------------|----------------|-------------|--------------------|--------------------------------------------------------|
|                    |                         | Grain Yield (t/ha) | Rank | Panicle/m² (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) | Grain Yield (t/ha) | Rank | Panicle/m² (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
| Mean of varieties: |                         |                    |      |                  |                |             |                    |                                                        |                    |      |                  |                |             |                    |                                                        |
|                    | V1                      | 4.99               | 2    | 330              | 3.16           | 26.35       | 114                | 2.55                                                   | 5.58               | 6    | 282              | 3.33           | 17.32       | 100                | 0.18                                                   |
|                    | V2                      | 4.82               | 5    | 315              | 3.37           | 26.39       | 105                | 2.36                                                   | 4.97               | 7    | 273              | 3.89           | 19.34       | 97                 | 10.45                                                  |
|                    | V3                      | 5.11               | 1    | 304              | 3.40           | 26.40       | 113                | 1.91                                                   | 6.66               | 2    | 235              | 5.52           | 22.59       | 98                 | 2.18                                                   |
|                    | V4                      | 4.88               | 4    | 321              | 3.49           | 26.43       | 93                 | 0.82                                                   | 6.63               | 3    | 269              | 3.97           | 22.75       | 85                 | 15.18                                                  |
|                    | V5                      | 4.97               | 3    | 306              | 3.21           | 26.37       | 107                | 2.09                                                   | 6.26               | 4    | 251              | 4.51           | 17.44       | 97                 | 8.55                                                   |
|                    | V6                      | 4.58               | 7    | 313              | 3.52           | 26.32       | 109                | 0.73                                                   | 6.23               | 5    | 267              | 3.94           | 18.10       | 95                 | 7.82                                                   |
|                    | V7                      | -                  | -    | -                | -              | -           | -                  | -                                                      | -                  | -    | -                | -              | -           | -                  | -                                                      |
|                    | V8                      | 4.59               | 6    | 325              | 3.44           | 26.24       | 103                | 0.45                                                   | 6.92               | 1    | 285              | 4.77           | 21.05       | 91                 | 1.73                                                   |
|                    | V9                      | 4.42               | 8    | 320              | 3.42           | 26.29       | 108                | 0.91                                                   | 4.93               | 8    | 280              | 3.27           | 16.58       | 100                | 8.55                                                   |
|                    | V10                     | -                  | -    | -                | -              | -           | -                  | -                                                      | -                  | -    | -                | -              | -           | -                  | -                                                      |
|                    | C.D.(0.05)              | 0.16               |      | NS               | 0.02           | 0.02        | 1.02               |                                                        | 0.43               |      | 19.74            | 0.33           | 0.61        | 0.72               |                                                        |
|                    | C.V. (%)                | 2.85               |      | 4.75             | 0.51           | 0.07        | 0.81               |                                                        | 6.11               |      | 6.24             | 6.76           | 2.66        | 0.64               |                                                        |
|                    | Expt. Mean              | 4.79               |      | 317              | 3.37           | 26.35       | 106                |                                                        | 6.02               |      | 268              | 4.15           | 19.39       | 95                 |                                                        |
|                    | Soil type               | -                  |      |                  |                |             |                    |                                                        | Clay loam          |      |                  |                |             |                    |                                                        |
|                    | pH                      | 7.70               |      |                  |                |             |                    |                                                        | 7.20               |      |                  |                |             |                    |                                                        |
|                    | N - levels (kg/ha)      |                    |      |                  |                |             |                    |                                                        |                    |      |                  |                |             |                    |                                                        |
|                    | F1                      | 120:60:40          |      |                  |                |             |                    |                                                        | 120:60:40          |      |                  |                |             |                    |                                                        |
|                    | F2                      | 180:90:60          |      |                  |                |             |                    |                                                        | 180:90:60          |      |                  |                |             |                    |                                                        |
|                    | Recomnd N:P:K (kg/ha)   | 120:60:40          |      |                  |                |             |                    |                                                        | 120:60:40          |      |                  |                |             |                    |                                                        |
|                    | Varieties               |                    |      |                  |                |             |                    |                                                        |                    |      |                  |                |             |                    |                                                        |
|                    | V1                      | IET 26549          |      |                  |                |             |                    |                                                        | IET 26549          |      |                  |                |             |                    |                                                        |
|                    | V2                      | IET 27136          |      |                  |                |             |                    |                                                        | IET 27136          |      |                  |                |             |                    |                                                        |
|                    | V3                      | IET 25802          |      |                  |                |             |                    |                                                        | IET 25802          |      |                  |                |             |                    |                                                        |
|                    | V4                      | IET 25798          |      |                  |                |             |                    |                                                        | IET 25798          |      |                  |                |             |                    |                                                        |
|                    | V5                      | IET 24990          |      |                  |                |             |                    |                                                        | IET 24990          |      |                  |                |             |                    |                                                        |
|                    | V6                      | DRRH 3             |      |                  |                |             |                    |                                                        | DRRH 3             |      |                  |                |             |                    |                                                        |
|                    | V7                      | -                  |      |                  |                |             |                    |                                                        | -                  |      |                  |                |             |                    |                                                        |
|                    | V8                      | KRH 4              |      |                  |                |             |                    |                                                        | KRH 4              |      |                  |                |             |                    |                                                        |
|                    | V9                      | WGL 14             |      |                  |                |             |                    |                                                        | WGL 14             |      |                  |                |             |                    |                                                        |
|                    | V10                     | -                  |      |                  |                |             |                    |                                                        | -                  |      |                  |                |             |                    |                                                        |
|                    | Available N:P:K (kg/ha) | 21:18.33:209       |      |                  |                |             |                    |                                                        | 172.4:23.4:452.7   |      |                  |                |             |                    |                                                        |

Table 4.1(g): Contd.

| F-levels    | Varieties | MARUTERU           |      |                              |                |             |                    | Over all mean | Rank |
|-------------|-----------|--------------------|------|------------------------------|----------------|-------------|--------------------|---------------|------|
|             |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering |               |      |
| F1          | V1        | 5.91               | 6    | 293                          | 3.83           | 18.12       | 104                | 5.70          | 10   |
|             | V2        | 5.84               | 8    | 291                          | 3.76           | 16.2        | 98                 | 5.36          | 17   |
|             | V3        | 5.63               | 10   | 275                          | 3.59           | 15.51       | 97                 | 6.06          | 5    |
|             | V4        | 5.74               | 9    | 281                          | 3.69           | 15.89       | 100                | 5.61          | 11   |
|             | V5        | 5.92               | 5    | 295                          | 3.83           | 16.48       | 100                | 5.39          | 16   |
|             | V6        | -                  | -    | -                            | -              | -           | -                  | 5.52          | 14   |
|             | V7        | 5.33               | 16   | 261                          | 3.35           | 15.53       | 101                | 5.58          | 12   |
|             | V8        | 5.55               | 12   | 268                          | 3.53           | 15.24       | 99                 | 5.57          | 13   |
|             | V9        | 5.43               | 14   | 264                          | 3.43           | 15.63       | 103                | 4.98          | 18   |
|             | V10       | -                  | -    | -                            | -              | -           | -                  | 2.60          | 20   |
| F2          | V1        | 6.23               | 1    | 302                          | 4.24           | 18.14       | 105                | 3.05          | 4    |
|             | V2        | 6.22               | 3    | 298                          | 4.11           | 16.21       | 100                | 3.62          | 8    |
|             | V3        | 5.91               | 6    | 296                          | 3.89           | 15.55       | 98                 | 2.67          | 1    |
|             | V4        | 6.03               | 4    | 297                          | 4.01           | 15.9        | 102                | 2.76          | 2    |
|             | V5        | 6.23               | 1    | 301                          | 4.21           | 16.5        | 103                | 2.95          | 9    |
|             | V6        | -                  | -    | -                            | -              | -           | -                  | 6.18          | 3    |
|             | V7        | 5.4                | 15   | 270                          | 3.58           | 15.51       | 102                | 0.67          | 6    |
|             | V8        | 5.6                | 11   | 284                          | 3.69           | 15.25       | 102                | 0.48          | 7    |
|             | V9        | 5.51               | 13   | 278                          | 3.6            | 15.66       | 105                | 0.76          | 15   |
|             | V10       | -                  | -    | -                            | -              | -           | -                  | 3.52          | 19   |
| Interation  |           |                    |      |                              |                |             |                    |               |      |
| F at same V |           | NS                 |      | NS                           | NS             | NS          | NS                 |               |      |
| V at same F |           | NS                 |      | NS                           | NS             | NS          | NS                 |               |      |
| F1          |           | 5.67               | 2    | 279                          | 3.63           | 16.08       | 100                | 5.51          | 2    |
| F2          |           | 5.89               | 1    | 291                          | 3.92           | 16.09       | 102                | 2.12          | 1    |
| C.D.(0.05)  |           | NS                 |      | 11.34                        | 0.21           | NS          | 1.24               |               |      |
| C.V.(%)     |           | 6.56               |      | 3.21                         | 4.46           | 2.79        | 0.99               |               |      |

Table 4.1(g): Contd.

| F-levels           | Varieties                       | MARUTERU           |      |                              |                |             |                    |                                                        | Over all mean | Rank |
|--------------------|---------------------------------|--------------------|------|------------------------------|----------------|-------------|--------------------|--------------------------------------------------------|---------------|------|
|                    |                                 | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |               |      |
| Mean of varieties: |                                 |                    |      |                              |                |             |                    |                                                        |               |      |
|                    | V1                              | 6.07               | 2    | 298                          | 4.04           | 18.13       | 105                | 3.05                                                   | 5.91          | 3    |
|                    | V2                              | 6.03               | 3    | 295                          | 3.94           | 16.21       | 99                 | 3.62                                                   | 5.61          | 8    |
|                    | V3                              | 5.77               | 5    | 286                          | 3.74           | 15.53       | 98                 | 2.67                                                   | 6.24          | 1    |
|                    | V4                              | 5.89               | 4    | 289                          | 3.85           | 15.90       | 101                | 2.76                                                   | 5.94          | 2    |
|                    | V5                              | 6.08               | 1    | 298                          | 4.02           | 16.49       | 102                | 2.95                                                   | 5.62          | 7    |
|                    | V6                              | -                  |      | -                            | -              | -           | -                  |                                                        | 5.85          | 4    |
|                    | V7                              | 5.37               |      | 266                          | 3.47           | 15.52       | 102                | 0.67                                                   | 5.77          | 5    |
|                    | V8                              | 5.58               | 6    | 276                          | 3.61           | 15.25       | 101                | 0.48                                                   | 5.74          | 6    |
|                    | V9                              | 5.47               | 7    | 271                          | 3.52           | 15.65       | 104                | 0.76                                                   | 5.22          | 9    |
|                    | V10                             | -                  |      | -                            | -              | -           | -                  |                                                        | 3.06          | 10   |
|                    | C.D.(0.05)                      | 0.43               |      | 19.74                        | 0.33           | 0.61        | 0.72               |                                                        |               |      |
|                    | C.V. (%)                        | 6.11               |      | 6.24                         | 6.76           | 2.66        | 0.64               |                                                        |               |      |
|                    | Expt. Mean                      | 5.78               |      | 285                          | 3.77           | 16.08       | 101                |                                                        | 5.74          |      |
|                    | Soil type                       | Delta alluvial     |      |                              |                |             |                    |                                                        |               |      |
|                    | pH                              | 7.16               |      |                              |                |             |                    |                                                        |               |      |
|                    | N - levels (kg/ha)              |                    |      |                              |                |             |                    |                                                        |               |      |
|                    | F1                              | 90:60:60           |      |                              |                |             |                    |                                                        |               |      |
|                    | F2                              | 135:90:90          |      |                              |                |             |                    |                                                        |               |      |
|                    | Recommended N:P:K (kg/ha)       | 90:60:60           |      |                              |                |             |                    |                                                        |               |      |
|                    | Varieties                       |                    |      |                              |                |             |                    |                                                        |               |      |
|                    | V1                              | IET 26549          |      |                              |                |             |                    |                                                        |               |      |
|                    | V2                              | IET 27136          |      |                              |                |             |                    |                                                        |               |      |
|                    | V3                              | IET 25802          |      |                              |                |             |                    |                                                        |               |      |
|                    | V4                              | IET 25798          |      |                              |                |             |                    |                                                        |               |      |
|                    | V5                              | IET 24990          |      |                              |                |             |                    |                                                        |               |      |
|                    | V6                              | -                  |      |                              |                |             |                    |                                                        |               |      |
|                    | V7                              | 27 P 63            |      |                              |                |             |                    |                                                        |               |      |
|                    | V8                              | KRH 4              |      |                              |                |             |                    |                                                        |               |      |
|                    | V9                              | WGL 14             |      |                              |                |             |                    |                                                        |               |      |
|                    | V10                             | -                  |      |                              |                |             |                    |                                                        |               |      |
|                    | Available N:P:K of soil (kg/ha) | 151:36:257         |      |                              |                |             |                    |                                                        |               |      |

### NMT 1(i) AL and ISTVT

Saline tolerant culture (IET 27077) was evaluated for its response to different levels of nutrients on grain yield at four different locations i.e. **Kanpur (120:60:50)**, **Lucknow (150:60:40)**, **Navsari (120:30:0)** and **Rajendranagar (120:60:40)**. The details and data received from these locations are summarized and presented in Table 4.1(i).

Different RDF doses significantly influenced the grain yield at both locations (**Kanpur** and **Lucknow**) and maximum increase in grain yield was observed with 150% RDF (2.77 to 5.25 t/ha) respectively. Application of 150% RDF recorded higher grain yields at **Kanpur** (2.77 t/ha) and **Lucknow** (5.25 t/ha) and higher nutrient response was recorded at **Kanpur** (5.71) and **Lucknow** (4.67).

Grain yield differences among the tested cultures were found to be significant at all the location except **Kanpur**. IET 27077 recorded higher yield at **Lucknow** (5.24 t/ha), **Navsari** (6.73 t/ha) and **ARI-Rajendranagar** (5.47 t/ha). Higher nutrient response was noted with IET 27077 at **Navsari** (6.00). Interaction effects among RFD x varieties on grain yield was found to be non-significant at all locations. Mean over the locations, IET 27077 was found promising with highest grain yield (5.81 t/ha)

In this trial, 150% RDF was found to be promising and also exhibited higher nutrient recovery, IET 27077 (5.81 t/ha) was found to be promising entry and recorded higher grain yield at most of the locations over other test entries.

Table 4.1(i): Summary of data on grain yield and ancillary characters of selected NMT AL&amp;ISTVT cultures grown under transplanted conditions at low and medium recommended fertilizer doses, kharif 2019.

| F-levels           | Varieties | KANPUR             |      |                              |                |             |                    |                                                        | LUCKNOW            |      |                              |                |             |                    |                                                        |
|--------------------|-----------|--------------------|------|------------------------------|----------------|-------------|--------------------|--------------------------------------------------------|--------------------|------|------------------------------|----------------|-------------|--------------------|--------------------------------------------------------|
|                    |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
| F1                 | V1        | 2.22               | 5    | 277                          | 1.36           | 27.65       | 77                 |                                                        | 4.97               | 6    | 342                          | 3.88           | 24.63       | 104                |                                                        |
|                    | V2        | 2.09               | 6    | 307                          | 1.36           | 22.72       | 95                 |                                                        | 3.78               | 12   | 255                          | 2.69           | 23.47       | 87                 |                                                        |
|                    | V3        | -                  |      | -                            | -              | -           | -                  |                                                        | 4.78               | 11   | 294                          | 2.90           | 22.97       | 96                 |                                                        |
|                    | V4        | -                  |      | -                            | -              | -           | -                  |                                                        | 4.85               | 7    | 323                          | 3.77           | 20.00       | 99                 |                                                        |
|                    | V5        | 2.04               | 7    | 280                          | 1.39           | 23.99       | 99                 |                                                        | 4.80               | 10   | 279                          | 3.75           | 17.07       | 95                 |                                                        |
|                    | V6        | 1.99               | 8    | 312                          | 1.31           | 26.15       | 86                 |                                                        | 4.83               | 8    | 275                          | 3.42           | 17.73       | 103                |                                                        |
| F2                 | V1        | 2.91               | 1    | 284                          | 1.51           | 28.19       | 79                 | 5.75                                                   | 5.51               | 1    | 438                          | 3.99           | 22.57       | 104                | 4.32                                                   |
|                    | V2        | 2.66               | 4    | 313                          | 1.59           | 23.87       | 92                 | 4.75                                                   | 4.82               | 9    | 352                          | 4.02           | 19.17       | 86                 | 8.32                                                   |
|                    | V3        | -                  |      | -                            | -              | -           | -                  |                                                        | 5.17               | 5    | 424                          | 3.85           | 19.83       | 93                 | 3.12                                                   |
|                    | V4        | -                  |      | -                            | -              | -           | -                  |                                                        | 5.45               | 2    | 396                          | 3.61           | 21.80       | 97                 | 4.80                                                   |
|                    | V5        | 2.73               | 3    | 280                          | 1.69           | 24.44       | 90                 | 5.75                                                   | 5.28               | 3    | 307                          | 3.87           | 18.57       | 91                 | 3.84                                                   |
|                    | V6        | 2.78               | 2    | 319                          | 1.63           | 27.45       | 89                 | 6.58                                                   | 5.28               | 3    | 310                          | 3.50           | 21.83       | 106                | 3.60                                                   |
| Interaction        |           |                    |      |                              |                |             |                    |                                                        |                    |      |                              |                |             |                    |                                                        |
| F at same V        |           | NS                 |      | NS                           | 0.04           | 0.14        | 1.62               |                                                        | NS                 |      | 34.41                        | 0.58           | 2.28        | NS                 |                                                        |
| V at same F        |           | NS                 |      | NS                           | 0.03           | 0.17        | 1.91               |                                                        | NS                 |      | 34.96                        | 0.7            | 2.99        | NS                 |                                                        |
| F1                 |           | 2.09               | 2    | 294                          | 1.36           | 25.13       | 89                 |                                                        | 4.67               | 2    | 295                          | 3.40           | 20.98       | 97                 |                                                        |
| F2                 |           | 2.77               | 1    | 299                          | 1.61           | 25.99       | 87                 | 5.71                                                   | 5.25               | 1    | 371                          | 3.81           | 20.63       | 96                 | 4.67                                                   |
| C.D.(0.05)         |           | 0.41               |      | 3.19                         | 0.01           | 0.14        | 1.64               |                                                        | 0.57               |      | 19.51                        | NS             | NS          | NS                 |                                                        |
| C.V.(%)            |           | 9.72               |      | 0.61                         | 0.41           | 0.32        | 1.06               |                                                        | 8.07               |      | 4.09                         | 11.44          | 9.22        | 0.91               |                                                        |
| Mean of varieties: |           |                    |      |                              |                |             |                    |                                                        |                    |      |                              |                |             |                    |                                                        |
|                    | V1        | 2.57               | 1    | 280                          | 1.44           | 27.92       | 78                 | 5.75                                                   | 5.24               | 1    | 390                          | 3.94           | 23.60       | 104                | 4.32                                                   |
|                    | V2        | 2.38               | 4    | 310                          | 1.48           | 23.30       | 94                 | 4.75                                                   | 4.30               | 6    | 303                          | 3.36           | 21.32       | 86                 | 8.32                                                   |
|                    | V3        | -                  |      | -                            | -              | -           | -                  |                                                        | 4.98               | 5    | 359                          | 3.38           | 21.40       | 95                 | 3.12                                                   |
|                    | V4        | -                  |      | -                            | -              | -           | -                  |                                                        | 5.15               | 2    | 359                          | 3.69           | 20.90       | 98                 | 4.80                                                   |
|                    | V5        | 2.39               | 2    | 280                          | 1.54           | 24.22       | 94                 | 5.75                                                   | 5.04               | 4    | 293                          | 3.81           | 17.82       | 93                 | 3.84                                                   |
|                    | V6        | 2.39               | 2    | 316                          | 1.47           | 26.80       | 87                 | 6.58                                                   | 5.06               | 3    | 292                          | 3.46           | 19.78       | 105                | 3.60                                                   |
| C.D.(0.05)         |           | NS                 |      | 3.75                         | 0.03           | 0.1         | 1.15               |                                                        | 0.31               |      | 24.33                        | 0.41           | 1.61        | 2.94               |                                                        |
| C.V. (%)           |           | 5.26               |      | 1                            | 1.43           | 0.31        | 1.03               |                                                        | 5.13               |      | 6.07                         | 9.37           | 6.44        | 2.53               |                                                        |
| Expt. Mean         |           | 2.43               |      | 296                          | 1.48           | 25.56       | 88                 |                                                        | 4.96               |      | 333                          | 3.60           | 20.80       | 97                 |                                                        |

Table 4.1(i): Contd.

| F-levels                        | Varieties | KANPUR                |      |                              |                |             |                    |                                                        | LUCKNOW            |      |                              |                |             |                    |                                                        |
|---------------------------------|-----------|-----------------------|------|------------------------------|----------------|-------------|--------------------|--------------------------------------------------------|--------------------|------|------------------------------|----------------|-------------|--------------------|--------------------------------------------------------|
|                                 |           | Grain Yield (t/ha)    | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
| Soil type                       |           | Sandy loam            |      |                              |                |             |                    |                                                        | -                  |      |                              |                |             |                    |                                                        |
| pH                              |           | 9.80                  |      |                              |                |             |                    |                                                        | 8.90               |      |                              |                |             |                    |                                                        |
| <b>N - levels (kg/ha)</b>       |           |                       |      |                              |                |             |                    |                                                        |                    |      |                              |                |             |                    |                                                        |
| F1                              |           | 120:60:60             |      |                              |                |             |                    |                                                        | 150:60:40          |      |                              |                |             |                    |                                                        |
| F2                              |           | 180:90:90             |      |                              |                |             |                    |                                                        | 225:90:60          |      |                              |                |             |                    |                                                        |
| Recommended N:P:K (kg/ha)       |           | 120:60:60             |      |                              |                |             |                    |                                                        | 150:60:40          |      |                              |                |             |                    |                                                        |
| <b>Varieties</b>                |           |                       |      |                              |                |             |                    |                                                        |                    |      |                              |                |             |                    |                                                        |
| V1                              |           | IET 27077             |      |                              |                |             |                    |                                                        | IET 27077          |      |                              |                |             |                    |                                                        |
| V2                              |           | CSR-10                |      |                              |                |             |                    |                                                        | CSR-10             |      |                              |                |             |                    |                                                        |
| V3                              |           | -                     |      |                              |                |             |                    |                                                        | CSR-23             |      |                              |                |             |                    |                                                        |
| V4                              |           | -                     |      |                              |                |             |                    |                                                        | CSR-36             |      |                              |                |             |                    |                                                        |
| V5                              |           | Jaya                  |      |                              |                |             |                    |                                                        | Jaya               |      |                              |                |             |                    |                                                        |
| V6                              |           | Local Check - NDR 312 |      |                              |                |             |                    |                                                        | Local Check        |      |                              |                |             |                    |                                                        |
| Available N:P:K of soil (kg/ha) |           | 148.3:22.9: 265.1     |      |                              |                |             |                    |                                                        | 116.32:28:336.12   |      |                              |                |             |                    |                                                        |

Table 4.1(i): Contd.

| F-levels           | Varieties | NAVSARI            |      |                              |                |             |                    |                                                        | Rajendranagar - ARI |      |                              |                |             |                                                        | Over all mean | Rank |
|--------------------|-----------|--------------------|------|------------------------------|----------------|-------------|--------------------|--------------------------------------------------------|---------------------|------|------------------------------|----------------|-------------|--------------------------------------------------------|---------------|------|
|                    |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) | Grain Yield (t/ha)  | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |               |      |
| F1                 | V1        | 6.50               | 2    | 304                          | 3.16           | 20.14       | 104                |                                                        | 5.29                | 2    | 327                          | 2.39           | 18.23       |                                                        | 5.59          | 2    |
|                    | V2        | 5.30               | 8    | 271                          | 2.82           | 26.88       | 95                 |                                                        | 4.43                | 6    | 364                          | 1.26           | 20.73       |                                                        | 4.50          | 12   |
|                    | V3        | 5.40               | 6    | 318                          | 2.77           | 23.84       | 96                 |                                                        | -                   |      | -                            | -              | -           |                                                        | 5.09          | 7    |
|                    | V4        | 5.10               | 12   | 262                          | 3.26           | 30.77       | 97                 |                                                        | -                   |      | -                            | -              | -           |                                                        | 4.98          | 9    |
|                    | V5        | 5.29               | 9    | 258                          | 3.14           | 28.63       | 93                 |                                                        | 4.24                | 8    | 228                          | 3.22           | 22.57       |                                                        | 4.78          | 11   |
|                    | V6        | 5.90               | 4    | 298                          | 3.22           | 22.37       | 97                 |                                                        | 4.25                | 7    | 235                          | 3.49           | 11.63       |                                                        | 4.99          | 8    |
| F2                 | V1        | 6.95               | 1    | 347                          | 3.61           | 20.09       | 105                | 6.00                                                   | 5.64                | 1    | 353                          | 2.93           | 18.90       | 3.18                                                   | 6.03          | 1    |
|                    | V2        | 5.39               | 7    | 310                          | 3.31           | 27.19       | 93                 | 1.20                                                   | 4.54                | 5    | 392                          | 1.26           | 23.93       | 1.00                                                   | 4.92          | 10   |
|                    | V3        | 5.27               | 10   | 338                          | 3.25           | 23.90       | 97                 | -1.73                                                  | -                   |      | -                            | -              | -           |                                                        | 5.22          | 5    |
|                    | V4        | 5.67               | 5    | 276                          | 3.29           | 30.66       | 95                 | 7.60                                                   | -                   |      | -                            | -              | -           |                                                        | 5.56          | 3    |
|                    | V5        | 5.19               | 11   | 287                          | 3.25           | 28.92       | 95                 | -1.33                                                  | 5.02                | 3    | 300                          | 3.26           | 23.33       | 7.09                                                   | 5.16          | 6    |
|                    | V6        | 6.18               | 3    | 314                          | 3.39           | 22.52       | 97                 | 3.73                                                   | 5.02                | 3    | 284                          | 4.07           | 12.13       | 7.00                                                   | 5.49          | 4    |
| Interaction        |           |                    |      |                              |                |             |                    |                                                        |                     |      |                              |                |             |                                                        |               |      |
| F at same V        |           | NS                 |      | NS                           | NS             | NS          | NS                 |                                                        | NS                  |      | NS                           | NS             | NS          |                                                        |               |      |
| V at same F        |           | NS                 |      | NS                           | NS             | NS          | NS                 |                                                        | NS                  |      | NS                           | NS             | NS          |                                                        |               |      |
| F1                 |           | 5.58               | 2    | 285                          | 3.06           | 25.44       | 97                 |                                                        | 4.55                | 2    | 288                          | 2.59           | 18.29       |                                                        | 4.93          | 2    |
| F2                 |           | 5.78               | 1    | 312                          | 3.35           | 25.55       | 97                 | 2.58                                                   | 5.06                | 1    | 332                          | 2.88           | 19.57       | 4.57                                                   | 5.36          | 1    |
| C.D.(0.05)         |           | NS                 |      | 22.37                        | 0.28           | NS          | NS                 |                                                        | NS                  |      | 14.61                        | NS             | NS          |                                                        |               |      |
| C.V.(%)            |           | 9.58               |      | 5.22                         | 6.02           | 2.82        | 0.45               |                                                        | 11.14               |      | 2.68                         | 12.6           | 14.26       |                                                        |               |      |
| Mean of varieties: |           |                    |      |                              |                |             |                    |                                                        |                     |      |                              |                |             |                                                        |               |      |
|                    | V1        | 6.73               | 1    | 326                          | 3.39           | 20.12       | 105                | 6.00                                                   | 5.47                | 1    | 340                          | 2.66           | 18.57       | 3.18                                                   | 5.81          | 1    |
|                    | V2        | 5.35               | 4    | 291                          | 3.07           | 27.04       | 94                 | 1.20                                                   | 4.49                | 4    | 378                          | 1.26           | 22.33       | 1.00                                                   | 4.71          | 6    |
|                    | V3        | 5.34               | 5    | 328                          | 3.01           | 23.87       | 97                 | -1.73                                                  | -                   |      | -                            | -              | -           |                                                        | 5.16          | 4    |
|                    | V4        | 5.39               | 3    | 269                          | 3.28           | 30.72       | 96                 | 7.60                                                   | -                   |      | -                            | -              | -           |                                                        | 5.27          | 2    |
|                    | V5        | 5.24               | 6    | 272                          | 3.20           | 28.78       | 94                 | -1.33                                                  | 4.63                | 3    | 264                          | 3.24           | 22.95       | 7.09                                                   | 4.97          | 5    |
|                    | V6        | 6.04               | 2    | 306                          | 3.31           | 22.45       | 97                 | 3.73                                                   | 4.64                | 2    | 259                          | 3.78           | 11.88       | 7.00                                                   | 5.24          | 3    |
| C.D.(0.05)         |           | 0.75               |      | 27.51                        | 0.16           | 0.28        | 1.55               |                                                        | 0.6                 |      | 61.2                         | 0.85           | 2.09        |                                                        |               |      |
| C.V. (%)           |           | 10.9               |      | 7.65                         | 4.09           | 0.9         | 1.33               |                                                        | 10                  |      | 15.68                        | 24.76          | 8.76        |                                                        |               |      |
| Expt. Mean         |           | 5.68               |      | 299                          | 3.21           | 25.49       | 97                 |                                                        | 4.80                |      | 310                          | 2.74           | 18.93       |                                                        | 5.15          |      |

Table 4.1(i): Contd.

| F-levels                        | Varieties | NAVSARI             |      |                              |                |             |                    |                                                        | Rajendranagar - ARI     |      |                              |                |             |                                                        | Over all mean | Rank |
|---------------------------------|-----------|---------------------|------|------------------------------|----------------|-------------|--------------------|--------------------------------------------------------|-------------------------|------|------------------------------|----------------|-------------|--------------------------------------------------------|---------------|------|
|                                 |           | Grain Yield (t/ha)  | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) | Grain Yield (t/ha)      | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |               |      |
| Soil type                       |           | -                   |      |                              |                |             |                    |                                                        | Clay loam               |      |                              |                |             |                                                        |               |      |
| pH                              |           | 8.51                |      |                              |                |             |                    |                                                        | 7.99                    |      |                              |                |             |                                                        |               |      |
| <b>N - levels (kg/ha)</b>       |           |                     |      |                              |                |             |                    |                                                        |                         |      |                              |                |             |                                                        |               |      |
| F1                              |           | 120:30:0            |      |                              |                |             |                    |                                                        | 120:60:40               |      |                              |                |             |                                                        |               |      |
| F2                              |           | 180:45:90           |      |                              |                |             |                    |                                                        | 180:90:60               |      |                              |                |             |                                                        |               |      |
| Recommended N:P:K (kg/ha)       |           | 120:30:0            |      |                              |                |             |                    |                                                        | 120:60:40               |      |                              |                |             |                                                        |               |      |
| <b>Varieties</b>                |           |                     |      |                              |                |             |                    |                                                        |                         |      |                              |                |             |                                                        |               |      |
| V1                              |           | IET 27077           |      |                              |                |             |                    |                                                        | IET 27077               |      |                              |                |             |                                                        |               |      |
| V2                              |           | CSR-10              |      |                              |                |             |                    |                                                        | CSR-10                  |      |                              |                |             |                                                        |               |      |
| V3                              |           | CSR-23              |      |                              |                |             |                    |                                                        | -                       |      |                              |                |             |                                                        |               |      |
| V4                              |           | CSR-36              |      |                              |                |             |                    |                                                        | -                       |      |                              |                |             |                                                        |               |      |
| V5                              |           | Jaya                |      |                              |                |             |                    |                                                        | Jaya                    |      |                              |                |             |                                                        |               |      |
| V6                              |           | Local Check - Dandi |      |                              |                |             |                    |                                                        | Local Check - RNR 15048 |      |                              |                |             |                                                        |               |      |
| Available N:P:K of soil (kg/ha) |           | 255:57:1184         |      |                              |                |             |                    |                                                        | 226:109:689             |      |                              |                |             |                                                        |               |      |

**NMT 1(j) RSL**

AVT-2 entry (IET 26692) was evaluated for its response to levels nutrients on grain yield at five locations i.e. **Chinsurah (80:40:40)**, **Dhangain (120:60:40)**, **Faizabad (80:40:40)**, **Ghaghraghat (60:30:30)** and **Pusa (120:60:40)** under two levels of RDF (100% and 150% RDF). The details and data received from these locations are summarized and presented in Table 4.1(j).

RDF doses of nutrient application significantly influenced the grain yield at both the locations **Chinsurah** and **Ghaghraghat** and the maximum increase in grain yield was recorded with 150% RDF (4.73 and 3.44 t/ha respectively). Higher nutrient response at 150% RDF was recorded at both these locations (6.62 and 7.00 kg grain / kg nutrient).

Grain yield differences among the tested varieties were significant at all the locations except **Ghaghraghat**. Significantly higher mean maximum grain yield was recorded by IET 26692 at **Chinsurah** (5.20 t/ha), **Dhangain** (7.47 t/ha), **Pusa** (3.57 t/ha) and **Faizabad** (3.34 t/ha). Interaction effects among RFD x varieties was found to be non-significant at all the locations. Mean over the location, IET 26692 recorded maximum grain yield of 4.67 t/ha over other cultivars.

In this trial, 150% RDF was found to be promising and also exhibited higher nutrient recovery efficiency. IET 26692 was found to be promising in terms of grain yield and nutrient response at most of the locations.

Table 4.1.1(j): Summary of data on grain yield and ancillary characters of selected NMT RSL cultures grown under transplanted conditions at low and medium of recommended fertilizer doses, kharif 2019.

| F-levels | Varieties                       | CHINSURAH          |      |                              |                |                       |                                                        |
|----------|---------------------------------|--------------------|------|------------------------------|----------------|-----------------------|--------------------------------------------------------|
|          |                                 | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Days to 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
| F1       | V1                              | 4.86               | 3    | 323                          | 3.10           | 118                   |                                                        |
|          | V2                              | -                  |      | -                            | -              | -                     |                                                        |
|          | V3                              | 3.73               | 7    | 311                          | 3.28           | 120                   |                                                        |
|          | V4                              | 3.46               | 8    | 298                          | 3.07           | 120                   |                                                        |
|          | V5                              | 4.73               | 4    | 5                            | 3.13           | 120                   |                                                        |
| F2       | V1                              | 5.54               | 1    | 343                          | 3.64           | 119                   | 8.50                                                   |
|          | V2                              | -                  |      | -                            | -              | -                     |                                                        |
|          | V3                              | 4.07               | 5    | 309                          | 3.14           | 120                   | 4.25                                                   |
|          | V4                              | 4.04               | 6    | 311                          | 3.08           | 121                   | 7.25                                                   |
|          | V5                              | 5.25               | 2    | 336                          | 3.33           | 120                   | 6.50                                                   |
|          | Interaction                     |                    |      |                              |                |                       |                                                        |
|          | F at same V                     | NS                 |      | 33.26                        | 0.23           | NS                    |                                                        |
|          | V at same F                     | NS                 |      | 36.33                        | 0.32           | NS                    |                                                        |
|          | F1                              | 4.20               | 2    | 234                          | 3.15           | 120                   |                                                        |
|          | F2                              | 4.73               | 1    | 325                          | 3.30           | 120                   | 6.62                                                   |
|          | C.D.(0.05)                      | 0.15               |      | 28.08                        | NS             | NS                    |                                                        |
|          | C.V.(%)                         | 1.91               |      | 5.72                         | 5.74           | 0.34                  |                                                        |
|          | <b>Mean of varieties:</b>       |                    |      |                              |                |                       |                                                        |
|          | V1                              | 5.20               | 1    | 333                          | 3.37           | 119                   | 8.50                                                   |
|          | V2                              | -                  |      | -                            | -              | -                     |                                                        |
|          | V3                              | 3.90               | 3    | 310                          | 3.21           | 120                   | 4.25                                                   |
|          | V4                              | 3.75               | 4    | 305                          | 3.08           | 121                   | 7.25                                                   |
|          | V5                              | 4.99               | 2    | 170                          | 3.23           | 120                   | 6.50                                                   |
|          | C.D.(0.05)                      | 0.44               |      | 23.52                        | 0.16           | 1.03                  |                                                        |
|          | C.V. (%)                        | 7.92               |      | 6.69                         | 4              | 0.68                  |                                                        |
|          | <b>Expt. Mean</b>               | <b>4.46</b>        |      | <b>279</b>                   | <b>3.22</b>    | <b>120</b>            |                                                        |
|          | Soil type                       | Clay loam          |      |                              |                |                       |                                                        |
|          | pH                              | 7.85               |      |                              |                |                       |                                                        |
|          | <b>N - levels (kg/ha)</b>       |                    |      |                              |                |                       |                                                        |
|          | F1                              | 80:40:40           |      |                              |                |                       |                                                        |
|          | F2                              | 120:60:60          |      |                              |                |                       |                                                        |
|          | Recommended N:P:K (kg/ha)       | 80:40:40           |      |                              |                |                       |                                                        |
|          | <b>Varieties</b>                |                    |      |                              |                |                       |                                                        |
|          | V1                              | IET 26692          |      |                              |                |                       |                                                        |
|          | V2                              | -                  |      |                              |                |                       |                                                        |
|          | V3                              | Pooja              |      |                              |                |                       |                                                        |
|          | V4                              | Savithri           |      |                              |                |                       |                                                        |
|          | V5                              | LC - Rajdeep       |      |                              |                |                       |                                                        |
|          | Available N:P:K of soil (kg/ha) | 530:116:364        |      |                              |                |                       |                                                        |

Table 4.1.1(j): Contd.

| F-levels                        | Varieties | DHANGAIN           |      |                              |                |                       |                                                        |
|---------------------------------|-----------|--------------------|------|------------------------------|----------------|-----------------------|--------------------------------------------------------|
|                                 |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Days to 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
| F1                              | V1        | 7.17               | 2    | 291                          | 3.56           | 106                   |                                                        |
|                                 | V2        | -                  |      | -                            | -              | -                     |                                                        |
|                                 | V3        | 5.12               | 6    | 287                          | 3.25           | 118                   |                                                        |
|                                 | V4        | 4.98               | 8    | 283                          | 2.55           | 103                   |                                                        |
|                                 | V5        | 5.10               | 7    | 272                          | 3.08           | 121                   |                                                        |
| F2                              | V1        | 7.77               | 1    | 302                          | 4.38           | 109                   | 5.45                                                   |
|                                 | V2        | -                  |      | -                            | -              | -                     |                                                        |
|                                 | V3        | 5.82               | 3    | 298                          | 4.35           | 120                   | 6.36                                                   |
|                                 | V4        | 5.65               | 4    | 292                          | 2.64           | 104                   | 6.09                                                   |
|                                 | V5        | 5.56               | 5    | 282                          | 3.14           | 123                   | 4.18                                                   |
| Interaction                     |           |                    |      |                              |                |                       |                                                        |
| F at same V                     |           | NS                 |      | NS                           | NS             | NS                    |                                                        |
| V at same F                     |           | NS                 |      | NS                           | NS             | NS                    |                                                        |
| F1                              |           | 5.59               | 2    | 283                          | 3.11           | 112                   |                                                        |
| F2                              |           | 6.20               | 1    | 294                          | 3.63           | 114                   | 5.52                                                   |
| C.D.(0.05)                      |           | NS                 |      | NS                           | NS             | 1.24                  |                                                        |
| C.V.(%)                         |           | 6.05               |      | 6.7                          | 18.55          | 0.63                  |                                                        |
| <b>Mean of varieties:</b>       |           |                    |      |                              |                |                       |                                                        |
|                                 | V1        | 7.47               | 1    | 297                          | 3.97           | 107                   | 5.45                                                   |
|                                 | V2        | -                  |      | -                            | -              | -                     |                                                        |
|                                 | V3        | 5.47               | 2    | 293                          | 3.80           | 119                   | 6.36                                                   |
|                                 | V4        | 5.32               |      | 288                          | 2.60           | 103                   | 6.09                                                   |
|                                 | V5        | 5.33               | 3    | 277                          | 3.11           | 122                   | 4.18                                                   |
| C.D.(0.05)                      |           | 0.49               |      | NS                           | 1              | 0.63                  |                                                        |
| C.V. (%)                        |           | 6.55               |      | 5.39                         | 23.66          | 0.44                  |                                                        |
| <b>Expt. Mean</b>               |           | <b>5.90</b>        |      | <b>289</b>                   | <b>3.37</b>    | <b>113</b>            |                                                        |
| Soil type                       |           | Loamy              |      |                              |                |                       |                                                        |
| pH                              |           | 6.80               |      |                              |                |                       |                                                        |
| <b>N - levels (kg/ha)</b>       |           |                    |      |                              |                |                       |                                                        |
| F1                              |           | 120:60:40          |      |                              |                |                       |                                                        |
| F2                              |           | 180:90:60          |      |                              |                |                       |                                                        |
| Recommended N:P:K (kg/ha)       |           | 120:60:40          |      |                              |                |                       |                                                        |
| <b>Varieties</b>                |           |                    |      |                              |                |                       |                                                        |
| V1                              |           | IET 26692          |      |                              |                |                       |                                                        |
| V2                              |           | -                  |      |                              |                |                       |                                                        |
| V3                              |           | Pooja              |      |                              |                |                       |                                                        |
| V4                              |           | Savithri           |      |                              |                |                       |                                                        |
| V5                              |           | LC - MTU 7029      |      |                              |                |                       |                                                        |
| Available N:P:K of soil (kg/ha) |           | 154:14.4:183       |      |                              |                |                       |                                                        |

Table 4.1.1(j): Contd.

| F-levels                        | Varieties | FAIZABAD           |      |                              |                |              |                       |                                                        |
|---------------------------------|-----------|--------------------|------|------------------------------|----------------|--------------|-----------------------|--------------------------------------------------------|
|                                 |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g)  | Days to 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
| F1                              | V1        | 3.19               | 2    | 254                          | 3.47           | 24.47        | 113                   |                                                        |
|                                 | V2        | -                  |      | -                            | -              | -            | -                     |                                                        |
|                                 | V3        | 2.01               | 8    | 255                          | 2.63           | 20.97        | 113                   |                                                        |
|                                 | V4        | 2.17               | 7    | 261                          | 2.87           | 21.43        | 107                   |                                                        |
|                                 | V5        | 2.90               | 4    | 257                          | 3.10           | 22.17        | 102                   |                                                        |
| F2                              | V1        | 3.49               | 1    | 267                          | 3.77           | 24.63        | 112                   | 3.75                                                   |
|                                 | V2        | -                  |      | -                            | -              | -            | -                     |                                                        |
|                                 | V3        | 2.57               | 5    | 267                          | 2.80           | 21.80        | 110                   | 7.00                                                   |
|                                 | V4        | 2.54               | 6    | 266                          | 3.03           | 21.60        | 106                   | 4.63                                                   |
|                                 | V5        | 2.93               | 3    | 265                          | 3.27           | 23.37        | 106                   | 0.38                                                   |
| Interaction                     |           |                    |      |                              |                |              |                       |                                                        |
| F at same V                     |           | NS                 |      | NS                           | NS             | NS           | NS                    |                                                        |
| V at same F                     |           | NS                 |      | NS                           | NS             | NS           | NS                    |                                                        |
| F1                              |           | 2.57               | 2    | 257                          | 3.02           |              | 109                   |                                                        |
| F2                              |           | 2.88               | 1    | 266                          | 3.22           |              | 108                   | 3.94                                                   |
| C.D.(0.05)                      |           | NS                 |      | 8.88                         | 0.06           | 0.07         | NS                    |                                                        |
| C.V.(%)                         |           | 6.89               |      | 1.93                         | 1.13           | 0.18         | 2.61                  |                                                        |
| <b>Mean of varieties:</b>       |           |                    |      |                              |                |              |                       |                                                        |
|                                 | V1        | 3.34               | 1    | 260                          | 3.62           | 24.55        | 112                   | 3.75                                                   |
|                                 | V2        | -                  |      | -                            | -              | -            | -                     |                                                        |
|                                 | V3        | 2.29               | 4    | 261                          | 2.72           | 21.39        | 112                   | 7.00                                                   |
|                                 | V4        | 2.36               | 3    | 264                          | 2.95           | 21.52        | 107                   | 4.63                                                   |
|                                 | V5        | 2.92               | 2    | 261                          | 3.19           | 22.77        | 104                   | 0.38                                                   |
| C.D.(0.05)                      |           | 0.25               |      | NS                           | 0.13           | 0.37         | 2.35                  |                                                        |
| C.V. (%)                        |           | 7.18               |      | 1.19                         | 3.36           | 1.31         | 1.72                  |                                                        |
| <b>Expt. Mean</b>               |           | <b>2.73</b>        |      | <b>261</b>                   | <b>3.12</b>    | <b>22.56</b> | <b>109</b>            |                                                        |
| Soil type                       |           | Sandy loam         |      |                              |                |              |                       |                                                        |
| pH                              |           | 7.60               |      |                              |                |              |                       |                                                        |
| <b>N - levels (kg/ha)</b>       |           |                    |      |                              |                |              |                       |                                                        |
| F1                              |           | 80:40:40           |      |                              |                |              |                       |                                                        |
| F2                              |           | 120:60:60          |      |                              |                |              |                       |                                                        |
| Recommended N:P:K (kg/ha)       |           | 80:40:40           |      |                              |                |              |                       |                                                        |
| <b>Varieties</b>                |           |                    |      |                              |                |              |                       |                                                        |
| V1                              |           | IET 26692          |      |                              |                |              |                       |                                                        |
| V2                              |           | -                  |      |                              |                |              |                       |                                                        |
| V3                              |           | Pooja              |      |                              |                |              |                       |                                                        |
| V4                              |           | Savithri           |      |                              |                |              |                       |                                                        |
| V5                              |           | LC - Narendra 8002 |      |                              |                |              |                       |                                                        |
| Available N:P:K of soil (kg/ha) |           | 200:24:234         |      |                              |                |              |                       |                                                        |

Table 4.1.1(j): Contd.

| F-levels                        | Varieties | GHAGHRAGHAT        |      |                              |                |                                                        |
|---------------------------------|-----------|--------------------|------|------------------------------|----------------|--------------------------------------------------------|
|                                 |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
| F1                              | V1        | 3.63               | 2    | 181                          | 2.67           |                                                        |
|                                 | V2        | 3.00               | 8    | 172                          | 2.70           |                                                        |
|                                 | V3        | 2.84               | 9    | 167                          | 2.51           |                                                        |
|                                 | V4        | 2.42               | 10   | 154                          | 2.83           |                                                        |
|                                 | V5        | 3.22               | 6    | 178                          | 2.04           |                                                        |
| F2                              | V1        | 3.94               | 1    | 194                          | 2.95           | 5.17                                                   |
|                                 | V2        | 3.36               | 4    | 180                          | 2.72           | 6.00                                                   |
|                                 | V3        | 3.44               | 3    | 174                          | 2.49           | 10.00                                                  |
|                                 | V4        | 3.19               | 7    | 161                          | 3.05           | 12.83                                                  |
|                                 | V5        | 3.28               | 5    | 187                          | 2.30           | 1.00                                                   |
| Interaction                     |           |                    |      |                              |                |                                                        |
| <i>F at same V</i>              |           | NS                 |      | NS                           | NS             |                                                        |
| <i>V at same F</i>              |           | NS                 |      | NS                           | NS             |                                                        |
| F1                              |           | 3.02               | 2    | 171                          | 2.55           |                                                        |
| F2                              |           | 3.44               | 1    | 179                          | 2.70           | 7.00                                                   |
| <i>C.D.(0.05)</i>               |           | 0.23               |      | NS                           | 0.05           |                                                        |
| <i>C.V.(%)</i>                  |           | 4.56               |      | 6.29                         | 1.11           |                                                        |
| <b>Mean of varieties:</b>       |           |                    |      |                              |                |                                                        |
| V1                              |           | 3.79               | 1    | 188                          | 2.81           | 5.17                                                   |
| V2                              |           | 3.18               | 3    | 176                          | 2.71           | 6.00                                                   |
| V3                              |           | 3.14               | 4    | 171                          | 2.50           | 10.00                                                  |
| V4                              |           | 2.81               | 5    | 158                          | 2.94           | 12.83                                                  |
| V5                              |           | 3.25               | 2    | 183                          | 2.17           | 1.00                                                   |
| <i>C.D.(0.05)</i>               |           | NS                 |      | 16.3                         | 0.3            |                                                        |
| <i>C.V. (%)</i>                 |           | 19.2               |      | 7.61                         | 9.41           |                                                        |
| <b>Expt. Mean</b>               |           | <b>3.23</b>        |      | <b>175</b>                   | <b>2.63</b>    |                                                        |
| Soil type                       |           | Sandy loam         |      |                              |                |                                                        |
| pH                              |           | 8.06               |      |                              |                |                                                        |
| <b>N - levels (kg/ha)</b>       |           |                    |      |                              |                |                                                        |
| F1                              |           | 60:30:30           |      |                              |                |                                                        |
| F2                              |           | 90:45:45           |      |                              |                |                                                        |
| Recommended N:P:K (kg/ha)       |           | 60:30:30           |      |                              |                |                                                        |
| <b>Varieties</b>                |           |                    |      |                              |                |                                                        |
| V1                              |           | IET 26692          |      |                              |                |                                                        |
| V2                              |           | Dhanrasi           |      |                              |                |                                                        |
| V3                              |           | Pooja              |      |                              |                |                                                        |
| V4                              |           | Savithri           |      |                              |                |                                                        |
| V5                              |           | LC - Sambha Sub-1  |      |                              |                |                                                        |
| Available N:P:K of soil (kg/ha) |           | -                  |      |                              |                |                                                        |

Table 4.1.1(j): Contd.

| F-levels                        | Varieties | PUSA               |      |                              |                                                        | Over all mean | Rank |
|---------------------------------|-----------|--------------------|------|------------------------------|--------------------------------------------------------|---------------|------|
|                                 |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |               |      |
| F1                              | V1        | 3.28               | 2    | 300                          |                                                        | 4.43          | 2    |
|                                 | V2        | -                  |      | -                            |                                                        | 3.00          | 10   |
|                                 | V3        | 2.46               | 8    | 283                          |                                                        | 3.23          | 8    |
|                                 | V4        | 2.64               | 7    | 290                          |                                                        | 3.13          | 9    |
|                                 | V5        | 2.74               | 6    | 292                          |                                                        | 3.74          | 5    |
| F2                              | V1        | 3.85               | 1    | 309                          | 5.18                                                   | 4.92          | 1    |
|                                 | V2        | -                  |      | -                            |                                                        | 3.36          | 7    |
|                                 | V3        | 2.81               | 5    | 294                          | 3.18                                                   | 3.74          | 4    |
|                                 | V4        | 3.07               | 4    | 297                          | 3.91                                                   | 3.70          | 6    |
|                                 | V5        | 3.26               | 3    | 301                          | 4.73                                                   | 4.06          | 3    |
| Interaction                     |           |                    |      |                              |                                                        |               |      |
| <i>F at same V</i>              |           | NS                 |      | NS                           |                                                        |               |      |
| <i>V at same F</i>              |           | NS                 |      | NS                           |                                                        |               |      |
| F1                              |           | 2.78               | 2    | 291                          |                                                        | 3.63          | 2    |
| F2                              |           | 3.25               | 1    | 300                          | 4.25                                                   | 4.10          | 1    |
| <i>C.D.(0.05)</i>               |           | NS                 |      | 8.15                         |                                                        |               |      |
| <i>C.V.(%)</i>                  |           | 11.84              |      | 1.57                         |                                                        |               |      |
| <b>Mean of varieties:</b>       |           |                    |      |                              |                                                        |               |      |
|                                 | V1        | 3.57               | 1    | 305                          | 5.18                                                   | 4.67          | 1    |
|                                 | V2        | -                  |      | -                            |                                                        | 3.18          | 5    |
|                                 | V3        | 2.64               | 4    | 289                          | 3.18                                                   | 3.49          | 3    |
|                                 | V4        | 2.86               | 3    | 294                          | 3.91                                                   | 3.42          | 4    |
|                                 | V5        | 3.00               | 2    | 297                          | 4.73                                                   | 3.90          | 2    |
| <i>C.D.(0.05)</i>               |           | 0.31               |      | NS                           |                                                        |               |      |
| <i>C.V. (%)</i>                 |           | 8.27               |      | 5.25                         |                                                        |               |      |
| <b>Expt. Mean</b>               |           | <b>3.01</b>        |      | <b>296</b>                   |                                                        | 3.87          |      |
| Soil type                       |           | -                  |      |                              |                                                        |               |      |
| pH                              |           | -                  |      |                              |                                                        |               |      |
| <b>N - levels (kg/ha)</b>       |           |                    |      |                              |                                                        |               |      |
|                                 | F1        | 120:60:40          |      |                              |                                                        |               |      |
|                                 | F2        | 180:90:20          |      |                              |                                                        |               |      |
| Recommended N:P:K (kg/ha)       |           | 120:60:40          |      |                              |                                                        |               |      |
| <b>Varieties</b>                |           |                    |      |                              |                                                        |               |      |
|                                 | V1        | IET 26692          |      |                              |                                                        |               |      |
|                                 | V2        | -                  |      |                              |                                                        |               |      |
|                                 | V3        | Pooja              |      |                              |                                                        |               |      |
|                                 | V4        | Savithri           |      |                              |                                                        |               |      |
|                                 | V5        | LC - Rajshree      |      |                              |                                                        |               |      |
| Available N:P:K of soil (kg/ha) |           | -                  |      |                              |                                                        |               |      |

### NMT 1 (k) Basmati Trials

Basmati cultures two (IET 26995 and IET 26999) were evaluated for their response to nutrients and grain yield at twelve different locations i.e., **Chatha (30:20:10)**, **Dhangain (120:60:40)**, **Faizabad (60:30:30)**, **Kanpur (90:30:30)**, **Kaul (90:30:0)**, **Kota (120:60:40)**, **Ludhiana (80:0:0)**, **Nagina (120:60:40)**, **Navsari (100:30:0)**, **Pantnagar (120:60:40)**, **Raipur (60:50:50)** and **Rewa (100:60:40)** under two different RFD. The details and data received from these locations are summarized and presented in Table 4.1(k).

Different RDF doses (optimum and higher doses of NDR) significantly influenced the grain yield at five out of twelve locations (**Chatha**, **Kanpur**, **Pantnagar**, **Raipur** and **Rewa**) and the maximum increase in grain yield was observed at most the locations. Application of 150% RDF recorded higher grain yields at **Chatha** (3.59 t/ha), **Kanpur** (2.16 t/ha) **Pantnagar** (3.65 t/ha), **Raipur** (4.34 t/ha) and **Rewa** (5.37 t/ha). Higher nutrient response was recorded with 150% RFD at **Chatha** (14.53).

Grain yield differences among the tested cultures were significant at all the locations. Significantly higher mean maximum grain yield was recorded by popular varieties at most of the locations. While, Tulasi (3.10 t/ha to 3.90 t/ha) at **Chatha**, **Dhangain** and **Navsari** and Sugandamati (3.94 t/ha) at **Pantnagar**. Among the IET cultures, IET 26995 (3.34 t/ha) at **Faizabad** and IET 26999 (2.79 to 6.75 t/ha) at **Kanpur**, **Ludhian**, **Nagina Kaul**, **Raipur** and **Rewa**. Mean over the locations, IET 26999 found promising (4.16 t/ha) followed by IET 26995 (3.64 t/ha).

In this trial, application of 150% RFD followed by 100% RFD was found to be promising and also exhibited higher nutrient recovery. Cultures IET 26999 and IET 26995 were found to be promising over rest of the tested entries with better response and grain yields obtained at different locations.

Table 4.1.1(k): Summary of data on grain yield and ancillary characters of selected NMT BT cultures grown under transplanted conditions at low and medium recommended fertilizer doses, kharif 2019.

| F-levels           | Varieties | CHATHA             |      |                              |                |             |                                                        | DHANGAIN           |      |                              |                |                    |                                                        |
|--------------------|-----------|--------------------|------|------------------------------|----------------|-------------|--------------------------------------------------------|--------------------|------|------------------------------|----------------|--------------------|--------------------------------------------------------|
|                    |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
| F1                 | V1        | 3.24               | 6    | 248                          | 1.61           | 19.63       |                                                        | 2.58               | 7    | 281                          | 2.63           | 68                 |                                                        |
|                    | V2        | 3.19               | 9    | 240                          | 1.58           | 19.37       |                                                        | 3.25               | 4    | 290                          | 3.69           | 81                 |                                                        |
|                    | V3        | 3.24               | 6    | 257                          | 1.55           | 19.37       |                                                        | 2.10               | 8    | 275                          | 2.52           | 91                 |                                                        |
|                    | V4        | 3.45               | 5    | 272                          | 1.62           | 20.00       |                                                        | 3.37               | 3    | 299                          | 4.04           | 86                 |                                                        |
|                    | V5        | 2.67               | 10   | 197                          | 1.46           | 18.40       |                                                        | -                  | -    | -                            | -              | -                  |                                                        |
| F2                 | V1        | 3.77               | 1    | 294                          | 2.29           | 20.30       | -104.23                                                | 3.18               | 5    | 288                          | 3.48           | 69                 | -20.27                                                 |
|                    | V2        | 3.62               | 4    | 254                          | 2.56           | 19.43       | -102.71                                                | 3.70               | 2    | 293                          | 4.01           | 83                 | -25.85                                                 |
|                    | V3        | 3.64               | 3    | 261                          | 2.23           | 20.07       | -104.36                                                | 2.62               | 6    | 282                          | 2.95           | 94                 | -16.47                                                 |
|                    | V4        | 3.74               | 2    | 273                          | 2.44           | 20.47       | -111.26                                                | 4.42               | 1    | 310                          | 4.21           | 87                 | -26.22                                                 |
|                    | V5        | 3.20               | 8    | 247                          | 1.57           | 19.40       | -85.80                                                 | -                  | -    | -                            | -              | -                  |                                                        |
| Interaction        |           |                    |      |                              |                |             |                                                        |                    |      |                              |                |                    |                                                        |
| F at same V        |           | NS                 |      | 17.08                        | NS             | NS          |                                                        | NS                 |      | NS                           | NS             | NS                 |                                                        |
| V at same F        |           | NS                 |      | 25.08                        | NS             | NS          |                                                        | NS                 |      | NS                           | NS             | NS                 |                                                        |
| F1                 |           | 3.16               | 2    | 243                          | 1.56           | 19          |                                                        | 2.83               | 2    | 286                          | 3.22           | 81                 |                                                        |
| F2                 |           | 3.59               | 1    | 266                          | 2.22           | 20          | 14.53                                                  | 3.48               | 1    | 293                          | 3.66           | 83                 | 5.95                                                   |
| C.D.(0.05)         |           | 0.19               |      | NS                           | 0.24           | 0.39        |                                                        | NS                 |      | NS                           | NS             | 0.72               |                                                        |
| C.V.(%)            |           | 3.51               |      | 6.41                         | 7.98           | 1.28        |                                                        | 15.31              |      | 2.21                         | 14.72          | 0.5                |                                                        |
| Mean of varieties: |           |                    |      |                              |                |             |                                                        |                    |      |                              |                |                    |                                                        |
| V1                 |           | 3.51               | 2    | 271                          | 1.95           | 20          | -104.23                                                | 2.88               | 3    | 285                          | 3.06           | 69                 | -20.27                                                 |
| V2                 |           | 3.41               | 4    | 247                          | 2.07           | 19          | -102.71                                                | 3.48               | 2    | 291                          | 3.85           | 82                 | -25.85                                                 |
| V3                 |           | 3.44               | 3    | 259                          | 1.89           | 20          | -104.36                                                | 2.36               | 4    | 279                          | 2.74           | 93                 | -16.47                                                 |
| V4                 |           | 3.60               | 1    | 273                          | 2.03           | 20          | -111.26                                                | 3.90               | 1    | 305                          | 4.13           | 87                 | -26.22                                                 |
| V5                 |           | 2.94               | 5    | 222                          | 1.52           | 19          | -85.80                                                 | -                  | -    | -                            | -              | -                  |                                                        |
| C.D.(0.05)         |           | 0.2                |      | 12.07                        | 0.25           | 0.29        |                                                        | 0.28               |      | 11.82                        | 1.02           | 0.51               |                                                        |
| C.V. (%)           |           | 4.86               |      | 3.88                         | 10.8           | 1.19        |                                                        | 7.07               |      | 3.24                         | 23.53          | 0.5                |                                                        |
| Expt. Mean         |           | 3.38               |      | 254                          | 1.89           | 19.64       |                                                        | 3.15               |      | 290                          | 3.44           | 82.38              |                                                        |

Table 4.1.1(k): Contd.

| F-levels                        | Varieties | CHATHA             |      |                              |                |             |                                                        | DHANGAIN           |      |                              |                |                    |                                                        |
|---------------------------------|-----------|--------------------|------|------------------------------|----------------|-------------|--------------------------------------------------------|--------------------|------|------------------------------|----------------|--------------------|--------------------------------------------------------|
|                                 |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
| Soil type                       |           | Clay loam          |      |                              |                |             |                                                        | Loamy              |      |                              |                |                    |                                                        |
| pH                              |           | 8.03               |      |                              |                |             |                                                        | 6.80               |      |                              |                |                    |                                                        |
| <b>N - levels (kg/ha)</b>       |           |                    |      |                              |                |             |                                                        |                    |      |                              |                |                    |                                                        |
| F1                              |           | 30:20:10           |      |                              |                |             |                                                        | 120:60:40          |      |                              |                |                    |                                                        |
| F2                              |           | 45:30:15           |      |                              |                |             |                                                        | 180:90:60          |      |                              |                |                    |                                                        |
| Recommended N:P:K (kg/ha)       |           | 30:20:10           |      |                              |                |             |                                                        | 120:60:40          |      |                              |                |                    |                                                        |
| <b>Varieties</b>                |           |                    |      |                              |                |             |                                                        |                    |      |                              |                |                    |                                                        |
| V1                              |           | IET 26995          |      |                              |                |             |                                                        | IET 26995          |      |                              |                |                    |                                                        |
| V2                              |           | IET 26999          |      |                              |                |             |                                                        | IET 26999          |      |                              |                |                    |                                                        |
| V3                              |           | Sugandhamati       |      |                              |                |             |                                                        | Sugandhamati       |      |                              |                |                    |                                                        |
| V4                              |           | Tulasi             |      |                              |                |             |                                                        | Tulasi             |      |                              |                |                    |                                                        |
| V5                              |           | LC - Basmati 370   |      |                              |                |             |                                                        | -                  |      |                              |                |                    |                                                        |
| Available N:P:K of soil (kg/ha) |           | 245:14.3:146.3     |      |                              |                |             |                                                        | 154:14.4:183       |      |                              |                |                    |                                                        |

Table 4.1.1(k): Contd.

| F-levels           | Varieties | FAIZABAD           |      |                              |                |             |                    |                                                        | KANPUR             |      |                              |                |             |                    |                                                        |
|--------------------|-----------|--------------------|------|------------------------------|----------------|-------------|--------------------|--------------------------------------------------------|--------------------|------|------------------------------|----------------|-------------|--------------------|--------------------------------------------------------|
|                    |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
| F1                 | V1        | 3.39               | 1    | 256                          | 2.79           | 23.70       | 98                 |                                                        | 1.39               | 9    | 315                          | 1.67           | 25.73       | 73                 |                                                        |
|                    | V2        | 3.19               | 3    | 258                          | 2.49           | 22.37       | 97                 |                                                        | 2.59               | 3    | 307                          | 1.64           | 23.21       | 73                 |                                                        |
|                    | V3        | 2.18               | 9    | 257                          | 2.43           | 22.53       | 100                |                                                        | 2.78               | 2    | 243                          | 1.30           | 19.33       | 82                 |                                                        |
|                    | V4        | 1.98               | 10   | 258                          | 1.50           | 21.53       | 96                 |                                                        | 1.97               | 6    | 281                          | 1.50           | 27.16       | 67                 |                                                        |
|                    | V5        | 2.67               | 6    | 257                          | 2.66           | 23.60       | 97                 |                                                        | 1.46               | 8    | 265                          | 1.36           | 19.16       | 71                 |                                                        |
| F2                 | V1        | 3.29               | 2    | 267                          | 2.58           | 24.00       | 97                 | -1.25                                                  | 1.83               | 7    | 342                          | 2.62           | 26.87       | 74                 | 3.67                                                   |
|                    | V2        | 3.09               | 4    | 267                          | 3.20           | 23.07       | 97                 | -1.25                                                  | 2.98               | 1    | 327                          | 2.58           | 24.05       | 72                 | 3.25                                                   |
|                    | V3        | 2.30               | 7    | 265                          | 2.27           | 22.83       | 102                | 1.50                                                   | 2.23               | 5    | 265                          | 1.68           | 20.55       | 83                 | -4.58                                                  |
|                    | V4        | 2.24               | 8    | 264                          | 2.67           | 21.80       | 99                 | 3.25                                                   | 2.54               | 4    | 283                          | 2.50           | 28.15       | 68                 | 4.75                                                   |
|                    | V5        | 2.99               | 5    | 271                          | 3.09           | 23.93       | 97                 | 4.00                                                   | 1.20               | 10   | 257                          | 1.71           | 19.98       | 74                 | -2.17                                                  |
| Interaction        |           |                    |      |                              |                |             |                    |                                                        |                    |      |                              |                |             |                    |                                                        |
| F at same V        |           | NS                 |      | NS                           | 0.3            | NS          | 1.09               |                                                        | 0.23               |      | 7.98                         | 0.02           | 0.11        | NS                 |                                                        |
| V at same F        |           | NS                 |      | NS                           | 0.29           | NS          | 1.42               |                                                        | 0.23               |      | 9.79                         | 0.02           | 0.13        | NS                 |                                                        |
| F1                 |           | 2.68               | 2    | 257                          | 2.37           | 22.75       | 98                 |                                                        | 2.04               | 2    | 282                          | 1.49           | 22.92       | 73                 |                                                        |
| F2                 |           | 2.78               | 1    | 267                          | 2.76           | 23.13       | 98                 | 1.25                                                   | 2.16               | 1    | 295                          | 2.22           | 23.92       | 74                 | 0.98                                                   |
| C.D.(0.05)         |           | NS                 |      | 7.89                         | 0.13           | 0.13        | NS                 |                                                        | 0.12               |      | 8.55                         | 0.01           | 0.11        | 1.03               |                                                        |
| C.V.(%)            |           | 5.82               |      | 1.92                         | 3.31           | 0.36        | 0.85               |                                                        | 3.52               |      | 1.89                         | 0.49           | 0.29        | 0.89               |                                                        |
| Mean of varieties: |           |                    |      |                              |                |             |                    |                                                        |                    |      |                              |                |             |                    |                                                        |
|                    | V1        | 3.34               | 1    | 261                          | 2.69           | 23.85       | 98                 | -1.25                                                  | 1.61               | 4    | 328                          | 2.15           | 26.30       | 74                 | 3.67                                                   |
|                    | V2        | 3.14               | 2    | 262                          | 2.85           | 22.72       | 97                 | -1.25                                                  | 2.79               | 1    | 317                          | 2.11           | 23.63       | 73                 | 3.25                                                   |
|                    | V3        | 2.24               | 4    | 261                          | 2.35           | 22.68       | 101                | 1.50                                                   | 2.51               | 2    | 254                          | 1.49           | 19.94       | 83                 | -4.58                                                  |
|                    | V4        | 2.11               | 5    | 261                          | 2.09           | 21.67       | 97                 | 3.25                                                   | 2.26               | 3    | 282                          | 2.00           | 27.66       | 68                 | 4.75                                                   |
|                    | V5        | 2.83               | 3    | 264                          | 2.88           | 23.77       | 97                 | 4.00                                                   | 1.33               | 5    | 261                          | 1.54           | 19.57       | 73                 | -2.17                                                  |
| C.D.(0.05)         |           | 0.25               |      | NS                           | 0.21           | 0.17        | 0.77               |                                                        | 0.16               |      | 5.64                         | 0.01           | 0.08        | 1.67               |                                                        |
| C.V. (%)           |           | 7.34               |      | 0.95                         | 6.77           | 0.62        | 0.64               |                                                        | 6.42               |      | 1.6                          | 0.62           | 0.27        | 1.85               |                                                        |
| Expt. Mean         |           | 2.73               |      | 262                          | 2.57           | 22.94       | 98                 |                                                        | 2.10               |      | 288                          | 1.86           | 23.42       | 74                 |                                                        |

Table 4.1.1(k): Contd.

| F-levels                           | Varieties | FAIZABAD              |      |                                 |                   |                |                          |                                                                    | KANPUR                |      |                                 |                   |                |                          |                                                                    |
|------------------------------------|-----------|-----------------------|------|---------------------------------|-------------------|----------------|--------------------------|--------------------------------------------------------------------|-----------------------|------|---------------------------------|-------------------|----------------|--------------------------|--------------------------------------------------------------------|
|                                    |           | Grain Yield<br>(t/ha) | Rank | Panicle/m <sup>2</sup><br>(No.) | Panicle<br>wt (g) | Test wt<br>(g) | Days<br>50%<br>flowering | Nutri. res.<br>(kg grain/kg<br>Nutri.)<br>(Base level<br>100% RDF) | Grain Yield<br>(t/ha) | Rank | Panicle/m <sup>2</sup><br>(No.) | Panicle<br>wt (g) | Test wt<br>(g) | Days<br>50%<br>flowering | Nutri. res.<br>(kg grain/kg<br>Nutri.)<br>(Base level<br>100% RDF) |
| Soil type                          |           | Sandy Loam            |      |                                 |                   |                |                          |                                                                    | Sandy Loam            |      |                                 |                   |                |                          |                                                                    |
| pH                                 |           | 7.60                  |      |                                 |                   |                |                          |                                                                    | 7.89                  |      |                                 |                   |                |                          |                                                                    |
| <b>N - levels (kg/ha)</b>          |           |                       |      |                                 |                   |                |                          |                                                                    |                       |      |                                 |                   |                |                          |                                                                    |
| F1                                 |           | 80:40:40              |      |                                 |                   |                |                          |                                                                    | 120:60:60             |      |                                 |                   |                |                          |                                                                    |
| F2                                 |           | 120:60:60             |      |                                 |                   |                |                          |                                                                    | 180:90:90             |      |                                 |                   |                |                          |                                                                    |
| Recommended<br>N:P:K (kg/ha)       |           | 80:40:40              |      |                                 |                   |                |                          |                                                                    | 120:60:60             |      |                                 |                   |                |                          |                                                                    |
| <b>Varieties</b>                   |           |                       |      |                                 |                   |                |                          |                                                                    |                       |      |                                 |                   |                |                          |                                                                    |
| V1                                 |           | IET 26995             |      |                                 |                   |                |                          |                                                                    | IET 26995             |      |                                 |                   |                |                          |                                                                    |
| V2                                 |           | IET 26999             |      |                                 |                   |                |                          |                                                                    | IET 26999             |      |                                 |                   |                |                          |                                                                    |
| V3                                 |           | Sugandhamati          |      |                                 |                   |                |                          |                                                                    | Sugandhamati          |      |                                 |                   |                |                          |                                                                    |
| V4                                 |           | Tulasi                |      |                                 |                   |                |                          |                                                                    | Tulasi                |      |                                 |                   |                |                          |                                                                    |
| V5                                 |           | LC - Narendra mahak   |      |                                 |                   |                |                          |                                                                    | LC - Ram Raj          |      |                                 |                   |                |                          |                                                                    |
| Available N:P:K of<br>soil (kg/ha) |           | 200:24:234            |      |                                 |                   |                |                          |                                                                    | 237.8:18.2:172        |      |                                 |                   |                |                          |                                                                    |

Table 4.1.1(k): Contd.

| F-levels           | Varieties | KAUL               |      |                              |                |             |                                                        | LUDHIANA           |      |                              |                |             |                    |                                                        |
|--------------------|-----------|--------------------|------|------------------------------|----------------|-------------|--------------------------------------------------------|--------------------|------|------------------------------|----------------|-------------|--------------------|--------------------------------------------------------|
|                    |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
| F1                 | V1        | 5.60               | 4    | 330                          | 1.90           | 25.93       |                                                        | 3.78               | 6    | 244                          | 2.92           | 27.59       | 81                 |                                                        |
|                    | V2        | 6.59               | 2    | 265                          | 2.76           | 24.67       |                                                        | 5.22               | 1    | 213                          | 3.54           | 23.63       | 100                |                                                        |
|                    | V3        | -                  |      | -                            | -              | -           |                                                        | -                  |      | -                            | -              | -           | -                  |                                                        |
|                    | V4        | -                  |      | -                            | -              | -           |                                                        | -                  |      | -                            | -              | -           | -                  |                                                        |
|                    | V5        | 3.40               | 6    | 268                          | 1.45           | 28.47       |                                                        | 4.00               | 4    | 216                          | 2.84           | 24.36       | 101                |                                                        |
| F2                 | V1        | 6.05               | 3    | 344                          | 1.97           | 26.03       | 6.00                                                   | 3.91               | 5    | 257                          | 2.80           | 27.57       | 81                 | 6.50                                                   |
|                    | V2        | 6.90               | 1    | 280                          | 2.79           | 24.77       | 4.13                                                   | 5.04               | 2    | 222                          | 3.45           | 24.04       | 101                | -9.00                                                  |
|                    | V3        | -                  |      | -                            | -              | -           |                                                        | -                  |      | -                            | -              | -           | -                  |                                                        |
|                    | V4        | -                  |      | -                            | -              | -           |                                                        | -                  |      | -                            | -              | -           | -                  |                                                        |
|                    | V5        | 3.88               | 5    | 288                          | 1.47           | 28.60       | 6.40                                                   | 4.24               | 3    | 227                          | 2.85           | 24.38       | 101                | 12.00                                                  |
| Interaction        |           |                    |      |                              |                |             |                                                        |                    |      |                              |                |             |                    |                                                        |
| F at same V        |           | NS                 |      | NS                           | NS             | NS          |                                                        | NS                 |      | NS                           | NS             | NS          | NS                 |                                                        |
| V at same F        |           | NS                 |      | NS                           | NS             | NS          |                                                        | NS                 |      | NS                           | NS             | NS          | NS                 |                                                        |
| F1                 |           | 5.20               | 2    | 288                          | 2.04           | 26.36       |                                                        | 4.33               | 2    | 224                          | 3.10           | 25.19       | 94                 |                                                        |
| F2                 |           | 5.61               | 1    | 304                          | 2.08           | 26.47       | 5.51                                                   | 4.40               | 1    | 235                          | 3.03           | 25.33       | 94                 | 3.17                                                   |
| C.D.(0.05)         |           | NS                 |      | NS                           | NS             | NS          |                                                        | NS                 |      | NS                           | NS             | NS          | NS                 |                                                        |
| C.V.(%)            |           | 9.38               |      | 7.24                         | 8.88           | 4.68        |                                                        | 7.99               |      | 5.11                         | 8.31           | 2.24        | 0.75               |                                                        |
| Mean of varieties: |           |                    |      |                              |                |             |                                                        |                    |      |                              |                |             |                    |                                                        |
| V1                 |           | 5.83               | 2    | 337                          | 1.94           | 25.98       | 6.00                                                   | 3.85               | 3    | 251                          | 2.86           | 27.58       | 81                 | 6.50                                                   |
| V2                 |           | 6.75               | 1    | 273                          | 2.78           | 24.72       | 4.13                                                   | 5.13               | 1    | 218                          | 3.50           | 23.84       | 101                | -9.00                                                  |
| V3                 |           | -                  |      | -                            | -              | -           |                                                        | -                  |      | -                            | -              | -           | -                  |                                                        |
| V4                 |           | -                  |      | -                            | -              | -           |                                                        | -                  |      | -                            | -              | -           | -                  |                                                        |
| V5                 |           | 3.64               | 3    | 278                          | 1.46           | 28.54       | 6.40                                                   | 4.12               | 2    | 221                          | 2.85           | 24.37       | 101                | 12.00                                                  |
| C.D.(0.05)         |           | 0.85               |      | 45.13                        | 0.19           | 1.92        |                                                        | 0.42               |      | 17.02                        | 0.36           | 0.86        | 0.94               |                                                        |
| C.V. (%)           |           | 11.81              |      | 11.46                        | 6.79           | 5.46        |                                                        | 7.29               |      | 5.56                         | 8.72           | 2.56        | 0.75               |                                                        |
| Expt. Mean         |           | 5.40               |      | 296                          | 2.06           | 26.41       |                                                        | 4.37               |      | 230                          | 3.07           | 25.26       | 94                 |                                                        |

Table 4.1.1(k): Contd.

| F-levels                        | Varieties | KAUL                   |      |                              |                |             |                                                        | LUDHIANA               |      |                              |                |             |                    |                                                        |
|---------------------------------|-----------|------------------------|------|------------------------------|----------------|-------------|--------------------------------------------------------|------------------------|------|------------------------------|----------------|-------------|--------------------|--------------------------------------------------------|
|                                 |           | Grain Yield (t/ha)     | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) | Grain Yield (t/ha)     | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
| Soil type                       |           | Clay loam              |      |                              |                |             |                                                        | Sandy loam             |      |                              |                |             |                    |                                                        |
| pH                              |           | 8.10                   |      |                              |                |             |                                                        | 7.80                   |      |                              |                |             |                    |                                                        |
| <b>N - levels (kg/ha)</b>       |           |                        |      |                              |                |             |                                                        |                        |      |                              |                |             |                    |                                                        |
| F1                              |           | 90:30:30               |      |                              |                |             |                                                        | 40:0:0                 |      |                              |                |             |                    |                                                        |
| F2                              |           | 135:45:45              |      |                              |                |             |                                                        | 60:0:0                 |      |                              |                |             |                    |                                                        |
| Recommended N:P:K (kg/ha)       |           | 90:30:30               |      |                              |                |             |                                                        | 40:0:0                 |      |                              |                |             |                    |                                                        |
| <b>Varieties</b>                |           |                        |      |                              |                |             |                                                        |                        |      |                              |                |             |                    |                                                        |
| V1                              |           | IET 26995              |      |                              |                |             |                                                        | IET 26995              |      |                              |                |             |                    |                                                        |
| V2                              |           | IET 26999              |      |                              |                |             |                                                        | IET 26999              |      |                              |                |             |                    |                                                        |
| V3                              |           | -                      |      |                              |                |             |                                                        | -                      |      |                              |                |             |                    |                                                        |
| V4                              |           | -                      |      |                              |                |             |                                                        | -                      |      |                              |                |             |                    |                                                        |
| V5                              |           | LC - Pusa Basmati 1121 |      |                              |                |             |                                                        | LC - Pusa Basmati 1121 |      |                              |                |             |                    |                                                        |
| Available N:P:K of soil (kg/ha) |           | 160:16:420             |      |                              |                |             |                                                        | 225-21.8-273           |      |                              |                |             |                    |                                                        |

Table 4.1.1(k): Contd.

| F-levels           | Varieties | NAGINA             |      |                              |                |             |                    |                                                        | NAVSARI            |      |                              |                |             |                    |                                                        |
|--------------------|-----------|--------------------|------|------------------------------|----------------|-------------|--------------------|--------------------------------------------------------|--------------------|------|------------------------------|----------------|-------------|--------------------|--------------------------------------------------------|
|                    |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
| F1                 | V1        | 4.66               | 4    | 355                          | 2.86           | 23.52       | 107                |                                                        | 3.16               | 5    | 264                          | 2.37           | 27.14       | 79                 |                                                        |
|                    | V2        | 4.79               | 2    | 374                          | 2.84           | 23.48       | 105                |                                                        | 3.38               | 4    | 287                          | 2.80           | 24.62       | 93                 |                                                        |
|                    | V3        | 4.06               | 8    | 305                          | 2.71           | 21.41       | 91                 |                                                        | 2.77               | 8    | 236                          | 3.01           | 20.81       | 93                 |                                                        |
|                    | V4        | 4.16               | 7    | 312                          | 2.67           | 23.70       | 83                 |                                                        | 3.58               | 2    | 174                          | 4.15           | 32.12       | 77                 |                                                        |
|                    | V5        | -                  |      | -                            | -              | -           | -                  |                                                        | -                  |      | -                            | -              | -           | -                  |                                                        |
| F2                 | V1        | 4.74               | 3    | 361                          | 2.88           | 23.54       | 108                | 0.73                                                   | 3.01               | 7    | 275                          | 2.40           | 27.57       | 80                 | -2.31                                                  |
|                    | V2        | 4.8                | 1    | 373                          | 2.87           | 23.49       | 106                | 0.09                                                   | 3.13               | 6    | 278                          | 3.00           | 25.87       | 92                 | -3.85                                                  |
|                    | V3        | 4.23               | 6    | 318                          | 2.73           | 21.46       | 94                 | 1.55                                                   | 3.43               | 3    | 287                          | 3.13           | 21.83       | 94                 | 10.15                                                  |
|                    | V4        | 4.29               | 5    | 326                          | 2.73           | 23.71       | 84                 | 1.18                                                   | 4.08               | 1    | 179                          | 4.10           | 32.14       | 83                 | 7.69                                                   |
|                    | V5        | -                  |      | -                            | -              | -           | -                  |                                                        | -                  |      | -                            | -              | -           | -                  |                                                        |
| Interaction        |           |                    |      |                              |                |             |                    |                                                        |                    |      |                              |                |             |                    |                                                        |
| F at same V        |           | NS                 |      | NS                           | NS             | NS          | NS                 |                                                        | NS                 |      | NS                           | NS             | NS          | 1.53               |                                                        |
| V at same F        |           | NS                 |      | NS                           | NS             | NS          | NS                 |                                                        | NS                 |      | NS                           | NS             | NS          | 1.57               |                                                        |
| F1                 |           | 4.42               | 2    | 336                          | 2.77           | 23.03       | 97                 |                                                        | 3.22               | 2    | 240                          | 3.08           | 26.17       | 86                 |                                                        |
| F2                 |           | 4.52               | 1    | 345                          | 2.80           | 23.05       | 98                 | 0.89                                                   | 3.41               | 1    | 255                          | 3.16           | 26.85       | 87                 | 2.92                                                   |
| C.D.(0.05)         |           | NS                 |      | NS                           | 0              | NS          | NS                 |                                                        | NS                 |      | NS                           | NS             | NS          | 1.08               |                                                        |
| C.V.(%)            |           | 2.45               |      | 3.34                         | 0.07           | 0.06        | 0.76               |                                                        | 10.36              |      | 4.01                         | 6.84           | 3.68        | 0.71               |                                                        |
| Mean of varieties: |           |                    |      |                              |                |             |                    |                                                        |                    |      |                              |                |             |                    |                                                        |
|                    | V1        | 4.70               | 2    | 358                          | 2.87           | 23.53       | 108                | 0.73                                                   | 3.09               | 4    | 269                          | 2.39           | 27.36       | 80                 | -2.31                                                  |
|                    | V2        | 4.80               | 1    | 373                          | 2.86           | 23.49       | 106                | 0.09                                                   | 3.26               | 2    | 282                          | 2.90           | 25.25       | 93                 | -3.85                                                  |
|                    | V3        | 4.15               | 4    | 312                          | 2.72           | 21.44       | 93                 | 1.55                                                   | 3.10               | 3    | 261                          | 3.07           | 21.32       | 94                 | 10.15                                                  |
|                    | V4        | 4.23               | 3    | 319                          | 2.70           | 23.71       | 84                 | 1.18                                                   | 3.83               | 1    | 176                          | 4.13           | 32.13       | 80                 | 7.69                                                   |
|                    | V5        | -                  |      | -                            | -              | -           | -                  |                                                        | -                  |      | -                            | -              | -           | -                  |                                                        |
| C.D.(0.05)         |           | 0.11               |      | 13.15                        | 0.02           | 0.03        | 1.24               |                                                        | 0.47               |      | 20.92                        | 0.39           | 1.98        | 1.08               |                                                        |
| C.V. (%)           |           | 1.89               |      | 3.07                         | 0.46           | 0.09        | 1.01               |                                                        | 11.33              |      | 6.73                         | 9.97           | 5.94        | 0.99               |                                                        |
| Expt. Mean         |           | 4.47               |      | 341                          | 2.79           | 23.04       | 97                 |                                                        | 3.32               |      | 247                          | 3.12           | 26.51       | 86                 |                                                        |

Table 4.1.1(k): Contd.

| F-levels                        | Varieties | NAGINA             |      |                              |                |             |                    |                                                        | NAVSARI            |      |                              |                |             |                    |                                                        |
|---------------------------------|-----------|--------------------|------|------------------------------|----------------|-------------|--------------------|--------------------------------------------------------|--------------------|------|------------------------------|----------------|-------------|--------------------|--------------------------------------------------------|
|                                 |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
| Soil type                       |           | -                  |      |                              |                |             |                    |                                                        | Clayey             |      |                              |                |             |                    |                                                        |
| pH                              |           | 7.70               |      |                              |                |             |                    |                                                        | 7.85               |      |                              |                |             |                    |                                                        |
| <b>N - levels (kg/ha)</b>       |           |                    |      |                              |                |             |                    |                                                        |                    |      |                              |                |             |                    |                                                        |
| F1                              |           | 120:60:40          |      |                              |                |             |                    |                                                        | 100:30:0           |      |                              |                |             |                    |                                                        |
| F2                              |           | 180:90:60          |      |                              |                |             |                    |                                                        | 150:45:0           |      |                              |                |             |                    |                                                        |
| Recommended N:P:K (kg/ha)       |           | 120:60:40          |      |                              |                |             |                    |                                                        | 100:30:0           |      |                              |                |             |                    |                                                        |
| <b>Varieties</b>                |           |                    |      |                              |                |             |                    |                                                        |                    |      |                              |                |             |                    |                                                        |
| V1                              |           | IET 26995          |      |                              |                |             |                    |                                                        | IET 26995          |      |                              |                |             |                    |                                                        |
| V2                              |           | IET 26999          |      |                              |                |             |                    |                                                        | IET 26999          |      |                              |                |             |                    |                                                        |
| V3                              |           | Sugandhamati       |      |                              |                |             |                    |                                                        | Sugandhamati       |      |                              |                |             |                    |                                                        |
| V4                              |           | Tulasi             |      |                              |                |             |                    |                                                        | Tulasi             |      |                              |                |             |                    |                                                        |
| V5                              |           | -                  |      |                              |                |             |                    |                                                        | -                  |      |                              |                |             |                    |                                                        |
| Available N:P:K of soil (kg/ha) |           | 21:18.33:209       |      |                              |                |             |                    |                                                        | 21:18.33:209       |      |                              |                |             |                    |                                                        |

Table 4.1.1(k): Contd.

| F-levels           | Varieties | PANTNAGAR          |      |                              |                |             |                    |                                                        | RAIPUR             |      |                              |                |             |                    |                                                        |
|--------------------|-----------|--------------------|------|------------------------------|----------------|-------------|--------------------|--------------------------------------------------------|--------------------|------|------------------------------|----------------|-------------|--------------------|--------------------------------------------------------|
|                    |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
| F1                 | V1        | 3.15               | 8    | 226                          | 1.68           | 27.88       | 87                 |                                                        | 2.85               | 8    | 217                          | 2.23           | 31.57       | 75                 |                                                        |
|                    | V2        | 3.17               | 7    | 229                          | 1.60           | 20.94       | 97                 |                                                        | 4.65               | 3    | 212                          | 3.52           | 25.20       | 87                 |                                                        |
|                    | V3        | 3.87               | 2    | 242                          | 1.84           | 21.41       | 94                 |                                                        | 3.41               | 6    | 170                          | 3.44           | 24.60       | 92                 |                                                        |
|                    | V4        | 3.56               | 4    | 233                          | 1.76           | 26.96       | 92                 |                                                        | 4.49               | 4    | 188                          | 3.45           | 34.43       | 90                 |                                                        |
|                    | V5        | -                  |      | -                            | -              | -           | -                  |                                                        | -                  |      | -                            | -              | -           | -                  |                                                        |
| F2                 | V1        | 3.43               | 6    | 248                          | 1.99           | 27.55       | 87                 | 2.55                                                   | 3.40               | 7    | 247                          | 2.28           | 31.80       | 75                 | 6.88                                                   |
|                    | V2        | 3.53               | 5    | 246                          | 2.00           | 21.14       | 95                 | 3.27                                                   | 4.73               | 2    | 228                          | 3.68           | 25.10       | 87                 | 1.00                                                   |
|                    | V3        | 4.00               | 1    | 239                          | 2.03           | 21.84       | 90                 | 1.18                                                   | 3.60               | 5    | 210                          | 3.51           | 24.70       | 92                 | 2.38                                                   |
|                    | V4        | 3.63               | 3    | 245                          | 1.74           | 27.02       | 90                 | 0.64                                                   | 5.64               | 1    | 218                          | 3.59           | 34.90       | 90                 | 14.38                                                  |
|                    | V5        | -                  |      | -                            | -              | -           | -                  |                                                        | -                  |      | -                            | -              | -           | -                  |                                                        |
| Interaction        |           |                    |      |                              |                |             |                    |                                                        |                    |      |                              |                |             |                    |                                                        |
| F at same V        |           | NS                 |      | NS                           | NS             | NS          | NS                 |                                                        | 0.41               |      | NS                           | NS             | NS          | NS                 |                                                        |
| V at same F        |           | NS                 |      | NS                           | NS             | NS          | NS                 |                                                        | 0.47               |      | NS                           | NS             | NS          | NS                 |                                                        |
| F1                 |           | 3.44               | 2    | 232                          | 1.72           | 24.30       | 93                 |                                                        | 3.85               | 2    | 197                          | 3.16           | 28.95       | 86                 |                                                        |
| F2                 |           | 3.65               | 1    | 245                          | 1.94           | 24.39       | 91                 | 1.91                                                   | 4.34               | 1    | 226                          | 3.27           | 29.13       | 86                 | 6.16                                                   |
| C.D.(0.05)         |           | 0.18               |      | NS                           | 0.22           | NS          | 1.29               |                                                        | 0.39               |      | 20.79                        | NS             | NS          | NS                 |                                                        |
| C.V.(%)            |           | 2.89               |      | 7.83                         | 6.81           | 3.96        | 0.8                |                                                        | 5.41               |      | 5.6                          | 3.46           | 2.65        | 0.63               |                                                        |
| Mean of varieties: |           |                    |      |                              |                |             |                    |                                                        |                    |      |                              |                |             |                    |                                                        |
|                    | V1        | 3.29               | 4    | 237                          | 1.84           | 27.72       | 87                 | 2.55                                                   | 3.13               | 4    | 232                          | 2              | 32          | 75                 | 6.88                                                   |
|                    | V2        | 3.35               | 3    | 238                          | 1.80           | 21.04       | 96                 | 3.27                                                   | 4.69               | 2    | 220                          | 4              | 25          | 87                 | 1.00                                                   |
|                    | V3        | 3.94               | 1    | 241                          | 1.94           | 21.63       | 92                 | 1.18                                                   | 3.51               | 3    | 190                          | 3              | 25          | 92                 | 2.38                                                   |
|                    | V4        | 3.60               | 2    | 239                          | 1.75           | 26.99       | 91                 | 0.64                                                   | 5.07               | 1    | 203                          | 4              | 35          | 90                 | 14.38                                                  |
|                    | V5        | -                  |      | -                            | -              | -           | -                  |                                                        | -                  |      | -                            | -              | -           | -                  |                                                        |
| C.D.(0.05)         |           | 0.25               |      | NS                           | 0.12           | 0.6         | 1.26               |                                                        | 0.29               |      | 17.72                        | 0.22           | 0.88        | 0.96               |                                                        |
| C.V. (%)           |           | 5.69               |      | 5.32                         | 5.04           | 1.95        | 1.09               |                                                        | 5.68               |      | 6.67                         | 5.51           | 2.42        | 0.89               |                                                        |
| Expt. Mean         |           | 3.54               |      | 238                          | 1.83           | 24.34       | 92                 |                                                        | 4.10               |      | 211                          | 3.21           | 29.04       | 86                 |                                                        |

Table 4.1.1(k): Contd.

| F-levels                        | Varieties | PANTNAGAR          |      |                              |                |             |                    |                                                        | RAIPUR             |      |                              |                |             |                    |                                                        |
|---------------------------------|-----------|--------------------|------|------------------------------|----------------|-------------|--------------------|--------------------------------------------------------|--------------------|------|------------------------------|----------------|-------------|--------------------|--------------------------------------------------------|
|                                 |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
| Soil type                       |           | Silt               |      |                              |                |             |                    |                                                        | Clay loam          |      |                              |                |             |                    |                                                        |
| pH                              |           | 7.60               |      |                              |                |             |                    |                                                        | 7.20               |      |                              |                |             |                    |                                                        |
| <b>N - levels (kg/ha)</b>       |           |                    |      |                              |                |             |                    |                                                        |                    |      |                              |                |             |                    |                                                        |
| F1                              |           | 120:60:40          |      |                              |                |             |                    |                                                        | 60:50:50           |      |                              |                |             |                    |                                                        |
| F2                              |           | 180:90:60          |      |                              |                |             |                    |                                                        | 90:75:75           |      |                              |                |             |                    |                                                        |
| Recommended N:P:K (kg/ha)       |           | 120:60:40          |      |                              |                |             |                    |                                                        | 60:50:50           |      |                              |                |             |                    |                                                        |
| <b>Varieties</b>                |           |                    |      |                              |                |             |                    |                                                        |                    |      |                              |                |             |                    |                                                        |
| V1                              |           | IET 26995          |      |                              |                |             |                    |                                                        | IET 26995          |      |                              |                |             |                    |                                                        |
| V2                              |           | IET 26999          |      |                              |                |             |                    |                                                        | IET 26999          |      |                              |                |             |                    |                                                        |
| V3                              |           | Sugandhamati       |      |                              |                |             |                    |                                                        | Sugandhamati       |      |                              |                |             |                    |                                                        |
| V4                              |           | Tulasi             |      |                              |                |             |                    |                                                        | Tulasi             |      |                              |                |             |                    |                                                        |
| V5                              |           | -                  |      |                              |                |             |                    |                                                        | -                  |      |                              |                |             |                    |                                                        |
| Available N:P:K of soil (kg/ha) |           | 230:22.01:215      |      |                              |                |             |                    |                                                        | 172.4:23.4:452.7   |      |                              |                |             |                    |                                                        |

Table 4.1.1(k): Contd.

| F-levels                  | Varieties | REWA               |      |                              |                |              |                    |                                                        | Over all mean | Rank |
|---------------------------|-----------|--------------------|------|------------------------------|----------------|--------------|--------------------|--------------------------------------------------------|---------------|------|
|                           |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g)  | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |               |      |
| F1                        | V1        | 4.50               | 5    | 263                          | 3.07           | 25.00        | 81                 |                                                        | 3.48          | 6    |
|                           | V2        | 4.50               | 5    | 300                          | 3.03           | 26.03        | 83                 |                                                        | 4.05          | 2    |
|                           | V3        | -                  |      | -                            | -              | -            | -                  |                                                        | 3.05          | 10   |
|                           | V4        | -                  |      | -                            | -              | -            | -                  |                                                        | 3.32          | 7    |
|                           | V5        | 4.83               | 4    | 287                          | 3.13           | 26.27        | 79                 |                                                        | 3.17          | 9    |
| F2                        | V1        | 5.23               | 3    | 301                          | 3.60           | 24.63        | 86                 | 7.30                                                   | 3.80          | 4    |
|                           | V2        | 5.47               | 1    | 309                          | 3.50           | 25.90        | 86                 | 9.70                                                   | 4.27          | 1    |
|                           | V3        | -                  |      | -                            | -              | -            | -                  |                                                        | 3.26          | 8    |
|                           | V4        | -                  |      | -                            | -              | -            | -                  |                                                        | 3.82          | 3    |
|                           | V5        | 5.40               | 2    | 297                          | 3.27           | 26.50        | 85                 | 5.70                                                   | 3.49          | 5    |
| Interaction               |           |                    |      |                              |                |              |                    |                                                        |               |      |
| F at same V               |           | NS                 |      | NS                           | NS             | NS           | NS                 |                                                        |               |      |
| V at same F               |           | NS                 |      | NS                           | NS             | NS           | NS                 |                                                        |               |      |
|                           | F1        | 4.61               | 2    | 283                          | 3.08           | 25.77        | 81                 |                                                        | 3.62          | 2    |
|                           | F2        | 5.37               | 1    | 303                          | 3.46           | 25.68        | 86                 | 7.57                                                   | 3.94          | 1    |
| C.D.(0.05)                |           | 0.13               |      | NS                           | 0.31           | NS           | 0.48               |                                                        |               |      |
| C.V.(%)                   |           | 1.25               |      | 7.3                          | 4.73           | 1.08         | 0.28               |                                                        |               |      |
| <b>Mean of varieties:</b> |           |                    |      |                              |                |              |                    |                                                        |               |      |
|                           | V1        | 4.87               | 3    | 282                          | 3.34           | 24.82        | 84                 | 7.30                                                   | 3.64          | 2    |
|                           | V2        | 4.99               | 2    | 305                          | 3.27           | 25.97        | 85                 | 9.70                                                   | 4.16          | 1    |
|                           | V3        | -                  |      | -                            | -              | -            | -                  |                                                        | 3.15          | 5    |
|                           | V4        | -                  |      | -                            | -              | -            | -                  |                                                        | 3.57          | 3    |
|                           | V5        | 5.12               | 1    | 292                          | 3.20           | 26.39        | 82                 | 5.70                                                   | 3.33          | 4    |
| C.D.(0.05)                |           | NS                 |      | NS                           | NS             | 0.74         | NS                 |                                                        |               |      |
| C.V. (%)                  |           | 4.32               |      | 6.57                         | 3.23           | 2.17         | 2.88               |                                                        |               |      |
| <b>Expt. Mean</b>         |           | <b>4.99</b>        |      | <b>293</b>                   | <b>3.27</b>    | <b>25.72</b> | <b>83</b>          |                                                        | 3.78          |      |

Table 4.1.1(k): Contd.

| F-levels                        | Varieties | REWA               |      |                              |                |             |                    |                                                        | Over all mean | Rank |
|---------------------------------|-----------|--------------------|------|------------------------------|----------------|-------------|--------------------|--------------------------------------------------------|---------------|------|
|                                 |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |               |      |
| Soil type                       |           | -                  |      |                              |                |             |                    |                                                        |               |      |
| pH                              |           | 6.2                |      |                              |                |             |                    |                                                        |               |      |
| <b>N - levels (kg/ha)</b>       |           |                    |      |                              |                |             |                    |                                                        |               |      |
| F1                              |           | 100:60:40          |      |                              |                |             |                    |                                                        |               |      |
| F2                              |           | 150:90:60          |      |                              |                |             |                    |                                                        |               |      |
| Recommended N:P:K (kg/ha)       |           | 100:60:40          |      |                              |                |             |                    |                                                        |               |      |
| <b>Varieties</b>                |           |                    |      |                              |                |             |                    |                                                        |               |      |
| V1                              |           | IET 26995          |      |                              |                |             |                    |                                                        |               |      |
| V2                              |           | IET 26999          |      |                              |                |             |                    |                                                        |               |      |
| V3                              |           |                    |      |                              |                |             |                    |                                                        |               |      |
| V4                              |           |                    |      |                              |                |             |                    |                                                        |               |      |
| V5                              |           | LC - IR 64         |      |                              |                |             |                    |                                                        |               |      |
| Available N:P:K of soil (kg/ha) |           | 302:19.8:416       |      |                              |                |             |                    |                                                        |               |      |

### NMT 1(l) Biofortified

AVT-2 entry (IET 27179) was evaluated for its response to different levels of nutrients (100% and 150% RDF) on grain yield from thirteen locations viz., **Chinsurah (80:40:40)**, **Coimbatore (150:60:40)**, **IIRR (120:60:40)**, **Kaul (150:60:60)**, **Mandya (100:50:50)**, **Nagina (120:60:40)**, **Nawagam (100:25:0)**, **Pantnagar (120:60:40)**, **Raipur (100:60:40)**, **Rajendranagar (120:60:40)**, **Rewa (120:60:40)**, **Maruteru (90:60:60)** and **Varanasi (120:60:60)**. The details and data received from these locations are summarized and presented in Table 4.1(l).

Application of different nutrient levels registered significantly higher grain yield at **Chinsurah, Mandya, Nawagam, Raipur, Rajendranagar** and **Rewa**. Application of 150% RDF recorded significantly higher grain yields at **Chinsurah** (4.65 t/ha), **Mandya** (5.43 t/ha), **Nawagam** (5.55 t/ha), **Raipur** (4.35 t/ha), **Rajendranagar** (3.83 t/ha), **Rewa** (5.55 t/ha) and **Varanasi** (2.61 t/ha). Higher nutrient response was recorded with 150% RDF over 100% RDF at **Chinsurah** (8.83), **Mandya** (4.68), **Nawagam** (15.60), **Raipur** (8.50), **Rajendranagar** (4.85), **Rewa** (5.88) and **Varanasi** (2.28) indicating higher nutrient application for better yields.

Grain yield differences among the tested cultures were found to be significant at all the locations except at **Rajendranagar** and **Maruteru**. Highest grain yield was recorded by IET 27179 at **Chinsurah** (4.93 t/ha), **Coimbatore** (5.50 t/ha), **Mandya** (7.09 t/ha), **Nagina** (4.11 t/ha), **Raipur** (5.57 t/ha) and **Varanasi** (3.81 t/ha). Mean over the locations, IET 27179 (4.70 t/ha) performed better and was found superior over local check - Kalanamak (3.43 t/ha). Interaction effects among RDF x varieties was found to be non-significant at all the locations except at **Pantnagar** and **Raipur** where significant interaction was noted. Application of 150% RDF with cultivar IET 27179 and BPT 5204 found promising in recording better yields.

In this trial, mean over the locations nutrient management with 150% had higher grain yield. IET 27179 and BPT 5204 were found to be promising and recorded higher mean grain yield over the locations.

Table 4.1(l): Summary of data on grain yield and ancillary characters of selected NMT Bio-fortified cultures grown under transplanted conditions at medium &amp; high levels of recommended fertilizer doses, kharif 2019.

| F-levels                        | Varieties | CHINSURAH          |      |                               |                |                    |                                                        | COIMBATORE         |      |                               |                |             |                    | Nutri. res.<br>(kg grain/kg Nutri.)<br>(Base level 100% RDF) |
|---------------------------------|-----------|--------------------|------|-------------------------------|----------------|--------------------|--------------------------------------------------------|--------------------|------|-------------------------------|----------------|-------------|--------------------|--------------------------------------------------------------|
|                                 |           | Grain Yield (t/ha) | Rank | Panicle /m <sup>2</sup> (No.) | Panicle wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) | Grain Yield (t/ha) | Rank | Panicle /m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering |                                                              |
| F1                              | V1        | 4.56               | 5    | 293                           | 3.55           | 89                 |                                                        | 5.41               | 3    | 346                           | 3.97           | 23.2        | 101                |                                                              |
|                                 | V2        | 3.75               | 8    | 270                           | 3.64           | 95                 |                                                        | 5.28               | 4    | 339                           | 2.84           | 14.5        | 98                 |                                                              |
|                                 | V3        | 3.92               | 7    | 316                           | 2.72           | 108                |                                                        | 3.90               | 8    | 365                           | 1.34           | 15.5        | 98                 |                                                              |
|                                 | V4        | 4.64               | 4    | 275                           | 3.25           | 84                 |                                                        | 4.51               | 6    | 344                           | 2.18           | 23.4        | 88                 |                                                              |
|                                 | V5        | 2.85               | 10   | 284                           | 2.78           | 98                 |                                                        | 3.64               | 9    | 335                           | 1.93           | 21.3        | 108                |                                                              |
| F2                              | V1        | 5.30               | 1    | 309                           | 4.83           | 90                 | -51.70                                                 | 5.58               | 1    | 351                           | 4.06           | 23.4        | 102                | -37.70                                                       |
|                                 | V2        | 4.83               | 3    | 313                           | 3.97           | 95                 | -42.05                                                 | 5.53               | 2    | 343                           | 2.88           | 14.7        | 99                 | -36.71                                                       |
|                                 | V3        | 4.18               | 6    | 327                           | 3.22           | 110                | -44.82                                                 | 4.01               | 7    | 377                           | 1.79           | 15.6        | 98                 | -27.19                                                       |
|                                 | V4        | 5.22               | 2    | 280                           | 3.42           | 84                 | -52.78                                                 | 4.67               | 5    | 355                           | 2.55           | 23.6        | 88                 | -31.41                                                       |
|                                 | V5        | 3.71               | 9    | 230                           | 3.00           | 98                 | -31.92                                                 | 3.62               | 10   | 348                           | 1.86           | 21.4        | 108                | -25.50                                                       |
| Interaction                     |           |                    |      |                               |                |                    |                                                        |                    |      |                               |                |             |                    |                                                              |
| F at same V                     |           | NS                 |      | NS                            | NS             | NS                 |                                                        | NS                 |      | NS                            | NS             | NS          | NS                 |                                                              |
| V at same F                     |           | NS                 |      | NS                            | NS             | NS                 |                                                        | NS                 |      | NS                            | NS             | NS          | NS                 |                                                              |
| F1                              |           | 3.94               | 2    | 288                           | 3.19           | 95                 |                                                        | 4.55               | 2    | 346                           | 2.45           | 19.6        | 99                 |                                                              |
| F2                              |           | 4.65               | 1    | 292                           | 3.69           | 95                 | 8.80                                                   | 4.68               | 1    | 355                           | 2.63           | 19.7        | 99                 | 1.07                                                         |
| C.D.(0.05)                      |           | 0.51               |      | NS                            | 0.12           | NS                 |                                                        | NS                 |      | NS                            | NS             | NS          | NS                 |                                                              |
| C.V.(%)                         |           | 7.51               |      | 5.01                          | 2.26           | 0.51               |                                                        | 1.91               |      | 4.95                          | 10.55          | 0.67        | 0.18               |                                                              |
| Mean of varieties:              |           |                    |      |                               |                |                    |                                                        |                    |      |                               |                |             |                    |                                                              |
| V1                              |           | 4.93               | 1    | 301                           | 4.19           | 90                 | -51.70                                                 | 5.50               | 1    | 349                           | 4.02           | 23.3        | 102                | -37.70                                                       |
| V2                              |           | 4.29               | 3    | 292                           | 3.81           | 95                 | -42.05                                                 | 5.41               | 2    | 341                           | 2.86           | 14.6        | 99                 | -36.71                                                       |
| V3                              |           | 4.05               | 4    | 321                           | 2.97           | 109                | -44.82                                                 | 3.96               | 4    | 371                           | 1.57           | 15.6        | 98                 | -27.19                                                       |
| V4                              |           | 4.93               | 1    | 278                           | 3.34           | 84                 | -52.78                                                 | 4.59               | 3    | 349                           | 2.37           | 23.5        | 88                 | -31.41                                                       |
| V5                              |           | 3.28               | 5    | 257                           | 2.89           | 98                 | -31.92                                                 | 3.63               | 5    | 341                           | 1.90           | 21.4        | 108                | -25.50                                                       |
| C.D.(0.05)                      |           | 0.36               |      | 26.21                         | 0.43           | 0.84               |                                                        | 0.26               |      | 18.48                         | 0.34           | 0.25        | 0.54               |                                                              |
| C.V. (%)                        |           | 6.78               |      | 7.39                          | 10.26          | 0.72               |                                                        | 4.58               |      | 4.31                          | 10.81          | 1.04        | 0.44               |                                                              |
| Expt. Mean                      |           | 4.30               |      | 290                           | 3.44           | 95.20              |                                                        | 4.62               |      | 350                           | 2.54           | 19.7        | 98.93              |                                                              |
| Soil type                       |           | Clay loam          |      |                               |                |                    |                                                        | Clay loam          |      |                               |                |             |                    |                                                              |
| pH                              |           | 7.87               |      |                               |                |                    |                                                        | 8.02               |      |                               |                |             |                    |                                                              |
| N - levels (kg/ha)              |           |                    |      |                               |                |                    |                                                        |                    |      |                               |                |             |                    |                                                              |
| F1                              |           | 80:40:40           |      |                               |                |                    |                                                        | 150:50:50          |      |                               |                |             |                    |                                                              |
| F2                              |           | 120:60:60          |      |                               |                |                    |                                                        | 225:75:75          |      |                               |                |             |                    |                                                              |
| Recommended N:P:K (kg/ha)       |           | 80:40:40           |      |                               |                |                    |                                                        | 150:50:50          |      |                               |                |             |                    |                                                              |
| Varieties                       |           |                    |      |                               |                |                    |                                                        |                    |      |                               |                |             |                    |                                                              |
| V1                              |           | IET 27179          |      |                               |                |                    |                                                        | IET 27179          |      |                               |                |             |                    |                                                              |
| V2                              |           | BPT 5204           |      |                               |                |                    |                                                        | BPT 5204           |      |                               |                |             |                    |                                                              |
| V3                              |           | Chittimuthyalu     |      |                               |                |                    |                                                        | Chittimuthyalu     |      |                               |                |             |                    |                                                              |
| V4                              |           | IR 64              |      |                               |                |                    |                                                        | IR 64              |      |                               |                |             |                    |                                                              |
| V5                              |           | Kalanamak          |      |                               |                |                    |                                                        | Kalanamak          |      |                               |                |             |                    |                                                              |
| Available N:P:K of soil (kg/ha) |           | 560:54:307         |      |                               |                |                    |                                                        | 193:30:616         |      |                               |                |             |                    |                                                              |

Table 4.1(l): Cntd....

| F-levels                        | Varieties | IIRR               |      |                               |                |             |                    |                                                        | KAUL               |      |                               |                |             |                                                        |
|---------------------------------|-----------|--------------------|------|-------------------------------|----------------|-------------|--------------------|--------------------------------------------------------|--------------------|------|-------------------------------|----------------|-------------|--------------------------------------------------------|
|                                 |           | Grain Yield (t/ha) | Rank | Panicle /m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) | Grain Yield (t/ha) | Rank | Panicle /m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
| F1                              | V1        | 3.51               | 8    | 235                           | 4.07           | 22.4        | 106                |                                                        | 5.51               | 6    | 266                           | 2.31           | 25.43       |                                                        |
|                                 | V2        | 3.64               | 6    | 334                           | 2.17           | 18.1        | 112                |                                                        | 6.57               | 4    | 309                           | 2.37           | 25.77       |                                                        |
|                                 | V3        | 3.72               | 4    | 286                           | 2.14           | 17.1        | 109                |                                                        | 4.14               | 8    | 308                           | 1.50           | 14.10       |                                                        |
|                                 | V4        | 3.79               | 3    | 287                           | 3.24           | 22.7        | 96                 |                                                        | 7.23               | 2    | 304                           | 2.69           | 28.20       |                                                        |
|                                 | V5        | 3.04               | 10   | 257                           | 2.51           | 20.5        | 93                 |                                                        | 3.09               | 9    | 293                           | 1.17           | 14.80       |                                                        |
| F2                              | V1        | 3.61               | 7    | 232                           | 4.33           | 21.3        | 108                | 0.91                                                   | 5.69               | 5    | 268                           | 2.37           | 25.63       | 1.33                                                   |
|                                 | V2        | 3.65               | 5    | 351                           | 2.62           | 18.1        | 114                | 0.09                                                   | 6.77               | 3    | 315                           | 2.40           | 26.03       | 1.48                                                   |
|                                 | V3        | 4.01               | 1    | 323                           | 2.13           | 18.1        | 111                | 2.64                                                   | 4.2                | 7    | 313                           | 1.51           | 14.23       | 0.44                                                   |
|                                 | V4        | 3.87               | 2    | 326                           | 3.68           | 17.7        | 103                | 0.73                                                   | 7.25               | 1    | 313                           | 2.68           | 28.10       | 0.15                                                   |
|                                 | V5        | 3.05               | 9    | 281                           | 2.80           | 20.1        | 97                 | 0.09                                                   | 3.09               | 9    | 288                           | 1.19           | 14.83       | 0.00                                                   |
| Interaction                     |           |                    |      |                               |                |             |                    |                                                        |                    |      |                               |                |             |                                                        |
| F at same V                     |           | NS                 |      | NS                            | 0.16           | 2.01        | NS                 |                                                        | NS                 |      | NS                            | NS             | NS          |                                                        |
| V at same F                     |           | NS                 |      | NS                            | 0.15           | 1.82        | NS                 |                                                        | NS                 |      | NS                            | NS             | NS          |                                                        |
| F1                              |           | 3.54               | 2    | 280                           | 2.83           | 20.2        | 103                |                                                        | 5.31               | 2    | 296                           | 2.01           | 21.66       |                                                        |
| F2                              |           | 3.64               | 1    | 303                           | 3.11           | 19.0        | 107                | 0.89                                                   | 5.40               | 1    | 299                           | 2.03           | 21.76       | 0.68                                                   |
| C.D.(0.05)                      |           | NS                 |      | 15.96                         | 0.08           | 0.35        | 1.31               |                                                        | NS                 |      | NS                            | NS             | NS          |                                                        |
| C.V.(%)                         |           | 2.65               |      | 3.49                          | 1.61           | 1.14        | 0.8                |                                                        | 5.39               |      | 5.96                          | 1.28           | 11.53       |                                                        |
| Mean of varieties:              |           |                    |      |                               |                |             |                    |                                                        |                    |      |                               |                |             |                                                        |
| V1                              |           | 3.56               | 4    | 234                           | 4.20           | 21.8        | 107                | 0.91                                                   | 5.60               | 3    | 267                           | 2.34           | 25.53       | 1.33                                                   |
| V2                              |           | 3.65               | 3    | 343                           | 2.40           | 18.1        | 113                | 0.09                                                   | 6.67               | 2    | 312                           | 2.39           | 25.90       | 1.48                                                   |
| V3                              |           | 3.87               | 1    | 304                           | 2.14           | 17.6        | 110                | 2.64                                                   | 4.17               | 4    | 310                           | 1.51           | 14.17       | 0.44                                                   |
| V4                              |           | 3.83               | 2    | 307                           | 3.46           | 20.2        | 100                | 0.73                                                   | 7.24               | 1    | 308                           | 2.69           | 28.15       | 0.15                                                   |
| V5                              |           | 3.05               | 5    | 269                           | 2.66           | 20.3        | 95                 | 0.09                                                   | 3.09               | 5    | 290                           | 1.18           | 14.82       | 0.00                                                   |
| C.D.(0.05)                      |           | 0.18               |      | 11.61                         | 0.11           | 1.42        | 2.57               |                                                        | 0.45               |      | 30.35                         | 0.16           | 2.01        |                                                        |
| C.V. (%)                        |           | 4.05               |      | 3.26                          | 3.11           | 5.93        | 2.01               |                                                        | 6.83               |      | 8.33                          | 6.46           | 7.57        |                                                        |
| Expt. Mean                      |           | 3.59               |      | 291                           | 2.97           | 19.6        | 105                |                                                        | 5.35               |      | 298                           | 2.02           | 21.71       |                                                        |
| Soil type                       |           | Black clay         |      |                               |                |             |                    |                                                        | Clay loam          |      |                               |                |             |                                                        |
| pH                              |           | 7.56               |      |                               |                |             |                    |                                                        | 8.10               |      |                               |                |             |                                                        |
| N - levels (kg/ha)              |           |                    |      |                               |                |             |                    |                                                        |                    |      |                               |                |             |                                                        |
| F1                              |           | 120:60:40          |      |                               |                |             |                    |                                                        | 150:60:60          |      |                               |                |             |                                                        |
| F2                              |           | 180:90:60          |      |                               |                |             |                    |                                                        | 225:90:90          |      |                               |                |             |                                                        |
| Recommended N:P:K (kg/ha)       |           | 120:60:40          |      |                               |                |             |                    |                                                        | 150:60:60          |      |                               |                |             |                                                        |
| Varieties                       |           |                    |      |                               |                |             |                    |                                                        |                    |      |                               |                |             |                                                        |
| V1                              |           | IET 27179          |      |                               |                |             |                    |                                                        | IET 27179          |      |                               |                |             |                                                        |
| V2                              |           | BPT 5204           |      |                               |                |             |                    |                                                        | BPT 5204           |      |                               |                |             |                                                        |
| V3                              |           | Chittimuthyalu     |      |                               |                |             |                    |                                                        | Chittimuthyalu     |      |                               |                |             |                                                        |
| V4                              |           | IR 64              |      |                               |                |             |                    |                                                        | IR 64              |      |                               |                |             |                                                        |
| V5                              |           | Kalanamak          |      |                               |                |             |                    |                                                        | Kalanamak          |      |                               |                |             |                                                        |
| Available N:P:K of soil (kg/ha) |           | -                  |      |                               |                |             |                    |                                                        | 160:16:420         |      |                               |                |             |                                                        |

Table 4.1(l): Cntd....

| F-levels                        | Varieties | MANDYA             |      |                              |                |             |                    |                                                        | NAGINA             |      |                              |                |             |                    |                                                        |
|---------------------------------|-----------|--------------------|------|------------------------------|----------------|-------------|--------------------|--------------------------------------------------------|--------------------|------|------------------------------|----------------|-------------|--------------------|--------------------------------------------------------|
|                                 |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
| F1                              | V1        | 6.74               | 4    | 327                          | 3.87           | 27.5        | 95                 |                                                        | 4.02               | 2    | 258                          | 2.16           | 23.9        | 99                 |                                                        |
|                                 | V2        | 4.70               | 7    | 377                          | 2.33           | 15.9        | 107                |                                                        | -                  | -    | -                            | -              | -           | -                  |                                                        |
|                                 | V3        | 2.00               | 10   | 406                          | 1.66           | 13.3        | 78                 |                                                        | 3.41               | 4    | 265                          | 2.48           | 24.9        | 109                |                                                        |
|                                 | V4        | 6.84               | 3    | 358                          | 3.23           | 25.2        | 90                 |                                                        | -                  | -    | -                            | -              | -           | -                  |                                                        |
|                                 | V5        | 4.53               | 8    | 321                          | 2.00           | 16.0        | 78                 |                                                        | 3.15               | 6    | 244                          | 2.45           | 17.7        | 115                |                                                        |
| F2                              | V1        | 7.43               | 1    | 340                          | 4.09           | 28.0        | 95                 | 26.60                                                  | 4.20               | 1    | 270                          | 2.16           | 23.2        | 99                 | 1.64                                                   |
|                                 | V2        | 5.19               | 5    | 385                          | 2.45           | 16.1        | 108                | 20.00                                                  | -                  | -    | -                            | -              | -           | -                  |                                                        |
|                                 | V3        | 2.23               | 9    | 422                          | 1.79           | 13.3        | 78                 | 23.30                                                  | 3.49               | 3    | 255                          | 2.50           | 24.9        | 109                | 0.73                                                   |
|                                 | V4        | 7.31               | 2    | 377                          | 3.44           | 25.7        | 91                 | 76.60                                                  | -                  | -    | -                            | -              | -           | -                  |                                                        |
|                                 | V5        | 4.99               | 6    | 340                          | 2.10           | 16.2        | 78                 | 43.30                                                  | 3.28               | 5    | 270                          | 2.45           | 17.8        | 117                | 1.18                                                   |
| Interaction                     |           |                    |      |                              |                |             |                    |                                                        |                    |      |                              |                |             |                    |                                                        |
| F at same V                     |           | NS                 |      | NS                           | NS             | NS          | NS                 |                                                        | NS                 |      | NS                           | NS             | NS          | NS                 |                                                        |
| V at same F                     |           | NS                 |      | NS                           | NS             | NS          | NS                 |                                                        | NS                 |      | NS                           | NS             | NS          | NS                 |                                                        |
| F1                              |           | 4.96               | 2    | 358                          | 2.62           | 19.6        | 90                 |                                                        | 3.53               | 2    | 256                          | 2.36           | 22.2        | 108                |                                                        |
| F2                              |           | 5.43               | 1    | 373                          | 2.77           | 19.9        | 90                 | 4.68                                                   | 3.66               | 1    | 265                          | 2.37           | 22.0        | 108                | 1.18                                                   |
| C.D.(0.05)                      |           | 0.1                |      | 10.06                        | 0.08           | 0.15        | NS                 |                                                        | NS                 |      | NS                           | NS             | NS          | NS                 |                                                        |
| C.V.(%)                         |           | 1.21               |      | 1.75                         | 1.85           | 0.47        | 0.89               |                                                        | 1.92               |      | 1.96                         | 0.36           | 2.12        | 0.38               |                                                        |
| Mean of varieties:              |           |                    |      |                              |                |             |                    |                                                        |                    |      |                              |                |             |                    |                                                        |
| V1                              |           | 7.09               | 1    | 334                          | 3.98           | 27.8        | 95                 | 26.60                                                  | 4.11               | 1    | 264                          | 2.16           | 23.5        | 99                 | 1.64                                                   |
| V2                              |           | 4.95               | 3    | 381                          | 2.39           | 16.0        | 108                | 20.00                                                  | -                  | -    | -                            | -              | -           | -                  |                                                        |
| V3                              |           | 2.12               | 5    | 414                          | 1.73           | 13.3        | 78                 | 23.30                                                  | 3.45               | 2    | 260                          | 2.49           | 24.9        | 109                | 0.73                                                   |
| V4                              |           | 7.08               | 2    | 367                          | 3.34           | -           | -                  | 76.60                                                  | -                  | -    | -                            | -              | -           | -                  |                                                        |
| V5                              |           | 4.76               | 4    | 330                          | 2.05           | 16.1        | 78                 | 43.30                                                  | 3.22               | 3    | 257                          | 2.45           | 17.7        | 116                | 1.18                                                   |
| C.D.(0.05)                      |           | 0.6                |      | 43.85                        | 0.39           | 2.48        | 0.74               |                                                        | 0.19               |      | NS                           | 0.02           | 0.87        | 1.09               |                                                        |
| C.V. (%)                        |           | 9.38               |      | 9.81                         | 11.76          | 10.26       | 0.68               |                                                        | 4.06               |      | 6.09                         | 0.62           | 2.97        | 0.76               |                                                        |
| Expt. Mean                      |           | 5.20               |      | 365                          | 2.70           | 18.3        | 89                 |                                                        | 3.59               |      | 260                          | 2.37           | 22.1        | 108                |                                                        |
| Soil type                       |           | Red sandy loam     |      |                              |                |             |                    |                                                        | -                  |      |                              |                |             |                    |                                                        |
| pH                              |           | 6.98               |      |                              |                |             |                    |                                                        | 7.70               |      |                              |                |             |                    |                                                        |
| N - levels (kg/ha)              |           |                    |      |                              |                |             |                    |                                                        |                    |      |                              |                |             |                    |                                                        |
| F1                              |           | 100:50:50          |      |                              |                |             |                    |                                                        | 120:60:40          |      |                              |                |             |                    |                                                        |
| F2                              |           | 150:75:75          |      |                              |                |             |                    |                                                        | 180:90:60          |      |                              |                |             |                    |                                                        |
| Recommended N:P:K (kg/ha)       |           | 100:50:50          |      |                              |                |             |                    |                                                        | 120:60:40          |      |                              |                |             |                    |                                                        |
| Varieties                       |           |                    |      |                              |                |             |                    |                                                        |                    |      |                              |                |             |                    |                                                        |
| V1                              |           | IET 27179          |      |                              |                |             |                    |                                                        | IET 27179          |      |                              |                |             |                    |                                                        |
| V2                              |           | BPT 5204           |      |                              |                |             |                    |                                                        |                    |      |                              |                |             |                    |                                                        |
| V3                              |           | Chittimuthyalu     |      |                              |                |             |                    |                                                        | Chittimuthyalu     |      |                              |                |             |                    |                                                        |
| V4                              |           | IR 64              |      |                              |                |             |                    |                                                        |                    |      |                              |                |             |                    |                                                        |
| V5                              |           | Kalanamak          |      |                              |                |             |                    |                                                        | Kalanamak          |      |                              |                |             |                    |                                                        |
| Available N:P:K of soil (kg/ha) |           | 356:89:256         |      |                              |                |             |                    |                                                        | 21:18.:209         |      |                              |                |             |                    |                                                        |

Table 4.1(l): Cntd....

| F-levels                        | Varieties | PANTNAGAR          |      |                              |                |             |                    |                                                        | RAIPUR             |      |                              |                |             |                    |  | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
|---------------------------------|-----------|--------------------|------|------------------------------|----------------|-------------|--------------------|--------------------------------------------------------|--------------------|------|------------------------------|----------------|-------------|--------------------|--|--------------------------------------------------------|
|                                 |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering |  |                                                        |
| F1                              | V1        | 2.57               | 8    | 233                          | 1.42           | 22.4        | 100                |                                                        | 5.07               | 2    | 223                          | 4.04           | 26.1        | 90                 |  |                                                        |
|                                 | V2        | 4.00               | 3    | 269                          | 1.77           | 21.3        | 110                |                                                        | -                  | -    | -                            | -              | -           | -                  |  |                                                        |
|                                 | V3        | 2.20               | 9    | 226                          | 1.12           | 23.8        | 113                |                                                        | 2.85               | 5    | 236                          | 2.15           | 12.4        | 110                |  |                                                        |
|                                 | V4        | 3.73               | 4    | 238                          | 1.76           | 25.2        | 87                 |                                                        | -                  | -    | -                            | -              | -           | -                  |  |                                                        |
|                                 | V5        | 2.83               | 6    | 240                          | 1.42           | 25.0        | 111                |                                                        | 2.57               | 6    | 247                          | 2.70           | 14.6        | 99                 |  |                                                        |
| F2                              | V1        | 2.86               | 5    | 193                          | 2.00           | 22.5        | 99                 | 2.64                                                   | 6.06               | 1    | 262                          | 4.58           | 26.4        | 90                 |  | 9.90                                                   |
|                                 | V2        | 5.30               | 1    | 298                          | 2.48           | 22.6        | 110                | 11.82                                                  | -                  | -    | -                            | -              | -           | -                  |  |                                                        |
|                                 | V3        | 2.17               | 10   | 294                          | 0.89           | 23.6        | 113                | -0.27                                                  | 3.23               | 4    | 293                          | 2.60           | 12.3        | 111                |  | 3.80                                                   |
|                                 | V4        | 4.60               | 2    | 231                          | 2.48           | 25.6        | 87                 | 7.91                                                   |                    |      |                              |                |             |                    |  |                                                        |
|                                 | V5        | 2.59               | 7    | 201                          | 1.73           | 22.4        | 109                | -2.18                                                  | 3.75               | 3    | 309                          | 3.30           | 14.4        | 100                |  | 11.80                                                  |
| Interaction F at same V         |           | 0.5                |      | 44.65                        | NS             | 0.74        | NS                 |                                                        | 0.28               |      | NS                           | NS             | NS          | NS                 |  |                                                        |
| V at same F                     |           | 0.6                |      | 62.99                        | NS             | 1.01        | NS                 |                                                        | 0.41               |      | NS                           | NS             | NS          | NS                 |  |                                                        |
| F1                              |           | 3.07               | 2    | 241                          | 1.50           | 23.5        | 104                |                                                        | 3.50               | 2    | 236                          | 2.96           | 17.7        | 100                |  |                                                        |
| F2                              |           | 3.50               | 1    | 244                          | 1.92           | 23.3        | 103                | 3.98                                                   | 4.35               | 1    | 288                          | 3.49           | 17.7        | 100                |  | 8.50                                                   |
| C.D.(0.05)                      |           | NS                 |      | NS                           | 0.35           | NS          | NS                 |                                                        | 0.43               |      | 17.1<br>1                    | 0.52           | NS          | NS                 |  |                                                        |
| C.V.(%)                         |           | 9.92               |      | 16.43                        | 13.1<br>8      | 2.66        | 1.68               |                                                        | 5.46               |      | 3.22                         | 7.88           | 5.02        | 0.71               |  |                                                        |
| Mean of varieties:              |           |                    |      |                              |                |             |                    |                                                        |                    |      |                              |                |             |                    |  |                                                        |
| V1                              |           | 2.72               | 3    | 213                          | 1.71           | 22.4        | 99                 | 2.64                                                   | 5.57               | 1    | 243                          | 4.31           | 26.3        | 90                 |  | 9.90                                                   |
| V2                              |           | 4.65               | 1    | 284                          | 2.13           | 21.9        | 110                | 11.82                                                  | -                  | -    | -                            | -              | -           | -                  |  |                                                        |
| V3                              |           | 2.19               | 5    | 260                          | 1.01           | 23.7        | 113                | -0.27                                                  | 3.04               | 3    | 265                          | 2.38           | 12.4        | 110                |  | 3.80                                                   |
| V4                              |           | 4.17               | 2    | 235                          | 2.12           | 25.4        | 87                 | 7.91                                                   | -                  | -    | -                            | -              | -           | -                  |  |                                                        |
| V5                              |           | 2.71               | 4    | 221                          | 1.58           | 23.7        | 110                | -2.18                                                  | 3.16               | 2    | 278                          | 3.00           | 14.5        | 100                |  | 11.80                                                  |
| C.D.(0.05)                      |           | 0.35               |      | 31.57                        | 0.5            | 0.52        | 2.26               |                                                        | 0.2                |      | 16.2<br>2                    | 0.26           | 0.9         | 0.59               |  |                                                        |
| C.V. (%)                        |           | 8.8                |      | 10.64                        | 23.8<br>2      | 1.82        | 1.78               |                                                        | 3.85               |      | 4.65                         | 6.01           | 3.83        | 0.44               |  |                                                        |
| Expt. Mean                      |           | 3.29               |      | 242                          | 1.71           | 23.4        | 104                |                                                        | 3.92               |      | 262                          | 3.23           | 17.7        | 100                |  |                                                        |
| Soil type                       |           | Silt loan          |      |                              |                |             |                    |                                                        | Clay loam          |      |                              |                |             |                    |  |                                                        |
| pH                              |           | 7.60               |      |                              |                |             |                    |                                                        | 7.20               |      |                              |                |             |                    |  |                                                        |
| N - levels (kg/ha)              |           |                    |      |                              |                |             |                    |                                                        |                    |      |                              |                |             |                    |  |                                                        |
| F1                              |           | 120:60:40          |      |                              |                |             |                    |                                                        | 100:60:40          |      |                              |                |             |                    |  |                                                        |
| F2                              |           | 180:90:60          |      |                              |                |             |                    |                                                        | 150:90:60          |      |                              |                |             |                    |  |                                                        |
| Recommended N:P:K (kg/ha)       |           | 120:60:40          |      |                              |                |             |                    |                                                        | 100:60:40          |      |                              |                |             |                    |  |                                                        |
| Varieties                       |           |                    |      |                              |                |             |                    |                                                        |                    |      |                              |                |             |                    |  |                                                        |
| V1                              |           | IET 27179          |      |                              |                |             |                    |                                                        | IET 27179          |      |                              |                |             |                    |  |                                                        |
| V2                              |           | BPT 5204           |      |                              |                |             |                    |                                                        | -                  |      |                              |                |             |                    |  |                                                        |
| V3                              |           | Chittimuthyalu     |      |                              |                |             |                    |                                                        | Chittimuthyalu     |      |                              |                |             |                    |  |                                                        |
| V4                              |           | IR 64              |      |                              |                |             |                    |                                                        | -                  |      |                              |                |             |                    |  |                                                        |
| V5                              |           | Kalanamak          |      |                              |                |             |                    |                                                        | Kalanamak          |      |                              |                |             |                    |  |                                                        |
| Available N:P:K of soil (kg/ha) |           | 230:22:215         |      |                              |                |             |                    |                                                        | 172:23:452         |      |                              |                |             |                    |  |                                                        |

Table 4.1(l): Cntd....

| F-levels                           | Varieties | RAJENDRANAGAR - ARI   |      |                                 |                   |              |                       | Nutri. res.<br>(kg grain/kg Nutri.)<br>(Base level 100% RDF) |
|------------------------------------|-----------|-----------------------|------|---------------------------------|-------------------|--------------|-----------------------|--------------------------------------------------------------|
|                                    |           | Grain Yield<br>(t/ha) | Rank | Panicle/m <sup>2</sup><br>(No.) | Panicle wt<br>(g) | Test wt (g)  | Days 50%<br>flowering |                                                              |
| F1                                 | V1        | 3.50                  | 5    | 234                             | 4.37              | 22.93        | 111                   |                                                              |
|                                    | V2        | 3.50                  | 5    | 335                             | 2.14              | 12.97        | 115                   |                                                              |
|                                    | V3        | 3.39                  | 8    | 300                             | 2.09              | 10.67        | 113                   |                                                              |
|                                    | V4        | 3.43                  | 7    | 255                             | 3.13              | 25.77        | 98                    |                                                              |
|                                    | V5        | 2.79                  | 10   | 278                             | 2.34              | 15.50        | 98                    |                                                              |
| F2                                 | V1        | 4.46                  | 1    | 239                             | 4.02              | 24.00        | 111                   | -27.36                                                       |
|                                    | V2        | 4.11                  | 2    | 371                             | 2.53              | 14.83        | 115                   | -27.71                                                       |
|                                    | V3        | 3.72                  | 3    | 318                             | 2.77              | 11.23        | 113                   | -27.10                                                       |
|                                    | V4        | 3.37                  | 9    | 315                             | 3.40              | 26.07        | 108                   | -27.81                                                       |
|                                    | V5        | 3.62                  | 4    | 290                             | 2.73              | 15.63        | 98                    | -21.74                                                       |
| Interaction                        |           |                       |      |                                 |                   |              |                       |                                                              |
| F at same V                        |           | NS                    |      | NS                              | NS                | NS           | 0.61                  |                                                              |
| V at same F                        |           | NS                    |      | NS                              | NS                | NS           | 0.87                  |                                                              |
|                                    | F1        | 3.32                  | 2    | 280                             | 2.81              | 17.57        | 107                   |                                                              |
|                                    | F2        | 3.86                  | 1    | 307                             | 3.09              | 18.35        | 109                   | 4.85                                                         |
| C.D.(0.05)                         |           | 0.24                  |      | NS                              | NS                | NS           | 0.86                  |                                                              |
| C.V.(%)                            |           | 4.17                  |      | 10.47                           | 14.74             | 5.7          | 0.51                  |                                                              |
| <b>Mean of varieties:</b>          |           |                       |      |                                 |                   |              |                       |                                                              |
|                                    | V1        | 3.98                  | 1    | 236                             | 4.20              | 23.47        | 111                   | -27.36                                                       |
|                                    | V2        | 3.81                  | 2    | 353                             | 2.34              | 13.90        | 115                   | -27.71                                                       |
|                                    | V3        | 3.56                  | 3    | 309                             | 2.43              | 10.95        | 113                   | -27.10                                                       |
|                                    | V4        | 3.40                  |      | 285                             | 3.27              | 25.92        | 103                   | -27.81                                                       |
|                                    | V5        | 3.21                  | 5    | 284                             | 2.54              | 15.57        | 98                    | -21.74                                                       |
| C.D.(0.05)                         |           | NS                    |      | 29.33                           | 0.46              | 1.65         | 0.43                  |                                                              |
| C.V. (%)                           |           | 15.59                 |      | 8.16                            | 12.74             | 7.49         | 0.33                  |                                                              |
| <b>Expt. Mean</b>                  |           | <b>3.59</b>           |      | <b>294</b>                      | <b>2.95</b>       | <b>17.96</b> | <b>108</b>            |                                                              |
| Soil type                          |           | Clay loam             |      |                                 |                   |              |                       |                                                              |
| pH                                 |           | 7.99                  |      |                                 |                   |              |                       |                                                              |
| <b>N - levels (kg/ha)</b>          |           |                       |      |                                 |                   |              |                       |                                                              |
| F1                                 |           | 120:60:40             |      |                                 |                   |              |                       |                                                              |
| F2                                 |           | 180:90:60             |      |                                 |                   |              |                       |                                                              |
| Recommended N:P:K<br>(kg/ha)       |           | 120:60:40             |      |                                 |                   |              |                       |                                                              |
| <b>Varieties</b>                   |           |                       |      |                                 |                   |              |                       |                                                              |
| V1                                 |           | IET 27179             |      |                                 |                   |              |                       |                                                              |
| V2                                 |           | BPT 5204              |      |                                 |                   |              |                       |                                                              |
| V3                                 |           | Chittimuthyalu        |      |                                 |                   |              |                       |                                                              |
| V4                                 |           | IR 64                 |      |                                 |                   |              |                       |                                                              |
| V5                                 |           | Kalanamak             |      |                                 |                   |              |                       |                                                              |
| Available N:P:K of soil<br>(kg/ha) |           | 226:109:689           |      |                                 |                   |              |                       |                                                              |

Table 4.1(l): Cntd....

| F-levels                        | Varieties | REWA               |      |                              |                |             |                    | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
|---------------------------------|-----------|--------------------|------|------------------------------|----------------|-------------|--------------------|--------------------------------------------------------|
|                                 |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days 50% flowering |                                                        |
| F1                              | V1        | 4.8                | 9    | 296                          | 3.33           | 23.13       | 79                 |                                                        |
|                                 | V2        | 4.97               | 8    | 303                          | 3.13           | 25          | 82                 |                                                        |
|                                 | V3        | 5.1                | 7    | 302                          | 2.93           | 26.03       | 80                 |                                                        |
|                                 | V4        | 5.23               | 6    | 296                          | 3.17           | 24.83       | 79                 |                                                        |
|                                 | V5        | 4.7                | 10   | 286                          | 3.07           | 26.03       | 82                 |                                                        |
| F2                              | V1        | 5.37               | 5    | 301                          | 3.4            | 24.47       | 83                 | 5.7                                                    |
|                                 | V2        | 5.43               | 4    | 308                          | 3.53           | 25.43       | 85                 | 4.6                                                    |
|                                 | V3        | 5.77               | 1    | 308                          | 3.67           | 26.23       | 87                 | 6.7                                                    |
|                                 | V4        | 5.7                | 2    | 304                          | 3.6            | 26.73       | 87                 | 4.7                                                    |
|                                 | V5        | 5.47               | 3    | 306                          | 3.5            | 25.17       | 84                 | 7.7                                                    |
| Interaction                     |           |                    |      |                              |                |             |                    |                                                        |
| F at same V                     |           | NS                 |      | NS                           | NS             | NS          | NS                 |                                                        |
| V at same F                     |           | NS                 |      | NS                           | NS             | NS          | NS                 |                                                        |
| F1                              |           | 4.96               | 2    | 297                          | 3.13           | 25          | 80                 |                                                        |
| F2                              |           | 5.55               | 1    | 305                          | 3.54           | 25.61       | 85                 | 5.88                                                   |
| C.D.(0.05)                      |           | 0.55               |      | NS                           | 0.1            | 0.52        | 2.91               |                                                        |
| C.V.(%)                         |           | 6.71               |      | 2.34                         | 1.97           | 1.32        | 2.24               |                                                        |
| Mean of varieties:              |           |                    |      |                              |                |             |                    |                                                        |
| V1                              |           | 5.09               | 4    | 299                          | 3.37           | 23.8        | 81                 | 5.7                                                    |
| V2                              |           | 5.2                | 3    | 306                          | 3.33           | 25.22       | 84                 | 4.6                                                    |
| V3                              |           | 5.44               | 2    | 305                          | 3.3            | 26.13       | 83                 | 6.7                                                    |
| V4                              |           | 5.47               | 1    | 300                          | 3.39           | 25.78       | 83                 | 4.7                                                    |
| V5                              |           | 5.09               | 4    | 296                          | 3.29           | 25.6        | 83                 | 7.7                                                    |
| C.D.(0.05)                      |           | 0.26               |      | NS                           | NS             | 1           | NS                 |                                                        |
| C.V. (%)                        |           | 3.99               |      | 2.11                         | 7.91           | 3.23        | 4.77               |                                                        |
| Expt. Mean                      |           | 5.25               |      | 301                          | 3.33           | 25.31       | 83                 |                                                        |
| Soil type                       |           | -                  |      |                              |                |             |                    |                                                        |
| pH                              |           | 6.7                |      |                              |                |             |                    |                                                        |
| N - levels (kg/ha)              |           |                    |      |                              |                |             |                    |                                                        |
| F1                              |           | 100:60:40          |      |                              |                |             |                    |                                                        |
| F2                              |           | 150:90:60          |      |                              |                |             |                    |                                                        |
| Recommended N:P:K (kg/ha)       |           | 100:60:40          |      |                              |                |             |                    |                                                        |
| Varieties                       |           |                    |      |                              |                |             |                    |                                                        |
| V1                              |           | IET 27179          |      |                              |                |             |                    |                                                        |
| V2                              |           | BPT 5204           |      |                              |                |             |                    |                                                        |
| V3                              |           | Chittimuthyalu     |      |                              |                |             |                    |                                                        |
| V4                              |           | IR 64              |      |                              |                |             |                    |                                                        |
| V5                              |           | Kalanamak          |      |                              |                |             |                    |                                                        |
| Available N:P:K of soil (kg/ha) |           | 20:02.2            |      |                              |                |             |                    |                                                        |

Table 4.1(l): Cntd....

| F-levels | Varieties                       | MARUTERU           |      |                              |                |              |                                                        |
|----------|---------------------------------|--------------------|------|------------------------------|----------------|--------------|--------------------------------------------------------|
|          |                                 | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g)  | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
| F1       | V1                              | 4.65               | 1    | 297                          | 2.98           | 18.85        |                                                        |
|          | V2                              |                    |      |                              |                |              |                                                        |
|          | V3                              | 4.42               | 2    | 292                          | 2.86           | 15.13        |                                                        |
|          | V4                              |                    |      |                              |                |              |                                                        |
|          | V5                              | 4.26               | 3    | 291                          | 2.66           | 17.85        |                                                        |
| F2       | V1                              | 4.18               | 4    | 292                          | 2.97           | 18.88        | -40.11                                                 |
|          | V2                              |                    |      |                              |                |              |                                                        |
|          | V3                              | 4.16               | 5    | 271                          | 2.78           | 15.15        | -37.94                                                 |
|          | V4                              |                    |      |                              |                |              |                                                        |
|          | V5                              | 4.01               | 6    | 260                          | 2.69           | 17.84        | -36.56                                                 |
|          | Interaction                     |                    |      |                              |                |              |                                                        |
|          | F at same V                     | NS                 |      | NS                           | NS             | NS           |                                                        |
|          | V at same F                     | NS                 |      | NS                           | NS             | NS           |                                                        |
|          | F1                              | 4.44               | 1    | 293                          | 2.83           | 17.28        |                                                        |
|          | F2                              | 4.12               | 2    | 274                          | 2.81           | 17.29        | -3.11                                                  |
|          | C.D.(0.05)                      | 0.25               |      | 15.34                        | NS             | NS           |                                                        |
|          | C.V.(%)                         | 2.88               |      | 2.66                         | 3.18           | 1.15         |                                                        |
|          | <b>Mean of varieties:</b>       |                    |      |                              |                |              |                                                        |
|          | V1                              | 4.42               | 1    | 295                          | 2.98           | 18.87        | -40.11                                                 |
|          | V2                              |                    |      |                              |                |              |                                                        |
|          | V3                              | 4.29               | 2    | 282                          | 2.82           | 15.14        | -37.94                                                 |
|          | V4                              |                    |      |                              |                |              |                                                        |
|          | V5                              | 4.14               | 3    | 276                          | 2.68           | 17.85        | -36.56                                                 |
|          | C.D.(0.05)                      | NS                 |      | NS                           | NS             | 0.63         |                                                        |
|          | C.V. (%)                        | 6.57               |      | 9.11                         | 12.27          | 2.72         |                                                        |
|          | <b>Expt. Mean</b>               | <b>4.28</b>        |      | <b>284</b>                   | <b>2.82</b>    | <b>17.28</b> |                                                        |
|          | Soil type                       | Delta alluvial     |      |                              |                |              |                                                        |
|          | pH                              | 7.16               |      |                              |                |              |                                                        |
|          | <b>N - levels (kg/ha)</b>       |                    |      |                              |                |              |                                                        |
|          | F1                              | 90:60:60           |      |                              |                |              |                                                        |
|          | F2                              | 135:90:90          |      |                              |                |              |                                                        |
|          | Recommended N:P:K (kg/ha)       | 90:60:60           |      |                              |                |              |                                                        |
|          | <b>Varieties</b>                |                    |      |                              |                |              |                                                        |
|          | V1                              | IET 27179          |      |                              |                |              |                                                        |
|          | V2                              | -                  |      |                              |                |              |                                                        |
|          | V3                              | Chittimuthyalu     |      |                              |                |              |                                                        |
|          | V4                              | -                  |      |                              |                |              |                                                        |
|          | V5                              | Kalanamak          |      |                              |                |              |                                                        |
|          | Available N:P:K of soil (kg/ha) | 151:36:257         |      |                              |                |              |                                                        |

Table 4.1(l): Cntd....

| F-levels                        | Varieties | VARANASI           |      |                              |                |              |                    |                                                        | Over all mean | Rank |
|---------------------------------|-----------|--------------------|------|------------------------------|----------------|--------------|--------------------|--------------------------------------------------------|---------------|------|
|                                 |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g)  | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |               |      |
| F1                              | V1        | 3.70               | 2    | 236                          | 2.35           | 24.72        | 89                 |                                                        | 4.50          | 6    |
|                                 | V2        |                    |      |                              |                |              |                    |                                                        | 4.55          | 5    |
|                                 | V3        | 1.65               | 5    | 235                          | 0.66           | 10.70        | 105                |                                                        | 3.39          | 9    |
|                                 | V4        |                    |      |                              |                |              |                    |                                                        | 4.93          | 3    |
|                                 | V5        | 1.63               | 6    | 208                          | 1.08           | 11.94        | 107                |                                                        | 3.26          | 10   |
| F2                              | V1        | 3.91               | 1    | 226                          | 2.47           | 25.44        | 91                 | -26.92                                                 | 4.89          | 4    |
|                                 | V2        |                    |      |                              |                |              |                    |                                                        | 5.10          | 2    |
|                                 | V3        | 1.76               | 4    | 284                          | 0.83           | 10.36        | 105                | -11.99                                                 | 3.58          | 8    |
|                                 | V4        |                    |      |                              |                |              |                    |                                                        | 5.25          | 1    |
|                                 | V5        | 2.13               | 3    | 231                          | 1.40           | 12.10        | 106                | -11.45                                                 | 3.61          | 7    |
| Interaction                     |           |                    |      |                              |                |              |                    |                                                        |               |      |
| F at same V                     |           | NS                 |      | 18.84                        | NS             | NS           | NS                 |                                                        |               |      |
| V at same F                     |           | NS                 |      | 18.66                        | NS             | NS           | NS                 |                                                        |               |      |
| F1                              |           | 2.33               | 2    | 226                          | 1.36           | 15.79        | 100                |                                                        | 3.95          | 2    |
| F2                              |           | 2.60               | 1    | 247                          | 1.57           | 15.97        | 101                | 2.28                                                   | 4.29          | 1    |
| C.D.(0.05)                      |           | 0.20               |      | 13.28                        | NS             | NS           | NS                 |                                                        |               |      |
| C.V.(%)                         |           | 4.07               |      | 2.77                         | 10.15          | 2.84         | 0.62               |                                                        |               |      |
| <b>Mean of varieties:</b>       |           |                    |      |                              |                |              |                    |                                                        |               |      |
|                                 | V1        | 3.81               | 1    | 231                          | 2.41           | 25.08        | 90                 | -26.92                                                 | 4.70          | 3    |
|                                 | V2        |                    |      |                              |                |              |                    |                                                        | 4.83          | 2    |
|                                 | V3        | 1.71               | 3    | 259                          | 0.75           | 10.53        | 105                | -11.99                                                 | 3.48          | 4    |
|                                 | V4        |                    |      |                              |                |              |                    |                                                        | 5.09          | 1    |
|                                 | V5        | 1.88               | 2    | 220                          | 1.24           | 12.02        | 106                | -11.45                                                 | 3.43          | 5    |
| C.D.(0.05)                      |           | 0.21               |      | 13.32                        | 0.25           | 1.61         | 0.99               |                                                        |               |      |
| C.V. (%)                        |           | 6.35               |      | 4.23                         | 12.61          | 7.60         | 0.74               |                                                        |               |      |
| <b>Expt. Mean</b>               |           | <b>2.46</b>        |      | <b>237</b>                   | <b>1.47</b>    | <b>15.88</b> | <b>100</b>         |                                                        | 4.12          |      |
| Soil type                       |           | Sandy loam         |      |                              |                |              |                    |                                                        |               |      |
| pH                              |           | 7.32               |      |                              |                |              |                    |                                                        |               |      |
| <b>N - levels (kg/ha)</b>       |           |                    |      |                              |                |              |                    |                                                        |               |      |
|                                 | F1        | 60:30:30           |      |                              |                |              |                    |                                                        |               |      |
|                                 | F2        | 120:60:60          |      |                              |                |              |                    |                                                        |               |      |
| Recommended N:P:K (kg/ha)       |           | 60:30:30           |      |                              |                |              |                    |                                                        |               |      |
| <b>Varieties</b>                |           |                    |      |                              |                |              |                    |                                                        |               |      |
|                                 | V1        | IET 27179          |      |                              |                |              |                    |                                                        |               |      |
|                                 | V2        | -                  |      |                              |                |              |                    |                                                        |               |      |
|                                 | V3        | Chittimuthyalu     |      |                              |                |              |                    |                                                        |               |      |
|                                 | V4        | -                  |      |                              |                |              |                    |                                                        |               |      |
|                                 | V5        | Kalanamak          |      |                              |                |              |                    |                                                        |               |      |
| Available N:P:K of soil (kg/ha) |           | 241:18:190         |      |                              |                |              |                    |                                                        |               |      |

Table 4.1(l): Cntd....

| F-levels                        | Varieties | NAWAGAM            |      |                              |                |              |                    |                                                        |
|---------------------------------|-----------|--------------------|------|------------------------------|----------------|--------------|--------------------|--------------------------------------------------------|
|                                 |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g)  | Days 50% flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
| F1                              | V1        | 5.30               | 5    | 202                          | 3.84           | 22.13        | 102                |                                                        |
|                                 | V2        | 5.43               | 4    | 197                          | 3.50           | 17.60        | 103                |                                                        |
|                                 | V3        | 4.19               | 6    | 189                          | 3.27           | 16.93        | 102                |                                                        |
|                                 | V4        | 3.39               | 8    | 190                          | 3.24           | 17.73        | 105                |                                                        |
|                                 | V5        | -                  | -    | -                            | -              | -            | -                  |                                                        |
|                                 | V6        |                    |      |                              |                |              |                    |                                                        |
| F2                              | V1        | 6.22               | 2    | 245                          | 4.23           | 22.20        | 104                | -78.58                                                 |
|                                 | V2        | 6.42               | 1    | 280                          | 3.94           | 18.13        | 105                | -80.46                                                 |
|                                 | V3        | 5.56               | 3    | 251                          | 3.69           | 15.33        | 106                | -61.48                                                 |
|                                 | V4        | 4.01               | 7    | 217                          | 3.35           | 19.60        | 105                | -50.23                                                 |
|                                 | V5        | -                  | -    | -                            | -              | -            | -                  |                                                        |
|                                 | V6        |                    |      |                              |                |              |                    |                                                        |
| Interaction                     |           |                    |      |                              |                |              |                    |                                                        |
| F at same V                     |           | NS                 |      | NS                           | NS             | NS           | NS                 |                                                        |
| V at same F                     |           | NS                 |      | NS                           | NS             | NS           | NS                 |                                                        |
| F1                              |           | 4.58               | 2    | 194                          | 3.46           | 18.60        | 103                |                                                        |
| F2                              |           | 5.55               | 1    | 248                          | 3.80           | 18.82        | 105                | 15.60                                                  |
| C.D.(0.05)                      |           | 0.95               |      | 39.68                        | NS             | NS           | 0.72               |                                                        |
| C.V.(%)                         |           | 10.68              |      | 10.21                        | 11.07          | 9.33         | 0.39               |                                                        |
| <b>Mean of varieties:</b>       |           |                    |      |                              |                |              |                    |                                                        |
|                                 | V1        | 5.76               | 2    | 224                          | 4.04           | 22.17        | 103                | -78.58                                                 |
|                                 | V2        | 5.93               | 1    | 238                          | 3.72           | 17.87        | 104                | -80.46                                                 |
|                                 | V3        | 4.88               | 3    | 220                          | 3.48           | 16.13        | 104                | -61.48                                                 |
|                                 | V4        | 3.70               |      | 203                          | 3.30           | 18.67        | 105                | -50.23                                                 |
|                                 | V5        | -                  | -    | -                            | -              | -            | -                  |                                                        |
| C.D.(0.05)                      |           | 0.63               |      | 21.92                        | 0.41           | 1.38         | NS                 |                                                        |
| C.V. (%)                        |           | 9.95               |      | 7.87                         | 8.89           | 5.87         | 1.68               |                                                        |
| <b>Expt. Mean</b>               |           | <b>5.07</b>        |      | <b>221</b>                   | <b>3.63</b>    | <b>18.71</b> | <b>104</b>         |                                                        |
| Soil type                       |           | Clay loam          |      |                              |                |              |                    |                                                        |
| pH                              |           | 7.63               |      |                              |                |              |                    |                                                        |
| <b>N - levels (kg/ha)</b>       |           |                    |      |                              |                |              |                    |                                                        |
| F1                              |           | 100:25:0           |      |                              |                |              |                    |                                                        |
| F2                              |           | 150:37.5:0         |      |                              |                |              |                    |                                                        |
| Recommended N:P:K (kg/ha)       |           | 100:25:0           |      |                              |                |              |                    |                                                        |
| <b>Varieties</b>                |           |                    |      |                              |                |              |                    |                                                        |
| V1                              |           | IET 27179          |      |                              |                |              |                    |                                                        |
| V2                              |           | GAR 14             |      |                              |                |              |                    |                                                        |
| V3                              |           | GAR 13             |      |                              |                |              |                    |                                                        |
| V4                              |           | GR 101             |      |                              |                |              |                    |                                                        |
| V5                              |           | -                  |      |                              |                |              |                    |                                                        |
| V6                              |           | -                  |      |                              |                |              |                    |                                                        |
| Available N:P:K of soil (kg/ha) |           | 0.035:39.8         |      |                              |                |              |                    |                                                        |

**NMT 1m(i) NIL – BL, BLB**

Evaluation of five AVT-2 NIL lines (IET 27285, IET 27294, IET 27280, IET 27286 and IET 28014) for blast resistance, a trial was conducted at four locations viz., **IIRR, Jagdalpur, Pantnagar** and **Nellore**. The selected AVT-2 cultures were compared with high yielding cultivars (Swarna, BPT 5204 and RP Bio-226) and along with a local check of respective locations under two recommended doses RDF *i.e.*, 100 & 150%. The data received from these locations are summarized and presented in **Table 4.1 (m-i)**.

Grain yields of the test cultures differed significantly at all the locations. Culture IET 27280 found promising and recorded higher grain yield at **IIRR** (6.97 t/ha) and **Jagdalpur** (6.41 t/ha), while IET 27285 (6.18 t/ha) found promising and next best culture at **IIRR** and **Pantnagar** (5.43 t/ha and 5.96 t/ha respectively), while IET 27286 (4.78 t/ha) found as second best culture at Nellore.

Mean over the locations, higher grain yield were obtained with IET 27280 (5.88 t/ha) followed by IET 27285 (4.97 t/ha). Significant responses to graded dose of nitrogen (RDN) application were observed at both the locations. Application of 150 % of RDF was promising at **Pantnagar** (4.42 t/ha) as compared to 100% RDF. Interaction effect of IET cultures and nitrogen levels were significant at **IIRR** where the performance of cultures was promising at 150% RDF (IET 27280 at 150% of RDF).

Three NIL Blast cultures were evaluated and the results revealed that the mean maximum grain yield was recorded by IET 27280 (5.29 t/ha) followed by IET 27285 (4.97 t/ha) which were found promising at higher nutrient level.

Table 4.1(m(i)): Summary of data on grain yield and ancillary characters of selected AVT-2 NIL BL, BLB cultures grown under transplanted conditions at low, medium &amp; high levels of recommended N fertilizer doses, kharif 2019.

| N-levels    | Varieties | IIRR               |      |                              |                |             |                        |                                                        | JAGADALPUR         |      |                              |                |             |                        |                                                        |
|-------------|-----------|--------------------|------|------------------------------|----------------|-------------|------------------------|--------------------------------------------------------|--------------------|------|------------------------------|----------------|-------------|------------------------|--------------------------------------------------------|
|             |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days for 50% Flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days for 50% Flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
| F1          | V1        | 5.48               | 3    | 552                          | 1.85           | 23.2        | 96                     |                                                        | 5.76               | 7    | 481                          | 2.15           | 21.1        | 78                     |                                                        |
|             | V2        | 5.07               | 5    | 372                          | 2.41           | 19.0        | 84                     |                                                        | 5.66               | 9    | 413                          | 2.37           | 16.9        | 76                     |                                                        |
|             | V3        | 6.67               | 2    | 356                          | 2.54           | 21.4        | 82                     |                                                        | 6.55               | 1    | 348                          | 2.79           | 20.1        | 62                     |                                                        |
|             | V4        | 4.34               | 12   | 455                          | 2.56           | 21.5        | 99                     |                                                        | 5.13               | 13   | 458                          | 2.49           | 21.8        | 82                     |                                                        |
|             | V5        | 4.11               | 14   | 368                          | 2.42           | 19.7        | 93                     |                                                        | 4.17               | 16   | 396                          | 2.24           | 17.3        | 85                     |                                                        |
|             | V6        | 4.73               | 8    | 482                          | 1.56           | 21.6        | 85                     |                                                        | 5.64               | 10   | 482                          | 1.76           | 20.6        | 80                     |                                                        |
|             | V7        | 3.2                | 16   | 382                          | 2.32           | 17.0        | 114                    |                                                        | 5.34               | 12   | 375                          | 2.59           | 19.9        | 85                     |                                                        |
|             | V8        | 4.55               | 9    | 428                          | 2.26           | 19.1        | 85                     |                                                        | 4.67               | 15   | 378                          | 2.03           | 18.0        | 80                     |                                                        |
|             | V9        | -                  |      | -                            | -              | -           | -                      |                                                        | 6.2                | 3    | 323                          | 3.22           | 22.1        | 68                     |                                                        |
| F2          | V1        | 5.37               | 4    | 533                          | 1.85           | 22.4        | 93                     | -1.00                                                  | 6.16               | 4    | 476                          | 2.41           | 20.2        | 79                     | 4.00                                                   |
|             | V2        | 4.89               | 6    | 393                          | 2.4            | 20.2        | 81                     | -1.64                                                  | 5.7                | 8    | 471                          | 2.36           | 17.5        | 76                     | 0.40                                                   |
|             | V3        | 7.27               | 1    | 372                          | 2.64           | 20.9        | 77                     | 5.45                                                   | 6.27               | 2    | 349                          | 3.05           | 23.9        | 61                     | -2.80                                                  |
|             | V4        | 4.24               | 13   | 446                          | 2.85           | 20.9        | 99                     | -0.91                                                  | 5.58               | 11   | 477                          | 2.4            | 22.0        | 82                     | 4.50                                                   |
|             | V5        | 4.38               | 11   | 384                          | 2.75           | 19.2        | 92                     | 2.45                                                   | 3.93               | 17   | 343                          | 2              | 17.5        | 86                     | -2.40                                                  |
|             | V6        | 4.44               | 10   | 473                          | 2.2            | 22.0        | 86                     | -2.64                                                  | 5.9                | 6    | 475                          | 2.14           | 19.5        | 81                     | 2.60                                                   |
|             | V7        | 3.26               | 15   | 404                          | 1.57           | 17.4        | 113                    | 0.55                                                   | 5.99               | 5    | 380                          | 2.18           | 19.5        | 85                     | 6.50                                                   |
|             | V8        | 4.74               | 7    | 422                          | 2.26           | 20.9        | 84                     | 1.73                                                   | 4.69               | 14   | 368                          | 2.67           | 18.9        | 81                     | 0.20                                                   |
|             | V9        | -                  |      | -                            | -              | -           | -                      |                                                        | 5.66               | 9    | 312                          | 3.36           | 20.7        | 69                     | -5.40                                                  |
| Interaction |           |                    |      |                              |                |             |                        |                                                        |                    |      |                              |                |             |                        |                                                        |
| N at same V |           | 0.23               |      | 12.86                        | 0.19           | NS          | NS                     |                                                        | NS                 |      | NS                           | NS             | NS          | NS                     |                                                        |
| V at same N |           | 0.25               |      | 16.54                        | 0.2            | NS          | NS                     |                                                        | NS                 |      | NS                           | NS             | NS          | NS                     |                                                        |
| F1          |           | 4.77               | 2    | 424                          | 2.24           | 20.31       | 92                     |                                                        | 5.46               | 2    | 406                          | 2.40           | 19.75       | 77                     |                                                        |
| F2          |           | 4.82               | 1    | 428                          | 2.32           | 20.50       | 91                     | 0.50                                                   | 5.54               | 1    | 406                          | 2.51           | 19.97       | 78                     | 1.90                                                   |
| C.D.(0.05)  |           | NS                 |      | NS                           | NS             | NS          | NS                     |                                                        | NS                 |      | NS                           | NS             | NS          | NS                     |                                                        |
| C.V.(%)     |           | 2.82               |      | 2.75                         | 4.4            | 1.56        | 1.82                   |                                                        | 13.93              |      | 4.66                         | 20.92          | 8.9         | 0.8                    |                                                        |

Table 4.1(m(i)): Cntd...

| N-levels           | Varieties                    | IIRR               |      |                              |                |             |                        |                                                        | JAGADALPUR         |      |                              |                |             |                        |                                                        |
|--------------------|------------------------------|--------------------|------|------------------------------|----------------|-------------|------------------------|--------------------------------------------------------|--------------------|------|------------------------------|----------------|-------------|------------------------|--------------------------------------------------------|
|                    |                              | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days for 50% Flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days for 50% Flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |
| Mean of varieties: |                              |                    |      |                              |                |             |                        |                                                        |                    |      |                              |                |             |                        |                                                        |
|                    | V1                           | 5.43               | 2    | 543                          | 1.85           | 22.8        | 94                     | -1.00                                                  | 5.96               | 2    | 478                          | 2.28           | 20.6        | 79                     | 4.00                                                   |
|                    | V2                           | 4.98               | 3    | 382                          | 2.41           | 19.6        | 83                     | -1.64                                                  | 5.68               | 5    | 442                          | 2.37           | 17.2        | 76                     | 0.40                                                   |
|                    | V3                           | 6.97               | 1    | 364                          | 2.59           | 21.1        | 80                     | 5.45                                                   | 6.41               | 1    | 349                          | 2.92           | 22.0        | 62                     | -2.80                                                  |
|                    | V4                           | 4.29               | 6    | 451                          | 2.71           | 21.2        | 99                     | -0.91                                                  | 5.36               | 7    | 468                          | 2.45           | 21.9        | 82                     | 4.50                                                   |
|                    | V5                           | 4.25               | 7    | 376                          | 2.59           | 19.5        | 93                     | 2.45                                                   | 4.05               | 9    | 370                          | 2.12           | 17.4        | 86                     | -2.40                                                  |
|                    | V6                           | 4.59               | 5    | 478                          | 1.88           | 21.8        | 86                     | -2.64                                                  | 5.77               | 4    | 478                          | 1.95           | 20.0        | 81                     | 2.60                                                   |
|                    | V7                           | 3.23               | 8    | 393                          | 1.95           | 17.2        | 113                    | 0.55                                                   | 5.67               | 6    | 378                          | 2.39           | 19.7        | 85                     | 6.50                                                   |
|                    | V8                           | 4.65               | 4    | 425                          | 2.26           | 20.0        | 84                     | 1.73                                                   | 4.68               | 8    | 373                          | 2.35           | 18.5        | 81                     | 0.20                                                   |
|                    | V9                           | -                  | -    | -                            | -              | -           | -                      | -                                                      | 5.93               | 3    | 318                          | 3.29           | 21.4        | 69                     | -5.40                                                  |
|                    | C.D.(0.05)                   | 0.16               |      | 9.09                         | 0.13           | 1.52        | 2.32                   |                                                        | 0.76               |      | 52.18                        | 0.44           | 2.44        | 0.69                   |                                                        |
|                    | C.V.(%)                      | 2.88               |      | 1.8                          | 4.95           | 6.29        | 2.14                   |                                                        | 11.85              |      | 11.02                        | 15.34          | 10.55       | 0.76                   |                                                        |
|                    | Expt. Mean                   | 4.80               |      | 426                          | 2.28           | 20.41       | 91                     |                                                        | 5.50               |      | 406                          | 2.46           | 19.86       | 78                     |                                                        |
|                    | Soil type                    | Black clay         |      |                              |                |             |                        |                                                        | Vertisols          |      |                              |                |             |                        |                                                        |
|                    | pH                           | 7.6                |      |                              |                |             |                        |                                                        | 6.6                |      |                              |                |             |                        |                                                        |
|                    | N - levels (kg/ha)           |                    |      |                              |                |             |                        |                                                        |                    |      |                              |                |             |                        |                                                        |
|                    | F1                           | 120:60:40          |      |                              |                |             |                        |                                                        | 100:60:40          |      |                              |                |             |                        |                                                        |
|                    | F2                           | 180:90:60          |      |                              |                |             |                        |                                                        | 150:90:60          |      |                              |                |             |                        |                                                        |
|                    | Recommended NPK (kg/ha)      | 120:60:40          |      |                              |                |             |                        |                                                        | 100:60:40          |      |                              |                |             |                        |                                                        |
|                    | Varieties                    |                    |      |                              |                |             |                        |                                                        |                    |      |                              |                |             |                        |                                                        |
|                    | V1                           | IET 27285          |      |                              |                |             |                        |                                                        | IET 27285          |      |                              |                |             |                        |                                                        |
|                    | V2                           | IET 27294          |      |                              |                |             |                        |                                                        | IET 27294          |      |                              |                |             |                        |                                                        |
|                    | V3                           | IET 27280          |      |                              |                |             |                        |                                                        | IET 27280          |      |                              |                |             |                        |                                                        |
|                    | V4                           | IET 27286          |      |                              |                |             |                        |                                                        | IET 27286          |      |                              |                |             |                        |                                                        |
|                    | V5                           | IET 28014          |      |                              |                |             |                        |                                                        | IET 28014          |      |                              |                |             |                        |                                                        |
|                    | V6                           | BPT 5204           |      |                              |                |             |                        |                                                        | BPT 5204           |      |                              |                |             |                        |                                                        |
|                    | V7                           | Swarna             |      |                              |                |             |                        |                                                        | Swarna             |      |                              |                |             |                        |                                                        |
|                    | V8                           | RP Bio 226         |      |                              |                |             |                        |                                                        | RP Bio 226         |      |                              |                |             |                        |                                                        |
|                    | V9                           | -                  |      |                              |                |             |                        |                                                        | LC - Samleswari    |      |                              |                |             |                        |                                                        |
|                    | Availabe NPK of soil (kg/ha) | -                  |      |                              |                |             |                        |                                                        | 260:15:321         |      |                              |                |             |                        |                                                        |

Table 4.1(m(i)): Cntd...

| N-levels    | Varieties | PANTNAGAR          |      |                              |                    |                 |                        |                                                        | NELLORE            |      |                              |                 |                                                        | Over all mean | Rank |
|-------------|-----------|--------------------|------|------------------------------|--------------------|-----------------|------------------------|--------------------------------------------------------|--------------------|------|------------------------------|-----------------|--------------------------------------------------------|---------------|------|
|             |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test weight (g) | Days for 50% Flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Test weight (g) | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |               |      |
| F1          | V1        | 4.06               | 8    | 226                          | 2.23               | 22.4            | 90                     |                                                        | 4.26               | 7    | 378                          | 28.6            |                                                        | 4.89          | 7    |
|             | V2        | 2.84               | 15   | 212                          | 1.69               | 22.39           | 110                    |                                                        | 3.95               | 11   | 344                          | 19.7            |                                                        | 4.38          | 13   |
|             | V3        | 3.84               | 10   | 218                          | 2.1                | 22.54           | 82                     |                                                        | 3.78               | 13   | 379                          | 35.2            |                                                        | 5.21          | 4    |
|             | V4        | 3.24               | 13   | 214                          | 1.73               | 27.59           | 110                    |                                                        | 4.95               | 1    | 322                          | 29.8            |                                                        | 4.42          | 11   |
|             | V5        | 3.82               | 11   | 216                          | 2.06               | 23.15           | 100                    |                                                        | 4.05               | 10   | 322                          | 22.2            |                                                        | 4.04          | 17   |
|             | V6        | 4                  | 9    | 233                          | 1.94               | 21.26           | 110                    |                                                        | 4.73               | 4    | 389                          | 30.7            |                                                        | 4.78          | 8    |
|             | V7        | 4.07               | 7    | 243                          | 1.97               | 21.8            | 93                     |                                                        | 4.83               | 3    | 355                          | 25.5            |                                                        | 4.36          | 14   |
|             | V8        | 2.77               | 16   | 226                          | 1.71               | 22.32           | 102                    |                                                        | 3.47               | 15   | 333                          | 20.0            |                                                        | 3.87          | 18   |
|             | V9        | -                  |      | -                            | -                  | -               | -                      |                                                        | -                  |      | -                            | -               |                                                        | 6.20          | 1    |
| F2          | V1        | 4.59               | 5    | 229                          | 2.36               | 22.67           | 92                     | 4.82                                                   | 4.07               | 9    | 356                          | 29.8            | -2.11                                                  | 5.05          | 5    |
|             | V2        | 3.17               | 14   | 234                          | 1.69               | 23.09           | 110                    | 3.00                                                   | 3.86               | 12   | 400                          | 21.2            | -1.00                                                  | 4.41          | 12   |
|             | V3        | 4.67               | 4    | 236                          | 2.29               | 23.49           | 82                     | 7.55                                                   | 3.27               | 16   | 367                          | 39.5            | -5.67                                                  | 5.37          | 3    |
|             | V4        | 4.1                | 6    | 245                          | 2.07               | 27.71           | 110                    | 7.82                                                   | 4.6                | 5    | 356                          | 30.4            | -3.89                                                  | 4.63          | 10   |
|             | V5        | 4.82               | 2    | 249                          | 2.27               | 20.97           | 104                    | 9.09                                                   | 4.12               | 8    | 356                          | 22.9            | 0.78                                                   | 4.31          | 15   |
|             | V6        | 5.47               | 1    | 270                          | 2.36               | 22.95           | 110                    | 13.36                                                  | 4.38               | 6    | 400                          | 30.6            | -3.89                                                  | 5.05          | 5    |
|             | V7        | 4.78               | 3    | 264                          | 2.11               | 22.56           | 94                     | 6.45                                                   | 4.84               | 2    | 378                          | 28.2            | 0.11                                                   | 4.72          | 9    |
|             | V8        | 3.74               | 12   | 249                          | 1.92               | 21.55           | 100                    | 8.82                                                   | 3.7                | 14   | 378                          | 23.3            | 2.56                                                   | 4.22          | 16   |
|             | V9        | -                  |      | -                            | -                  | -               | -                      |                                                        | -                  |      | -                            | -               |                                                        | 5.66          | 2    |
| Interaction |           |                    |      |                              |                    |                 |                        |                                                        |                    |      |                              |                 |                                                        |               |      |
| N at same V |           | NS                 |      | NS                           | NS                 | 1.06            | 0.82                   |                                                        | NS                 |      | NS                           | NS              |                                                        |               |      |
| V at same N |           | NS                 |      | NS                           | NS                 | 1.34            | 1.19                   |                                                        | NS                 |      | NS                           | NS              |                                                        |               |      |
| F1          |           | 3.58               | 2    | 223                          | 1.93               | 22.93           | 100                    |                                                        | 4.25               | 1    | 353                          | 26.46           |                                                        | 4.51          | 2    |
| F2          |           | 4.42               | 1    | 247                          | 2.13               | 23.12           | 100                    | 7.61                                                   | 4.11               | 2    | 374                          | 28.24           | -1.64                                                  | 4.72          | 1    |
| C.D.(0.05)  |           | 0.27               |      | 4.37                         | 0.17               | NS              | NS                     |                                                        | 0.14               |      | NS                           | 1.51            |                                                        |               |      |
| C.V.(%)     |           | 5.52               |      | 1.5                          | 6.61               | 4.01            | 0.95                   |                                                        | 2.6                |      | 17.84                        | 4.44            |                                                        |               |      |

Table 4.1(m(i)): Cntd...

| N-levels           | Varieties                    | PANTNAGAR          |      |                              |                    |                 |                        |                                                        | NELLORE            |      |                              |                 |                                                        | Over all mean | Rank |
|--------------------|------------------------------|--------------------|------|------------------------------|--------------------|-----------------|------------------------|--------------------------------------------------------|--------------------|------|------------------------------|-----------------|--------------------------------------------------------|---------------|------|
|                    |                              | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle Weight (g) | Test weight (g) | Days for 50% Flowering | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Test weight (g) | Nutri. res. (kg grain/kg Nutri.) (Base level 100% RDF) |               |      |
| Mean of varieties: |                              |                    |      |                              |                    |                 |                        |                                                        |                    |      |                              |                 |                                                        |               |      |
|                    | V1                           | 4.33               | 3    | 228                          | 2.30               | 22.5            | 91                     | 4.82                                                   | 4.17               | 4    | 367                          | 29.2            | -2.11                                                  | 4.97          | 3    |
|                    | V2                           | 3.01               | 8    | 223                          | 1.69               | 22.7            | 110                    | 3.00                                                   | 3.91               | 6    | 372                          | 20.4            | -1.00                                                  | 4.39          | 7    |
|                    | V3                           | 4.26               | 5    | 227                          | 2.20               | 23.0            | 82                     | 7.55                                                   | 3.53               | 8    | 373                          | 37.4            | -5.67                                                  | 5.29          | 2    |
|                    | V4                           | 3.67               | 6    | 229                          | 1.90               | 27.7            | 110                    | 7.82                                                   | 4.78               | 2    | 339                          | 30.1            | -3.89                                                  | 4.52          | 6    |
|                    | V5                           | 4.32               | 4    | 232                          | 2.17               | 22.1            | 102                    | 9.09                                                   | 4.09               | 5    | 339                          | 22.5            | 0.78                                                   | 4.18          | 8    |
|                    | V6                           | 4.74               | 1    | 251                          | 2.15               | 22.1            | 110                    | 13.36                                                  | 4.56               | 3    | 395                          | 30.7            | -3.89                                                  | 4.91          | 4    |
|                    | V7                           | 4.43               | 2    | 253                          | 2.04               | 22.2            | 94                     | 6.45                                                   | 4.84               | 1    | 367                          | 26.9            | 0.11                                                   | 4.54          | 5    |
|                    | V8                           | 3.26               | 7    | 237                          | 1.82               | 21.9            | 101                    | 8.82                                                   | 3.59               | 7    | 355                          | 21.7            | 2.56                                                   | 4.04          | 9    |
|                    | V9                           | -                  |      | -                            | -                  | -               | -                      |                                                        | -                  |      | -                            | -               |                                                        | 5.93          | 1    |
|                    | C.D.(0.05)                   | 0.56               |      | 20.6                         | 0.27               | 0.75            | 0.58                   |                                                        | 0.25               |      | 33.66                        | 1.7             |                                                        |               |      |
|                    | C.V.(%)                      | 11.88              |      | 7.41                         | 11.08              | 2.76            | 0.49                   |                                                        | 5.04               |      | 7.84                         | 5.26            |                                                        |               |      |
|                    | Expt. Mean                   | 4.00               |      | 235                          | 2.03               | 23.03           | 100                    |                                                        | 4.18               |      | 363                          | 27.35           |                                                        | 4.62          |      |
|                    | Soil type                    | Silt loam          |      |                              |                    |                 |                        |                                                        | Sandy clay loam    |      |                              |                 |                                                        |               |      |
|                    | pH                           | 7.6                |      |                              |                    |                 |                        |                                                        | 7.5                |      |                              |                 |                                                        |               |      |
|                    | N - levels (kg/ha)           |                    |      |                              |                    |                 |                        |                                                        |                    |      |                              |                 |                                                        |               |      |
|                    | F1                           | 120:60:40          |      |                              |                    |                 |                        |                                                        | 80:60:40           |      |                              |                 |                                                        |               |      |
|                    | F2                           | 180:90:60          |      |                              |                    |                 |                        |                                                        | 120:90:60          |      |                              |                 |                                                        |               |      |
|                    | Recommended NPK (kg/ha)      | 120:60:40          |      |                              |                    |                 |                        |                                                        | 80:60:40           |      |                              |                 |                                                        |               |      |
|                    | Varieties                    |                    |      |                              |                    |                 |                        |                                                        |                    |      |                              |                 |                                                        |               |      |
|                    | V1                           | IET 27285          |      |                              |                    |                 |                        |                                                        | IET 27285          |      |                              |                 |                                                        |               |      |
|                    | V2                           | IET 27294          |      |                              |                    |                 |                        |                                                        | IET 27294          |      |                              |                 |                                                        |               |      |
|                    | V3                           | IET 27280          |      |                              |                    |                 |                        |                                                        | IET 27280          |      |                              |                 |                                                        |               |      |
|                    | V4                           | IET 27286          |      |                              |                    |                 |                        |                                                        | IET 27286          |      |                              |                 |                                                        |               |      |
|                    | V5                           | IET 28014          |      |                              |                    |                 |                        |                                                        | IET 28014          |      |                              |                 |                                                        |               |      |
|                    | V6                           | BPT 5204           |      |                              |                    |                 |                        |                                                        | BPT 5204           |      |                              |                 |                                                        |               |      |
|                    | V7                           | Swarna             |      |                              |                    |                 |                        |                                                        | Swarna             |      |                              |                 |                                                        |               |      |
|                    | V8                           | RP Bio 226         |      |                              |                    |                 |                        |                                                        | RP Bio 226         |      |                              |                 |                                                        |               |      |
|                    | V9                           | -                  |      |                              |                    |                 |                        |                                                        | -                  |      |                              |                 |                                                        |               |      |
|                    | Availabe NPK of soil (kg/ha) | 230:22.01;215      |      |                              |                    |                 |                        |                                                        | 138:50:401         |      |                              |                 |                                                        |               |      |

### NMT 1m(ii) NIL – HT (Herbicide Tolerant Genotypes)

Rice crop suffers more from weed competition unlike other cereal crops. Efficient cultures will reduce the weed competition and enhance the productivity with reduced input. The present investigation to study the herbicide tolerance in elite genotypes for their efficacy in Basmati growing areas of the country was taken up at six locations viz., **ICAR-IARI, ICAR-IIRR, Kaul, Ludhiana, Nagina** and **Pantnagar** during kharif 2019. The trial was conducted in replicated split plot design with weed control treatments (T1–Imazethapyr 10%SL post-emergence application; T2–Pendimethelin 30% EC pre-emergence application followed by Bispyribacsodium 10% SC post-emergence application; T3–Weed free check) in main plots and genotypes (G1–IET 28812, G2–IET 28813, G3–IET 28814, G4–IET 28815, G5–Pusa Basmati 1121, G6– Pusa Basmatia1509) in sub plots. The data on crop growth parameters, yield attributes, yield and weed parameters were recorded in the crop season and results are presented in **Tables 4.1m(ii)**

The mean grain yield ranged from 1.76 t/ha at **Ludhiana** to 4.07 t/ha at **Pantnagar**. At all the test locations, irrespective of the genotypes, weed free check has resulted in significantly higher plant growth and yield attributes viz., no of panicles, panicle weight, test weight, filled grain percentage, grain yield and straw yield. The standard herbicide application of pre-emergence Pendimethalin and post-emergence Bispyribacsodium resulted in significantly higher crop growth, yield attributes and grain yield compared to Imazethapyr application. Among the three weed management treatments, application of Imazethapyr resulted in lowest grain yield and significantly inferior to others. At four locations, Pusa Basmati 1121 & Pusa Basmati 1509 exhibited high phytotoxicity of Imazethapyr, and at one location **Kaul** showed little recovery resulting in very low yields of Pusa Basmati 1509 (1.18 t/ha) and Pusa Basmati 1121 (0.17 t/ha). Similar trend was observed in the result of straw yield data also. Among the test genotypes, at **ICAR-IARI, ICAR-IIRR, Kaul**, IET 28812 and IET 28813 recorded significantly higher grain yield and comparable. At **Nagina** and **Ludhiana**, IET 28814 and IET 28815 recorded significantly higher grain yield and were comparable. At **Pantnagar**, four genotypes viz., IET 28812, 28813, 28815 recorded significantly higher grain yields and comparable with each other. Similar trend was observed in crop growth, yield attributes and straw yield also. The mean grain yield of 3.84 t/ha was recorded with IET 28812 followed by IET 28813 (3.67 t/ha) and IET 28815 (3.66 t/ha). The genotype IET 28814 recorded lowest grain yield of 3.53 t/ha among the IET group of genotypes. The recurring parents Pusa Basmati 1121 & 1509 recorded significantly low mean yields. (**Tables 4.1m(ii)**)

The results of data on weed population and weed biomass was reported by all the test locations. The stages of observation were 15, 30, 45 and 60 DAHA by one location, 15, 30 & 60 by one locations; 15&30 DAHA by one location; 45& 60 DAHA by one location; 30 & 60 DAHA at one location and 60 DAHA at one location.

In sandy loam soils of **ICAR-IARI**, the dominant weed group was BLW followed by sedges. Grasses group was the least competent group in the study period. The weed species reported were *Trianthema portulacastrum*, *portulaca oleraceae*, *Eclipta prostrata* among

BLW; *Cyperus rotundus* among sedges; *Echinochloa crusgalli* among grasses. The results of data on weed population indicate that at 15 days after herbicide application (DAHA), no grass weeds infestation was noticed. From 30 DAHA to 60 DAHA grass weed infestation was present. The group-wise weed population as well as total weed population was lowest at 30 DAHA. At 45 DAHA, the weed population was highest and decreased at 60 DAHA. At 15 and 30 DAHA, application of standard pre-emergence application of Pendimethain and post-emergence application of Bispyribacsodium recorded significantly low total weed population. At 45 and 60 DAHA, application of Imazethapyr recorded significantly low total weed population. Among the genotypes, no significant difference was reported by weeds group wise, except Broad leaf weeds at 45 DAHA. The test genotypes IET 28812, 28813 & 28814 reported lowest BLW population and comparable. The interaction effects of weed management and genotypes was found non significant.

At **ICAR – IIRR**, the weed population at 15 DAHA was dominated by grasses. The BLW group was lowest throughout the crop season. At 30 and 60 DAHA, sedges were dominant group followed by grasses. Among the grasses *Echinochloa crusgalli*; among the sedges *Cyperus rotundus*, *Cyperus iria*; among the BLW *Alternanthera spp*, *Trianthema portulacastrum*, *Corchorus spp*, etc., were prevalent in the experimental plot. The weed population was highest at 30 DAHA and lowest at 60 DAHA. At 15 DAHA, the sedges were in second position where as at 30 & 60 DAHA, sedges population was dominant. Among the weed management treatments, application of Imazethapyr recorded highest weed population of all groups and significantly inferior to standard herbicides application and weed free check. Among the test genotypes, at 15 DAHA there was no significant difference in sedges & BLW population; at 30 DAHA in case of BLWs; at 60 DAHA in case of in sedges was observed. At all the stages of observation, genotypes IET 28812 and IET 28814 recorded lowest total weed population.

In clay loam soils of **Kaul**, only at 60 DAHA, group-wise weed data was reported. Grasses were dominant and sedges, BLW were prevalent in equal proportion. The weed management treatments showed that, weed free check was without weeds and application of Imazthepyr recorded significantly lower weed population of grasses & BLW. Among the genotypes, IET 28812 and IET 28813 recorded lower total weed population and comparable.

At **Nagina**, at all stages of observation, weed population was stable. Grasses, sedges and BLW were present in equal proportion. At all stages of observation, apart from weed free check, application of Imazethapyr recorded lowest weed population. Among the genotypes, at 15 DAHA no significant difference was observed. At 30 DAHA & 45 DAHA, genotype 28815, Pusa Basmati 1121 & Pusa Basmati 1509 recorded significantly lower weed population and at 60 DAHA, Pusa Basmati 1121 recorded lowest weed population.

At **Ludhiana**, weedy check was maintained instead of weed-free check. Grasses were dominant group followed by sedges and BLW. Among the weed management treatments, application of Imazethapyr recorded lower weed population and weedy check recorded ten times higher weed population than herbicide applied plots. The genotypes did not show any significant difference in weed population at both 30 & 60 DAHA.

At **Pantnagar** also, the weed free check treatment was not maintained. At both 15 and 30 DAHA, the treatment of Imazethapyr application recorded lowest weed population. No significant difference was recorded at 15& 30 DAHA, among weed groups or total weed population by test genotypes & recurring parents.

The data on weed biomass recorded and reported till 60 DAHA at five locations showed that the weed biomass was lower with application of Imaethapyr. At these locations, after 60 DAHA also, another weed flush might had appeared and resulted in lower crop growth, and grain yield etc. in the treatment of Imazethaypr application. At **ICAR-IIRR**, the weed biomass was lowest with standard pre and post emergence herbicides application.

The results of data on crop phytotoxicity observations indicate that at all the test locations, the genotypes IET 28812, 28813, 28814 and 28815 showed no or low visual phytotoxicity of herbicide Imazethapyr application. But the recurring parents Pusa Basmati 1121 and Pusa Basmati 1509 showed complete mortality when exposed to Imazethapyr herbicide spray at **ICAR-IARI, ICAR IIRR, Ludhiana, Nagina and Pantnagar** . Only at **Kaul**, the genotype Pusa Basmati 1121 showed 81-90% crop injury and genotype Pusa Basmati 1509 showed 51-60% crop injury, resulting in poor recovery, poor crop growth and yield.

The results of one season study of HT genotypes showed that at all the locations, irrespective of genotypes tested, weed free check has resulted is significantly high crop growth, yield attributes and grain yield. The herbicide treatment of standard pre and post-emergence application of Pendimethalin and Bispyribacsodium resulted in higher yield, yield attributes and growth parameters. Till 60 days after herbicide application, application of Imazethapyr resulted in lower weed parameters at five out of six locations. At these locations, after 60 DAHA also, another weed flush might had appeared and resulted in lower crop growth, and grain yield etc. in the treatment of Imazethaypr application. Among the test genotypes, IET 28812 and 28813 were superior at three locations; IET 28814 and 28815 at two locations ; IET 28812, 28813, 28814 and 28815 were comparable at one location. At majority of the test locations, weed population and biomass at 30, 45 & 60 days after herbicide application were lower with IET 28812 and 28813. The genotypes IET 28812 and IET28813 with no or low phytotoxicity to Imazethapyr have contributed to higher crop growth and grain yield with standard pre and post-emergence application of Pendimethalin, Bispyribacsodium.

**Table 1m(ii): Summary of data on grain yield, yield attributes, weed population and weed biomass of AVT-2 NIL Herbicide Tolerant genotypes grown under direct seeded condition, kharif 2019.**

| Main plot                       | Genotypes | IARI-NEW DELHI                        |                                          |                            |                |              |                |                  |                  |
|---------------------------------|-----------|---------------------------------------|------------------------------------------|----------------------------|----------------|--------------|----------------|------------------|------------------|
|                                 |           | Plant height at max. vegetative stage | Plant height at panicle initiation stage | Panicle no /m <sup>2</sup> | Panicle wt (g) | Test wt (g)  | Filled grain % | Grain yield t/ha | Straw yield t/ha |
| T1                              | G1        | 38.00                                 | 89.00                                    | 494                        | 1.25           | 26.05        | 90.28          | 4.58             | 7.37             |
|                                 | G2        | 38.50                                 | 87.67                                    | 495                        | 1.19           | 24.86        | 90.71          | 4.43             | 7.03             |
|                                 | G3        | 28.67                                 | 61.17                                    | 446                        | 1.28           | 28.48        | 88.79          | 4.21             | 5.53             |
|                                 | G4        | 28.17                                 | 60.67                                    | 461                        | 1.26           | 30.37        | 89.79          | 4.27             | 5.13             |
|                                 | G5        | 0.00                                  | 0.00                                     | 0.00                       | 0.00           | 0.00         | 0.00           | 0.00             | 0.00             |
|                                 | G6        | 0.00                                  | 0.00                                     | 0.00                       | 0.00           | 0.00         | 0.00           | 0.00             | 0.00             |
| T2                              | G1        | 37.17                                 | 85.83                                    | 417                        | 1.24           | 26.23        | 88.50          | 4.08             | 6.77             |
|                                 | G2        | 38.67                                 | 86.67                                    | 390                        | 1.27           | 24.09        | 86.27          | 3.55             | 7.00             |
|                                 | G3        | 29.00                                 | 59.33                                    | 279                        | 1.30           | 28.72        | 77.87          | 2.54             | 4.37             |
|                                 | G4        | 28.00                                 | 60.50                                    | 350                        | 1.03           | 30.39        | 82.62          | 3.04             | 5.07             |
|                                 | G5        | 37.83                                 | 86.17                                    | 337                        | 1.23           | 25.32        | 84.93          | 3.09             | 6.40             |
|                                 | G6        | 27.83                                 | 59.50                                    | 261                        | 1.26           | 30.46        | 74.97          | 2.42             | 4.30             |
| T3                              | G1        | 36.67                                 | 85.83                                    | 474                        | 1.19           | 25.90        | 90.43          | 4.38             | 7.27             |
|                                 | G2        | 38.33                                 | 87.83                                    | 439                        | 1.29           | 24.38        | 88.43          | 4.05             | 6.57             |
|                                 | G3        | 28.33                                 | 60.67                                    | 329                        | 1.17           | 28.68        | 84.39          | 2.81             | 4.23             |
|                                 | G4        | 28.50                                 | 60.00                                    | 395                        | 1.30           | 30.15        | 88.11          | 3.67             | 5.30             |
|                                 | G5        | 37.00                                 | 88.50                                    | 378                        | 1.22           | 25.39        | 84.69          | 3.43             | 6.03             |
|                                 | G6        | 27.67                                 | 61.00                                    | 278                        | 1.18           | 30.64        | 78.23          | 2.58             | 3.57             |
| Interaction                     |           |                                       |                                          |                            |                |              |                |                  |                  |
| M and T                         |           | 1.33                                  | 2.21                                     | 75.36                      | 0.22           | 0.45         | 4.82           | 0.76             | 1.69             |
| T and M                         |           | 1.23                                  | 2.05                                     | 76.75                      | 0.20           | 0.43         | 4.64           | 0.73             | 1.59             |
| Mean of Factor-1                |           |                                       |                                          |                            |                |              |                |                  |                  |
| 1                               |           | 22.22                                 | 49.75                                    | 316                        | 0.83           | 18.29        | 59.93          | 2.91             | 4.18             |
| 2                               |           | 33.08                                 | 73.00                                    | 339                        | 1.22           | 27.54        | 82.53          | 3.12             | 5.65             |
| 3                               |           | 32.75                                 | 73.97                                    | 382                        | 1.23           | 27.52        | 85.71          | 3.49             | 5.49             |
| CD(0.05)                        |           | 0.39                                  | 0.57                                     | NS                         | 0.06           | 0.21         | 2.42           | NS               | 0.67             |
| Mean of Factor-2                |           |                                       |                                          |                            |                |              |                |                  |                  |
| 1                               |           | 37.28                                 | 86.89                                    | 462                        | 1.23           | 26.06        | 89.73          | 4.35             | 7.13             |
| 2                               |           | 38.50                                 | 87.39                                    | 441                        | 1.25           | 24.44        | 88.47          | 4.01             | 6.87             |
| 3                               |           | 28.67                                 | 60.39                                    | 352                        | 1.25           | 28.63        | 83.68          | 3.19             | 4.71             |
| 4                               |           | 28.22                                 | 60.39                                    | 402                        | 1.20           | 30.30        | 86.84          | 3.66             | 5.17             |
| 5                               |           | 24.94                                 | 58.22                                    | 238                        | 0.82           | 16.90        | 56.54          | 2.17             | 4.14             |
| 6                               |           | 18.50                                 | 40.17                                    | 180                        | 0.81           | 20.37        | 51.07          | 1.67             | 2.62             |
| CD(0.05)                        |           | 0.77                                  | 1.28                                     | 43.51                      | 0.13           | 0.26         | 2.78           | 0.44             | 0.97             |
| <b>Experimental Mean</b>        |           | <b>29.35</b>                          | <b>65.57</b>                             | <b>345.65</b>              | <b>1.09</b>    | <b>24.45</b> | <b>76.06</b>   | <b>3.17</b>      | <b>5.11</b>      |
| Soil type                       |           | Sandy Loam                            |                                          |                            |                |              |                |                  |                  |
| pH                              |           | 8.19                                  |                                          |                            |                |              |                |                  |                  |
| Recommended N:P:K (kg/ha)       |           | 80:15:20                              |                                          |                            |                |              |                |                  |                  |
| Available N:P:K of soil (kg/ha) |           | 0.46-0.61                             |                                          |                            |                |              |                |                  |                  |

**T1: Imazethapyr**

**T2: Pendimethalin fb bispyribacsodium**

**T3: Weed free check**

**G1 - IET 28812**

**G2 - IET 28813**

**G3 - IET 28814**

**G4 - IET 28815**

**G5 - Pusa Basmati 1121 (RP)**

**G6 - Pusa Basmati 1509 (RP)**

Table 1m(ii): Contd.

| Main plot                       | Genotypes | ICAR-IIRR            |                          |                        |                          |                            |              |                |                |                    |                  |
|---------------------------------|-----------|----------------------|--------------------------|------------------------|--------------------------|----------------------------|--------------|----------------|----------------|--------------------|------------------|
|                                 |           | Plant height(cm)     |                          | Tillers/m <sup>2</sup> |                          | Panicle no /m <sup>2</sup> | Test wt (g)  | Panicle wt (g) | Filled grain % | Grain yield (t/ha) | Straw yield t/ha |
|                                 |           | Max vegetative stage | Panicle initiation stage | Max vegetative stage   | Panicle initiation stage |                            |              |                |                |                    |                  |
| T1                              | G1        | 39.54                | 58.67                    | 290                    | 340                      | 313                        | 20.80        | 0.45           | 72.76          | 2.22               | 2.82             |
|                                 | G2        | 37.31                | 56.78                    | 215                    | 301                      | 271                        | 23.57        | 0.34           | 77.66          | 2.10               | 2.79             |
|                                 | G3        | 36.14                | 52.34                    | 215                    | 262                      | 236                        | 23.86        | 0.35           | 71.90          | 1.86               | 2.96             |
|                                 | G4        | 38.39                | 45.98                    | 185                    | 263                      | 228                        | 17.66        | 0.25           | 76.50          | 2.04               | 2.45             |
|                                 | G5        | 0                    | 0                        | 0                      | 0                        | 0                          | 0.00         | 0.00           | 0.00           | 0.00               | 0.00             |
|                                 | G6        | 0                    | 0                        | 0                      | 0                        | 0                          | 0.00         | 0.00           | 0.00           | 0.00               | 0.00             |
| T2                              | G1        | 36.02                | 64.48                    | 326                    | 395                      | 380                        | 27.93        | 1.18           | 75.29          | 2.87               | 3.80             |
|                                 | G2        | 37.89                | 58.26                    | 311                    | 410                      | 401                        | 27.72        | 1.36           | 80.04          | 2.75               | 3.98             |
|                                 | G3        | 36.72                | 61.31                    | 277                    | 460                      | 431                        | 29.56        | 1.27           | 77.14          | 2.51               | 3.35             |
|                                 | G4        | 36.81                | 58.4                     | 272                    | 444                      | 409                        | 28.45        | 1.02           | 78.35          | 2.13               | 3.45             |
|                                 | G5        | 39.6                 | 60.37                    | 319                    | 429                      | 392                        | 28.47        | 1.11           | 72.78          | 2.69               | 3.49             |
|                                 | G6        | 36.21                | 64.81                    | 258                    | 450                      | 413                        | 29.08        | 1.17           | 76.73          | 2.10               | 3.56             |
| T3                              | G1        | 46.41                | 70.73                    | 439                    | 487                      | 476                        | 28.81        | 1.52           | 87.24          | 4.53               | 5.62             |
|                                 | G2        | 46.42                | 68.51                    | 395                    | 556                      | 505                        | 28.47        | 1.31           | 85.11          | 4.24               | 5.35             |
|                                 | G3        | 38.48                | 64.79                    | 426                    | 497                      | 487                        | 29.87        | 1.21           | 88.09          | 3.13               | 3.91             |
|                                 | G4        | 46.26                | 61.77                    | 454                    | 500                      | 491                        | 29.25        | 1.26           | 79.77          | 3.20               | 4.10             |
|                                 | G5        | 42.11                | 59.16                    | 397                    | 466                      | 445                        | 29.82        | 1.11           | 75.60          | 3.52               | 4.39             |
|                                 | G6        | 40.9                 | 61.39                    | 391                    | 464                      | 417                        | 28.61        | 1.27           | 85.53          | 3.53               | 4.41             |
| Interaction                     |           |                      |                          |                        |                          |                            |              |                |                |                    |                  |
| M and T                         |           | 3.58                 | 2.78                     | 25.6                   | 22.74                    | 32.01                      | 2.48         | 0.08           | 7.88           | 0.30               | 0.59             |
| T and M                         |           | 3.33                 | 2.74                     | 24.43                  | 21.71                    | 29.77                      | 2.31         | 0.08           | 7.24           | 0.27               | 0.55             |
| Mean of Factor-1                |           |                      |                          |                        |                          |                            |              |                |                |                    |                  |
| 1                               |           | 25.23                | 35.63                    | 151                    | 194                      | 175                        | 14.31        | 0.23           | 49.80          | 1.37               | 1.84             |
| 2                               |           | 37.21                | 61.27                    | 294                    | 431                      | 404                        | 28.54        | 1.18           | 76.72          | 2.51               | 3.60             |
| 3                               |           | 43.43                | 64.39                    | 417                    | 495                      | 470                        | 29.14        | 1.28           | 83.56          | 3.69               | 4.63             |
| CD(0.05)                        |           | 1.06                 | 1.64                     | 11.8                   | 10.5                     | 9.69                       | 0.81         | 0.07           | 1.35           | 0.03               | 0.15             |
| Mean of Factor-2                |           |                      |                          |                        |                          |                            |              |                |                |                    |                  |
| 1                               |           | 40.66                | 64.63                    | 352                    | 407                      | 389                        | 25.85        | 1.05           | 78.43          | 3.20               | 4.08             |
| 2                               |           | 40.54                | 61.18                    | 307                    | 422                      | 392                        | 26.59        | 1.00           | 80.93          | 3.03               | 4.04             |
| 3                               |           | 37.11                | 59.48                    | 306                    | 406                      | 384                        | 27.76        | 0.94           | 79.04          | 2.50               | 3.41             |
| 4                               |           | 40.49                | 55.38                    | 304                    | 402                      | 376                        | 25.12        | 0.85           | 78.21          | 2.45               | 3.33             |
| 5                               |           | 27.24                | 39.84                    | 239                    | 298                      | 279                        | 19.43        | 0.74           | 49.46          | 2.07               | 2.63             |
| 6                               |           | 25.7                 | 42.07                    | 216                    | 305                      | 277                        | 19.23        | 0.81           | 54.09          | 1.88               | 2.66             |
| CD(0.05)                        |           | 2.07                 | 1.61                     | 14.78                  | 13.13                    | 18.48                      | 1.43         | 0.04           | 4.55           | 0.17               | 0.34             |
| <b>Experimental Mean</b>        |           | <b>35.29</b>         | <b>53.76</b>             | <b>287</b>             | <b>374</b>               | <b>350</b>                 | <b>24.00</b> | <b>0.90</b>    | <b>70.03</b>   | <b>2.52</b>        | <b>3.36</b>      |
| Soil type                       |           | Black clay           |                          |                        |                          |                            |              |                |                |                    |                  |
| pH                              |           | 7.6                  |                          |                        |                          |                            |              |                |                |                    |                  |
| Recommended N:P:K (kg/ha)       |           | 120:60:40            |                          |                        |                          |                            |              |                |                |                    |                  |
| Available N:P:K of soil (kg/ha) |           | -                    |                          |                        |                          |                            |              |                |                |                    |                  |

T1: Imazethapyr

T2: Pendimethalin fb bispyribacsodium

T3: Weed free check

G1 - IET 28812

G2 - IET 28813

G3 - IET 28814

G4 - IET 28815

G5 - Pusa Basmati 1121 (RP)

G6 - Pusa Basmati 1509 (RP)

Table 1m(ii): Contd.

| Main plot                       | Genotypes | KAUL                                                     |                            |                |              |                  |
|---------------------------------|-----------|----------------------------------------------------------|----------------------------|----------------|--------------|------------------|
|                                 |           | No of tillers/m <sup>2</sup> at panicle initiation stage | Panicle no /m <sup>2</sup> | Panicle wt (g) | Test wt (g)  | Grain yield t/ha |
| T1                              | G1        | 384                                                      | 382                        | 1.47           | 30.40        | 4.85             |
|                                 | G2        | 391                                                      | 390                        | 1.35           | 26.50        | 4.61             |
|                                 | G3        | 374                                                      | 372                        | 1.23           | 28.40        | 3.93             |
|                                 | G4        | 367                                                      | 367                        | 1.21           | 28.20        | 3.86             |
|                                 | G5        | 22                                                       | 21                         | 0.89           | 22.20        | 0.17             |
|                                 | G6        | 116                                                      | 115                        | 1.33           | 31.50        | 1.18             |
| T2                              | G1        | 361                                                      | 359                        | 1.48           | 30.23        | 4.74             |
|                                 | G2        | 356                                                      | 355                        | 1.34           | 27.67        | 4.20             |
|                                 | G3        | 298                                                      | 296                        | 1.23           | 27.33        | 3.25             |
|                                 | G4        | 305                                                      | 303                        | 1.19           | 28.40        | 3.19             |
|                                 | G5        | 395                                                      | 393                        | 1.04           | 25.40        | 3.65             |
|                                 | G6        | 351                                                      | 351                        | 1.33           | 31.53        | 4.12             |
| T3                              | G1        | 393                                                      | 392                        | 1.45           | 30.63        | 4.97             |
|                                 | G2        | 422                                                      | 420                        | 1.39           | 28.90        | 4.95             |
|                                 | G3        | 374                                                      | 373                        | 1.24           | 27.67        | 4.04             |
|                                 | G4        | 376                                                      | 375                        | 1.17           | 27.70        | 4.11             |
|                                 | G5        | 409                                                      | 407                        | 1.01           | 24.87        | 3.79             |
|                                 | G6        | 354                                                      | 353                        | 1.30           | 31.77        | 4.12             |
| Interaction                     |           |                                                          |                            |                |              |                  |
| M and T                         |           | 39.88                                                    | 37.88                      | NS             | NS           | 0.50             |
| T and M                         |           | 37.95                                                    | 36.16                      | NS             | NS           | 0.46             |
| Mean of Factor-1                |           |                                                          |                            |                |              |                  |
| 1                               |           | 276                                                      | 274                        | 1.25           | 27.87        | 3.10             |
| 2                               |           | 344                                                      | 343                        | 1.27           | 28.43        | 3.86             |
| 3                               |           | 388                                                      | 387                        | 1.26           | 28.59        | 4.33             |
| CD(0.05)                        |           | 17.82                                                    | 17.51                      | NS             | NS           | 0.14             |
| Mean of Factor-2                |           |                                                          |                            |                |              |                  |
| 1                               |           | 379                                                      | 378                        | 1.47           | 30.42        | 4.85             |
| 2                               |           | 390                                                      | 388                        | 1.36           | 27.69        | 4.59             |
| 3                               |           | 349                                                      | 347                        | 1.23           | 27.80        | 3.74             |
| 4                               |           | 349                                                      | 348                        | 1.19           | 28.10        | 3.72             |
| 5                               |           | 275                                                      | 274                        | 0.98           | 24.16        | 2.53             |
| 6                               |           | 274                                                      | 273                        | 1.32           | 31.60        | 3.14             |
| CD(0.05)                        |           | 23.02                                                    | 21.87                      | 0.07           | 2.41         | 0.29             |
| <b>Experimental Mean</b>        |           | <b>336</b>                                               | <b>334.65</b>              | <b>1.26</b>    | <b>28.29</b> | <b>3.76</b>      |
| Soil type                       |           | Clay loam                                                |                            |                |              |                  |
| pH                              |           | 8.1                                                      |                            |                |              |                  |
| Recommended N:P:K (kg/ha)       |           | 110                                                      |                            |                |              |                  |
| Available N:P:K of soil (kg/ha) |           | 160:16:420                                               |                            |                |              |                  |

T1: Imazethapyr

T2: Pendimethalin fb bispyribacsodium

T3: Weed free check

G1 - IET 28812

G2 - IET 28813

G3 - IET 28814

G4 - IET 28815

G5 - Pusa Basmati 1121 (RP)

G6 - Pusa Basmati 1509 (RP)

Table 1m(ii): Contd.

| Main plot                       | Genotypes | NAGINA                                  |                                              |                                                      |                            |                |              |                  |
|---------------------------------|-----------|-----------------------------------------|----------------------------------------------|------------------------------------------------------|----------------------------|----------------|--------------|------------------|
|                                 |           | Plant height(cm) at Max-tillering stage | Plant height(cm) at panicle initiation stage | No of tillers/m <sup>2</sup> at Max vegetative stage | Panicle no /m <sup>2</sup> | Panicle wt (g) | Test wt (g)  | Grain yield t/ha |
| T1                              | G1        | 70.17                                   | 105.10                                       | 310                                                  | 305                        | 2.72           | 23.92        | 4.43             |
|                                 | G2        | 70.03                                   | 104.83                                       | 315                                                  | 312                        | 2.69           | 23.93        | 4.53             |
|                                 | G3        | 66.87                                   | 100.97                                       | 320                                                  | 315                        | 2.72           | 24.13        | 4.67             |
|                                 | G4        | 68.27                                   | 100.37                                       | 323                                                  | 314                        | 2.70           | 24.12        | 4.72             |
|                                 | G5        | 0.00                                    | 0.00                                         | 0                                                    | 0                          | 0.00           | 0.00         | 0.00             |
|                                 | G6        | 0.00                                    | 0.00                                         | 0                                                    | 0                          | 0.00           | 0.00         | 0.00             |
| T2                              | G1        | 70.13                                   | 104.60                                       | 307                                                  | 304                        | 2.71           | 23.95        | 4.47             |
|                                 | G2        | 69.97                                   | 104.80                                       | 315                                                  | 311                        | 2.69           | 23.94        | 4.35             |
|                                 | G3        | 66.83                                   | 101.17                                       | 318                                                  | 315                        | 2.73           | 24.14        | 4.58             |
|                                 | G4        | 68.23                                   | 100.37                                       | 315                                                  | 310                        | 2.72           | 24.13        | 4.61             |
|                                 | G5        | 68.83                                   | 103.37                                       | 321                                                  | 304                        | 2.67           | 24.12        | 4.43             |
|                                 | G6        | 67.13                                   | 101.67                                       | 315                                                  | 310                        | 2.70           | 23.99        | 4.52             |
| T3                              | G1        | 70.20                                   | 104.60                                       | 309                                                  | 306                        | 2.71           | 23.96        | 4.51             |
|                                 | G2        | 70.03                                   | 104.93                                       | 320                                                  | 313                        | 2.70           | 23.96        | 4.50             |
|                                 | G3        | 66.90                                   | 99.87                                        | 323                                                  | 318                        | 2.72           | 24.15        | 4.65             |
|                                 | G4        | 68.23                                   | 99.33                                        | 317                                                  | 316                        | 2.71           | 24.14        | 4.71             |
|                                 | G5        | 68.87                                   | 103.60                                       | 310                                                  | 307                        | 2.69           | 24.14        | 4.55             |
|                                 | G6        | 67.17                                   | 100.67                                       | 318                                                  | 311                        | 2.69           | 24.00        | 4.59             |
| Interaction                     |           |                                         |                                              |                                                      |                            |                |              |                  |
| M and T                         |           | 0.12                                    | 1.08                                         | 14.54                                                | 15.28                      | 0.02           | 0.03         | 0.13             |
| T and M                         |           | 0.11                                    | 1.00                                         | 14.02                                                | 14.04                      | 0.01           | 0.02         | 0.12             |
| Mean of Factor-1                |           |                                         |                                              |                                                      |                            |                |              |                  |
| 1                               |           | 45.89                                   | 68.54                                        | 211                                                  | 208                        | 1.80           | 16.02        | 3.06             |
| 2                               |           | 68.52                                   | 102.66                                       | 315                                                  | 309                        | 2.70           | 24.05        | 4.50             |
| 3                               |           | 68.57                                   | 102.17                                       | 316                                                  | 312                        | 2.70           | 24.06        | 4.59             |
| CD(0.05)                        |           | 0.04                                    | 0.20                                         | 7.36                                                 | 2.79                       | 0.00           | 0.01         | 0.03             |
| Mean of Factor-2                |           |                                         |                                              |                                                      |                            |                |              |                  |
| 1                               |           | 70.17                                   | 104.77                                       | 309                                                  | 305                        | 2.71           | 23.95        | 4.47             |
| 2                               |           | 70.01                                   | 104.86                                       | 317                                                  | 312                        | 2.69           | 23.94        | 4.46             |
| 3                               |           | 66.87                                   | 100.67                                       | 320                                                  | 316                        | 2.73           | 24.14        | 4.63             |
| 4                               |           | 68.24                                   | 100.02                                       | 318                                                  | 313                        | 2.71           | 24.13        | 4.68             |
| 5                               |           | 45.90                                   | 68.99                                        | 210                                                  | 203                        | 1.79           | 16.09        | 3.00             |
| 6                               |           | 44.77                                   | 67.44                                        | 211                                                  | 207                        | 1.80           | 16.00        | 3.04             |
| CD(0.05)                        |           | 0.07                                    | 0.63                                         | 8.40                                                 | 8.82                       | 0.01           | 0.01         | 0.07             |
| <b>Experimental Mean</b>        |           | <b>60.99</b>                            | <b>91.12</b>                                 | <b>280.93</b>                                        | <b>276.13</b>              | <b>2.40</b>    | <b>21.37</b> | <b>4.05</b>      |
| Soil type                       |           | -                                       |                                              |                                                      |                            |                |              |                  |
| pH                              |           | 7.7                                     |                                              |                                                      |                            |                |              |                  |
| Recommended N:P:K (kg/ha)       |           | 120:60:40                               |                                              |                                                      |                            |                |              |                  |
| Available N:P:K of soil (kg/ha) |           | 21:18.33:209                            |                                              |                                                      |                            |                |              |                  |

T1: Imazethapyr

T2: Pendimethalin fb bispyribacsodium

T3: Weed free check

G1 - IET 28812

G2 - IET 28813

G3 - IET 28814

G4 - IET 28815

G5 - Pusa Basmati 1121 (RP)

G6 - Pusa Basmati 1509 (RP)

Table 1m(ii): Contd.

| Main plot                       | Genotypes | PANTNAGAR                               |                                              |                                                     |                                                          |                            |                |              |                  |                  |
|---------------------------------|-----------|-----------------------------------------|----------------------------------------------|-----------------------------------------------------|----------------------------------------------------------|----------------------------|----------------|--------------|------------------|------------------|
|                                 |           | Plant height(cm) at Mid-tillering stage | Plant height(cm) at panicle initiation stage | No of tillers/m <sup>2</sup> at Mid tillering stage | No of tillers/m <sup>2</sup> at panicle initiation stage | Panicle no /m <sup>2</sup> | Panicle wt (g) | Test wt (g)  | Grain yield t/ha | Straw yield t/ha |
| T1                              | G1        | 90.67                                   | 101.33                                       | 144                                                 | 391                                                      | 373                        | 1.34           | 25.58        | 4.38             | 4.89             |
|                                 | G2        | 90.00                                   | 99.33                                        | 146                                                 | 371                                                      | 380                        | 1.45           | 26.21        | 4.65             | 5.31             |
|                                 | G3        | 87.67                                   | 104.00                                       | 153                                                 | 398                                                      | 385                        | 1.46           | 28.65        | 4.77             | 4.84             |
|                                 | G4        | 93.00                                   | 101.67                                       | 160                                                 | 396                                                      | 375                        | 1.31           | 29.17        | 4.40             | 5.03             |
|                                 | G5        | 0.00                                    | 0.00                                         | 0.00                                                | 0.00                                                     | 0.00                       | 0.00           | 0.00         | 0.00             | 0.00             |
|                                 | G6        | 0.00                                    | 0.00                                         | 0.00                                                | 0.00                                                     | 0.00                       | 0.00           | 0.00         | 0.00             | 0.00             |
| T2                              | G1        | 86.00                                   | 100.00                                       | 141                                                 | 348                                                      | 343                        | 1.49           | 27.57        | 4.40             | 5.02             |
|                                 | G2        | 89.00                                   | 97.33                                        | 165                                                 | 381                                                      | 360                        | 1.41           | 26.77        | 4.58             | 4.90             |
|                                 | G3        | 90.67                                   | 102.00                                       | 188                                                 | 393                                                      | 364                        | 1.48           | 27.67        | 4.25             | 5.13             |
|                                 | G4        | 96.33                                   | 102.33                                       | 181                                                 | 392                                                      | 388                        | 1.43           | 27.62        | 4.69             | 5.08             |
|                                 | G5        | 78.33                                   | 101.33                                       | 178                                                 | 378                                                      | 338                        | 1.48           | 26.88        | 4.21             | 4.69             |
|                                 | G6        | 90.67                                   | 102.00                                       | 124                                                 | 393                                                      | 383                        | 1.49           | 27.81        | 4.79             | 4.99             |
| T3                              | G1        | 85.67                                   | 99.33                                        | 146                                                 | 404                                                      | 403                        | 1.27           | 26.94        | 4.77             | 5.04             |
|                                 | G2        | 87.33                                   | 101.33                                       | 148                                                 | 392                                                      | 388                        | 1.45           | 27.94        | 4.75             | 5.08             |
|                                 | G3        | 89.67                                   | 102.67                                       | 128                                                 | 397                                                      | 395                        | 1.39           | 28.85        | 4.48             | 4.99             |
|                                 | G4        | 90.67                                   | 100.67                                       | 148                                                 | 397                                                      | 391                        | 1.60           | 26.67        | 4.84             | 4.92             |
|                                 | G5        | 90.00                                   | 100.67                                       | 141                                                 | 388                                                      | 373                        | 1.64           | 25.11        | 4.54             | 5.19             |
|                                 | G6        | 89.00                                   | 103.33                                       | 128                                                 | 403                                                      | 395                        | 1.49           | 28.82        | 4.85             | 4.92             |
| Interaction                     |           |                                         |                                              |                                                     |                                                          |                            |                |              |                  |                  |
| M and T                         |           | 3.69                                    | 3.22                                         | 9.83                                                | 19.20                                                    | 73.77                      | 0.32           | 2.26         | 0.41             | 0.62             |
| T and M                         |           | 3.45                                    | 3.02                                         | 10.28                                               | 17.64                                                    | 71.29                      | 0.30           | 2.20         | 0.38             | 0.58             |
| Mean of Factor-1                |           |                                         |                                              |                                                     |                                                          |                            |                |              |                  |                  |
| 1                               |           | 60.22                                   | 67.72                                        | 100                                                 | 259                                                      | 252                        | 0.93           | 18.27        | 3.03             | 3.34             |
| 2                               |           | 88.50                                   | 100.83                                       | 163                                                 | 381                                                      | 363                        | 1.46           | 27.39        | 4.49             | 4.97             |
| 3                               |           | 88.72                                   | 101.33                                       | 140                                                 | 397                                                      | 391                        | 1.47           | 27.39        | 4.71             | 5.02             |
| CD(0.05)                        |           | 1.29                                    | 1.20                                         | 7.83                                                | 3.46                                                     | 38.27                      | 0.11           | 1.23         | 0.16             | 0.23             |
| Mean of Factor-2                |           |                                         |                                              |                                                     |                                                          |                            |                |              |                  |                  |
| 1                               |           | 87.44                                   | 100.22                                       | 144                                                 | 381                                                      | 373                        | 1.37           | 26.70        | 4.51             | 4.99             |
| 2                               |           | 88.78                                   | 99.33                                        | 153                                                 | 381                                                      | 376                        | 1.44           | 26.97        | 4.66             | 5.10             |
| 3                               |           | 89.33                                   | 102.89                                       | 156                                                 | 396                                                      | 381                        | 1.45           | 28.39        | 4.50             | 4.98             |
| 4                               |           | 93.33                                   | 101.56                                       | 163                                                 | 395                                                      | 385                        | 1.45           | 27.82        | 4.64             | 5.01             |
| 5                               |           | 56.11                                   | 67.33                                        | 106                                                 | 256                                                      | 237                        | 1.04           | 17.33        | 2.92             | 3.29             |
| 6                               |           | 59.89                                   | 68.44                                        | 84                                                  | 266                                                      | 259                        | 0.99           | 18.88        | 3.22             | 3.30             |
| CD(0.05)                        |           | 2.13                                    | 1.86                                         | 5.68                                                | 11.08                                                    | 42.59                      | 0.18           | 1.31         | 0.24             | 0.36             |
| <b>Experimental Mean</b>        |           | <b>79.15</b>                            | <b>89.96</b>                                 | <b>134.40</b>                                       | <b>345.56</b>                                            | <b>335.09</b>              | <b>1.29</b>    | <b>24.35</b> | <b>4.07</b>      | <b>4.45</b>      |
| Soil type                       |           | Silt loam                               |                                              |                                                     |                                                          |                            |                |              |                  |                  |
| pH                              |           | 7.8                                     |                                              |                                                     |                                                          |                            |                |              |                  |                  |
| Recommended N:P:K (kg/ha)       |           | 120:60:40                               |                                              |                                                     |                                                          |                            |                |              |                  |                  |
| Available N:P:K of soil (kg/ha) |           | 235:21.7:212                            |                                              |                                                     |                                                          |                            |                |              |                  |                  |

T1: Imazethapyr

T2: Pendimethalin fb bispyribacsodium

T3: Weed free check

G1 - IET 28812

G2 - IET 28813

G3 - IET 28814

G4 - IET 28815

G5 - Pusa Basmati 1121 (RP)

G6 - Pusa Basmati 1509 (RP)

Table 1m(ii): Contd.

| Main plot                       | Genotypes | LUDHIANA                                     |                                                          |                            |                |              |              |                  |                  |
|---------------------------------|-----------|----------------------------------------------|----------------------------------------------------------|----------------------------|----------------|--------------|--------------|------------------|------------------|
|                                 |           | Plant height(cm) at panicle initiation stage | No of tillers/m <sup>2</sup> at panicle initiation stage | Panicle no /m <sup>2</sup> | Panicle wt (g) | Test wt (g)  | Filled grain | Grain yield t/ha | Straw yield t/ha |
| T1                              | G1        | 83.40                                        | 225                                                      | 208                        | 0.93           | 28.69        | 59.29        | 1.89             | 7.33             |
|                                 | G2        | 74.93                                        | 255                                                      | 242                        | 1.02           | 27.62        | 59.80        | 1.00             | 7.02             |
|                                 | G3        | 88.07                                        | 345                                                      | 315                        | 1.56           | 31.89        | 71.26        | 3.51             | 7.88             |
|                                 | G4        | 87.27                                        | 322                                                      | 305                        | 1.54           | 31.03        | 75.18        | 3.63             | 8.57             |
|                                 | G5        | 0.00                                         | 0.00                                                     | 0.00                       | 0.00           | 0.00         | 0.00         | 0.00             | 0.00             |
|                                 | G6        | 0.00                                         | 0.00                                                     | 0.00                       | 0.00           | 0.00         | 0.00         | 0.00             | 0.00             |
| T2                              | G1        | 90.67                                        | 328                                                      | 300                        | 1.36           | 30.20        | 66.68        | 2.75             | 6.74             |
|                                 | G2        | 81.80                                        | 308                                                      | 275                        | 1.16           | 30.32        | 48.28        | 2.53             | 6.28             |
|                                 | G3        | 87.60                                        | 370                                                      | 338                        | 1.47           | 31.75        | 71.65        | 3.68             | 7.55             |
|                                 | G4        | 89.40                                        | 353                                                      | 337                        | 1.52           | 31.28        | 73.36        | 3.86             | 7.73             |
|                                 | G5        | 85.80                                        | 335                                                      | 317                        | 0.98           | 30.15        | 55.14        | 2.08             | 7.29             |
|                                 | G6        | 83.20                                        | 338                                                      | 298                        | 1.66           | 30.02        | 70.15        | 3.63             | 7.13             |
| T3                              | G1        | 72.27                                        | 120                                                      | 110                        | 0.54           | 27.89        | 43.16        | 0.37             | 0.97             |
|                                 | G2        | 66.33                                        | 140                                                      | 127                        | 0.58           | 26.43        | 47.08        | 0.24             | 0.42             |
|                                 | G3        | 68.40                                        | 178                                                      | 152                        | 0.65           | 30.83        | 55.56        | 0.68             | 2.04             |
|                                 | G4        | 77.60                                        | 183                                                      | 153                        | 0.69           | 30.37        | 57.14        | 0.86             | 2.99             |
|                                 | G5        | 79.43                                        | 182                                                      | 130                        | 0.46           | 29.17        | 38.67        | 0.18             | 1.88             |
|                                 | G6        | 72.73                                        | 185                                                      | 160                        | 0.70           | 27.23        | 50.85        | 0.73             | 2.80             |
| Interaction M and T             |           | 6.39                                         | 21.47                                                    | 21.30                      | 0.21           | 1.58         | 12.13        | 0.34             | 0.90             |
| T and M                         |           | 5.90                                         | 20.39                                                    | 19.52                      | 0.19           | 1.46         | 11.77        | 0.32             | 0.84             |
| Mean of Factor-1                |           |                                              |                                                          |                            |                |              |              |                  |                  |
| 1                               |           | 55.61                                        | 191                                                      | 178                        | 0.84           | 19.87        | 44.25        | 1.67             | 5.13             |
| 2                               |           | 86.41                                        | 339                                                      | 311                        | 1.36           | 30.62        | 64.21        | 3.09             | 7.12             |
| 3                               |           | 72.79                                        | 165                                                      | 139                        | 0.60           | 28.65        | 48.74        | 0.51             | 1.85             |
| CD(0.05)                        |           | 1.60                                         | 9.36                                                     | 2.90                       | 0.07           | 0.38         | 6.52         | 0.09             | 0.24             |
| Mean of Factor-2                |           |                                              |                                                          |                            |                |              |              |                  |                  |
| 1                               |           | 82.11                                        | 224                                                      | 206                        | 0.94           | 28.93        | 56.38        | 1.67             | 5.01             |
| 2                               |           | 74.36                                        | 234                                                      | 214                        | 0.92           | 28.12        | 51.72        | 1.26             | 4.57             |
| 3                               |           | 81.36                                        | 298                                                      | 268                        | 1.23           | 31.49        | 66.16        | 2.62             | 5.83             |
| 4                               |           | 84.76                                        | 286                                                      | 265                        | 1.25           | 30.89        | 68.56        | 2.78             | 6.43             |
| 5                               |           | 55.08                                        | 172                                                      | 149                        | 0.48           | 19.77        | 31.27        | 0.76             | 3.06             |
| 6                               |           | 51.98                                        | 174                                                      | 153                        | 0.79           | 19.09        | 40.33        | 1.45             | 3.31             |
| CD(0.05)                        |           | 3.69                                         | 12.40                                                    | 12.30                      | 0.12           | 0.91         | 7.00         | 0.20             | 0.52             |
| <b>Experimental Mean</b>        |           | <b>71.61</b>                                 | <b>231.57</b>                                            | <b>209.26</b>              | <b>0.94</b>    | <b>26.38</b> | <b>52.4</b>  | <b>1.76</b>      | <b>4.7</b>       |
| Soil type                       |           | Sandy loam                                   |                                                          |                            |                |              |              |                  |                  |
| pH                              |           | 7.8                                          |                                                          |                            |                |              |              |                  |                  |
| Recommended N:P:K (kg/ha)       |           | 150                                          |                                                          |                            |                |              |              |                  |                  |
| Available N:P:K of soil (kg/ha) |           | 220:22.0:289                                 |                                                          |                            |                |              |              |                  |                  |

T1: Imazethapyr

T2: Pendimethalin fb bispyribacsodium

T3: Weed free check

G1 - IET 28812

G2 - IET 28813

G3 - IET 28814

G4 - IET 28815

G5 - Pusa Basmati 1121 (RP)

G6 - Pusa Basmati 1509 (RP)

Table 1m(ii): Contd.

| Main plot         | Genotypes | IARI-NEW DELHI                              |               |               |                                             |               |               |                                             |               |               |               |
|-------------------|-----------|---------------------------------------------|---------------|---------------|---------------------------------------------|---------------|---------------|---------------------------------------------|---------------|---------------|---------------|
|                   |           | 1 DBHA                                      |               |               | 15 DAHA                                     |               |               | 30 DAHA                                     |               |               |               |
|                   |           | Groupwise weed population no/m <sup>2</sup> |               |               | Groupwise weed population no/m <sup>2</sup> |               |               | Groupwise Weed population no/m <sup>2</sup> |               |               |               |
|                   |           | Sedges                                      | BLW           | Total         | Sedges                                      | BLW           | Total         | Grasses                                     | Sedges        | BLW           | Total         |
| T1                | G1        | 50.67(7.14)                                 | 398.67(19.85) | 449.33(21.08) | 18.67(4.37)                                 | 337.33(18.30) | 356.00(18.80) | 0.00(0.71)                                  | 9.33(3.06)    | 281.33(16.76) | 290.67(17.04) |
|                   | G2        | 40.00(6.34)                                 | 506.67(22.51) | 546.67(23.38) | 20.00(4.51)                                 | 388.00(19.68) | 408.00(20.18) | 0.00(0.71)                                  | 8.00(2.86)    | 345.33(18.58) | 353.33(18.80) |
|                   | G3        | 37.33(6.05)                                 | 572.00(23.67) | 609.33(24.49) | 14.67(3.84)                                 | 400.00(20.01) | 414.67(20.37) | 0.00(0.71)                                  | 4.00(2.12)    | 341.33(18.49) | 345.33(18.59) |
|                   | G4        | 137.33(9.45)                                | 606.67(24.46) | 744.00(26.72) | 72.00(6.61)                                 | 530.67(22.93) | 602.67(24.25) | 0.00(0.71)                                  | 22.67(4.01)   | 400.00(20.01) | 422.67(20.54) |
|                   | G5        | 64.00(8.00)                                 | 686.67(25.88) | 750.67(27.10) | 18.67(4.37)                                 | 469.33(21.60) | 488.00(22.03) | 0.00(0.71)                                  | 13.33(3.71)   | 368.00(19.17) | 381.33(19.52) |
|                   | G6        | 44.00(6.61)                                 | 546.67(23.29) | 590.67(24.20) | 20.00(4.53)                                 | 420.00(20.45) | 440.00(20.94) | 0.00(0.71)                                  | 4.00(2.12)    | 293.33(17.07) | 297.33(17.19) |
| T2                | G1        | 1.33(1.18)                                  | 1.33(1.18)    | 2.67(1.65)    | 34.67(5.73)                                 | 66.67(8.08)   | 101.33(10.01) | 8.00(2.86)                                  | 105.33(10.12) | 142.67(11.80) | 256.00(15.99) |
|                   | G2        | 0.00(0.71)                                  | 12.00(3.39)   | 12.00(3.39)   | 32.00(5.65)                                 | 52.00(6.95)   | 84.00(9.09)   | 5.33(2.39)                                  | 113.33(10.14) | 130.67(11.22) | 249.33(15.37) |
|                   | G3        | 0.00(0.71)                                  | 10.67(3.33)   | 10.67(3.33)   | 24.00(4.88)                                 | 70.67(8.37)   | 94.67(9.74)   | 13.33(3.25)                                 | 80.00(8.80)   | 158.67(12.52) | 252.00(15.88) |
|                   | G4        | 6.67(2.65)                                  | 2.67(1.44)    | 9.33(3.03)    | 30.67(5.30)                                 | 96.00(9.81)   | 126.67(11.24) | 17.33(4.22)                                 | 78.67(8.85)   | 200.00(14.15) | 296.00(17.21) |
|                   | G5        | 2.67(1.65)                                  | 1.33(1.18)    | 4.00(1.91)    | 30.67(5.53)                                 | 74.67(8.34)   | 105.33(10.14) | 10.67(3.24)                                 | 166.67(12.45) | 168.00(12.77) | 345.33(18.49) |
|                   | G6        | 0.00(0.71)                                  | 0.00(0.71)    | 0.00(0.71)    | 24.00(4.81)                                 | 73.33(8.56)   | 97.33(9.84)   | 12.00(3.39)                                 | 38.67(6.14)   | 165.33(12.84) | 216.00(14.67) |
| T3                | G1        | -                                           | -             | -             | -                                           | -             | -             | -                                           | -             | -             | -             |
|                   | G2        | -                                           | -             | -             | -                                           | -             | -             | -                                           | -             | -             | -             |
|                   | G3        | -                                           | -             | -             | -                                           | -             | -             | -                                           | -             | -             | -             |
|                   | G4        | -                                           | -             | -             | -                                           | -             | -             | -                                           | -             | -             | -             |
|                   | G5        | -                                           | -             | -             | -                                           | -             | -             | -                                           | -             | -             | -             |
|                   | G6        | -                                           | -             | -             | -                                           | -             | -             | -                                           | -             | -             | -             |
| Interaction       |           |                                             |               |               |                                             |               |               |                                             |               |               |               |
| M and T           |           | NS                                          | NS            | NS            | NS                                          | NS            | NS            | NS                                          | NS            | NS            | NS            |
| T and M           |           | NS                                          | NS            | NS            | NS                                          | NS            | NS            | NS                                          | NS            | NS            | NS            |
| Mean of Factor-1  |           |                                             |               |               |                                             |               |               |                                             |               |               |               |
| 1                 |           | 62.22(7.27)                                 | 552.89(23.27) | 615.11(24.50) | 27.33(4.70)                                 | 424.22(20.49) | 451.56(21.09) | 0.00(0.71)                                  | 10.22(2.98)   | 338.22(18.35) | 348.44(18.61) |
| 2                 |           | 1.78(1.27)                                  | 4.67(1.87)    | 6.44(2.34)    | 29.33(5.32)                                 | 72.22(8.35)   | 101.56(10.01) | 11.11(3.22)                                 | 97.11(9.42)   | 160.89(12.55) | 269.11(16.27) |
| 3                 |           | -                                           | -             | -             | -                                           | -             | -             | -                                           | -             | -             | -             |
| CD(0.05)          |           | 4.58                                        | 4.52          | 4.82          | NS                                          | 1.06          | 3.43          | 1                                           | 1.62          | 1.38          | 1.86          |
| Mean of Factor-2  |           |                                             |               |               |                                             |               |               |                                             |               |               |               |
| 1                 |           | 26.00(4.16)                                 | 200.00(10.51) | 226.00(11.37) | 26.67(5.05)                                 | 202.00(13.19) | 228.67(14.40) | 4.00(1.78)                                  | 57.33(6.59)   | 212.00(14.28) | 273.33(16.52) |
| 2                 |           | 20.00(3.53)                                 | 259.33(12.95) | 279.33(13.39) | 26.00(5.08)                                 | 220.00(13.32) | 246.00(14.64) | 2.67(1.55)                                  | 60.67(6.50)   | 238.00(14.90) | 301.33(17.09) |
| 3                 |           | 18.67(3.38)                                 | 291.33(13.50) | 310.00(13.91) | 19.33(4.36)                                 | 235.33(14.19) | 254.67(15.06) | 6.67(1.98)                                  | 42.00(5.46)   | 250.00(15.50) | 298.67(17.24) |
| 4                 |           | 72.00(6.05)                                 | 304.67(12.95) | 376.67(14.88) | 51.33(5.95)                                 | 313.33(16.37) | 364.67(17.74) | 8.67(2.46)                                  | 50.67(6.43)   | 300.00(17.08) | 359.33(18.88) |
| 5                 |           | 33.33(4.82)                                 | 344.00(13.53) | 377.33(14.51) | 24.67(4.95)                                 | 272.00(14.97) | 296.67(16.08) | 5.33(1.97)                                  | 90.00(8.08)   | 268.00(15.97) | 363.33(19.00) |
| 6                 |           | 22.00(3.66)                                 | 273.33(12.00) | 295.33(12.46) | 22.00(4.67)                                 | 246.67(14.51) | 268.67(15.39) | 6.00(2.05)                                  | 21.33(4.13)   | 229.33(14.96) | 256.67(15.93) |
| CD(0.05)          |           | NS                                          | NS            | NS            | NS                                          | NS            | NS            | NS                                          | NS            | NS            | 2.23          |
| Experimental Mean |           | 4.27                                        | 12.57         | 13.42         | 5.01                                        | 14.42         | 15.55         | 1.97                                        | 6.2           | 15.45         | 17.44         |

(Values in parentheses are transformed figures)

Table 1m(ii): Contd.

| Main plot         | Genotypes | IARI-NEW DELHI                              |               |               |               |                                             |               |               |               |
|-------------------|-----------|---------------------------------------------|---------------|---------------|---------------|---------------------------------------------|---------------|---------------|---------------|
|                   |           | 45 DAHA                                     |               |               |               | 60 DAHA                                     |               |               |               |
|                   |           | Groupwise Weed population no/m <sup>2</sup> |               |               |               | Groupwise Weed population no/m <sup>2</sup> |               |               |               |
|                   |           | Grasses                                     | Sedges        | BLW           | Total         | Grasses                                     | Sedges        | BLW           | Total         |
| T1                | G1        | 0.00(0.71)                                  | 0.00(0.71)    | 213.33(14.62) | 213.33(14.62) | 0.00(0.71)                                  | 0.00(0.71)    | 173.33(13.09) | 173.33(13.09) |
|                   | G2        | 0.00(0.71)                                  | 0.00(0.71)    | 253.33(15.92) | 253.33(15.92) | 0.00(0.71)                                  | 0.00(0.71)    | 220.00(14.81) | 220.00(14.81) |
|                   | G3        | 0.00(0.71)                                  | 0.00(0.71)    | 220.00(14.84) | 220.00(14.84) | 0.00(0.71)                                  | 0.00(0.71)    | 220.00(14.84) | 220.00(14.84) |
|                   | G4        | 0.00(0.71)                                  | 0.00(0.71)    | 253.33(15.92) | 253.33(15.92) | 0.00(0.71)                                  | 0.00(0.71)    | 221.33(14.88) | 221.33(14.88) |
|                   | G5        | 0.00(0.71)                                  | 0.00(0.71)    | 273.33(16.55) | 273.33(16.55) | 0.00(0.71)                                  | 0.00(0.71)    | 226.67(15.02) | 226.67(15.02) |
|                   | G6        | 0.00(0.71)                                  | 0.00(0.71)    | 180.00(13.33) | 180.00(13.33) | 0.00(0.71)                                  | 0.00(0.71)    | 173.33(13.10) | 173.33(13.10) |
| T2                | G1        | 20.00(4.51)                                 | 186.67(13.66) | 248.00(15.68) | 454.67(21.31) | 14.67(3.87)                                 | 166.67(12.92) | 261.33(16.17) | 442.67(21.05) |
|                   | G2        | 13.33(3.71)                                 | 280.00(16.56) | 202.67(14.16) | 496.00(22.15) | 12.00(3.45)                                 | 306.67(17.30) | 250.67(15.83) | 569.33(23.80) |
|                   | G3        | 16.00(3.87)                                 | 266.67(16.31) | 241.33(15.46) | 524.00(22.89) | 13.33(3.57)                                 | 246.67(15.72) | 264.00(16.18) | 524.00(22.86) |
|                   | G4        | 22.67(4.76)                                 | 240.00(15.47) | 312.00(17.67) | 574.67(23.96) | 22.67(4.76)                                 | 213.33(14.61) | 324.00(18.01) | 560.00(23.67) |
|                   | G5        | 12.00(3.50)                                 | 320.00(17.72) | 317.33(17.79) | 649.33(25.43) | 17.33(4.11)                                 | 253.33(15.61) | 329.33(18.07) | 600.00(24.28) |
|                   | G6        | 13.33(3.57)                                 | 180.00(12.90) | 298.67(17.30) | 492.00(22.08) | 12.00(3.39)                                 | 173.33(12.71) | 301.33(17.36) | 486.67(22.03) |
| T3                | G1        | -                                           | -             | -             | -             | -                                           | -             | -             | -             |
|                   | G2        | -                                           | -             | -             | -             | -                                           | -             | -             | -             |
|                   | G3        | -                                           | -             | -             | -             | -                                           | -             | -             | -             |
|                   | G4        | -                                           | -             | -             | -             | -                                           | -             | -             | -             |
|                   | G5        | -                                           | -             | -             | -             | -                                           | -             | -             | -             |
|                   | G6        | -                                           | -             | -             | -             | -                                           | -             | -             | -             |
| Interaction       |           |                                             |               |               |               |                                             |               |               |               |
| M and T           |           | NS                                          | NS            | NS            | NS            | NS                                          | NS            | NS            | NS            |
| T and M           |           | NS                                          | NS            | NS            | NS            | NS                                          | NS            | NS            | NS            |
| Mean of Factor-1  |           |                                             |               |               |               |                                             |               |               |               |
| 1                 |           | 0.00(0.71)                                  | 0.00(0.71)    | 232.22(15.20) | 232.22(15.20) | 0.00(0.71)                                  | 0.00(0.71)    | 205.78(14.29) | 205.78(14.29) |
| 2                 |           | 16.22(3.99)                                 | 245.56(15.44) | 270.00(16.34) | 531.78(22.97) | 15.33(3.86)                                 | 226.67(14.81) | 288.44(16.94) | 530.44(22.95) |
| 3                 |           | -                                           | -             | -             | -             | -                                           | -             | -             | -             |
| CD(0.05)          |           | 1.84                                        | 3.57          | NS            | 4.06          | 0.69                                        | 4.17          | 2.4           | 5.1           |
| Mean of Factor-2  |           |                                             |               |               |               |                                             |               |               |               |
| 1                 |           | 10.00(2.61)                                 | 93.33(7.18)   | 230.67(15.15) | 334.00(17.97) | 7.33(2.29)                                  | 83.33(6.82)   | 217.33(14.63) | 308.00(17.07) |
| 2                 |           | 6.67(2.21)                                  | 140.00(8.63)  | 228.00(15.04) | 374.67(19.04) | 6.00(2.08)                                  | 153.33(9.00)  | 235.33(15.32) | 394.67(19.30) |
| 3                 |           | 8.00(2.29)                                  | 133.33(8.51)  | 230.67(15.15) | 372.00(18.87) | 6.67(2.14)                                  | 123.33(8.21)  | 242.00(15.51) | 372.00(18.85) |
| 4                 |           | 11.33(2.74)                                 | 120.00(8.09)  | 282.67(16.80) | 414.00(19.94) | 11.33(2.74)                                 | 106.67(7.66)  | 272.67(16.45) | 390.67(19.28) |
| 5                 |           | 6.00(2.11)                                  | 160.00(9.21)  | 295.33(17.17) | 461.33(20.99) | 8.67(2.41)                                  | 126.67(8.16)  | 278.00(16.55) | 413.33(19.65) |
| 6                 |           | 6.67(2.14)                                  | 90.00(6.80)   | 239.33(15.31) | 336.00(17.70) | 6.00(2.05)                                  | 86.67(6.71)   | 237.33(15.23) | 330.00(17.56) |
| CD(0.05)          |           | NS                                          | NS            | 1.58          | 1.79          | NS                                          | NS            | NS            | 1.84          |
| Experimental Mean |           | 2.35                                        | 8.07          | 15.77         | 19.08         | 2.28                                        | 7.76          | 15.61         | 18.62         |

(Values in parentheses are transformed figures)

Table 1m(ii): Contd.

| Main plot         | Genotypes | ICAR-IIRR             |             |             |                       |             |            |               |                       |               |             |               |
|-------------------|-----------|-----------------------|-------------|-------------|-----------------------|-------------|------------|---------------|-----------------------|---------------|-------------|---------------|
|                   |           | 1 DBHA                |             |             | 15 DAHA               |             |            |               | 30 DAHA               |               |             |               |
|                   |           | Weed popluation no/m² |             |             | Weed population no/m² |             |            |               | Weed population no/m² |               |             |               |
|                   |           | Grasses               | Sedges      | Total       | Grasses               | Sedges      | BLWs       | Total         | Grasses               | Sedges        | BLWs        | Total         |
| T1                | G1        | 1.67(1.46)            | 18.00(4.30) | 19.67(4.49) | 60.67(7.78)           | 5.33(2.39)  | 4.67(2.26) | 70.67(8.40)   | 122.00(11.05)         | 14.67(3.89)   | 8.67(2.97)  | 145.33(12.06) |
|                   | G2        | 3.00(1.81)            | 15.33(3.97) | 18.33(4.31) | 91.00(9.56)           | 6.67(2.39)  | 7.67(2.81) | 105.33(10.28) | 142.00(11.93)         | 18.00(4.30)   | 10.00(3.21) | 170.00(13.05) |
|                   | G3        | 2.00(1.47)            | 13.00(3.66) | 15.00(3.94) | 98.00(9.92)           | 2.67(1.65)  | 2.33(1.54) | 103.00(10.17) | 174.00(13.20)         | 3.67(1.87)    | 11.33(3.41) | 189.00(13.75) |
|                   | G4        | 3.00(1.82)            | 14.67(3.88) | 17.67(4.24) | 100.00(10.02)         | 2.67(1.65)  | 5.33(2.39) | 108.00(10.42) | 156.00(12.51)         | 13.33(3.68)   | 10.67(3.29) | 180.00(13.43) |
|                   | G5        | 4.67(2.26)            | 19.67(4.48) | 24.33(4.98) | 65.67(8.11)           | 18.67(4.34) | 6.67(2.59) | 91.00(9.55)   | 117.00(10.84)         | 21.00(4.63)   | 12.67(3.56) | 150.67(12.29) |
|                   | G6        | 3.33(1.93)            | 17.00(4.17) | 20.33(4.56) | 114.67(10.66)         | 9.33(3.13)  | 4.67(2.02) | 128.67(11.29) | 169.00(13.01)         | 10.33(3.28)   | 8.67(2.87)  | 188.00(13.73) |
| T2                | G1        | 0.00(0.71)            | 22.33(4.77) | 22.33(4.77) | 0.00(0.71)            | 15.67(3.97) | 0.00(0.71) | 15.67(3.97)   | 0.00(0.71)            | 80.00(8.94)   | 4.00(1.91)  | 84.00(9.15)   |
|                   | G2        | 0.00(0.71)            | 34.00(5.87) | 34.00(5.87) | 0.00(0.71)            | 40.67(6.36) | 0.00(0.71) | 40.67(6.36)   | 0.00(0.71)            | 149.33(12.23) | 0.00(0.71)  | 149.33(12.23) |
|                   | G3        | 0.00(0.71)            | 18.67(4.36) | 18.67(4.36) | 0.00(0.71)            | 34.00(5.87) | 0.00(0.71) | 34.00(5.87)   | 0.00(0.71)            | 53.33(7.28)   | 4.00(1.91)  | 57.33(7.57)   |
|                   | G4        | 0.00(0.71)            | 21.00(4.59) | 21.00(4.59) | 0.00(0.71)            | 38.00(6.18) | 0.00(0.71) | 38.00(6.18)   | 0.00(0.71)            | 76.00(8.73)   | 1.33(1.18)  | 77.33(8.81)   |
|                   | G5        | 0.00(0.71)            | 37.00(6.11) | 37.00(6.11) | 0.00(0.71)            | 30.33(5.41) | 0.00(0.71) | 30.33(5.41)   | 0.00(0.71)            | 101.33(10.09) | 0.00(0.71)  | 101.33(10.09) |
|                   | G6        | 0.00(0.71)            | 23.67(4.91) | 23.67(4.91) | 0.00(0.71)            | 33.00(5.63) | 0.00(0.71) | 33.00(5.63)   | 0.00(0.71)            | 101.33(10.09) | 0.00(0.71)  | 101.33(10.09) |
| T3                | G1        | 0.00(0.71)            | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)            | 0.00(0.71)  | 0.00(0.71) | 0.00(0.71)    | 0.00(0.71)            | 0.00(0.71)    | 0.00(0.71)  | 0.00(0.71)    |
|                   | G2        | 0.00(0.71)            | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)            | 0.00(0.71)  | 0.00(0.71) | 0.00(0.71)    | 0.00(0.71)            | 0.00(0.71)    | 0.00(0.71)  | 0.00(0.71)    |
|                   | G3        | 0.00(0.71)            | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)            | 0.00(0.71)  | 0.00(0.71) | 0.00(0.71)    | 0.00(0.71)            | 0.00(0.71)    | 0.00(0.71)  | 0.00(0.71)    |
|                   | G4        | 0.00(0.71)            | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)            | 0.00(0.71)  | 0.00(0.71) | 0.00(0.71)    | 0.00(0.71)            | 0.00(0.71)    | 0.00(0.71)  | 0.00(0.71)    |
|                   | G5        | 0.00(0.71)            | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)            | 0.00(0.71)  | 0.00(0.71) | 0.00(0.71)    | 0.00(0.71)            | 0.00(0.71)    | 0.00(0.71)  | 0.00(0.71)    |
|                   | G6        | 0.00(0.71)            | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)            | 0.00(0.71)  | 0.00(0.71) | 0.00(0.71)    | 0.00(0.71)            | 0.00(0.71)    | 0.00(0.71)  | 0.00(0.71)    |
| Interaction       |           |                       |             |             |                       |             |            |               |                       |               |             |               |
| M and T           |           | NS                    | 0.6         | 0.61        | 0.83                  | 1.25        | NS         | NS            | 0.51                  | 0.7           | NS          | 0.68          |
| T and M           |           | NS                    | 0.57        | 0.57        | 0.76                  | 1.22        | NS         | NS            | 0.47                  | 0.73          | NS          | 0.68          |
| Mean of Factor-1  |           |                       |             |             |                       |             |            |               |                       |               |             |               |
| 1                 |           | 2.94(1.79)            | 16.28(4.08) | 19.22(4.42) | 88.33(9.34)           | 7.56(2.59)  | 5.22(2.27) | 101.11(10.02) | 146.67(12.09)         | 13.50(3.61)   | 10.33(3.22) | 170.50(13.05) |
| 2                 |           | 0.00(0.71)            | 26.11(5.10) | 26.11(5.10) | 0.00(0.71)            | 31.94(5.57) | 0.00(0.71) | 31.94(5.57)   | 0.00(0.71)            | 93.56(9.56)   | 1.56(1.19)  | 95.11(9.66)   |
| 3                 |           | 0.00(0.71)            | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)            | 0.00(0.71)  | 0.00(0.71) | 0.00(0.71)    | 0.00(0.71)            | 0.00(0.71)    | 0.00(0.71)  | 0.00(0.71)    |
| CD(0.05)          |           | 0.25                  | 0.24        | 0.17        | 0.05                  | 0.68        | 0.24       | 0.57          | 0.11                  | 0.55          | 0.43        | 0.45          |
| Mean of Factor-2  |           |                       |             |             |                       |             |            |               |                       |               |             |               |
| 1                 |           | 0.56(0.96)            | 13.44(3.26) | 14.00(3.32) | 20.22(3.07)           | 7.00(2.36)  | 1.56(1.23) | 28.78(4.36)   | 40.67(4.16)           | 31.56(4.51)   | 4.22(1.86)  | 76.44(7.31)   |
| 2                 |           | 1.00(1.08)            | 16.44(3.51) | 17.44(3.63) | 30.33(3.66)           | 15.78(3.15) | 2.56(1.41) | 48.67(5.78)   | 47.33(4.45)           | 55.78(5.75)   | 3.33(1.54)  | 106.44(8.66)  |
| 3                 |           | 0.67(0.96)            | 10.56(2.91) | 11.22(3.00) | 32.67(3.78)           | 12.22(2.74) | 0.78(0.99) | 45.67(5.58)   | 58.00(4.87)           | 19.00(3.29)   | 5.11(2.01)  | 82.11(7.34)   |
| 4                 |           | 1.00(1.08)            | 11.89(3.06) | 12.89(3.18) | 33.33(3.81)           | 13.56(2.84) | 1.78(1.27) | 48.67(5.77)   | 52.00(4.64)           | 29.78(4.37)   | 4.00(1.73)  | 85.78(7.65)   |
| 5                 |           | 1.56(1.22)            | 18.89(3.76) | 20.44(3.93) | 21.89(3.18)           | 16.33(3.48) | 2.22(1.34) | 40.44(5.22)   | 39.00(4.08)           | 40.78(5.14)   | 4.22(1.66)  | 84.00(7.70)   |
| 6                 |           | 1.11(1.12)            | 13.56(3.26) | 14.67(3.39) | 38.22(4.03)           | 14.11(3.16) | 1.56(1.15) | 53.89(5.88)   | 56.33(4.81)           | 37.22(4.69)   | 2.89(1.43)  | 96.44(8.17)   |
| CD(0.05)          |           | NS                    | 0.35        | 0.35        | 0.48                  | NS          | NS         | 0.73          | 0.29                  | 0.41          | NS          | 0.39          |
| Experimental Mean |           | 1.07                  | 3.29        | 3.41        | 3.59                  | 2.96        | 1.23       | 5.43          | 4.5                   | 4.62          | 1.7         | 7.8           |

(Values in parentheses are transformed figures)

Table 1m(ii): Contd.

| Main plot         | Genotypes | ICAR-IIRR                         |             |             |             | KAUL                                        |            |            |             |
|-------------------|-----------|-----------------------------------|-------------|-------------|-------------|---------------------------------------------|------------|------------|-------------|
|                   |           | 60 DAHA                           |             |             |             | 60 DAHA                                     |            |            |             |
|                   |           | Weed population no/m <sup>2</sup> |             |             |             | Groupwise weed population no/m <sup>2</sup> |            |            |             |
|                   |           | Grasses                           | Sedges      | BLWs        | Total       | Grasses                                     | Sedges     | BLW        | Total       |
| T1                | G1        | 21.67(4.71)                       | 6.33(2.34)  | 9.33(3.11)  | 37.33(6.14) | 1.80(1.52)                                  | 1.10(1.26) | 1.10(1.26) | 4.00(2.12)  |
|                   | G2        | 50.00(7.11)                       | 5.00(2.12)  | 5.00(2.34)  | 60.00(7.77) | 1.73(1.49)                                  | 0.63(1.06) | 1.20(1.30) | 3.57(2.02)  |
|                   | G3        | 25.00(4.34)                       | 4.00(1.91)  | 4.00(2.03)  | 33.00(5.31) | 2.33(1.68)                                  | 1.00(1.22) | 1.03(1.24) | 4.37(2.21)  |
|                   | G4        | 54.00(7.38)                       | 7.67(2.54)  | 6.67(2.65)  | 68.33(8.29) | 2.27(1.66)                                  | 1.37(1.36) | 1.03(1.24) | 4.67(2.27)  |
|                   | G5        | 74.00(8.63)                       | 17.67(4.24) | 7.33(2.79)  | 99.00(9.97) | 7.83(2.89)                                  | 4.70(2.28) | 3.10(1.90) | 15.63(4.02) |
|                   | G6        | 57.00(7.57)                       | 0.67(1.05)  | 8.33(2.92)  | 66.00(8.14) | 5.47(2.44)                                  | 3.40(1.97) | 2.13(1.62) | 11.00(3.39) |
| T2                | G1        | 0.33(0.88)                        | 48.00(6.96) | 6.00(2.47)  | 54.33(7.40) | 4.20(2.17)                                  | 1.90(1.55) | 1.93(1.56) | 8.03(2.92)  |
|                   | G2        | 2.00(1.48)                        | 68.00(8.27) | 2.00(1.56)  | 72.00(8.51) | 4.47(2.23)                                  | 1.53(1.42) | 1.97(1.57) | 7.97(2.91)  |
|                   | G3        | 0.67(1.00)                        | 54.00(7.38) | 5.33(2.41)  | 60.00(7.78) | 4.90(2.32)                                  | 1.70(1.48) | 1.93(1.56) | 8.53(3.01)  |
|                   | G4        | 0.00(0.71)                        | 42.33(6.51) | 11.00(3.34) | 53.33(7.32) | 4.80(2.30)                                  | 1.90(1.55) | 1.77(1.50) | 8.47(2.99)  |
|                   | G5        | 2.67(1.64)                        | 57.00(7.58) | 6.33(2.56)  | 66.00(8.15) | 5.87(2.52)                                  | 2.37(1.69) | 2.50(1.73) | 10.73(3.35) |
|                   | G6        | 0.33(0.88)                        | 75.00(8.68) | 9.00(3.05)  | 84.33(9.20) | 5.30(2.41)                                  | 2.13(1.62) | 1.90(1.55) | 9.33(3.14)  |
| T3                | G1        | 0.00(0.71)                        | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  |
|                   | G2        | 0.00(0.71)                        | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  |
|                   | G3        | 0.00(0.71)                        | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  |
|                   | G4        | 0.00(0.71)                        | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  |
|                   | G5        | 0.00(0.71)                        | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  |
|                   | G6        | 0.00(0.71)                        | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  |
| Interaction       |           |                                   |             |             |             |                                             |            |            |             |
| M and T           |           | 1.38                              | 1.25        | NS          | 1.27        | 0.14                                        | 0.08       | 0.11       | 0.09        |
| T and M           |           | 1.3                               | 1.15        | NS          | 1.18        | 0.13                                        | 0.08       | 0.1        | 0.08        |
| Mean of Factor-1  |           |                                   |             |             |             |                                             |            |            |             |
| 1                 |           | 46.94(6.62)                       | 6.89(2.37)  | 6.78(2.64)  | 60.61(7.60) | 3.57(1.95)                                  | 2.03(1.53) | 1.60(1.43) | 7.21(2.67)  |
| 2                 |           | 1.00(1.10)                        | 57.39(7.56) | 6.61(2.57)  | 65.00(8.06) | 4.92(2.32)                                  | 1.92(1.55) | 2.00(1.58) | 8.84(3.05)  |
| 3                 |           | 0.00(0.71)                        | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  |
| CD(0.05)          |           | 0.55                              | 0.26        | 0.17        | 0.38        | 0.02                                        | 0.05       | 0.02       | 0.03        |
| Mean of Factor-2  |           |                                   |             |             |             |                                             |            |            |             |
| 1                 |           | 7.33(2.10)                        | 18.11(3.34) | 5.11(2.09)  | 30.56(4.75) | 2.00(1.46)                                  | 1.00(1.17) | 1.01(1.18) | 4.01(1.92)  |
| 2                 |           | 17.33(3.10)                       | 24.33(3.70) | 2.33(1.53)  | 44.00(5.66) | 2.07(1.48)                                  | 0.72(1.07) | 1.06(1.19) | 3.84(1.88)  |
| 3                 |           | 8.56(2.02)                        | 19.33(3.33) | 3.11(1.71)  | 31.00(4.60) | 2.41(1.57)                                  | 0.90(1.14) | 0.99(1.17) | 4.30(1.97)  |
| 4                 |           | 18.00(2.93)                       | 16.67(3.25) | 5.89(2.23)  | 40.56(5.44) | 2.36(1.56)                                  | 1.09(1.21) | 0.93(1.15) | 4.38(1.99)  |
| 5                 |           | 25.56(3.66)                       | 24.89(4.18) | 4.56(2.02)  | 55.00(6.28) | 4.57(2.04)                                  | 2.36(1.56) | 1.87(1.44) | 8.79(2.69)  |
| 6                 |           | 19.11(3.05)                       | 25.22(3.48) | 5.78(2.23)  | 50.11(6.02) | 3.59(1.85)                                  | 1.84(1.43) | 1.34(1.29) | 6.78(2.41)  |
| CD(0.05)          |           | 0.8                               | NS          | 0.45        | 0.74        | 0.08                                        | 0.05       | 0.06       | 0.05        |
| Experimental Mean |           | 2.81                              | 3.55        | 1.97        | 5.46        | 1.66                                        | 1.26       | 1.24       | 2.14        |

(Values in parentheses are transformed figures)

Table 1m(ii): Contd.

| Main plot         | Genotypes | NAGINA                                      |            |            |             |                                             |            |            |            |                                             |            |            |             |
|-------------------|-----------|---------------------------------------------|------------|------------|-------------|---------------------------------------------|------------|------------|------------|---------------------------------------------|------------|------------|-------------|
|                   |           | 1 DBHA                                      |            |            |             | 15 DAHA                                     |            |            |            | 30 DAHA                                     |            |            |             |
|                   |           | Groupwise weed population no/m <sup>2</sup> |            |            |             | Groupwise weed population no/m <sup>2</sup> |            |            |            | Groupwise weed population no/m <sup>2</sup> |            |            |             |
|                   |           | Grasses                                     | Sedges     | BLW        | Total       | Grasses                                     | Sedges     | BLW        | Total      | Grasses                                     | Sedges     | BLW        | Total       |
| T1                | G1        | 3.25(1.92)                                  | 2.27(1.64) | 3.84(2.08) | 9.36(3.13)  | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  |
|                   | G2        | 3.07(1.88)                                  | 2.55(1.74) | 3.19(1.92) | 8.81(3.05)  | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  |
|                   | G3        | 3.21(1.92)                                  | 2.07(1.60) | 3.08(1.89) | 8.37(2.97)  | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  |
|                   | G4        | 3.12(1.89)                                  | 2.76(1.79) | 3.59(2.02) | 9.47(3.15)  | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  |
|                   | G5        | 2.52(1.73)                                  | 2.97(1.86) | 2.85(1.82) | 8.34(2.97)  | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  |
|                   | G6        | 2.21(1.65)                                  | 2.97(1.86) | 2.55(1.74) | 7.73(2.87)  | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  |
| T2                | G1        | 2.76(1.80)                                  | 2.88(1.83) | 3.58(2.00) | 9.22(3.11)  | 2.74(1.79)                                  | 3.48(1.98) | 2.96(1.86) | 9.18(3.10) | 3.20(1.91)                                  | 2.96(1.84) | 3.50(2.00) | 9.66(3.18)  |
|                   | G2        | 2.42(1.69)                                  | 2.90(1.83) | 3.11(1.89) | 8.43(2.99)  | 2.87(1.84)                                  | 2.34(1.68) | 2.75(1.80) | 7.96(2.91) | 3.28(1.94)                                  | 3.34(1.95) | 3.27(1.94) | 9.90(3.22)  |
|                   | G3        | 3.22(1.91)                                  | 3.06(1.87) | 4.38(2.21) | 10.66(3.34) | 3.16(1.91)                                  | 2.50(1.71) | 2.64(1.77) | 8.31(2.96) | 4.28(2.17)                                  | 5.86(2.52) | 4.04(2.13) | 14.18(3.83) |
|                   | G4        | 3.55(2.00)                                  | 4.02(2.12) | 3.31(1.95) | 10.88(3.37) | 2.98(1.86)                                  | 2.86(1.82) | 3.03(1.87) | 8.86(3.05) | 3.71(2.05)                                  | 2.79(1.81) | 3.22(1.93) | 9.72(3.20)  |
|                   | G5        | 2.89(1.84)                                  | 3.64(2.03) | 3.18(1.92) | 9.72(3.19)  | 2.33(1.68)                                  | 2.46(1.72) | 2.65(1.77) | 7.44(2.82) | 2.67(1.75)                                  | 2.89(1.84) | 3.00(1.87) | 8.56(3.00)  |
|                   | G6        | 2.74(1.79)                                  | 2.49(1.72) | 3.62(2.03) | 8.86(3.06)  | 2.22(1.64)                                  | 2.54(1.74) | 2.78(1.80) | 7.54(2.83) | 3.18(1.90)                                  | 3.22(1.90) | 2.96(1.84) | 9.36(3.13)  |
| T3                | G1        | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  |
|                   | G2        | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  |
|                   | G3        | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  |
|                   | G4        | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  |
|                   | G5        | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  |
|                   | G6        | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  |
| Interaction       |           |                                             |            |            |             |                                             |            |            |            |                                             |            |            |             |
| M and T           |           | NS                                          | NS         | NS         | NS          | NS                                          | NS         | NS         | NS         | NS                                          | 0.24       | NS         | 0.16        |
| T and M           |           | NS                                          | NS         | NS         | NS          | NS                                          | NS         | NS         | NS         | NS                                          | 0.23       | NS         | 0.16        |
| Mean of Factor-1  |           |                                             |            |            |             |                                             |            |            |            |                                             |            |            |             |
| 1                 |           | 2.90(1.83)                                  | 2.60(1.75) | 3.18(1.91) | 8.68(3.02)  | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  |
| 2                 |           | 2.93(1.84)                                  | 3.17(1.90) | 3.53(2.00) | 9.62(3.17)  | 2.72(1.79)                                  | 2.70(1.77) | 2.80(1.81) | 8.21(2.94) | 3.39(1.95)                                  | 3.51(1.98) | 3.33(1.95) | 10.23(3.26) |
| 3                 |           | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  |
| CD(0.05)          |           | 0.09                                        | 0.05       | 0.08       | 0.05        | 0.03                                        | 0.08       | 0.06       | 0.09       | 0.15                                        | 0.1        | 0.03       | 0.12        |
| Mean of Factor-2  |           |                                             |            |            |             |                                             |            |            |            |                                             |            |            |             |
| 1                 |           | 2.00(1.48)                                  | 1.71(1.39) | 2.47(1.59) | 6.19(2.32)  | 0.91(1.07)                                  | 1.16(1.13) | 0.99(1.09) | 3.06(1.51) | 1.07(1.11)                                  | 0.99(1.08) | 1.17(1.14) | 3.22(1.53)  |
| 2                 |           | 1.83(1.43)                                  | 1.82(1.43) | 2.10(1.51) | 5.75(2.25)  | 0.96(1.08)                                  | 0.78(1.03) | 0.92(1.07) | 2.65(1.44) | 1.09(1.12)                                  | 1.11(1.12) | 1.09(1.12) | 3.30(1.55)  |
| 3                 |           | 2.14(1.51)                                  | 1.71(1.39) | 2.49(1.60) | 6.34(2.34)  | 1.05(1.11)                                  | 0.83(1.04) | 0.88(1.06) | 2.77(1.46) | 1.43(1.20)                                  | 1.95(1.31) | 1.35(1.18) | 4.73(1.75)  |
| 4                 |           | 2.22(1.53)                                  | 2.26(1.54) | 2.30(1.56) | 6.78(2.41)  | 0.99(1.09)                                  | 0.95(1.08) | 1.01(1.09) | 2.95(1.49) | 1.24(1.15)                                  | 0.93(1.08) | 1.07(1.11) | 3.24(1.54)  |
| 5                 |           | 1.80(1.43)                                  | 2.21(1.53) | 2.01(1.48) | 6.02(2.29)  | 0.78(1.03)                                  | 0.82(1.04) | 0.88(1.06) | 2.48(1.41) | 0.89(1.05)                                  | 0.96(1.08) | 1.00(1.09) | 2.85(1.47)  |
| 6                 |           | 1.65(1.38)                                  | 1.82(1.43) | 2.06(1.49) | 5.53(2.21)  | 0.74(1.02)                                  | 0.85(1.05) | 0.93(1.07) | 2.51(1.41) | 1.06(1.11)                                  | 1.07(1.10) | 0.99(1.08) | 3.12(1.52)  |
| CD(0.05)          |           | NS                                          | NS         | NS         | NS          | NS                                          | NS         | NS         | NS         | NS                                          | 0.14       | NS         | 0.09        |
| Experimental Mean |           | 1.46                                        | 1.45       | 1.54       | 2.3         | 1.07                                        | 1.06       | 1.08       | 1.45       | 1.12                                        | 1.13       | 1.12       | 1.56        |

(Values in parentheses are transformed figures)

Table 1m(ii): Contd.

| Main plot         | Genotypes | NAGINA                                      |            |            |             |                                             |            |            |             |
|-------------------|-----------|---------------------------------------------|------------|------------|-------------|---------------------------------------------|------------|------------|-------------|
|                   |           | 45 DAHA                                     |            |            |             | 60 DAHA                                     |            |            |             |
|                   |           | Groupwise weed population no/m <sup>2</sup> |            |            |             | Groupwise weed population no/m <sup>2</sup> |            |            |             |
|                   |           | Grasses                                     | Sedges     | BLW        | Total       | Grasses                                     | Sedges     | BLW        | Total       |
| T1                | G1        | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  |
|                   | G2        | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  |
|                   | G3        | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  |
|                   | G4        | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  |
|                   | G5        | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  |
|                   | G6        | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  |
| T2                | G1        | 3.53(2.01)                                  | 4.08(2.11) | 3.80(2.07) | 11.41(3.44) | 3.77(2.06)                                  | 4.67(2.27) | 3.28(1.94) | 11.72(3.49) |
|                   | G2        | 3.95(2.10)                                  | 3.71(2.05) | 3.27(1.94) | 10.93(3.38) | 3.75(2.05)                                  | 4.00(2.12) | 3.04(1.88) | 10.80(3.36) |
|                   | G3        | 4.28(2.17)                                  | 3.60(2.02) | 3.86(2.09) | 11.74(3.50) | 3.16(1.91)                                  | 4.42(2.22) | 3.11(1.90) | 10.69(3.35) |
|                   | G4        | 3.71(2.05)                                  | 2.98(1.86) | 3.22(1.93) | 9.90(3.23)  | 3.47(1.99)                                  | 4.67(2.27) | 3.25(1.93) | 11.39(3.45) |
|                   | G5        | 2.67(1.75)                                  | 2.89(1.84) | 3.00(1.87) | 8.56(3.00)  | 2.14(1.62)                                  | 2.82(1.82) | 2.83(1.82) | 7.78(2.88)  |
|                   | G6        | 2.69(1.77)                                  | 3.25(1.93) | 3.22(1.93) | 9.16(3.11)  | 3.50(1.99)                                  | 3.63(2.00) | 3.27(1.93) | 10.40(3.30) |
| T3                | G1        | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  |
|                   | G2        | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  |
|                   | G3        | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  |
|                   | G4        | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  |
|                   | G5        | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  |
|                   | G6        | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  |
| Interaction       |           |                                             |            |            |             |                                             |            |            |             |
| M and T           |           | 0.16                                        | NS         | NS         | NS          | 0.16                                        | NS         | NS         | 0.09        |
| T and M           |           | 0.19                                        | NS         | NS         | NS          | 0.16                                        | NS         | NS         | 0.09        |
| Mean of Factor-1  |           |                                             |            |            |             |                                             |            |            |             |
| 1                 |           | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  |
| 2                 |           | 3.47(1.98)                                  | 3.42(1.97) | 3.39(1.97) | 10.28(3.27) | 3.30(1.94)                                  | 4.03(2.12) | 3.13(1.90) | 10.46(3.30) |
| 3                 |           | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  | 0.00(0.71)                                  | 0.00(0.71) | 0.00(0.71) | 0.00(0.71)  |
| CD(0.05)          |           | 0.17                                        | 0.12       | 0.04       | 0.09        | 0.1                                         | 0.1        | 0.03       | 0.05        |
| Mean of Factor-2  |           |                                             |            |            |             |                                             |            |            |             |
| 1                 |           | 1.18(1.14)                                  | 1.36(1.17) | 1.27(1.16) | 3.80(1.62)  | 1.26(1.16)                                  | 1.56(1.23) | 1.09(1.12) | 3.91(1.64)  |
| 2                 |           | 1.32(1.17)                                  | 1.24(1.16) | 1.09(1.12) | 3.64(1.60)  | 1.25(1.16)                                  | 1.33(1.18) | 1.01(1.10) | 3.60(1.59)  |
| 3                 |           | 1.43(1.20)                                  | 1.20(1.15) | 1.29(1.17) | 3.91(1.64)  | 1.05(1.11)                                  | 1.47(1.21) | 1.04(1.10) | 3.56(1.59)  |
| 4                 |           | 1.24(1.15)                                  | 0.99(1.09) | 1.07(1.11) | 3.30(1.55)  | 1.16(1.13)                                  | 1.56(1.23) | 1.08(1.12) | 3.80(1.62)  |
| 5                 |           | 0.89(1.05)                                  | 0.96(1.08) | 1.00(1.09) | 2.85(1.47)  | 0.71(1.01)                                  | 0.94(1.08) | 0.94(1.08) | 2.59(1.43)  |
| 6                 |           | 0.90(1.06)                                  | 1.08(1.11) | 1.07(1.11) | 3.05(1.51)  | 1.17(1.13)                                  | 1.21(1.14) | 1.09(1.12) | 3.47(1.57)  |
| CD(0.05)          |           | 0.09                                        | NS         | NS         | 0.11        | 0.09                                        | NS         | NS         | 0.05        |
| Experimental Mean |           | 1.13                                        | 1.13       | 1.13       | 1.56        | 1.12                                        | 1.18       | 1.11       | 1.57        |

(Values in parentheses are transformed figures)

Table 1m(ii): Contd.

| Main plot         | Genotypes | PANTNAGAR                                   |             |            |             |                                             |             |             |             |                                             |             |             |               |
|-------------------|-----------|---------------------------------------------|-------------|------------|-------------|---------------------------------------------|-------------|-------------|-------------|---------------------------------------------|-------------|-------------|---------------|
|                   |           | 1 DBHA                                      |             |            |             | 15 DAHA                                     |             |             |             | 30 DAHA                                     |             |             |               |
|                   |           | Groupwise weed population no/m <sup>2</sup> |             |            |             | Groupwise weed population no/m <sup>2</sup> |             |             |             | Groupwise Weed population no/m <sup>2</sup> |             |             |               |
|                   |           | Grasses                                     | Sedges      | BLW        | Total       | Grasses                                     | Sedges      | BLW         | Total       | Grasses                                     | Sedges      | BLW         | Total         |
| T1                | G1        | 8.00(2.56)                                  | 22.67(4.65) | 4.00(1.65) | 34.67(5.81) | 2.00(1.32)                                  | 6.00(2.53)  | 4.67(2.26)  | 12.67(3.56) | 7.33(2.79)                                  | 7.33(2.79)  | 7.33(2.79)  | 22.00(4.74)   |
|                   | G2        | 2.67(1.44)                                  | 29.33(5.41) | 0.00(0.71) | 32.00(5.61) | 4.67(2.21)                                  | 3.33(1.79)  | 4.67(2.06)  | 12.67(3.56) | 6.00(2.53)                                  | 7.33(2.79)  | 4.67(2.06)  | 18.00(4.27)   |
|                   | G3        | 4.00(1.91)                                  | 28.00(5.33) | 0.00(0.71) | 32.00(5.68) | 2.67(1.65)                                  | 4.67(2.26)  | 4.67(2.06)  | 12.00(3.41) | 4.00(1.91)                                  | 7.33(2.79)  | 5.33(2.18)  | 16.67(4.06)   |
|                   | G4        | 4.00(1.91)                                  | 13.33(3.68) | 2.67(1.44) | 20.00(4.40) | 5.33(2.41)                                  | 5.33(2.41)  | 5.33(2.18)  | 16.00(4.05) | 6.00(2.53)                                  | 6.67(2.67)  | 6.67(2.65)  | 19.33(4.45)   |
|                   | G5        | 4.00(1.91)                                  | 44.00(6.64) | 6.67(2.65) | 54.67(7.39) | 6.00(2.55)                                  | 6.67(2.67)  | 2.00(1.32)  | 14.67(3.88) | 7.33(2.79)                                  | 8.00(2.92)  | 4.00(1.91)  | 19.33(4.44)   |
|                   | G6        | 4.00(1.65)                                  | 22.67(4.65) | 8.00(2.56) | 34.67(5.67) | 5.33(2.39)                                  | 4.00(2.12)  | 2.67(1.65)  | 12.00(3.50) | 7.33(2.79)                                  | 6.67(2.65)  | 6.00(2.53)  | 20.00(4.52)   |
| T2                | G1        | 12.00(3.33)                                 | 17.33(4.13) | 1.33(1.18) | 30.67(5.48) | 13.33(3.68)                                 | 22.67(4.58) | 9.33(3.06)  | 45.33(6.70) | 16.00(3.49)                                 | 48.00(6.69) | 13.33(3.59) | 77.33(8.58)   |
|                   | G2        | 4.00(1.91)                                  | 26.67(5.13) | 6.67(2.39) | 37.33(6.11) | 5.33(2.39)                                  | 25.33(5.02) | 6.67(2.39)  | 37.33(6.05) | 8.00(2.56)                                  | 38.67(6.01) | 16.00(3.98) | 62.67(7.64)   |
|                   | G3        | 4.00(1.91)                                  | 26.67(5.13) | 1.33(1.18) | 32.00(5.65) | 8.00(2.77)                                  | 22.67(4.70) | 14.67(3.89) | 45.33(6.76) | 5.33(2.39)                                  | 41.33(6.31) | 30.67(5.56) | 77.33(8.78)   |
|                   | G4        | 6.67(2.39)                                  | 40.00(6.34) | 5.33(1.83) | 52.00(7.24) | 10.67(2.86)                                 | 34.67(5.85) | 12.00(3.50) | 57.33(7.60) | 21.33(3.91)                                 | 61.33(7.80) | 24.00(4.90) | 106.67(10.35) |
|                   | G5        | 4.00(1.91)                                  | 32.00(5.64) | 0.00(0.71) | 36.00(5.99) | 10.67(3.24)                                 | 28.00(5.10) | 10.67(2.86) | 49.33(7.01) | 14.67(3.80)                                 | 56.00(7.18) | 25.33(4.85) | 96.00(9.73)   |
|                   | G6        | 4.00(1.91)                                  | 34.67(5.90) | 5.33(2.12) | 44.00(6.66) | 18.67(4.01)                                 | 18.67(4.16) | 6.67(2.39)  | 44.00(6.61) | 18.67(3.53)                                 | 36.00(5.76) | 13.33(3.24) | 68.00(8.08)   |
| T3                | G1        | -                                           | -           | -          | -           | -                                           | -           | -           | -           | -                                           | -           | -           | -             |
|                   | G2        | -                                           | -           | -          | -           | -                                           | -           | -           | -           | -                                           | -           | -           | -             |
|                   | G3        | -                                           | -           | -          | -           | -                                           | -           | -           | -           | -                                           | -           | -           | -             |
|                   | G4        | -                                           | -           | -          | -           | -                                           | -           | -           | -           | -                                           | -           | -           | -             |
|                   | G5        | -                                           | -           | -          | -           | -                                           | -           | -           | -           | -                                           | -           | -           | -             |
|                   | G6        | -                                           | -           | -          | -           | -                                           | -           | -           | -           | -                                           | -           | -           | -             |
| Interaction       |           |                                             |             |            |             |                                             |             |             |             |                                             |             |             |               |
| M and T           |           | NS                                          | NS          | NS         | NS          | NS                                          | NS          | NS          | NS          | NS                                          | NS          | NS          | NS            |
| T and M           |           | NS                                          | NS          | NS         | NS          | NS                                          | NS          | NS          | NS          | NS                                          | NS          | NS          | NS            |
| Mean of Factor-1  |           |                                             |             |            |             |                                             |             |             |             |                                             |             |             |               |
| 1                 |           | 4.44(1.90)                                  | 26.67(5.06) | 3.56(1.62) | 34.67(5.76) | 4.33(2.09)                                  | 5.00(2.30)  | 4.00(1.92)  | 13.33(3.66) | 6.33(2.56)                                  | 7.22(2.77)  | 5.67(2.35)  | 19.22(4.41)   |
| 2                 |           | 5.78(2.23)                                  | 29.56(5.38) | 3.33(1.57) | 38.67(6.19) | 11.11(3.16)                                 | 25.33(4.90) | 10.00(3.01) | 46.44(6.79) | 14.00(3.28)                                 | 46.89(6.62) | 20.44(4.36) | 81.33(8.86)   |
| 3                 |           | -                                           | -           | -          | -           | -                                           | -           | -           | -           | -                                           | -           | -           | -             |
| CD(0.05)          |           | NS                                          | NS          | NS         | NS          | NS                                          | 2.19        | 0.9         | 0.47        | NS                                          | 2.71        | 0.7         | 2.22          |
| Mean of Factor-2  |           |                                             |             |            |             |                                             |             |             |             |                                             |             |             |               |
| 1                 |           | 10.00(2.95)                                 | 20.00(4.39) | 2.67(1.41) | 32.67(5.64) | 7.67(2.50)                                  | 14.33(3.55) | 7.00(2.66)  | 29.00(5.13) | 11.67(3.14)                                 | 27.67(4.74) | 10.33(3.19) | 49.67(6.66)   |
| 2                 |           | 3.33(1.68)                                  | 28.00(5.27) | 3.33(1.55) | 34.67(5.86) | 5.00(2.30)                                  | 14.33(3.41) | 5.67(2.22)  | 25.00(4.80) | 7.00(2.55)                                  | 23.00(4.40) | 10.33(3.02) | 40.33(5.95)   |
| 3                 |           | 4.00(1.91)                                  | 27.33(5.23) | 0.67(0.94) | 32.00(5.67) | 5.33(2.21)                                  | 13.67(3.48) | 9.67(2.97)  | 28.67(5.09) | 4.67(2.15)                                  | 24.33(4.55) | 18.00(3.87) | 47.00(6.42)   |
| 4                 |           | 5.33(2.15)                                  | 26.67(5.01) | 4.00(1.63) | 36.00(5.82) | 8.00(2.63)                                  | 20.00(4.13) | 8.67(2.84)  | 36.67(5.82) | 13.67(3.22)                                 | 34.00(5.23) | 15.33(3.78) | 63.00(7.40)   |
| 5                 |           | 4.00(1.91)                                  | 38.00(6.14) | 3.33(1.68) | 45.33(6.69) | 8.33(2.89)                                  | 17.33(3.89) | 6.33(2.09)  | 32.00(5.45) | 11.00(3.30)                                 | 32.00(5.05) | 14.67(3.38) | 57.67(7.09)   |
| 6                 |           | 4.00(1.78)                                  | 28.67(5.28) | 6.67(2.34) | 39.33(6.16) | 12.00(3.20)                                 | 11.33(3.14) | 4.67(2.02)  | 28.00(5.06) | 13.00(3.16)                                 | 21.33(4.21) | 9.67(2.88)  | 44.00(6.30)   |
| CD(0.05)          |           | NS                                          | NS          | NS         | NS          | NS                                          | NS          | NS          | NS          | NS                                          | NS          | NS          | NS            |
| Experimental Mean |           | 2.06                                        | 5.22        | 1.59       | 5.97        | 2.62                                        | 3.6         | 2.47        | 5.22        | 2.92                                        | 4.7         | 3.35        | 6.64          |

(Values in parentheses are transformed figures)

Table 1m(ii): Contd.

| Main plot         | Genotypes | LUDHIANA                                    |             |             |             |                                             |            |            |             |                                             |            |            |             |
|-------------------|-----------|---------------------------------------------|-------------|-------------|-------------|---------------------------------------------|------------|------------|-------------|---------------------------------------------|------------|------------|-------------|
|                   |           | 1 DBHA                                      |             |             |             | 30 DAHA                                     |            |            |             | 60 DAHA                                     |            |            |             |
|                   |           | Groupwise weed population no/m <sup>2</sup> |             |             |             | Groupwise weed population no/m <sup>2</sup> |            |            |             | Groupwise Weed population no/m <sup>2</sup> |            |            |             |
|                   |           | Grasses                                     | Sedges      | BLW         | Total       | Grasses                                     | Sedges     | BLW        | Total       | Grasses                                     | Sedges     | BLW        | Total       |
| T1                | G1        | 52.33(7.26)                                 | 12.67(3.60) | 14.67(3.85) | 79.67(8.94) | 2.67(1.77)                                  | 4.00(2.08) | 2.67(1.74) | 9.33(3.10)  | 3.67(1.87)                                  | 4.67(2.16) | 4.00(2.09) | 12.33(3.53) |
|                   | G2        | 52.00(7.20)                                 | 11.67(3.46) | 14.33(3.83) | 78.00(8.84) | 2.33(1.66)                                  | 3.00(1.81) | 2.00(1.56) | 7.33(2.76)  | 3.33(1.80)                                  | 4.00(2.00) | 4.00(2.08) | 11.33(3.42) |
|                   | G3        | 47.67(6.88)                                 | 9.00(3.03)  | 14.00(3.77) | 70.67(8.41) | 4.67(2.26)                                  | 3.00(1.86) | 2.67(1.77) | 10.33(3.28) | 6.33(2.61)                                  | 5.00(2.27) | 4.33(2.18) | 15.67(4.00) |
|                   | G4        | 48.00(6.96)                                 | 11.00(3.36) | 13.00(3.63) | 72.00(8.49) | 2.00(1.56)                                  | 3.67(1.94) | 2.00(1.56) | 7.67(2.80)  | 3.33(1.90)                                  | 4.67(2.26) | 3.33(1.85) | 11.33(3.41) |
|                   | G5        | 46.67(6.82)                                 | 8.33(2.93)  | 13.00(3.67) | 68.00(8.24) | 2.33(1.64)                                  | 3.00(1.81) | 1.67(1.46) | 7.00(2.71)  | 3.33(1.77)                                  | 4.00(1.91) | 3.33(1.93) | 10.67(3.27) |
|                   | G6        | 46.33(6.77)                                 | 8.67(3.02)  | 13.33(3.69) | 68.33(8.24) | 5.00(2.34)                                  | 3.67(2.02) | 3.00(1.86) | 11.67(3.47) | 5.67(2.46)                                  | 5.33(2.40) | 5.00(2.34) | 16.00(4.05) |
| T2                | G1        | 5.33(2.40)                                  | 14.67(3.89) | 13.00(3.65) | 33.00(5.78) | 4.00(2.11)                                  | 4.33(2.18) | 3.67(2.02) | 12.00(3.52) | 5.33(2.39)                                  | 5.67(2.41) | 5.00(2.30) | 16.00(4.03) |
|                   | G2        | 5.33(2.39)                                  | 12.33(3.54) | 13.33(3.71) | 31.00(5.61) | 3.67(2.00)                                  | 4.00(2.08) | 3.33(1.93) | 11.00(3.38) | 5.00(2.35)                                  | 5.33(2.34) | 5.00(2.30) | 15.33(3.93) |
|                   | G3        | 4.33(2.16)                                  | 8.33(2.95)  | 13.00(3.64) | 25.67(5.11) | 3.67(2.02)                                  | 4.00(2.04) | 3.67(1.97) | 11.33(3.44) | 4.67(2.22)                                  | 5.33(2.38) | 4.67(2.18) | 14.67(3.85) |
|                   | G4        | 3.67(1.97)                                  | 8.00(2.86)  | 13.33(3.71) | 25.00(5.01) | 3.33(1.94)                                  | 4.33(2.18) | 3.67(1.94) | 11.33(3.39) | 4.33(2.15)                                  | 5.67(2.41) | 4.67(2.11) | 14.67(3.86) |
|                   | G5        | 4.00(2.11)                                  | 9.33(3.13)  | 12.33(3.54) | 25.67(5.09) | 4.00(2.11)                                  | 4.33(2.16) | 3.33(1.93) | 11.67(3.48) | 5.00(2.29)                                  | 5.67(2.41) | 4.33(1.99) | 15.00(3.92) |
|                   | G6        | 4.00(2.11)                                  | 6.67(2.67)  | 13.33(3.71) | 24.00(4.94) | 3.33(1.93)                                  | 4.00(2.11) | 3.67(1.97) | 11.00(3.33) | 4.00(2.11)                                  | 5.33(2.34) | 4.00(2.06) | 13.33(3.69) |
| T3                | G1        | -                                           | -           | -           | -           | -                                           | -          | -          | -           | -                                           | -          | -          | -           |
|                   | G2        | -                                           | -           | -           | -           | -                                           | -          | -          | -           | -                                           | -          | -          | -           |
|                   | G3        | -                                           | -           | -           | -           | -                                           | -          | -          | -           | -                                           | -          | -          | -           |
|                   | G4        | -                                           | -           | -           | -           | -                                           | -          | -          | -           | -                                           | -          | -          | -           |
|                   | G5        | -                                           | -           | -           | -           | -                                           | -          | -          | -           | -                                           | -          | -          | -           |
|                   | G6        | -                                           | -           | -           | -           | -                                           | -          | -          | -           | -                                           | -          | -          | -           |
| Interaction       |           |                                             |             |             |             |                                             |            |            |             |                                             |            |            |             |
| M and T           |           | NS                                          | NS          | NS          | NS          | NS                                          | NS         | NS         | NS          | NS                                          | NS         | NS         | NS          |
| T and M           |           | NS                                          | NS          | NS          | NS          | NS                                          | NS         | NS         | NS          | NS                                          | NS         | NS         | NS          |
| Mean of Factor-1  |           |                                             |             |             |             |                                             |            |            |             |                                             |            |            |             |
| 1                 |           | 48.83(6.98)                                 | 10.22(3.23) | 13.72(3.74) | 72.78(8.53) | 3.17(1.87)                                  | 3.39(1.92) | 2.33(1.66) | 8.89(3.02)  | 4.28(2.07)                                  | 4.61(2.17) | 4.00(2.08) | 12.89(3.61) |
| 2                 |           | 4.44(2.19)                                  | 9.89(3.17)  | 13.06(3.66) | 27.39(5.26) | 3.67(2.02)                                  | 4.17(2.13) | 3.56(1.96) | 11.39(3.42) | 4.72(2.25)                                  | 5.50(2.38) | 4.61(2.16) | 14.83(3.88) |
| 3                 |           | -                                           | -           | -           | -           | -                                           | -          | -          | -           | -                                           | -          | -          | -           |
| CD(0.05)          |           | 0.99                                        | NS          | NS          | 1.12        | NS                                          | NS         | NS         | NS          | NS                                          | NS         | NS         | NS          |
| Mean of Factor-2  |           |                                             |             |             |             |                                             |            |            |             |                                             |            |            |             |
| 1                 |           | 28.83(4.83)                                 | 13.67(3.74) | 13.83(3.75) | 56.33(7.36) | 3.33(1.94)                                  | 4.17(2.13) | 3.17(1.88) | 10.67(3.31) | 4.50(2.13)                                  | 5.17(2.29) | 4.50(2.20) | 14.17(3.78) |
| 2                 |           | 28.67(4.79)                                 | 12.00(3.50) | 13.83(3.77) | 54.50(7.23) | 3.00(1.83)                                  | 3.50(1.95) | 2.67(1.75) | 9.17(3.07)  | 4.17(2.07)                                  | 4.67(2.17) | 4.50(2.19) | 13.33(3.68) |
| 3                 |           | 26.17(4.56)                                 | 9.67(3.15)  | 13.00(3.64) | 48.83(6.80) | 2.83(1.79)                                  | 3.83(1.99) | 2.83(1.76) | 9.50(3.12)  | 4.00(2.06)                                  | 5.00(2.32) | 4.00(2.01) | 13.00(3.63) |
| 4                 |           | 25.17(4.39)                                 | 8.17(2.89)  | 13.17(3.69) | 46.50(6.63) | 2.83(1.79)                                  | 3.67(2.00) | 2.67(1.70) | 9.17(3.05)  | 3.83(1.96)                                  | 4.83(2.16) | 4.00(2.02) | 12.67(3.57) |
| 5                 |           | 25.83(4.50)                                 | 9.17(3.08)  | 13.17(3.65) | 48.17(6.75) | 4.33(2.18)                                  | 3.67(2.01) | 3.00(1.85) | 11.00(3.38) | 5.67(2.45)                                  | 5.33(2.34) | 4.33(2.08) | 15.33(3.96) |
| 6                 |           | 25.17(4.44)                                 | 7.67(2.84)  | 13.33(3.70) | 46.17(6.59) | 4.17(2.14)                                  | 3.83(2.06) | 3.33(1.91) | 11.33(3.40) | 4.83(2.29)                                  | 5.33(2.37) | 4.50(2.20) | 14.67(3.87) |
| CD(0.05)          |           | NS                                          | 0.61        | NS          | NS          | NS                                          | NS         | NS         | NS          | NS                                          | NS         | NS         | NS          |
| Experimental Mean |           | 4.59                                        | 3.2         | 3.7         | 6.89        | 1.94                                        | 2.02       | 1.81       | 3.22        | 2.16                                        | 2.27       | 2.12       | 3.75        |

(Values in parentheses are transformed figures)

Table 1m(ii): Contd.

| Main plot         | Genotypes | IARI-NEW DELHI                          |        |        |                                         |        |        |                                         |        |        |        |                                         |        |        |        |                                         |        |        |        |
|-------------------|-----------|-----------------------------------------|--------|--------|-----------------------------------------|--------|--------|-----------------------------------------|--------|--------|--------|-----------------------------------------|--------|--------|--------|-----------------------------------------|--------|--------|--------|
|                   |           | 1 DBHA                                  |        |        | 15 DAHA                                 |        |        | 30 DAHA                                 |        |        |        | 45 DAHA                                 |        |        |        | 60 DAHA                                 |        |        |        |
|                   |           | Groupwise weed biomass g/m <sup>2</sup> |        |        | Groupwise weed biomass g/m <sup>2</sup> |        |        | Groupwise weed biomass g/m <sup>2</sup> |        |        |        | Groupwise weed biomass g/m <sup>2</sup> |        |        |        | Groupwise weed biomass g/m <sup>2</sup> |        |        |        |
|                   |           | Sedges                                  | BLW    | Total  | Sedges                                  | BLW    | Total  | Grasses                                 | Sedges | BLW    | Total  | Grasses                                 | Sedges | BLW    | Total  | Grasses                                 | Sedges | BLW    | Total  |
| T1                | G1        | 36.00                                   | 358.67 | 394.67 | 13.33                                   | 572.00 | 585.33 | 0.00                                    | 4.67   | 459.33 | 464.00 | 0.00                                    | 0.00   | 164.00 | 164.00 | 0.00                                    | 0.00   | 100.00 | 100.00 |
|                   | G2        | 34.67                                   | 412.00 | 446.67 | 12.67                                   | 612.00 | 624.67 | 0.00                                    | 4.00   | 525.33 | 529.33 | 0.00                                    | 0.00   | 236.67 | 236.67 | 0.00                                    | 0.00   | 103.33 | 103.33 |
|                   | G3        | 28.00                                   | 444.67 | 472.67 | 13.33                                   | 633.33 | 646.67 | 0.00                                    | 1.33   | 491.33 | 492.67 | 0.00                                    | 0.00   | 154.67 | 154.67 | 0.00                                    | 0.00   | 106.67 | 106.67 |
|                   | G4        | 73.33                                   | 513.33 | 586.67 | 32.67                                   | 726.00 | 758.67 | 0.00                                    | 7.33   | 541.33 | 548.67 | 0.00                                    | 0.00   | 212.67 | 212.67 | 0.00                                    | 0.00   | 108.67 | 108.67 |
|                   | G5        | 50.00                                   | 500.67 | 550.67 | 13.33                                   | 697.33 | 710.67 | 0.00                                    | 6.67   | 523.33 | 530.00 | 0.00                                    | 0.00   | 240.00 | 240.00 | 0.00                                    | 0.00   | 105.33 | 105.33 |
|                   | G6        | 28.67                                   | 461.33 | 490.00 | 14.00                                   | 664.00 | 678.00 | 0.00                                    | 2.00   | 457.33 | 459.33 | 0.00                                    | 0.00   | 148.00 | 148.00 | 0.00                                    | 0.00   | 91.33  | 91.33  |
| T2                | G1        | 2.67                                    | 4.00   | 6.67   | 32.67                                   | 80.00  | 112.67 | 19.33                                   | 92.67  | 144.53 | 256.53 | 44.00                                   | 260.00 | 295.33 | 599.33 | 90.00                                   | 263.33 | 316.67 | 670.00 |
|                   | G2        | 0.00                                    | 13.33  | 13.33  | 31.33                                   | 54.00  | 85.33  | 21.33                                   | 78.67  | 138.00 | 238.00 | 49.33                                   | 370.67 | 218.00 | 638.00 | 68.00                                   | 325.33 | 309.33 | 702.67 |
|                   | G3        | 0.00                                    | 14.00  | 14.00  | 24.00                                   | 89.33  | 113.33 | 24.67                                   | 66.67  | 190.00 | 281.33 | 56.67                                   | 432.00 | 213.33 | 702.00 | 94.67                                   | 293.33 | 306.67 | 694.67 |
|                   | G4        | 6.67                                    | 4.00   | 10.67  | 28.00                                   | 120.00 | 148.00 | 42.67                                   | 59.33  | 218.67 | 320.67 | 55.33                                   | 361.33 | 362.00 | 778.67 | 138.00                                  | 284.67 | 430.00 | 852.67 |
|                   | G5        | 4.67                                    | 2.00   | 6.67   | 32.67                                   | 92.67  | 125.33 | 22.00                                   | 117.33 | 181.07 | 320.40 | 36.67                                   | 486.67 | 346.00 | 869.33 | 100.00                                  | 388.00 | 369.33 | 857.33 |
|                   | G6        | 0.00                                    | 0.00   | 0.00   | 20.67                                   | 89.07  | 109.73 | 32.67                                   | 34.67  | 193.33 | 260.67 | 37.33                                   | 224.67 | 403.33 | 665.33 | 75.33                                   | 230.00 | 380.00 | 685.33 |
| T3                | G1        | -                                       | -      | -      | -                                       | -      | -      | -                                       | -      | -      | -      | -                                       | -      | -      | -      | -                                       | -      | -      | -      |
|                   | G2        | -                                       | -      | -      | -                                       | -      | -      | -                                       | -      | -      | -      | -                                       | -      | -      | -      | -                                       | -      | -      | -      |
|                   | G3        | -                                       | -      | -      | -                                       | -      | -      | -                                       | -      | -      | -      | -                                       | -      | -      | -      | -                                       | -      | -      | -      |
|                   | G4        | -                                       | -      | -      | -                                       | -      | -      | -                                       | -      | -      | -      | -                                       | -      | -      | -      | -                                       | -      | -      | -      |
|                   | G5        | -                                       | -      | -      | -                                       | -      | -      | -                                       | -      | -      | -      | -                                       | -      | -      | -      | -                                       | -      | -      | -      |
|                   | G6        | -                                       | -      | -      | -                                       | -      | -      | -                                       | -      | -      | -      | -                                       | -      | -      | -      | -                                       | -      | -      | -      |
| Interaction       |           |                                         |        |        |                                         |        |        |                                         |        |        |        |                                         |        |        |        |                                         |        |        |        |
| M and T           |           | NS                                      | 53.45  | NS     | NS                                      | NS     | NS     | NS                                      | NS     | NS     | NS     | NS                                      | NS     | 81.64  | NS     | NS                                      | NS     | NS     | NS     |
| T and M           |           | NS                                      | 117.88 | NS     | NS                                      | NS     | NS     | NS                                      | NS     | NS     | NS     | NS                                      | NS     | 76.18  | NS     | NS                                      | NS     | NS     | NS     |
| Mean of Factor-1  |           |                                         |        |        |                                         |        |        |                                         |        |        |        |                                         |        |        |        |                                         |        |        |        |
| 1                 |           | 41.78                                   | 448.44 | 490.22 | 16.56                                   | 650.78 | 667.33 | 0.00                                    | 4.33   | 499.67 | 504.00 | 0.00                                    | 0.00   | 192.67 | 192.67 | 0.00                                    | 0.00   | 102.56 | 102.56 |
| 2                 |           | 2.33                                    | 6.22   | 8.56   | 28.22                                   | 87.51  | 115.73 | 27.11                                   | 74.89  | 177.60 | 279.60 | 46.56                                   | 355.89 | 306.33 | 708.78 | 94.33                                   | 297.44 | 352.00 | 743.78 |
| 3                 |           | -                                       | -      | -      | -                                       | -      | -      | -                                       | -      | -      | -      | -                                       | -      | -      | -      | -                                       | -      | -      | -      |
| CD(0.05)          |           | NS                                      | 142.32 | 179.63 | NS                                      | 59.08  | 101.16 | 8.62                                    | 47.20  | 36.75  | 75.11  | 26.19                                   | 123.63 | 20.10  | 110.34 | 27.08                                   | 144.53 | 48.50  | 199.19 |
| Mean of Factor-2  |           |                                         |        |        |                                         |        |        |                                         |        |        |        |                                         |        |        |        |                                         |        |        |        |
| 1                 |           | 19.33                                   | 181.33 | 200.67 | 23.00                                   | 326.00 | 349.00 | 9.67                                    | 48.67  | 301.93 | 360.27 | 22.00                                   | 130.00 | 229.67 | 381.67 | 45.00                                   | 131.67 | 208.33 | 385.00 |
| 2                 |           | 17.33                                   | 212.67 | 230.00 | 22.00                                   | 333.00 | 355.00 | 10.67                                   | 41.33  | 331.67 | 383.67 | 24.67                                   | 185.33 | 227.33 | 437.33 | 34.00                                   | 162.67 | 206.33 | 403.00 |
| 3                 |           | 14.00                                   | 229.33 | 243.33 | 18.67                                   | 361.33 | 380.00 | 12.33                                   | 34.00  | 340.67 | 387.00 | 28.33                                   | 216.00 | 184.00 | 428.33 | 47.33                                   | 146.67 | 206.67 | 400.67 |
| 4                 |           | 40.00                                   | 258.67 | 298.67 | 30.33                                   | 423.00 | 453.33 | 21.33                                   | 33.33  | 380.00 | 434.67 | 27.67                                   | 180.67 | 287.33 | 495.67 | 69.00                                   | 142.33 | 269.33 | 480.67 |
| 5                 |           | 27.33                                   | 251.33 | 278.67 | 23.00                                   | 395.00 | 418.00 | 11.00                                   | 62.00  | 352.20 | 425.20 | 18.33                                   | 243.33 | 293.00 | 554.67 | 50.00                                   | 194.00 | 237.33 | 481.33 |
| 6                 |           | 14.33                                   | 230.67 | 245.00 | 17.33                                   | 376.53 | 393.87 | 16.33                                   | 18.33  | 325.33 | 360.00 | 18.67                                   | 112.33 | 275.67 | 406.67 | 37.67                                   | 115.00 | 235.67 | 388.33 |
| CD(0.05)          |           | NS                                      | 37.80  | 57.43  | NS                                      | 62.00  | 68.71  | NS                                      | NS     | NS     | NS     | NS                                      | NS     | 57.73  | NS     | NS                                      | NS     | NS     | NS     |
| Experimental Mean |           | 22.06                                   | 227.33 | 249.39 | 22.39                                   | 369.14 | 391.53 | 13.56                                   | 39.61  | 338.63 | 391.80 | 23.28                                   | 177.94 | 249.50 | 450.72 | 47.17                                   | 148.72 | 227.28 | 423.17 |

Table 1m(ii): Contd.

| Main plot         | Genotypes | ICAR-IIRR                     |        |       |                                         |        |      |       |                               |        |       |        |                               |        |       |        |  |
|-------------------|-----------|-------------------------------|--------|-------|-----------------------------------------|--------|------|-------|-------------------------------|--------|-------|--------|-------------------------------|--------|-------|--------|--|
|                   |           | 1 DBHA                        |        |       | 15 DAHA                                 |        |      |       | 30 DAHA                       |        |       |        | 60 DAHA                       |        |       |        |  |
|                   |           | Weed biomass g/m <sup>2</sup> |        |       | Groupwise weed biomass g/m <sup>2</sup> |        |      |       | Weed biomass g/m <sup>2</sup> |        |       |        | Weed biomass g/m <sup>2</sup> |        |       |        |  |
|                   |           | Grasses                       | Sedges | Total | Grasses                                 | Sedges | BLWs | Total | Grasses                       | Sedges | BLWs  | Total  | Grasses                       | Sedges | BLWs  | Total  |  |
| T1                | G1        | 0.30                          | 2.51   | 2.81  | 13.86                                   | 2.09   | 3.74 | 19.68 | 64.23                         | 7.66   | 23.35 | 95.23  | 44.39                         | 3.61   | 42.79 | 90.79  |  |
|                   | G2        | 0.75                          | 2.42   | 3.17  | 14.82                                   | 2.88   | 4.47 | 22.17 | 76.23                         | 10.33  | 21.81 | 108.38 | 93.84                         | 2.29   | 20.12 | 116.24 |  |
|                   | G3        | 0.25                          | 0.88   | 1.13  | 15.60                                   | 1.79   | 5.93 | 23.32 | 85.11                         | 2.09   | 14.54 | 101.75 | 66.06                         | 6.42   | 17.80 | 90.29  |  |
|                   | G4        | 0.57                          | 0.98   | 1.56  | 15.29                                   | 0.64   | 4.45 | 20.38 | 72.88                         | 4.76   | 12.44 | 90.08  | 74.83                         | 12.04  | 35.53 | 122.40 |  |
|                   | G5        | 0.91                          | 2.57   | 3.49  | 10.07                                   | 4.35   | 4.75 | 19.17 | 56.77                         | 13.64  | 33.96 | 104.36 | 183.48                        | 11.74  | 29.71 | 224.93 |  |
|                   | G6        | 0.62                          | 2.09   | 2.71  | 22.04                                   | 5.16   | 5.78 | 32.99 | 81.93                         | 9.62   | 14.96 | 106.52 | 84.94                         | 1.21   | 45.09 | 131.25 |  |
| T2                | G1        | 0.00                          | 2.48   | 2.48  | 0.00                                    | 13.99  | 0.00 | 13.99 | 0.00                          | 19.67  | 0.69  | 20.36  | 0.17                          | 40.64  | 9.24  | 50.05  |  |
|                   | G2        | 0.00                          | 2.77   | 2.77  | 0.00                                    | 10.56  | 0.00 | 10.56 | 0.00                          | 33.35  | 0.00  | 33.35  | 3.42                          | 71.67  | 8.45  | 83.53  |  |
|                   | G3        | 0.00                          | 2.65   | 2.65  | 0.00                                    | 6.33   | 0.00 | 6.33  | 0.00                          | 25.92  | 0.31  | 26.23  | 0.50                          | 51.33  | 16.89 | 68.72  |  |
|                   | G4        | 0.00                          | 2.09   | 2.09  | 0.00                                    | 7.05   | 0.00 | 7.05  | 0.00                          | 27.18  | 0.24  | 27.42  | 0.00                          | 74.33  | 9.09  | 83.42  |  |
|                   | G5        | 0.00                          | 3.00   | 3.00  | 0.00                                    | 4.95   | 0.00 | 4.95  | 0.00                          | 22.88  | 0.00  | 22.88  | 2.64                          | 59.11  | 26.65 | 88.40  |  |
|                   | G6        | 0.00                          | 2.79   | 2.79  | 0.00                                    | 5.62   | 0.00 | 5.62  | 0.00                          | 31.34  | 0.00  | 31.34  | 0.44                          | 37.46  | 18.70 | 56.60  |  |
| T3                | G1        | 0.00                          | 0.00   | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                          | 0.00   | 0.00  | 0.00   | 0.00                          | 0.00   | 0.00  | 0.00   |  |
|                   | G2        | 0.00                          | 0.00   | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                          | 0.00   | 0.00  | 0.00   | 0.00                          | 0.00   | 0.00  | 0.00   |  |
|                   | G3        | 0.00                          | 0.00   | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                          | 0.00   | 0.00  | 0.00   | 0.00                          | 0.00   | 0.00  | 0.00   |  |
|                   | G4        | 0.00                          | 0.00   | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                          | 0.00   | 0.00  | 0.00   | 0.00                          | 0.00   | 0.00  | 0.00   |  |
|                   | G5        | 0.00                          | 0.00   | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                          | 0.00   | 0.00  | 0.00   | 0.00                          | 0.00   | 0.00  | 0.00   |  |
|                   | G6        | 0.00                          | 0.00   | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                          | 0.00   | 0.00  | 0.00   | 0.00                          | 0.00   | 0.00  | 0.00   |  |
| Interaction       |           |                               |        |       |                                         |        |      |       |                               |        |       |        |                               |        |       |        |  |
| M and T           |           | 0.13                          | NS     | NS    | 2.92                                    | 3.05   | NS   | 4.41  | 8.56                          | NS     | NS    | NS     | 27.66                         | 11.38  | NS    | 37.40  |  |
| T and M           |           | 0.14                          | NS     | NS    | 2.67                                    | 2.92   | NS   | 4.11  | 8.89                          | NS     | NS    | NS     | 26.73                         | 10.97  | NS    | 34.96  |  |
| Mean of Factor-1  |           |                               |        |       |                                         |        |      |       |                               |        |       |        |                               |        |       |        |  |
| 1                 |           | 0.57                          | 1.91   | 2.48  | 15.28                                   | 2.82   | 4.85 | 22.95 | 72.86                         | 8.02   | 20.18 | 101.05 | 91.26                         | 6.22   | 31.84 | 129.32 |  |
| 2                 |           | 0.00                          | 2.63   | 2.63  | 0.00                                    | 8.09   | 0.00 | 8.09  | 0.00                          | 26.72  | 0.21  | 26.93  | 1.19                          | 55.76  | 14.84 | 71.79  |  |
| 3                 |           | 0.00                          | 0.00   | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                          | 0.00   | 0.00  | 0.00   | 0.00                          | 0.00   | 0.00  | 0.00   |  |
| CD(0.05)          |           | 0.12                          | 0.53   | 0.49  | 0.33                                    | 1.47   | 0.53 | 1.40  | 6.64                          | 8.86   | 2.64  | 14.14  | 14.34                         | 5.77   | 2.85  | 12.78  |  |
| Mean of Factor-2  |           |                               |        |       |                                         |        |      |       |                               |        |       |        |                               |        |       |        |  |
| 1                 |           | 0.10                          | 1.66   | 1.76  | 4.62                                    | 5.36   | 1.25 | 11.22 | 21.41                         | 9.11   | 8.01  | 38.53  | 14.85                         | 14.75  | 17.35 | 46.95  |  |
| 2                 |           | 0.25                          | 1.73   | 1.98  | 4.94                                    | 4.48   | 1.49 | 10.91 | 25.41                         | 14.56  | 7.27  | 47.24  | 32.42                         | 24.65  | 9.52  | 66.59  |  |
| 3                 |           | 0.08                          | 1.18   | 1.26  | 5.20                                    | 2.71   | 1.98 | 9.89  | 28.37                         | 9.34   | 4.95  | 42.66  | 22.19                         | 19.25  | 11.57 | 53.00  |  |
| 4                 |           | 0.19                          | 1.02   | 1.22  | 5.10                                    | 2.56   | 1.48 | 9.14  | 24.29                         | 10.65  | 4.23  | 39.17  | 24.94                         | 28.79  | 14.87 | 68.61  |  |
| 5                 |           | 0.30                          | 1.86   | 2.16  | 3.36                                    | 3.10   | 1.58 | 8.04  | 18.92                         | 12.17  | 11.32 | 42.42  | 62.04                         | 23.62  | 18.79 | 104.44 |  |
| 6                 |           | 0.21                          | 1.63   | 1.83  | 7.35                                    | 3.59   | 1.93 | 12.87 | 27.31                         | 13.65  | 4.99  | 45.95  | 28.46                         | 12.89  | 21.27 | 62.61  |  |
| CD(0.05)          |           | 0.08                          | NS     | NS    | 1.68                                    | 1.76   | NS   | 2.55  | 4.94                          | NS     | 4.60  | NS     | 15.97                         | 6.57   | NS    | 21.59  |  |
| Experimental Mean |           | 0.19                          | 1.51   | 1.70  | 5.09                                    | 3.63   | 1.62 | 10.35 | 24.29                         | 11.58  | 6.79  | 42.66  | 30.82                         | 20.66  | 15.56 | 67.03  |  |

Table 1m(ii): Contd.

| Main plot         | Genotypes | KAUL                             |        |       |       | NAGINA                                  |        |      |       |                                         |        |      |       |                                         |        |      |       |
|-------------------|-----------|----------------------------------|--------|-------|-------|-----------------------------------------|--------|------|-------|-----------------------------------------|--------|------|-------|-----------------------------------------|--------|------|-------|
|                   |           | 60 DAHA                          |        |       |       | 1 DBHA                                  |        |      |       | 15 DAHA                                 |        |      |       | 30 DAHA                                 |        |      |       |
|                   |           | Wweed biomassat g/m <sup>2</sup> |        |       |       | Groupwise weed biomass g/m <sup>2</sup> |        |      |       | Groupwise weed biomass g/m <sup>2</sup> |        |      |       | Groupwise weed biomass g/m <sup>2</sup> |        |      |       |
|                   |           | Grasses                          | Sedges | BLW   | Total | Grasses                                 | Sedges | BLW  | Total | Grasses                                 | Sedges | BLW  | Total | Grasses                                 | Sedges | BLW  | Total |
| T1                | G1        | 9.50                             | 8.20   | 7.90  | 25.60 | 2.91                                    | 2.86   | 2.65 | 8.42  | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  |
|                   | G2        | 7.53                             | 8.03   | 6.70  | 22.27 | 2.71                                    | 2.48   | 2.46 | 7.66  | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  |
|                   | G3        | 41.70                            | 24.30  | 16.70 | 82.70 | 2.71                                    | 2.65   | 2.77 | 8.13  | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  |
|                   | G4        | 9.87                             | 8.27   | 6.30  | 24.43 | 2.70                                    | 2.48   | 2.70 | 7.89  | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  |
|                   | G5        | 9.63                             | 8.50   | 7.20  | 25.33 | 2.94                                    | 2.67   | 2.47 | 8.09  | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  |
|                   | G6        | 24.67                            | 16.77  | 13.03 | 54.47 | 2.68                                    | 2.43   | 2.31 | 7.43  | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  |
| T2                | G1        | 15.50                            | 10.77  | 10.20 | 36.47 | 3.55                                    | 2.90   | 2.66 | 9.12  | 2.11                                    | 2.23   | 1.92 | 6.26  | 2.62                                    | 2.93   | 2.66 | 8.21  |
|                   | G2        | 23.43                            | 10.83  | 11.13 | 45.40 | 3.06                                    | 2.95   | 3.31 | 9.32  | 2.11                                    | 2.18   | 2.09 | 6.39  | 2.71                                    | 2.55   | 2.34 | 7.61  |
|                   | G3        | 26.30                            | 12.00  | 13.50 | 51.80 | 2.20                                    | 2.37   | 2.70 | 7.26  | 1.81                                    | 2.03   | 2.09 | 5.93  | 2.71                                    | 2.71   | 2.59 | 8.01  |
|                   | G4        | 24.70                            | 11.00  | 10.70 | 46.40 | 2.98                                    | 3.18   | 2.83 | 8.99  | 2.06                                    | 2.13   | 2.17 | 6.36  | 2.70                                    | 2.53   | 2.33 | 7.57  |
|                   | G5        | 21.83                            | 11.93  | 11.57 | 45.33 | 2.83                                    | 2.78   | 3.06 | 8.68  | 1.99                                    | 1.96   | 2.11 | 6.06  | 2.94                                    | 2.75   | 2.56 | 8.25  |
|                   | G6        | 23.30                            | 13.20  | 11.90 | 48.40 | 2.89                                    | 3.17   | 3.31 | 9.36  | 2.19                                    | 2.52   | 2.66 | 7.36  | 2.94                                    | 2.71   | 2.38 | 8.04  |
| T3                | G1        | 0.00                             | 0.00   | 0.00  | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  |
|                   | G2        | 0.00                             | 0.00   | 0.00  | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  |
|                   | G3        | 0.00                             | 0.00   | 0.00  | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  |
|                   | G4        | 0.00                             | 0.00   | 0.00  | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  |
|                   | G5        | 0.00                             | 0.00   | 0.00  | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  |
|                   | G6        | 0.00                             | 0.00   | 0.00  | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  |
| Interaction       |           |                                  |        |       |       |                                         |        |      |       |                                         |        |      |       |                                         |        |      |       |
| M and T           |           | 2.94                             | 1.52   | 1.30  | 3.47  | 0.35                                    | NS     | NS   | NS    | NS                                      | NS     | NS   | NS    | NS                                      | NS     | NS   | NS    |
| T and M           |           | 2.72                             | 1.43   | 1.20  | 3.23  | 0.36                                    | NS     | NS   | NS    | NS                                      | NS     | NS   | NS    | NS                                      | NS     | NS   | NS    |
| Mean of Factor-1  |           |                                  |        |       |       |                                         |        |      |       |                                         |        |      |       |                                         |        |      |       |
| 1                 |           | 17.15                            | 12.34  | 9.64  | 39.13 | 2.78                                    | 2.60   | 2.56 | 7.93  | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  |
| 2                 |           | 22.51                            | 11.62  | 11.50 | 45.63 | 2.92                                    | 2.89   | 2.98 | 8.79  | 2.04                                    | 2.18   | 2.17 | 6.39  | 2.77                                    | 2.70   | 2.48 | 7.95  |
| 3                 |           | 0.00                             | 0.00   | 0.00  | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  |
| CD(0.05)          |           | 0.68                             | 0.56   | 0.29  | 1.14  | 0.27                                    | 0.26   | 0.63 | 1.05  | 0.03                                    | 0.10   | 0.10 | 0.19  | 0.21                                    | 0.19   | 0.11 | 0.33  |
| Mean of Factor-2  |           |                                  |        |       |       |                                         |        |      |       |                                         |        |      |       |                                         |        |      |       |
| 1                 |           | 8.33                             | 6.32   | 6.03  | 20.69 | 2.16                                    | 1.92   | 1.77 | 5.85  | 0.70                                    | 0.74   | 0.64 | 2.09  | 0.87                                    | 0.98   | 0.89 | 2.74  |
| 2                 |           | 10.32                            | 6.29   | 5.94  | 22.56 | 1.92                                    | 1.81   | 1.92 | 5.66  | 0.70                                    | 0.73   | 0.70 | 2.13  | 0.90                                    | 0.85   | 0.78 | 2.54  |
| 3                 |           | 22.67                            | 12.10  | 10.07 | 44.83 | 1.64                                    | 1.67   | 1.82 | 5.13  | 0.60                                    | 0.68   | 0.70 | 1.98  | 0.90                                    | 0.90   | 0.86 | 2.67  |
| 4                 |           | 11.52                            | 6.42   | 5.67  | 23.61 | 1.89                                    | 1.89   | 1.85 | 5.63  | 0.69                                    | 0.71   | 0.72 | 2.12  | 0.90                                    | 0.84   | 0.78 | 2.52  |
| 5                 |           | 10.49                            | 6.81   | 6.26  | 23.56 | 1.93                                    | 1.82   | 1.84 | 5.59  | 0.66                                    | 0.65   | 0.70 | 2.02  | 0.98                                    | 0.92   | 0.85 | 2.75  |
| 6                 |           | 15.99                            | 9.99   | 8.31  | 34.29 | 1.86                                    | 1.87   | 1.87 | 5.60  | 0.73                                    | 0.84   | 0.89 | 2.45  | 0.98                                    | 0.90   | 0.79 | 2.68  |
| CD(0.05)          |           | 1.70                             | 0.88   | 0.75  | 2.00  | 0.20                                    | NS     | NS   | NS    | NS                                      | NS     | NS   | NS    | NS                                      | NS     | NS   | NS    |
| Experimental Mean |           | 13.22                            | 7.99   | 7.05  | 28.26 | 1.90                                    | 1.83   | 1.85 | 5.57  | 0.68                                    | 0.73   | 0.72 | 2.13  | 0.92                                    | 0.90   | 0.83 | 2.65  |

Table 1m(ii): Contd.

| Main plot         | Genotypes | NAGINA                                  |        |      |       |                                         |        |      |       | PANTNAGAR                                      |                                                    |                                                    |
|-------------------|-----------|-----------------------------------------|--------|------|-------|-----------------------------------------|--------|------|-------|------------------------------------------------|----------------------------------------------------|----------------------------------------------------|
|                   |           | 45 DAHA                                 |        |      |       | 60 DAHA                                 |        |      |       | Total                                          |                                                    |                                                    |
|                   |           | Groupwise weed biomass g/m <sup>2</sup> |        |      |       | Groupwise weed biomass g/m <sup>2</sup> |        |      |       | Groupwise weed biomass 1 DBHA g/m <sup>2</sup> | Groupwise weed biomass at 15 DAHA g/m <sup>2</sup> | Groupwise weed biomass at 30 DAHA g/m <sup>2</sup> |
|                   |           | Grasses                                 | Sedges | BLW  | Total | Grasses                                 | Sedges | BLW  | Total |                                                |                                                    |                                                    |
| T1                | G1        | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  | 2.40                                           | 1.41                                               | 4.73                                               |
|                   | G2        | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  | 1.89                                           | 1.12                                               | 5.89                                               |
|                   | G3        | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  | 1.13                                           | 1.61                                               | 4.73                                               |
|                   | G4        | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  | 1.55                                           | 1.43                                               | 4.60                                               |
|                   | G5        | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.81                                           | 1.59                                               | 6.20                                               |
|                   | G6        | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  | 1.12                                           | 1.11                                               | 5.25                                               |
| T2                | G1        | 2.62                                    | 2.93   | 2.66 | 8.21  | 2.24                                    | 2.78   | 2.46 | 7.48  | 0.63                                           | 7.47                                               | 50.40                                              |
|                   | G2        | 2.71                                    | 2.55   | 2.34 | 7.61  | 2.84                                    | 2.25   | 2.22 | 7.32  | 0.92                                           | 4.84                                               | 42.48                                              |
|                   | G3        | 2.71                                    | 2.71   | 2.59 | 8.01  | 2.66                                    | 2.36   | 2.28 | 7.30  | 1.59                                           | 6.27                                               | 46.35                                              |
|                   | G4        | 2.70                                    | 2.53   | 2.33 | 7.57  | 2.66                                    | 2.60   | 2.23 | 7.49  | 0.63                                           | 9.49                                               | 41.47                                              |
|                   | G5        | 2.94                                    | 2.75   | 2.56 | 8.25  | 2.77                                    | 2.35   | 2.24 | 7.36  | 1.17                                           | 5.45                                               | 46.40                                              |
|                   | G6        | 2.83                                    | 2.66   | 2.76 | 8.25  | 2.80                                    | 2.46   | 2.63 | 7.90  | 0.79                                           | 8.83                                               | 54.00                                              |
| T3                | G1        | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  | -                                              | -                                                  | -                                                  |
|                   | G2        | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  | -                                              | -                                                  | -                                                  |
|                   | G3        | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  | -                                              | -                                                  | -                                                  |
|                   | G4        | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  | -                                              | -                                                  | -                                                  |
|                   | G5        | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  | -                                              | -                                                  | -                                                  |
|                   | G6        | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  | -                                              | -                                                  | -                                                  |
| Interaction       |           |                                         |        |      |       |                                         |        |      |       |                                                |                                                    |                                                    |
| M and T           |           | NS                                      | NS     | NS   | NS    | NS                                      | NS     | NS   | NS    | NS                                             | NS                                                 | NS                                                 |
| T and M           |           | NS                                      | NS     | NS   | NS    | NS                                      | NS     | NS   | NS    | NS                                             | NS                                                 | NS                                                 |
| Mean of Factor-1  |           |                                         |        |      |       |                                         |        |      |       |                                                |                                                    |                                                    |
| 1                 |           | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  | 1.48                                           | 1.38                                               | 5.24                                               |
| 2                 |           | 2.75                                    | 2.69   | 2.54 | 7.98  | 2.66                                    | 2.47   | 2.34 | 7.47  | 0.95                                           | 7.06                                               | 46.85                                              |
| 3                 |           | 0.00                                    | 0.00   | 0.00 | 0.00  | 0.00                                    | 0.00   | 0.00 | 0.00  |                                                |                                                    |                                                    |
| CD(0.05)          |           | 0.19                                    | 0.17   | 0.16 | 0.36  | 0.07                                    | 0.19   | 0.08 | 0.18  | NS                                             | 0.32                                               | 4.36                                               |
| Mean of Factor-2  |           |                                         |        |      |       |                                         |        |      |       |                                                |                                                    |                                                    |
| 1                 |           | 0.87                                    | 0.98   | 0.89 | 2.74  | 0.75                                    | 0.93   | 0.82 | 2.49  | 1.51                                           | 4.44                                               | 27.57                                              |
| 2                 |           | 0.90                                    | 0.85   | 0.78 | 2.54  | 0.95                                    | 0.75   | 0.74 | 2.44  | 1.41                                           | 2.98                                               | 24.19                                              |
| 3                 |           | 0.90                                    | 0.90   | 0.86 | 2.67  | 0.89                                    | 0.79   | 0.76 | 2.43  | 1.36                                           | 3.94                                               | 25.54                                              |
| 4                 |           | 0.90                                    | 0.84   | 0.78 | 2.52  | 0.89                                    | 0.87   | 0.74 | 2.50  | 1.09                                           | 5.46                                               | 23.03                                              |
| 5                 |           | 0.98                                    | 0.92   | 0.85 | 2.75  | 0.92                                    | 0.78   | 0.75 | 2.45  | 0.99                                           | 3.52                                               | 26.30                                              |
| 6                 |           | 0.94                                    | 0.89   | 0.92 | 2.75  | 0.93                                    | 0.82   | 0.88 | 2.63  | 0.95                                           | 4.97                                               | 29.63                                              |
| CD(0.05)          |           | NS                                      | NS     | NS   | NS    | NS                                      | NS     | NS   | NS    | NS                                             | NS                                                 | NS                                                 |
| Experimental Mean |           | 0.92                                    | 0.90   | 0.85 | 2.66  | 0.89                                    | 0.82   | 0.78 | 2.49  | 1.22                                           | 4.22                                               | 26.04                                              |

Table 1m(ii): Contd.

| Main plot         | Genotypes | LUDHIANA                                |        |       |        |                                         |        |      |       |                                         |        |      |       |
|-------------------|-----------|-----------------------------------------|--------|-------|--------|-----------------------------------------|--------|------|-------|-----------------------------------------|--------|------|-------|
|                   |           | 1 DBHA                                  |        |       |        | 30 DAHA                                 |        |      |       | 60 DAHA                                 |        |      |       |
|                   |           | Groupwise weed biomass g/m <sup>2</sup> |        |       |        | Groupwise weed biomass g/m <sup>2</sup> |        |      |       | Groupwise weed biomass g/m <sup>2</sup> |        |      |       |
|                   |           | Grasses                                 | Sedges | BLW   | Total  | Grasses                                 | Sedges | BLW  | Total | Grasses                                 | Sedges | BLW  | Total |
| T1                | G1        | 75.23                                   | 10.04  | 42.08 | 127.34 | 6.20                                    | 3.50   | 3.48 | 13.18 | 8.82                                    | 4.88   | 4.37 | 18.07 |
|                   | G2        | 82.30                                   | 9.54   | 42.29 | 134.13 | 5.05                                    | 2.78   | 2.57 | 10.40 | 7.68                                    | 4.12   | 4.41 | 16.21 |
|                   | G3        | 80.92                                   | 8.11   | 41.88 | 130.91 | 7.56                                    | 2.40   | 2.87 | 12.83 | 12.83                                   | 5.38   | 4.89 | 23.11 |
|                   | G4        | 79.56                                   | 8.23   | 39.35 | 127.14 | 4.76                                    | 3.38   | 2.63 | 10.76 | 8.68                                    | 4.82   | 3.66 | 17.16 |
|                   | G5        | 79.67                                   | 8.13   | 39.10 | 126.89 | 5.19                                    | 2.78   | 2.25 | 10.22 | 8.67                                    | 3.74   | 3.86 | 16.28 |
|                   | G6        | 79.27                                   | 8.29   | 39.02 | 126.58 | 6.60                                    | 2.81   | 2.55 | 11.97 | 13.78                                   | 5.24   | 5.09 | 24.11 |
| T2                | G1        | 18.80                                   | 10.02  | 41.27 | 70.10  | 10.67                                   | 3.78   | 4.24 | 18.69 | 16.70                                   | 5.33   | 5.55 | 27.58 |
|                   | G2        | 18.58                                   | 9.68   | 40.96 | 69.22  | 10.02                                   | 3.60   | 4.33 | 17.95 | 16.38                                   | 5.10   | 5.46 | 26.94 |
|                   | G3        | 17.44                                   | 7.68   | 41.25 | 66.37  | 9.42                                    | 3.85   | 4.75 | 18.02 | 15.49                                   | 5.19   | 5.38 | 26.07 |
|                   | G4        | 16.72                                   | 7.80   | 40.66 | 65.19  | 8.02                                    | 3.74   | 4.56 | 16.32 | 15.28                                   | 5.10   | 4.91 | 25.30 |
|                   | G5        | 18.10                                   | 8.78   | 40.28 | 67.16  | 8.97                                    | 3.72   | 4.16 | 16.85 | 16.49                                   | 5.59   | 4.64 | 26.72 |
|                   | G6        | 17.05                                   | 7.76   | 39.61 | 64.41  | 8.99                                    | 3.54   | 4.45 | 16.97 | 15.33                                   | 5.14   | 4.78 | 25.25 |
| T3                | G1        | -                                       | -      | -     | -      | -                                       | -      | -    | -     | -                                       | -      | -    | -     |
|                   | G2        | -                                       | -      | -     | -      | -                                       | -      | -    | -     | -                                       | -      | -    | -     |
|                   | G3        | -                                       | -      | -     | -      | -                                       | -      | -    | -     | -                                       | -      | -    | -     |
|                   | G4        | -                                       | -      | -     | -      | -                                       | -      | -    | -     | -                                       | -      | -    | -     |
|                   | G5        | -                                       | -      | -     | -      | -                                       | -      | -    | -     | -                                       | -      | -    | -     |
|                   | G6        | -                                       | -      | -     | -      | -                                       | -      | -    | -     | -                                       | -      | -    | -     |
| Interaction       |           |                                         |        |       |        |                                         |        |      |       |                                         |        |      |       |
| M and T           |           | NS                                      | NS     | NS    | NS     | NS                                      | NS     | NS   | NS    | NS                                      | NS     | NS   | NS    |
| T and M           |           | NS                                      | NS     | NS    | NS     | NS                                      | NS     | NS   | NS    | NS                                      | NS     | NS   | NS    |
| Mean of Factor-1  |           |                                         |        |       |        |                                         |        |      |       |                                         |        |      |       |
| 1                 |           | 79.49                                   | 8.72   | 40.62 | 128.83 | 5.89                                    | 2.94   | 2.72 | 11.56 | 10.08                                   | 4.70   | 4.38 | 19.16 |
| 2                 |           | 17.78                                   | 8.62   | 40.67 | 67.07  | 9.35                                    | 3.70   | 4.41 | 17.47 | 15.95                                   | 5.24   | 5.12 | 26.31 |
| 3                 |           | -                                       | -      | -     | -      | -                                       | -      | -    | -     | -                                       | -      | -    | -     |
| CD(0.05)          |           | 7.35                                    | NS     | NS    | 7.06   | NS                                      | NS     | 1.27 | 5.87  | NS                                      | NS     | NS   | NS    |
| Mean of Factor-2  |           |                                         |        |       |        |                                         |        |      |       |                                         |        |      |       |
| 1                 |           | 47.01                                   | 10.03  | 41.67 | 98.72  | 8.43                                    | 3.64   | 3.86 | 15.93 | 12.76                                   | 5.10   | 4.96 | 22.83 |
| 2                 |           | 50.44                                   | 9.61   | 41.63 | 101.67 | 7.54                                    | 3.19   | 3.45 | 14.18 | 12.03                                   | 4.61   | 4.94 | 21.58 |
| 3                 |           | 48.50                                   | 7.95   | 40.30 | 96.76  | 7.09                                    | 3.61   | 3.69 | 14.39 | 12.09                                   | 5.00   | 4.52 | 21.62 |
| 4                 |           | 48.20                                   | 7.96   | 39.88 | 96.04  | 6.60                                    | 3.26   | 3.40 | 13.27 | 11.98                                   | 4.42   | 4.38 | 20.79 |
| 5                 |           | 49.51                                   | 8.44   | 41.08 | 99.04  | 8.26                                    | 3.06   | 3.52 | 14.84 | 14.66                                   | 5.49   | 4.77 | 24.92 |
| 6                 |           | 48.16                                   | 8.03   | 39.32 | 95.50  | 7.80                                    | 3.17   | 3.50 | 14.47 | 14.56                                   | 5.19   | 4.94 | 24.68 |
| CD(0.05)          |           | NS                                      | 1.52   | NS    | NS     | NS                                      | NS     | NS   | NS    | NS                                      | NS     | NS   | NS    |
| Experimental Mean |           | 48.64                                   | 8.67   | 40.65 | 97.95  | 7.62                                    | 3.32   | 3.57 | 14.51 | 13.01                                   | 4.97   | 4.75 | 22.73 |

Table 1m(ii): Contd.

| Main plot | Genotypes | Phytotoxicity % |           |           |             |           |           |             |           |           |             |           |           |             |           |           |
|-----------|-----------|-----------------|-----------|-----------|-------------|-----------|-----------|-------------|-----------|-----------|-------------|-----------|-----------|-------------|-----------|-----------|
|           |           | ICAR-IIRR       |           |           |             |           |           |             |           |           |             |           |           |             |           |           |
|           |           | 7 DAHA          |           |           | 14 DAHA     |           |           | 21 DAHA     |           |           | 28 DAHA     |           |           | 35 DAHA     |           |           |
|           |           | Tip burning     | Scorching | Yellowing | Tip burning | Scorching | Yellowing | Tip burning | Scorching | Yellowing | Tip burning | Scorching | Yellowing | Tip burning | Scorching | Yellowing |
| T1        | G1        | 1.5             | 1         | 0.7       | 1.7         | 1.1       | 1         | 2           | 1.4       | 1         | 2           | 1.4       | 1         | 1.4         | 0         | 0         |
|           | G2        | 1.5             | 1         | 0.7       | 1.6         | 1.5       | 0.8       | 1.9         | 1.5       | 1         | 1.6         | 1.2       | 1         | 1.6         | 1         | 0         |
|           | G3        | 1.3             | 1         | 0.7       | 1.8         | 1.3       | 0.9       | 2           | 1.3       | 1         | 1.9         | 1         | 1         | 1.8         | 1         | 0         |
|           | G4        | 1.5             | 0.9       | 0.9       | 1.8         | 1.2       | 1         | 2           | 1.5       | 1         | 1.7         | 1.1       | 1         | 1           | 1         | 0         |
|           | G5        | 9               | 9         | 7         | 9           | 9         | 9         | 9           | 9         | 9         | 10          | 10        | 10        | 10          | 10        | 10        |
|           | G6        | 9               | 9         | 7         | 9           | 9         | 9         | 9           | 9         | 9         | 10          | 10        | 10        | 10          | 10        | 10        |
| T2        | G1        | 0               | 0         | 0         | 0           | 0         | 0         | 0           | 0         | 0         | 0           | 0         | 0         | 0           | 0         | 0         |
|           | G2        | 0               | 0         | 0         | 0           | 0         | 0         | 0           | 0         | 0         | 0           | 0         | 0         | 0           | 0         | 0         |
|           | G3        | 0               | 0         | 0         | 0           | 0         | 0         | 0           | 0         | 0         | 0           | 0         | 0         | 0           | 0         | 0         |
|           | G4        | 0               | 0         | 0         | 0           | 0         | 0         | 0           | 0         | 0         | 0           | 0         | 0         | 0           | 0         | 0         |
|           | G5        | 0               | 0         | 0         | 0           | 0         | 0         | 0           | 0         | 0         | 0           | 0         | 0         | 0           | 0         | 0         |
|           | G6        | 0               | 0         | 0         | 0           | 0         | 0         | 0           | 0         | 0         | 0           | 0         | 0         | 0           | 0         | 0         |
| T3        | G1        | 0               | 0         | 0         | 0           | 0         | 0         | 0           | 0         | 0         | 0           | 0         | 0         | 0           | 0         | 0         |
|           | G2        | 0               | 0         | 0         | 0           | 0         | 0         | 0           | 0         | 0         | 0           | 0         | 0         | 0           | 0         | 0         |
|           | G3        | 0               | 0         | 0         | 0           | 0         | 0         | 0           | 0         | 0         | 0           | 0         | 0         | 0           | 0         | 0         |
|           | G4        | 0               | 0         | 0         | 0           | 0         | 0         | 0           | 0         | 0         | 0           | 0         | 0         | 0           | 0         | 0         |
|           | G5        | 0               | 0         | 0         | 0           | 0         | 0         | 0           | 0         | 0         | 0           | 0         | 0         | 0           | 0         | 0         |
|           | G6        | 0               | 0         | 0         | 0           | 0         | 0         | 0           | 0         | 0         | 0           | 0         | 0         | 0           | 0         | 0         |

\*DAHA - Days after herbicide application

Table 1m(ii): Contd.

| Main plot | Genotypes | Phytotoxicity % |        |        |        |        |           |          |         |           |           |          |           |                                                                                                                                                                        |
|-----------|-----------|-----------------|--------|--------|--------|--------|-----------|----------|---------|-----------|-----------|----------|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |           | IARI-NEW DELHI  |        |        |        |        | KAUL      |          |         |           |           |          | PANTNAGAR | LUDHIANA                                                                                                                                                               |
|           |           | 7 DAS           | 14 DAS | 21 DAS | 28 DAS | 35 DAS | Chlorosis | Necrosis | Wilting | Scorching | Hyponasty | Epinasty | Wilting   |                                                                                                                                                                        |
| T1        | G1        | 0               | 0      | 0      | 0      | 0      | 0         | 0        | 0       | 0         | 0         | 0        | 1.33      | No visual phytotoxicity of herbicide Imazethpyr was observed in genotypes 1,2,4,5 but genotypes 3 and 6 showed complete mortality when exposed to imazethpyr herbicide |
|           | G2        | 0               | 0      | 0      | 0      | 0      | 0         | 0        | 0       | 0         | 0         | 0        | 1.67      |                                                                                                                                                                        |
|           | G3        | 0               | 0      | 0      | 0      | 0      | 0         | 0        | 0       | 0         | 0         | 0        | 2.00      |                                                                                                                                                                        |
|           | G4        | 0               | 0      | 0      | 0      | 0      | 0         | 0        | 0       | 0         | 0         | 0        | 2.00      |                                                                                                                                                                        |
|           | G5        | 6               | 9      | 10     | 10     | 10     | 9         | 9        | 9       | 9         | 9         | 9        | 10.00     |                                                                                                                                                                        |
|           | G6        | 6               | 9      | 10     | 10     | 10     | 6         | 6        | 6       | 6         | 6         | 6        | 10.00     |                                                                                                                                                                        |
| T2        | G1        | 0               | 0      | 0      | 0      | 0      | 0         | 0        | 0       | 0         | 0         | 0        | 2.00      |                                                                                                                                                                        |
|           | G2        | 0               | 0      | 0      | 0      | 0      | 0         | 0        | 0       | 0         | 0         | 0        | 2.00      |                                                                                                                                                                        |
|           | G3        | 0               | 0      | 0      | 0      | 0      | 0         | 0        | 0       | 0         | 0         | 0        | 2.00      |                                                                                                                                                                        |
|           | G4        | 0               | 0      | 0      | 0      | 0      | 0         | 0        | 0       | 0         | 0         | 0        | 2.00      |                                                                                                                                                                        |
|           | G5        | 0               | 0      | 0      | 0      | 0      | 0         | 0        | 0       | 0         | 0         | 0        | 2.00      |                                                                                                                                                                        |
|           | G6        | 0               | 0      | 0      | 0      | 0      | 0         | 0        | 0       | 0         | 0         | 0        | 2.00      |                                                                                                                                                                        |
| T3        | G1        | 0               | 0      | 0      | 0      | 0      | 0         | 0        | 0       | 0         | 0         | 0        | 2.00      |                                                                                                                                                                        |
|           | G2        | 0               | 0      | 0      | 0      | 0      | 0         | 0        | 0       | 0         | 0         | 0        | 2.00      |                                                                                                                                                                        |
|           | G3        | 0               | 0      | 0      | 0      | 0      | 0         | 0        | 0       | 0         | 0         | 0        | 2.00      |                                                                                                                                                                        |
|           | G4        | 0               | 0      | 0      | 0      | 0      | 0         | 0        | 0       | 0         | 0         | 0        | 2.00      |                                                                                                                                                                        |
|           | G5        | 0               | 0      | 0      | 0      | 0      | 0         | 0        | 0       | 0         | 0         | 0        | 2.00      |                                                                                                                                                                        |
|           | G6        | 0               | 0      | 0      | 0      | 0      | 0         | 0        | 0       | 0         | 0         | 0        | 2.00      |                                                                                                                                                                        |

\*DAS - Days after spraying

## Reference:

| Crop response / crop injury | Rating |
|-----------------------------|--------|
| 0                           | 0      |
| 1-10 %                      | 1      |
| 11-20 %                     | 2      |
| 21-30 %                     | 3      |
| 31-40 %                     | 4      |
| 41-50 %                     | 5      |
| 51-60 %                     | 6      |
| 61-70 %                     | 7      |
| 71-80 %                     | 8      |
| 81-90 %                     | 9      |
| 91-100 %                    | 10     |

### NMT 1m(iii) Evaluation of identified cultures and cultivars for enhancing nitrogen use efficiency in irrigated rice

The productivity of rice is very low due to imbalanced and excessive use of nitrogen fertilizers by the farmers. It has been reported that the apparent recovery efficiency of applied nitrogen is approximately about 30-33%. The remaining amount of N is either lost through surface runoff, leaching, volatilization or denitrification and further adds to increased cost of production and environmental degradation. The use of efficient and economical rates of nitrogen fertilizer is important for enhancing crop productivity and maintaining environmental sustainability. To achieve this, it is imperative to identify high nitrogen utilizing cultivars which can minimize the losses. Large numbers of rice cultivars have been released in India so far, but the question is that whether these cultivars are capable to utilizing the nitrogen efficiently. Inter varietal differences for nitrogen use efficiency has been reported by many researchers. Therefore, there is a need to identify the cultivars which can efficiently utilize the nitrogen and to develop a sustainable nitrogen rate recommendation for these cultivars which can further give enhanced yield and resource use efficiency. Hence the present trial is constituted to evaluate the identified cultures and cultivars with the following objective: 1) To study the comparative performance of elite lines and cultivars under different levels of nitrogen. The trial was conducted at 4 locations (**ICAR-IIRR, Ludhiana, Ranchi and Maruteru**). Split plot design was adopted with 3 main plots of nitrogen levels (N<sub>1</sub>- No nitrogen, N<sub>2</sub>: 50 % of recommended N dose (P and K is constant) and M<sub>3</sub>: 100 % of recommended dose of N (P and K constant). Sub plots consists of 25 advanced cultures. The results were summarized and presented in **Table 4.1. m(iii)** and the salient findings are as followed.

Interaction effect of nitrogen level and advanced cultures on grain yield was found significant at **ICAR-IIRR** and **Maruteru** only. However, our interest is to find out suitable and efficient cultivars under 0%, 50% and 100% RDN, we will limit our discussion to these three RDN levels.

The recommended nitrogen dose of black clay soils of **ICAR-IIRR** research plot is 120 kg N/ha (100% recommended dose of nitrogen). There are four fixed nitrogen plots (0, 60, 120 and 180 kg N/ha) are maintained at Rajendranagar farm of ICAR-IIRR since last three years. So 60 and 120 kg N/ha corresponds to 50 and 100% of recommended dose of nitrogen, respectively. Every season the above mentioned nitrogen dose is applied keeping other nutrients dose (P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O) constant. The recommended phosphorus and potassium doses are 60 and 40 kg/ha, respectively. For a better comparison among the locations and valid conclusion we have taken three nitrogen level (0, 60 and 120 kg N/ha) for in depth discussion.

At black clay soils of **ICAR-IIRR** all cultures performed better under 150% of RDN than under 100% RDN. At 150% of RDN, IET 28827 resulted the highest grain yield (8.75 t/ha) followed by IET 28084 (8.03 t/ha), IET 28088 (7.99 t/ha), IET 28080 (7.55 t/ha) and IET 27730 (7.49 t/ha). Similarly, at 100% RDN IET 28080 resulted the highest grain yield (7.31 t/ha) closely followed by IET 28084 (7.29 t/ha), IET 27730 (7.29 t/ha), IET 28088 (7.24 t/ha). Similarly, at 50% of RDN the highest grain yield was recorded in IET 28087 (5.81 t/ha) closely followed by IET 27730 (5.26 t/ha), IET 28080 (5.03 t/ha), IET 28831

(4.47 t/ha), IET 28081 (4.38 t/ha) and IET 28830 (4.37 t/ha). In without nitrogen (0 kg/ha) applied plots IET 27730 (3.32 t/ha) resulted the highest grain yield, followed by IET 28081 (3.07 t/ha), IET 28830 (2.95 t/ha), IET 28080 (2.94 t/ha) and IET 28084 (2.93 t/ha). The highest agronomic efficiency of N was recorded in IET 28088 (43.83%) followed by Tella Hamsa (41.33%) at 100% RDN. Similarly, at 50% RDN the highest agronomic efficiency of N was recorded in IET 28831 (39.33%) followed by IET 28080 (35.0%). Among nitrogen levels 150% RDN resulted significantly highest grain yield (6.45 t/ha) than 100% (6.05 t/ha), 50% (3.70 t/ha), without nitrogen (2.2 t/ha). Among advanced cultures IET 27730 (5.84 t/ha) resulted the highest grain yield followed by IET 28080 (5.82 t/ha), IET 28087 (5.75 t/ha), IET 28086 (5.52 t/ha).

The recommended **N: P<sub>2</sub>O<sub>5</sub>: K<sub>2</sub>O/ha** at sandy loam soils of **Ludhiana** is **105:30:30 kg/ha**. Two nitrogen levels (52.5 and 105 kg N/ha) were adopted in the trial which corresponds to 50 and 100% of RDN, respectively. The above mentioned nitrogen doses are applied keeping other recommended nutrients dose (P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O) constant. Entries/Cultivars not taken up/grown for the trial were (IET 28083, IET 27730, IET 28079, BPT 5204 and Swarna). At 100% RDN, IET 28087 resulted the highest grain yield (5.93 t/ha) closely followed by IET 28827 (5.51 t/ha), Varadhan (5.48 t/ha), IET 28826 (5.37 t/ha). Similarly, at 50% of RDN the highest grain yield was recorded in IET 28087 (4.99 t/ha) closely followed by IET 28827 (4.98 t/ha), IET 28084 (4.98 t/ha), IET 28088 (4.84 t/ha), IET 28828 (4.81 t/ha), IET 28086 (4.78 t/ha) and Varadhan (4.71 t/ha). At 100% RDN the highest agronomic efficiency of N was recorded in IET 28081 (11.33%) followed by IET 28829 (10.67%). Effect of main plots nitrogen levels were non-significant on grain yields. Among advanced cultures IET 28087 (5.46 t/ha) resulted the highest grain yield followed by IET 28827 (5.25 t/ha), Varadhan (5.10 t/ha), IET 28084 (4.96 t/ha), IET 28826 (4.93 t/ha) and IET 28086 (4.89).

The recommended **N: P<sub>2</sub>O<sub>5</sub>: K<sub>2</sub>O/ha** of **Ranchi** soils is **120:60:40 kg/ha**. Three nitrogen levels (0, 60 and 120 kg N/ha) were adopted in the trial which corresponds to 0, 50 and 100% of RDN, respectively. The above mentioned nitrogen doses are applied keeping other recommended nutrients dose (P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O) constant. The interaction effect of nitrogen level and advanced cultures on grain yield was statistically non-significant. At 100% RDN, IET 27730 resulted the highest grain yield (4.82 t/ha) followed by IET 28831 (4.62 t/ha), Rasi (4.61 t/ha), IET 28827 (4.56 t/ha) and BPT 5204 (4.55 t/ha). At 50% RDN, the highest grain yield was recorded in IET 28828 (4.05 t/ha) followed by BPT 5204 (4.02 t/ha), IET 28831 (3.96 t/ha), IET 27730 (3.94 t/ha) and Tella Hamsa (3.92 t/ha). In without nitrogen (0 kg/ha) applied plots IET 28828 (2.33 t/ha) given the highest grain yield followed by IET 28088 (2.3 t/ha), IET 28832 (2.24 t/ha), IET 28084 (2.23 t/ha) and Rasi (2.22 t/ha). Among advanced cultures IET 28828 (3.63 t/ha) resulted the highest grain yield followed by Rasi (3.58 t/ha), IET 27730 (3.58 t/ha), IET 28831 (3.57 t/ha) and Tella Hamsa (3.53 t/ha).

The recommended **N: P<sub>2</sub>O<sub>5</sub>: K<sub>2</sub>O/ha** at **Maruteru** is **90:60:60 kg/ha**. Three nitrogen levels (0, 45 and 90 kg N/ha) were adopted in the trial which corresponds to 0, 50 and 100% of RDN, respectively. The above mentioned nitrogen doses are applied keeping other recommended nutrients dose (P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O) constant. In delta alluvial soils of **Maruteru** IET 27730 at 100% RDN resulted the highest grain yield (6.96 t/ha) closely followed by IET 28831 (6.52 t/ha), Improved Samba Mahsuri (6.25 t/ha). At 50% RDN, the highest grain

yield recorded in IET 28831 (6.52 t/ha), IET 28828 (5.87 t/ha), Improved Samba Mahsuri (5.53 t/ha), IET 28079 (5.52 t/ha) and IET 28086 (5.43 t/ha). The highest agronomic efficiency of N was recorded in IET 28831 (78.22%) at 50% RDN. In without nitrogen (0 kg/ha) applied plots the highest grain yield recorded in IET 28831 (3.0 t/ha) followed by IET 28828 (2.83 t/ha), IET 28832 (2.71 t/ha), IET 28079 (2.68 t/ha) and IET 28086 (2.58 t/ha). Among nitrogen levels 100% RDN resulted significantly highest grain yield (4.87 t/ha) followed by 50% (4.74 t/ha) and without nitrogen (2.37 t/ha). Among advanced cultures IET 28831 (4.94 t/ha) resulted the highest grain yield followed by Improved Samba Mahsuri (4.8 t/ha), IET 28828 (4.69 t/ha), IET 27730 (4.59 t/ha) and IET 28826 (4.49 t/ha).

**Trials conducted at 4 locations revealed that the following cultivars/entries to be high grain yielding and nitrogen use efficient**

| Location      | High grain yielding entries/cultivars (descending order) under without application of nitrogen (0 kh/ha)                                                                                                                                     | High grain yielding entries/cultivars (descending order) under 50% of recommended nitrogen dose                                                                                                                                                                              | High grain yielding entries/cultivars (descending order) under 100% of recommended nitrogen dose                                                                                                            | High grain yielding entries/cultivars (descending order) under 150% of recommended nitrogen dose                                                                                                                  |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ICAR-IIRR     | <b>IET 27730 (3.32 t/ha)</b> ,<br>IET 28081 (3.07 t/ha),<br><b>IET 28830 (2.95 t/ha)</b> ,<br><b>IET 28080 (2.94 t/ha)</b> and<br><b>IET 28084 (2.93 t/ha)</b><br>*The highest grain yield recorded among checks is under Swarna (2.59 t/ha) | <b>IET 28087 (5.81 t/ha)</b> ,<br><b>IET 27730 (5.26 t/ha)</b> ,<br><b>IET 28080 (5.03 t/ha)</b> ,<br><b>IET 28831 (4.47 t/ha)</b> ,<br>IET 28081 (4.38 t/ha) and <b>IET 28830 (4.37 t/ha)</b><br>*The highest grain yield recorded among checks is under Swarna (4.15 t/ha) | <b>IET 28080 (7.31 t/ha)</b> ,<br>IET 28084 (7.29 t/ha),<br><b>IET 27730 (7.29 t/ha)</b> and<br>IET 28088 (7.24 t/ha)<br>*The highest grain yield recorded among checks is under Tella Hamsa (7.03 t/ha)    | IET 28827 (8.75 t/ha),<br>IET 28084 (8.03 t/ha), IET 28088 (7.99 t/ha), <b>IET 28080 (7.55 t/ha)</b> and IET 27730 (7.49 t/ha)<br>*The highest grain yield recorded among checks is under Tella Hamsa (7.28 t/ha) |
| PAU, Ludhiana |                                                                                                                                                                                                                                              | <b>IET 28087 (4.99 t/ha)</b> ,<br>IET 28827 (4.98 t/ha),<br><b>IET 28084 (4.98 t/ha)</b> ,<br><b>IET 28088 (4.84 t/ha)</b> ,<br><b>IET 28828 (4.81 t/ha)</b> , and<br>IET 28086 (4.78 t/ha)<br>*The highest grain yield recorded among checks is under Varadhan (4.71 t/ha)  | <b>IET 28087 (5.93 t/ha)</b> ,<br>IET 28827 (5.51 t/ha),<br>Varadhan (5.48 t/ha) and<br>IET 28826 (5.37 t/ha)<br>*The highest grain yield recorded among checks is under Varadhan (5.48 t/ha)               |                                                                                                                                                                                                                   |
| Ranchi        | IET 28828 (2.33 t/ha),<br><b>IET 28088 (2.30 t/ha)</b> ,<br>IET 28832 (2.24 t/ha),<br><b>IET 28084 (2.23 t/ha)</b> and<br>*The highest grain yield recorded among checks is under Rasi (2.22 t/ha)                                           | IET 28828 (4.05 t/ha),<br>BPT 5204 (4.02 t/ha),<br><b>IET 28831 (3.96 t/ha)</b> ,<br><b>IET 27730 (3.94 t/ha)</b> and Tella Hamsa (3.92 t/ha)<br>*The highest grain yield recorded among checks is under BPT 5204 (4.02 t/ha)                                                | <b>IET 27730 (4.82 t/ha)</b> ,<br>IET 28831 (4.62 t/ha),<br>Rasi (4.61 t/ha),<br>IET 28827 (4.56 t/ha) and BPT 5204 (4.55 t/ha)<br>*The highest grain yield recorded among checks is under Rasi (4.61 t/ha) |                                                                                                                                                                                                                   |
| Maruteru      | <b>IET 28831 (3.0 t/ha)</b><br><b>IET 28828 (2.83 t/ha)</b> ,<br>IET 28832 (2.71 t/ha),<br>IET 28079 (2.68 t/ha) and<br>IET 28086 (2.58 t/ha)<br>*The highest grain yield recorded among checks is under Improved Samba Mahsuri (2.63 t/ha)  | <b>IET 28831 (6.52 t/ha)</b> ,<br><b>IET 28828 (5.87 t/ha)</b> , Improved Samba Mahsuri (5.53 t/ha),<br>IET 28079 (5.52 t/ha) and IET 28086 (5.43 t/ha)                                                                                                                      | <b>IET 27730 (6.96 t/ha)</b> ,<br><b>IET 28831 (6.52 t/ha)</b> ,<br>*The highest grain yield recorded among checks is under Improved Samba Mahsuri (6.25 t/ha)                                              |                                                                                                                                                                                                                   |

**High grain yielding entries/cultivars irrespective of nitrogen levels**

|               |                                                                                                                                                |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| ICAR-IIRR     | <b>IET 27730 (5.84 t/ha)</b> , <b>IET 28080 (5.82 t/ha)</b> , <b>IET 28087 (5.75 t/ha)</b> and IET 28086 (5.52 t/ha)                           |
| PAU, Ludhiana | <b>IET 28087 (5.46 t/ha)</b> , IET 28827 (5.25 t/ha), Varadhan (5.10 t/ha), IET 28084 (4.96 t/ha), IET 28826 (4.93 t/ha) and IET 28086 (4.89). |
| Ranchi        | IET 28828 (3.63 t/ha), Rasi (3.58 t/ha), <b>IET 27730 (3.58 t/ha)</b> , <b>IET 28831 (3.57 t/ha)</b> and Tella Hamsa (3.53 t/ha)               |
| Maruteru      | IET 28831 (4.94 t/ha), Improved Samba Mahsuri (4.8 t/ha), IET 28828 (4.69 t/ha), <b>IET 27730 (4.59 t/ha)</b> and IET 28826 (4.49 t/ha)        |

**Table 4.1(m(iii)): Summary of data on grain yield and ancillary characters of selected IVT NIL LNT cultures grown under transplanted conditions at low, medium & high levels of recommended N fertilizer doses, kharif 2019.**

| N-levels | Varieties | ICAR-IIRR          |      |                              |                |           |                      |                                                    |
|----------|-----------|--------------------|------|------------------------------|----------------|-----------|----------------------|----------------------------------------------------|
|          |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Teswt (g) | No of grains/panicle | Nitrogen. res. (kg grain/kg N) (Base level 0% RDN) |
| F1       | V1        | 3.07               | 73   | 143                          | 1.70           | 16.83     | 123                  |                                                    |
|          | V2        | 2.94               | 77   | 153                          | 2.19           | 18.13     | 113                  |                                                    |
|          | V3        | 2.93               | 78   | 118                          | 1.66           | 19.97     | 104                  |                                                    |
|          | V4        | 2.14               | 85   | 160                          | 1.79           | 17.83     | 105                  |                                                    |
|          | V5        | 4.24               | 58   | 192                          | 1.74           | 17.77     | 105                  |                                                    |
|          | V6        | 2.14               | 85   | 111                          | 1.79           | 16.27     | 116                  |                                                    |
|          | V7        | 3.32               | 71   | 121                          | 1.24           | 17.47     | 102                  |                                                    |
|          | V8        | 1.98               | 92   | 214                          | 1.52           | 18.60     | 96                   |                                                    |
|          | V9        | 1.38               | 96   | 178                          | 1.58           | 20.20     | 116                  |                                                    |
|          | V10       | 2.13               | 87   | 114                          | 1.60           | 17.63     | 127                  |                                                    |
|          | V11       | 1.83               | 93   | 185                          | 1.57           | 18.47     | 96                   |                                                    |
|          | V12       | 1.83               | 93   | 118                          | 1.66           | 17.40     | 128                  |                                                    |
|          | V13       | 1.61               | 95   | 107                          | 1.63           | 18.40     | 132                  |                                                    |
|          | V14       | 2.1                | 89   | 207                          | 1.77           | 16.77     | 107                  |                                                    |
|          | V15       | 1.02               | 99   | 192                          | 1.63           | 19.17     | 86                   |                                                    |
|          | V16       | 2.95               | 76   | 164                          | 1.78           | 20.70     | 103                  |                                                    |
|          | V17       | 2.11               | 88   | 128                          | 1.85           | 20.70     | 88                   |                                                    |
|          | V18       | 2.35               | 83   | 171                          | 1.78           | 18.97     | 88                   |                                                    |
|          | V19       | 2.48               | 82   | 114                          | 1.67           | 18.27     | 108                  |                                                    |
|          | V20       | 1.18               | 97   | 196                          | 1.67           | 18.40     | 100                  |                                                    |
|          | V21       | 2.1                | 89   | 171                          | 1.55           | 17.33     | 108                  |                                                    |
|          | V22       | 0.15               | 100  | 143                          | 1.70           | 20.27     | 119                  |                                                    |
|          | V23       | 2.24               | 84   | 171                          | 1.59           | 20.43     | 79                   |                                                    |
|          | V24       | 2.59               | 80   | 175                          | 1.63           | 18.83     | 89                   |                                                    |
|          | V25       | 2.07               | 91   | 132                          | 1.72           | 18.30     | 98                   |                                                    |
| F2       | V1        | 4.38               | 54   | 224                          | 1.84           | 19.03     | 148                  | 21.83                                              |
|          | V2        | 4.29               | 57   | 221                          | 2.04           | 20.10     | 130                  | 22.50                                              |
|          | V3        | 5.03               | 49   | 171                          | 1.50           | 18.63     | 115                  | 35.00                                              |
|          | V4        | 3.39               | 68   | 217                          | 1.99           | 19.80     | 108                  | 20.83                                              |
|          | V5        | 5.81               | 34   | 246                          | 1.90           | 18.57     | 117                  | 26.17                                              |
|          | V6        | 3.64               | 64   | 196                          | 1.85           | 17.27     | 121                  | 25.00                                              |
|          | V7        | 5.26               | 41   | 207                          | 1.81           | 17.47     | 107                  | 32.33                                              |
|          | V8        | 3.02               | 75   | 281                          | 1.75           | 20.10     | 105                  | 17.33                                              |
|          | V9        | 3.04               | 74   | 192                          | 1.41           | 20.17     | 117                  | 27.67                                              |
|          | V10       | 3.73               | 61   | 185                          | 1.87           | 17.57     | 114                  | 26.67                                              |
|          | V11       | 3.37               | 69   | 260                          | 1.92           | 18.43     | 108                  | 25.67                                              |
|          | V12       | 3.35               | 70   | 185                          | 1.90           | 18.53     | 126                  | 25.33                                              |
|          | V13       | 3.3                | 72   | 207                          | 1.88           | 19.33     | 145                  | 28.17                                              |
|          | V14       | 3.41               | 67   | 256                          | 1.58           | 18.33     | 138                  | 21.83                                              |
|          | V15       | 2.51               | 81   | 253                          | 1.96           | 21.23     | 95                   | 24.83                                              |
|          | V16       | 4.37               | 55   | 303                          | 1.83           | 19.57     | 108                  | 23.67                                              |
|          | V17       | 4.47               | 53   | 196                          | 1.98           | 19.97     | 106                  | 39.33                                              |
|          | V18       | 3.68               | 62   | 242                          | 1.94           | 21.23     | 113                  | 22.17                                              |
|          | V19       | 3.66               | 63   | 146                          | 1.95           | 19.70     | 116                  | 19.67                                              |
|          | V20       | 2.7                | 79   | 207                          | 1.89           | 19.30     | 109                  | 25.33                                              |
|          | V21       | 3.85               | 60   | 235                          | 1.70           | 18.83     | 115                  | 29.17                                              |
|          | V22       | 1.1                | 98   | 178                          | 1.58           | 20.83     | 98                   | 15.83                                              |
|          | V23       | 3.47               | 65   | 199                          | 1.76           | 20.60     | 106                  | 20.50                                              |
|          | V24       | 4.15               | 59   | 260                          | 1.71           | 20.03     | 104                  | 26.00                                              |
|          | V25       | 3.45               | 66   | 182                          | 1.97           | 20.87     | 117                  | 23.00                                              |

Table 4.1(m(iii)): Cntd....

| N-levels    | Varieties | ICAR-IIRR          |      |                              |                |           |                              |                                                    |
|-------------|-----------|--------------------|------|------------------------------|----------------|-----------|------------------------------|----------------------------------------------------|
|             |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Teswt (g) | Panicle/m <sup>2</sup> (No.) | Nitrogen. res. (kg grain/kg N) (Base level 0% RDN) |
| F3          | V1        | 6.86               | 16   | 316                          | 2.02           | 20.37     | 170                          | 31.58                                              |
|             | V2        | 7.31               | 6    | 306                          | 2.43           | 21.10     | 154                          | 36.42                                              |
|             | V3        | 7.29               | 7    | 249                          | 2.29           | 20.80     | 138                          | 36.33                                              |
|             | V4        | 5.34               | 38   | 309                          | 2.01           | 20.43     | 164                          | 26.67                                              |
|             | V5        | 6.4                | 21   | 295                          | 2.18           | 18.17     | 157                          | 18.00                                              |
|             | V6        | 5.75               | 36   | 299                          | 2.08           | 17.70     | 160                          | 30.08                                              |
|             | V7        | 7.29               | 7    | 299                          | 2.35           | 18.60     | 132                          | 33.08                                              |
|             | V8        | 7.24               | 10   | 331                          | 2.17           | 21.40     | 109                          | 43.83                                              |
|             | V9        | 5.07               | 47   | 281                          | 2.15           | 21.73     | 130                          | 30.75                                              |
|             | V10       | 6.35               | 22   | 299                          | 2.06           | 19.17     | 147                          | 35.17                                              |
|             | V11       | 5.29               | 40   | 327                          | 2.34           | 20.50     | 140                          | 28.83                                              |
|             | V12       | 5.88               | 32   | 274                          | 2.37           | 20.33     | 166                          | 33.75                                              |
|             | V13       | 6.12               | 29   | 288                          | 2.20           | 21.60     | 171                          | 37.58                                              |
|             | V14       | 5.3                | 39   | 299                          | 2.22           | 19.63     | 135                          | 26.67                                              |
|             | V15       | 4.37               | 55   | 320                          | 2.22           | 21.43     | 107                          | 27.92                                              |
|             | V16       | 7.1                | 12   | 334                          | 2.09           | 21.43     | 121                          | 34.58                                              |
|             | V17       | 6.16               | 28   | 256                          | 2.13           | 23.67     | 114                          | 33.75                                              |
|             | V18       | 6.23               | 25   | 324                          | 2.35           | 21.83     | 127                          | 32.33                                              |
|             | V19       | 5.08               | 46   | 252                          | 2.14           | 20.17     | 126                          | 21.67                                              |
|             | V20       | 5.83               | 33   | 302                          | 2.38           | 20.00     | 115                          | 38.75                                              |
|             | V21       | 5.07               | 47   | 313                          | 1.96           | 20.53     | 141                          | 24.75                                              |
|             | V22       | 4.51               | 52   | 242                          | 2.29           | 21.77     | 108                          | 36.33                                              |
|             | V23       | 6.23               | 25   | 288                          | 2.41           | 21.83     | 113                          | 33.25                                              |
|             | V24       | 6.27               | 24   | 320                          | 2.56           | 19.17     | 122                          | 30.67                                              |
|             | V25       | 7.03               | 13   | 299                          | 2.11           | 21.30     | 131                          | 41.33                                              |
| F4          | V1        | 6.96               | 15   | 380                          | 2.36           | 21.13     | 153                          | 21.61                                              |
|             | V2        | 7.55               | 4    | 363                          | 2.63           | 24.20     | 150                          | 25.61                                              |
|             | V3        | 8.03               | 2    | 324                          | 2.49           | 24.17     | 138                          | 28.33                                              |
|             | V4        | 5.21               | 43   | 334                          | 2.31           | 17.77     | 162                          | 17.06                                              |
|             | V5        | 6.55               | 19   | 309                          | 2.20           | 20.40     | 151                          | 12.83                                              |
|             | V6        | 5.21               | 43   | 327                          | 2.18           | 18.37     | 160                          | 17.06                                              |
|             | V7        | 7.49               | 5    | 324                          | 2.33           | 21.40     | 123                          | 23.17                                              |
|             | V8        | 7.99               | 3    | 341                          | 2.21           | 22.83     | 113                          | 33.39                                              |
|             | V9        | 4.88               | 50   | 306                          | 2.35           | 20.37     | 130                          | 19.44                                              |
|             | V10       | 5.68               | 37   | 327                          | 1.92           | 21.20     | 140                          | 19.72                                              |
|             | V11       | 5.12               | 45   | 306                          | 2.55           | 19.07     | 156                          | 18.28                                              |
|             | V12       | 6.35               | 22   | 324                          | 2.44           | 18.80     | 164                          | 25.11                                              |
|             | V13       | 8.75               | 1    | 341                          | 2.62           | 23.30     | 156                          | 39.67                                              |
|             | V14       | 5.23               | 42   | 334                          | 2.17           | 17.57     | 151                          | 17.39                                              |
|             | V15       | 5.81               | 34   | 331                          | 2.41           | 21.57     | 123                          | 26.61                                              |
|             | V16       | 7.18               | 11   | 327                          | 1.88           | 21.90     | 136                          | 23.50                                              |
|             | V17       | 6.09               | 30   | 263                          | 2.91           | 20.93     | 125                          | 22.11                                              |
|             | V18       | 6.72               | 17   | 352                          | 2.81           | 20.53     | 128                          | 24.28                                              |
|             | V19       | 6.23               | 25   | 281                          | 2.43           | 19.50     | 135                          | 20.83                                              |
|             | V20       | 5.97               | 31   | 327                          | 2.49           | 21.13     | 109                          | 26.61                                              |
|             | V21       | 4.83               | 51   | 295                          | 1.98           | 18.23     | 151                          | 15.17                                              |
|             | V22       | 6.67               | 18   | 263                          | 2.50           | 19.83     | 123                          | 36.22                                              |
|             | V23       | 6.99               | 14   | 313                          | 2.54           | 19.87     | 117                          | 26.39                                              |
|             | V24       | 6.43               | 20   | 334                          | 2.30           | 18.33     | 131                          | 21.33                                              |
|             | V25       | 7.28               | 9    | 313                          | 1.83           | 20.33     | 124                          | 28.94                                              |
| Interaction |           |                    |      |                              |                |           |                              |                                                    |
| N at same V |           | 0.46               |      | 29.62                        | 0.37           | 1.66      | 11.72                        |                                                    |
| V at same N |           | 0.49               |      | 30.29                        | 0.38           | 1.76      | 11.78                        |                                                    |

Table 4.1(m(iii)): Cntd....

| N-levels                  | Varieties               | ICAR-IIRR          |      |                              |                |           |                              | Nitrogen. res. (kg grain/kg N) (Base level 0% RDN) |
|---------------------------|-------------------------|--------------------|------|------------------------------|----------------|-----------|------------------------------|----------------------------------------------------|
|                           |                         | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Teswt (g) | Panicle/m <sup>2</sup> (No.) |                                                    |
| Mean of fertilizer dosage |                         |                    |      |                              |                |           |                              |                                                    |
|                           | F1                      | 2.20               | 4    | 155                          | 1.68           | 18.52     | 106                          |                                                    |
|                           | F2                      | 3.70               | 3    | 218                          | 1.82           | 19.42     | 115                          | 25.03                                              |
|                           | F3                      | 6.05               | 2    | 297                          | 2.22           | 20.59     | 136                          | 32.16                                              |
|                           | F4                      | 6.45               | 1    | 322                          | 2.35           | 20.51     | 138                          | 23.63                                              |
|                           | C.D.(0.05)              | 0.24               |      | 10.93                        | 0.13           | 0.87      | 3.28                         |                                                    |
|                           | C.V.(%)                 | 13.01              |      | 11.03                        | 16.43          | 10.99     | 6.64                         |                                                    |
| Mean of varieties:        |                         |                    |      |                              |                |           |                              |                                                    |
| V1                        | IET 28081               | 5.32               | 6    | 266                          | 1.98           | 19.34     | 149                          | 25.01                                              |
| V2                        | IET 28080               | 5.52               | 4    | 261                          | 2.32           | 20.88     | 137                          | 28.18                                              |
| V3                        | IET 28084               | 5.82               | 2    | 215                          | 1.99           | 20.89     | 124                          | 33.22                                              |
| V4                        | IET 28086               | 4.02               | 18   | 255                          | 2.03           | 18.96     | 135                          | 21.52                                              |
| V5                        | IET 28087               | 5.75               | 3    | 261                          | 2.01           | 18.73     | 133                          | 19.00                                              |
| V6                        | IET 28083               | 4.19               | 17   | 233                          | 1.98           | 17.40     | 139                          | 24.05                                              |
| V7                        | IET 27730               | 5.84               | 1    | 238                          | 1.93           | 18.74     | 116                          | 29.53                                              |
| V8                        | IET 28088               | 5.06               | 7    | 292                          | 1.91           | 20.73     | 106                          | 31.52                                              |
| V9                        | IET 28085               | 3.59               | 23   | 239                          | 1.87           | 20.62     | 123                          | 25.95                                              |
| V10                       | IET 28079               | 4.47               | 14   | 231                          | 1.86           | 18.89     | 132                          | 27.19                                              |
| V11                       | IET 28082               | 3.90               | 22   | 270                          | 2.10           | 19.12     | 125                          | 24.26                                              |
| V12                       | IET 28826               | 4.35               | 16   | 225                          | 2.09           | 18.77     | 146                          | 28.06                                              |
| V13                       | IET 28827               | 4.95               | 9    | 236                          | 2.08           | 20.66     | 151                          | 35.14                                              |
| V14                       | IET 28828               | 4.01               | 19   | 274                          | 1.94           | 18.08     | 133                          | 21.96                                              |
| V15                       | IET 28829               | 3.43               | 24   | 274                          | 2.06           | 20.85     | 103                          | 26.45                                              |
| V16                       | IET 28830               | 5.40               | 5    | 282                          | 1.90           | 20.90     | 117                          | 27.25                                              |
| V17                       | IET 28831               | 4.71               | 13   | 211                          | 2.22           | 21.32     | 108                          | 31.73                                              |
| V18                       | IET 28832               | 4.75               | 11   | 272                          | 2.22           | 20.64     | 114                          | 26.26                                              |
| V19                       | IET 28833               | 4.36               | 15   | 198                          | 2.05           | 19.41     | 121                          | 20.72                                              |
| V20                       | Rasi                    | 3.92               | 21   | 258                          | 2.11           | 19.71     | 108                          | 30.23                                              |
| V21                       | Improved Samba Mahsuri  | 3.96               | 20   | 254                          | 1.80           | 18.73     | 129                          | 23.03                                              |
| V22                       | Varadhan                | 3.11               | 25   | 206                          | 2.02           | 20.68     | 112                          | 29.46                                              |
| V23                       | BPT 5204                | 4.73               | 12   | 243                          | 2.08           | 20.68     | 104                          | 26.71                                              |
| V24                       | Swarna                  | 4.86               | 10   | 272                          | 2.05           | 19.09     | 112                          | 26.00                                              |
| V25                       | TellaHamsa              | 4.96               | 8    | 231                          | 1.91           | 20.20     | 118                          | 31.09                                              |
|                           | C.D.(0.05)              | 0.23               |      | 14.81                        | 0.18           | 0.83      | 5.86                         |                                                    |
|                           | C.V.(%)                 | 6.27               |      | 7.47                         | 11.38          | 5.24      | 5.92                         |                                                    |
|                           | Expt. Mean              | 4.60               |      | 248                          | 2.02           | 19.76     | 124                          |                                                    |
|                           | Soil type               | Black clay         |      |                              |                |           |                              |                                                    |
|                           | pH                      | 7.6                |      |                              |                |           |                              |                                                    |
|                           | N - levels (kg/ha)      |                    |      |                              |                |           |                              |                                                    |
|                           | F1                      | 0                  |      |                              |                |           |                              |                                                    |
|                           | F2                      | 60                 |      |                              |                |           |                              |                                                    |
|                           | F3                      | 120                |      |                              |                |           |                              |                                                    |
|                           | F4                      | 180                |      |                              |                |           |                              |                                                    |
|                           | Recommended NPK (kg/ha) | 120:60:40          |      |                              |                |           |                              |                                                    |

Table 4.1(m(iii)): Cntd....

| N-levels | Varieties | LUDHIANA           |      |                              |                |           |                       |                    |                                                    |
|----------|-----------|--------------------|------|------------------------------|----------------|-----------|-----------------------|--------------------|----------------------------------------------------|
|          |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Teswt (g) | Days to 50% flowering | Straw Yield (t/ha) | Nitrogen. res. (kg grain/kg N) (Base level 0% RDN) |
| F1       | V1        | -                  |      | -                            | -              | -         | -                     | -                  |                                                    |
|          | V2        | -                  |      | -                            | -              | -         | -                     | -                  |                                                    |
|          | V3        | -                  |      | -                            | -              | -         | -                     | -                  |                                                    |
|          | V4        | -                  |      | -                            | -              | -         | -                     | -                  |                                                    |
|          | V5        | -                  |      | -                            | -              | -         | -                     | -                  |                                                    |
|          | V6        | -                  |      | -                            | -              | -         | -                     | -                  |                                                    |
|          | V7        | -                  |      | -                            | -              | -         | -                     | -                  |                                                    |
|          | V8        | -                  |      | -                            | -              | -         | -                     | -                  |                                                    |
|          | V9        | -                  |      | -                            | -              | -         | -                     | -                  |                                                    |
|          | V10       | -                  |      | -                            | -              | -         | -                     | -                  |                                                    |
|          | V11       | -                  |      | -                            | -              | -         | -                     | -                  |                                                    |
|          | V12       | -                  |      | -                            | -              | -         | -                     | -                  |                                                    |
|          | V13       | -                  |      | -                            | -              | -         | -                     | -                  |                                                    |
|          | V14       | -                  |      | -                            | -              | -         | -                     | -                  |                                                    |
|          | V15       | -                  |      | -                            | -              | -         | -                     | -                  |                                                    |
|          | V16       | -                  |      | -                            | -              | -         | -                     | -                  |                                                    |
|          | V17       | -                  |      | -                            | -              | -         | -                     | -                  |                                                    |
|          | V18       | -                  |      | -                            | -              | -         | -                     | -                  |                                                    |
|          | V19       | -                  |      | -                            | -              | -         | -                     | -                  |                                                    |
|          | V20       | -                  |      | -                            | -              | -         | -                     | -                  |                                                    |
|          | V21       | -                  |      | -                            | -              | -         | -                     | -                  |                                                    |
|          | V22       | -                  |      | -                            | -              | -         | -                     | -                  |                                                    |
|          | V23       | -                  |      | -                            | -              | -         | -                     | -                  |                                                    |
|          | V24       | -                  |      | -                            | -              | -         | -                     | -                  |                                                    |
|          | V25       | -                  |      | -                            | -              | -         | -                     | -                  |                                                    |
| F2       | V1        | 3.48               | 27   | 250.8                        | 2.46           | 14.11     | 98.33                 | 5.4                |                                                    |
|          | V2        | 2.99               | 31   | 220                          | 3.29           | 14.61     | 105.33                | 5.5                |                                                    |
|          | V3        | 4.98               | 7    | 264                          | 2.89           | 18.21     | 97.33                 | 5.69               |                                                    |
|          | V4        | 4.78               | 13   | 268.4                        | 3.31           | 17.61     | 78.33                 | 6.01               |                                                    |
|          | V5        | 4.99               | 5    | 286                          | 2.35           | 14.44     | 101                   | 7.01               |                                                    |
|          | V6        | -                  |      | -                            | -              | -         | -                     | -                  |                                                    |
|          | V7        | -                  |      | -                            | -              | -         | -                     | -                  |                                                    |
|          | V8        | 4.84               | 10   | 305.8                        | 2.92           | 18.3      | 80                    | 6.26               |                                                    |
|          | V9        | 1.95               | 38   | 259.6                        | 1.11           | 14.9      | 101                   | 4.67               |                                                    |
|          | V10       | -                  |      | -                            | -              | -         | -                     | -                  |                                                    |
|          | V11       | 2.82               | 33   | 242                          | 1.66           | 19.2      | 80.33                 | 6.89               |                                                    |
|          | V12       | 4.48               | 17   | 226.6                        | 2.59           | 16.68     | 97.67                 | 5.82               |                                                    |
|          | V13       | 4.98               | 7    | 231                          | 3.34           | 20.18     | 80.33                 | 5.61               |                                                    |
|          | V14       | 4.81               | 12   | 305.8                        | 2.63           | 16.81     | 81.33                 | 7.04               |                                                    |
|          | V15       | 2.28               | 35   | 266.2                        | 1.29           | 13.73     | 100.33                | 4.56               |                                                    |
|          | V16       | 3.75               | 22   | 294.8                        | 2.24           | 13.79     | 99.67                 | 7.22               |                                                    |
|          | V17       | 3.53               | 25   | 297                          | 2.64           | 23.5      | 92.33                 | 6.7                |                                                    |
|          | V18       | 3.79               | 21   | 264                          | 2.27           | 12.94     | 97                    | 5.56               |                                                    |
|          | V19       | 4.11               | 19   | 233.2                        | 2.65           | 18.24     | 81.33                 | 5.04               |                                                    |
|          | V20       | 1.53               | 40   | 321.2                        | 0.92           | 13.54     | 71.67                 | 6.19               |                                                    |
|          | V21       | 2.25               | 37   | 270.6                        | 1.45           | 16.59     | 102.67                | 4.38               |                                                    |
|          | V22       | 4.71               | 14   | 233.2                        | 2.38           | 19.93     | 81.33                 | 5.77               |                                                    |
|          | V23       | -                  |      | -                            | -              | -         | -                     | -                  |                                                    |
|          | V24       | -                  |      | -                            | -              | -         | -                     | -                  |                                                    |
|          | V25       | 2.99               | 31   | 270.6                        | 1.8            | 18.14     | 69.33                 | 6.1                |                                                    |

Table 4.1(m(iii)): Cntd....

| N-levels    | Varieties | LUDHIANA           |      |                              |                |           |                       |                    |                                                    |
|-------------|-----------|--------------------|------|------------------------------|----------------|-----------|-----------------------|--------------------|----------------------------------------------------|
|             |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Teswt (g) | Days to 50% flowering | Straw Yield (t/ha) | Nitrogen. res. (kg grain/kg N) (Base level 0% RDN) |
| F3          | V1        | 4.67               | 16   | 257.4                        | 2.74           | 14.94     | 100                   | 6.48               | 11.33                                              |
|             | V2        | 3.54               | 24   | 246.4                        | 3.66           | 15.5      | 104.33                | 5.79               | 5.24                                               |
|             | V3        | 4.93               | 9    | 257.4                        | 2.87           | 17.46     | 96                    | 6.31               | -0.48                                              |
|             | V4        | 4.99               | 5    | 272.8                        | 3.82           | 18.49     | 77.33                 | 6.33               | 2.00                                               |
|             | V5        | 5.93               | 1    | 272.8                        | 2.95           | 15.28     | 100.67                | 7.26               | 8.95                                               |
|             | V6        | -                  | -    | -                            | -              | -         | -                     | -                  | -                                                  |
|             | V7        | -                  | -    | -                            | -              | -         | -                     | -                  | -                                                  |
|             | V8        | 4.82               | 11   | 305.8                        | 2.83           | 18.26     | 80                    | 7.08               | -0.19                                              |
|             | V9        | 2.26               | 36   | 316.8                        | 2.07           | 14.03     | 100.67                | 6.5                | 2.95                                               |
|             | V10       | -                  | -    | -                            | -              | -         | -                     | -                  | -                                                  |
|             | V11       | 3.22               | 30   | 266.2                        | 2.35           | 20.45     | 79.67                 | 7.3                | 3.81                                               |
|             | V12       | 5.37               | 4    | 248.6                        | 2.93           | 16.12     | 96                    | 7.11               | 8.48                                               |
|             | V13       | 5.51               | 2    | 213.4                        | 3.87           | 20.08     | 79.67                 | 5.97               | 5.05                                               |
|             | V14       | 3.64               | 23   | 301.4                        | 2.53           | 17.24     | 79                    | 6.34               | -11.14                                             |
|             | V15       | 3.4                | 28   | 297                          | 1.88           | 14.62     | 98.33                 | 6.42               | 10.67                                              |
|             | V16       | 3.52               | 26   | 288.2                        | 2.05           | 12.2      | 100.33                | 6.89               | -2.19                                              |
|             | V17       | 4.1                | 20   | 305.8                        | 2.94           | 24.3      | 87.67                 | 7.94               | 5.43                                               |
|             | V18       | 4.18               | 18   | 305.8                        | 2.67           | 13.55     | 97.33                 | 6.61               | 3.71                                               |
|             | V19       | 4.71               | 14   | 233.2                        | 3.32           | 19.59     | 78                    | 5.45               | 5.71                                               |
|             | V20       | 1.89               | 39   | 338.8                        | 1.38           | 14.77     | 71                    | 7.24               | 3.43                                               |
|             | V21       | 2.55               | 34   | 292.6                        | 2.21           | 17.05     | 103                   | 5.55               | 2.86                                               |
|             | V22       | 5.48               | 3    | 281.6                        | 3.15           | 20.49     | 80                    | 7.02               | 7.33                                               |
|             | V23       | -                  | -    | -                            | -              | -         | -                     | -                  | -                                                  |
|             | V24       | -                  | -    | -                            | -              | -         | -                     | -                  | -                                                  |
|             | V25       | 3.32               | 29   | 294.8                        | 1.88           | 17.19     | 68.67                 | 7.05               | 3.14                                               |
| F4          | V1        | -                  | -    | -                            | -              | -         | -                     | -                  | -                                                  |
|             | V2        | -                  | -    | -                            | -              | -         | -                     | -                  | -                                                  |
|             | V3        | -                  | -    | -                            | -              | -         | -                     | -                  | -                                                  |
|             | V4        | -                  | -    | -                            | -              | -         | -                     | -                  | -                                                  |
|             | V5        | -                  | -    | -                            | -              | -         | -                     | -                  | -                                                  |
|             | V6        | -                  | -    | -                            | -              | -         | -                     | -                  | -                                                  |
|             | V7        | -                  | -    | -                            | -              | -         | -                     | -                  | -                                                  |
|             | V8        | -                  | -    | -                            | -              | -         | -                     | -                  | -                                                  |
|             | V9        | -                  | -    | -                            | -              | -         | -                     | -                  | -                                                  |
|             | V10       | -                  | -    | -                            | -              | -         | -                     | -                  | -                                                  |
|             | V11       | -                  | -    | -                            | -              | -         | -                     | -                  | -                                                  |
|             | V12       | -                  | -    | -                            | -              | -         | -                     | -                  | -                                                  |
|             | V13       | -                  | -    | -                            | -              | -         | -                     | -                  | -                                                  |
|             | V14       | -                  | -    | -                            | -              | -         | -                     | -                  | -                                                  |
|             | V15       | -                  | -    | -                            | -              | -         | -                     | -                  | -                                                  |
|             | V16       | -                  | -    | -                            | -              | -         | -                     | -                  | -                                                  |
|             | V17       | -                  | -    | -                            | -              | -         | -                     | -                  | -                                                  |
|             | V18       | -                  | -    | -                            | -              | -         | -                     | -                  | -                                                  |
|             | V19       | -                  | -    | -                            | -              | -         | -                     | -                  | -                                                  |
|             | V20       | -                  | -    | -                            | -              | -         | -                     | -                  | -                                                  |
|             | V21       | -                  | -    | -                            | -              | -         | -                     | -                  | -                                                  |
|             | V22       | -                  | -    | -                            | -              | -         | -                     | -                  | -                                                  |
|             | V23       | -                  | -    | -                            | -              | -         | -                     | -                  | -                                                  |
|             | V24       | -                  | -    | -                            | -              | -         | -                     | -                  | -                                                  |
|             | V25       | -                  | -    | -                            | -              | -         | -                     | -                  | -                                                  |
| Interaction |           |                    |      |                              |                |           |                       |                    |                                                    |
| N at same V |           | NS                 |      | 60.22                        | NS             | NS        | 1.83                  | NS                 |                                                    |
| V at same N |           | NS                 |      | 67.21                        | NS             | NS        | 1.82                  | NS                 |                                                    |

Table 4.1(m(iii)): Cntd....

| N-levels                  | Varieties               | LUDHIANA           |      |                              |                |           |                       |                    |                                                    |
|---------------------------|-------------------------|--------------------|------|------------------------------|----------------|-----------|-----------------------|--------------------|----------------------------------------------------|
|                           |                         | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Teswt (g) | Days to 50% flowering | Straw Yield (t/ha) | Nitrogen. res. (kg grain/kg N) (Base level 0% RDN) |
| Mean of fertilizer dosage |                         |                    |      |                              |                |           |                       |                    |                                                    |
|                           | F1                      |                    |      |                              |                |           |                       |                    |                                                    |
|                           | F2                      | 3.70               | 2    | 266                          | 2.31           | 16.77     | 89.83                 | 5.87               |                                                    |
|                           | F3                      | 4.10               | 1    | 280                          | 2.71           | 17.08     | 88.88                 | 6.63               | 7.61                                               |
|                           | F4                      |                    |      |                              |                |           |                       |                    |                                                    |
|                           | C.D.(0.05)              | NS                 |      | NS                           | 0.33           | NS        | 0.43                  | NS                 |                                                    |
|                           | C.V.(%)                 | 40.41              |      | 21.05                        | 16.55          | 5.57      | 0.61                  | 17.89              |                                                    |
| Mean of varieties:        |                         |                    |      |                              |                |           |                       |                    |                                                    |
| V1                        | IET 28081               | 4.08               | 10   | 254                          | 2.60           | 14.53     | 99.17                 | 5.94               | 11.33                                              |
| V2                        | IET 28080               | 3.27               | 14   | 233                          | 3.48           | 15.06     | 104.83                | 5.65               | 5.24                                               |
| V3                        | IET 28084               | 4.96               | 4    | 261                          | 2.88           | 17.84     | 96.67                 | 6.00               | -0.48                                              |
| V4                        | IET 28086               | 4.89               | 6    | 271                          | 3.57           | 18.05     | 77.83                 | 6.17               | 2.00                                               |
| V5                        | IET 28087               | 5.46               | 1    | 279                          | 2.65           | 14.86     | 100.84                | 7.14               | 8.95                                               |
| V6                        | IET 28083               | -                  |      | -                            | -              | -         | -                     | -                  |                                                    |
| V7                        | IET 27730               | -                  |      | -                            | -              | -         | -                     | -                  |                                                    |
| V8                        | IET 28088               | 4.83               | 7    | 306                          | 2.88           | 18.28     | 80.00                 | 6.67               | -0.19                                              |
| V9                        | IET 28085               | 2.11               | 19   | 288                          | 1.59           | 14.47     | 100.84                | 5.59               | 2.95                                               |
| V10                       | IET 28079               | -                  |      | -                            | -              | -         | -                     | -                  |                                                    |
| V11                       | IET 28082               | 3.02               | 16   | 254                          | 2.01           | 19.83     | 80.00                 | 7.10               | 3.81                                               |
| V12                       | IET 28826               | 4.93               | 5    | 238                          | 2.76           | 16.40     | 96.84                 | 6.47               | 8.48                                               |
| V13                       | IET 28827               | 5.25               | 2    | 222                          | 3.61           | 20.13     | 80.00                 | 5.79               | 5.05                                               |
| V14                       | IET 28828               | 4.23               | 9    | 304                          | 2.58           | 17.03     | 80.17                 | 6.69               | -11.14                                             |
| V15                       | IET 28829               | 2.84               | 17   | 282                          | 1.59           | 14.18     | 99.33                 | 5.49               | 10.67                                              |
| V16                       | IET 28830               | 3.64               | 13   | 292                          | 2.15           | 13.00     | 100.00                | 7.06               | -2.19                                              |
| V17                       | IET 28831               | 3.82               | 12   | 301                          | 2.79           | 23.90     | 90.00                 | 7.32               | 5.43                                               |
| V18                       | IET 28832               | 3.99               | 11   | 285                          | 2.47           | 13.25     | 97.17                 | 6.09               | 3.71                                               |
| V19                       | IET 28833               | 4.41               | 8    | 233                          | 2.99           | 18.92     | 79.67                 | 5.25               | 5.71                                               |
| V20                       | Rasi                    | 1.71               | 20   | 330                          | 1.15           | 14.16     | 71.34                 | 6.72               | 3.43                                               |
|                           | Improved Samba          |                    |      |                              |                |           |                       |                    |                                                    |
| V21                       | Mahsuri                 | 2.40               | 18   | 282                          | 1.83           | 16.82     | 102.84                | 4.97               | 2.86                                               |
| V22                       | Varadhan                | 5.10               | 3    | 257                          | 2.77           | 20.21     | 80.67                 | 6.40               | 7.33                                               |
| V23                       | BPT 5204                | -                  |      | -                            | -              | -         | -                     | -                  |                                                    |
| V24                       | Swarna                  | -                  |      | -                            | -              | -         | -                     | -                  |                                                    |
| V25                       | TellaHamsa              | 3.16               | 15   | 283                          | 1.84           | 17.67     | 69.00                 | 6.58               | 3.14                                               |
|                           | C.D.(0.05)              | 0.61               |      | 42.58                        | 0.51           | 1.04      | 1.3                   | 0.67               |                                                    |
|                           | C.V.(%)                 | 13.69              |      | 14.34                        | 17.68          | 5.39      | 1.27                  | 9.33               |                                                    |
|                           | Expt. Mean              | 3.90               |      | 273                          | 2.51           | 16.93     | 89.36                 | 6.25               |                                                    |
|                           | Soil type               | Sandy loam         |      |                              |                |           |                       |                    |                                                    |
|                           | pH                      | 7.8                |      |                              |                |           |                       |                    |                                                    |
|                           | N - levels (kg/ha)      |                    |      |                              |                |           |                       |                    |                                                    |
|                           | F1                      | 0                  |      |                              |                |           |                       |                    |                                                    |
|                           | F2                      | 52.5               |      |                              |                |           |                       |                    |                                                    |
|                           | F3                      | 105                |      |                              |                |           |                       |                    |                                                    |
|                           | F4                      | -                  |      |                              |                |           |                       |                    |                                                    |
|                           | Recommended NPK (kg/ha) | 105:30:30          |      |                              |                |           |                       |                    |                                                    |

Table 4.1(m(iii)): Cntd....

| N-levels | Varieties | RANCHI             |      |                              |                    |                           |                           |                                                   | MARUTERU           |      |                              |                                                   | Mean of Grain Yield | Rank |
|----------|-----------|--------------------|------|------------------------------|--------------------|---------------------------|---------------------------|---------------------------------------------------|--------------------|------|------------------------------|---------------------------------------------------|---------------------|------|
|          |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Straw Yield (t/ha) | N uptake by grain (kg/ha) | N uptake by straw (kg/ha) | Nitrogen res. (kg grain/kg N) (Base level 0% RDN) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Nitrogen res. (kg grain/kg N) (Base level 0% RDN) |                     |      |
| F1       | V1        | 1.68               | 69   | 131                          | 2.69               | 21.85                     | 9.73                      |                                                   | 2.27               | 67   | 232                          |                                                   | 2.34                | 83   |
|          | V2        | 1.77               | 67   | 134                          | 2.83               | 22.90                     | 10.16                     |                                                   | 2.11               | 71   | 215                          |                                                   | 2.27                | 84   |
|          | V3        | 2.23               | 54   | 215                          | 3.68               | 29.69                     | 14.38                     |                                                   | 2.56               | 57   | 235                          |                                                   | 2.57                | 77   |
|          | V4        | 2.02               | 60   | 196                          | 3.25               | 26.42                     | 11.61                     |                                                   | 2.58               | 56   | 236                          |                                                   | 2.25                | 85   |
|          | V5        | 1.55               | 75   | 128                          | 2.57               | 20.02                     | 9.48                      |                                                   | 2.47               | 59   | 229                          |                                                   | 2.75                | 76   |
|          | V6        | 1.84               | 63   | 141                          | 3.00               | 24.15                     | 11.37                     |                                                   | 2.36               | 61   | 231                          |                                                   | 2.11                | 89   |
|          | V7        | 1.97               | 61   | 152                          | 3.21               | 25.90                     | 12.49                     |                                                   | 2.29               | 66   | 226                          |                                                   | 2.53                | 78   |
|          | V8        | 2.30               | 52   | 193                          | 3.84               | 31.20                     | 14.24                     |                                                   | 2.38               | 60   | 230                          |                                                   | 2.22                | 86   |
|          | V9        | 1.59               | 73   | 131                          | 2.59               | 20.72                     | 9.90                      |                                                   | 2.21               | 69   | 222                          |                                                   | 1.73                | 98   |
|          | V10       | 1.65               | 71   | 135                          | 2.70               | 21.44                     | 9.98                      |                                                   | 2.68               | 54   | 233                          |                                                   | 2.15                | 88   |
|          | V11       | 2.12               | 57   | 165                          | 3.46               | 27.75                     | 12.38                     |                                                   | 2                  | 75   | 201                          |                                                   | 1.98                | 95   |
|          | V12       | 1.94               | 62   | 156                          | 3.24               | 25.76                     | 12.37                     |                                                   | 2.23               | 68   | 224                          |                                                   | 2.00                | 94   |
|          | V13       | 1.83               | 65   | 136                          | 2.95               | 24.18                     | 10.51                     |                                                   | 2.32               | 64   | 228                          |                                                   | 1.92                | 96   |
|          | V14       | 2.33               | 51   | 236                          | 3.57               | 31.52                     | 13.96                     |                                                   | 2.83               | 52   | 236                          |                                                   | 2.42                | 80   |
|          | V15       | 1.62               | 72   | 125                          | 2.60               | 21.35                     | 9.65                      |                                                   | 2.35               | 62   | 227                          |                                                   | 1.66                | 99   |
|          | V16       | 1.84               | 63   | 131                          | 3.04               | 24.57                     | 11.61                     |                                                   | 2.3                | 65   | 225                          |                                                   | 2.36                | 82   |
|          | V17       | 2.12               | 57   | 159                          | 3.39               | 28.38                     | 13.26                     |                                                   | 3                  | 51   | 241                          |                                                   | 2.41                | 81   |
|          | V18       | 2.24               | 53   | 220                          | 3.63               | 30.18                     | 13.75                     |                                                   | 2.71               | 53   | 239                          |                                                   | 2.43                | 79   |
|          | V19       | 1.59               | 73   | 138                          | 2.77               | 20.71                     | 9.89                      |                                                   | 2.02               | 72   | 208                          |                                                   | 2.03                | 92   |
|          | V20       | 2.22               | 55   | 221                          | 3.64               | 29.54                     | 13.84                     |                                                   | 2.34               | 63   | 231                          |                                                   | 1.91                | 97   |
|          | V21       | 1.75               | 68   | 140                          | 2.90               | 22.95                     | 10.12                     |                                                   | 2.63               | 55   | 235                          |                                                   | 2.16                | 87   |
|          | V22       | 2.08               | 59   | 163                          | 3.41               | 27.50                     | 13.69                     |                                                   | 2.53               | 58   | 232                          |                                                   | 1.59                | 100  |
|          | V23       | 1.83               | 65   | 150                          | 3.06               | 23.94                     | 11.66                     |                                                   | 2.02               | 72   | 207                          |                                                   | 2.03                | 92   |
|          | V24       | 1.67               | 70   | 138                          | 2.78               | 22.15                     | 10.28                     |                                                   | 2.02               | 72   | 209                          |                                                   | 2.09                | 91   |
|          | V25       | 2.13               | 56   | 171                          | 3.59               | 28.57                     | 12.81                     |                                                   | 2.12               | 70   | 223                          |                                                   | 2.11                | 90   |
| F2       | V1        | 3.03               | 50   | 196                          | 4.78               | 41.22                     | 19.58                     | 22.50                                             | 4.68               | 26   | 292                          | 53.56                                             | 3.89                | 65   |
|          | V2        | 3.19               | 48   | 200                          | 4.98               | 43.43                     | 19.86                     | 23.67                                             | 4.03               | 42   | 276                          | 42.67                                             | 3.63                | 69   |
|          | V3        | 3.77               | 33   | 256                          | 6.03               | 52.31                     | 27.68                     | 25.67                                             | 5.41               | 11   | 302                          | 63.33                                             | 4.80                | 41   |
|          | V4        | 3.55               | 41   | 235                          | 5.61               | 49.63                     | 23.51                     | 25.50                                             | 5.43               | 10   | 303                          | 63.33                                             | 4.29                | 53   |
|          | V5        | 3.43               | 43   | 230                          | 5.47               | 47.43                     | 21.91                     | 31.33                                             | 4.68               | 26   | 291                          | 49.11                                             | 4.73                | 44   |
|          | V6        | 3.73               | 36   | 250                          | 5.86               | 52.28                     | 25.24                     | 31.50                                             | 4.93               | 18   | 297                          | 57.11                                             | 4.10                | 59   |
|          | V7        | 3.94               | 28   | 261                          | 6.26               | 55.19                     | 28.27                     | 32.83                                             | 4.52               | 33   | 284                          | 49.56                                             | 4.57                | 49   |
|          | V8        | 3.65               | 37   | 265                          | 5.81               | 51.77                     | 25.75                     | 22.50                                             | 4.72               | 25   | 293                          | 52.00                                             | 4.06                | 60   |
|          | V9        | 3.17               | 49   | 256                          | 4.96               | 43.82                     | 18.91                     | 26.33                                             | 4.57               | 32   | 288                          | 52.44                                             | 3.18                | 74   |
|          | V10       | 3.60               | 39   | 198                          | 5.31               | 50.44                     | 21.21                     | 32.50                                             | 5.52               | 8    | 307                          | 63.11                                             | 4.28                | 54   |
|          | V11       | 3.75               | 34   | 255                          | 5.94               | 53.18                     | 23.23                     | 27.17                                             | 3.44               | 50   | 273                          | 32.00                                             | 3.35                | 72   |
|          | V12       | 3.48               | 42   | 251                          | 5.39               | 49.82                     | 21.63                     | 25.67                                             | 4.83               | 21   | 294                          | 57.78                                             | 4.04                | 63   |
|          | V13       | 3.85               | 32   | 260                          | 6.12               | 53.88                     | 27.12                     | 33.67                                             | 4.68               | 26   | 292                          | 52.44                                             | 4.20                | 56   |
|          | V14       | 4.05               | 25   | 246                          | 6.48               | 57.60                     | 29.22                     | 28.67                                             | 5.87               | 5    | 309                          | 67.56                                             | 4.54                | 50   |
|          | V15       | 3.62               | 38   | 255                          | 5.83               | 50.27                     | 22.21                     | 33.33                                             | 4.48               | 34   | 283                          | 47.33                                             | 3.22                | 73   |
|          | V16       | 3.42               | 44   | 226                          | 6.00               | 48.24                     | 25.24                     | 26.33                                             | 4.66               | 30   | 290                          | 52.44                                             | 4.05                | 62   |
|          | V17       | 3.96               | 27   | 265                          | 6.26               | 55.35                     | 27.77                     | 30.67                                             | 6.52               | 2    | 301                          | 78.22                                             | 4.62                | 48   |
|          | V18       | 3.75               | 34   | 252                          | 5.90               | 53.68                     | 24.18                     | 25.17                                             | 5.37               | 12   | 299                          | 59.11                                             | 4.15                | 58   |
|          | V19       | 3.35               | 47   | 232                          | 5.40               | 46.26                     | 23.29                     | 29.33                                             | 3.68               | 48   | 275                          | 36.89                                             | 3.70                | 67   |
|          | V20       | 3.91               | 31   | 241                          | 6.18               | 54.71                     | 27.72                     | 28.17                                             | 4.24               | 37   | 279                          | 42.22                                             | 3.10                | 75   |
|          | V21       | 3.36               | 46   | 235                          | 5.31               | 46.99                     | 20.76                     | 26.83                                             | 5.53               | 7    | 308                          | 64.44                                             | 3.75                | 66   |
|          | V22       | 3.40               | 45   | 241                          | 5.34               | 48.07                     | 21.29                     | 22.00                                             | 5.02               | 17   | 298                          | 55.33                                             | 3.56                | 71   |
|          | V23       | 4.02               | 26   | 271                          | 6.39               | 57.10                     | 28.70                     | 36.50                                             | 3.47               | 49   | 274                          | 32.22                                             | 3.65                | 68   |
|          | V24       | 3.56               | 40   | 248                          | 5.70               | 49.11                     | 24.49                     | 31.50                                             | 4.08               | 41   | 277                          | 45.78                                             | 3.93                | 64   |
|          | V25       | 3.92               | 29   | 258                          | 6.19               | 55.50                     | 27.45                     | 29.83                                             | 4.12               | 40   | 278                          | 44.44                                             | 3.62                | 70   |

Table 4.1(m(iii)): Cntd....

| N-levels    | Varieties | RANCHI             |      |                              |                    |                           |                           |                                                   | MARUTERU           |      |                              |                                                   | Mean Grain Yield (t/ha) | Rank |
|-------------|-----------|--------------------|------|------------------------------|--------------------|---------------------------|---------------------------|---------------------------------------------------|--------------------|------|------------------------------|---------------------------------------------------|-------------------------|------|
|             |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Straw Yield (t/ha) | N uptake by grain (kg/ha) | N uptake by straw (kg/ha) | Nitrogen res. (kg grain/kg N) (Base level 0% RDN) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Nitrogen res. (kg grain/kg N) (Base level 0% RDN) |                         |      |
| F3          | V1        | 4.15               | 20   | 273                          | 6.39               | 57.33                     | 27.54                     | 20.58                                             | 4.61               | 31   | 287                          | 26.00                                             | 5.07                    | 31   |
|             | V2        | 4.12               | 23   | 270                          | 6.47               | 57.77                     | 28.34                     | 19.58                                             | 3.78               | 47   | 273                          | 18.56                                             | 4.69                    | 47   |
|             | V3        | 4.45               | 10   | 284                          | 6.90               | 63.16                     | 32.38                     | 18.50                                             | 3.92               | 46   | 281                          | 15.11                                             | 5.15                    | 28   |
|             | V4        | 4.52               | 8    | 288                          | 7.05               | 64.73                     | 33.97                     | 20.83                                             | 4.27               | 36   | 284                          | 18.78                                             | 4.78                    | 42   |
|             | V5        | 4.12               | 23   | 270                          | 6.51               | 57.67                     | 29.97                     | 21.42                                             | 4.13               | 39   | 283                          | 18.44                                             | 5.15                    | 29   |
|             | V6        | 4.55               | 5    | 288                          | 7.01               | 65.17                     | 33.33                     | 22.58                                             | 3.97               | 44   | 282                          | 17.89                                             | 4.76                    | 43   |
|             | V7        | 4.82               | 1    | 296                          | 7.52               | 69.75                     | 36.93                     | 23.75                                             | 6.96               | 1    | 308                          | 51.89                                             | 6.36                    | 14   |
|             | V8        | 4.25               | 16   | 279                          | 6.67               | 61.83                     | 28.09                     | 16.25                                             | 5.07               | 16   | 292                          | 29.89                                             | 5.35                    | 23   |
|             | V9        | 4.15               | 20   | 275                          | 6.38               | 58.71                     | 28.74                     | 21.33                                             | 4.73               | 23   | 288                          | 28.00                                             | 4.05                    | 61   |
|             | V10       | 4.38               | 12   | 278                          | 6.79               | 62.54                     | 31.17                     | 22.75                                             | 4.73               | 23   | 289                          | 22.78                                             | 5.15                    | 27   |
|             | V11       | 4.42               | 11   | 280                          | 6.90               | 63.74                     | 31.85                     | 19.17                                             | 3.95               | 45   | 282                          | 21.67                                             | 4.22                    | 55   |
|             | V12       | 4.16               | 18   | 277                          | 6.49               | 60.33                     | 29.15                     | 18.50                                             | 6.41               | 3    | 305                          | 46.44                                             | 5.46                    | 21   |
|             | V13       | 4.56               | 4    | 272                          | 7.11               | 65.71                     | 33.79                     | 22.75                                             | 5.36               | 14   | 295                          | 33.78                                             | 5.39                    | 22   |
|             | V14       | 4.52               | 8    | 283                          | 7.09               | 65.84                     | 32.53                     | 18.25                                             | 5.37               | 12   | 296                          | 28.22                                             | 4.71                    | 45   |
|             | V15       | 4.15               | 20   | 272                          | 6.47               | 58.46                     | 27.73                     | 21.08                                             | 4.87               | 19   | 291                          | 28.00                                             | 4.20                    | 57   |
|             | V16       | 4.20               | 17   | 279                          | 6.51               | 60.03                     | 28.80                     | 19.67                                             | 5.45               | 9    | 300                          | 35.00                                             | 5.07                    | 32   |
|             | V17       | 4.62               | 2    | 281                          | 7.30               | 66.64                     | 33.51                     | 20.83                                             | 5.3                | 15   | 296                          | 25.56                                             | 5.05                    | 33   |
|             | V18       | 4.28               | 15   | 269                          | 6.68               | 62.54                     | 28.68                     | 17.00                                             | 4.68               | 26   | 289                          | 21.89                                             | 4.84                    | 38   |
|             | V19       | 4.16               | 18   | 275                          | 6.37               | 58.98                     | 26.81                     | 21.42                                             | 4.82               | 22   | 290                          | 31.11                                             | 4.69                    | 46   |
|             | V20       | 4.61               | 3    | 293                          | 7.15               | 65.88                     | 33.54                     | 19.92                                             | 4.87               | 19   | 291                          | 28.11                                             | 4.30                    | 52   |
|             | V21       | 3.92               | 29   | 261                          | 6.12               | 55.78                     | 27.41                     | 18.08                                             | 6.25               | 4    | 302                          | 40.22                                             | 4.45                    | 51   |
|             | V22       | 4.35               | 13   | 290                          | 6.70               | 62.71                     | 30.97                     | 18.92                                             | 5.8                | 6    | 301                          | 36.33                                             | 5.04                    | 34   |
|             | V23       | 4.55               | 5    | 272                          | 7.01               | 66.00                     | 33.67                     | 22.67                                             | 4.03               | 42   | 282                          | 22.33                                             | 4.94                    | 35   |
|             | V24       | 4.31               | 14   | 268                          | 6.72               | 61.13                     | 30.15                     | 22.00                                             | 4.22               | 38   | 284                          | 24.44                                             | 4.93                    | 36   |
|             | V25       | 4.53               | 7    | 270                          | 7.07               | 65.54                     | 33.16                     | 20.00                                             | 4.32               | 35   | 285                          | 24.44                                             | 4.80                    | 40   |
| F4          | V1        | -                  | -    | -                            | -                  | -                         | -                         | -                                                 | -                  | -    | -                            | -                                                 | 6.96                    | 9    |
|             | V2        | -                  | -    | -                            | -                  | -                         | -                         | -                                                 | -                  | -    | -                            | -                                                 | 7.55                    | 4    |
|             | V3        | -                  | -    | -                            | -                  | -                         | -                         | -                                                 | -                  | -    | -                            | -                                                 | 8.03                    | 2    |
|             | V4        | -                  | -    | -                            | -                  | -                         | -                         | -                                                 | -                  | -    | -                            | -                                                 | 5.21                    | 25   |
|             | V5        | -                  | -    | -                            | -                  | -                         | -                         | -                                                 | -                  | -    | -                            | -                                                 | 6.55                    | 12   |
|             | V6        | -                  | -    | -                            | -                  | -                         | -                         | -                                                 | -                  | -    | -                            | -                                                 | 5.21                    | 25   |
|             | V7        | -                  | -    | -                            | -                  | -                         | -                         | -                                                 | -                  | -    | -                            | -                                                 | 7.49                    | 5    |
|             | V8        | -                  | -    | -                            | -                  | -                         | -                         | -                                                 | -                  | -    | -                            | -                                                 | 7.99                    | 3    |
|             | V9        | -                  | -    | -                            | -                  | -                         | -                         | -                                                 | -                  | -    | -                            | -                                                 | 4.88                    | 37   |
|             | V10       | -                  | -    | -                            | -                  | -                         | -                         | -                                                 | -                  | -    | -                            | -                                                 | 5.68                    | 20   |
|             | V11       | -                  | -    | -                            | -                  | -                         | -                         | -                                                 | -                  | -    | -                            | -                                                 | 5.12                    | 30   |
|             | V12       | -                  | -    | -                            | -                  | -                         | -                         | -                                                 | -                  | -    | -                            | -                                                 | 6.35                    | 15   |
|             | V13       | -                  | -    | -                            | -                  | -                         | -                         | -                                                 | -                  | -    | -                            | -                                                 | 8.75                    | 1    |
|             | V14       | -                  | -    | -                            | -                  | -                         | -                         | -                                                 | -                  | -    | -                            | -                                                 | 5.23                    | 24   |
|             | V15       | -                  | -    | -                            | -                  | -                         | -                         | -                                                 | -                  | -    | -                            | -                                                 | 5.81                    | 19   |
|             | V16       | -                  | -    | -                            | -                  | -                         | -                         | -                                                 | -                  | -    | -                            | -                                                 | 7.18                    | 7    |
|             | V17       | -                  | -    | -                            | -                  | -                         | -                         | -                                                 | -                  | -    | -                            | -                                                 | 6.09                    | 17   |
|             | V18       | -                  | -    | -                            | -                  | -                         | -                         | -                                                 | -                  | -    | -                            | -                                                 | 6.72                    | 10   |
|             | V19       | -                  | -    | -                            | -                  | -                         | -                         | -                                                 | -                  | -    | -                            | -                                                 | 6.23                    | 16   |
|             | V20       | -                  | -    | -                            | -                  | -                         | -                         | -                                                 | -                  | -    | -                            | -                                                 | 5.97                    | 18   |
|             | V21       | -                  | -    | -                            | -                  | -                         | -                         | -                                                 | -                  | -    | -                            | -                                                 | 4.83                    | 39   |
|             | V22       | -                  | -    | -                            | -                  | -                         | -                         | -                                                 | -                  | -    | -                            | -                                                 | 6.67                    | 11   |
|             | V23       | -                  | -    | -                            | -                  | -                         | -                         | -                                                 | -                  | -    | -                            | -                                                 | 6.99                    | 8    |
|             | V24       | -                  | -    | -                            | -                  | -                         | -                         | -                                                 | -                  | -    | -                            | -                                                 | 6.43                    | 13   |
|             | V25       | -                  | -    | -                            | -                  | -                         | -                         | -                                                 | -                  | -    | -                            | -                                                 | 7.28                    | 6    |
| Interaction |           |                    |      |                              |                    |                           |                           |                                                   |                    |      |                              |                                                   |                         |      |
| N at same V |           | NS                 |      | 32                           | NS                 | NS                        | NS                        |                                                   | 0.34               |      | NS                           |                                                   |                         |      |
| V at same N |           | NS                 |      | 31.7                         | NS                 | NS                        | NS                        |                                                   | 0.34               |      | NS                           |                                                   |                         |      |

Table 4.1(m(iii)): Cntd....

| N-levels                  | Varieties               | RANCHI             |      |                              |                    |                           |                           |                                                    | MARUTERU           |      |                              |                                                    | Mean Grain Yield (t/ha) | Rank |
|---------------------------|-------------------------|--------------------|------|------------------------------|--------------------|---------------------------|---------------------------|----------------------------------------------------|--------------------|------|------------------------------|----------------------------------------------------|-------------------------|------|
|                           |                         | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Straw Yield (t/ha) | N uptake by grain (kg/ha) | N uptake by straw (kg/ha) | Nitrogen. res. (kg grain/kg N) (Base level 0% RDN) | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Nitrogen. res. (kg grain/kg N) (Base level 0% RDN) |                         |      |
| Mean of fertilizer dosage |                         |                    |      |                              |                    |                           |                           |                                                    |                    |      |                              |                                                    |                         |      |
|                           | F1                      | 1.92               | 3    | 160                          | 3.14               | 25.33                     | 11.72                     |                                                    | 2.37               | 3    | 226                          |                                                    | 2.16                    | 4    |
|                           | F2                      | 3.62               | 2    | 243                          | 5.74               | 50.69                     | 24.25                     | 28.37                                              | 4.74               | 2    | 291                          | 52.58                                              | 3.94                    | 3    |
|                           | F3                      | 4.35               | 1    | 278                          | 6.78               | 62.32                     | 30.89                     | 20.31                                              | 4.87               | 1    | 290                          | 27.80                                              | 4.85                    | 2    |
|                           | F4                      |                    |      |                              |                    |                           |                           |                                                    |                    |      |                              |                                                    | 6.45                    | 1    |
|                           | C.D.(0.05)              | 0.13               |      | 7.55                         | 0.16               | 1.77                      | 0.53                      |                                                    | 0.04               |      | 5.87                         |                                                    |                         |      |
|                           | C.V.(%)                 | 13.97              |      | 11.47                        | 10.81              | 13.26                     | 8.18                      |                                                    | 3.39               |      | 7.53                         |                                                    |                         |      |
| Mean of varieties:        |                         |                    |      |                              |                    |                           |                           |                                                    |                    |      |                              |                                                    |                         |      |
| V1                        | IET 28081               | 2.95               | 25   | 200                          | 4.62               | 40.13                     | 18.95                     | 21.54                                              | 3.85               | 15   | 270                          | 39.78                                              | 4.05                    | 12   |
| V2                        | IET 28080               | 3.03               | 22   | 201                          | 4.76               | 41.37                     | 19.45                     | 21.63                                              | 3.31               | 23   | 255                          | 30.61                                              | 3.78                    | 19   |
| V3                        | IET 28084               | 3.48               | 6    | 252                          | 5.54               | 48.39                     | 24.81                     | 22.08                                              | 3.96               | 13   | 273                          | 39.22                                              | 4.56                    | 2    |
| V4                        | IET 28086               | 3.36               | 13   | 240                          | 5.30               | 46.93                     | 23.03                     | 23.17                                              | 4.09               | 11   | 274                          | 41.06                                              | 4.09                    | 10   |
| V5                        | IET 28087               | 3.03               | 20   | 209                          | 4.85               | 41.71                     | 20.45                     | 26.38                                              | 3.76               | 18   | 268                          | 33.78                                              | 4.50                    | 3    |
| V6                        | IET 28083               | 3.37               | 12   | 226                          | 5.29               | 47.20                     | 23.31                     | 27.04                                              | 3.75               | 19   | 270                          | 37.50                                              | 3.77                    | 20   |
| V7                        | IET 27730               | 3.58               | 3    | 236                          | 5.66               | 50.28                     | 25.90                     | 28.29                                              | 4.59               | 4    | 273                          | 50.72                                              | 4.67                    | 1    |
| V8                        | IET 28088               | 3.40               | 11   | 246                          | 5.44               | 48.27                     | 22.69                     | 19.38                                              | 4.06               | 12   | 272                          | 40.94                                              | 4.34                    | 5    |
| V9                        | IET 28085               | 2.97               | 24   | 221                          | 4.64               | 41.08                     | 19.18                     | 23.83                                              | 3.84               | 16   | 266                          | 40.22                                              | 3.13                    | 25   |
| V10                       | IET 28079               | 3.21               | 15   | 204                          | 4.93               | 44.81                     | 20.79                     | 27.63                                              | 4.31               | 7    | 276                          | 42.94                                              | 4.00                    | 13   |
| V11                       | IET 28082               | 3.43               | 8    | 233                          | 5.43               | 48.22                     | 22.49                     | 23.17                                              | 3.13               | 25   | 252                          | 26.83                                              | 3.37                    | 22   |
| V12                       | IET 28826               | 3.19               | 16   | 228                          | 5.04               | 45.30                     | 21.05                     | 22.08                                              | 4.49               | 5    | 274                          | 52.11                                              | 4.24                    | 7    |
| V13                       | IET 28827               | 3.41               | 10   | 223                          | 5.39               | 47.92                     | 23.81                     | 28.21                                              | 4.12               | 10   | 272                          | 43.11                                              | 4.43                    | 4    |
| V14                       | IET 28828               | 3.63               | 1    | 255                          | 5.71               | 51.65                     | 25.24                     | 23.46                                              | 4.69               | 3    | 280                          | 47.89                                              | 4.14                    | 8    |
| V15                       | IET 28829               | 3.13               | 19   | 217                          | 4.97               | 43.36                     | 19.86                     | 27.21                                              | 3.90               | 14   | 267                          | 37.67                                              | 3.32                    | 23   |
| V16                       | IET 28830               | 3.15               | 18   | 212                          | 5.18               | 44.28                     | 21.88                     | 23.00                                              | 4.14               | 9    | 272                          | 43.72                                              | 4.08                    | 11   |
| V17                       | IET 28831               | 3.57               | 4    | 235                          | 5.65               | 50.12                     | 24.85                     | 25.75                                              | 4.94               | 1    | 279                          | 51.89                                              | 4.26                    | 6    |
| V18                       | IET 28832               | 3.42               | 9    | 247                          | 5.40               | 48.80                     | 22.20                     | 21.08                                              | 4.25               | 8    | 276                          | 40.50                                              | 4.10                    | 9    |
| V19                       | IET 28833               | 3.03               | 20   | 215                          | 4.85               | 41.98                     | 20.00                     | 25.38                                              | 3.51               | 21   | 258                          | 34.00                                              | 3.83                    | 15   |
| V20                       | Rasi                    | 3.58               | 2    | 252                          | 5.66               | 50.04                     | 25.03                     | 24.04                                              | 3.82               | 17   | 267                          | 35.17                                              | 3.26                    | 24   |
| V21                       | Improved Samba Mahsuri  | 3.01               | 23   | 212                          | 4.78               | 41.91                     | 19.43                     | 22.46                                              | 4.80               | 2    | 282                          | 52.33                                              | 3.54                    | 21   |
| V22                       | Varadhan                | 3.28               | 14   | 231                          | 5.15               | 46.09                     | 21.98                     | 20.46                                              | 4.45               | 6    | 277                          | 45.83                                              | 3.98                    | 14   |
| V23                       | BPT 5204                | 3.47               | 7    | 231                          | 5.49               | 49.01                     | 24.68                     | 29.58                                              | 3.17               | 24   | 254                          | 27.28                                              | 3.79                    | 17   |
| V24                       | Swarna                  | 3.18               | 17   | 218                          | 5.07               | 44.13                     | 21.64                     | 26.75                                              | 3.44               | 22   | 257                          | 35.11                                              | 3.83                    | 16   |
| V25                       | TellaHamsa              | 3.53               | 5    | 233                          | 5.62               | 49.87                     | 24.47                     | 24.92                                              | 3.52               | 20   | 262                          | 34.44                                              | 3.79                    | 18   |
|                           | C.D.(0.05)              | 0.23               |      | 18.47                        | 0.33               | 3.68                      | 2.22                      |                                                    | 0.2                |      | NS                           |                                                    |                         |      |
|                           | C.V.(%)                 | 7.69               |      | 8.81                         | 6.82               | 8.64                      | 10.77                     |                                                    | 5.36               |      | 9.01                         |                                                    |                         |      |
|                           | Expt. Mean              | 3.30               |      | 227                          | 5.22               | 46.11                     | 22                        |                                                    | 4.00               |      | 269                          |                                                    | 3.95                    |      |
|                           | Soil type               | -                  |      |                              |                    |                           |                           |                                                    | Delta alluvial     |      |                              |                                                    |                         |      |
|                           | pH                      | -                  |      |                              |                    |                           |                           |                                                    | 7.16               |      |                              |                                                    |                         |      |
|                           | N - levels (kg/ha)      |                    |      |                              |                    |                           |                           |                                                    |                    |      |                              |                                                    |                         |      |
|                           | F1                      | 0                  |      |                              |                    |                           |                           |                                                    | 0                  |      |                              |                                                    |                         |      |
|                           | F2                      | 60                 |      |                              |                    |                           |                           |                                                    | 45                 |      |                              |                                                    |                         |      |
|                           | F3                      | 120                |      |                              |                    |                           |                           |                                                    | 90                 |      |                              |                                                    |                         |      |
|                           | F4                      | -                  |      |                              |                    |                           |                           |                                                    | -                  |      |                              |                                                    |                         |      |
|                           | Recommended NPK (kg/ha) | 120:60:40          |      |                              |                    |                           |                           |                                                    | 90:60:60           |      |                              |                                                    |                         |      |

### NMT 1m(iv) Evaluation of identified cultures and cultivars for enhancing phosphorus use efficiency in irrigated rice

Rice is a major cereal crop of India. Phosphorus is an important nutrient for rice production but the use efficiency of this nutrient is very low (20-30%) and phosphorus deficiency has been identified as one of the major constraint limiting crop production. Enhancing phosphorus use efficiency in rice would offer an affordable option for improving yields and economic returns with reduced inputs. Further, research studies have revealed that genotypic differences for PUE exist. There is a need to identify the cultivars which are adapted to low P situations and have higher P use efficiency. Hence the present trial is constituted to evaluate the identified cultures and cultivars with the following objectives: 1) To study the comparative performance of elite lines and cultivars in different levels of Phosphorus and 2) To identify the elite lines for tolerance to low P soil conditions. The trial was conducted at 3 locations (**ICAR-IIRR, Ludhiana, and Nellore**). Split plot design was adopted with 3 main plots of phosphorus levels (P<sub>1</sub>- No Phosphorus (Control) (N and K Constant), P<sub>2</sub>: 50 % of recommended P dose (N and K is constant) and P<sub>3</sub>: 100 % of recommended dose of P (N and K constant). Subplots consist of 36 advanced cultures. The results were summarized and presented in **Table 4.1. Im(iv)** and the salient findings are as followed.

Interaction effect of phosphorus level and advanced cultures on grain yield was found significant at **ICAR-IIRR and Nellore**.

The recommended phosphorus dose at clay loam soils of ICAR-IIRR research plot is 60 kg P<sub>2</sub>O<sub>5</sub>/ha (100% recommended dose of phosphorus). There are four fixed phosphorus plots (0, 20, 40 and 60 kg P<sub>2</sub>O<sub>5</sub>/ha) are maintained at Rajendranagar farm of ICAR-IIRR since last 20 years. So 20 and 40 kg P<sub>2</sub>O<sub>5</sub>/ha corresponds to 33.3 and 66.6% of recommended dose of phosphorus, respectively. Every season the above mentioned phosphorus dose is applied keeping other nutrients dose (N and K<sub>2</sub>O) constant. The recommended nitrogen and potassium doses are 120 and 40 kg/ha, respectively. In *kharif* (rainy) season of 2019, IET 28060 was not grown/taken up due to lack of seeds. Further, for a better comparison and valid conclusion we have taken two phosphorus level (20 and 60 kg P<sub>2</sub>O<sub>5</sub>/ha) for in depth discussion. In *kharif* (rainy) season of 2019, IET 28061 at 100% RDP (60 kg P<sub>2</sub>O<sub>5</sub>/ha) resulted the highest grain yield (5.41 t/ha) closely followed by IET 28816 (5.15 t/ha), IET 28066 (5.0 t/ha), IET 28076 (4.93 t/ha). Similarly, at 66.6% of RDP (40 kg P<sub>2</sub>O<sub>5</sub>/ha) the highest grain yield was recorded in IET 28066 (4.67 t/ha) closely followed by IET 28076 (4.62 t/ha). Again at 33.3% of RDP (20 kg P<sub>2</sub>O<sub>5</sub>/ha) the highest grain yield was resulted in IET 28061 (3.73 t/ha) followed by IET 28065 (3.49 t/ha), IET 28076 (3.44 t/ha), IET 28776 (3.34 t/ha), IET 27641 (3.32 t/ha) and IET 28075 (3.32 t/ha). At 100% RDP the highest agronomic efficiency of P was recorded in IET 28071 (52.5%) followed by IET 28059 (50.0%). Similarly, among phosphorus levels, RDP (60 kg P<sub>2</sub>O<sub>5</sub>) resulted in significantly highest grain yield (4.44 t/ha) than 40 kg P<sub>2</sub>O<sub>5</sub> (4.02 t/ha) and 20 kg P<sub>2</sub>O<sub>5</sub> (2.78 t/ha). Among advanced cultures IET 28061 (4.57 t/ha) resulted the highest grain yield followed by IET 28076 (4.33 t/ha) and IET 28066 (4.32 t/ha).

Recommended dose of fertilizer at sandy loam soils of **Ludhiana** is **105:30:30 kg N: P<sub>2</sub>O<sub>5</sub>: K<sub>2</sub>O/ha**. Two phosphorus levels (0, and 30 kg P<sub>2</sub>O<sub>5</sub>/ha) were adopted in the trial which corresponds to 0% and 100% of RDP. The above mentioned phosphorus doses are applied keeping other recommended nutrients dose (N and K<sub>2</sub>O) constant. Entries/Cultivars not taken up/grown for the trial were (IET 28073, IET 28063, IET 28069, IET 28059, IET 28065, IET 28819, IET 28070, IET 28064, IET 28078, IET 28072). Interaction effect of phosphorus level and advanced cultivars on grain yield was found to be statistically non-significant. However, under the plots received no phosphorus, the highest grain yield was recorded in IET 28816 (3.84 t/ha) closely followed by IET 28061 (3.79 t/ha), IET 28066 (3.77 t/ha) and IET 28075 (3.56 t/ha). Similarly, at 100% RDP applied plots, IET 28066 resulted the highest grain yield (4.2 t/ha) followed by IET 28816 (3.9 t/ha), IET 28075 (3.88 t/ha) and IET 28061 (3.7 t/ha). Main plots (phosphorus level) effect on grain yield was also found to be statistically non-significant. Among advanced cultivars IET 28066 resulted the highest grain yield (3.99 t/ha) followed by IET 28816 (3.87), IET 28061 (3.75 t/ha) and IET 28075 (3.72 t/ha). The highest agronomic efficiency of P was recorded in IET 28824 (20.33%) followed by Rasi (15.67%).

Recommended dose of fertilizer at sandy clay loam soils of **Nellore** is **80:40:0 kg N: P<sub>2</sub>O<sub>5</sub>: K<sub>2</sub>O/ha**. Three phosphorus levels (0, 20 kg and 40 P<sub>2</sub>O<sub>5</sub>/ha) were adopted in the trial which corresponds to 0%, 50% and 100% of RDP. The above mentioned phosphorus doses are applied keeping other recommended nutrients dose (N and K<sub>2</sub>O) constant. Entries/Cultivars not taken up/grown for the trial were (IET 28060 and IET 28074). In *kharif* (rainy) season of 2019, at 100% RDP (40 kg P<sub>2</sub>O<sub>5</sub>/ha) IET 28070 resulted in the highest grain yield (6.4 t/ha) closely followed by IET 28816 (5.77 t/ha). Similarly, at 50% RDP the highest grain yield was recorded in IET 28071 (6.36 t/ha) followed by IET 28816 (6.02 t/ha). However, under the plots received no phosphorus, the highest grain yield was recorded in IET 28816 (6.1 t/ha) closely followed by IET 28070 (5.9 t/ha), IET 28818 (5.57 t/ha), IET 27641 (5.3 t/ha) and IET 28821 (5.3 t/ha). The highest agronomic efficiency of P was recorded in IET 28069 (72%) followed by IET 28072 (48%). Main plots (phosphorus level) effect on grain yield was also found to be non-significant. Among advanced cultures IET 28816 (5.96 t/ha) resulted the highest grain yield followed by IET 28070 (5.84 t/ha) and IET 28818 (5.53 t/ha).

### **Trials conducted at 3 locations revealed that the following cultivars/entries to be high grain yielding and phosphorus use efficient**

| <b>Location</b>      | <b>High grain yielding entries/cultivars (descending order) under low phosphorus condition</b>                                                                                                                                                                                                                                            | <b>High grain yielding entries/cultivars (descending order) under recommended phosphorus dose</b>                                                                                                                                                                                              |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ICAR-IIRR</b>     | <b>IET 28061 (3.73 t/ha),</b><br><b>IET 28065 (3.49 t/ha),</b><br><b>IET 28076 (3.44 t/ha),</b><br>IET 28776 (3.34 t/ha),<br>IET 27641 (3.32 t/ha) and IET 28075 (3.32 t/ha)<br>*Rasi and BPT 5204 resulted the highest grain yield (2.38 t/ha) over other checks (Swarna and ISM) at 33.3% RDP (20 kg P <sub>2</sub> O <sub>5</sub> /ha) | <b>IET 28061 (5.41 t/ha),</b><br><b>IET 28816 (5.15 t/ha),</b><br><b>IET 28066 (5.0 t/ha)</b> and<br>IET 28076 (4.93 t/ha)<br>*Rasi resulted the highest grain yield (4.41 t/ha) over other checks (Swarna, ISM, BPT 5204) at 100% RDP (60 kg P <sub>2</sub> O <sub>5</sub> /ha)               |
| <b>PAU, Ludhiana</b> | <b>IET 28816 (3.84 t/ha),</b><br><b>IET 28061 (3.79 t/ha),</b><br><b>IET 28066 (3.77 t/ha)</b> and<br>IET 28075 (3.56 t/ha)<br>*ISM resulted the highest grain yield (2.69 t/ha) over other checks (Rasi, Swarna, BPT 5204) at without P applied plots (0 kg P <sub>2</sub> O <sub>5</sub> /ha)                                           | <b>IET 28066 (4.2 t/ha),</b><br><b>IET 28816 (3.9 t/ha),</b><br><b>IET 28075 (3.88 t/ha)</b> and<br>IET 28061 (3.7 t/ha)<br>*ISM resulted the highest grain yield (2.68 t/ha) over other checks (Rasi, Swarna, BPT 5204) at without 100% applied RDP (30 kg P <sub>2</sub> O <sub>5</sub> /ha) |
| <b>Nellore, AP</b>   | <b>IET 28816 (6.1 t/ha),</b><br><b>IET 28070 (5.9 t/ha),</b><br><b>IET 28818 (5.57 t/ha),</b><br>IET 27641 (5.3 t/ha) and<br>IET 28821 (5.3 t/ha)<br>*Swarna resulted the highest grain yield (5.05 t/ha) over other checks (Rasi, ISM, BPT 5204) at without P applied plots (0 kg P <sub>2</sub> O <sub>5</sub> /ha)                     | <b>IET 28070 (6.4 t/ha)</b> closely followed by<br><b>IET 28816 (5.77 t/ha)</b><br>*Swarna resulted the highest grain yield (5.05 t/ha) over other checks (Rasi, ISM, BPT 5204) at 100% RDP applied plots (40 kg P <sub>2</sub> O <sub>5</sub> /ha)                                            |

### **High grain yielding entries/cultivars irrespective of phosphorus fertility levels**

|                      |                                                                                                 |
|----------------------|-------------------------------------------------------------------------------------------------|
| <b>ICAR-IIRR</b>     | <b>IET 28061 (4.57 t/ha),</b> IET 28076 (4.33 t/ha) and <b>IET 28066 (4.32 t/ha)</b>            |
| <b>PAU, Ludhiana</b> | <b>IET 28066 (3.99 t/ha), IET 28816 (3.87), IET 28061 (3.75 t/ha)</b> and IET 28075 (3.72 t/ha) |
| <b>Nellore, AP</b>   | <b>IET 28816 (5.96 t/ha),</b> IET 28070 (5.84 t/ha) and IET 28818 (5.53 t/ha)                   |

**Table 4.1(m(vi)):** Summary of data on grain yield and ancillary characters of selected IVT NIL LPT cultures grown under transplanted conditions at graded levels of recommended N fertilizer doses, kharif 2019.

| N-levels | Varieties | LUDHIANA           |      |                              |                |           |                       |                                                       |
|----------|-----------|--------------------|------|------------------------------|----------------|-----------|-----------------------|-------------------------------------------------------|
|          |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Teswt (g) | Days to 50% flowering | Phosphorous. res. (kg grain/kg P) (Base level 0% RDP) |
| F1       | V1        | 3.77               | 6    | 301                          | 2.29           | 22.72     | 76                    |                                                       |
|          | V2        | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V3        | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V4        | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V5        | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V6        | 1.88               | 37   | 299                          | 2.30           | 26.60     | 71                    |                                                       |
|          | V7        | 3.84               | 4    | 295                          | 2.66           | 20.44     | 104                   |                                                       |
|          | V8        | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V9        | 3.79               | 5    | 396                          | 2.85           | 22.18     | 95                    |                                                       |
|          | V10       | 0.92               | 52   | 400                          | 1.36           | 23.28     | 72                    |                                                       |
|          | V11       | 2.48               | 27   | 352                          | 2.41           | 22.89     | 88                    |                                                       |
|          | V12       | 3.37               | 10   | 301                          | 2.84           | 20.48     | 103                   |                                                       |
|          | V13       | 2.68               | 21   | 367                          | 2.63           | 24.65     | 101                   |                                                       |
|          | V14       | 2.05               | 34   | 343                          | 2.44           | 22.60     | 103                   |                                                       |
|          | V15       | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V16       | 1.19               | 46   | 389                          | 1.74           | 20.28     | 93                    |                                                       |
|          | V17       | 1.57               | 44   | 341                          | 1.36           | 19.99     | 99                    |                                                       |
|          | V18       | 1.07               | 50   | 387                          | 1.18           | 18.95     | 104                   |                                                       |
|          | V19       | 2.34               | 31   | 312                          | 1.93           | 20.33     | 71                    |                                                       |
|          | V20       | 2.39               | 29   | 337                          | 1.75           | 22.44     | 102                   |                                                       |
|          | V21       | 2.67               | 23   | 284                          | 1.74           | 26.63     | 102                   |                                                       |
|          | V22       | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V23       | 2.65               | 24   | 312                          | 1.91           | 24.62     | 101                   |                                                       |
|          | V24       | 2.52               | 25   | 350                          | 2.33           | 25.12     | 90                    |                                                       |
|          | V25       | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V26       | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V27       | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V28       | 3.38               | 9    | 345                          | 2.28           | 24.28     | 84                    |                                                       |
|          | V29       | 2.45               | 28   | 343                          | 2.28           | 25.69     | 91                    |                                                       |
|          | V30       | 3.56               | 8    | 328                          | 2.19           | 21.34     | 97                    |                                                       |
|          | V31       | 2.52               | 25   | 345                          | 2.33           | 20.75     | 96                    |                                                       |
|          | V32       | 3.03               | 16   | 293                          | 2.06           | 18.61     | 98                    |                                                       |
|          | V33       | 1.40               | 45   | 330                          | 1.87           | 18.41     | 101                   |                                                       |
|          | V34       | 1.60               | 41   | 249                          | 1.78           | 22.12     | 84                    |                                                       |
|          | V35       | 2.69               | 20   | 323                          | 2.09           | 23.23     | 98                    |                                                       |
|          | V36       | 1.66               | 40   | 268                          | 1.40           | 17.85     | 101                   |                                                       |

Table 4.1(m(ivi)): Cntd....

| N-levels | Varieties | LUDHIANA           |      |                              |                |           |                       |                                                       |
|----------|-----------|--------------------|------|------------------------------|----------------|-----------|-----------------------|-------------------------------------------------------|
|          |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Teswt (g) | Days to 50% flowering | Phosphorous. res. (kg grain/kg P) (Base level 0% RDP) |
| F2       | V1        | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V2        | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V3        | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V4        | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V5        | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V6        | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V7        | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V8        | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V9        | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V10       | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V11       | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V12       | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V13       | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V14       | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V15       | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V16       | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V17       | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V18       | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V19       | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V20       | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V21       | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V22       | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V23       | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V24       | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V25       | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V26       | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V27       | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V28       | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V29       | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V30       | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V31       | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V32       | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V33       | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V34       | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V35       | -                  |      | -                            | -              | -         | -                     |                                                       |
|          | V36       | -                  |      | -                            | -              | -         | -                     |                                                       |

Table 4.1(m(ivi)): Cntd....

| N-levels    | Varieties | LUDHIANA           |      |                              |                |           |                       |                                                       |
|-------------|-----------|--------------------|------|------------------------------|----------------|-----------|-----------------------|-------------------------------------------------------|
|             |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Teswt (g) | Days to 50% flowering | Phosphorous. res. (kg grain/kg P) (Base level 0% RDP) |
| F3          | V1        | 4.20               | 1    | 298                          | 2.85           | 22.65     | 78                    | 14.33                                                 |
|             | V2        | -                  |      | -                            | -              | -         | -                     |                                                       |
|             | V3        | -                  |      | -                            | -              | -         | -                     |                                                       |
|             | V4        | -                  |      | -                            | -              | -         | -                     |                                                       |
|             | V5        | -                  |      | -                            | -              | -         | -                     |                                                       |
|             | V6        | 1.94               | 36   | 299                          | 2.33           | 26.73     | 70                    | 2.00                                                  |
|             | V7        | 3.90               | 2    | 299                          | 2.66           | 20.49     | 103                   | 2.00                                                  |
|             | V8        | -                  |      | -                            | -              | -         | -                     |                                                       |
|             | V9        | 3.70               | 7    | 392                          | 2.86           | 22.04     | 96                    | -3.00                                                 |
|             | V10       | 1.07               | 50   | 398                          | 1.42           | 23.32     | 72                    | 5.00                                                  |
|             | V11       | 2.33               | 33   | 345                          | 2.33           | 22.61     | 86                    | -5.00                                                 |
|             | V12       | 3.12               | 12   | 348                          | 2.80           | 20.58     | 102                   | -8.33                                                 |
|             | V13       | 2.82               | 18   | 293                          | 2.73           | 24.42     | 101                   | 4.67                                                  |
|             | V14       | 2.00               | 35   | 332                          | 2.35           | 22.46     | 104                   | -1.67                                                 |
|             | V15       | -                  |      | -                            | -              | -         | -                     |                                                       |
|             | V16       | 1.09               | 49   | 403                          | 1.66           | 21.36     | 94                    | -3.33                                                 |
|             | V17       | 1.60               | 41   | 348                          | 1.35           | 19.57     | 98                    | 1.00                                                  |
|             | V18       | 1.13               | 48   | 350                          | 1.25           | 18.97     | 104                   | 2.00                                                  |
|             | V19       | 2.34               | 31   | 315                          | 1.94           | 20.45     | 71                    | 0.00                                                  |
|             | V20       | 2.35               | 30   | 319                          | 1.82           | 22.51     | 103                   | -1.33                                                 |
|             | V21       | 2.77               | 19   | 293                          | 2.18           | 26.45     | 101                   | 3.33                                                  |
|             | V22       | -                  |      | -                            | -              | -         | -                     |                                                       |
|             | V23       | 3.08               | 14   | 246                          | 2.25           | 24.57     | 101                   | 14.33                                                 |
|             | V24       | 1.69               | 39   | 363                          | 2.02           | 25.15     | 91                    | -27.67                                                |
|             | V25       | -                  |      | -                            | -              | -         | -                     |                                                       |
|             | V26       | -                  |      | -                            | -              | -         | -                     |                                                       |
|             | V27       | -                  |      | -                            | -              | -         | -                     |                                                       |
|             | V28       | 3.31               | 11   | 345                          | 2.35           | 24.38     | 83                    | -2.33                                                 |
|             | V29       | 3.06               | 15   | 290                          | 2.98           | 26.13     | 92                    | 20.33                                                 |
|             | V30       | 3.88               | 3    | 361                          | 2.46           | 21.68     | 96                    | 10.67                                                 |
|             | V31       | 2.86               | 17   | 356                          | 2.49           | 20.84     | 96                    | 11.33                                                 |
|             | V32       | 3.12               | 12   | 293                          | 2.10           | 18.40     | 98                    | 3.00                                                  |
|             | V33       | 1.87               | 38   | 295                          | 2.18           | 18.78     | 101                   | 15.67                                                 |
|             | V34       | 1.18               | 47   | 268                          | 1.46           | 22.20     | 84                    | -14.00                                                |
|             | V35       | 2.68               | 21   | 332                          | 2.18           | 23.25     | 98                    | -0.33                                                 |
|             | V36       | 1.58               | 43   | 271                          | 1.44           | 17.74     | 103                   | -2.67                                                 |
| Interaction |           |                    |      |                              |                |           |                       |                                                       |
| N at same V |           | NS                 |      | NS                           | NS             | NS        | NS                    |                                                       |
| V at same N |           | NS                 |      | NS                           | NS             | NS        | NS                    |                                                       |
| F1          |           | 2.44               | 2    | 331                          | 2.08           | 22.17     | 93.28                 |                                                       |
| F2          |           |                    |      |                              |                |           |                       |                                                       |
| F3          |           | 2.49               | 1    | 325                          | 2.17           | 22.22     | 93.41                 | 1.54                                                  |
| C.D.(0.05)  |           | NS                 |      | NS                           | 0.05           | NS        | NS                    |                                                       |
| C.V.(%)     |           | 4.3                |      | 25.99                        | 3.45           | 7.12      | 0.48                  |                                                       |

Table 4.1(m(ivi)): Cntd....

| N-<br>levels                    | Varieties          | LUDHIANA           |      |                                 |                   |           |                             |                                                             |
|---------------------------------|--------------------|--------------------|------|---------------------------------|-------------------|-----------|-----------------------------|-------------------------------------------------------------|
|                                 |                    | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup><br>(No.) | Panicle wt<br>(g) | Teswt (g) | Days to<br>50%<br>flowering | Phosphorous. res.<br>(kg grain/kg P) (Base<br>level 0% RDP) |
| Mean of varieties:              |                    |                    |      |                                 |                   |           |                             |                                                             |
| V1                              | IET 28066          | 3.99               | 1    | 300                             | 2.57              | 22.69     | 76.84                       | 14.33                                                       |
| V2                              | IET 28073          | -                  |      | -                               | -                 | -         | -                           |                                                             |
| V3                              | IET 28063          | -                  |      | -                               | -                 | -         | -                           |                                                             |
| V4                              | IET 28069          | -                  |      | -                               | -                 | -         | -                           |                                                             |
| V5                              | IET 28059          | -                  |      | -                               | -                 | -         | -                           |                                                             |
| V6                              | IET 28071          | 1.91               | 19   | 299                             | 2.32              | 26.67     | 70.50                       | 2.00                                                        |
| V7                              | IET 28816          | 3.87               | 2    | 297                             | 2.66              | 20.47     | 103.67                      | 2.00                                                        |
| V8                              | IET 28065          | -                  |      | -                               | -                 | -         | -                           |                                                             |
| V9                              | IET 28061          | 3.75               | 3    | 394                             | 2.86              | 22.11     | 95.83                       | -3.00                                                       |
| V10                             | IET 28817          | 1.00               | 26   | 399                             | 1.39              | 23.30     | 71.67                       | 5.00                                                        |
| V11                             | IET 28818          | 2.41               | 14   | 349                             | 2.37              | 22.75     | 87.00                       | -5.00                                                       |
| V12                             | IET 27641          | 3.25               | 6    | 325                             | 2.82              | 20.53     | 102.83                      | -8.33                                                       |
| V13                             | IET 28076          | 2.75               | 10   | 330                             | 2.68              | 24.54     | 100.67                      | 4.67                                                        |
| V14                             | IET 28063          | 2.03               | 18   | 338                             | 2.40              | 22.53     | 103.83                      | -1.67                                                       |
| V15                             | IET 28819          | -                  |      | -                               | -                 | -         | -                           |                                                             |
| V16                             | IET 28820          | 1.14               | 24   | 396                             | 1.70              | 20.82     | 93.83                       | -3.33                                                       |
| V17                             | IET 28062          | 1.59               | 22   | 344                             | 1.36              | 19.78     | 98.50                       | 1.00                                                        |
| V18                             | IET 28821          | 1.10               | 25   | 369                             | 1.22              | 18.96     | 103.67                      | 2.00                                                        |
| V19                             | IET 28822          | 2.34               | 16   | 314                             | 1.94              | 20.39     | 71.33                       | 0.00                                                        |
| V20                             | IET 28067          | 2.37               | 15   | 328                             | 1.79              | 22.48     | 102.50                      | -1.33                                                       |
| V21                             | IET 28060          | 2.72               | 11   | 288                             | 1.96              | 26.54     | 101.83                      | 3.33                                                        |
| V22                             | IET 28070          | -                  |      | -                               | -                 | -         | -                           |                                                             |
| V23                             | IET 28823          | 2.87               | 8    | 279                             | 2.08              | 24.60     | 101.33                      | 14.33                                                       |
| V24                             | IET 28074          | 2.11               | 17   | 356                             | 2.18              | 25.14     | 90.50                       | -27.67                                                      |
| V25                             | IET 28064          | -                  |      | -                               | -                 | -         | -                           |                                                             |
| V26                             | IET 28078          | -                  |      | -                               | -                 | -         | -                           |                                                             |
| V27                             | IET 28072          | -                  |      | -                               | -                 | -         | -                           |                                                             |
| V28                             | IET 28776          | 3.35               | 5    | 345                             | 2.32              | 24.33     | 83.50                       | -2.33                                                       |
| V29                             | IET 28824          | 2.76               | 9    | 317                             | 2.63              | 25.91     | 91.83                       | 20.33                                                       |
| V30                             | IET 28075          | 3.72               | 4    | 344                             | 2.33              | 21.51     | 96.34                       | 10.67                                                       |
| V31                             | IET 28077          | 2.69               | 12   | 351                             | 2.41              | 20.80     | 95.84                       | 11.33                                                       |
| V32                             | IET 28825          | 3.08               | 7    | 293                             | 2.08              | 18.51     | 97.84                       | 3.00                                                        |
| V33                             | Rasi               | 1.64               | 20   | 312                             | 2.03              | 18.60     | 101.00                      | 15.67                                                       |
| V34                             | Swarna<br>Improved | 1.39               | 23   | 259                             | 1.62              | 22.16     | 84.33                       | -14.00                                                      |
| V35                             | Samba              | 2.69               |      | 328                             | 2.14              | 23.24     | 97.84                       | -0.33                                                       |
| V36                             | Mahsuri            | 1.62               | 13   |                                 |                   |           |                             |                                                             |
|                                 | BPT 5204           |                    | 21   | 270                             | 1.42              | 17.80     | 102.17                      | -2.67                                                       |
| C.D.(0.05)                      |                    | 0.5                |      | 58.77                           | 0.42              | 2.08      | 2.79                        |                                                             |
| C.V.(%)                         |                    | 17.73              |      | 15.69                           | 17.5              | 8.2       | 2.62                        |                                                             |
| Expt. Mean                      |                    | 2.46               |      | 328                             | 2.12              | 22.20     | 93.35                       |                                                             |
| Soil type                       |                    | Sandy loam         |      |                                 |                   |           |                             |                                                             |
| pH                              |                    | 7.8                |      |                                 |                   |           |                             |                                                             |
| N - levels (kg/ha)              |                    |                    |      |                                 |                   |           |                             |                                                             |
| F1                              |                    | 0                  |      |                                 |                   |           |                             |                                                             |
| F2                              |                    | 15                 |      |                                 |                   |           |                             |                                                             |
| F3                              |                    | 30                 |      |                                 |                   |           |                             |                                                             |
| Recommended NPK<br>(kg/ha)      |                    | 105:30:30          |      |                                 |                   |           |                             |                                                             |
| Availabe NPK of soil<br>(kg/ha) |                    | 245:22.5:197       |      |                                 |                   |           |                             |                                                             |

Table 4.1(m(ivi)): Cntd....

| N-levels | Varieties | NELLORE            |      |                              |           |                       |                                             | Ove all mean | Rank |
|----------|-----------|--------------------|------|------------------------------|-----------|-----------------------|---------------------------------------------|--------------|------|
|          |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Teswt (g) | Days to 50% flowering | P. res. (kg grain/kg P) (Base level 0% RDP) |              |      |
| F1       | V1        | 3.11               | 95   | 322                          | 37.80     | 79                    |                                             | 3.44         | 69   |
|          | V2        | 3.13               | 93   | 429                          | 27.30     | 79                    |                                             | 3.13         | 79   |
|          | V3        | 5.14               | 21   | 403                          | 24.13     | 81                    |                                             | 5.14         | 12   |
|          | V4        | 3.78               | 82   | 366                          | 26.87     | 80                    |                                             | 3.78         | 50   |
|          | V5        | 2.57               | 102  | 362                          | 40.40     | 75                    |                                             | 2.57         | 94   |
|          | V6        | 5.20               | 18   | 366                          | 28.57     | 81                    |                                             | 3.54         | 67   |
|          | V7        | 6.10               | 3    | 411                          | 29.30     | 81                    |                                             | 4.97         | 14   |
|          | V8        | 3.82               | 79   | 394                          | 31.20     | 83                    |                                             | 3.82         | 47   |
|          | V9        | 3.81               | 80   | 380                          | 25.23     | 79                    |                                             | 3.80         | 48   |
|          | V10       | 3.60               | 89   | 363                          | 43.17     | 81                    |                                             | 2.26         | 100  |
|          | V11       | 5.57               | 9    | 365                          | 30.93     | 80                    |                                             | 4.03         | 39   |
|          | V12       | 5.30               | 12   | 365                          | 36.27     | 80                    |                                             | 4.34         | 28   |
|          | V13       | 4.01               | 68   | 368                          | 32.70     | 81                    |                                             | 3.35         | 72   |
|          | V14       | 4.91               | 28   | 354                          | 23.43     | 90                    |                                             | 3.48         | 68   |
|          | V15       | 4.24               | 57   | 373                          | 34.87     | 81                    |                                             | 4.24         | 32   |
|          | V16       | 3.93               | 72   | 364                          | 25.80     | 80                    |                                             | 2.56         | 95   |
|          | V17       | 3.89               | 76   | 355                          | 32.30     | 79                    |                                             | 2.73         | 91   |
|          | V18       | 5.30               | 12   | 332                          | 36.80     | 78                    |                                             | 3.19         | 78   |
|          | V19       | 5.07               | 24   | 418                          | 25.27     | 80                    |                                             | 3.71         | 54   |
|          | V20       | 3.83               | 78   | 357                          | 40.40     | 76                    |                                             | 3.11         | 82   |
|          | V21       | -                  |      | -                            | -         | -                     |                                             | 2.67         | 92   |
|          | V22       | 5.90               | 5    | 354                          | 28.73     | 81                    |                                             | 5.90         | 4    |
|          | V23       | 4.71               | 34   | 303                          | 42.13     | 81                    |                                             | 3.68         | 55   |
|          | V24       | -                  |      | -                            | -         | -                     |                                             | 2.52         | 96   |
|          | V25       | 4.16               | 62   | 290                          | 38.53     | 81                    |                                             | 4.16         | 35   |
|          | V26       | 4.04               | 67   | 366                          | 24.83     | 79                    |                                             |              |      |
|          | V27       | 3.64               | 87   | 386                          | 42.80     | 76                    |                                             | 3.64         | 58   |
|          | V28       | 4.69               | 36   | 337                          | 30.47     | 81                    |                                             | 4.04         | 38   |
|          | V29       | 4.87               | 31   | 360                          | 28.33     | 81                    |                                             | 3.66         | 57   |
|          | V30       | 3.69               | 85   | 298                          | 29.33     | 81                    |                                             | 3.63         | 61   |
|          | V31       | 4.21               | 61   | 354                          | 30.43     | 81                    |                                             | 3.37         | 71   |
|          | V32       | 4.32               | 53   | 386                          | 32.57     | 81                    |                                             | 3.68         | 56   |
|          | V33       | 2.59               | 101  | 352                          | 38.67     | 74                    |                                             | 2.00         | 101  |
|          | V34       | 5.05               | 25   | 366                          | 28.83     | 80                    |                                             | 3.33         | 74   |
|          | V35       | 4.00               | 69   | 371                          | 21.90     | 81                    |                                             | 3.35         | 72   |
|          | V36       | 4.33               | 52   | 375                          | 24.83     | 88                    |                                             | 3.00         | 86   |

Table 4.((m(iv))): Cntd....

| N-levels | Varieties | NELLORE            |      |                              |           |                       |                                                       | Ove all mean | Rank |
|----------|-----------|--------------------|------|------------------------------|-----------|-----------------------|-------------------------------------------------------|--------------|------|
|          |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Teswt (g) | Days to 50% flowering | Phosphorous. res. (kg grain/kg P) (Base level 0% RDP) |              |      |
| F2       | V1        | 3.10               | 96   | 372                          | 34.37     | 79                    | -0.5                                                  | 3.10         | 83   |
|          | V2        | 3.32               | 91   | 415                          | 26.60     | 80                    | 9.5                                                   | 3.32         | 75   |
|          | V3        | 5.62               | 8    | 307                          | 23.97     | 80                    | 24                                                    | 5.62         | 6    |
|          | V4        | 5.22               | 15   | 343                          | 26.77     | 80                    | 72                                                    | 5.22         | 9    |
|          | V5        | 2.85               | 98   | 366                          | 36.67     | 79                    | 14                                                    | 2.85         | 88   |
|          | V6        | 6.36               | 2    | 339                          | 26.57     | 80                    | 58                                                    | 6.36         | 2    |
|          | V7        | 6.02               | 4    | 339                          | 27.57     | 56                    | -4                                                    | 6.02         | 3    |
|          | V8        | 4.37               | 50   | 402                          | 32.37     | 90                    | 27.5                                                  | 4.37         | 27   |
|          | V9        | 4.22               | 60   | 407                          | 25.17     | 80                    | 20.5                                                  | 4.22         | 34   |
|          | V10       | 3.84               | 77   | 363                          | 42.20     | 80                    | 12                                                    | 3.84         | 45   |
|          | V11       | 5.81               | 6    | 353                          | 29.33     | 56                    | 12                                                    | 5.81         | 5    |
|          | V12       | 5.38               | 11   | 315                          | 36.43     | 80                    | 4                                                     | 5.38         | 8    |
|          | V13       | 4.23               | 58   | 347                          | 30.03     | 80                    | 11                                                    | 4.23         | 33   |
|          | V14       | 4.92               | 27   | 365                          | 25.23     | 95                    | 0.5                                                   | 4.92         | 15   |
|          | V15       | 3.94               | 71   | 386                          | 34.10     | 78                    | -15                                                   | 3.94         | 42   |
|          | V16       | 3.91               | 73   | 313                          | 31.10     | 84                    | -1                                                    | 3.91         | 43   |
|          | V17       | 3.64               | 87   | 319                          | 35.83     | 78                    | -12.5                                                 | 3.64         | 58   |
|          | V18       | 5.20               | 18   | 356                          | 34.30     | 80                    | -5                                                    | 5.20         | 11   |
|          | V19       | 4.88               | 30   | 401                          | 25.93     | 80                    | -9.5                                                  | 4.88         | 16   |
|          | V20       | 4.62               | 40   | 376                          | 37.20     | 76                    | 39.5                                                  | 4.62         | 21   |
|          | V21       | -                  | -    | -                            | -         | -                     | -                                                     | -            | -    |
|          | V22       | 5.22               | 15   | 372                          | 33.43     | 80                    | -34                                                   | 5.22         | 9    |
|          | V23       | 4.37               | 50   | 357                          | 43.70     | 80                    | -17                                                   | -            | -    |
|          | V24       | -                  | -    | -                            | -         | -                     | -                                                     | -            | -    |
|          | V25       | 4.27               | 56   | 313                          | 44.57     | 80                    | 5.5                                                   | 4.27         | 31   |
|          | V26       | 4.64               | 38   | 363                          | 25.77     | 79                    | 30                                                    | -            | -    |
|          | V27       | 4.60               | 43   | 374                          | 32.70     | 80                    | 48                                                    | 4.60         | 23   |
|          | V28       | 4.60               | 43   | 320                          | 35.20     | 80                    | -4.5                                                  | 4.60         | 23   |
|          | V29       | 4.52               | 48   | 384                          | 32.60     | 80                    | -17.5                                                 | 4.52         | 25   |
|          | V30       | 3.91               | 73   | 312                          | 30.27     | 80                    | 11                                                    | 3.91         | 43   |
|          | V31       | 4.62               | 40   | 337                          | 30.60     | 80                    | 20.5                                                  | 4.62         | 21   |
|          | V32       | 4.63               | 39   | 360                          | 30.17     | 80                    | 15.5                                                  | 4.63         | 20   |
|          | V33       | 2.82               | 99   | 378                          | 41.63     | 80                    | 11.5                                                  | 2.82         | 89   |
|          | V34       | 5.43               | 10   | 402                          | 29.70     | 85                    | 19                                                    | 5.43         | 7    |
|          | V35       | 4.29               | 54   | 344                          | 26.33     | 80                    | 14.5                                                  | 4.29         | 29   |
|          | V36       | 5.09               | 23   | 328                          | 23.53     | 80                    | 38                                                    | 5.09         | 13   |

Table 4.1(m(ivi)): Cntd....

| N-levels | Varieties   | NELLORE            |       |                              |           |                       |                                                       | Ove all mean | Rank |
|----------|-------------|--------------------|-------|------------------------------|-----------|-----------------------|-------------------------------------------------------|--------------|------|
|          |             | Grain Yield (t/ha) | Rank  | Panicle/m <sup>2</sup> (No.) | Teswt (g) | Days to 50% flowering | Phosphorous. res. (kg grain/kg P) (Base level 0% RDP) |              |      |
| F3       | V1          | 3.30               | 92    | 355                          | 35.33     | 81                    | 4.75                                                  | 3.75         | 52   |
|          | V2          | 3.12               | 94    | 356                          | 27.73     | 79                    | -0.25                                                 | 3.12         | 80   |
|          | V3          | 4.67               | 37    | 322                          | 24.77     | 80                    | -11.75                                                | 4.67         | 19   |
|          | V4          | 4.44               | 49    | 332                          | 25.43     | 56                    | 16.50                                                 | 4.44         | 26   |
|          | V5          | 3.07               | 97    | 311                          | 44.30     | 79                    | 12.50                                                 | 3.07         | 85   |
|          | V6          | 4.83               | 32    | 413                          | 28.87     | 80                    | -9.25                                                 | 3.39         | 70   |
|          | V7          | 5.77               | 7     | 323                          | 27.77     | 80                    | -8.25                                                 | 4.84         | 17   |
|          | V8          | 3.56               | 90    | 283                          | 32.57     | 80                    | -6.50                                                 | 3.56         | 65   |
|          | V9          | 3.90               | 75    | 333                          | 23.33     | 80                    | 2.25                                                  | 3.80         | 48   |
|          | V10         | 3.76               | 83    | 309                          | 42.30     | 80                    | 4.00                                                  | 2.42         | 98   |
|          | V11         | 5.22               | 15    | 341                          | 29.50     | 79                    | -8.75                                                 | 3.78         | 51   |
|          | V12         | 5.15               | 20    | 360                          | 36.07     | 80                    | -3.75                                                 | 4.14         | 36   |
|          | V13         | 3.72               | 84    | 323                          | 31.30     | 69                    | -7.25                                                 | 3.27         | 76   |
|          | V14         | 5.23               | 14    | 314                          | 22.67     | 85                    | 8.00                                                  | 3.62         | 64   |
|          | V15         | 4.13               | 63    | 381                          | 31.07     | 83                    | -2.75                                                 | 4.13         | 37   |
|          | V16         | 3.80               | 81    | 313                          | 25.73     | 85                    | -3.25                                                 | 2.45         | 97   |
|          | V17         | 3.68               | 86    | 346                          | 35.30     | 80                    | -5.25                                                 | 2.64         | 93   |
|          | V18         | 4.70               | 35    | 322                          | 36.53     | 79                    | -15.00                                                | 2.92         | 87   |
|          | V19         | 5.11               | 22    | 390                          | 26.47     | 80                    | 1.00                                                  | 3.73         | 53   |
|          | V20         | 4.12               | 65    | 336                          | 37.17     | 80                    | 7.25                                                  | 3.24         | 77   |
|          | V21         | -                  | -     | -                            | -         | -                     | -                                                     | 2.77         | 90   |
|          | V22         | 6.40               | 1     | 325                          | 36.17     | 80                    | 12.50                                                 | 6.40         | 1    |
|          | V23         | 4.89               | 29    | 330                          | 39.20     | 80                    | 4.50                                                  | 3.99         | 40   |
|          | V24         | -                  | -     | -                            | -         | -                     | -                                                     | 1.69         | 102  |
|          | V25         | 4.79               | 33    | 333                          | 42.93     | 80                    | 15.75                                                 | 4.79         | 18   |
|          | V26         | 4.61               | 42    | 450                          | 25.24     | 80                    | 14.25                                                 |              |      |
|          | V27         | 4.29               | 54    | 374                          | 40.23     | 79                    | 16.25                                                 | 4.29         | 29   |
|          | V28         | 3.95               | 70    | 382                          | 34.33     | 80                    | -18.50                                                | 3.63         | 60   |
|          | V29         | 4.59               | 45    | 363                          | 31.00     | 80                    | -7.00                                                 | 3.83         | 46   |
|          | V30         | 4.05               | 66    | 346                          | 29.07     | 80                    | 9.00                                                  | 3.97         | 41   |
|          | V31         | 4.23               | 58    | 351                          | 27.40     | 80                    | 0.50                                                  | 3.55         | 66   |
|          | V32         | 4.13               | 63    | 415                          | 30.13     | 80                    | -4.75                                                 | 3.63         | 61   |
|          | V33         | 2.72               | 100   | 338                          | 39.90     | 80                    | 3.25                                                  | 2.30         | 99   |
|          | V34         | 5.05               | 25    | 386                          | 27.87     | 90                    | 0.00                                                  | 3.12         | 81   |
|          | V35         | 4.56               | 47    | 367                          | 25.67     | 82                    | 14.00                                                 | 3.62         | 63   |
|          | V36         | 4.59               | 45    | 399                          | 23.87     | 83                    | 6.50                                                  | 3.09         | 84   |
|          | Interaction |                    |       |                              |           |                       |                                                       |              |      |
|          | N at same V | 0.63               | 0.63  |                              | NS        | 3.91                  | NS                                                    |              |      |
|          | V at same N | 0.63               | 0.63  |                              | NS        | 3.88                  | NS                                                    |              |      |
|          | F1          | 4.31               | 4.31  | 3                            | 363       | 31.62                 | 80                                                    |              | 3.38 |
|          | F2          | 4.54               | 4.54  | 1                            | 357       | 31.82                 | 79                                                    | 12           | 4.54 |
|          | F3          | 4.36               | 4.36  | 2                            | 351       | 31.68                 | 80                                                    | 1.19         | 3.42 |
|          | C.D.(0.05)  | NS                 | NS    |                              | NS        | NS                    | NS                                                    |              |      |
|          | C.V.(%)     | 14.46              | 14.46 |                              | 33.86     | 9.83                  | 9.75                                                  |              |      |

Table 4.1(m(ivi)): Cntd....

| N-<br>levels                 | Varieties                 | NELLORE                  |      |                                 |           |                             |                                                                   | Ove all<br>mean | Rank |
|------------------------------|---------------------------|--------------------------|------|---------------------------------|-----------|-----------------------------|-------------------------------------------------------------------|-----------------|------|
|                              |                           | Grain<br>Yield<br>(t/ha) | Rank | Panicle/m <sup>2</sup><br>(No.) | Teswt (g) | Days to<br>50%<br>flowering | Phosphorous.<br>res. (kg<br>grain/kg P)<br>(Base level<br>0% RDP) |                 |      |
| Mean of varieties:           |                           |                          |      |                                 |           |                             |                                                                   |                 |      |
| V1                           | IET 28066                 | 3.17                     | 32   | 350                             | 35.83     | 79.45                       | 2.13                                                              | 3.58            | 19   |
| V2                           | IET 28073                 | 3.19                     | 31   | 400                             | 27.21     | 79.44                       | 4.63                                                              | 3.19            | 26   |
| V3                           | IET 28063                 | 5.14                     | 7    | 344                             | 24.29     | 80.22                       | 6.13                                                              | 5.14            | 2    |
| V4                           | IET 28069                 | 4.48                     | 14   | 347                             | 26.36     | 72.00                       | 44.25                                                             | 4.48            | 4    |
| V5                           | IET 28059                 | 2.83                     | 33   | 346                             | 40.46     | 77.89                       | 13.25                                                             | 2.83            | 29   |
| V6                           | IET 28071                 | 5.46                     | 4    | 373                             | 28.00     | 80.33                       | 24.38                                                             | 3.69            | 17   |
| V7                           | IET 28816                 | 5.96                     | 1    | 358                             | 28.21     | 72.33                       | -6.13                                                             | 4.92            | 3    |
| V8                           | IET 28065                 | 3.92                     | 26   | 360                             | 32.05     | 84.44                       | 10.50                                                             | 3.92            | 10   |
| V9                           | IET 28061                 | 3.98                     | 25   | 373                             | 24.58     | 79.67                       | 11.38                                                             | 3.86            | 12   |
| V10                          | IET 28817                 | 3.73                     | 30   | 345                             | 42.56     | 80.11                       | 8.00                                                              | 2.36            | 33   |
| V11                          | IET 28818                 | 5.53                     | 3    | 353                             | 29.92     | 71.78                       | 1.62                                                              | 3.97            | 9    |
| V12                          | IET 27641                 | 5.28                     | 5    | 347                             | 36.26     | 79.89                       | 0.13                                                              | 4.26            | 6    |
| V13                          | IET 28076                 | 3.99                     | 24   | 346                             | 31.34     | 76.67                       | 1.88                                                              | 3.37            | 23   |
| V14                          | IET 28063                 | 5.02                     | 9    | 345                             | 23.78     | 90.00                       | 4.25                                                              | 3.52            | 20   |
| V15                          | IET 28819                 | 4.10                     | 23   | 380                             | 33.35     | 80.78                       | -8.88                                                             | 4.10            | 8    |
| V16                          | IET 28820                 | 3.88                     | 28   | 330                             | 27.54     | 82.89                       | -2.13                                                             | 2.51            | 32   |
| V17                          | IET 28062                 | 3.74                     | 29   | 340                             | 34.48     | 78.89                       | -8.88                                                             | 2.66            | 31   |
| V18                          | IET 28821                 | 5.07                     | 8    | 337                             | 35.88     | 79.33                       | -10.00                                                            | 3.08            | 28   |
| V19                          | IET 28822                 | 5.02                     | 10   | 403                             | 25.89     | 80.22                       | -4.25                                                             | 3.68            | 18   |
| V20                          | IET 28067                 | 4.19                     | 21   | 356                             | 38.26     | 77.11                       | 23.38                                                             | 3.28            | 25   |
| V21                          | IET 28060                 | -                        |      | -                               | -         | -                           |                                                                   | 2.72            | 30   |
| V22                          | IET 28070                 | 5.84                     | 2    | 350                             | 32.78     | 80.33                       | -10.75                                                            | 5.84            | 1    |
| V23                          | IET 28823                 | 4.66                     | 13   | 330                             | 41.68     | 80.33                       | -6.25                                                             | 3.76            | 14   |
| V24                          | IET 28074                 | -                        |      | -                               | -         | -                           |                                                                   | 2.11            | 35   |
| V25                          | IET 28064                 | 4.41                     | 17   | 312                             | 42.01     | 80.33                       | 10.63                                                             | 4.41            | 5    |
| V26                          | IET 28078                 | 4.43                     | 15   | 393                             | 25.28     | 79.33                       | 22.13                                                             |                 |      |
| V27                          | IET 28072                 | 4.18                     | 22   | 378                             | 38.58     | 78.33                       | 32.13                                                             | 4.18            | 7    |
| V28                          | IET 28776                 | 4.41                     | 16   | 347                             | 33.33     | 80.33                       | -11.50                                                            | 3.88            | 11   |
| V29                          | IET 28824                 | 4.66                     | 12   | 369                             | 30.64     | 80.22                       | -12.25                                                            | 3.71            | 16   |
| V30                          | IET 28075                 | 3.88                     | 27   | 319                             | 29.56     | 80.22                       | 10.00                                                             | 3.80            | 13   |
| V31                          | IET 28077                 | 4.35                     | 19   | 347                             | 29.48     | 80.22                       | 10.50                                                             | 3.52            | 21   |
| V32                          | IET 28825                 | 4.36                     | 18   | 387                             | 30.96     | 80.22                       | 5.37                                                              | 3.72            | 15   |
| V33                          | Rasi                      | 2.71                     | 34   | 356                             | 40.07     | 77.78                       | 7.38                                                              | 2.17            | 34   |
| V34                          | Swarna                    | 5.18                     | 6    | 385                             | 28.80     | 85.00                       | 9.50                                                              | 3.28            | 24   |
| V35                          | Improved Samba<br>Mahsuri | 4.28                     | 20   | 361                             | 24.63     | 81.11                       | 14.25                                                             | 3.48            | 22   |
| V36                          | BPT 5204                  | 4.67                     | 11   | 367                             | 24.08     | 83.78                       | 22.25                                                             | 3.15            | 27   |
| C.D.(0.05)                   |                           | 0.37                     |      | 47.9                            | 2.26      | 6.85                        |                                                                   |                 |      |
| C.V.(%)                      |                           | 8.99                     |      | 14.53                           | 7.71      | 9.29                        |                                                                   |                 |      |
| Expt. Mean                   |                           | 4.40                     |      | 357                             | 31.71     | 79.74                       |                                                                   | 3.43            |      |
| Soil type                    |                           | Sandy clay loam          |      |                                 |           |                             |                                                                   |                 |      |
| pH                           |                           | -                        |      |                                 |           |                             |                                                                   |                 |      |
| N - levels (kg/ha)           |                           |                          |      |                                 |           |                             |                                                                   |                 |      |
| F1                           |                           | 0                        |      |                                 |           |                             |                                                                   |                 |      |
| F2                           |                           | 20                       |      |                                 |           |                             |                                                                   |                 |      |
| F3                           |                           | 40                       |      |                                 |           |                             |                                                                   |                 |      |
| Recommended NPK (kg/ha)      |                           | 80:40:0                  |      |                                 |           |                             |                                                                   |                 |      |
| Availabe NPK of soil (kg/ha) |                           | 163:55:555               |      |                                 |           |                             |                                                                   |                 |      |

Table 4.1(m(iv)): Cntd....

| N-levels                     | Varieties | IIRR                  |      |                                 |                   |           |                         | Phosphorous. res.<br>(kg grain/kg P)<br>(Base level 33.3%<br>RDP) |
|------------------------------|-----------|-----------------------|------|---------------------------------|-------------------|-----------|-------------------------|-------------------------------------------------------------------|
|                              |           | Grain Yield<br>(t/ha) | Rank | Panicle/m <sup>2</sup><br>(No.) | Panicle wt<br>(g) | Teswt (g) | No of<br>grains/panicle |                                                                   |
| F1 (P<br>20kg/ha)<br>(33.3%) | V1        | 3.28                  | 78   | 263                             | 1.55              | 18.30     | 91                      |                                                                   |
|                              | V2        | 2.92                  | 80   | 196                             | 1.35              | 20.73     | 96                      |                                                                   |
|                              | V3        | 2.68                  | 87   | 203                             | 1.58              | 19.27     | 149                     |                                                                   |
|                              | V4        | 2.63                  | 90   | 206                             | 1.93              | 21.30     | 109                     |                                                                   |
|                              | V5        | 2.55                  | 92   | 217                             | 1.59              | 17.47     | 78                      |                                                                   |
|                              | V6        | 2.23                  | 103  | 235                             | 1.86              | 21.33     | 109                     |                                                                   |
|                              | V7        | 3.30                  | 77   | 281                             | 1.97              | 17.33     | 157                     |                                                                   |
|                              | V8        | 3.49                  | 68   | 196                             | 1.50              | 23.93     | 109                     |                                                                   |
|                              | V9        | 3.73                  | 61   | 295                             | 2.09              | 18.70     | 160                     |                                                                   |
|                              | V10       | 2.38                  | 100  | 260                             | 2.15              | 16.63     | 73                      |                                                                   |
|                              | V11       | 2.55                  | 92   | 238                             | 1.36              | 20.37     | 79                      |                                                                   |
|                              | V12       | 2.85                  | 84   | 284                             | 1.83              | 21.30     | 142                     |                                                                   |
|                              | V13       | 3.32                  | 75   | 199                             | 3.05              | 19.20     | 105                     |                                                                   |
|                              | V14       | 3.44                  | 70   | 306                             | 2.51              | 21.03     | 115                     |                                                                   |
|                              | V15       | 2.89                  | 82   | 213                             | 2.05              | 17.60     | 194                     |                                                                   |
|                              | V16       | 2.52                  | 94   | 256                             | 1.73              | 20.97     | 133                     |                                                                   |
|                              | V17       | 2.52                  | 94   | 302                             | 1.67              | 18.40     | 123                     |                                                                   |
|                              | V18       | 2.62                  | 91   | 231                             | 1.61              | 17.23     | 82                      |                                                                   |
|                              | V19       | 2.34                  | 102  | 213                             | 1.74              | 15.60     | 110                     |                                                                   |
|                              | V20       | 2.67                  | 88   | 217                             | 1.47              | 16.27     | 121                     |                                                                   |
|                              | V21       | 2.46                  | 98   | 288                             | 1.55              | 16.40     | 98                      |                                                                   |
|                              | V22       | 2.64                  | 89   | 299                             | 2.09              | 20.70     | 76                      |                                                                   |
|                              | V23       | -                     | -    | -                               | -                 | -         | -                       |                                                                   |
|                              | V24       | 2.79                  | 85   | 188                             | 1.45              | 16.13     | 103                     |                                                                   |
|                              | V25       | 3.06                  | 79   | 228                             | 1.71              | 18.53     | 137                     |                                                                   |
|                              | V26       | 2.77                  |      | 220                             | 1.40              | 17.43     | 128.89                  |                                                                   |
|                              | V27       | 2.92                  | 80   | 267                             | 1.57              | 24.03     | 109                     |                                                                   |
|                              | V28       | 2.50                  | 96   | 206                             | 1.30              | 19.13     | 102                     |                                                                   |
|                              | V29       | 2.49                  | 97   | 235                             | 1.57              | 24.77     | 75                      |                                                                   |
|                              | V30       | 3.34                  | 74   | 267                             | 1.99              | 16.80     | 107                     |                                                                   |
|                              | V31       | 2.46                  | 98   | 249                             | 1.61              | 20.50     | 114                     |                                                                   |
|                              | V32       | 3.32                  | 75   | 167                             | 2.00              | 21.40     | 103                     |                                                                   |
|                              | V33       | 2.14                  | 104  | 213                             | 2.07              | 19.47     | 95                      |                                                                   |
|                              | V34       | 2.88                  | 83   | 213                             | 1.87              | 20.40     | 107                     |                                                                   |
|                              | V35       | 2.12                  | 105  | 217                             | 1.69              | 20.83     | 100                     |                                                                   |
|                              | V36       | 2.38                  | 100  | 196                             | 1.59              | 17.47     | 108                     |                                                                   |

Table 4.1(m(iv)): Cntd....

| N-levels               | Varieties | IIRR               |      |                              |                |           |                      |                                                          |
|------------------------|-----------|--------------------|------|------------------------------|----------------|-----------|----------------------|----------------------------------------------------------|
|                        |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Teswt (g) | No of grains/panicle | Phosphorous. res. (kg grain/kg P) (Base level 33.3% RDP) |
| F2 (P 40kg/ha) (66.6%) | V1        | 4.67               | 10   | 302                          | 1.69           | 19.07     | 132                  | 69.5                                                     |
|                        | V2        | 4.29               | 35   | 213                          | 1.49           | 21.40     | 128                  | 68.5                                                     |
|                        | V3        | 4.01               | 51   | 210                          | 1.99           | 19.70     | 175                  | 66.5                                                     |
|                        | V4        | 4.03               | 49   | 210                          | 2.06           | 21.23     | 122                  | 70                                                       |
|                        | V5        | 4.00               | 52   | 235                          | 1.69           | 18.30     | 97                   | 72.5                                                     |
|                        | V6        | 3.74               | 60   | 302                          | 2.14           | 23.23     | 138                  | 75.5                                                     |
|                        | V7        | 4.49               | 21   | 327                          | 2.25           | 18.00     | 184                  | 59.5                                                     |
|                        | V8        | 4.32               | 33   | 238                          | 1.72           | 24.97     | 128                  | 41.5                                                     |
|                        | V9        | 4.57               | 13   | 331                          | 2.28           | 21.27     | 167                  | 42                                                       |
|                        | V10       | 3.67               | 64   | 295                          | 2.17           | 16.67     | 104                  | 64.5                                                     |
|                        | V11       | 4.11               | 43   | 313                          | 1.34           | 20.60     | 102                  | 78                                                       |
|                        | V12       | 4.30               | 34   | 356                          | 2.06           | 21.30     | 176                  | 72.5                                                     |
|                        | V13       | 4.42               | 24   | 245                          | 3.22           | 19.90     | 121                  | 55                                                       |
|                        | V14       | 4.62               | 12   | 327                          | 2.36           | 21.60     | 131                  | 59                                                       |
|                        | V15       | 4.36               | 27   | 231                          | 1.93           | 17.50     | 215                  | 73.5                                                     |
|                        | V16       | 3.45               | 69   | 267                          | 2.14           | 19.73     | 129                  | 46.5                                                     |
|                        | V17       | 3.71               | 63   | 377                          | 1.97           | 18.57     | 156                  | 59.5                                                     |
|                        | V18       | 4.27               | 36   | 274                          | 1.80           | 18.47     | 116                  | 82.5                                                     |
|                        | V19       | 3.58               | 66   | 220                          | 1.65           | 17.60     | 141                  | 62                                                       |
|                        | V20       | 3.82               | 57   | 270                          | 1.27           | 17.53     | 142                  | 57.5                                                     |
|                        | V21       | 3.85               | 56   | 359                          | 1.67           | 18.37     | 122                  | 69.5                                                     |
|                        | V22       | 3.82               | 57   | 331                          | 1.85           | 21.33     | 96                   | 59                                                       |
|                        | V23       | -                  | -    | -                            | -              | -         | -                    | -                                                        |
|                        | V24       | 4.22               | 37   | 220                          | 1.98           | 18.50     | 121                  | 71.5                                                     |
|                        | V25       | 4.33               | 29   | 302                          | 1.99           | 21.67     | 141                  | 63.5                                                     |
|                        | V26       | 4.17               | 39   | 263                          | 1.72           | 21.63     | 119.78               | 70.0                                                     |
|                        | V27       | 4.14               | 42   | 299                          | 1.96           | 26.40     | 116                  | 61                                                       |
|                        | V28       | 3.65               | 65   | 231                          | 1.45           | 22.33     | 134                  | 57.5                                                     |
|                        | V29       | 3.40               | 71   | 324                          | 2.07           | 27.43     | 103                  | 45.5                                                     |
|                        | V30       | 4.33               | 29   | 320                          | 2.23           | 19.77     | 127                  | 49.5                                                     |
|                        | V31       | 3.72               | 62   | 313                          | 1.75           | 21.53     | 132                  | 63                                                       |
|                        | V32       | 4.53               | 17   | 196                          | 1.91           | 21.30     | 126                  | 60.5                                                     |
|                        | V33       | 3.36               | 72   | 228                          | 2.13           | 18.33     | 134                  | 61                                                       |
|                        | V34       | 3.95               | 53   | 263                          | 1.98           | 19.70     | 137                  | 53.5                                                     |
|                        | V35       | 3.35               | 73   | 284                          | 1.86           | 19.53     | 127                  | 61.5                                                     |
|                        | V36       | 3.56               | 67   | 213                          | 1.56           | 16.67     | 131                  | 59                                                       |

Table 4.1(m(ivi)): Cntd....

| N-levels              | Varieties | IIRR               |      |                              |                |           |                      |                                                          |
|-----------------------|-----------|--------------------|------|------------------------------|----------------|-----------|----------------------|----------------------------------------------------------|
|                       |           | Grain Yield (t/ha) | Rank | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Teswt (g) | No of grains/panicle | Phosphorous. res. (kg grain/kg P) (Base level 33.3% RDP) |
| F3 (P 60kg/ha) (100%) | V1        | 5.00               | 3    | 348                          | 1.81           | 21.50     | 133                  | 43.0                                                     |
|                       | V2        | 4.63               | 11   | 267                          | 1.62           | 23.60     | 135                  | 42.8                                                     |
|                       | V3        | 4.47               | 22   | 260                          | 2.17           | 20.27     | 205                  | 44.8                                                     |
|                       | V4        | 4.53               | 17   | 331                          | 2.30           | 24.60     | 137                  | 47.5                                                     |
|                       | V5        | 4.55               | 14   | 306                          | 1.95           | 21.30     | 100                  | 50.0                                                     |
|                       | V6        | 4.33               | 29   | 338                          | 2.12           | 28.03     | 158                  | 52.5                                                     |
|                       | V7        | 5.15               | 2    | 359                          | 2.42           | 22.30     | 208                  | 46.3                                                     |
|                       | V8        | 4.89               | 5    | 256                          | 1.84           | 29.37     | 133                  | 35.0                                                     |
|                       | V9        | 5.41               | 1    | 345                          | 2.51           | 20.63     | 211                  | 42.0                                                     |
|                       | V10       | 4.41               | 25   | 334                          | 2.22           | 17.43     | 98                   | 50.8                                                     |
|                       | V11       | 4.53               | 17   | 316                          | 1.47           | 21.63     | 101                  | 49.5                                                     |
|                       | V12       | 4.53               | 17   | 370                          | 2.43           | 22.57     | 213                  | 42.0                                                     |
|                       | V13       | 4.83               | 7    | 267                          | 3.58           | 21.07     | 129                  | 37.8                                                     |
|                       | V14       | 4.93               | 4    | 373                          | 2.70           | 23.77     | 145                  | 37.3                                                     |
|                       | V15       | 4.70               | 8    | 288                          | 2.19           | 18.73     | 233                  | 45.3                                                     |
|                       | V16       | 4.06               | 45   | 320                          | 2.26           | 22.37     | 153                  | 38.5                                                     |
|                       | V17       | 4.05               | 47   | 377                          | 1.90           | 21.63     | 169                  | 38.3                                                     |
|                       | V18       | 4.45               | 23   | 309                          | 1.80           | 18.47     | 111                  | 45.8                                                     |
|                       | V19       | 4.02               | 50   | 284                          | 1.85           | 20.50     | 164                  | 42.0                                                     |
|                       | V20       | 4.16               | 41   | 309                          | 1.34           | 17.70     | 148                  | 37.3                                                     |
|                       | V21       | 4.17               | 39   | 359                          | 1.83           | 18.93     | 123                  | 42.8                                                     |
|                       | V22       | 4.20               | 38   | 331                          | 2.10           | 20.80     | 93                   | 39.0                                                     |
|                       | V23       | -                  | -    | -                            | -              | -         | -                    | -                                                        |
|                       | V24       | 4.40               | 26   | 302                          | 2.02           | 24.97     | 138                  | 40.3                                                     |
|                       | V25       | 4.54               | 15   | 320                          | 1.84           | 22.47     | 167                  | 37.0                                                     |
|                       | V26       | 4.33               | 29   | 302                          | 1.67           | 21.80     | 125.33               | 39.0                                                     |
|                       | V27       | 4.35               | 28   | 338                          | 2.17           | 31.20     | 122                  | 35.8                                                     |
|                       | V28       | 4.06               | 45   | 277                          | 1.43           | 24.63     | 142                  | 39.0                                                     |
|                       | V29       | 3.81               | 59   | 331                          | 2.10           | 37.30     | 96                   | 33.0                                                     |
|                       | V30       | 4.70               | 8    | 313                          | 2.34           | 22.20     | 136                  | 34.0                                                     |
|                       | V31       | 4.08               | 44   | 320                          | 1.75           | 25.23     | 140                  | 40.5                                                     |
|                       | V32       | 4.86               | 6    | 199                          | 2.24           | 21.30     | 132                  | 38.5                                                     |
|                       | V33       | 3.87               | 54   | 224                          | 2.45           | 20.47     | 138                  | 43.3                                                     |
|                       | V34       | 4.54               | 15   | 309                          | 2.12           | 19.83     | 155                  | 41.5                                                     |
|                       | V35       | 3.86               | 55   | 299                          | 2.09           | 21.57     | 132                  | 43.5                                                     |
|                       | V36       | 4.05               | 47   | 213                          | 1.76           | 17.80     | 142                  | 41.8                                                     |
| Interaction           |           |                    |      |                              |                |           |                      |                                                          |
| N at same V           |           | 0.2                |      | 32.21                        | 0.18           | 1.95      | 9.74                 |                                                          |
| V at same N           |           | 0.2                |      | 31.94                        | 0.18           | 1.94      | 9.7                  |                                                          |
| F1                    |           | 2.78               | 3    | 236                          | 1.77           | 19.34     | 111                  |                                                          |
| F2                    |           | 4.02               | 2    | 277                          | 1.92           | 20.32     | 134                  | 62                                                       |
| F3                    |           | 4.44               | 1    | 308                          | 2.07           | 22.51     | 145                  | 41.62                                                    |
| C.D.(0.05)            |           | 0.03               |      | 5.62                         | 0.05           | 0.35      | 2.27                 |                                                          |
| C.V.(%)               |           | 2.83               |      | 8.37                         | 11.17          | 6.81      | 7.13                 |                                                          |

Table 4.1(m(ivi)): Cntd....

| N-<br>levels       | Varieties                    | IIRR                     |      |                                 |                   |           |                         |                                                                   |
|--------------------|------------------------------|--------------------------|------|---------------------------------|-------------------|-----------|-------------------------|-------------------------------------------------------------------|
|                    |                              | Grain<br>Yield<br>(t/ha) | Rank | Panicle/m <sup>2</sup><br>(No.) | Panicle<br>wt (g) | Teswt (g) | No of<br>grains/panicle | Phosphorous. res.<br>(kg grain/kg P)<br>(Base level 33.3%<br>RDP) |
| Mean of varieties: |                              |                          |      |                                 |                   |           |                         |                                                                   |
| V1                 | IET 28066                    | 4.32                     | 3    | 305                             | 1.68              | 19.62     | 118                     | 56.25                                                             |
| V2                 | IET 28073                    | 3.95                     | 11   | 225                             | 1.49              | 21.91     | 120                     | 55.63                                                             |
| V3                 | IET 28063                    | 3.72                     | 19   | 224                             | 1.91              | 19.75     | 176                     | 55.63                                                             |
| V4                 | IET 28069                    | 3.73                     | 17   | 249                             | 2.10              | 22.38     | 123                     | 58.75                                                             |
| V5                 | IET 28059                    | 3.70                     | 20   | 252                             | 1.74              | 19.02     | 92                      | 61.25                                                             |
| V6                 | IET 28071                    | 3.43                     | 25   | 292                             | 2.04              | 24.20     | 135                     | 64.00                                                             |
| V7                 | IET 28816                    | 4.31                     | 4    | 322                             | 2.21              | 19.21     | 183                     | 52.88                                                             |
| V8                 | IET 28065                    | 4.23                     | 6    | 230                             | 1.69              | 26.09     | 123                     | 38.25                                                             |
| V9                 | IET 28061                    | 4.57                     | 1    | 324                             | 2.29              | 20.20     | 179                     | 42.00                                                             |
| V10                | IET 28817                    | 3.49                     | 24   | 296                             | 2.18              | 16.91     | 92                      | 57.63                                                             |
| V11                | IET 28818                    | 3.73                     | 17   | 289                             | 1.39              | 20.87     | 94                      | 63.75                                                             |
| V12                | IET 27641                    | 3.89                     | 12   | 337                             | 2.11              | 21.72     | 177                     | 57.25                                                             |
| V13                | IET 28076                    | 4.19                     | 7    | 237                             | 3.28              | 20.06     | 118                     | 46.38                                                             |
| V14                | IET 28063                    | 4.33                     | 2    | 335                             | 2.52              | 22.13     | 130                     | 48.13                                                             |
| V15                | IET 28819                    | 3.98                     | 9    | 244                             | 2.06              | 17.94     | 214                     | 59.38                                                             |
| V16                | IET 28820                    | 3.34                     | 29   | 281                             | 2.04              | 21.02     | 138                     | 42.50                                                             |
| V17                | IET 28062                    | 3.43                     | 26   | 352                             | 1.85              | 19.53     | 149                     | 48.88                                                             |
| V18                | IET 28821                    | 3.78                     | 16   | 271                             | 1.74              | 18.06     | 103                     | 64.13                                                             |
| V19                | IET 28822                    | 3.31                     | 31   | 239                             | 1.75              | 17.90     | 139                     | 52.00                                                             |
| V20                | IET 28067                    | 3.55                     | 22   | 265                             | 1.36              | 17.17     | 137                     | 47.38                                                             |
| V21                | IET 28060                    | 3.49                     | 23   | 335                             | 1.68              | 17.90     | 114                     | 56.13                                                             |
| V22                | IET 28070                    | 3.55                     | 21   | 320                             | 2.01              | 20.94     | 88                      | 49.00                                                             |
| V23                | IET 28823                    | -                        |      | -                               | -                 | -         | -                       |                                                                   |
| V24                | IET 28074                    | 3.80                     | 13   | 237                             | 1.82              | 19.87     | 121                     | 55.88                                                             |
| V25                | IET 28064                    | 3.98                     | 10   | 283                             | 1.85              | 20.89     | 148                     | 50.25                                                             |
| V26                | IET 28078                    | -                        |      | -                               | -                 | -         | -                       |                                                                   |
| V27                | IET 28072                    | 3.80                     | 13   | 301                             | 1.90              | 27.21     | 116                     | 48.38                                                             |
| V28                | IET 28776                    | 3.40                     | 28   | 238                             | 1.39              | 22.03     | 126                     | 48.25                                                             |
| V29                | IET 28824                    | 3.23                     | 32   | 296                             | 1.91              | 29.83     | 91                      | 39.25                                                             |
| V30                | IET 28075                    | 4.12                     | 8    | 300                             | 2.19              | 19.59     | 123                     | 41.75                                                             |
| V31                | IET 28077                    | 3.42                     | 27   | 294                             | 1.70              | 22.42     | 129                     | 51.75                                                             |
| V32                | IET 28825                    | 4.24                     | 5    | 187                             | 2.05              | 21.33     | 121                     | 49.50                                                             |
| V33                | Rasi                         | 3.12                     | 33   | 222                             | 2.22              | 19.42     | 122                     | 52.13                                                             |
| V34                | Swarna                       | 3.79                     | 15   | 262                             | 1.99              | 19.98     | 133                     | 47.50                                                             |
|                    | Improved Samba               |                          |      |                                 |                   |           |                         |                                                                   |
| V35                | Mahsuri                      | 3.11                     | 34   | 267                             | 1.88              | 20.64     | 120                     | 52.50                                                             |
| V36                | BPT 5204                     | 3.33                     | 30   | 207                             | 1.64              | 17.31     | 127                     | 50.38                                                             |
|                    | C.D.(0.05)                   | 0.12                     |      | 18.6                            | 0.11              | 1.13      | 5.62                    |                                                                   |
|                    | C.V.(%)                      | 3.35                     |      | 7.35                            | 5.92              | 5.89      | 4.68                    |                                                                   |
|                    | Expt. Mean                   | 3.75                     |      | 274                             | 1.93              | 20.74     | 130                     |                                                                   |
|                    | Soil type                    | Clay loam                |      |                                 |                   |           |                         |                                                                   |
|                    | pH                           | -                        |      |                                 |                   |           |                         |                                                                   |
|                    | N - levels (kg/ha)           |                          |      |                                 |                   |           |                         |                                                                   |
|                    | F1                           | 20                       |      |                                 |                   |           |                         |                                                                   |
|                    | F2                           | 40                       |      |                                 |                   |           |                         |                                                                   |
|                    | F3                           | 60                       |      |                                 |                   |           |                         |                                                                   |
|                    | Recommended NPK (kg/ha)      | 120:60:40                |      |                                 |                   |           |                         |                                                                   |
|                    | Availabe NPK of soil (kg/ha) | -                        |      |                                 |                   |           |                         |                                                                   |

#### 4.1(n) Grain Yield Efficiency Index values (GYEI):

Grain yield is the best measure for evaluation of given genotype in the screening experiments. Field screening results can be interpreted using the grain yield efficiency index (GYEI) for identifying efficient, stable, suitable and promising cultures at various levels of nutrient application.

Grain yield efficiency Index (GYEI) was computed for genotype evaluation using the following formula in the present Nitrogen variety evaluation trial.

$$\text{GYEI} = \frac{(\text{Yield at low nutrient level}) (\text{Yield at high nutrient level})}{(\text{Experimental mean yield at low nutrient level}) \times (\text{Experimental mean yield at high nutrient level})}$$

Tolerant genotypes have a (GYEI) of 1 or higher and the susceptible ones have a GYEI in the range of 0 to 0.50 and the genotypes between these two limits are considered intermediate types. The results of these trials, if utilized meticulously not only aid to develop promising cultivars but also to reduce the cost of cultivation in rice production.

**Based on the GYEI values few promising cultivars identified in different groups is furnished below:**

Based on the Grain yield efficiency index GYEI values (stable and efficient genotypes), the top ten identified cultures were viz., IET 25838 (1.33), IET 26579 (1.28) and IET 26594 (1.26) in AVT-MH (irrigated); IET 25713 (1.20), IET 26477 (1.17), IET 24914 (1.12) and IET 26767 (1.06) in AVT-2 E-TP; IET 24950 (1.33) and IET 25745 (1.18) in AVT-2 IME-TP; IET 27263 (1.26) and IET 26420 (1.16) in AVT-IM-TP; IET 26974 (1.15), IET 26948 (1.12) and IET 25948 (1.11) in AVT-2 L' IET 25802 (1.18), IET 25798 and IET 26549 (1.05) in AVT-2 MS; IET 26692 (1.46) in AVT-2 RSL; IET 27077 (1.27) in AL-ISTVT; IET 26999 (1.21) in AVT-2 BT; IET 27179 (1.25) in AVT-2 Bio-fortified; IET 27280 (1.31) and IET 27285 (1.16) in AVT-2 NIL BL&BLB. Further critical analysis of the data based on higher GYEI, as well as lesser yield reduction in reduced nutrient application (50% of RDF) over 100% RDF, a total Twelve cultures identified viz., IET 25838 in AVT-MH irrigated; IET 26477 and IET 24954 in AVT-2 E; IET 25745 in AVT-2 IME-TP; IET 26420 in IM-TP; IET 25948 in AVT-2 Late; IET 25802 in AVT\_2 MS; IET 27077 in AVT-2 AL&ISTVT; IET 26999 in AVT-2 BT; IET 27179 in AVT-2 Bio-fortified; IET 27285 and IET 27280 in AVT-2 NIL (BL&BLB) (Table. 4.1.n & 4.1. o) were identified as higher nutrient use and efficient cultures during kharif 2019. These cultures can be recommended for low input management.

With regards to evaluate to identify high nitrogen and phosphorous use efficient cultures, four IET cultures viz., IET 27730 and IET 28084 (1.35), IET 28087 (1.29) and IET 28831 (1.18) were found promising with higher mean GYEI value for Nitrogen: IET 28081 (30.09%) and IET 28087 (48.79%) recorded lesser grain yield reduction due to reduction in 'N' level with higher GYEI hence considered to be promising cultures.

Phosphorous use efficiency of 32 cultures tested varied with GYEI values 0.73 to 1.67. the best cultures identified were IET 28816 (1.67) followed by IET 28819 (1.41), IET 28063 (1.38), IET 27641 (1.35) and IET 28075 (1.35) (Table. 4.1.n &4.1.o). however, there was no yield reduction due to 50% of P application in IET 28071, IET 28063, IET 28067, IET 28820, IET 28822, IET 28076, IET 28821 which are found to be high 'P' use efficient cultures and superior to Rasi (Test entry).

**Table. 4.1(n): Identification of cultures based on the GYEI values in different groups of cultivars.**

| AVT-2 EH (Irrigated) |                 |      | AVT-2 MH (Irrigated) |              |      | AVT-2 E-TP     |                |      | AVT-2-IME (TP) |                |      |
|----------------------|-----------------|------|----------------------|--------------|------|----------------|----------------|------|----------------|----------------|------|
| Nutrient-Levels      | Varieties       | GYEI | Nutrient-Level       | Varieties    | GYEI | Nutrient-Level | Varieties      | GYEI | Nutrient-Level | Varieties      | GYEI |
| F2                   | IET 26565       | 0.88 | F2                   | IET 26579    | 1.28 | F2             | IET 26767      | 1.06 | F2             | IET 24950      | 1.33 |
|                      | Shalimar Rice-3 | 1.06 |                      | IET 26594    | 1.26 |                | IET 26803      | 0.77 |                | IET 25745      | 1.18 |
|                      | Vivekdhan-86    | 1.04 |                      | IET 25838    | 1.33 |                | IET 26477      | 1.17 |                | NC- IR 64      | 0.84 |
|                      | VL Dhan-86      | 0.62 |                      | Vivekdhan-62 | 1.16 |                | IET 24914      | 1.12 |                | ZC- PR 113 (N) | 1.23 |
|                      | Local Check     | 1.83 |                      | V L Dhan-65  | 0.83 |                | IET 25713      | 1.20 |                | Lalat (E & NE) | 0.85 |
|                      |                 |      |                      | Local Check  | 1.37 |                | Sahbhagidhan   | 0.90 |                | Karjat 7 (W)   | 0.84 |
|                      |                 |      |                      |              |      |                | Vandana        | 0.82 |                | MTU 1010       | 0.96 |
|                      |                 |      |                      |              |      |                | ZC-Govind (NW) | 0.77 |                | HC- US 312     | 0.46 |
|                      |                 |      |                      |              |      |                | Narendra 97 E  | 1.14 |                | Local check    | 0.89 |
|                      |                 |      |                      |              |      |                | Varalu         | 0.88 |                |                |      |
|                      |                 |      |                      |              |      |                | CR Dhan 201    | 0.87 |                |                |      |
|                      |                 |      |                      |              |      |                | Local check    | 1.05 |                |                |      |
|                      |                 |      |                      |              |      |                |                |      |                |                |      |
|                      | Mean            | 1.09 |                      |              | Mean |                | 1.20           |      |                | Mean           | 0.98 |

Table. 4.1(n): Cntd...

| AVT-2 IM (TP)  |                  |      | AVT-2 L        |              |      | AVT-2 MS       |           |      | AVT 2 - RSL    |             |      |
|----------------|------------------|------|----------------|--------------|------|----------------|-----------|------|----------------|-------------|------|
| Nutrient-Level | Varieties        | GYEI | Nutrient-Level | Varieties    | GYEI | Nutrient-Level | Varieties | GYEI | Nutrient-Level | Varieties   | GYEI |
| F2             | IET 27263        | 1.26 | F2             | IET 26927    | 0.95 | F2             | IET 26549 | 1.06 | F2             | IET 26692   | 1.46 |
|                | IET 26418        | 1.00 |                | IET 26974    | 1.15 |                | IET 27136 | 0.95 |                | Dhanrasi    | 0.68 |
|                | IET 26420        | 1.16 |                | IET 25948    | 1.11 |                | IET 25802 | 1.18 |                | Pooja       | 0.81 |
|                | NC-NDR 359       | 1.34 |                | IET 26948    | 1.12 |                | IET 25798 | 1.06 |                | Savithri    | 0.78 |
|                | ZC- Pant Dhan-19 | 0.82 |                | Samba Masuri | 0.84 |                | IET 24990 | 0.96 |                | Local Check | 1.02 |
|                | NDR 8002 (E&C)   | 0.78 |                | Swarna       | 0.90 |                | DRRH 3    | 1.03 |                |             |      |
|                | Jaya (NE & S)    | 0.80 |                | Pushyami     | 0.96 |                | 27 P 63   | 1.01 |                |             |      |
|                | Akshayadhan (W)  | 0.77 |                | Local Check  | 0.90 |                | KRH 4     | 1.00 |                |             |      |
|                | Local Check      | 1.05 |                |              |      |                | WGL 14    | 0.82 |                |             |      |
|                |                  |      |                |              |      |                |           |      |                | Local Check | 0.28 |
| Mean           | 1.00             |      | Mean           | 0.99         |      | Mean           | 1.03      |      | Mean           | 0.95        |      |

Table. 4.1(n): Cntd...

| AL & ISTVT     |             |             | AVT-2 BT       |              |             | AVT 2- Biofotified |                |             | AVT 2- NIL BL, BLB |             |             |
|----------------|-------------|-------------|----------------|--------------|-------------|--------------------|----------------|-------------|--------------------|-------------|-------------|
| Nutrient-Level | Varieties   | GYEI        | Nutrient-Level | Varieties    | GYEI        | Nutrient-Level     | Varieties      | GYEI        | Nutrient-Level     | Varieties   | GYEI        |
| <b>F2</b>      | IET 27077   | 1.27        | <b>F2</b>      | IET 26995    | 0.93        | <b>F2</b>          | IET 27179      | 1.25        | <b>F2</b>          | IET 27285   | 1.16        |
|                | CSR-10      | 0.84        |                | IET 26999    | 1.21        |                    | BPT 5204       | 1.28        |                    | IET 27294   | 0.91        |
|                | CSR-23      | 1.00        |                | Sugandhamati | 0.70        |                    | Chittimuthyalu | 0.73        |                    | IET 27280   | 1.31        |
|                | CSR-36      | 1.05        |                | Tulasi       | 0.89        |                    | IR 64          | 1.42        |                    | IET 27286   | 0.96        |
|                | Jaya        | 0.93        |                | Local Check  | 0.78        |                    | Kalanamak      | 0.70        |                    | IET 28014   | 0.82        |
|                | Local Check | 1.04        |                |              |             |                    |                |             |                    | BPT 5204    | 1.13        |
|                |             |             |                |              |             |                    |                |             |                    | Swarna      | 0.96        |
|                |             |             |                |              |             |                    |                |             |                    | RP Bio 226  | 0.76        |
|                |             |             |                |              |             |                    |                |             |                    | Local Check | 1.65        |
|                | <b>Mean</b> | <b>1.02</b> |                | <b>Mean</b>  | <b>0.90</b> |                    | <b>Mean</b>    | <b>1.08</b> |                    | <b>Mean</b> | <b>1.07</b> |

Table. 4.1(n): Cntd...

| IVT NIL LNT        |                           |             |                    |                           |             |                    |                           |             | Mean<br>GYEI | Rank      |
|--------------------|---------------------------|-------------|--------------------|---------------------------|-------------|--------------------|---------------------------|-------------|--------------|-----------|
| Nutrient-<br>Level | Varieties                 | GYEI        | Nutrient-<br>Level | Varieties                 | GYEI        | Nutrient-<br>Level | Varieties                 | GYEI        |              |           |
| <b>N2</b>          | IET 28081                 | 1.07        | <b>N3</b>          | IET 28081                 | 1.10        | <b>N4</b>          | IET 28081                 | 1.17        | <b>1.11</b>  | <b>9</b>  |
|                    | IET 28080                 | 0.97        |                    | IET 28080                 | 1.15        |                    | IET 28080                 | 1.23        | <b>1.12</b>  | <b>8</b>  |
|                    | IET 28084                 | 1.45        |                    | IET 28084                 | 1.10        |                    | IET 28084                 | 1.48        | <b>1.35</b>  | <b>2</b>  |
|                    | IET 28086                 | 1.13        |                    | IET 28086                 | 1.26        |                    | IET 28086                 | 0.84        | <b>1.08</b>  | <b>11</b> |
|                    | IET 28087                 | 1.53        |                    | IET 28087                 | 1.04        |                    | IET 28087                 | 1.29        | <b>1.29</b>  | <b>3</b>  |
|                    | IET 28083                 | 1.02        |                    | IET 28083                 | 1.15        |                    | IET 28083                 | 0.79        | <b>0.98</b>  | <b>13</b> |
|                    | IET 27730                 | 1.36        |                    | IET 27730                 | 1.35        |                    | IET 27730                 | 1.36        | <b>1.35</b>  | <b>1</b>  |
|                    | IET 28088                 | 1.06        |                    | IET 28088                 | 0.88        |                    | IET 28088                 | 1.27        | <b>1.07</b>  | <b>12</b> |
|                    | IET 28085                 | 0.65        |                    | IET 28085                 | 0.83        |                    | IET 28085                 | 0.60        | <b>0.69</b>  | <b>25</b> |
|                    | IET 28079                 | 1.08        |                    | IET 28079                 | 0.98        |                    | IET 28079                 | 0.88        | <b>0.98</b>  | <b>15</b> |
|                    | IET 28082                 | 0.78        |                    | IET 28082                 | 0.81        |                    | IET 28082                 | 0.73        | <b>0.77</b>  | <b>23</b> |
|                    | IET 28826                 | 0.95        |                    | IET 28826                 | 1.00        |                    | IET 28826                 | 0.91        | <b>0.95</b>  | <b>18</b> |
|                    | IET 28827                 | 0.95        |                    | IET 28827                 | 1.24        |                    | IET 28827                 | 1.21        | <b>1.13</b>  | <b>7</b>  |
|                    | IET 28828                 | 1.29        |                    | IET 28828                 | 0.75        |                    | IET 28828                 | 0.91        | <b>0.98</b>  | <b>14</b> |
|                    | IET 28829                 | 0.63        |                    | IET 28829                 | 0.95        |                    | IET 28829                 | 0.69        | <b>0.76</b>  | <b>24</b> |
|                    | IET 28830                 | 1.12        |                    | IET 28830                 | 1.17        |                    | IET 28830                 | 1.22        | <b>1.17</b>  | <b>6</b>  |
|                    | IET 28831                 | 1.31        |                    | IET 28831                 | 1.17        |                    | IET 28831                 | 1.05        | <b>1.18</b>  | <b>5</b>  |
|                    | IET 28832                 | 1.19        |                    | IET 28832                 | 0.94        |                    | IET 28832                 | 1.17        | <b>1.10</b>  | <b>10</b> |
|                    | IET 28833                 | 0.88        |                    | IET 28833                 | 0.86        |                    | IET 28833                 | 0.91        | <b>0.88</b>  | <b>19</b> |
|                    | Rasi                      | 0.70        |                    | Rasi                      | 0.89        |                    | Rasi                      | 0.82        | <b>0.80</b>  | <b>20</b> |
|                    | Improved Samba<br>Mahsuri | 0.95        |                    | Improved Samba<br>Mahsuri | 0.67        |                    | Improved Samba<br>Mahsuri | 0.75        | <b>0.79</b>  | <b>22</b> |
|                    | Varadhan                  | 0.66        |                    | Varadhan                  | 0.98        |                    | Varadhan                  | 0.76        | <b>0.80</b>  | <b>21</b> |
|                    | BPT 5204                  | 0.87        |                    | BPT 5204                  | 0.99        |                    | BPT 5204                  | 1.02        | <b>0.96</b>  | <b>17</b> |
|                    | Swarna                    | 0.97        |                    | Swarna                    | 0.99        |                    | Swarna                    | 0.97        | <b>0.97</b>  | <b>16</b> |
|                    | Tella Hamsa               | 0.81        |                    | Tella Hamsa               | 1.78        |                    | Tella Hamsa               | 1.10        | <b>1.23</b>  | <b>4</b>  |
|                    | <b>Mean</b>               | <b>1.01</b> |                    | <b>Mean</b>               | <b>1.04</b> |                    | <b>Mean</b>               | <b>1.01</b> | <b>1.02</b>  |           |

Table. 4.1(n): Cntd...

| IVT NIL LPT    |                |      | Rank |
|----------------|----------------|------|------|
| Nutrient-Level | Varieties      | GYEI |      |
| P2             | IET 28066      | 0.97 | 22   |
|                | IET 28073      | 0.88 | 26   |
|                | IET 28063      | 1.38 | 3    |
|                | IET 28069      | 1.28 | 6    |
|                | IET 28059      | 0.75 | 31   |
|                | IET 28071      | 1.15 | 13   |
|                | IET 28816      | 1.67 | 1    |
|                | IET 28065      | 1.21 | 10   |
|                | IET 28061      | 1.25 | 8    |
|                | IET 28817      | 0.52 | 35   |
|                | IET 28818      | 0.82 | 29   |
|                | IET 27641      | 1.35 | 4    |
|                | IET 28076      | 1.35 | 5    |
|                | IET 28063      | 0.99 | 20   |
|                | IET 28819      | 1.41 | 2    |
|                | IET 28820      | 0.73 | 33   |
|                | IET 28062      | 0.74 | 32   |
|                | IET 28821      | 0.70 | 34   |
|                | IET 28822      | 1.07 | 15   |
|                | IET 28067      | 1.07 | 17   |
|                | IET 28060      | 1.07 | 16   |
|                | IET 28070      | 1.10 | 14   |
|                | IET 28823      |      |      |
|                | IET 28074      | 1.21 | 9    |
|                | IET 28064      | 1.27 | 7    |
|                | IET 28078      | 0.87 | 27   |
|                | IET 28072      | 1.19 | 12   |
|                | IET 28776      | 1.04 | 19   |
|                | IET 28824      | 0.96 | 23   |
|                | IET 28075      | 1.20 | 11   |
|                | IET 28077      | 0.97 | 21   |
|                | IET 28825      | 1.05 | 18   |
|                | Rasi           | 0.82 | 30   |
|                | Swarna         | 0.90 | 25   |
|                | Improved Samba |      |      |
|                | Mahsuri        | 0.86 | 28   |
|                | BPT 5204       | 0.92 | 24   |
|                | Mean           | 1.05 |      |

**Table. 4.1. (o): Identification of cultures performing better with low level of Nutrients application based on the % yield reduction at 50 % of RDN and 100% of RDN**

| Group          | Group | Entry No             | 50   | 100  | Difference -50 | (%) Reduction |
|----------------|-------|----------------------|------|------|----------------|---------------|
| EH (Irrigated) | V1    | IET 26565            | 3.74 | 4.30 | 0.56           | 13.02         |
|                | V2    | Shalimar Rice-3      | 3.94 | 4.90 | 0.97           | 19.69         |
|                | V3    | Vivekdhan-86         | 4.09 | 4.67 | 0.58           | 12.43         |
|                | V4    | VL Dhan-86           | 3.18 | 3.54 | 0.36           | 10.17         |
|                | V5    | Local Check          | 5.16 | 6.49 | 1.33           | 20.51         |
| MH (Irriaged)  | V1    | IET 26579            | 4.21 | 4.08 | -0.12          | -3.05         |
|                | V2    | IET 26594            | 3.83 | 4.42 | 0.59           | 13.24         |
|                | V3    | IET 25838            | 3.96 | 4.54 | 0.58           | 12.81         |
|                | V4    | Vivekdhan-62         | 3.99 | 3.92 | -0.07          | -1.66         |
|                | V5    | V L Dhan-65 (N)      | 3.77 | 2.97 | -0.80          | -26.91        |
|                | V6    | Local Check          | 3.75 | 4.89 | 1.14           | 23.30         |
| E(TP)          | V1    | IET 26767            | 4.46 | 5.19 | 0.73           | 14.11         |
|                | V2    | IET 26803            | 3.59 | 4.67 | 1.08           | 23.13         |
|                | V3    | IET 26477            | 4.92 | 5.19 | 0.27           | 5.25          |
|                | V4    | IET 24914            | 4.70 | 5.18 | 0.48           | 9.27          |
|                | V5    | IET 25713            | 4.64 | 5.61 | 0.96           | 17.19         |
|                | V6    | NC- Sahbhagidhan     | 4.18 | 4.70 | 0.52           | 11.00         |
|                | V7    | Vandana              | 3.78 | 4.72 | 0.94           | 19.94         |
|                | V8    | ZC-Govind (NW)       | 3.87 | 4.33 | 0.46           | 10.55         |
|                | V9    | Narendra 97 E        | 4.77 | 5.20 | 0.43           | 8.27          |
|                | V10   | Varalu               | 4.16 | 4.59 | 0.43           | 9.28          |
|                | V11   | CR Dhan 201 (W&S)    | 4.27 | 4.46 | 0.19           | 4.26          |
|                | V12   | Local check          | 4.51 | 5.05 | 0.54           | 10.75         |
| Group          | Group | Entry No             | 50   | 100  | Difference -50 | (%) Reduction |
| IME (TP)       | V1    | IET 24950            | 5.39 | 5.75 | 0.36           | 6.20          |
|                | V2    | IET 25745            | 5.15 | 5.37 | 0.22           | 4.13          |
|                | V3    | NC- IR 64            | 4.32 | 4.57 | 0.25           | 5.53          |
|                | V4    | ZC- PR 113 (N)       | 5.37 | 5.36 | -0.01          | -0.14         |
|                | V5    | Lalat (E & NE)       | 4.37 | 4.57 | 0.20           | 4.42          |
|                | V6    | Karjat 7 (W)         | 4.39 | 4.45 | 0.06           | 1.44          |
|                | V7    | MTU 1010 (C & S)     | 4.61 | 4.86 | 0.25           | 5.13          |
|                | V8    | HC- US 312           | 2.86 | 3.74 | 0.88           | 23.43         |
|                | V9    | Local check          | 4.49 | 4.65 | 0.16           | 3.47          |
| Group          | Group | Entry No             | 100  | 150  | Difference -50 | (%) Reduction |
| IM (TP)        | V1    | IET 27263            | 5.34 | 5.98 | 0.64           | 10.77         |
|                | V2    | IET 26418            | 4.76 | 5.35 | 0.58           | 10.94         |
|                | V3    | IET 26420            | 5.24 | 5.65 | 0.41           | 7.27          |
|                | V4    | NC-NDR 359           | 5.58 | 6.11 | 0.53           | 8.67          |
|                | V5    | ZC- Pant Dhan-19 (N) | 4.35 | 4.79 | 0.44           | 9.19          |
|                | V6    | NDR 8002 (E&C)       | 4.19 | 4.73 | 0.53           | 11.31         |
|                | V7    | Jaya (NE & S)        | 4.29 | 4.73 | 0.44           | 9.39          |
|                | V8    | Akshayadhan (W)      | 4.21 | 4.65 | 0.45           | 9.63          |
|                | V9    | Local Check          | 4.95 | 5.40 | 0.45           | 8.29          |
| Group          | Group | Entry No             | 100  | 150  | Difference -50 | (%) Reduction |
| Late           | V1    | IET 26927            | 4.89 | 5.27 | 0.39           | 7.31          |
|                | V2    | IET 26974            | 5.36 | 5.87 | 0.51           | 8.62          |
|                | V3    | IET 25948            | 5.40 | 5.62 | 0.22           | 3.88          |
|                | V4    | IET 26948            | 5.34 | 5.70 | 0.36           | 6.35          |
|                | V5    | Samba Masuri         | 4.58 | 4.98 | 0.40           | 8.10          |
|                | V6    | Swarna               | 4.82 | 5.10 | 0.28           | 5.54          |
|                | V7    | Pushyami             | 4.95 | 5.29 | 0.34           | 6.47          |
|                | V8    | Local Check          | 4.74 | 5.19 | 0.45           | 8.62          |

Table. 4.1. (o): Cntd....

| Group        | Group | Entry No       | 100  | 150  | Diffrence -50 | (%) Reduction |
|--------------|-------|----------------|------|------|---------------|---------------|
| MS           | V1    | IET 26549      | 5.70 | 6.12 | 0.43          | 6.95          |
|              | V2    | IET 27136      | 5.36 | 5.85 | 0.48          | 8.28          |
|              | V3    | IET 25802      | 6.06 | 6.42 | 0.36          | 5.63          |
|              | V4    | IET 25798      | 5.61 | 6.26 | 0.64          | 10.27         |
|              | V5    | IET 24990      | 5.39 | 5.84 | 0.45          | 7.70          |
|              | V6    | DRRH 3         | 5.52 | 6.18 | 0.66          | 10.63         |
|              | V7    | 27 P 63        | 5.58 | 5.96 | 0.38          | 6.34          |
|              | V8    | KRH 4          | 5.57 | 5.92 | 0.35          | 5.89          |
|              | V9    | WGL 14         | 4.98 | 5.46 | 0.47          | 8.64          |
|              | V10   | Local Check    | 2.60 | 3.52 | 0.92          | 26.14         |
| Group        | Group | Entry No       | 100  | 150  | Diffrence -50 | (%) Reduction |
| RSL          | V1    | IET 26692      | 4.43 | 4.92 | 0.49          | 10.00         |
|              | V2    | Dhanrasi       | 3.00 | 3.36 | 0.36          | 10.71         |
|              | V3    | Pooja          | 3.23 | 3.74 | 0.51          | 13.63         |
|              | V4    | Savithri       | 3.13 | 3.70 | 0.56          | 15.25         |
|              | V5    | Local Check    | 3.74 | 4.06 | 0.32          | 7.84          |
| Group        | Group | Entry No       | 100  | 150  | Diffrence -50 | (%) Reduction |
| AL&ISTVT     | V1    | IET 27077      | 5.59 | 6.03 | 0.45          | 7.40          |
|              | V2    | CSR-10         | 4.50 | 4.92 | 0.41          | 8.41          |
|              | V3    | CSR-23         | 5.09 | 5.22 | 0.13          | 2.49          |
|              | V4    | CSR-36         | 4.98 | 5.56 | 0.59          | 10.52         |
|              | V5    | Jaya           | 4.78 | 5.16 | 0.39          | 7.49          |
|              | V6    | Local Check    | 4.99 | 5.49 | 0.50          | 9.10          |
| Group        | Group | Entry No       | 100  | 150  | Diffrence -50 | (%) Reduction |
| BT           | V1    | IET 26995      | 3.48 | 3.80 | 0.32          | 8.46          |
|              | V2    | IET 26999      | 4.05 | 4.27 | 0.22          | 5.26          |
|              | V3    | Sugandhamati   | 3.05 | 3.26 | 0.21          | 6.30          |
|              | V4    | Tulasi         | 3.32 | 3.82 |               |               |
|              | V5    | Local Check    | 3.17 | 3.49 | 0.31          | 8.99          |
| Biofortified | V1    | IET 27179      | 4.58 | 4.98 | 0.40          | 8.04          |
|              | V2    | BPT 5204       | 4.55 | 5.10 | 0.55          | 10.78         |
|              | V3    | Chittimuthyalu | 3.55 | 3.74 | 0.19          | 5.15          |
|              | V4    | IR 64          | 4.93 | 5.25 | 0.32          | 6.17          |
|              | V5    | Kalanamak      | 3.40 | 3.74 | 0.34          | 9.06          |
| Group        | Group | Entry No       | 100  | 150  | Diffrence -50 | (%) Reduction |
| NIL BL, BLB  | V1    | IET 27285      | 4.89 | 5.05 | 0.16          | 3.12          |
|              | V2    | IET 27294      | 4.38 | 4.41 | 0.02          | 0.57          |
|              | V3    | IET 27280      | 5.21 | 5.37 | 0.16          | 2.98          |
|              | V4    | IET 27286      | 4.42 | 4.63 | 0.22          | 4.64          |
|              | V5    | IET 28014      | 4.04 | 4.31 | 0.28          | 6.38          |
|              | V6    | BPT 5204       | 4.78 | 5.05 | 0.27          | 5.40          |
|              | V7    | Swarna         | 4.36 | 4.72 | 0.36          | 7.58          |
|              | V8    | RP Bio 226     | 3.87 | 4.22 | 0.35          | 8.36          |
|              | V9    | Local Check    | 6.20 | 5.66 | -0.54         | -9.54         |

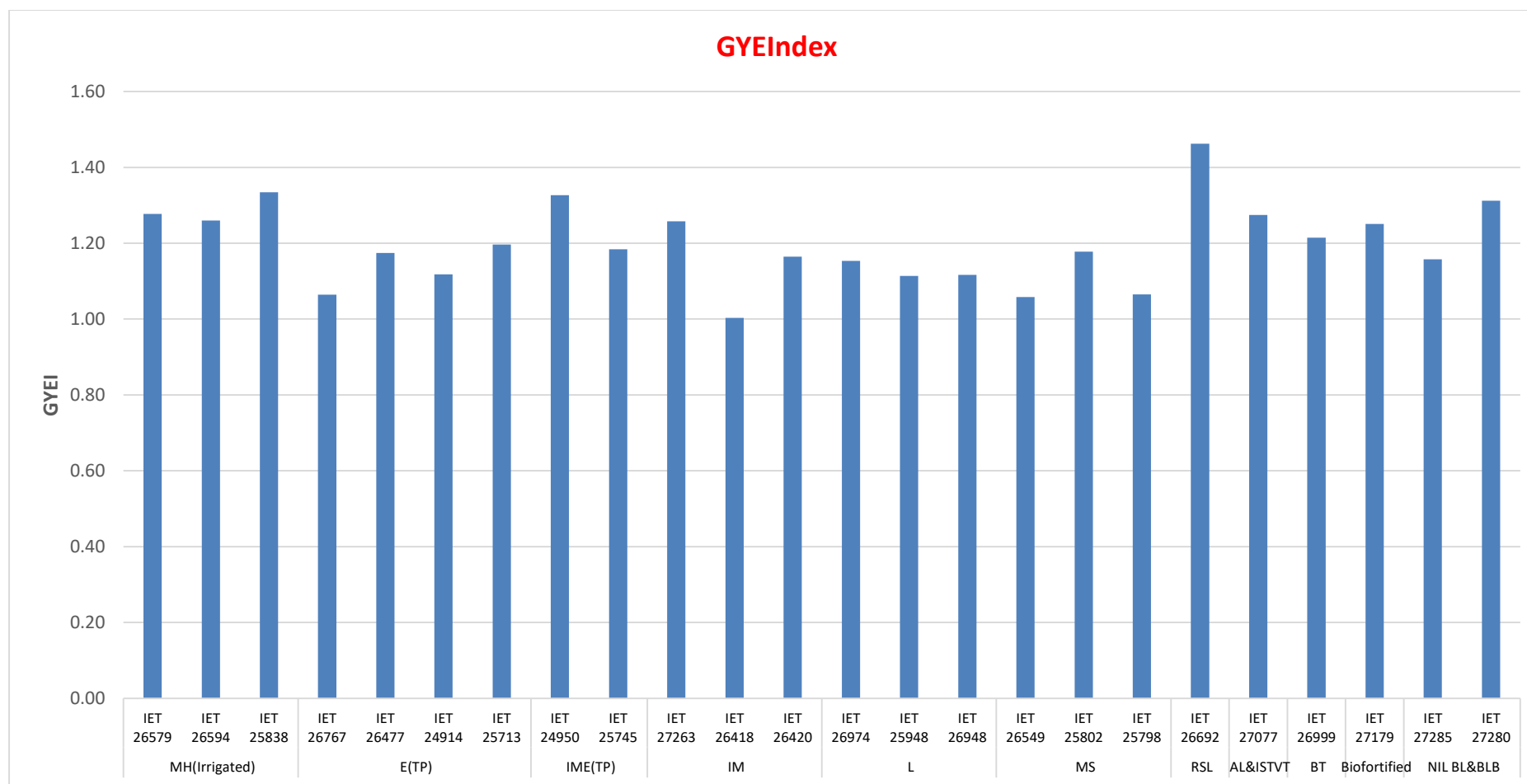
Table. 4.1. (o): Cntd....

| Group   | Group | Entry No               | 0% RDN | 50% RDN | 100% RDN | 150% RDN | 0-50% difference | Reduction % | 50-100% difference | Reduction % | 100-150% difference | Reduction % | Mean Grain Yield difference | Mean Reduction % |
|---------|-------|------------------------|--------|---------|----------|----------|------------------|-------------|--------------------|-------------|---------------------|-------------|-----------------------------|------------------|
| NIL LNT | V1    | IET 28081              | 2.34   | 3.89    | 5.07     | 6.96     | 1.55             | 39.88       | 1.18               | 23.26       | 1.89                | 27.12       | 1.54                        | 30.09            |
|         | V2    | IET 28080              | 2.27   | 3.63    | 4.69     | 7.55     | 1.35             | 37.29       | 2.41               | 51.50       | 5.28                | 69.89       | 3.01                        | 52.89            |
|         | V3    | IET 28084              | 2.57   | 4.80    | 5.15     | 8.03     | 2.22             | 46.36       | 2.57               | 50.01       | 5.46                | 67.95       | 3.42                        | 54.77            |
|         | V4    | IET 28086              | 2.25   | 4.29    | 4.78     | 5.21     | 2.04             | 47.60       | 2.53               | 53.00       | 2.96                | 56.88       | 2.51                        | 52.49            |
|         | V5    | IET 28087              | 2.75   | 4.73    | 5.15     | 6.55     | 1.97             | 41.76       | 2.39               | 46.49       | 3.80                | 57.96       | 2.72                        | 48.74            |
|         | V6    | IET 28083              | 2.11   | 4.10    | 4.76     | 5.21     | 1.99             | 48.46       | 2.64               | 55.57       | 3.10                | 59.44       | 2.58                        | 54.49            |
|         | V7    | IET 27730              | 2.53   | 4.57    | 6.36     | 7.49     | 2.05             | 44.75       | 3.83               | 60.25       | 4.96                | 66.27       | 3.61                        | 57.09            |
|         | V8    | IET 28088              | 2.22   | 4.06    | 5.35     | 7.99     | 1.84             | 45.29       | 3.13               | 58.47       | 5.77                | 72.22       | 3.58                        | 58.66            |
|         | V9    | IET 28085              | 1.73   | 3.18    | 4.05     | 4.88     | 1.46             | 45.74       | 2.33               | 57.39       | 3.15                | 64.62       | 2.31                        | 55.92            |
|         | V10   | IET 28079              | 2.15   | 4.28    | 5.15     | 5.68     | 2.13             | 49.73       | 3.00               | 58.21       | 3.53                | 62.09       | 2.89                        | 56.68            |
|         | V11   | IET 28082              | 1.98   | 3.35    | 4.22     | 5.12     | 1.36             | 40.71       | 2.24               | 53.00       | 3.14                | 61.26       | 2.25                        | 51.66            |
|         | V12   | IET 28826              | 2.00   | 4.04    | 5.46     | 6.35     | 2.04             | 50.43       | 3.46               | 63.34       | 4.35                | 68.50       | 3.28                        | 60.76            |
|         | V13   | IET 28827              | 1.92   | 4.20    | 5.39     | 8.75     | 2.28             | 54.31       | 3.47               | 64.36       | 6.83                | 78.06       | 4.19                        | 65.58            |
|         | V14   | IET 28828              | 2.42   | 4.54    | 4.71     | 5.23     | 2.12             | 46.64       | 2.29               | 48.59       | 2.81                | 53.73       | 2.40                        | 49.65            |
|         | V15   | IET 28829              | 1.66   | 3.22    | 4.20     | 5.81     | 1.56             | 48.38       | 2.53               | 60.37       | 4.15                | 71.37       | 2.75                        | 60.04            |
|         | V16   | IET 28830              | 2.36   | 4.05    | 5.07     | 7.18     | 1.69             | 41.65       | 2.70               | 53.36       | 4.82                | 67.08       | 3.07                        | 54.03            |
|         | V17   | IET 28831              | 2.41   | 4.62    | 5.05     | 6.09     | 2.21             | 47.84       | 2.64               | 52.23       | 3.68                | 60.43       | 2.84                        | 53.50            |
|         | V18   | IET 28832              | 2.43   | 4.15    | 4.84     | 6.72     | 1.71             | 41.33       | 2.41               | 49.75       | 4.29                | 63.79       | 2.80                        | 51.62            |
|         | V19   | IET 28833              | 2.03   | 3.70    | 4.69     | 6.23     | 1.67             | 45.14       | 2.66               | 56.74       | 4.20                | 67.42       | 2.84                        | 56.43            |
|         | V20   | Rasi                   | 1.91   | 3.10    | 4.30     | 5.97     | 1.18             | 38.18       | 2.39               | 55.50       | 4.06                | 67.95       | 2.54                        | 53.88            |
|         | V21   | Improved Samba Mahsuri | 2.16   | 3.75    | 4.45     | 4.83     | 1.59             | 42.36       | 2.29               | 51.43       | 2.67                | 55.28       | 2.18                        | 49.69            |
|         | V22   | Varadhan               | 1.59   | 3.56    | 5.04     | 6.67     | 1.97             | 55.40       | 3.45               | 68.49       | 5.08                | 76.21       | 3.50                        | 66.70            |
|         | V23   | BPT 5204               | 2.03   | 3.65    | 4.94     | 6.99     | 1.62             | 44.43       | 2.91               | 58.88       | 4.96                | 70.96       | 3.16                        | 58.09            |
|         | V24   | Swarna                 | 2.09   | 3.93    | 4.93     | 6.43     | 1.84             | 46.73       | 2.84               | 57.57       | 4.34                | 67.44       | 3.00                        | 57.25            |
|         | V25   | Tella Hamsa            | 2.11   | 3.62    | 4.80     | 7.28     | 1.51             | 41.80       | 2.69               | 56.11       | 5.17                | 71.06       | 3.13                        | 56.33            |

Table. 4.1. (o): Cntd....

| Group   | Group | Entry No                 | 50% P | 100 % P | Difference -50 | (%) Reduction |
|---------|-------|--------------------------|-------|---------|----------------|---------------|
| NIL LPT | V1    | IET 28066                | 3.19  | 4.17    | 0.98           | 23.44         |
|         | V2    | IET 28073                | 3.12  | 3.88    | 0.76           | 19.48         |
|         | V3    | IET 28063                | 4.15  | 4.57    | 0.42           | 9.19          |
|         | V4    | IET 28069                | 3.93  | 4.49    | 0.56           | 12.49         |
|         | V5    | IET 28059                | 2.70  | 3.81    | 1.11           | 29.13         |
|         | V6    | IET 28071                | 4.30  | 3.70    | -0.60          | -16.08        |
|         | V7    | IET 28816                | 4.66  | 4.94    | 0.28           | 5.67          |
|         | V8    | IET 28065                | 3.93  | 4.23    | 0.29           | 6.98          |
|         | V9    | IET 28061                | 3.98  | 4.34    | 0.36           | 8.34          |
|         | V10   | IET 28817                | 2.60  | 2.73    | 0.13           | 4.88          |
|         | V11   | IET 28818                | 3.20  | 3.54    | 0.35           | 9.75          |
|         | V12   | IET 27641                | 4.33  | 4.29    | -0.04          | -0.93         |
|         | V13   | IET 28076                | 4.35  | 4.27    | -0.08          | -1.95         |
|         | V14   | IET 28063                | 3.84  | 3.55    | -0.29          | -8.03         |
|         | V15   | IET 28819                | 3.91  | 4.97    | 1.06           | 21.35         |
|         | V16   | IET 28820                | 3.23  | 3.09    | -0.14          | -4.42         |
|         | V17   | IET 28062                | 3.22  | 3.15    | -0.06          | -2.06         |
|         | V18   | IET 28821                | 3.13  | 3.09    | -0.04          | -1.40         |
|         | V19   | IET 28822                | 3.89  | 3.80    | -0.08          | -2.15         |
|         | V20   | IET 28067                | 3.94  | 3.74    | -0.20          | -5.31         |
|         | V21   | IET 28060                | 3.67  | 4.02    | 0.35           | 8.63          |
|         | V22   | IET 28070                | 3.63  | 4.16    | 0.53           | 12.74         |
|         | V23   | IET 28823                |       | 3.08    | 3.08           |               |
|         | V24   | IET 28074                | 4.01  | 4.16    | 0.16           | 3.80          |
|         | V25   | IET 28064                | 3.72  | 4.72    | 1.00           | 21.21         |
|         | V26   | IET 28078                | 2.77  | 4.33    |                |               |
|         | V27   | IET 28072                | 3.60  | 4.57    | 0.98           | 21.33         |
|         | V28   | IET 28776                | 3.57  | 3.99    | 0.42           | 10.60         |
|         | V29   | IET 28824                | 3.55  | 3.72    | 0.18           | 4.70          |
|         | V30   | IET 28075                | 3.97  | 4.18    | 0.21           | 4.95          |
|         | V31   | IET 28077                | 3.49  | 3.84    | 0.35           | 9.19          |
|         | V32   | IET 28825                | 3.62  | 4.01    | 0.40           | 9.85          |
|         | V33   | Rasi                     | 3.38  | 3.32    | -0.06          | -1.71         |
|         | V34   | Swarna<br>Improved Samba | 3.76  | 3.28    | -0.47          | -14.37        |
|         | V35   | Mahsuri                  | 3.21  | 3.70    | 0.50           | 13.38         |
|         | V36   | BPT 5204                 | 3.74  | 3.41    | -0.33          | -9.64         |

100% RDP      Ludhiana 30 kg/ha  
                     Nellore 40 kg/ha  
                     IIRR 60 kg/ha



**Fig. Promising cultivars identified in different groups based on GYEI**



# CULTURAL MANAGEMENT TRIALS





## 4.2. CULTURAL MANAGEMENT TRIALS (CMTs)

Cultural management practices include all the activities carried out on the farm before, during and after planting of crops like pre-planting, planting and post-planting operations. These practices are adopted to improve crop growth, prevent or reduce weed problems and increase the grain yields in different systems of rice establishment by manipulating the micro climate. With the idea of utilizing economic and effective cultural practices in enhancing grain yields of rain fed, aerobic, direct sown rice under puddle condition, water management, mechanized transplanting a total of eight trials were conducted during *Kharif* 2019 & *Rabi* 2018-19 to enhance production, productivity and profitability of rice. The traditional rice establishment method is transplanting with 30-40 days old rice seedlings, which involves replanting of rice seedlings grown in nurseries to puddled soils. However, rising labour costs and the need to intensify rice production through double and triple cropping, provide economic incentives for a shift to alternative establishment methods, such as direct sowing, mechanical transplanting, seedling broadcasting or a combination of methods. Simultaneously, the availability of high-yielding, short-duration varieties and chemical weed control methods have made such a shift technically viable.

### 4.2.1. Development of package of practices for mechanized transplanting

Mechanical transplanting of rice is the process of transplanting young rice seedlings, which have been grown in a mat nursery, using a paddy transplanter. In conventional manual transplanting practice, 8-12 labourers are required to transplant one acre. The process is also very time consuming and difficult. However, if self-propelled paddy transplanters are used, three people can transplant up to three to four acres in one day. This has great advantages in areas where farm labor is scarce and expensive. Hence the present trial is constituted to enhance the productivity of the mechanized transplanted rice with the following objectives: 1) To enhance the productivity of mechanized transplanted rice and 2) To identify the suitable agronomic management practices to enhance the efficiency of mechanized transplanting. The trial was conducted at 7 locations (**Aduthurai, Chiplima, Gangavathi, Puducherry, ARI Rajendranagar, Ranchi and Warangal**). Split plot design was adopted with 3 main plots of crop establishments {M<sub>1</sub>: Normal Planting time Mechanical Transplanting (15 days seedlings and recommended spacing); M<sub>2</sub>: Normal Planting time Mechanical Transplanting (21 days seedling and recommended spacing); M<sub>3</sub>: Delayed Planting time (15 days late) Mechanical Transplanting (15 days seedlings and recommended spacing); M<sub>4</sub>: Manual transplanting – Normal time (25 days old seedlings) and M<sub>5</sub>: Manual transplanting – Delayed sowing time (25 days old seedlings) and 3 subplots consists of local latest released rice varieties. The results were summarized and presented in **Table 4.2.1** and the salient findings are as followed.

At all locations except **Gangavathi** interaction between crop establishment methods and varieties were found to be non-significant.

At **Aduthurai**, among main plot treatments, M<sub>1</sub>{(normal planting time under mechanical transplanting (15 days seedlings with recommended spacing))} resulted

significantly highest grain yield of 4.97 t/ha than those all other treatments. Both manual transplanted treatments either planted in normal time or delayed (M<sub>5</sub> and M<sub>6</sub>) resulted lower grain yield than rest four mechanized transplanting treatments (M<sub>1</sub>, M<sub>2</sub>, M<sub>3</sub> and M<sub>4</sub>). ADT-53 resulted higher grain yield (4.57 t/ha) than ADT-43 (4.09 t/ha). Similarly, in sandy clay loam soils at **Chiplima** both M<sub>1</sub> (4.41 t/ha) and M<sub>4</sub> (4.41 t/ha) are found to be equally effective and superior over M<sub>5</sub> (manual transplanting, 2.98 t/ha) in terms of grain yield. Among varieties Arize Gold resulted higher yield (4.0 t/ha) than MTU-1156 (3.62 t/ha). In black clay soils of **Gangavathi**, GGV-05-01 resulted the highest grain yield (8.1 t/ha) under mechanically transplanting of 21 days seedlings at normal time of sowing. In clay soils of **Puducherry**, mechanical transplanting of 15 days seedlings sown at normal time resulted the highest yield (6.3 t/ha). Among the two varieties, TKM 13 (6.27 t/ha) was found to be superior than CR 1009 (6.0 t/ha). In clay loam soils of **Rajendranagar**, mechanically transplanting of 15 days seedlings at normal sowing time resulted the highest grain yield (7.15 t/ha). All mechanically transplanted plots resulted higher yield than manually transplanted plots. Among varieties KNM 733 produced the highest yield (5.84 t/ha), however, similar to RNR 15048 (5.8 t/ha). In clay loam soils of **Ranchi**, mechanically transplanting of 15 days seedlings at normal sowing time resulted the highest grain yield (4.9 t/ha). Among varieties, Naveen yielded (4.32 t/ha) higher than IR 64 DRT1 (4.11 t/ha) and BVD 203 (3.89 t/ha). In clay loam soils of **Warangal**, 15 days delayed mechanical transplanting of 21 days seedlings resulted the highest grain yield of 7.27 t/ha, however, rest of the establishment methods also found equally effective with respect to yield. Both varieties WGL 739 and WGL 915 resulted similar yield of 6.65 and 6.22 t/ha, respectively.

**Mechanical transplanting of 15 days seedlings at normal sowing time resulted the highest grain yield (5.87 t/ha) at five locations out of seven locations.** Among the cultures tested, ADT-53 at **Aduthurai** (4.57 t/ha), Arize Gold at **Chiplima** (4.00 t/ha), GGV -0501 at **Gangavathi** (7.38 t/ha) TKM-13 at **Puducherry** (6.27 t/ha), Naveen at **Ranchi** (4.32 t/ha) were found promising.

Table-4.2.1: Development of package of practices for Mechanized Transplanting, Kharif-2019

| Methods of crop establishment<br>Varieties |    | ADUTHURAI          |                   |                |             | CHIPLIMA              |                  |                |             |                        |
|--------------------------------------------|----|--------------------|-------------------|----------------|-------------|-----------------------|------------------|----------------|-------------|------------------------|
|                                            |    | Grain yield (t/ha) | Panicle/ m² (No.) | Panicle wt (g) | Test wt (g) | Grain yield (t/ha)    | Panicle/m² (No.) | Panicle wt (g) | Test wt (g) | Days for 50% flowering |
| M1                                         | V1 | 5.41               | 326               | 2.46           | 17.3        | 4.22                  | 188              | 6.77           | 25.0        | 74                     |
|                                            | V2 | 4.53               | 306               | 2.35           | 18.3        | 4.59                  | 198              | 7.43           | 25.3        | 85                     |
|                                            | V3 | -                  | -                 | -              | -           | -                     | -                | -              | -           | -                      |
| M2                                         | V1 | 4.52               | 298               | 2.38           | 17.0        | 3.82                  | 170              | 6.27           | 25.7        | 70                     |
|                                            | V2 | 4.05               | 282               | 2.27           | 18.2        | 4.32                  | 158              | 6.57           | 25.0        | 82                     |
|                                            | V3 | -                  | -                 | -              | -           | -                     | -                | -              | -           | -                      |
| M3                                         | V1 | 4.68               | 308               | 2.41           | 17.1        | 3.02                  | 167              | 5.28           | 24.0        | 68                     |
|                                            | V2 | 4.24               | 279               | 2.35           | 18.5        | 3.37                  | 146              | 5.90           | 24.0        | 81                     |
|                                            | V3 | -                  | -                 | -              | -           | -                     | -                | -              | -           | -                      |
| M4                                         | V1 | 4.55               | 287               | 2.30           | 17.0        | 4.24                  | 207              | 6.30           | 25.0        | 74                     |
|                                            | V2 | 4.45               | 269               | 2.22           | 18.1        | 4.58                  | 185              | 7.13           | 26.0        | 84                     |
|                                            | V3 | -                  | -                 | -              | -           | -                     | -                | -              | -           | -                      |
| M5                                         | V1 | 4.01               | 266               | 2.27           | 17.0        | 2.82                  | 133              | 4.87           | 24.0        | 75                     |
|                                            | V2 | 3.43               | 244               | 2.16           | 18.0        | 3.13                  | 175              | 5.30           | 24.0        | 79                     |
|                                            | V3 | -                  | -                 | -              | -           | -                     | -                | -              | -           | -                      |
| M6                                         | V1 | 4.22               | 238               | 2.17           | 17.2        | -                     | -                | -              | -           | -                      |
|                                            | V2 | 3.84               | 211               | 2.14           | 18.1        | -                     | -                | -              | -           | -                      |
|                                            | V3 | -                  | -                 | -              | -           | -                     | -                | -              | -           | -                      |
| Interaction                                |    |                    |                   |                |             |                       |                  |                |             |                        |
| M and S                                    |    | NS                 | NS                | 0.03           | NS          | NS                    | NS               | NS             | NS          | 2.93                   |
| S and M                                    |    | NS                 | NS                | 0.03           | NS          | NS                    | NS               | NS             | NS          | 2.39                   |
| Mean of Methods                            |    |                    |                   |                |             |                       |                  |                |             |                        |
| M1                                         |    | 4.97               | 316               | 2.40           | 17.8        | 4.41                  | 193              | 7.10           | 25.2        | 79                     |
| M2                                         |    | 4.28               | 290               | 2.33           | 17.6        | 4.07                  | 164              | 6.42           | 25.3        | 76                     |
| M3                                         |    | 4.46               | 294               | 2.38           | 17.8        | 3.19                  | 156              | 5.59           | 24.0        | 75                     |
| M4                                         |    | 4.50               | 278               | 2.26           | 17.6        | 4.41                  | 196              | 6.72           | 25.5        | 79                     |
| M5                                         |    | 3.72               | 255               | 2.22           | 17.5        | 2.98                  | 154              | 5.09           | 24.0        | 77                     |
| M6                                         |    | 4.03               | 224               | 2.15           | 17.7        |                       |                  |                |             |                        |
| C.D. (0.05)                                |    | 0.41               | 9.81              | 0.03           | 0.19        | 0.30                  | 23.77            | 0.46           | NS          | 1.64                   |
| C.V. (%)                                   |    | 7.43               | 2.76              | 0.98           | 0.82        | 5.84                  | 10.33            | 5.63           | 4.25        | 1.59                   |
| Mena of Varieties                          |    |                    |                   |                |             |                       |                  |                |             |                        |
| V1                                         |    | 4.57               | 287               | 2.33           | 17.1        | 3.62                  | 173              | 5.90           | 24.7        | 72                     |
| V2                                         |    | 4.09               | 265               | 2.25           | 18.2        | 4.00                  | 172              | 6.47           | 24.9        | 82                     |
| V3                                         |    | -                  | -                 | -              | -           | -                     | -                | -              | -           | -                      |
| CD (0.05)                                  |    | 0.18               | 6.90              | 0.01           | 0.08        | 0.30                  | NS               | 0.42           | NS          | 1.31                   |
| C.V. (%)                                   |    | 5.72               | 3.44              | 0.67           | 0.60        | 9.78                  | 9.64             | 8.34           | 4.16        | 2.09                   |
| Experimental Mean                          |    | 4.33               | 276               | 2.29           | 17.7        | 3.81                  | 173              | 6.18           | 24.8        | 77                     |
| Soil type                                  |    | -                  |                   |                |             | Sandy clay loam       |                  |                |             |                        |
| pH                                         |    | -                  |                   |                |             | -                     |                  |                |             |                        |
| EC                                         |    | -                  |                   |                |             | -                     |                  |                |             |                        |
| Variety & Duration                         |    | ADT 53 120 days    |                   | ADT 43         |             | MTU 1156 & ARIZR GOLD |                  |                |             |                        |
| Available NPK kg/ha                        |    | -                  |                   |                |             | -                     |                  |                |             |                        |

T<sub>1</sub> – Normal planting time Mechanical Transplanting (15 days seedlings)T<sub>2</sub> - Normal planting time Mechanical Transplanting (21 days seedlings)T<sub>3</sub> – Delayed planting time (15 days late) Mechanical transplanting (15 days seedlings)T<sub>4</sub> - Delayed planting time (15 days late) Mechanical transplanting (21 days seedlings)T<sub>5</sub> – Manual transplanting – Normal time (25 days old seedlings)T<sub>6</sub> – Manual transplanting – Delayed sowing time (25 days old seedlings)

Table-4.2.1: Contd....

| Methods of crop establishment | Varieties | GANGAVATHI          |                    |                               |                |             |                      | PUDUCHERRY         |                    |                               |                |             |                      |
|-------------------------------|-----------|---------------------|--------------------|-------------------------------|----------------|-------------|----------------------|--------------------|--------------------|-------------------------------|----------------|-------------|----------------------|
|                               |           | Grain yield (t/ha)  | Straw yield (t/ha) | Panicle/ m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | No of Grains/panicle | Grain yield (t/ha) | Straw yield (t/ha) | Panicle/ m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | No of Grains/panicle |
| M1                            | V1        | 8.04                | 8.92               | 428                           | 2.63           | 14.6        | 166                  | 6.39               | 7.88               | 383                           | 3.44           | 16.7        | 89                   |
|                               | V2        | 6.17                | 7.10               | 393                           | 2.90           | 17.6        | 142                  | 6.21               | 7.61               | 379                           | 3.69           | 25.3        | 113                  |
|                               | V3        | 6.72                | 7.73               | 481                           | 2.66           | 12.8        | 188                  |                    |                    |                               |                |             |                      |
| M2                            | V1        | 8.10                | 9.31               | 357                           | 2.94           | 15.2        | 179                  | 6.31               | 7.78               | 377                           | 3.35           | 16.5        | 89                   |
|                               | V2        | 6.91                | 7.95               | 420                           | 3.29           | 17.8        | 157                  | 6.02               | 7.42               | 197                           | 3.56           | 24.6        | 114                  |
|                               | V3        | 7.03                | 8.08               | 443                           | 2.76           | 13.4        | 187                  |                    |                    |                               |                |             |                      |
| M3                            | V1        | 6.74                | 7.75               | 383                           | 2.89           | 15.1        | 168                  | 6.26               | 7.71               | 369                           | 3.27           | 16.7        | 89                   |
|                               | V2        | 6.43                | 7.39               | 460                           | 3.23           | 16.9        | 166                  | 5.93               | 7.32               | 355                           | 3.43           | 24.8        | 115                  |
|                               | V3        | 6.77                | 7.79               | 440                           | 2.59           | 13.4        | 176                  |                    |                    |                               |                |             |                      |
| M4                            | V1        | 7.35                | 8.45               | 429                           | 2.68           | 15.2        | 163                  | 6.32               | 7.80               | 375                           | 3.36           | 16.6        | 89                   |
|                               | V2        | 6.51                | 7.48               | 425                           | 3.49           | 17.3        | 177                  | 6.04               | 7.44               | 360                           | 3.56           | 24.7        | 115                  |
|                               | V3        | 6.73                | 7.74               | 397                           | 2.29           | 13.0        | 159                  |                    |                    |                               |                |             |                      |
| M5                            | V1        | 6.68                | 7.68               | 434                           | 2.64           | 15.5        | 146                  | 6.07               | 7.49               | 340                           | 3.10           | 16.5        | 90                   |
|                               | V2        | 6.91                | 7.94               | 462                           | 3.08           | 17.0        | 162                  | 5.79               | 7.15               | 337                           | 3.34           | 24.8        | 115                  |
|                               | V3        | 6.38                | 7.34               | 482                           | 2.37           | 13.7        | 160                  |                    |                    |                               |                |             |                      |
| M6                            | V1        | -                   | -                  | -                             | -              | -           | -                    | -                  | -                  | -                             | -              | -           | -                    |
|                               | V2        | -                   | -                  | -                             | -              | -           | -                    | -                  | -                  | -                             | -              | -           | -                    |
|                               | V3        | -                   | -                  | -                             | -              | -           | -                    | -                  | -                  | -                             | -              | -           | -                    |
| Interaction                   |           |                     |                    |                               |                |             |                      |                    |                    |                               |                |             |                      |
| M and S                       |           | 0.65                | NS                 | 35.54                         | NS             | NS          | NS                   | NS                 | NS                 | NS                            | NS             | NS          | NS                   |
| S and M                       |           | 0.64                | NS                 | 33.31                         | NS             | NS          | NS                   | NS                 | NS                 | NS                            | NS             | NS          | NS                   |
| Mean of Methods               |           |                     |                    |                               |                |             |                      |                    |                    |                               |                |             |                      |
| M1                            |           | 6.98                | 7.92               | 434                           | 2.73           | 15.0        | 166                  | 6.30               | 7.75               | 381                           | 3.56           | 21.0        | 101                  |
| M2                            |           | 7.35                | 8.44               | 407                           | 3.00           | 15.4        | 175                  | 6.16               | 7.60               | 287                           | 3.45           | 20.5        | 102                  |
| M3                            |           | 6.65                | 7.65               | 428                           | 2.90           | 15.1        | 170                  | 6.09               | 7.52               | 362                           | 3.35           | 20.8        | 102                  |
| M4                            |           | 6.86                | 7.89               | 417                           | 2.82           | 15.2        | 166                  | 6.18               | 7.62               | 368                           | 3.46           | 20.7        | 102                  |
| M5                            |           | 6.66                | 7.65               | 459                           | 2.70           | 15.4        | 156                  | 5.93               | 7.32               | 338                           | 3.22           | 20.6        | 102                  |
| M6                            |           | -                   | -                  | -                             | -              | -           | -                    | -                  | -                  | -                             | -              | -           | -                    |
| C.D. (0.05)                   |           | NS                  | 0.53               | 21.90                         | NS             | NS          | NS                   | 0.20               | 0.24               | 61.29                         | 0.12           | NS          | NS                   |
| C.V. (%)                      |           | 6.37                | 6.19               | 4.70                          | 9.19           | 2.93        | 7.03                 | 2.51               | 2.43               | 13.26                         | 2.54           | 2.73        | 1.05                 |
| Mean of Varieties             |           |                     |                    |                               |                |             |                      |                    |                    |                               |                |             |                      |
| V1                            |           | 7.38                | 8.42               | 406                           | 2.76           | 15.1        | 164                  | 6.27               | 7.73               | 369                           | 3.30           | 16.6        | 89                   |
| V2                            |           | 6.59                | 7.57               | 432                           | 3.20           | 17.3        | 161                  | 6.00               | 7.39               | 326                           | 3.51           | 24.9        | 115                  |
| V3                            |           | 6.73                | 7.73               | 449                           | 2.53           | 13.3        | 174                  |                    |                    |                               |                |             |                      |
| CD (0.05)                     |           | 0.29                | 0.38               | 15.90                         | 0.22           | 0.35        | NS                   | 0.10               | 0.12               | 36.80                         | 0.06           | 0.38        | 0.71                 |
| C.V. (%)                      |           | 5.51                | 6.28               | 4.87                          | 10.19          | 3.02        | 8.87                 | 2.06               | 1.96               | 13.02                         | 2.11           | 2.26        | 0.86                 |
| Experimental Mean             |           | 6.90                | 7.91               | 429                           | 2.83           | 15.2        | 167                  | 6.13               | 7.56               | 347                           | 3.41           | 20.7        | 102                  |
| Soil type                     |           | Blackclay           |                    |                               |                |             |                      | Clay               |                    |                               |                |             |                      |
| pH                            |           | 8.2                 |                    |                               |                |             |                      | 6.14               |                    |                               |                |             |                      |
| EC                            |           | 1.6                 |                    |                               |                |             |                      | 0.26               |                    |                               |                |             |                      |
| Variety & Duration            |           | GGV-05-01           |                    |                               |                |             |                      | TKM 13 & CR 1009   |                    |                               |                |             |                      |
| Available NPK kg/ha           |           | GNV10-89 & RNR15048 |                    |                               |                |             |                      | 112:15:136         |                    |                               |                |             |                      |

T<sub>1</sub> – Normal planting time Mechanical Transplanting (15 days seedlings)T<sub>2</sub> – Normal planting time Mechanical Transplanting (21 days seedlings)T<sub>3</sub> – Delayed planting time (15 days late) Mechanical transplanting (15 days seedlings)T<sub>4</sub> – Delayed planting time (15 days late) Mechanical transplanting (21 days seedlings)T<sub>5</sub> – Manual transplanting – Normal time (25 days old seedlings)T<sub>6</sub> – Manual transplanting – Delayed sowing time (25 days old seedlings)

Table-4.2.1: Contd....

| Methods of crop establishment | Varieties | RAJENDRANAGAR               |                              |                |             |                        |                      | RANCHI                      |                              |                |             |                      |
|-------------------------------|-----------|-----------------------------|------------------------------|----------------|-------------|------------------------|----------------------|-----------------------------|------------------------------|----------------|-------------|----------------------|
|                               |           | Grain yield (t/ha)          | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days for 50% flowering | No of Grains/panicle | Grain yield (t/ha)          | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | No of Grains/panicle |
| M1                            | V1        | 6.61                        | 362                          | 4.20           | 12.87       | 89                     | 272                  | 4.83                        | 264                          | 3.41           | 24.4        | 106                  |
|                               | V2        | 6.97                        | 430                          | 3.84           | 16.93       | 90                     | 147                  | 5.17                        | 288                          | 3.62           | 24.6        | 111                  |
|                               | V3        | 7.87                        | 425                          | 4.58           | 26.20       | 89                     | 417                  | 4.70                        | 261                          | 3.39           | 24.4        | 104                  |
| M2                            | V1        | 6.43                        | 396                          | 4.28           | 12.87       | 89                     | 348                  | 3.59                        | 206                          | 2.72           | 23.9        | 82                   |
|                               | V2        | 6.08                        | 463                          | 3.10           | 16.97       | 89                     | 157                  | 3.52                        | 220                          | 2.87           | 24.0        | 89                   |
|                               | V3        | 6.36                        | 430                          | 3.18           | 24.73       | 87                     | 221                  | 3.25                        | 201                          | 2.67           | 23.9        | 77                   |
| M3                            | V1        | 5.90                        | 318                          | 3.87           | 13.77       | 86                     | 263                  | 4.38                        | 245                          | 3.37           | 24.4        | 105                  |
|                               | V2        | 5.75                        | 377                          | 4.23           | 15.07       | 85                     | 251                  | 4.76                        | 261                          | 3.52           | 24.4        | 108                  |
|                               | V3        | 5.70                        | 375                          | 4.29           | 24.73       | 86                     | 344                  | 4.17                        | 240                          | 3.27           | 24.2        | 102                  |
| M4                            | V1        | 6.43                        | 352                          | 3.64           | 11.53       | 89                     | 192                  | 4.13                        | 232                          | 3.25           | 24.3        | 102                  |
|                               | V2        | 6.56                        | 377                          | 3.66           | 15.07       | 91                     | 121                  | 4.25                        | 247                          | 3.37           | 24.4        | 105                  |
|                               | V3        | 6.75                        | 375                          | 3.66           | 27.33       | 90                     | 256                  | 3.91                        | 230                          | 3.12           | 24.3        | 96                   |
| M5                            | V1        | 3.63                        | 356                          | 3.69           | 12.73       | 86                     | 352                  | 3.65                        | 220                          | 3.14           | 24.2        | 94                   |
|                               | V2        | 3.82                        | 367                          | 4.09           | 15.07       | 88                     | 151                  | 3.88                        | 234                          | 3.20           | 24.2        | 97                   |
|                               | V3        | 4.01                        | 374                          | 3.52           | 23.93       | 86                     | 223                  | 3.42                        | 217                          | 3.10           | 24.1        | 90                   |
| M6                            | V1        | -                           | -                            | -              | -           | -                      | -                    | -                           | -                            | -              | -           | -                    |
|                               | V2        | -                           | -                            | -              | -           | -                      | -                    | -                           | -                            | -              | -           | -                    |
|                               | V3        | -                           | -                            | -              | -           | -                      | -                    | -                           | -                            | -              | -           | -                    |
| Interaction M and S           |           | NS                          | NS                           | NS             | 1.17        | NS                     | 88.97                | NS                          | NS                           | NS             | NS          | NS                   |
| S and M                       |           | NS                          | NS                           | NS             | 1.19        | NS                     | 84.20                | NS                          | NS                           | NS             | NS          | NS                   |
| Mean of Methods               |           |                             |                              |                |             |                        |                      |                             |                              |                |             |                      |
| M1                            |           | 7.15                        | 406                          | 4.21           | 18.67       | 90                     | 279                  | 4.90                        | 271                          | 3.47           | 24.5        | 107                  |
| M2                            |           | 6.29                        | 430                          | 3.52           | 18.19       | 88                     | 242                  | 3.45                        | 209                          | 2.75           | 23.9        | 83                   |
| M3                            |           | 5.79                        | 357                          | 4.13           | 17.86       | 86                     | 286                  | 4.44                        | 249                          | 3.39           | 24.3        | 105                  |
| M4                            |           | 6.58                        | 368                          | 3.66           | 17.98       | 90                     | 190                  | 4.10                        | 236                          | 3.25           | 24.3        | 101                  |
| M5                            |           | 3.82                        | 365                          | 3.76           | 17.24       | 87                     | 242                  | 3.65                        | 224                          | 3.15           | 24.2        | 94                   |
| M6                            |           | -                           | -                            | -              | -           | -                      | -                    | -                           | -                            | -              | -           | -                    |
| C.D. (0.05)                   |           | 0.84                        | 29.43                        | 0.44           | NS          | 2.44                   | 57.13                | 0.36                        | 17.59                        | 0.32           | 0.16        | 9.06                 |
| C.V. (%)                      |           | 13.04                       | 7.03                         | 10.52          | 4.91        | 2.55                   | 21.21                | 8.07                        | 6.81                         | 9.08           | 0.60        | 8.51                 |
| Mean of Varieties             |           |                             |                              |                |             |                        |                      |                             |                              |                |             |                      |
| V1                            |           | 5.80                        | 357                          | 3.94           | 12.75       | 88                     | 285                  | 4.11                        | 233                          | 3.18           | 24.2        | 98                   |
| V2                            |           | 5.84                        | 403                          | 3.78           | 15.82       | 89                     | 166                  | 4.32                        | 250                          | 3.32           | 24.3        | 102                  |
| V3                            |           | 6.14                        | 396                          | 3.85           | 25.39       | 88                     | 292                  | 3.89                        | 230                          | 3.11           | 24.2        | 94                   |
| CD (0.05)                     |           | NS                          | 20.60                        | NS             | 0.52        | NS                     | 39.79                | 0.29                        | 11.19                        | NS             | NS          | NS                   |
| C.V. (%)                      |           | 11.97                       | 7.02                         | 14.59          | 3.82        | 2.22                   | 21.08                | 9.39                        | 6.18                         | 12.07          | 0.98        | 8.93                 |
| Experimental Mean             |           | 5.93                        | 385                          | 3.86           | 17.99       | 88                     | 248                  | 4.11                        | 238                          | 3.20           | 24.2        | 98                   |
| Soil type                     |           | Clay loam                   |                              |                |             |                        |                      | Clay loam                   |                              |                |             |                      |
| pH                            |           | 7.7                         |                              |                |             |                        |                      | -                           |                              |                |             |                      |
| EC                            |           | 1.1                         |                              |                |             |                        |                      | -                           |                              |                |             |                      |
| Variety & Duration            |           | RNR15048, KNM 733 & KNM 118 |                              |                |             |                        |                      | IR 64 dt1, NAVEEN & BVD 203 |                              |                |             |                      |
| Available NPK kg/ha           |           | -                           |                              |                |             |                        |                      | 240:37:161                  |                              |                |             |                      |

T<sub>1</sub> – Normal planting time Mechanical Transplanting (15 days seedlings)T<sub>2</sub> – Normal planting time Mechanical Transplanting (21 days seedlings)T<sub>3</sub> – Delayed planting time (15 days late) Mechanical transplanting (15 days seedlings)T<sub>4</sub> – Delayed planting time (15 days late) Mechanical transplanting (21 days seedlings)T<sub>5</sub> – Manual transplanting – Normal time (25 days old seedlings)T<sub>6</sub> – Manual transplanting – Delayed sowing time (25 days old seedlings)

Table-4.2.1: Contd....

| Methods of crop establishment | Varieties | WARANGAL           |                               |                |             |                        | Over all Mean | Rank |
|-------------------------------|-----------|--------------------|-------------------------------|----------------|-------------|------------------------|---------------|------|
|                               |           | Grain yield (t/ha) | Panicle/ m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days for 50% flowering |               |      |
| M1                            | V1        | 6.72               | 362                           | 1.63           | 21.21       | 101                    | 6.03          | 2    |
|                               | V2        | 6.01               | 212                           | 2.10           | 29.60       | 101                    | 5.66          | 5    |
|                               | V3        | -                  | -                             | -              | -           | -                      | 6.43          | 1    |
| M2                            | V1        | 6.46               | 292                           | 1.75           | 19.81       | 99                     | 5.60          | 7    |
|                               | V2        | 5.42               | 203                           | 1.95           | 29.33       | 99                     | 5.19          | 12   |
|                               | V3        | -                  | -                             | -              | -           | -                      | 5.55          | 8    |
| M3                            | V1        | 6.25               | 277                           | 1.47           | 18.98       | 98                     | 5.32          | 10   |
|                               | V2        | 5.98               | 170                           | 1.63           | 27.76       | 99                     | 5.21          | 11   |
|                               | V3        | -                  | -                             | -              | -           | -                      | 5.55          | 8    |
| M4                            | V1        | 7.36               | 391                           | 1.82           | 21.37       | 100                    | 5.77          | 4    |
|                               | V2        | 7.17               | 296                           | 2.05           | 29.64       | 100                    | 5.65          | 6    |
|                               | V3        | -                  | -                             | -              | -           | -                      | 5.80          | 3    |
| M5                            | V1        | 6.45               | 351                           | 1.55           | 20.40       | 99                     | 4.76          | 14   |
|                               | V2        | 6.53               | 208                           | 1.74           | 28.89       | 99                     | 4.78          | 13   |
|                               | V3        | -                  | -                             | -              | -           | -                      | 4.60          | 15   |
| M6                            | V1        | -                  | -                             | -              | -           | -                      | 4.22          | 16   |
|                               | V2        | -                  | -                             | -              | -           | -                      | 3.84          | 17   |
|                               | V3        | -                  | -                             | -              | -           | -                      | -             | -    |
| Interaction                   |           |                    |                               |                |             |                        |               |      |
| M and S                       |           | NS                 | NS                            | NS             | NS          | NS                     |               |      |
| S and M                       |           | NS                 | NS                            | NS             | NS          | NS                     |               |      |
| Mean of Methods               |           |                    |                               |                |             |                        |               |      |
| M1                            |           | 6.36               | 287                           | 1.87           | 25.40       | 101                    | 5.87          | 1    |
| M2                            |           | 5.94               | 247                           | 1.85           | 24.57       | 99                     | 5.36          | 3    |
| M3                            |           | 6.12               | 223                           | 1.55           | 23.37       | 99                     | 5.25          | 4    |
| M4                            |           | 7.27               | 344                           | 1.93           | 25.51       | 100                    | 5.70          | 2    |
| M5                            |           | 6.49               | 280                           | 1.64           | 24.64       | 99                     | 4.75          | 5    |
| M6                            |           | -                  | -                             | -              | -           | -                      | 4.03          | 6    |
| C.D. (0.05)                   |           | NS                 | 45.82                         | 0.80           | 0.70        | 0.49                   |               |      |
| C.V. (%)                      |           | 10.78              | 12.46                         | 3.41           | 2.12        | 0.37                   |               |      |
| Mena of Varieties             |           |                    |                               |                |             |                        |               |      |
| V1                            |           | 6.65               | 335                           | 1.64           | 20.35       | 100                    | 5.49          | 2    |
| V2                            |           | 6.22               | 218                           | 1.90           | 29.04       | 100                    | 5.29          | 3    |
| V3                            |           | -                  | -                             | -              | -           | -                      | 5.59          | 1    |
| CD (0.05)                     |           | NS                 | 19.72                         | 0.59           | 0.26        | NS                     |               |      |
| C.V. (%)                      |           | 8.32               | 8.78                          | 4.12           | 1.28        | 0.18                   |               |      |
| Experimental Mean             |           | 6.44               | 276                           | 1.77           | 24.70       | 100                    |               |      |
| Soil type                     |           | Clay loam          |                               |                |             |                        |               |      |
| pH                            |           | 7.3                |                               |                |             |                        |               |      |
| EC                            |           |                    |                               |                |             |                        |               |      |
| Variety & Duration            |           | WGL 739 & WGL 915  |                               |                |             |                        |               |      |
| Available NPK kg/ha           |           | -                  |                               |                |             |                        |               |      |

T<sub>1</sub> – Normal planting time Mechanical Transplanting (15 days seedlings)T<sub>2</sub> - Normal planting time Mechanical Transplanting (21 days seedlings)T<sub>3</sub> – Delayed planting time (15 days late) Mechanical transplanting (15 days seedlings)T<sub>4</sub> - Delayed planting time (15 days late) Mechanical transplanting (21 days seedlings)T<sub>5</sub> – Manual transplanting – Normal time (25 days old seedlings)T<sub>6</sub> – Manual transplanting – Delayed sowing time (25 days old seedlings)

#### 4.2.2. Developing suitable package of practices for dry DSR

Imminent water crisis, labour scarcity and climate change threaten the sustainability and profitability of traditional transplanted rice. Direct-seeded rice (DSR) technology has been proposed to reduce water requirement, save labour demand, mitigate greenhouse gas emission and improve environmental sustainability. It involves three principal methods viz., dry seeding, wet seeding, and water seeding, among which dry DSR is gaining momentum due to relatively high grain yield, less water consumption, reduced labour intensity, facilitating to mechanization during crop establishment, and less greenhouse gases emission. The major challenges confronting the development of dry DSR in India are poor crop establishment, weed infestation, lodging susceptibility, yield decline under continuous cropping, and variety breeding; and the strategies which may help in mitigating the constraints to dry DSR. Hence the present trial is constituted to enhance the productivity of the wet DSR with the following objectives 1) To identify suitable and cost effective agronomic management practices to enhance the productivity of dry DSR and 2) To maximize the resource use efficiency. The trial was conducted at 15 locations (**Arundhatinagar, Chatha, Gangavathi, Jagdalpur, Kota, Mandya, Nagina, Nawagam, Pantnagar, Ragolu, Tuljapur, Ranchi, Ludhiana and Pusa**). Split plot design was adopted with 2 main plots of sowing time ( $M_1$ : Normal sowing time and  $M_2$ : Delayed sowing by 30 days). Four subplots consist of  $S_1$ : Broadcasting of seeds;  $S_2$ : Manual line sowing of seed (20-25 cm row spacing sown in solid row);  $S_3$ : Mechanized line sowing of seeds (Dribbler, Happy Seeder or any Drum Seeder) and  $S_4$ : Any improved system in that particular location. The results were summarized and presented in **Table 4.2.2** and the salient findings are as followed.

Interaction effect of grain yield between sowing time and crop establishment methods were found to be non-significant at all locations except at **Gangavathi** and **Nawagam**. At Jagdalpur main plots and sub plots CV are very high. So, grain yield data may not be considered. Similarly, Jagtial centre grain yield data was not correctly provided. Further, Tuljapur experimental mean grain yield was very low (1.24 t/ha). So both locations data were not included. At all the locations normal sowing resulted higher grain yield than late sowing except at **Gangavathi** and **Ragolu**. Normal sowing time resulted higher grain yield at **Arundhatinagar** (3.98 t/ha), **Chatha** (2.67 t/ha), **Jagdalpur** (3.25 t/ha), **Kota** (5.87 t/ha), **Mandya** (5.9 t/ha), **Nagina** (4.37 t/ha), **Nawagam** (5.01 t/ha), **Pantnagar** (4.73 t/ha) and **Ranchi** (4.27 t/ha).

At **Arundhatinagar**, crop establishment methods were found to be non-significant. At **Chatha** local management practices (dibbling SRI) with 3.31 t/ha grain yield found to be best compared to all other practices. At **Gangavathi**, manual line sowing of seeds resulted the highest grain yield (5.85 t/ha). However, at **Jagdalpur** mechanized line sowing of seeds gave higher yield (2.32 t/ha). Similar effect of same treatment was also recorded at **Kota, Mandya, Nagina, Nawagam** and **Pantnagar**) with mechanized line sowing of seeds gave the highest grain yield (5.91, 5.54, 4.59, 4.59 and 4.74 t/ha, respectively). At **Mandya** weed population were not affected due to late sowing either at active tillering or panicle initiation

stage. However, broadcasting method of rice seeds resulted in more weed population compared to other methods at active tillering stage. At **Nagina**, broadcasting method of rice seeds resulted in more weed population and dry weight compared to other methods either at active tillering or panicle initiation stage. At **Nawagam**, broadcasting method of rice seeds resulted in more weed population and dry weight compared to other methods at active tillering stage. At **Ragolu**, local establishment method (semi dry rice, 20 x 15 cm) resulted the highest grain yield (5.83 t/ha) than other methods. Similarly, broadcasting method of rice seeds resulted in more weed population and dry weight compared to other methods at active tillering stage. At **Ranchi**, local establishment method (Rice + Sesbania was broadcasted, Sesbania was broadcasted at the rate of 40 kg/ha and then rice was sown in lines 20 cm apart , at 25<sup>th</sup> DAS sesbania was uprooted and placed in between rice rows) resulted the highest grain yield (4.58 t/ha) than all other methods.

The experimental mean of cost of cultivation at Gangavathi (Rs. 63155/-), Mandya (Rs. 56251/-), Nagina (Rs. 25236/-), Nawagam (Rs. 39014/-) and Ragolu (Rs. 28365/-).

In silty loam soils of **Ludhiana** mechanized line sowing of seeds resulted in higher yield (7.39 t/ha) than other treatments. Broadcasting method of rice seeds resulted in more weed population and dry weight compared to other methods at active tillering stage. Similarly, in silty loam soils of **Pusa** also mechanized line sowing of seeds resulted in higher yield (3.75 t/ha) than other treatments.

Multi-location trial revealed that normal date of sowing at most of the locations resulted in higher grain yield. Similarly, mechanized line sowing found to be the best among all establishment methods. Local practices at **Chatha**, **Ragolu** and **Ranchi** also showing better results in terms of economics.

#### 4.2.2(R). Nutrient and Weed management for higher productivity in different rice establishment methods

Rice crop suffers more from weed competition unlike other cereal crops. Weed infestation and weed competition are more in direct seeded rice as compared to transplanted rice and SRI because the land is exposed till the initial seedling establishment in direct seeded rice. Crop establishment and weed management techniques are critical in rice farming. So, present investigation to study the weed infestation and nutrient removal by weeds in different crop establishment methods of rice, their influence on productivity of rice and nutrient uptake by rice was taken up. A trial was conducted i) to identify the optimum and cost effective nutrient management practices in different crop establishment methods and ii) to assess the agronomic efficiency, plant and soil nutrient status under different nutrient management practices in different crop establishment methods. The experiment was conducted during *rabi*2018-19 in split-split design with four replications. Treatments consisting of five crop establishment methods {Mechanical Transplanting method (All the principles as per the SRI); M<sub>2</sub>: Direct seeding (Use of Drum seeder/ dibbling of sprouted seed at 25 x25 cm) fb

SRI principles (saturation method of water management, weeding with cono-weeder and fertilizer management); M<sub>3</sub>: Normal Transplanting (20 x15 cm with flooding water management, 3-4 seedlings transplanted at 25-30 days old seedlings); M<sub>4</sub>: SRI; M<sub>5</sub>: Aerobic rice and M<sub>6</sub>: Semi dry rice} were assessed for their system productivity performance at 2 locations (**Mandya and Puducherry**). The results were summarized and presented in **Table 4.2.2(R)** and the salient findings are as followed.

At red sandy loam soils of **Mandya**, cowpea was grown in 2018-19 *rabi* season. Main plots and sub plots effect on grain yield was non-significant. Rice equivalent yield of rice-cowpea system was highest (11.66 t/ha) under direct seeding followed by SRI principles. Similarly, at 150% RDF this system produced highest system productivity (12.0 t/ha). In clay loam soils of **Puducherry**, rice was grown in *rabi* season. In *rabi* season mechanical transplanting resulted the highest rice grain yield (6.89 t/ha). Among nutrient managements practices LCC based nitrogen application resulted the highest yield (7.07 t/ha). The highest rice-rice system productivity was recorded under mechanical transplanting followed by LCC based N management. Lower weed population at active tillering stage was also recorded under mechanical transplanting and LCC based N management.

Table-4.2.2: (CMT-2)(Dry DSR) - Developing suitable package of practices for dry DSR, Kharif-2019

| Treatment                            |           | ARUNDATHINAGAR     |                    |                              |                              |                |             |                        |                                            |                                         |                                           |                                           |
|--------------------------------------|-----------|--------------------|--------------------|------------------------------|------------------------------|----------------|-------------|------------------------|--------------------------------------------|-----------------------------------------|-------------------------------------------|-------------------------------------------|
| Main Plot                            | Sub-plots | Grain yield (t/ha) | Straw yield (t/ha) | Tillers/m <sup>2</sup> (No.) | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days for 50% flowering | Weed population at AT (no/m <sup>2</sup> ) | Weed population PI (no/m <sup>2</sup> ) | Weed dry weight at AT (g/m <sup>2</sup> ) | Weed dry weight at PI (g/m <sup>2</sup> ) |
| <b>M1- Normal sowing time</b>        | S1        | 3.52               | 1.06               | 315                          | 302                          | 4.94           | 20.95       | 72                     | 318                                        | 169                                     | 425.0                                     | 162.5                                     |
|                                      | S2        | 4.14               | 1.12               | 320                          | 308                          | 5.38           | 21.14       | 73                     | 260                                        | 164                                     | 451.3                                     | 178.3                                     |
|                                      | S3        | 3.96               | 1.06               | 334                          | 316                          | 4.52           | 21.01       | 74                     | 239                                        | 180                                     | 333.8                                     | 195.0                                     |
|                                      | S4        | 4.31               | 1.48               | 386                          | 369                          | 4.81           | 21.11       | 74                     | 401                                        | 195                                     | 420.0                                     | 280.0                                     |
| <b>M2- Delayed sowing by 30 days</b> | S1        | 3.13               | 0.55               | 185                          | 178                          | 4.42           | 20.27       | 71                     | 249                                        | 189                                     | 423.8                                     | 173.8                                     |
|                                      | S2        | 3.14               | 0.55               | 225                          | 211                          | 3.72           | 20.93       | 72                     | 263                                        | 183                                     | 432.5                                     | 183.8                                     |
|                                      | S3        | 3.21               | 0.53               | 254                          | 241                          | 3.66           | 19.82       | 72                     | 299                                        | 187                                     | 456.3                                     | 188.8                                     |
|                                      | S4        | 3.31               | 2.85               | 236                          | 219                          | 4.54           | 20.28       | 72                     | 280                                        | 196                                     | 427.5                                     | 198.8                                     |
| <b>Interaction</b>                   |           |                    |                    |                              |                              |                |             |                        |                                            |                                         |                                           |                                           |
| <i>I and M</i>                       |           | NS                 | NS                 | NS                           | 29.96                        | NS             | NS          | NS                     | NS                                         | NS                                      | 37.24                                     | NS                                        |
| <i>M and I</i>                       |           | NS                 | NS                 | NS                           | 41.09                        | NS             | NS          | NS                     | NS                                         | NS                                      | 40.74                                     | NS                                        |
| <b>Mean of Main plot</b>             |           |                    |                    |                              |                              |                |             |                        |                                            |                                         |                                           |                                           |
| M1                                   |           | 3.98               | 1.18               | 339                          | 324                          | 4.91           | 21.05       | 73                     | 304                                        | 177                                     | 407.5                                     | 203.9                                     |
| M2                                   |           | 3.19               | 1.12               | 225                          | 212                          | 4.08           | 20.33       | 72                     | 273                                        | 189                                     | 435.0                                     | 186.3                                     |
| <b>C.D. (0.05)</b>                   |           | 0.54               | NS                 | 41.05                        | 41.36                        | 0.39           | NS          | 0.88                   | NS                                         | NS                                      | NS                                        | NS                                        |
| <b>C.V. (%)</b>                      |           | 13.33              | 128                | 12.94                        | 13.72                        | 7.80           | 7.58        | 1.09                   | 44.99                                      | 7.69                                    | 6.62                                      | 19.78                                     |
| <b>Method of Sub plots</b>           |           |                    |                    |                              |                              |                |             |                        |                                            |                                         |                                           |                                           |
| S1                                   |           | 3.32               | 0.80               | 250                          | 240                          | 4.68           | 20.61       | 71                     | 283                                        | 179                                     | 424.4                                     | 168.1                                     |
| S2                                   |           | 3.64               | 0.83               | 273                          | 260                          | 4.55           | 21.04       | 72                     | 261                                        | 174                                     | 441.9                                     | 181.0                                     |
| S3                                   |           | 3.58               | 0.80               | 294                          | 279                          | 4.09           | 20.41       | 73                     | 269                                        | 183                                     | 395.0                                     | 191.9                                     |
| S4                                   |           | 3.81               | 2.16               | 311                          | 294                          | 4.67           | 20.70       | 73                     | 341                                        | 195                                     | 423.8                                     | 239.4                                     |
| <b>CD (0.05)</b>                     |           | NS                 | NS                 | 23.52                        | 21.18                        | NS             | NS          | 0.68                   | NS                                         | NS                                      | 26.33                                     | 38.64                                     |
| <b>C.V. (%)</b>                      |           | 14.93              | 132                | 7.94                         | 7.52                         | 16.17          | 4.51        | 0.90                   | 38.03                                      | 10.08                                   | 5.95                                      | 18.84                                     |
| <b>Experimental Mean</b>             |           | 3.59               | 1.15               | 282                          | 268                          | 4.50           | 20.69       | 72                     | 288                                        | 183                                     | 421.3                                     | 195.1                                     |
| Soil type                            |           | -                  |                    |                              |                              |                |             |                        |                                            |                                         |                                           |                                           |
| pH                                   |           | 4.92               |                    |                              |                              |                |             |                        |                                            |                                         |                                           |                                           |
| Variety                              |           | Sahabhagidhan      |                    |                              |                              |                |             |                        |                                            |                                         |                                           |                                           |
| Available NPK kg/ha                  |           | 180:44:295         |                    |                              |                              |                |             |                        |                                            |                                         |                                           |                                           |

S1: Broadcasting of seeds

S2: Manual line sowing of seeds (20-25 cm row spacing sown in solid row)

S3: Mechanized line sowing of seeds (Dribbler, Happy seeder or any Drum Seeder: Spacing as per the equipment specifications)

S4: Any improved system in that particular location

Table-4.2.2: Contd....

| Treatment                            |           | CHATHA             |                    |                              |                              |                |             |                        |                                            |                                         |
|--------------------------------------|-----------|--------------------|--------------------|------------------------------|------------------------------|----------------|-------------|------------------------|--------------------------------------------|-----------------------------------------|
| Main Plot                            | Sub-plots | Grain yield (t/ha) | Straw yield (t/ha) | Tillers/m <sup>2</sup> (No.) | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days for 50% flowering | Weed population at AT (no/m <sup>2</sup> ) | Weed population PI (no/m <sup>2</sup> ) |
| <b>M1- Normal sowing time</b>        | S1        | 2.32               | 3.29               | 164                          | 138                          | 1.16           | 19.17       | 103                    | 1.7                                        | 44.0                                    |
|                                      | S2        | 2.77               | 3.92               | 195                          | 172                          | 1.31           | 19.57       | 100                    | 2.3                                        | 37.7                                    |
|                                      | S3        | 2.13               | 2.99               | 141                          | 117                          | 0.93           | 18.43       | 101                    | 2.3                                        | 47.3                                    |
|                                      | S4        | 3.45               | 4.81               | 282                          | 256                          | 2.07           | 20.33       | 104                    | 0.3                                        | 13.7                                    |
| <b>M2- Delayed sowing by 30 days</b> | S1        | 2.02               | 2.73               | 138                          | 110                          | 1.02           | 18.20       | 98                     | 1.3                                        | 45.0                                    |
|                                      | S2        | 2.45               | 3.34               | 159                          | 127                          | 1.16           | 18.80       | 100                    | 2.0                                        | 38.7                                    |
|                                      | S3        | 1.89               | 2.59               | 142                          | 104                          | 0.87           | 17.73       | 101                    | 2.7                                        | 50.3                                    |
|                                      | S4        | 3.16               | 4.44               | 252                          | 221                          | 1.96           | 19.57       | 106                    | 0.3                                        | 13.3                                    |
| <b>Interaction</b>                   |           |                    |                    |                              |                              |                |             |                        |                                            |                                         |
| <i>I and M</i>                       |           | NS                 | NS                 | NS                           | NS                           | NS             | NS          | 1.54                   | NS                                         | NS                                      |
| <i>M and I</i>                       |           | NS                 | NS                 | NS                           | NS                           | NS             | NS          | 1.75                   | NS                                         | NS                                      |
| <b>Mean of Main plot</b>             |           |                    |                    |                              |                              |                |             |                        |                                            |                                         |
| M1                                   |           | 2.67               | 3.75               | 195                          | 171                          | 1.37           | 19.38       | 102                    | 1.7                                        | 35.7                                    |
| M2                                   |           | 2.38               | 3.28               | 173                          | 141                          | 1.25           | 18.57       | 101                    | 1.6                                        | 36.8                                    |
| <b>C.D. (0.05)</b>                   |           | 0.03               | 0.10               | 2.00                         | 0.95                         | 0.06           | 0.06        | NS                     | NS                                         | NS                                      |
| <b>C.V. (%)</b>                      |           | 0.74               | 1.58               | 0.62                         | 0.35                         | 2.42           | 0.19        | 0.80                   | 33.23                                      | 2.82                                    |
| <b>Method of Sub plots</b>           |           |                    |                    |                              |                              |                |             |                        |                                            |                                         |
| S1                                   |           | 2.17               | 3.01               | 151                          | 124                          | 1.09           | 18.68       | 101                    | 1.5                                        | 44.5                                    |
| S2                                   |           | 2.61               | 3.63               | 177                          | 150                          | 1.23           | 19.18       | 100                    | 2.2                                        | 38.2                                    |
| S3                                   |           | 2.01               | 2.79               | 142                          | 111                          | 0.90           | 18.08       | 101                    | 2.5                                        | 48.8                                    |
| S4                                   |           | 3.31               | 4.63               | 267                          | 238                          | 2.01           | 19.95       | 105                    | 0.3                                        | 13.5                                    |
| <b>CD (0.05)</b>                     |           | 0.11               | 0.13               | 14.00                        | 15.63                        | 0.05           | 0.36        | 1.09                   | 0.66                                       | 2.76                                    |
| <b>C.V. (%)</b>                      |           | 3.59               | 3.01               | 6.05                         | 7.98                         | 3.33           | 1.50        | 0.85                   | 32.43                                      | 6.05                                    |
| <b>Experimental Mean</b>             |           | 2.53               | 3.51               | 184                          | 156                          | 1.31           | 18.98       | 102                    | 1.6                                        | 36.3                                    |
| Soil type                            |           | Sandy clay loam    |                    |                              |                              |                |             |                        |                                            |                                         |
| pH                                   |           | 8.03               |                    |                              |                              |                |             |                        |                                            |                                         |
| Variety                              |           | Basmathi - 370     |                    |                              |                              |                |             |                        |                                            |                                         |
| Available NPK kg/ha                  |           | 245:14.3:146.3     |                    |                              |                              |                |             |                        |                                            |                                         |

S1: Broadcasting of seeds

\*S4-Dibbling SRI

S2: Manual line sowing of seeds (20-25 cm row spacing sown in solid row)

S3: Mechanized line sowing of seeds (Dribbler, Happy seeder of any Drum Seeder: Spacing as per the equipment specifications)

S4: Any improved system in that particular location

Table-4.2.2: Contd....

| Treatment                            |           | GANGAVATHI         |                    |                              |                              |                |             |                                            |                                            |                                      |                   |
|--------------------------------------|-----------|--------------------|--------------------|------------------------------|------------------------------|----------------|-------------|--------------------------------------------|--------------------------------------------|--------------------------------------|-------------------|
| Main Plot                            | Sub-plots | Grain yield (t/ha) | Straw yield (t/ha) | Tillers/m <sup>2</sup> (No.) | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Weed population at AT (no/m <sup>2</sup> ) | Weed population at PI (no/m <sup>2</sup> ) | Weed dry wt at AT(g/m <sup>2</sup> ) | Weed dry wt at PI |
| <b>M1- Normal sowing time</b>        | S1        | 4.70               | 5.48               | 739                          | 344                          | 3.72           | 18.6        | 46                                         | 67                                         | 9.50                                 | 10.85             |
|                                      | S2        | 5.36               | 6.19               | 655                          | 383                          | 3.38           | 18.3        | 32                                         | 31                                         | 4.65                                 | 4.80              |
|                                      | S3        | 4.37               | 5.09               | 757                          | 404                          | 3.05           | 18.8        | 42                                         | 46                                         | 5.58                                 | 6.25              |
|                                      | S4        | 5.16               | 5.92               | 533                          | 385                          | 3.50           | 17.7        | 38                                         | 41                                         | 6.69                                 | 7.52              |
| <b>M2- Delayed sowing by 30 days</b> | S1        | 5.59               | 6.44               | 769                          | 427                          | 2.99           | 17.3        | 12                                         | 15                                         | 3.35                                 | 3.82              |
|                                      | S2        | 6.35               | 7.37               | 747                          | 499                          | 2.74           | 18.3        | 11                                         | 12                                         | 3.00                                 | 3.17              |
|                                      | S3        | 6.05               | 6.97               | 745                          | 466                          | 2.56           | 17.9        | 21                                         | 27                                         | 3.03                                 | 3.45              |
|                                      | S4        | 5.94               | 6.88               | 592                          | 469                          | 2.32           | 17.3        | 12                                         | 15                                         | 2.25                                 | 2.28              |
| <b>Interaction</b>                   |           |                    |                    |                              |                              |                |             |                                            |                                            |                                      |                   |
| <i>I and M</i>                       |           | 0.33               | NS                 | 34.87                        | NS                           | 0.23           | NS          | NS                                         | 6.66                                       | 0.93                                 | 1.90              |
| <i>M and I</i>                       |           | 0.30               | NS                 | 38.92                        | NS                           | 0.37           | NS          | NS                                         | 8.12                                       | 1.07                                 | 1.78              |
| <b>Mean of Main plot</b>             |           |                    |                    |                              |                              |                |             |                                            |                                            |                                      |                   |
| M1                                   |           | 4.90               | 5.67               | 671                          | 379                          | 3.41           | 18.3        | 39                                         | 46                                         | 6.60                                 | 7.36              |
| M2                                   |           | 5.98               | 6.92               | 713                          | 465                          | 2.65           | 17.7        | 14                                         | 17                                         | 2.91                                 | 3.18              |
| <b>C.D. (0.05)</b>                   |           | 0.12               | 0.16               | 31.01                        | 18.26                        | 0.42           | 0.26        | 2.49                                       | 7.30                                       | 0.90                                 | 0.81              |
| <b>C.V. (%)</b>                      |           | 1.91               | 2.27               | 3.98                         | 3.85                         | 12.25          | 1.29        | 8.35                                       | 20.55                                      | 16.77                                | 13.70             |
| <b>Method of Sub plots</b>           |           |                    |                    |                              |                              |                |             |                                            |                                            |                                      |                   |
| S1                                   |           | 5.14               | 5.96               | 754                          | 385                          | 3.36           | 18.0        | 29                                         | 41                                         | 6.42                                 | 7.34              |
| S2                                   |           | 5.85               | 6.78               | 701                          | 441                          | 3.06           | 18.3        | 21                                         | 22                                         | 3.82                                 | 3.99              |
| S3                                   |           | 5.21               | 6.03               | 751                          | 435                          | 2.80           | 18.4        | 31                                         | 36                                         | 4.30                                 | 4.85              |
| S4                                   |           | 5.55               | 6.40               | 563                          | 427                          | 2.91           | 17.5        | 25                                         | 28                                         | 4.47                                 | 4.90              |
| <b>CD (0.05)</b>                     |           | 0.23               | 0.46               | 24.66                        | 25.67                        | 0.16           | 0.40        | 4.85                                       | 4.71                                       | 0.66                                 | 1.35              |
| <b>C.V. (%)</b>                      |           | 4.03               | 6.95               | 3.39                         | 5.79                         | 5.03           | 2.13        | 17.37                                      | 14.20                                      | 13.11                                | 24.32             |
| <b>Experimental Mean</b>             |           | 5.44               | 6.29               | 692                          | 422                          | 3.03           | 18.0        | 27                                         | 32                                         | 4.75                                 | 5.27              |
| Soil type                            |           | Black clay         |                    |                              |                              |                |             |                                            |                                            |                                      |                   |
| pH                                   |           | 8.20               |                    |                              |                              |                |             |                                            |                                            |                                      |                   |
| Variety                              |           | GGV-10-89          |                    |                              |                              |                |             |                                            |                                            |                                      |                   |
| Available NPK kg/ha                  |           | -                  |                    |                              |                              |                |             |                                            |                                            |                                      |                   |

\*S4-Dibbling

Table-4.2.2: Contd....

| Treatment                            |           | JAGDALPUR          |                    |                              |                |             |                        |                                            |                                         |                                           |                                           | KOTA               |                              |                |
|--------------------------------------|-----------|--------------------|--------------------|------------------------------|----------------|-------------|------------------------|--------------------------------------------|-----------------------------------------|-------------------------------------------|-------------------------------------------|--------------------|------------------------------|----------------|
| Main Plot                            | Sub-plots | Grain yield (t/ha) | Straw yield (t/ha) | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days for 50% flowering | Weed population at AT (no/m <sup>2</sup> ) | Weed population PI (no/m <sup>2</sup> ) | Weed dry weight at AT (g/m <sup>2</sup> ) | Weed dry weight at PI (g/m <sup>2</sup> ) | Grain yield (t/ha) | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) |
| <b>M1- Normal sowing time</b>        | S1        | 3.55               | 3.58               | 434                          | 2.75           | 40.0        | 85                     | 43                                         | 103                                     | 3.30                                      | 9.41                                      | 5.26               | 268                          | 3.22           |
|                                      | S2        | 2.84               | 3.51               | 332                          | 2.55           | 38.6        | 83                     | 62                                         | 150                                     | 5.07                                      | 13.81                                     | 5.98               | 297                          | 3.65           |
|                                      | S3        | 3.36               | 3.84               | 418                          | 2.63           | 40.4        | 82                     | 42                                         | 143                                     | 3.15                                      | 13.25                                     | 6.12               | 305                          | 3.76           |
|                                      | S4        | -                  | -                  | -                            | -              | -           | -                      | -                                          | -                                       | -                                         | -                                         | 6.11               | 278                          | 3.41           |
| <b>M2- Delayed sowing by 30 days</b> | S1        | 0.75               | 0.63               | 111                          | 1.86           | 38.2        | 75                     | 163                                        | 213                                     | 14.74                                     | 20.22                                     | 4.74               | 232                          | 2.96           |
|                                      | S2        | 0.43               | 0.41               | 79                           | 1.66           | 36.1        | 75                     | 211                                        | 263                                     | 18.51                                     | 21.76                                     | 5.58               | 279                          | 3.38           |
|                                      | S3        | 1.29               | 0.71               | 108                          | 1.72           | 38.0        | 74                     | 193                                        | 219                                     | 17.92                                     | 20.87                                     | 5.70               | 286                          | 3.47           |
|                                      | S4        | -                  | -                  | -                            | -              | -           | -                      | -                                          | -                                       | -                                         | -                                         | 5.05               | 259                          | 3.18           |
| <b>Interaction</b>                   |           |                    |                    |                              |                |             |                        |                                            |                                         |                                           |                                           |                    |                              |                |
| <i>I and M</i>                       |           | NS                 | NS                 | NS                           | NS             | NS          | NS                     | NS                                         | NS                                      | NS                                        | NS                                        | NS                 | NS                           | NS             |
| <i>M and I</i>                       |           | NS                 | NS                 | NS                           | NS             | NS          | NS                     | NS                                         | NS                                      | NS                                        | NS                                        | NS                 | NS                           | NS             |
| <b>Mean of Main plot</b>             |           |                    |                    |                              |                |             |                        |                                            |                                         |                                           |                                           |                    |                              |                |
| M1                                   |           | 3.25               | 3.64               | 395                          | 2.64           | 39.6        | 83                     | 49                                         | 132                                     | 3.84                                      | 12.16                                     | 5.87               | 287                          | 3.51           |
| M2                                   |           | 0.82               | 0.58               | 99                           | 1.75           | 37.4        | 75                     | 189                                        | 232                                     | 17.06                                     | 20.95                                     | 5.27               | 264                          | 3.25           |
| <b>C.D. (0.05)</b>                   |           | 1.06               | 0.65               | 160.61                       | 0.18           | 2.19        | 4.42                   | 16.10                                      | 22.73                                   | 0.98                                      | 5.44                                      | 0.29               | 17                           | 0.16           |
| <b>C.V. (%)</b>                      |           | 39.99              | 23.75              | 50.08                        | 6.31           | 4.38        | 4.32                   | 10.44                                      | 9.63                                    | 7.20                                      | 25.28                                     | 4.71               | 5                            | 4.33           |
| <b>Method of Sub plots</b>           |           |                    |                    |                              |                |             |                        |                                            |                                         |                                           |                                           |                    |                              |                |
| S1                                   |           | 2.15               | 2.10               | 273                          | 2.30           | 39.1        | 80                     | 103                                        | 158                                     | 9.02                                      | 14.82                                     | 5.00               | 250                          | 3.09           |
| S2                                   |           | 1.64               | 1.96               | 205                          | 2.10           | 37.3        | 79                     | 136                                        | 207                                     | 11.79                                     | 17.78                                     | 5.78               | 288                          | 3.51           |
| S3                                   |           | 2.32               | 2.27               | 263                          | 2.18           | 39.2        | 78                     | 118                                        | 181                                     | 10.54                                     | 17.06                                     | 5.91               | 296                          | 3.62           |
| S4                                   |           | -                  | -                  | -                            | -              | -           | -                      | -                                          | -                                       | -                                         | -                                         | 5.58               | 268                          | 3.29           |
| <b>CD (0.05)</b>                     |           | NS                 | NS                 | 51.77                        | NS             | 1.58        | NS                     | 22.80                                      | 29.45                                   | 2.14                                      | NS                                        | 0.40               | 14.85                        | 0.33           |
| <b>C.V. (%)</b>                      |           | 29.69              | 23.74              | 19.25                        | 13.83          | 3.76        | 2.54                   | 17.62                                      | 14.87                                   | 18.82                                     | 14.29                                     | 6.76               | 5.13                         | 9.35           |
| <b>Experimental Mean</b>             |           | 2.04               | 2.11               | 247                          | 2.20           | 38.5        | 79                     | 119                                        | 182                                     | 10.45                                     | 16.55                                     | 5.57               | 275                          | 3.38           |
| Soil type                            |           | -                  |                    |                              |                |             |                        |                                            |                                         |                                           |                                           | Clay loam          |                              |                |
| pH                                   |           | 6.20               |                    |                              |                |             |                        |                                            |                                         |                                           |                                           | 7.80               |                              |                |
| Variety                              |           | Samleswari         |                    |                              |                |             |                        |                                            |                                         |                                           |                                           | Pusa sungandha-5   |                              |                |
| Available NPK kg/ha                  |           | -                  |                    |                              |                |             |                        |                                            |                                         |                                           |                                           | 318:60:523         |                              |                |

S1: Broadcasting of seeds

S2: Manual line sowing of seeds (20-25 cm row spacing sown in solid row)

S3: Mechanized line sowing of seeds (Dribbler, Happy seeder of any Drum Seeder: Spacing as per the equipment specifications)

S4: Any improved system in that particular location

Table-4.2.2: Contd....

| Treatment                            |           | MANDYA             |                    |                              |                              |                |             |                        |                                                          |                                                         |                                                         |                                                           |
|--------------------------------------|-----------|--------------------|--------------------|------------------------------|------------------------------|----------------|-------------|------------------------|----------------------------------------------------------|---------------------------------------------------------|---------------------------------------------------------|-----------------------------------------------------------|
| Main Plot                            | Sub-plots | Grain yield (t/ha) | Straw yield (t/ha) | Tillers/m <sup>2</sup> (No.) | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days for 50% flowering | Weed population at active tillering (no/m <sup>2</sup> ) | Weed population panicle initiation (no/m <sup>2</sup> ) | Weed dry weight at active tillering (g/m <sup>2</sup> ) | Weed dry weight at panicle initiation (g/m <sup>2</sup> ) |
| <b>M1- Normal sowing time</b>        | S1        | 5.29               | 8.70               | 346                          | 306                          | 4.02           | 22.7        | 85                     | 10.8                                                     | 21.8                                                    | 1.88                                                    | 6.54                                                      |
|                                      | S2        | 5.95               | 9.18               | 371                          | 344                          | 4.57           | 25.5        | 85                     | 9.8                                                      | 9.3                                                     | 1.81                                                    | 2.19                                                      |
|                                      | S3        | 6.47               | 9.63               | 355                          | 340                          | 4.79           | 24.1        | 85                     | 8.8                                                      | 7.8                                                     | 1.28                                                    | 1.61                                                      |
|                                      | S4        | -                  | -                  | -                            | -                            | -              | -           | -                      | -                                                        | -                                                       | -                                                       | -                                                         |
| <b>M2- Delayed sowing by 30 days</b> | S1        | 4.08               | 8.49               | 284                          | 260                          | 4.06           | 23.9        | 86                     | 20.5                                                     | 28.3                                                    | 1.85                                                    | 7.80                                                      |
|                                      | S2        | 4.44               | 8.93               | 253                          | 247                          | 4.09           | 23.1        | 86                     | 15.8                                                     | 13.8                                                    | 1.95                                                    | 3.90                                                      |
|                                      | S3        | 4.61               | 9.09               | 277                          | 268                          | 4.12           | 22.6        | 85                     | 13.8                                                     | 10.8                                                    | 2.19                                                    | 3.31                                                      |
|                                      | S4        | -                  | -                  | -                            | -                            | -              | -           | -                      | -                                                        | -                                                       | -                                                       | -                                                         |
| <b>Interaction</b>                   |           |                    |                    |                              |                              |                |             |                        |                                                          |                                                         |                                                         |                                                           |
| <i>I and M</i>                       |           | NS                 | NS                 | NS                           | NS                           | NS             | NS          | NS                     | NS                                                       | NS                                                      | NS                                                      | NS                                                        |
| <i>M and I</i>                       |           | NS                 | NS                 | NS                           | NS                           | NS             | NS          | NS                     | NS                                                       | NS                                                      | NS                                                      | NS                                                        |
| <b>Mean of Main plot</b>             |           |                    |                    |                              |                              |                |             |                        |                                                          |                                                         |                                                         |                                                           |
| M1                                   |           | 5.90               | 9.17               | 358                          | 330                          | 4.46           | 24.1        | 85                     | 9.8                                                      | 12.9                                                    | 1.66                                                    | 3.45                                                      |
| M2                                   |           | 4.38               | 8.83               | 271                          | 258                          | 4.09           | 23.2        | 86                     | 16.7                                                     | 17.6                                                    | 1.99                                                    | 5.00                                                      |
| <b>C.D. (0.05)</b>                   |           | 0.97               | NS                 | 41.97                        | 49.54                        | NS             | NS          | 1.09                   | NS                                                       | 2.81                                                    | NS                                                      | NS                                                        |
| <b>C.V. (%)</b>                      |           | 14.60              | 5.74               | 10.27                        | 12.97                        | 8.39           | 7.58        | 0.99                   | 42.41                                                    | 14.17                                                   | 35.80                                                   | 53.82                                                     |
| <b>Method of Sub plots</b>           |           |                    |                    |                              |                              |                |             |                        |                                                          |                                                         |                                                         |                                                           |
| S1                                   |           | 4.68               | 8.59               | 315                          | 283                          | 4.04           | 23.3        | 85                     | 15.6                                                     | 25.0                                                    | 1.86                                                    | 7.17                                                      |
| S2                                   |           | 5.20               | 9.05               | 312                          | 295                          | 4.33           | 24.3        | 86                     | 12.8                                                     | 11.5                                                    | 1.88                                                    | 3.05                                                      |
| S3                                   |           | 5.54               | 9.36               | 316                          | 304                          | 4.45           | 23.3        | 85                     | 11.3                                                     | 9.3                                                     | 1.73                                                    | 2.46                                                      |
| S4                                   |           | -                  | -                  | -                            | -                            | -              | -           | -                      | -                                                        | -                                                       | -                                                       | -                                                         |
| <b>CD (0.05)</b>                     |           | 0.51               | NS                 | NS                           | NS                           | NS             | NS          | NS                     | 2.80                                                     | 4.95                                                    | NS                                                      | 0.85                                                      |
| <b>C.V. (%)</b>                      |           | 9.06               | 9.48               | 10.45                        | 9.45                         | 7.36           | 8.75        | 0.81                   | 19.45                                                    | 29.81                                                   | 31.81                                                   | 18.53                                                     |
| <b>Experimental Mean</b>             |           | 5.14               | 9.00               | 314                          | 294                          | 4.27           | 23.7        | 85                     | 13.2                                                     | 15.3                                                    | 1.83                                                    | 4.23                                                      |
| Soil type                            |           | Red Sandy loam     |                    |                              |                              |                |             |                        |                                                          |                                                         |                                                         |                                                           |
| pH                                   |           | 6.84               |                    |                              |                              |                |             |                        |                                                          |                                                         |                                                         |                                                           |
| Variety                              |           | KMP 175            |                    |                              |                              |                |             |                        |                                                          |                                                         |                                                         |                                                           |
| Available NPK kg/ha                  |           | 334:110:265        |                    |                              |                              |                |             |                        |                                                          |                                                         |                                                         |                                                           |

S1: Broadcasting of seeds

S2: Manual line sowing of seeds (20-25 cm row spacing sown in solid row)

S3: Mechanized line sowing of seeds (Dribbler, Happy seeder of any Drum Seeder: Spacing as per the equipment specifications)

S4: Any improved system in that particular location

Table-4.2.2: Contd....

| Treatment                    |           | NAGINA             |                              |                              |                |             |                        |                               |                                         |                              |                                           | NAWAGAM                |                    |                              |                              |                |             |                        |                               |                              |  |
|------------------------------|-----------|--------------------|------------------------------|------------------------------|----------------|-------------|------------------------|-------------------------------|-----------------------------------------|------------------------------|-------------------------------------------|------------------------|--------------------|------------------------------|------------------------------|----------------|-------------|------------------------|-------------------------------|------------------------------|--|
| Main Plot                    | Sub-plots | Grain yield (t/ha) | Tillers/m <sup>2</sup> (No.) | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days for 50% flowering | Weed population at AT (no/m2) | Weed population PI (no/m <sup>2</sup> ) | Weed dry weight at AT (g/m2) | Weed dry weight at PI (g/m <sup>2</sup> ) | Grai n yield (t/ha)    | Straw yield (t/ha) | Tillers/m <sup>2</sup> (No.) | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days for 50% flowering | Weed population at AT (no/m2) | Weed dry weight at AT (g/m2) |  |
| M1-Normal sowing time        | S1        | 3.99               | 300                          | 293                          | 2.78           | 25.9        | 82                     | 9.4                           | 4.8                                     | 5.68                         | 4.20                                      | 4.39                   | 4.83               | 242                          | 215                          | 2.39           | 17.9        | 70                     | 43.8                          | 17.6                         |  |
|                              | S2        | 4.44               | 320                          | 316                          | 2.81           | 26.0        | 85                     | 8.5                           | 4.6                                     | 5.29                         | 3.43                                      | 4.55                   | 5.01               | 193                          | 167                          | 3.80           | 17.1        | 71                     | 34.5                          | 12.9                         |  |
|                              | S3        | 4.69               | 333                          | 328                          | 2.83           | 26.2        | 92                     | 5.6                           | 3.5                                     | 3.76                         | 2.34                                      | 6.22                   | 6.85               | 212                          | 183                          | 4.54           | 19.1        | 72                     | 28.3                          | 10.8                         |  |
|                              | S4        | -                  | -                            | -                            | -              | -           | -                      | -                             | -                                       | -                            | -                                         | 4.86                   | 5.34               | 219                          | 189                          | 2.59           | 18.7        | 73                     | 40.0                          | 15.5                         |  |
| M2-Delayed sowing by 30 days | S1        | 3.91               | 292                          | 282                          | 2.78           | 25.8        | 86                     | 8.8                           | 5.4                                     | 6.45                         | 4.62                                      | 2.54                   | 2.56               | 179                          | 148                          | 2.34           | 17.0        | 61                     | 60.3                          | 23.6                         |  |
|                              | S2        | 4.35               | 315                          | 307                          | 2.81           | 26.0        | 86                     | 7.9                           | 4.8                                     | 5.57                         | 3.74                                      | 3.33                   | 3.36               | 151                          | 131                          | 2.18           | 16.4        | 62                     | 36.8                          | 16.2                         |  |
|                              | S3        | 4.48               | 326                          | 317                          | 2.84           | 26.2        | 94                     | 5.7                           | 3.8                                     | 4.36                         | 2.76                                      | 2.95                   | 2.98               | 191                          | 160                          | 2.29           | 16.9        | 62                     | 38.8                          | 15.9                         |  |
|                              | S4        | -                  | -                            | -                            | -              | -           | -                      | -                             | -                                       | -                            | -                                         | 3.89                   | 3.93               | 188                          | 151                          | 2.59           | 16.9        | 62                     | 35.8                          | 14.1                         |  |
| Interaction                  |           |                    |                              |                              |                |             |                        |                               |                                         |                              |                                           |                        |                    |                              |                              |                |             |                        |                               |                              |  |
| I and M                      |           | NS                 | NS                           | NS                           | NS             | NS          | NS                     | NS                            | NS                                      | NS                           | NS                                        | 0.66                   | 0.64               | NS                           | 14.30                        | 0.43           | NS          | NS                     | NS                            | NS                           |  |
| M and I                      |           | NS                 | NS                           | NS                           | NS             | NS          | NS                     | NS                            | NS                                      | NS                           | NS                                        | 0.75                   | 0.70               | NS                           | 20.24                        | 0.49           | NS          | NS                     | NS                            | NS                           |  |
| Mean of Main plot            |           |                    |                              |                              |                |             |                        |                               |                                         |                              |                                           |                        |                    |                              |                              |                |             |                        |                               |                              |  |
| M1                           |           | 4.37               | 317                          | 312                          | 2.81           | 26.0        | 86                     | 7.8                           | 4.3                                     | 4.91                         | 3.32                                      | 5.01                   | 5.51               | 216                          | 188                          | 3.33           | 18.2        | 72                     | 36.6                          | 14.2                         |  |
| M2                           |           | 4.25               | 311                          | 302                          | 2.81           | 26.0        | 88                     | 7.5                           | 4.7                                     | 5.46                         | 3.71                                      | 3.18                   | 3.21               | 177                          | 148                          | 2.35           | 16.8        | 62                     | 42.9                          | 17.5                         |  |
| C.D. (0.05)                  |           | NS                 | NS                           | NS                           | NS             | NS          | 1.40                   | NS                            | 0.14                                    | NS                           | NS                                        | 0.61                   | 0.54               | 19.60                        | 20.87                        | 0.39           | 1.39        | 0.88                   | 1.09                          | 0.72                         |  |
| C.V. (%)                     |           | 2.82               | 2.14                         | 3.27                         | 0.30           | 0.28        | 1.24                   | 13.48                         | 2.46                                    | 11.22                        | 11.16                                     | 13.24                  | 11.00              | 8.86                         | 11.04                        | 12.19          | 7.05        | 1.18                   | 2.43                          | 4.04                         |  |
| Method of Sub plots          |           |                    |                              |                              |                |             |                        |                               |                                         |                              |                                           |                        |                    |                              |                              |                |             |                        |                               |                              |  |
| S1                           |           | 3.95               | 296                          | 287                          | 2.78           | 25.8        | 84                     | 9.1                           | 5.1                                     | 6.07                         | 4.41                                      | 3.46                   | 3.70               | 211                          | 181                          | 2.36           | 17.5        | 66                     | 52.0                          | 20.6                         |  |
| S2                           |           | 4.39               | 317                          | 311                          | 2.81           | 26.0        | 85                     | 8.2                           | 4.7                                     | 5.43                         | 3.58                                      | 3.94                   | 4.18               | 172                          | 149                          | 2.99           | 16.7        | 67                     | 35.6                          | 14.5                         |  |
| S3                           |           | 4.59               | 330                          | 322                          | 2.83           | 26.2        | 93                     | 5.7                           | 3.7                                     | 4.06                         | 2.55                                      | 4.59                   | 4.91               | 201                          | 172                          | 3.42           | 18.0        | 67                     | 33.5                          | 13.4                         |  |
| S4                           |           | -                  | -                            | -                            | -              | -           | -                      | -                             | -                                       | -                            | -                                         | 4.38                   | 4.64               | 203                          | 170                          | 2.59           | 17.8        | 67                     | 37.9                          | 14.8                         |  |
| CD (0.05)                    |           | 0.09               | 7.67                         | 8.75                         | 0.01           | 0.07        | 1.82                   | 0.73                          | 0.85                                    | 0.98                         | 0.62                                      | 0.47                   | 0.45               | 13.13                        | 10.11                        | 0.31           | NS          | 1.31                   | 8.27                          | 3.72                         |  |
| C.V. (%)                     |           | 2.02               | 2.24                         | 2.62                         | 0.37           | 0.23        | 1.91                   | 8.75                          | 17.34                                   | 17.42                        | 16.13                                     | 10.89                  | 9.82               | 6.36                         | 5.73                         | 10.26          | 6.92        | 1.87                   | 19.80                         | 22.34                        |  |
| Experimental Mean            |           | 4.31               | 314                          | 307                          | 2.81           | 26.0        | 87                     | 7.6                           | 4.5                                     | 5.19                         | 3.51                                      | 4.09                   | 4.36               | 197                          | 168                          | 2.84           | 17.5        | 67                     | 39.8                          | 15.8                         |  |
| Soil type                    |           | -                  |                              |                              |                |             |                        |                               |                                         |                              |                                           | -                      |                    |                              |                              |                |             |                        |                               |                              |  |
| pH                           |           | 7.70               |                              |                              |                |             |                        |                               |                                         |                              |                                           | 7.56                   |                    |                              |                              |                |             |                        |                               |                              |  |
| Variety                      |           | Pusa Basmati 1509  |                              |                              |                |             |                        |                               |                                         |                              |                                           | Mahisagar 100-110 Days |                    |                              |                              |                |             |                        |                               |                              |  |
| Available NPK                |           | 21:18:209          |                              |                              |                |             |                        |                               |                                         |                              |                                           | -                      |                    |                              |                              |                |             |                        |                               |                              |  |

S1: Broadcasting of seeds

S2: Manual line sowing of seeds (20-25 cm row spacing sown in solid row)

S3: Mechanized line sowing of seeds (Dribbler, Happy seeder of any Drum Seeder: Spacing as per the equipment specifications)

S4: Any improved system in that particular location

\*S4- Sprouted seed on unpuddle

Table-4.2.2: Contd....

| Treatment                            |           | PANTNAGAR          |                    |                              |                              |                |             |                                                          |                                                         |                                                         |                                                           |
|--------------------------------------|-----------|--------------------|--------------------|------------------------------|------------------------------|----------------|-------------|----------------------------------------------------------|---------------------------------------------------------|---------------------------------------------------------|-----------------------------------------------------------|
| Main Plot                            | Sub-plots | Grain yield (t/ha) | Straw yield (t/ha) | Tillers/m <sup>2</sup> (No.) | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Weed population at active tillering (no/m <sup>2</sup> ) | Weed population panicle initiation (no/m <sup>2</sup> ) | Weed dry weight at active tillering (g/m <sup>2</sup> ) | Weed dry weight at panicle initiation (g/m <sup>2</sup> ) |
| <b>M1- Normal sowing time</b>        | S1        | 4.17               | 4.77               | 281                          | 323                          | 1.56           | 23.7        | 143                                                      | 131                                                     | 53.0                                                    | 53.0                                                      |
|                                      | S2        | 4.98               | 5.32               | 173                          | 335                          | 1.78           | 23.7        | 157                                                      | 137                                                     | 47.7                                                    | 47.7                                                      |
|                                      | S3        | 5.03               | 5.30               | 187                          | 340                          | 1.80           | 26.4        | 132                                                      | 124                                                     | 48.0                                                    | 48.0                                                      |
|                                      | S4        | -                  | -                  | -                            | -                            | -              | -           | -                                                        | -                                                       | -                                                       | -                                                         |
| <b>M2- Delayed sowing by 30 days</b> | S1        | 3.58               | 4.26               | 245                          | 308                          | 1.37           | 22.8        | 148                                                      | 124                                                     | 42.0                                                    | 42.0                                                      |
|                                      | S2        | 4.43               | 4.93               | 158                          | 295                          | 1.83           | 20.9        | 139                                                      | 119                                                     | 42.2                                                    | 42.2                                                      |
|                                      | S3        | 4.45               | 4.89               | 171                          | 303                          | 1.72           | 23.9        | 137                                                      | 143                                                     | 51.8                                                    | 51.8                                                      |
|                                      | S4        | -                  | -                  | -                            | -                            | -              | -           | -                                                        | -                                                       | -                                                       | -                                                         |
| <b>Interaction</b>                   |           |                    |                    |                              |                              |                |             |                                                          |                                                         |                                                         |                                                           |
| <i>I and M</i>                       |           | NS                 | NS                 | NS                           | NS                           | NS             | 0.77        | NS                                                       | NS                                                      | NS                                                      | NS                                                        |
| <i>M and I</i>                       |           | NS                 | NS                 | NS                           | NS                           | NS             | 0.79        | NS                                                       | NS                                                      | NS                                                      | NS                                                        |
| <b>Mean of Main plot</b>             |           |                    |                    |                              |                              |                |             |                                                          |                                                         |                                                         |                                                           |
| M1                                   |           | 4.73               | 5.13               | 214                          | 333                          | 1.71           | 24.6        | 144                                                      | 131                                                     | 49.6                                                    | 49.6                                                      |
| M2                                   |           | 4.15               | 4.69               | 192                          | 302                          | 1.64           | 22.5        | 141                                                      | 128                                                     | 45.3                                                    | 45.3                                                      |
| <b>C.D. (0.05)</b>                   |           | 0.06               | 0.22               | 19.72                        | NS                           | NS             | 0.61        | NS                                                       | NS                                                      | NS                                                      | NS                                                        |
| <b>C.V. (%)</b>                      |           | 0.64               | 2.22               | 4.80                         | 6.07                         | 2.97           | 1.28        | 6.06                                                     | 23.96                                                   | 21.80                                                   | 21.80                                                     |
| <b>Method of Sub plots</b>           |           |                    |                    |                              |                              |                |             |                                                          |                                                         |                                                         |                                                           |
| S1                                   |           | 3.87               | 4.51               | 263                          | 315                          | 1.46           | 23.2        | 145                                                      | 127                                                     | 47.5                                                    | 47.5                                                      |
| S2                                   |           | 4.70               | 5.13               | 165                          | 315                          | 1.80           | 22.3        | 148                                                      | 128                                                     | 45.0                                                    | 45.0                                                      |
| S3                                   |           | 4.74               | 5.10               | 179                          | 321                          | 1.76           | 25.1        | 135                                                      | 133                                                     | 49.9                                                    | 49.9                                                      |
| S4                                   |           |                    |                    |                              |                              |                |             |                                                          |                                                         |                                                         |                                                           |
| <b>CD (0.05)</b>                     |           | 0.17               | 0.19               | 13.31                        | NS                           | 0.18           | 0.54        | NS                                                       | NS                                                      | NS                                                      | NS                                                        |
| <b>C.V. (%)</b>                      |           | 2.79               | 2.93               | 4.94                         | 4.96                         | 7.91           | 1.74        | 18.04                                                    | 11.71                                                   | 17.24                                                   | 17.24                                                     |
| <b>Experimental Mean</b>             |           | 4.44               | 4.91               | 203                          | 317                          | 1.67           | 23.6        | 143                                                      | 130                                                     | 47.5                                                    | 47.5                                                      |
| Soil type                            |           | Silt loam          |                    |                              |                              |                |             |                                                          |                                                         |                                                         |                                                           |
| pH                                   |           | 7.80               |                    |                              |                              |                |             |                                                          |                                                         |                                                         |                                                           |
| Variety                              |           | HKR-47             |                    |                              |                              |                |             |                                                          |                                                         |                                                         |                                                           |
| Available NPK kg/ha                  |           | 239:21:219         |                    |                              |                              |                |             |                                                          |                                                         |                                                         |                                                           |

S1: Broadcasting of seeds

S2: Manual line sowing of seeds (20-25 cm row spacing sown in solid row)

S3: Mechanized line sowing of seeds (Dribbler, Happy seeder or any Drum Seeder: Spacing as per the equipment specifications)

S4: Any improved system in that particular location

Table-4.2.2: Contd....

| Treatment                            |           | RAGOLU              |                    |                              |                              |                |             |                                                          |                                                         |                                           |                                           | TULJAPUR           |                    |                              |                              |                |             |                        |
|--------------------------------------|-----------|---------------------|--------------------|------------------------------|------------------------------|----------------|-------------|----------------------------------------------------------|---------------------------------------------------------|-------------------------------------------|-------------------------------------------|--------------------|--------------------|------------------------------|------------------------------|----------------|-------------|------------------------|
| Main Plot                            | Sub-plots | Grain yield (t/ha)  | Straw yield (t/ha) | Tillers/m <sup>2</sup> (No.) | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Weed population at active tillering (no/m <sup>2</sup> ) | Weed population panicle initiation (no/m <sup>2</sup> ) | Weed dry weight at AT (g/m <sup>2</sup> ) | Weed dry weight at PI (g/m <sup>2</sup> ) | Grain yield (t/ha) | Straw yield (t/ha) | Tillers/m <sup>2</sup> (No.) | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days for 50% flowering |
| <b>M1- Normal sowing time</b>        | S1        | 4.77                | 6.29               | 162                          | 151                          | 2.97           | 22.8        | 67.0                                                     | 53.0                                                    | 83.60                                     | 28.30                                     | 0.94               | 3.36               | 469                          | 299                          | 1.94           | 24.88       | 87                     |
|                                      | S2        | 4.92                | 7.05               | 261                          | 252                          | 3.17           | 23.7        | 25.3                                                     | 38.3                                                    | 59.25                                     | 15.40                                     | 1.63               | 3.17               | 613                          | 334                          | 2.09           | 26.48       | 85                     |
|                                      | S3        | 5.53                | 7.12               | 268                          | 260                          | 3.28           | 23.8        | 19.5                                                     | 20.0                                                    | 72.05                                     | 16.60                                     | 1.75               | 3.76               | 625                          | 359                          | 2.28           | 26.40       | 83                     |
|                                      | S4        | 5.23                | 7.35               | 270                          | 262                          | 3.22           | 24.0        | 26.5                                                     | 20.3                                                    | 23.67                                     | 8.80                                      | 1.39               | 3.92               | 533                          | 300                          | 1.94           | 24.92       | 85                     |
| <b>M2- Delayed sowing by 30 days</b> | S1        | 4.70                | 8.48               | 185                          | 180                          | 3.98           | 22.6        | 119.5                                                    | 44.3                                                    | 138.60                                    | 48.04                                     | 0.53               | 2.90               | 359                          | 196                          | 1.73           | 24.90       | 84                     |
|                                      | S2        | 6.14                | 8.18               | 276                          | 273                          | 4.20           | 22.8        | 117.8                                                    | 41.3                                                    | 113.54                                    | 36.38                                     | 1.14               | 2.89               | 390                          | 286                          | 2.01           | 26.20       | 84                     |
|                                      | S3        | 5.76                | 9.47               | 287                          | 283                          | 4.07           | 23.0        | 62.5                                                     | 31.8                                                    | 67.58                                     | 23.06                                     | 1.31               | 3.60               | 497                          | 315                          | 2.17           | 26.10       | 82                     |
|                                      | S4        | 6.44                | 9.85               | 308                          | 281                          | 4.06           | 21.8        | 50.0                                                     | 20.5                                                    | 55.90                                     | 18.50                                     | 1.19               | 3.66               | 397                          | 291                          | 1.80           | 24.60       | 83                     |
| <b>Interaction</b>                   |           |                     |                    |                              |                              |                |             |                                                          |                                                         |                                           |                                           |                    |                    |                              |                              |                |             |                        |
| <i>I and M</i>                       |           | NS                  | NS                 | NS                           | NS                           | NS             | NS          | NS                                                       | NS                                                      | NS                                        | NS                                        | NS                 | NS                 | NS                           | 30.78                        | NS             | NS          | NS                     |
| <i>M and I</i>                       |           | NS                  | NS                 | NS                           | NS                           | NS             | NS          | NS                                                       | NS                                                      | NS                                        | NS                                        | NS                 | NS                 | NS                           | 37.60                        | NS             | NS          | NS                     |
| <b>Mean of Main plot</b>             |           |                     |                    |                              |                              |                |             |                                                          |                                                         |                                           |                                           |                    |                    |                              |                              |                |             |                        |
| M1                                   |           | 5.11                | 6.95               | 240                          | 231                          | 3.16           | 23.6        | 34.6                                                     | 32.9                                                    | 59.64                                     | 17.28                                     | 1.43               | 3.55               | 560                          | 323                          | 2.06           | 25.67       | 85                     |
| M2                                   |           | 5.76                | 9.00               | 264                          | 254                          | 4.08           | 22.6        | 87.4                                                     | 34.4                                                    | 93.90                                     | 31.49                                     | 1.04               | 3.26               | 411                          | 272                          | 1.93           | 25.45       | 83                     |
| <b>C.D. (0.05)</b>                   |           | 0.45                | 1.37               | NS                           | NS                           | 0.21           | NS          | 52.60                                                    | NS                                                      | NS                                        | NS                                        | 0.16               | 0.06               | 26.51                        | 33.91                        | NS             | NS          | 1.26                   |
| <b>C.V. (%)</b>                      |           | 7.29                | 15.24              | 26.93                        | 22.32                        | 5.25           | 7.73        | 76.65                                                    | 111.04                                                  | 57.04                                     | 78.63                                     | 11.73              | 1.47               | 4.86                         | 10.14                        | 10.15          | 1.15        | 1.33                   |
| <b>Method of Sub plots</b>           |           |                     |                    |                              |                              |                |             |                                                          |                                                         |                                           |                                           |                    |                    |                              |                              |                |             |                        |
| S1                                   |           | 4.73                | 7.39               | 173                          | 166                          | 3.48           | 22.7        | 93.3                                                     | 48.6                                                    | 111.10                                    | 38.17                                     | 0.74               | 3.13               | 414                          | 248                          | 1.83           | 24.89       | 86                     |
| S2                                   |           | 5.53                | 7.61               | 268                          | 263                          | 3.69           | 23.2        | 71.5                                                     | 39.8                                                    | 86.39                                     | 25.89                                     | 1.38               | 3.03               | 502                          | 310                          | 2.05           | 26.34       | 84                     |
| S3                                   |           | 5.64                | 8.30               | 278                          | 272                          | 3.68           | 23.4        | 41.0                                                     | 25.9                                                    | 69.81                                     | 19.83                                     | 1.53               | 3.68               | 561                          | 337                          | 2.22           | 26.25       | 83                     |
| S4                                   |           | 5.83                | 8.60               | 289                          | 271                          | 3.64           | 22.9        | 38.3                                                     | 20.4                                                    | 39.79                                     | 13.65                                     | 1.29               | 3.79               | 465                          | 296                          | 1.87           | 24.76       | 84                     |
| <b>CD (0.05)</b>                     |           | 0.54                | NS                 | 44.73                        | 45.96                        | NS             | NS          | 35.92                                                    | 18.59                                                   | 41.10                                     | NS                                        | 0.17               | 0.35               | 62.69                        | 21.76                        | 0.20           | 0.31        | 0.99                   |
| <b>C.V. (%)</b>                      |           | 9.41                | 11.79              | 16.90                        | 18.02                        | 11.89          | 4.53        | 56.03                                                    | 52.54                                                   | 50.93                                     | 74.28                                     | 13.16              | 9.90               | 12.29                        | 6.96                         | 9.38           | 1.14        | 1.12                   |
| <b>Experimental Mean</b>             |           | 5.44                | 7.97               | 252                          | 243                          | 3.62           | 23.1        | 61.0                                                     | 33.7                                                    | 76.77                                     | 24.38                                     | 1.24               | 3.41               | 485                          | 297                          | 1.99           | 25.56       | 84                     |
| Soil type                            |           | Red Sandy Clay Loam |                    |                              |                              |                |             |                                                          |                                                         |                                           |                                           | -                  |                    |                              |                              |                |             |                        |
| pH                                   |           | 7.80                |                    |                              |                              |                |             |                                                          |                                                         |                                           |                                           | 7.60               |                    |                              |                              |                |             |                        |
| Variety                              |           | VASUNDHARA 135Days  |                    |                              |                              |                |             |                                                          |                                                         |                                           |                                           | TJP-48 110Days     |                    |                              |                              |                |             |                        |
| Available NPK kg/ha                  |           | 227:39:285          |                    |                              |                              |                |             |                                                          |                                                         |                                           |                                           | -                  |                    |                              |                              |                |             |                        |

S1: Broadcasting of seeds

\*S4 - Semi dry rice 20 x 15 cm

S2: Manual line sowing of seeds (20-25 cm row spacing sown in solid row)

S3: Mechanized line sowing of seeds (Dribbler, Happy seeder of any Drum Seeder: Spacing as per the equipment specifications)

S4: Any improved system in that particular location

Table-4.2.2: Contd....

| Treatment                            |           | RANCHI              |                              |                |             |                                                         | Over all Mean | Rank |
|--------------------------------------|-----------|---------------------|------------------------------|----------------|-------------|---------------------------------------------------------|---------------|------|
| Main Plot                            | Sub-plots | Grain yield (t/ha)  | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Weed dry weight at active tillering (g/m <sup>2</sup> ) |               |      |
| <b>M1- Normal sowing time</b>        | S1        | 4.02                | 236                          | 2.96           | 24.17       | 36.25                                                   | 3.91          | 5    |
|                                      | S2        | 4.32                | 251                          | 3.20           | 24.22       | 25.23                                                   | 4.32          | 3    |
|                                      | S3        | 3.96                | 228                          | 2.94           | 24.12       | 42.23                                                   | 4.47          | 1    |
|                                      | S4        | 4.78                | 276                          | 3.27           | 24.34       | 10.16                                                   | 4.41          | 2    |
| <b>M2- Delayed sowing by 30 days</b> | S1        | 3.52                | 214                          | 2.93           | 23.97       | 42.36                                                   | 3.26          | 8    |
|                                      | S2        | 3.75                | 224                          | 2.99           | 24.19       | 30.23                                                   | 3.79          | 6    |
|                                      | S3        | 3.36                | 208                          | 2.92           | 23.90       | 50.48                                                   | 3.76          | 7    |
|                                      | S4        | 4.38                | 253                          | 3.22           | 25.38       | 11.50                                                   | 4.17          | 4    |
| <b>Interaction</b>                   |           |                     |                              |                |             |                                                         |               |      |
| <i>I and M</i>                       |           | NS                  | NS                           | NS             | NS          | NS                                                      |               |      |
| <i>M and I</i>                       |           | NS                  | NS                           | NS             | NS          | NS                                                      |               |      |
| <b>Mean of Main plot</b>             |           |                     |                              |                |             |                                                         |               |      |
| M1                                   |           | 4.27                | 248                          | 3.09           | 24.21       | 28.47                                                   | 4.29          | 1    |
| M2                                   |           | 3.75                | 225                          | 3.02           | 24.36       | 33.64                                                   | 3.68          | 2    |
| <b>C.D. (0.05)</b>                   |           | 0.34                | NS                           | NS             | NS          | 1.94                                                    |               |      |
| <b>C.V. (%)</b>                      |           | 7.54                | 15.19                        | 2.28           | 3.75        | 5.56                                                    |               |      |
| <b>Method of Sub plots</b>           |           |                     |                              |                |             |                                                         |               |      |
| S1                                   |           | 3.77                | 225                          | 2.95           | 24.07       | 39.31                                                   | 3.58          | 4    |
| S2                                   |           | 4.04                | 238                          | 3.09           | 24.20       | 27.73                                                   | 4.06          | 3    |
| S3                                   |           | 3.66                | 218                          | 2.93           | 24.01       | 46.35                                                   | 4.11          | 2    |
| S4                                   |           | 4.58                | 265                          | 3.25           | 24.86       | 10.83                                                   | 4.29          | 1    |
| <b>CD (0.05)</b>                     |           | 0.42                | 21.53                        | 0.16           | NS          | 3.52                                                    |               |      |
| <b>C.V. (%)</b>                      |           | 9.98                | 8.67                         | 4.98           | 3.73        | 10.78                                                   |               |      |
| <b>Experimental Mean</b>             |           | 4.01                | 236                          | 3.05           | 24.29       | 31.06                                                   | 3.99          |      |
| Soil type                            |           | Red Sandy Clay Loam |                              |                |             |                                                         |               |      |
| pH                                   |           | 7.80                |                              |                |             |                                                         |               |      |
| Variety                              |           | VASUNDHARA 135Days  |                              |                |             |                                                         |               |      |
| Available NPK kg/ha                  |           | 227:39:285          |                              |                |             |                                                         |               |      |

\*S4- Rice + Sesbania was broadcasted (Sesbania was broadcasted at the rate of 40 kg/ha and then rice was sown in lines 20 cm apart. At 25th DAS sesbania was uprooted and placed in between rice rows.

| Cost of Cultivation (Rs./ha) |           |           |           |           | Total Water Input mm/ha |
|------------------------------|-----------|-----------|-----------|-----------|-------------------------|
| GANGAVATHI                   | MANDYA    | NAGINA    | NAWAGAM   | RAGOLU    | RAGOLU                  |
| 61405                        | 55289     | 22720     | 38785     | 25120     | 2500                    |
| 62155                        | 58082     | 24615     | 39670     | 32100     | 2500                    |
| 62655                        | 57256     | 28372     | 38642     | 28620     | 2500                    |
| 66405                        |           |           | 38958     | 27120     | 3000                    |
| 61405                        | 54299     | 22720     | 38785     | 25367     | 2000                    |
| 62155                        | 56849     | 24615     | 39679     | 32350     | 2000                    |
| 62655                        | 55733     | 28372     | 38643     | 28870     | 2000                    |
| 66405                        |           |           | 38954     | 27370     | 2500                    |
| -                            | -         | -         | -         | -         | -                       |
| -                            | -         | -         | -         | -         | -                       |
| 63155                        | 56876     | 25236     | 39014     | 28240     | 2625                    |
| 63155                        | 55627     | 25236     | 39015     | 28489     | 2125                    |
| -                            | -         | -         | -         | -         | -                       |
| -                            | -         | -         | -         | -         | -                       |
| 61405                        | 54794     | 22720     | 38785     | 25244     | 2250                    |
| 62155                        | 57465     | 24615     | 39674     | 32225     | 2250                    |
| 62655                        | 56495     | 28372     | 38643     | 28745     | 2250                    |
| 66405                        | -         | -         | 38956     | 27245     | 2750                    |
| -                            | -         | -         | -         | -         | -                       |
| -                            | -         | -         | -         | -         | -                       |
| 63155                        | 56251.307 | 25235.667 | 39014.375 | 28364.625 | 2375                    |

Table-4.2.2: Contd....

| Treatment                     |           | LUDHIANA           |                    |                              |                              |                |             |                        |                                                          |                                                         | PUSA               |                              |                |
|-------------------------------|-----------|--------------------|--------------------|------------------------------|------------------------------|----------------|-------------|------------------------|----------------------------------------------------------|---------------------------------------------------------|--------------------|------------------------------|----------------|
| Main Plot                     | Sub-plots | Grain yield (t/ha) | Straw yield (t/ha) | Tillers/m <sup>2</sup> (No.) | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days for 50% flowering | Weed population at active tillering (no/m <sup>2</sup> ) | Weed dry weight at active tillering (g/m <sup>2</sup> ) | Grain yield (t/ha) | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) |
| <b>M1- Normal sowing time</b> | S1        | 7.30               | 9.76               | 526.0                        | 508.5                        | 2.91           | 21.42       | 76.3                   | 20.13                                                    | 12.94                                                   | 3.18               | 287                          | 2.92           |
|                               | S2        | 7.26               | 9.65               | 461.1                        | 450.4                        | 3.34           | 21.27       | 79.7                   | 5.77                                                     | 4.75                                                    | 3.69               | 298                          | 2.90           |
|                               | S3        | 7.39               | 9.56               | 471.9                        | 460.9                        | 3.36           | 21.30       | 80.3                   | 5.33                                                     | 4.89                                                    | 3.75               | 301                          | 2.89           |
|                               | S4        | -                  | -                  | -                            | -                            | -              | -           | -                      | -                                                        | -                                                       | 3.58               | 295                          | 2.90           |
| <b>Exp. mean</b>              |           | 7.32               | 9.66               | 486.3                        | 473.3                        | 3.20           | 21.33       | 78.8                   | 10.41                                                    | 7.53                                                    | 3.55               | 295                          | 2.90           |
| <b>CD(0.05)</b>               |           | 0.28               | 0.18               | 33.81                        | 24.86                        | 0.14           | 0.15        | 0.48                   | 2.82                                                     | 1.64                                                    | 0.31               | 23.33                        | 0.23           |
| <b>CV</b>                     |           | 2.64               | 1.30               | 4.79                         | 3.62                         | 2.93           | 0.49        | 0.42                   | 18.71                                                    | 15.06                                                   | 6.29               | 5.73                         | 5.87           |
| <b>res(t)</b>                 |           | NS                 | NS                 | NS                           | *                            | **             | NS          | **                     | **                                                       | **                                                      | **                 | NS                           | NS             |
| Soil type                     |           | Silty loam         |                    |                              |                              |                |             |                        |                                                          |                                                         | Silty loam         |                              |                |
| pH                            |           | 7.80               |                    |                              |                              |                |             |                        |                                                          |                                                         | 7.80               |                              |                |
| Variety                       |           | -                  |                    |                              |                              |                |             |                        |                                                          |                                                         | Abhishek           |                              |                |
| Available NPK kg/ha           |           | 210:19:247         |                    |                              |                              |                |             |                        |                                                          |                                                         | -                  |                              |                |

S1: Broadcasting of seeds

S2: Manual line sowing of seeds (20-25 cm row spacing sown in solid row)

S3: Mechanized line sowing of seeds (Dribbler, Happy seeder or any Drum Seeder: Spacing as per the equipment specifications)

S4: Any improved system in that particular location

\*S4 - Broad casting of seed (20% higher than S1)

Table-4.2.2: (Rabi)YET-2Evaluation of nutrient and weed management for higher productivity in different rice establishment methods, Rabi-2018-19

| Method of crop establishment | Sub plot (Nitrogen splits) | Sub sub plot           | MANDYA                         |                               |              |                                 |      |          |
|------------------------------|----------------------------|------------------------|--------------------------------|-------------------------------|--------------|---------------------------------|------|----------|
|                              |                            |                        | Grain Yield (t/ha) Kharif 2018 | Grain Yield (t/ha) Rabi 18-19 | Germination% | Plant population/m <sup>2</sup> | REY  | (K+R)REY |
| M2 - DS fb SRI               | S1                         | F0- Without fertilizer | 5.88                           | 1.26                          | 95.00        | 19.67                           | 5.40 | 11.28    |
|                              |                            | F1- 100% of RDF        |                                | 1.14                          | 91.67        | 19.67                           | 4.91 | 4.91     |
|                              | S2                         | F0- Without fertilizer | 5.64                           | 1.26                          | 93.33        | 20.74                           | 5.43 | 11.07    |
|                              |                            | F1- 100% of RDF        |                                | 1.43                          | 96.67        | 20.74                           | 6.15 | 6.15     |
|                              | S3                         | F0- Without fertilizer | 6.5                            | 1.20                          | 98.33        | 20.37                           | 5.13 | 11.63    |
|                              |                            | F1- 100% of RDF        |                                | 1.37                          | 90.00        | 20.00                           | 5.87 | 5.87     |
|                              | S4                         | F0- Without fertilizer | 5.66                           | 1.45                          | 93.33        | 19.26                           | 6.24 | 11.90    |
|                              |                            | F1- 100% of RDF        |                                | 1.45                          | 91.67        | 19.63                           | 6.21 | 6.21     |
| M3 - Normal Transplanting    | S1                         | F0- Without fertilizer | 6.34                           | 1.19                          | 95.00        | 20.37                           | 5.11 | 11.45    |
|                              |                            | F1- 100% of RDF        |                                | 1.11                          | 91.67        | 18.89                           | 4.79 | 4.79     |
|                              | S2                         | F0- Without fertilizer | 5.85                           | 1.01                          | 83.33        | 18.89                           | 4.31 | 10.16    |
|                              |                            | F1- 100% of RDF        |                                | 0.99                          | 93.33        | 20.74                           | 4.25 | 4.25     |
|                              | S3                         | F0- Without fertilizer | 6.75                           | 1.15                          | 90.00        | 20.00                           | 4.93 | 11.68    |
|                              |                            | F1- 100% of RDF        |                                | 1.07                          | 91.67        | 20.00                           | 4.60 | 4.60     |
|                              | S4                         | F0- Without fertilizer | 6.02                           | 1.14                          | 100.00       | 20.74                           | 4.88 | 10.90    |
|                              |                            | F1- 100% of RDF        |                                | 0.97                          | 95.00        | 19.26                           | 4.17 | 4.17     |
| M6- Semi dry rice            | S1                         | F0- Without fertilizer | 5.68                           | 1.46                          | 91.67        | 20.74                           | 6.26 | 11.94    |
|                              |                            | F1- 100% of RDF        |                                | 1.21                          | 88.33        | 20.00                           | 5.21 | 5.21     |
|                              | S2                         | F0- Without fertilizer | 4.89                           | 1.29                          | 85.00        | 20.00                           | 5.55 | 10.44    |
|                              |                            | F1- 100% of RDF        |                                | 1.26                          | 83.33        | 17.04                           | 5.40 | 5.40     |
|                              | S3                         | F0- Without fertilizer | 6.81                           | 1.42                          | 100.00       | 20.74                           | 6.10 | 12.91    |
|                              |                            | F1- 100% of RDF        |                                | 1.22                          | 96.67        | 21.48                           | 5.26 | 5.26     |
|                              | S4                         | F0- Without fertilizer | 5.61                           | 1.20                          | 90.00        | 20.00                           | 5.15 | 10.76    |
|                              |                            | F1- 100% of RDF        |                                | 1.22                          | 85.00        | 18.89                           | 5.26 | 5.26     |
|                              | S5                         | F0- Without fertilizer | 4.61                           | 1.47                          | 90.00        | 18.89                           | 6.31 | 10.92    |
|                              |                            | F1- 100% of RDF        |                                | 0.92                          | 98.33        | 20.74                           | 3.97 | 3.97     |
|                              | Mean of M levels:          |                        |                                |                               |              |                                 |      |          |
|                              | M1                         |                        | 5.81                           | 1.36                          | 94.00        | 20.04                           | 5.85 | 11.66    |
|                              | M2                         |                        | 6.24                           | 1.08                          | 92.83        | 19.92                           | 4.65 | 10.89    |
|                              | M3                         |                        | 5.52                           | 1.27                          | 90.83        | 19.85                           | 5.45 | 10.97    |
|                              | C.D.(0.05)                 |                        | 0.11                           | NS                            | NS           | NS                              |      |          |
|                              | SE(m)                      |                        | 3.54                           | 0.13                          | 2.117        | 0.258                           |      |          |

Table-4.2.2: (Rabi)YET-2Cntd....

| Method of crop establishment | Sub plot (Nitrogen splits)   | Sub sub plot | MANDYA                         |                               |               |                                 |      |           |
|------------------------------|------------------------------|--------------|--------------------------------|-------------------------------|---------------|---------------------------------|------|-----------|
|                              |                              |              | Grain Yield (t/ha) Kharif 2018 | Grain Yield (t/ha) Rabi 18-19 | Germination % | Plant population/m <sup>2</sup> | RE Y | (K+R)RE Y |
|                              | Mean of Sub Plots:           |              |                                |                               |               |                                 |      |           |
|                              | S1                           |              | 5.97                           | 1.23                          | 92.22         | 19.89                           | 5.28 | 11.25     |
|                              | S2                           |              | 5.46                           | 1.21                          | 89.17         | 19.69                           | 5.18 | 10.64     |
|                              | S3                           |              | 6.69                           | 1.24                          | 94.44         | 20.43                           | 5.31 | 12.00     |
|                              | S4                           |              | 5.76                           | 1.24                          | 92.50         | 19.63                           | 5.32 | 11.08     |
|                              | S5                           |              | 5.42                           | 1.28                          | 94.44         | 20.06                           | 5.48 | 10.89     |
|                              | C.D.(0.05)                   |              | 0.21                           | NS                            | NS            | NS                              |      |           |
|                              | SE(m)                        |              | 4.47                           | 0.07                          | 1.362         | 0.287                           |      |           |
|                              | Mean of Sub-sub Plots:       |              |                                |                               |               |                                 |      |           |
|                              | F0 Without fertilizer        |              |                                | 1.27                          | 93.00         | 20.10                           | 5.45 | 5.45      |
|                              | F1 100% RDF                  |              |                                | 1.21                          | 92.11         | 19.78                           | 5.18 | 5.18      |
|                              | C.D.(0.05)                   |              |                                | N/A                           | N/A           | N/A                             |      |           |
|                              | SE(m)                        |              |                                | 0.04                          | 0.868         | 0.164                           |      |           |
|                              | Interactions                 |              |                                |                               |               |                                 |      |           |
|                              | Expt. Mean                   |              | 5.86                           | 1.24                          | 92.56         | 19.94                           | 5.31 | 11.17     |
|                              | Soil type                    |              | Red sandy loam                 | Red sandy loam                |               |                                 |      |           |
|                              | pH                           |              | 6.97                           | 7.2                           |               |                                 |      |           |
|                              | Variety                      |              | MTU 1001                       | Cowpea-KBC-9                  |               |                                 |      |           |
|                              | Location specific RDF        |              |                                | 25:50:2                       |               |                                 |      |           |
|                              | NPK (kg/ha)                  |              |                                | 5                             |               |                                 |      |           |
|                              | Availabe NPK of soil (kg/ha) |              | 226:98:276                     | 28.5:72.5:132                 |               |                                 |      |           |

Rice-Cowpea

MSP for Chickpea Rs.7511/Q

M1 - Mechanical Transplanting  
M2 - DS fb SRI  
M3 - Normal Transplanting  
M4 - SRI  
M5 - Aerobic rice  
M6 - Semi dry rice

S1:100% recommended inorganic fertilizers (120:60:40 kg NPK/ha)  
S2:75% inorganic + 25% (equivalent of N dose) organic  
S3:150% recommended fertilizer dose  
S4:LCC based N application  
S5:Location specific fertiliser management

Table-4.2.2: (Rabi)YET-2Contd....

| Treatment                            |                    | PUDUCHERRY                     |                                  |              |                    |                               |                |              |                                                          |                                                         |                             |
|--------------------------------------|--------------------|--------------------------------|----------------------------------|--------------|--------------------|-------------------------------|----------------|--------------|----------------------------------------------------------|---------------------------------------------------------|-----------------------------|
| Methods of crop establishment        | Method of Nutrient | Grain yield (t/ha) Kharif-2018 | Grain yield (t/ha) Ra bi 2018-19 | REY          | Straw yield (t/ha) | Panicle/ m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g)  | Weed population at active tillering (no/m <sup>2</sup> ) | Weed dry weight at active tillering (g/m <sup>2</sup> ) | Cost of cultivation (Rs/ha) |
| <b>M1 - Mechanical Transplanting</b> | <b>S1</b>          | 6.15                           | 6.69                             | 12.84        | 10.95              | 356                           | 3.87           | 14.77        | 46.70(6.87)                                              | 43.07                                                   | 44025                       |
|                                      | <b>S2</b>          | 6.41                           | 6.89                             | 13.30        | 11.29              | 371                           | 3.99           | 14.88        | 44.40(6.70)                                              | 39.30                                                   | 45569                       |
|                                      | <b>S3</b>          | 6.55                           | 7.05                             | 13.60        | 11.54              | 379                           | 4.14           | 15.02        | 42.04(6.52)                                              | 35.12                                                   | 46402                       |
|                                      | <b>S4</b>          | 6.74                           | 7.20                             | 13.94        | 11.78              | 386                           | 4.26           | 15.18        | 38.60(6.25)                                              | 28.00                                                   | 43300                       |
|                                      | <b>S5</b>          | 5.99                           | 6.62                             | 12.61        | 10.85              | 356                           | 3.82           | 14.30        | 49.31(7.05)                                              | 45.75                                                   | 51153                       |
| <b>M2 - DS fb SRI</b>                | <b>S1</b>          | 5.61                           | 6.57                             | 12.18        | 10.76              | 341                           | 3.64           | 14.07        | 52.35(7.27)                                              | 50.43                                                   | 42151                       |
|                                      | <b>S2</b>          | 5.73                           | 6.61                             | 12.34        | 10.82              | 340                           | 3.69           | 14.29        | 48.77(7.02)                                              | 47.27                                                   | 43695                       |
|                                      | <b>S3</b>          | 6.15                           | 6.78                             | 12.93        | 11.09              | 358                           | 4.01           | 14.48        | 46.31(6.84)                                              | 46.92                                                   | 44528                       |
|                                      | <b>S4</b>          | 6.4                            | 6.97                             | 13.37        | 11.57              | 364                           | 4.19           | 14.98        | 44.68(6.72)                                              | 43.86                                                   | 41676                       |
|                                      | <b>S5</b>          | 5.33                           | 6.37                             | 11.70        | 10.43              | 332                           | 3.56           | 13.86        | 56.24(7.53)                                              | 54.72                                                   | 48778                       |
| <b>M3 - Normal Transplanting</b>     | <b>S1</b>          | 5.75                           | 6.64                             | 12.39        | 10.87              | 347                           | 3.86           | 14.80        | 48.36(6.99)                                              | 45.15                                                   | 46276                       |
|                                      | <b>S2</b>          | 6.18                           | 6.74                             | 12.92        | 11.06              | 353                           | 3.97           | 14.91        | 45.15(6.75)                                              | 40.17                                                   | 47820                       |
|                                      | <b>S3</b>          | 6.38                           | 6.94                             | 13.32        | 11.50              | 378                           | 4.16           | 14.64        | 43.53(6.63)                                              | 39.01                                                   | 48653                       |
|                                      | <b>S4</b>          | 6.58                           | 7.05                             | 13.63        | 11.55              | 373                           | 4.19           | 14.98        | 40.43(6.40)                                              | 33.33                                                   | 45301                       |
|                                      | <b>S5</b>          | 5.54                           | 6.44                             | 11.98        | 10.54              | 342                           | 3.78           | 14.72        | 50.80(7.16)                                              | 48.48                                                   | 52153                       |
| <b>Interaction M and S</b>           |                    | NS                             | NS                               |              | NS                 | NS                            | NS             | NS           | NS                                                       | 2.04                                                    |                             |
| <b>S and M</b>                       |                    | NS                             | NS                               |              | NS                 | NS                            | NS             | NS           | NS                                                       | 1.88                                                    |                             |
| <b>Mean of Methods</b>               |                    |                                |                                  |              |                    |                               |                |              |                                                          |                                                         |                             |
| <b>M1</b>                            |                    | 6.37                           | 6.89                             | 13.26        | 11.28              | 370                           | 4.02           | 14.83        | 44.21(6.68)                                              | 38.25                                                   | 46090                       |
| <b>M2</b>                            |                    | 5.84                           | 6.66                             | 12.50        | 10.93              | 347                           | 3.82           | 14.34        | 49.67(7.07)                                              | 48.64                                                   | 44166                       |
| <b>M3</b>                            |                    | 6.09                           | 6.76                             | 12.85        | 11.10              | 359                           | 3.99           | 14.81        | 45.66(6.79)                                              | 41.23                                                   | 48041                       |
| <b>C.D. (0.05)</b>                   |                    | 0.09                           | 0.07                             |              | NS                 | 4.34                          | 0.05           | 0.24         | 0.05                                                     | 0.77                                                    |                             |
| <b>C.V. (%)</b>                      |                    | 2.25                           | 1.71                             |              | 3.35               | 1.87                          | 2.03           | 2.54         | 1.18                                                     | 2.78                                                    |                             |
| <b>Method of Nutrition</b>           |                    |                                |                                  |              |                    |                               |                |              |                                                          |                                                         |                             |
| <b>S1</b>                            |                    | 5.84                           | 6.63                             | 12.47        | 10.86              | 348                           | 3.79           | 14.54        | 49.14(7.04)                                              | 46.22                                                   | 44151                       |
| <b>S2</b>                            |                    | 6.11                           | 6.75                             | 12.86        | 11.06              | 355                           | 3.88           | 14.69        | 46.11(6.82)                                              | 42.24                                                   | 45695                       |
| <b>S3</b>                            |                    | 6.36                           | 6.92                             | 13.28        | 11.38              | 372                           | 4.10           | 14.71        | 43.96(6.66)                                              | 40.35                                                   | 46528                       |
| <b>S4</b>                            |                    | 6.57                           | 7.07                             | 13.64        | 11.63              | 375                           | 4.22           | 15.04        | 41.24(6.46)                                              | 35.06                                                   | 43426                       |
| <b>S5</b>                            |                    | 5.62                           | 6.48                             | 12.10        | 10.61              | 343                           | 3.72           | 14.29        | 52.12(7.25)                                              | 49.65                                                   | 50695                       |
| <b>CD (0.05)</b>                     |                    | 0.15                           | 0.10                             |              | 0.23               | 6.91                          | 0.09           | 0.39         | 0.08                                                     | 1.18                                                    |                             |
| <b>C.V. (%)</b>                      |                    | 2.55                           | 1.59                             |              | 2.09               | 1.98                          | 2.33           | 2.75         | 1.23                                                     | 2.83                                                    |                             |
| <b>Experimental Mean</b>             |                    | <b>6.1</b>                     | <b>6.77</b>                      | <b>12.87</b> | <b>11.11</b>       | <b>358</b>                    | <b>3.94</b>    | <b>14.66</b> | <b>6.85</b>                                              | <b>42.70</b>                                            | <b>46099</b>                |
| <b>Soil type</b>                     |                    | Clay loam                      | Clay loam                        |              |                    |                               |                |              |                                                          |                                                         |                             |
| <b>pH</b>                            |                    | 6.62                           | 7.95                             |              |                    |                               |                |              |                                                          |                                                         |                             |
| <b>EC</b>                            |                    | 0.26                           | 0.08                             |              |                    |                               |                |              |                                                          |                                                         |                             |
| <b>Variety &amp; Duration</b>        |                    | CO-52                          | ADT-53                           |              |                    |                               |                |              |                                                          |                                                         |                             |
| <b>Available NPK kg/ha</b>           |                    | 324.8:36.35:200                | 157:30:102                       |              |                    |                               |                |              |                                                          |                                                         |                             |

Rice - Rice

S1: 100% RDF inorganic(120:60:40)

S2: 75% inorganic + 25% organic(equivalent of N dose)

S3: 150 % RDF

S4:LCC based N application

S5: Location specific fertilizer management

### 4.2.3. Developing suitable package of practices for wet DSR

Direct wet seeding offers the advantage of faster and easier planting, reduced labour and less drudgery, 7-10 days earlier crop maturity, more efficient water use and higher tolerance to water deficit, less methane emission, and often higher profit in areas with assured water supply. This method of seeding in the past has received relatively less attention than transplanting. Sowing of sprouted rice seed or wet-seeded rice in puddled soil though becoming increasingly important as a method of crop establishment under lowland rice is beset with weed problems, particularly grassy weeds besides other management practices. Weeds emerge at about the same time that the rice seeds germinate, and therefore the yield losses caused by weeds will become greater with the trend towards wet seeding. Effective weed control is one of the key issue and major requirements to ensure a successful wet-seeded rice crop. Furthermore, varieties must be improved for early seeding vigour, weed competitiveness, submergence tolerance to survive untimely rainfall during stand establishment and drought tolerance to survive dry conditions during germination and later growth stages, and for lodging resistance at maturity. Hence the present trial is constituted to enhance the productivity of the wet DSR with the following objectives 1) To identify suitable and cost effective agronomic management practices to enhance the productivity of wet DSR 2) To maximize the resource use efficiency. The trial was conducted at 16 locations (**Aduthurai, Chatha, Chiplitima, Coimbatore, Karjat, Kota, Mandya, Navsari, Nawagam, Puducherry, Rajendranagar, Ranchi, Rewa, Titabar, Warangal and Pusa**). Split plot design was adopted with 2 main plots of sowing time (M<sub>1</sub>: Normal sowing time and M<sub>2</sub>: Delayed sowing by 30 days). Four subplots consist of S<sub>1</sub>: Broadcasting of seeds; S<sub>2</sub>: Manual line sowing of seed (20-25 cm row spacing sown in solid row); S<sub>3</sub>: Mechanized line sowing of seeds (Dribbler, Happy Seeder or any Drum Seeder), S<sub>4</sub>: Any improved system in that particular location and S<sub>5</sub>: Normal Transplanting. The results were summarized and presented in **Table 4.2.3** and the salient findings are as followed.

At one location (**Pusa**) only one treatment (normal sowing time) was taken up out of 2 main plots treatment. So results were presented separately. Further, interaction effect between sowing time and crop establishment methods were found to be non-significant at **Aduthurai, Chiplitima, Coimbatore, Kota, Mandya, Navsari, Rajendranagar, Ranchi, Rewa, Titabar and Warangal**.

All locations recorded higher grain yield when rice crop was sown in normal sowing time except Aduthurai, where 30 days late sown crop resulted higher grain yield. Normal sowing time resulted higher grain yield in sandy clay loam soils of **Chatha** (2.86 t/ha), **Chiplitima** (4.34 t/ha), clay loam soils of **Coimbatore** (5.44 t/ha), **Karjat** (6.36 t/ha), clay loam soil of **Kota** (6.1 t/ha), red sandy loam soils of **Mandya** (6.22 t/ha), clay soils of **Navsari** (5.31 t/ha), Clay loam soils of **Nawagam** (4.85 t/ha), clay loam soils of **Puducherry** (6.1 t/ha), clay loam soils of **Ranchi** (4.82 t/ha), **Rewa** (4.62 t/ha), **Titabar** (3.16 t/ha) and clay loam soils of **Warangal** (6.47 t/ha). Delay in sowing time by 30 days reduced grain yield by 16% across the locations.

Among crop establishment methods transplanting method resulted in the highest grain yield at Chiplima (4.78 t/ha), Coimbatore (6.13 t/ha), Puducherry (6.26 t/ha), Ranchi (5.01 t/ha), Titabar (3.98 t/ha), Warangal (6.27 t/ha) and Pusa (4.32 t/ha).

At **Aduthurai**, delayed sowing by 30 days resulted higher grain yield (5.45 t/ha) than normal sowing time (4.92 t/ha). Among all establishment methods, local practices gave the highest grain yield (7.38 t/ha). Higher weed population and dry weight were recorded under manual line sowing treatment at active tillering stage. At **Chatha**, local establishment system at normal sowing time found to be best combination giving the highest grain yield of 3.5 t/ha than other combinations. Among establishment methods, mechanized line sowing resulted in higher weed population at active tillering and panicle initiation stages. At **Chiplima**, Normal sowing resulted higher grain yield (4.34 t/ha) than late sowing (3.86 t/ha). Among establishment methods, apart from transplanting, mechanized line sowing resulted higher grain yield (4.27 t/ha). At **Coimbatore**, among crop establishment methods, apart from transplanting, local system (Paddy + Dhaincha drum seeder) showed encouraging result (5.39 t/ha). Broadcasting of seeds resulted more weed population at active tillering and panicle initiation stage. At **Karjat**, local establishment method followed at normal sowing time resulted the highest grain yield (7.22 t/ha). Local package and practices was not provided. Among establishment methods, broadcasting of seeds resulted more weed population at active tillering and panicle initiation stage. At **Kota**, among establishment methods, locally followed method resulted the highest yield (6.27 t/ha). At **Mandya**, mechanized line sowing produced the highest grain yield (6.06 t/ha). Similarly, among establishment methods, broadcasting of seeds resulted more weed population and dry matter at active tillering and panicle initiation stage. At **Navsari**, among establishment methods, local package and practices provided the higher grain yield (5.51 t/ha). However, details of local packages and practices not provided. Similarly, among establishment methods, broadcasting of seeds resulted more weed dry matter at active tillering and panicle initiation stage. At **Nawagam**, locally practiced establishment method at normal sowing time resulted the highest grain yield (5.66 t/ha). Similarly, among establishment methods, broadcasting of seeds resulted more weed population and dry matter at active tillering and panicle initiation stage. At **Puducherry**, among crop establishment methods apart from transplanting (6.26 t/ha), mechanized line sowing resulted higher grain yield (6.14 t/ha). At **Rajendranagar**, mechanized line sowing resulted in the higher grain yield (7.05 t/ha) than transplanting (5.41 t/ha). At **Ranchi**, among crop establishment methods apart from transplanting (5.01 t/ha), mechanized line sowing resulted higher grain yield (4.93 t/ha). However, at **Rewa**, locally practiced establishment method gave the highest grain yield (5.21 t/ha). Details of package and practices was not provided. At Titabar, mechanized line sowing (3.11 t/ha) was encouraging though manual transplanting recorded the highest yield (3.98 t/ha). At **Warangal** apart from transplanting (6.27 t/ha) locally practiced establishment method resulted in the highest grain yield (5.59 t/ha).

The experimental mean of cost of cultivation at Coimbatore (Rs. 38039/-), Mandya (Rs. 55909/-), Navsari (Rs. 35415/-), Nawagam (Rs. 39986/-) and Puducherry (Rs. 44163/-) and Rewa (Rs. 23720/-).

In silty loam soils of **Pusa** apart from manual transplanting (4.32 t/ha) locally practiced **random transplanting** resulted in higher yield (4.17 t/ha) than other treatments.

Multi-locational trials revealed that locally practiced establishment methods sown at normal time were found to be superior in resulting higher grain yield.

Table-4.2.3: (CMT-3)(Wet DSR) - Developing suitable package of practices for Wet DSR, Kharif-2019

| Treatment                     |          | ADUTHURAI          |                              |                              |                |             |                       |                                                  |                                                  |                                                         |                                                           |
|-------------------------------|----------|--------------------|------------------------------|------------------------------|----------------|-------------|-----------------------|--------------------------------------------------|--------------------------------------------------|---------------------------------------------------------|-----------------------------------------------------------|
| Main Plot                     | Sub-plot | Grain yield (t/ha) | Tillers/m <sup>2</sup> (No.) | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | No of grains/panicles | Weed population at AT stage (no/m <sup>2</sup> ) | Weed population at PI stage (no/m <sup>2</sup> ) | Weed dry weight at active tillering (g/m <sup>2</sup> ) | Weed dry weight at panicle initiation (g/m <sup>2</sup> ) |
| M1- Normal sowing time        | S1       | 3.33               | 318                          | 302                          | 2.32           | 17.4        | 150                   | 45.50(6.77)                                      | 22.75(4.82)                                      | 4.80                                                    | 3.65                                                      |
|                               | S2       | 4.07               | 310                          | 290                          | 2.36           | 17.4        | 161                   | 49.00(7.01)                                      | 28.50(5.38)                                      | 4.93                                                    | 3.60                                                      |
|                               | S3       | 6.24               | 345                          | 328                          | 2.51           | 17.8        | 166                   | 51.75(7.22)                                      | 16.25(4.03)                                      | 5.15                                                    | 3.27                                                      |
|                               | S4       | 6.82               | 387                          | 376                          | 2.70           | 18.2        | 188                   | 32.25(5.71)                                      | 13.75(3.76)                                      | 4.62                                                    | 3.01                                                      |
|                               | S5       | 4.12               | 334                          | 321                          | 2.42           | 17.4        | 164                   | 34.25(5.89)                                      | 16.00(4.05)                                      | 4.56                                                    | 2.52                                                      |
| M2- Delayed sowing by 30 days | S1       | 4.21               | 352                          | 337                          | 2.45           | 17.7        | 176                   | 53.00(7.27)                                      | 15.75(3.99)                                      | 4.63                                                    | 3.99                                                      |
|                               | S2       | 4.31               | 346                          | 333                          | 2.43           | 17.4        | 163                   | 59.00(7.69)                                      | 17.25(4.21)                                      | 4.81                                                    | 4.10                                                      |
|                               | S3       | 6.69               | 352                          | 334                          | 2.52           | 18.0        | 184                   | 48.00(6.95)                                      | 14.00(3.79)                                      | 5.13                                                    | 3.61                                                      |
|                               | S4       | 7.94               | 420                          | 405                          | 2.80           | 18.4        | 214                   | 47.75(6.94)                                      | 15.00(3.92)                                      | 4.54                                                    | 3.53                                                      |
|                               | S5       | 4.08               | 336                          | 319                          | 2.42           | 17.5        | 154                   | 36.00(6.03)                                      | 15.00(3.90)                                      | 4.56                                                    | 3.56                                                      |
| Interaction                   |          |                    |                              |                              |                |             |                       |                                                  |                                                  |                                                         |                                                           |
| I and M                       |          | NS                 | NS                           | 16.09                        | 0.04           | NS          | 5.89                  | NS                                               | NS                                               | NS                                                      | 0.27                                                      |
| M and I                       |          | NS                 | NS                           | 18.04                        | 0.04           | NS          | 6.03                  | NS                                               | NS                                               | NS                                                      | 0.30                                                      |
| Mean of Main plot             |          |                    |                              |                              |                |             |                       |                                                  |                                                  |                                                         |                                                           |
| M1                            |          | 4.92               | 339                          | 323                          | 2.46           | 17.6        | 166                   | 42.55(6.52)                                      | 19.45(4.41)                                      | 4.81                                                    | 3.21                                                      |
| M2                            |          | 5.45               | 361                          | 346                          | 2.53           | 17.8        | 178                   | 48.75(6.98)                                      | 15.40(3.96)                                      | 4.73                                                    | 3.76                                                      |
| C.D. (0.05)                   |          | 0.19               | 16.90                        | 13.67                        | 0.02           | 0.14        | 3.64                  | 0.33                                             | 0.12                                             | NS                                                      | 0.23                                                      |
| C.V. (%)                      |          | 3.57               | 4.80                         | 4.06                         | 0.66           | 0.81        | 2.11                  | 4.88                                             | 2.93                                             | 3.33                                                    | 6.58                                                      |
| Method of Sub plots           |          |                    |                              |                              |                |             |                       |                                                  |                                                  |                                                         |                                                           |
| S1                            |          | 3.77               | 335                          | 320                          | 2.39           | 17.5        | 163                   | 49.25(7.02)                                      | 19.25(4.41)                                      | 4.71                                                    | 3.82                                                      |
| S2                            |          | 4.19               | 328                          | 311                          | 2.40           | 17.4        | 162                   | 54.00(7.35)                                      | 22.88(4.79)                                      | 4.87                                                    | 3.85                                                      |
| S3                            |          | 6.47               | 348                          | 331                          | 2.52           | 17.9        | 175                   | 49.88(7.09)                                      | 15.13(3.91)                                      | 5.14                                                    | 3.44                                                      |
| S4                            |          | 7.38               | 404                          | 390                          | 2.75           | 18.3        | 201                   | 40.00(6.33)                                      | 14.38(3.84)                                      | 4.58                                                    | 3.27                                                      |
| S5                            |          | 4.10               | 335                          | 320                          | 2.42           | 17.4        | 159                   | 35.13(5.96)                                      | 15.50(3.97)                                      | 4.56                                                    | 3.04                                                      |
| CD (0.05)                     |          | 0.39               | 12.42                        | 11.38                        | 0.03           | 0.20        | 4.17                  | 0.50                                             | 0.48                                             | 0.21                                                    | 0.19                                                      |
| C.V. (%)                      |          | 7.27               | 3.44                         | 3.30                         | 1.13           | 1.07        | 2.35                  | 7.17                                             | 11.12                                            | 4.36                                                    | 5.34                                                      |
| Experimental Mean             |          | 5.18               | 350                          | 334                          | 2.49           | 17.7        | 172                   | 6.75                                             | 4.18                                             | 4.77                                                    | 3.48                                                      |
| Soil type                     |          | -                  |                              |                              |                |             |                       |                                                  |                                                  |                                                         |                                                           |
| pH                            |          | -                  |                              |                              |                |             |                       |                                                  |                                                  |                                                         |                                                           |
| Variety                       |          | -                  |                              |                              |                |             |                       |                                                  |                                                  |                                                         |                                                           |
| Available NPK kg/ha           |          | -                  |                              |                              |                |             |                       |                                                  |                                                  |                                                         |                                                           |

S1: Broadcasting of seeds

S2: Manual line sowing of seeds (20-25 cm row spacing sown in solid row)

S3: Mechanized line sowing of seeds (Dribbler, Happy seeder or any Drum Seeder: Spacing as per the equipment specifications)

S4: Any improved system in that particular location

S5: Normal transplanting

Table-4.2.3: Contd....

| Treatment                     |          | CHATHA             |                    |                              |                              |                |             |                        |                                            |                                         | CHIPLIMA           |                    |                              |                |             |                        |
|-------------------------------|----------|--------------------|--------------------|------------------------------|------------------------------|----------------|-------------|------------------------|--------------------------------------------|-----------------------------------------|--------------------|--------------------|------------------------------|----------------|-------------|------------------------|
| Main Plot                     | Sub-plot | Grain yield (t/ha) | Straw yield (t/ha) | Tillers/m <sup>2</sup> (No.) | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days for 50% flowering | Weed population at AT (no/m <sup>2</sup> ) | Weed population PI (no/m <sup>2</sup> ) | Grain yield (t/ha) | Straw yield (t/ha) | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days for 50% flowering |
| M1- Normal sowing time        | S1       | 2.48               | 3.45               | 171                          | 145                          | 1.30           | 19.4        | 106                    | 1.67(1.46)                                 | 44.33(6.69)                             | 3.71               | 4.81               | 166                          | 4.68           | 25.5        | 79                     |
|                               | S2       | 2.63               | 3.68               | 198                          | 170                          | 1.39           | 19.7        | 101                    | 2.33(1.68)                                 | 39.67(6.33)                             | 4.30               | 5.22               | 193                          | 5.85           | 23.8        | 79                     |
|                               | S3       | 2.79               | 3.90               | 195                          | 167                          | 1.63           | 19.7        | 100                    | 2.33(1.68)                                 | 47.00(6.89)                             | 4.51               | 5.26               | 210                          | 6.40           | 26.5        | 80                     |
|                               | S4       | 3.50               | 5.07               | 279                          | 257                          | 2.20           | 20.5        | 105                    | 0.33(0.88)                                 | 13.67(3.76)                             | 4.17               | 5.40               | 184                          | 5.50           | 27.5        | 83                     |
|                               | S5       | 2.90               | 4.20               | 247                          | 215                          | 1.82           | 20.0        | 110                    | 0.00(0.71)                                 | 13.33(3.72)                             | 5.00               | 5.88               | 209                          | 7.25           | 26.3        | 84                     |
| M2- Delayed sowing by 30 days | S1       | 2.09               | 2.88               | 156                          | 121                          | 1.13           | 18.3        | 103                    | 1.33(1.34)                                 | 45.67(6.79)                             | 3.18               | 4.24               | 151                          | 4.72           | 24.3        | 76                     |
|                               | S2       | 2.43               | 3.42               | 161                          | 135                          | 1.20           | 19.1        | 100                    | 2.00(1.58)                                 | 40.00(6.36)                             | 3.76               | 4.64               | 174                          | 5.20           | 23.0        | 76                     |
|                               | S3       | 2.53               | 3.54               | 172                          | 145                          | 1.35           | 19.4        | 101                    | 2.67(1.77)                                 | 50.67(7.15)                             | 4.03               | 4.79               | 174                          | 6.65           | 25.8        | 78                     |
|                               | S4       | 3.28               | 4.75               | 262                          | 240                          | 2.02           | 19.7        | 106                    | 0.33(0.88)                                 | 14.00(3.81)                             | 3.78               | 4.87               | 179                          | 5.10           | 26.0        | 81                     |
|                               | S5       | 2.40               | 3.47               | 233                          | 202                          | 1.73           | 19.6        | 110                    | 0.33(0.88)                                 | 14.67(3.89)                             | 4.57               | 5.70               | 186                          | 6.35           | 26.3        | 81                     |
| Interaction                   |          |                    |                    |                              |                              |                |             |                        |                                            |                                         |                    |                    |                              |                |             |                        |
| I and M                       |          | 0.09               | 0.14               | NS                           | NS                           | NS             | 0.23        | NS                     | NS                                         | NS                                      | NS                 | NS                 | NS                           | NS             | NS          | NS                     |
| M and I                       |          | 0.12               | 0.17               | NS                           | NS                           | NS             | 0.31        | NS                     | NS                                         | NS                                      | NS                 | NS                 | NS                           | NS             | NS          | NS                     |
| Mean of Main plot             |          |                    |                    |                              |                              |                |             |                        |                                            |                                         |                    |                    |                              |                |             |                        |
| M1                            |          | 2.86               | 4.06               | 218                          | 191                          | 1.67           | 19.9        | 104                    | 1.33(1.28)                                 | 31.60(5.48)                             | 4.34               | 5.31               | 193                          | 5.94           | 25.9        | 81                     |
| M2                            |          | 2.54               | 3.61               | 197                          | 168                          | 1.49           | 19.2        | 104                    | 1.33(1.29)                                 | 33.00(5.60)                             | 3.86               | 4.85               | 173                          | 5.60           | 25.1        | 78                     |
| C.D. (0.05)                   |          | 0.12               | 0.15               | 10.9                         | 6.96                         | 0.02           | 0.29        | NS                     | NS                                         | 0.08                                    | 0.25               | 0.25               | 18.90                        | NS             | NS          | 0.26                   |
| C.V. (%)                      |          | 2.75               | 2.54               | 3.35                         | 2.47                         | 0.61           | 0.95        | 0.70                   | 22.79                                      | 0.95                                    | 6.08               | 4.83               | 10.29                        | 17.90          | 4.10        | 0.32                   |
| Method of Sub plots           |          |                    |                    |                              |                              |                |             |                        |                                            |                                         |                    |                    |                              |                |             |                        |
| S1                            |          | 2.28               | 3.17               | 163                          | 133                          | 1.22           | 18.8        | 104                    | 1.50(1.40)                                 | 45.00(6.74)                             | 3.45               | 4.53               | 158                          | 4.70           | 24.9        | 77                     |
| S2                            |          | 2.53               | 3.55               | 179                          | 153                          | 1.30           | 19.4        | 100                    | 2.17(1.63)                                 | 39.83(6.35)                             | 4.03               | 4.93               | 184                          | 5.52           | 23.4        | 78                     |
| S3                            |          | 2.66               | 3.72               | 183                          | 156                          | 1.49           | 19.6        | 100                    | 2.50(1.73)                                 | 48.83(7.02)                             | 4.27               | 5.02               | 192                          | 6.52           | 26.1        | 79                     |
| S4                            |          | 3.39               | 4.91               | 271                          | 248                          | 2.11           | 20.1        | 106                    | 0.33(0.88)                                 | 13.83(3.78)                             | 3.97               | 5.13               | 182                          | 5.30           | 26.8        | 82                     |
| S5                            |          | 2.65               | 3.84               | 240                          | 209                          | 1.77           | 19.8        | 110                    | 0.17(0.79)                                 | 14.00(3.81)                             | 4.78               | 5.79               | 198                          | 6.80           | 26.3        | 82                     |
| CD (0.05)                     |          | 0.06               | 0.10               | 9.38                         | 9.69                         | 0.05           | 0.16        | 1.07                   | 0.22                                       | 0.17                                    | 0.33               | 0.36               | 25.92                        | 0.68           | 1.60        | NS                     |
| C.V. (%)                      |          | 1.85               | 2.14               | 3.70                         | 4.41                         | 2.46           | 0.68        | 0.84                   | 14.14                                      | 2.51                                    | 7.79               | 6.82               | 13.75                        | 11.43          | 6.08        | 5.39                   |
| Experimental Mean             |          | 2.70               | 3.84               | 207                          | 180                          | 1.58           | 19.5        | 104                    | 1.29                                       | 5.54                                    | 4.10               | 5.08               | 183                          | 5.77           | 25.5        | 80                     |
| Soil type                     |          | Sandy clay loam    |                    |                              |                              |                |             |                        |                                            |                                         | -                  |                    |                              |                |             |                        |
| pH                            |          | 8.03               |                    |                              |                              |                |             |                        |                                            |                                         | -                  |                    |                              |                |             |                        |
| Variety                       |          | Basmathi - 370     |                    |                              |                              |                |             |                        |                                            |                                         | MTU 1156           |                    |                              |                |             |                        |
| Available NPK kg/ha           |          | 245:14.3:146.3     |                    |                              |                              |                |             |                        |                                            |                                         | -                  |                    |                              |                |             |                        |

S1: Broadcasting of seeds

S2: Manual line sowing of seeds (20-25 cm row spacing sown in solid row)

S3: Mechanized line sowing of seeds (Dribbler, Happy seeder or any Drum Seeder: Spacing as per the equipment specifications)

S4: Any improved system in that particular location

S5: Normal transplanting

Table-4.2.3: Contd....

| Treatment                     |          | COIMBATORE         |                    |                              |                              |                |             |                                            |                                         |                                           | KOTA               |                              |                |
|-------------------------------|----------|--------------------|--------------------|------------------------------|------------------------------|----------------|-------------|--------------------------------------------|-----------------------------------------|-------------------------------------------|--------------------|------------------------------|----------------|
| Main Plot                     | Sub-plot | Grain yield (t/ha) | Straw yield (t/ha) | Tillers/m <sup>2</sup> (No.) | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Weed population at AT (no/m <sup>2</sup> ) | Weed population PI (no/m <sup>2</sup> ) | Weed dry weight at AT (g/m <sup>2</sup> ) | Grain yield (t/ha) | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) |
| M1- Normal sowing time        | S1       | 4.64               | 6.07               | 348                          | 286                          | 2.34           | 16.25       | 32.28(5.72)                                | 10.70(3.35)                             | 5.32                                      | 5.72               | 276                          | 4.12           |
|                               | S2       | 5.22               | 6.8                | 370                          | 326                          | 2.43           | 16.2        | 26.78(5.22)                                | 8.57(3.01)                              | 4.65                                      | 6.05               | 294                          | 4.27           |
|                               | S3       | 5.45               | 6.88               | 379                          | 333                          | 2.3            | 16.3        | 22.00(4.74)                                | 7.30(2.79)                              | 4.17                                      | 6.16               | 308                          | 4.36           |
|                               | S4       | 5.57               | 7.16               | 384                          | 335                          | 2.49           | 16.42       | 12.92(3.66)                                | 5.60(2.47)                              | 3.73                                      | 6.46               | 325                          | 4.6            |
|                               | S5       | 6.31               | 7.36               | 436                          | 375                          | 2.71           | 16.25       | 9.88(3.22)                                 | 5.00(2.34)                              | 2.32                                      |                    |                              |                |
| M2- Delayed sowing by 30 days | S1       | 4.05               | 5.55               | 318                          | 275                          | 2.11           | 16.18       | 35.90(6.03)                                | 11.95(3.53)                             | 5.6                                       | 5.2                | 255                          | 3.3            |
|                               | S2       | 5.04               | 6.25               | 363                          | 325                          | 2.96           | 16.18       | 28.17(5.35)                                | 8.80(3.05)                              | 4.9                                       | 5.56               | 278                          | 3.51           |
|                               | S3       | 5.13               | 6.5                | 368                          | 324                          | 2.49           | 16.27       | 22.93(4.84)                                | 7.27(2.79)                              | 4.27                                      | 5.66               | 290                          | 3.6            |
|                               | S4       | 5.21               | 6.76               | 370                          | 327                          | 2.28           | 16.23       | 13.88(3.79)                                | 5.47(2.44)                              | 3.57                                      | 6.07               | 309                          | 3.83           |
|                               | S5       | 5.95               | 7.09               | 408                          | 340                          | 2.53           | 16.15       | 8.95(3.07)                                 | 4.93(2.33)                              | 2.38                                      |                    |                              |                |
| Interaction                   |          |                    |                    |                              |                              |                |             |                                            |                                         |                                           |                    |                              |                |
| I and M                       |          | NS                 | NS                 | NS                           | NS                           | NS             | NS          | NS                                         | NS                                      | NS                                        | NS                 | NS                           | NS             |
| M and I                       |          | NS                 | NS                 | NS                           | NS                           | NS             | NS          | NS                                         | NS                                      | NS                                        | NS                 | NS                           | NS             |
| Mean of Main plot             |          |                    |                    |                              |                              |                |             |                                            |                                         |                                           |                    |                              |                |
| M1                            |          | 5.44               | 6.85               | 383                          | 331                          | 2.45           | 16.28       | 20.77(4.51)                                | 7.43(2.79)                              | 4.04                                      | 6.1                | 301                          | 4.34           |
| M2                            |          | 5.08               | 6.43               | 365                          | 318                          | 2.47           | 16.2        | 21.97(4.62)                                | 7.68(2.83)                              | 4.14                                      | 5.62               | 283                          | 3.56           |
| C.D. (0.05)                   |          | 0.11               | 0.05               | 7.48                         | 6.47                         | NS             | NS          | 0.05                                       | NS                                      | NS                                        | 0.34               | 16.83                        | 0.24           |
| C.V. (%)                      |          | 2.02               | 0.69               | 1.99                         | 1.98                         | 12.05          | 0.89        | 1.01                                       | 2.92                                    | 4.86                                      | 5.11               | 5.12                         | 5.4            |
| Method of Sub plots           |          |                    |                    |                              |                              |                |             |                                            |                                         |                                           |                    |                              |                |
| S1                            |          | 4.35               | 5.81               | 333                          | 280                          | 2.22           | 16.21       | 34.09(5.88)                                | 11.32(3.44)                             | 5.46                                      | 5.46               | 265.5                        | 3.71           |
| S2                            |          | 5.13               | 6.52               | 366                          | 326                          | 2.7            | 16.19       | 27.48(5.29)                                | 8.69(3.03)                              | 4.77                                      | 5.8                | 286                          | 3.89           |
| S3                            |          | 5.29               | 6.69               | 373                          | 328                          | 2.4            | 16.29       | 22.46(4.79)                                | 7.29(2.79)                              | 4.22                                      | 5.91               | 299                          | 3.98           |
| S4                            |          | 5.39               | 6.96               | 377                          | 331                          | 2.39           | 16.32       | 13.40(3.73)                                | 5.54(2.46)                              | 3.65                                      | 6.27               | 317                          | 4.21           |
| S5                            |          | 6.13               | 7.23               | 422                          | 357                          | 2.62           | 16.2        | 9.41(3.14)                                 | 4.96(2.34)                              | 2.35                                      |                    |                              |                |
| CD (0.05)                     |          | 0.13               | 0.17               | 12.67                        | 12.27                        | 0.31           | 0.07        | 0.16                                       | 0.08                                    | 0.23                                      | 0.3                | 16.61                        | 0.15           |
| C.V. (%)                      |          | 2.41               | 2.45               | 3.28                         | 3.66                         | 12.32          | 0.45        | 3.31                                       | 2.74                                    | 5.42                                      | 4.93               | 5.41                         | 3.64           |
| Experimental Mean             |          | 5.26               | 6.64               | 374                          | 324                          | 2.46           | 16.24       | 4.57                                       | 2.81                                    | 4.09                                      | 5.86               | 292                          | 3.95           |
| Soil type                     |          | Clay loam          |                    |                              |                              |                |             |                                            |                                         |                                           | Clay loam          |                              |                |
| pH                            |          | 8.05               |                    |                              |                              |                |             |                                            |                                         |                                           | 7.80               |                              |                |
| Variety                       |          | CO 51              |                    |                              |                              |                |             |                                            |                                         |                                           | PUSA SUGANDHA-5    |                              |                |
| Available NPK kg/ha           |          | 216:28:466         |                    |                              |                              |                |             |                                            |                                         |                                           | 318:60:523         |                              |                |

S1: Broadcasting of seeds

\*S4-Paddy + Daincha drum seeder

S2: Manual line sowing of seeds (20-25 cm row spacing sown in solid row)

S3: Mechanized line sowing of seeds (Dribbler, Happy seeder or any Drum Seeder: Spacing as per the equipment specifications)

S4: Any improved system in that particular location

S5: Normal transplanting

Table-4.2.3: Contd....

| Treatment                     |          | KARJAT             |                    |                              |                              |                |             |                        |                                            |                                         |                                           |                                           |
|-------------------------------|----------|--------------------|--------------------|------------------------------|------------------------------|----------------|-------------|------------------------|--------------------------------------------|-----------------------------------------|-------------------------------------------|-------------------------------------------|
| Main Plot                     | Sub-plot | Grain yield (t/ha) | Straw yield (t/ha) | Tillers/m <sup>2</sup> (No.) | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days for 50% flowering | Weed population at AT (no/m <sup>2</sup> ) | Weed population PI (no/m <sup>2</sup> ) | Weed dry weight at AT (g/m <sup>2</sup> ) | Weed dry weight at PI (g/m <sup>2</sup> ) |
| M1- Normal sowing time        | S1       | 6.04               | 8.45               | 225                          | 219                          | 2.75           | 22.6        | 83                     | 7.50(2.83)                                 | 5.50(2.45)                              | 1.13                                      | 0.88                                      |
|                               | S2       | 6.12               | 9.74               | 386                          | 382                          | 1.60           | 22.2        | 82                     | 6.50(2.64)                                 | 4.50(2.23)                              | 0.91                                      | 0.72                                      |
|                               | S3       | 5.97               | 8.12               | 279                          | 272                          | 2.19           | 25.4        | 82                     | 5.75(2.50)                                 | 4.25(2.18)                              | 0.75                                      | 0.68                                      |
|                               | S4       | 7.22               | 8.52               | 377                          | 372                          | 1.94           | 25.4        | 89                     | 4.50(2.23)                                 | 3.75(2.05)                              | 0.61                                      | 0.52                                      |
|                               | S5       | 6.45               | 8.06               | 355                          | 348                          | 1.85           | 25.2        | 88                     | 4.25(2.18)                                 | 2.50(1.73)                              | 0.57                                      | 0.34                                      |
| M2- Delayed sowing by 30 days | S1       | 3.33               | 4.98               | 159                          | 158                          | 1.95           | 21.5        | 85                     | 6.75(2.69)                                 | 5.25(2.40)                              | 1.01                                      | 0.84                                      |
|                               | S2       | 3.37               | 5.73               | 274                          | 271                          | 1.14           | 21.1        | 84                     | 6.50(2.64)                                 | 4.25(2.18)                              | 0.91                                      | 0.68                                      |
|                               | S3       | 3.28               | 4.79               | 198                          | 193                          | 1.55           | 24.2        | 84                     | 6.25(2.60)                                 | 4.00(2.11)                              | 0.81                                      | 0.64                                      |
|                               | S4       | 3.97               | 5.04               | 268                          | 264                          | 1.38           | 24.1        | 90                     | 4.75(2.29)                                 | 3.25(1.93)                              | 0.64                                      | 0.45                                      |
|                               | S5       | 3.55               | 4.75               | 251                          | 247                          | 1.31           | 24.0        | 89                     | 4.50(2.23)                                 | 2.75(1.80)                              | 0.61                                      | 0.38                                      |
| Interaction                   |          |                    |                    |                              |                              |                |             |                        |                                            |                                         |                                           |                                           |
| I and M                       |          | 0.21               | NS                 | 5.89                         | 4.32                         | 0.05           | 0.03        | NS                     | NS                                         | NS                                      | NS                                        | NS                                        |
| M and I                       |          | 0.26               | NS                 | 5.75                         | 4.02                         | 0.05           | 0.02        | NS                     | NS                                         | NS                                      | NS                                        | NS                                        |
| Mean of Main plot             |          |                    |                    |                              |                              |                |             |                        |                                            |                                         |                                           |                                           |
| M1                            |          | 6.36               | 8.58               | 324                          | 319                          | 2.07           | 24.2        | 85                     | 5.70(2.48)                                 | 4.10(2.13)                              | 0.79                                      | 0.63                                      |
| M2                            |          | 3.50               | 5.06               | 230                          | 227                          | 1.47           | 23.0        | 86                     | 5.75(2.49)                                 | 3.90(2.08)                              | 0.80                                      | 0.60                                      |
| C.D. (0.05)                   |          | 0.23               | 0.32               | 2.86                         | 1.33                         | 0.01           | 0.01        | 0.55                   | NS                                         | NS                                      | NS                                        | NS                                        |
| C.V. (%)                      |          | 4.70               | 4.62               | 1.02                         | 0.49                         | 0.57           | 0.04        | 0.64                   | 3.91                                       | 3.00                                    | 8.28                                      | 6.21                                      |
| Method of Sub plots           |          |                    |                    |                              |                              |                |             |                        |                                            |                                         |                                           |                                           |
| S1                            |          | 4.68               | 6.72               | 192                          | 188                          | 2.35           | 22.0        | 84                     | 7.13(2.76)                                 | 5.38(2.42)                              | 1.07                                      | 0.86                                      |
| S2                            |          | 4.74               | 7.73               | 330                          | 327                          | 1.37           | 21.6        | 83                     | 6.50(2.64)                                 | 4.38(2.21)                              | 0.91                                      | 0.70                                      |
| S3                            |          | 4.63               | 6.46               | 239                          | 233                          | 1.87           | 24.8        | 83                     | 6.00(2.55)                                 | 4.13(2.15)                              | 0.78                                      | 0.66                                      |
| S4                            |          | 5.60               | 6.78               | 323                          | 318                          | 1.66           | 24.7        | 90                     | 4.63(2.26)                                 | 3.50(1.99)                              | 0.63                                      | 0.49                                      |
| S5                            |          | 5.00               | 6.41               | 303                          | 298                          | 1.58           | 24.6        | 89                     | 4.38(2.21)                                 | 2.63(1.76)                              | 0.59                                      | 0.36                                      |
| CD (0.05)                     |          | 0.15               | 0.22               | 4.17                         | 3.06                         | 0.04           | 0.02        | 0.52                   | 0.11                                       | 0.17                                    | 0.07                                      | 0.10                                      |
| C.V. (%)                      |          | 2.93               | 3.14               | 1.46                         | 1.09                         | 1.94           | 0.08        | 0.58                   | 4.21                                       | 7.61                                    | 9.10                                      | 16.43                                     |
| Experimental Mean             |          | 4.93               | 6.82               | 277                          | 273                          | 1.77           | 23.6        | 86                     | 2.48                                       | 2.11                                    | 0.80                                      | 0.61                                      |
| Soil type                     |          | -                  |                    |                              |                              |                |             |                        |                                            |                                         |                                           |                                           |
| pH                            |          | -                  |                    |                              |                              |                |             |                        |                                            |                                         |                                           |                                           |
| Variety                       |          | KARJAT-3           |                    |                              |                              |                |             |                        |                                            |                                         |                                           |                                           |
| Available NPK kg/ha           |          | -                  |                    |                              |                              |                |             |                        |                                            |                                         |                                           |                                           |

S1: Broadcasting of seeds

S2: Manual line sowing of seeds (20-25 cm row spacing sown in solid row)

S3: Mechanized line sowing of seeds (Dribbler, Happy seeder or any Drum Seeder: Spacing as per the equipment specifications)

S4: Any improved system in that particular location

S5: Normal transplanting

Table-4.2.3: Contd....

| Treatment                     |          | MANDYA             |                    |                              |                              |                |             |                        |                                                          |                                                         |                                                         |                                                           |
|-------------------------------|----------|--------------------|--------------------|------------------------------|------------------------------|----------------|-------------|------------------------|----------------------------------------------------------|---------------------------------------------------------|---------------------------------------------------------|-----------------------------------------------------------|
| Main Plot                     | Sub-plot | Grain yield (t/ha) | Straw yield (t/ha) | Tillers/m <sup>2</sup> (No.) | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days for 50% flowering | Weed population at active tillering (no/m <sup>2</sup> ) | Weed population panicle initiation (no/m <sup>2</sup> ) | Weed dry weight at active tillering (g/m <sup>2</sup> ) | Weed dry weight at panicle initiation (g/m <sup>2</sup> ) |
| M1- Normal sowing time        | S1       | 5.02               | 12.82              | 388                          | 375                          | 4.63           | 22.9        | 80                     | 8.25(2.93)                                               | 13.50(3.70)                                             | 1.67                                                    | 2.86                                                      |
|                               | S2       |                    |                    |                              |                              |                |             |                        |                                                          |                                                         |                                                         |                                                           |
|                               | S3       | 6.74               | 10.74              | 347                          | 320                          | 4.96           | 21.7        | 80                     | 3.75(2.04)                                               | 5.50(2.43)                                              | 1.04                                                    | 1.42                                                      |
|                               | S4       |                    |                    |                              |                              |                |             |                        |                                                          |                                                         |                                                         |                                                           |
|                               | S5       | 6.90               | 10.14              | 341                          | 326                          | 5.22           | 23.3        | 84                     | 2.50(1.73)                                               | 4.25(2.18)                                              | 0.56                                                    | 0.90                                                      |
| M2- Delayed sowing by 30 days | S1       | 4.38               | 8.18               | 329                          | 309                          | 4.83           | 20.6        | 79                     | 7.50(2.77)                                               | 12.25(3.55)                                             | 2.75                                                    | 3.47                                                      |
|                               | S2       |                    |                    |                              |                              |                |             |                        |                                                          |                                                         |                                                         |                                                           |
|                               | S3       | 5.38               | 9.32               | 344                          | 332                          | 4.96           | 20.8        | 78                     | 4.50(2.22)                                               | 6.75(2.68)                                              | 0.97                                                    | 1.80                                                      |
|                               | S4       |                    |                    |                              |                              |                |             |                        |                                                          |                                                         |                                                         |                                                           |
|                               | S5       | 5.04               | 8.70               | 338                          | 329                          | 4.74           | 21.5        | 83                     | 4.00(2.11)                                               | 4.50(2.21)                                              | 0.65                                                    | 1.25                                                      |
| Interaction                   |          |                    |                    |                              |                              |                |             |                        |                                                          |                                                         |                                                         |                                                           |
| I and M                       |          | NS                 | 1.42               | NS                           | NS                           | NS             | NS          | NS                     | NS                                                       | NS                                                      | NS                                                      | NS                                                        |
| M and I                       |          | NS                 | 1.45               | NS                           | NS                           | NS             | NS          | NS                     | NS                                                       | NS                                                      | NS                                                      | NS                                                        |
| Mean of Main plot             |          |                    |                    |                              |                              |                |             |                        |                                                          |                                                         |                                                         |                                                           |
| M1                            |          | 6.22               | 11.24              | 359                          | 340                          | 4.94           | 22.6        | 81                     | 4.83(2.23)                                               | 7.75(2.77)                                              | 1.09                                                    | 1.73                                                      |
| M2                            |          | 4.94               | 8.73               | 337                          | 323                          | 4.84           | 20.9        | 80                     | 5.33(2.37)                                               | 7.83(2.81)                                              | 1.46                                                    | 2.17                                                      |
| C.D. (0.05)                   |          | 0.64               | 1.09               | NS                           | NS                           | NS             | 1.68        | 1.18                   | NS                                                       | NS                                                      | NS                                                      | NS                                                        |
| C.V. (%)                      |          | 8.81               | 8.40               | 12.85                        | 13.35                        | 18.97          | 5.94        | 1.12                   | 5.09                                                     | 24.16                                                   | 30.06                                                   | 38.55                                                     |
| Method of Sub plots           |          |                    |                    |                              |                              |                |             |                        |                                                          |                                                         |                                                         |                                                           |
| S1                            |          | 4.70               | 10.50              | 358                          | 342                          | 4.73           | 21.7        | 80                     | 7.88(2.85)                                               | 12.88(3.62)                                             | 2.21                                                    | 3.16                                                      |
| S2                            |          |                    |                    |                              |                              |                |             |                        |                                                          |                                                         |                                                         |                                                           |
| S3                            |          | 6.06               | 10.03              | 345                          | 326                          | 4.96           | 21.2        | 79                     | 4.13(2.13)                                               | 6.13(2.56)                                              | 1.00                                                    | 1.61                                                      |
| S4                            |          |                    |                    |                              |                              |                |             |                        |                                                          |                                                         |                                                         |                                                           |
| S5                            |          | 5.97               | 9.42               | 340                          | 327                          | 4.98           | 22.4        | 83                     | 3.25(1.92)                                               | 4.38(2.19)                                              | 0.61                                                    | 1.07                                                      |
| CD (0.05)                     |          | 0.57               | NS                 | NS                           | NS                           | NS             | NS          | 0.78                   | 0.44                                                     | 0.38                                                    | 0.46                                                    | 0.47                                                      |
| C.V. (%)                      |          | 9.38               | 9.23               | 7.60                         | 9.66                         | 10.49          | 5.23        | 0.89                   | 17.65                                                    | 12.53                                                   | 33.28                                                   | 22.20                                                     |
| Experimental Mean             |          | 5.58               | 9.98               | 348                          | 332                          | 4.89           | 21.8        | 81                     | 2.30                                                     | 2.79                                                    | 1.27                                                    | 1.95                                                      |
| Soil type                     |          | Red Sandy loam     |                    |                              |                              |                |             |                        |                                                          |                                                         |                                                         |                                                           |
| pH                            |          | 6.84               |                    |                              |                              |                |             |                        |                                                          |                                                         |                                                         |                                                           |
| Variety                       |          | KMP 175            |                    |                              |                              |                |             |                        |                                                          |                                                         |                                                         |                                                           |
| Available NPK kg/ha           |          | 334:110:265        |                    |                              |                              |                |             |                        |                                                          |                                                         |                                                         |                                                           |

S1: Broadcasting of seeds

S2: Manual line sowing of seeds (20-25 cm row spacing sown in solid row)

S3: Mechanized line sowing of seeds (Dribbler, Happy seeder or any Drum Seeder: Spacing as per the equipment specifications)

S4: Any improved system in that particular location

S5: Normal transplanting

Table-4.2.3: Contd....

| Treatment                     |          | NAVSARI            |                    |                              |                              |                |             |                        |                                                          |                                                         |                                                         |                                                           |
|-------------------------------|----------|--------------------|--------------------|------------------------------|------------------------------|----------------|-------------|------------------------|----------------------------------------------------------|---------------------------------------------------------|---------------------------------------------------------|-----------------------------------------------------------|
| Main Plot                     | Sub-plot | Grain yield (t/ha) | Straw yield (t/ha) | Tillers/m <sup>2</sup> (No.) | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days for 50% flowering | Weed population at active tillering (no/m <sup>2</sup> ) | Weed population panicle initiation (no/m <sup>2</sup> ) | Weed dry weight at active tillering (g/m <sup>2</sup> ) | Weed dry weight at panicle initiation (g/m <sup>2</sup> ) |
| M1- Normal sowing time        | S1       | 5.03               | 5.04               | 237                          | 163                          | 4.52           | 29.9        | 93                     | 22.25(4.77)                                              | 38.13(6.21)                                             | 36.85                                                   | 56.01                                                     |
|                               | S2       | 5.08               | 5.18               | 233                          | 178                          | 4.26           | 30.6        | 93                     | 21.75(4.72)                                              | 36.25(6.06)                                             | 37.05                                                   | 54.10                                                     |
|                               | S3       | 5.22               | 5.29               | 245                          | 178                          | 4.82           | 32.1        | 91                     | 19.75(4.50)                                              | 34.75(5.93)                                             | 35.74                                                   | 54.29                                                     |
|                               | S4       | 5.62               | 5.30               | 256                          | 199                          | 5.02           | 32.8        | 92                     | 17.75(4.27)                                              | 31.00(5.61)                                             | 34.19                                                   | 53.36                                                     |
|                               | S5       | 5.61               | 5.34               | 246                          | 188                          | 4.83           | 32.2        | 93                     | 19.25(4.44)                                              | 33.25(5.80)                                             | 34.26                                                   | 53.58                                                     |
| M2- Delayed sowing by 30 days | S1       | 4.75               | 4.59               | 239                          | 163                          | 4.39           | 30.5        | 91                     | 21.25(4.66)                                              | 36.88(6.11)                                             | 36.79                                                   | 54.90                                                     |
|                               | S2       | 4.66               | 5.37               | 237                          | 193                          | 4.49           | 30.6        | 91                     | 22.00(4.74)                                              | 35.00(5.95)                                             | 35.53                                                   | 54.46                                                     |
|                               | S3       | 4.82               | 5.35               | 243                          | 187                          | 4.85           | 31.4        | 91                     | 22.50(4.79)                                              | 34.50(5.92)                                             | 36.50                                                   | 54.02                                                     |
|                               | S4       | 5.40               | 5.25               | 253                          | 201                          | 4.98           | 31.3        | 91                     | 18.25(4.33)                                              | 31.00(5.61)                                             | 33.72                                                   | 53.17                                                     |
|                               | S5       | 5.35               | 5.31               | 249                          | 182                          | 4.87           | 31.4        | 92                     | 19.50(4.47)                                              | 33.00(5.79)                                             | 34.15                                                   | 53.31                                                     |
| Interaction                   |          |                    |                    |                              |                              |                |             |                        |                                                          |                                                         |                                                         |                                                           |
| I and M                       |          | NS                 | NS                 | NS                           | NS                           | NS             | NS          | NS                     | NS                                                       | NS                                                      | NS                                                      | NS                                                        |
| M and I                       |          | NS                 | NS                 | NS                           | NS                           | NS             | NS          | NS                     | NS                                                       | NS                                                      | NS                                                      | NS                                                        |
| Mean of Main plot             |          |                    |                    |                              |                              |                |             |                        |                                                          |                                                         |                                                         |                                                           |
| M1                            |          | 5.31               | 5.23               | 243                          | 181                          | 4.69           | 31.5        | 92                     | 20.15(4.54)                                              | 34.68(5.92)                                             | 35.62                                                   | 54.27                                                     |
| M2                            |          | 5.00               | 5.17               | 244                          | 185                          | 4.72           | 31.0        | 91                     | 20.70(4.60)                                              | 34.08(5.88)                                             | 35.34                                                   | 53.97                                                     |
| C.D. (0.05)                   |          | NS                 | NS                 | NS                           | NS                           | NS             | NS          | NS                     | NS                                                       | NS                                                      | NS                                                      | NS                                                        |
| C.V. (%)                      |          | 8.45               | 9.46               | 6.37                         | 8.64                         | 8.20           | 4.79        | 1.77                   | 2.91                                                     | 3.40                                                    | 7.09                                                    | 8.16                                                      |
| Method of Sub plots           |          |                    |                    |                              |                              |                |             |                        |                                                          |                                                         |                                                         |                                                           |
| S1                            |          | 4.89               | 4.81               | 238                          | 163                          | 4.46           | 30.2        | 92                     | 21.75(4.71)                                              | 37.50(6.16)                                             | 36.82                                                   | 55.46                                                     |
| S2                            |          | 4.87               | 5.28               | 235                          | 185                          | 4.38           | 30.6        | 92                     | 21.88(4.73)                                              | 35.63(6.01)                                             | 36.29                                                   | 54.28                                                     |
| S3                            |          | 5.02               | 5.32               | 244                          | 182                          | 4.84           | 31.8        | 91                     | 21.13(4.64)                                              | 34.63(5.92)                                             | 36.12                                                   | 54.15                                                     |
| S4                            |          | 5.51               | 5.28               | 254                          | 200                          | 5.00           | 32.0        | 92                     | 18.00(4.30)                                              | 31.00(5.61)                                             | 33.96                                                   | 53.27                                                     |
| S5                            |          | 5.48               | 5.32               | 247                          | 185                          | 4.85           | 31.8        | 93                     | 19.38(4.45)                                              | 33.13(5.80)                                             | 34.20                                                   | 53.44                                                     |
| CD (0.05)                     |          | 0.38               | NS                 | 12.73                        | 11.83                        | NS             | 1.37        | NS                     | 0.21                                                     | 0.23                                                    | NS                                                      | NS                                                        |
| C.V. (%)                      |          | 7.20               | 9.42               | 5.06                         | 6.26                         | 10.50          | 4.24        | 1.69                   | 4.43                                                     | 3.75                                                    | 6.26                                                    | 7.09                                                      |
| Experimental Mean             |          | 5.15               | 5.20               | 244                          | 183                          | 4.70           | 31.3        | 92                     | 4.57                                                     | 5.90                                                    | 35.48                                                   | 54.12                                                     |
| Soil type                     |          | Clay               |                    |                              |                              |                |             |                        |                                                          |                                                         |                                                         |                                                           |
| pH                            |          | 7.84               |                    |                              |                              |                |             |                        |                                                          |                                                         |                                                         |                                                           |
| Variety                       |          | GNR 3              |                    |                              |                              |                |             |                        |                                                          |                                                         |                                                         |                                                           |
| Available NPK kg/ha           |          | 170:139:372        |                    |                              |                              |                |             |                        |                                                          |                                                         |                                                         |                                                           |

S1: Broadcasting of seeds

S2: Manual line sowing of seeds (20-25 cm row spacing sown in solid row)

S3: Mechanized line sowing of seeds (Dribbler, Happy seeder or any Drum Seeder: Spacing as per the equipment specifications)

S4: Any improved system in that particular location

S<sub>5</sub>: Normal transplanting

Table-4.2.3: Contd....

| Treatment                     |          | NAWAGAM            |                    |                              |                              |                |             |                        |                                            |                                         |                                           |                                           |
|-------------------------------|----------|--------------------|--------------------|------------------------------|------------------------------|----------------|-------------|------------------------|--------------------------------------------|-----------------------------------------|-------------------------------------------|-------------------------------------------|
| Main Plot                     | Sub-plot | Grain yield (t/ha) | Straw yield (t/ha) | Tillers/m <sup>2</sup> (No.) | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days for 50% flowering | Weed population at AT (no/m <sup>2</sup> ) | Weed population PI (no/m <sup>2</sup> ) | Weed dry weight at AT (g/m <sup>2</sup> ) | Weed dry weight at PI (g/m <sup>2</sup> ) |
| M1- Normal sowing time        | S1       | 4.00               | 4.58               | 179                          | 143                          | 14.61          | 17.4        | 74                     | 41.00(6.39)                                | 86.25(9.29)                             | 15.65                                     | 34.59                                     |
|                               | S2       | 4.79               | 4.97               | 106                          | 85                           | 15.43          | 18.5        | 73                     | 37.25(6.05)                                | 80.50(8.95)                             | 15.36                                     | 33.79                                     |
|                               | S3       | 4.94               | 5.08               | 136                          | 109                          | 17.09          | 18.4        | 73                     | 33.75(5.84)                                | 74.75(8.63)                             | 13.28                                     | 29.88                                     |
|                               | S4       | 5.66               | 6.38               | 275                          | 231                          | 18.28          | 18.5        | 72                     | 38.25(6.20)                                | 65.50(7.97)                             | 14.80                                     | 31.18                                     |
|                               | S5       |                    |                    |                              |                              |                |             |                        |                                            |                                         |                                           |                                           |
| M2- Delayed sowing by 30 days | S1       | 2.99               | 3.22               | 163                          | 130                          | 11.06          | 17.5        | 63                     | 56.50(7.52)                                | 99.00(9.97)                             | 21.81                                     | 38.64                                     |
|                               | S2       | 2.06               | 2.26               | 103                          | 83                           | 10.19          | 16.1        | 63                     | 38.25(6.17)                                | 88.00(9.39)                             | 14.82                                     | 35.96                                     |
|                               | S3       | 2.29               | 2.86               | 108                          | 86                           | 11.61          | 15.9        | 63                     | 43.00(6.59)                                | 91.75(9.59)                             | 16.78                                     | 35.81                                     |
|                               | S4       | 3.04               | 3.40               | 205                          | 165                          | 15.38          | 17.8        | 63                     | 35.50(5.99)                                | 71.50(8.33)                             | 13.71                                     | 31.13                                     |
|                               | S5       |                    |                    |                              |                              |                |             |                        |                                            |                                         |                                           |                                           |
| Interaction                   |          |                    |                    |                              |                              |                |             |                        |                                            |                                         |                                           |                                           |
| I and M                       |          | 0.49               | 0.54               | 20.09                        | 18.99                        | NS             | 0.78        | NS                     | NS                                         | NS                                      | NS                                        | NS                                        |
| M and I                       |          | 0.60               | 0.65               | 21.97                        | 21.57                        | NS             | 0.80        | NS                     | NS                                         | NS                                      | NS                                        | NS                                        |
| Mean of Main plot             |          |                    |                    |                              |                              |                |             |                        |                                            |                                         |                                           |                                           |
| M1                            |          | 4.85               | 5.25               | 174                          | 142                          | 16.35          | 18.2        | 73                     | 37.56(6.12)                                | 76.75(8.71)                             | 14.77                                     | 32.36                                     |
| M2                            |          | 2.59               | 2.94               | 145                          | 116                          | 12.06          | 16.8        | 63                     | 43.31(6.57)                                | 87.56(9.32)                             | 16.78                                     | 35.38                                     |
| C.D. (0.05)                   |          | 0.55               | 0.58               | 16.90                        | 17.68                        | 2.25           | 0.54        | 2.11                   | NS                                         | NS                                      | NS                                        | NS                                        |
| C.V. (%)                      |          | 13.07              | 12.52              | 9.42                         | 12.19                        | 14.05          | 2.75        | 2.77                   | 20.41                                      | 15.65                                   | 36.01                                     | 31.87                                     |
| Method of Sub plots           |          |                    |                    |                              |                              |                |             |                        |                                            |                                         |                                           |                                           |
| S1                            |          | 3.50               | 3.90               | 171                          | 137                          | 12.84          | 17.4        | 68                     | 48.75(6.95)                                | 92.63(9.63)                             | 18.73                                     | 36.62                                     |
| S2                            |          | 3.42               | 3.61               | 105                          | 84                           | 12.81          | 17.3        | 68                     | 37.75(6.11)                                | 84.25(9.17)                             | 15.09                                     | 34.87                                     |
| S3                            |          | 3.62               | 3.97               | 122                          | 97                           | 14.35          | 17.2        | 68                     | 38.38(6.21)                                | 83.25(9.11)                             | 15.03                                     | 32.84                                     |
| S4                            |          | 4.35               | 4.89               | 240                          | 198                          | 16.83          | 18.1        | 67                     | 36.88(6.09)                                | 68.50(8.15)                             | 14.25                                     | 31.15                                     |
| S5                            |          |                    |                    |                              |                              |                |             |                        |                                            |                                         |                                           |                                           |
| CD (0.05)                     |          | 0.35               | 0.38               | 14.20                        | 13.42                        | 1.30           | 0.55        | NS                     | NS                                         | NS                                      | NS                                        | NS                                        |
| C.V. (%)                      |          | 8.85               | 8.81               | 8.48                         | 9.91                         | 8.71           | 3.00        | 2.54                   | 10.50                                      | 12.30                                   | 21.17                                     | 24.07                                     |
| Experimental Mean             |          | 3.72               | 4.09               | 159                          | 129                          | 14.21          | 17.5        | 68                     | 6.34                                       | 9.01                                    | 15.78                                     | 33.87                                     |
| Soil type                     |          | Clay loam          |                    |                              |                              |                |             |                        |                                            |                                         |                                           |                                           |
| pH                            |          | 7.56               |                    |                              |                              |                |             |                        |                                            |                                         |                                           |                                           |
| Variety                       |          | Mahisagar          |                    |                              |                              |                |             |                        |                                            |                                         |                                           |                                           |
| Available NPK kg/ha           |          | -                  |                    |                              |                              |                |             |                        |                                            |                                         |                                           |                                           |

S1: Broadcasting of seeds

S2: Manual line sowing of seeds (20-25 cm row spacing sown in solid row)

S3: Mechanized line sowing of seeds (Dribbler, Happy seeder or any Drum Seeder: Spacing as per the equipment specifications)

S4: Any improved system in that particular location

S5: Normal transplanting

Table-4.2.3: Contd....

| Treatment                     |          | PUDUCHERRY         |                    |                              |                              |                |             |                        |                                            |                                            |                                           |                                           |
|-------------------------------|----------|--------------------|--------------------|------------------------------|------------------------------|----------------|-------------|------------------------|--------------------------------------------|--------------------------------------------|-------------------------------------------|-------------------------------------------|
| Main Plot                     | Sub-plot | Grain yield (t/ha) | Straw yield (t/ha) | Tillers/m <sup>2</sup> (No.) | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days for 50% flowering | Weed population at AT (no/m <sup>2</sup> ) | Weed population at PI (no/m <sup>2</sup> ) | Weed dry weight at AT (g/m <sup>2</sup> ) | Weed dry weight at PI (g/m <sup>2</sup> ) |
| M1- Normal sowing time        | S1       | 5.79               | 7.23               | 336                          | 318                          | 3.06           | 15.6        | 91                     | 40.16(6.38)                                | 54.42(7.41)                                | 14.16                                     | 16.84                                     |
|                               | S2       | 6.01               | 7.52               | 362                          | 339                          | 3.23           | 16.2        | 89                     | 36.26(6.06)                                | 49.87(7.10)                                | 13.10                                     | 16.57                                     |
|                               | S3       | 6.35               | 7.94               | 388                          | 362                          | 3.35           | 16.4        | 89                     | 28.03(5.34)                                | 42.00(6.52)                                | 9.89                                      | 12.99                                     |
|                               | S4       |                    |                    |                              |                              |                |             |                        |                                            |                                            |                                           |                                           |
|                               | S5       | 6.23               | 7.79               | 375                          | 356                          | 3.21           | 16.4        | 89                     | 30.67(5.58)                                | 45.40(6.77)                                | 10.82                                     | 14.04                                     |
| M2- Delayed sowing by 30 days | S1       | 5.44               | 6.80               | 342                          | 314                          | 3.02           | 15.6        | 91                     | 39.53(6.33)                                | 59.50(7.75)                                | 14.28                                     | 19.77                                     |
|                               | S2       | 5.74               | 7.17               | 347                          | 323                          | 3.17           | 15.8        | 90                     | 32.40(5.74)                                | 52.96(7.31)                                | 11.43                                     | 16.39                                     |
|                               | S3       | 5.92               | 7.40               | 366                          | 337                          | 3.34           | 16.4        | 90                     | 29.01(5.43)                                | 48.67(7.01)                                | 10.48                                     | 16.17                                     |
|                               | S4       |                    |                    |                              |                              |                |             |                        |                                            |                                            |                                           |                                           |
|                               | S5       | 6.29               | 7.86               | 378                          | 358                          | 3.45           | 16.5        | 88                     | 25.63(5.11)                                | 44.40(6.70)                                | 9.26                                      | 14.75                                     |
| Interaction                   |          |                    |                    |                              |                              |                |             |                        |                                            |                                            |                                           |                                           |
| I and M                       |          | NS                 | NS                 | NS                           | NS                           | NS             | NS          | NS                     | 0.12                                       | 0.15                                       | 0.51                                      | 0.69                                      |
| M and I                       |          | NS                 | NS                 | NS                           | NS                           | NS             | NS          | NS                     | 0.16                                       | 0.20                                       | 0.67                                      | 0.93                                      |
| Mean of Main plot             |          |                    |                    |                              |                              |                |             |                        |                                            |                                            |                                           |                                           |
| M1                            |          | 6.10               | 7.62               | 365                          | 344                          | 3.21           | 16.2        | 89                     | 33.78(5.84)                                | 47.92(6.95)                                | 11.99                                     | 15.11                                     |
| M2                            |          | 5.85               | 7.31               | 358                          | 333                          | 3.24           | 16.1        | 90                     | 31.64(5.65)                                | 51.38(7.19)                                | 11.36                                     | 16.77                                     |
| C.D. (0.05)                   |          | NS                 | NS                 | NS                           | NS                           | NS             | NS          | NS                     | 0.16                                       | 0.20                                       | NS                                        | 0.92                                      |
| C.V. (%)                      |          | 3.72               | 3.77               | 4.09                         | 2.44                         | 4.23           | 2.45        | 0.46                   | 1.58                                       | 1.63                                       | 3.11                                      | 3.29                                      |
| Method of Sub plots           |          |                    |                    |                              |                              |                |             |                        |                                            |                                            |                                           |                                           |
| S1                            |          | 5.61               | 7.02               | 339                          | 316                          | 3.04           | 15.6        | 91                     | 39.85(6.35)                                | 56.96(7.58)                                | 14.22                                     | 18.30                                     |
| S2                            |          | 5.88               | 7.34               | 354                          | 331                          | 3.20           | 16.0        | 90                     | 34.33(5.90)                                | 51.41(7.20)                                | 12.26                                     | 16.48                                     |
| S3                            |          | 6.14               | 7.67               | 377                          | 350                          | 3.34           | 16.4        | 89                     | 28.52(5.39)                                | 45.34(6.77)                                | 10.18                                     | 14.58                                     |
| S4                            |          |                    |                    |                              |                              |                |             |                        |                                            |                                            |                                           |                                           |
| S5                            |          | 6.26               | 7.82               | 377                          | 357                          | 3.33           | 16.5        | 89                     | 28.15(5.35)                                | 44.90(6.74)                                | 10.04                                     | 14.40                                     |
| CD (0.05)                     |          | 0.27               | 0.34               | 10.10                        | 14.48                        | 0.12           | 0.49        | 0.73                   | 0.09                                       | 0.10                                       | 0.36                                      | 0.48                                      |
| C.V. (%)                      |          | 3.61               | 3.62               | 2.22                         | 3.40                         | 2.89           | 2.43        | 0.64                   | 1.18                                       | 1.17                                       | 2.45                                      | 2.42                                      |
| Experimental Mean             |          | 5.97               | 7.46               | 362                          | 338                          | 3.23           | 16.1        | 90                     | 5.75                                       | 7.07                                       | 11.68                                     | 15.94                                     |
| Soil type                     |          | Clay loam          |                    |                              |                              |                |             |                        |                                            |                                            |                                           |                                           |
| pH                            |          | 6.19               |                    |                              |                              |                |             |                        |                                            |                                            |                                           |                                           |
| Variety                       |          | TKM 13             |                    |                              |                              |                |             |                        |                                            |                                            |                                           |                                           |
| Available NPK kg/ha           |          | 123:15:129         |                    |                              |                              |                |             |                        |                                            |                                            |                                           |                                           |

S1: Broadcasting of seeds

S2: Manual line sowing of seeds (20-25 cm row spacing sown in solid row)

S3: Mechanized line sowing of seeds (Dribbler, Happy seeder or any Drum Seeder: Spacing as per the equipment specifications)

S4: Any improved system in that particular location

S5: Normal transplanting

Table-4.2.3: Contd....

| Treatment                     |           | ARI-RAJENDRANAGAR  |                    |                              |                              |                |             |                        |                                         |                                        | RANCHI             |                              |                |             |                                                         |
|-------------------------------|-----------|--------------------|--------------------|------------------------------|------------------------------|----------------|-------------|------------------------|-----------------------------------------|----------------------------------------|--------------------|------------------------------|----------------|-------------|---------------------------------------------------------|
| Main Plot                     | Sub-plots | Grain yield (t/ha) | Straw yield (t/ha) | Tillers/m <sup>2</sup> (No.) | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days for 50% flowering | Weed population at (no/m <sup>2</sup> ) | Weed dry weight at (g/m <sup>2</sup> ) | Grain yield (t/ha) | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Weed dry weight at active tillering (g/m <sup>2</sup> ) |
| M1- Normal sowing time        | S1        | 7.15               | 8.08               | 498                          | 434                          | 3.64           | 12.9        | 87                     | 40.00(6.09)                             | 1.97                                   | 4.65               | 246                          | 3.13           | 24.2        | 30.2                                                    |
|                               | S2        | 6.78               | 7.58               | 376                          | 402                          | 3.55           | 13.3        | 87                     | 33.50(5.72)                             | 3.08                                   | 4.75               | 252                          | 3.21           | 24.28       | 19.2                                                    |
|                               | S3        | 7.24               | 8.88               | 452                          | 417                          | 3.54           | 12.2        | 87                     | 20.75(4.55)                             | 1.72                                   | 5.21               | 275                          | 3.15           | 24.31       | 27.2                                                    |
|                               | S4        |                    |                    |                              |                              |                |             |                        |                                         |                                        | 4.12               | 220                          | 2.81           | 24.23       | 36.2                                                    |
|                               | S5        | 5.82               | 8.67               | 341                          | 339                          | 3.75           | 12.1        | 90                     | 36.75(6.10)                             | 2.02                                   | 5.35               | 281                          | 3.24           | 24.3        | 19.15                                                   |
| M2- Delayed sowing by 30 days | S1        | 6.12               | 14.83              | 475                          | 363                          | 2.64           | 13.4        | 73                     | 56.25(7.52)                             | 1.79                                   | 3.82               | 219                          | 2.94           | 24.1        | 35.8                                                    |
|                               | S2        | 5.17               | 13.92              | 305                          | 333                          | 2.67           | 13.4        | 73                     | 34.75(5.82)                             | 1.94                                   | 4.05               | 225                          | 3.03           | 24.14       | 25.2                                                    |
|                               | S3        | 6.86               | 13.75              | 394                          | 380                          | 3.33           | 13.0        | 72                     | 41.75(6.48)                             | 1.42                                   | 4.65               | 247                          | 2.95           | 24.1        | 32.4                                                    |
|                               | S4        |                    |                    |                              |                              |                |             |                        |                                         |                                        | 3.66               | 196                          | 2.87           | 23.95       | 40.2                                                    |
|                               | S5        | 5.00               | 10.67              | 335                          | 328                          | 3.05           | 13.1        | 80                     | 45.50(6.76)                             | 1.73                                   | 4.68               | 252                          | 3.07           | 24.17       | 24.2                                                    |
| Interaction                   |           |                    |                    |                              |                              |                |             |                        |                                         |                                        |                    |                              |                |             |                                                         |
| I and M                       |           | NS                 | NS                 | NS                           | NS                           | NS             | NS          | 0.56                   | NS                                      | NS                                     | NS                 | NS                           | NS             | NS          | NS                                                      |
| M and I                       |           | NS                 | NS                 | NS                           | NS                           | NS             | NS          | 0.51                   | NS                                      | NS                                     | NS                 | NS                           | NS             | NS          | NS                                                      |
| Mean of Main plot             |           |                    |                    |                              |                              |                |             |                        |                                         |                                        |                    |                              |                |             |                                                         |
| M1                            |           | 6.74               | 8.30               | 416                          | 398                          | 3.62           | 12.6        | 88                     | 32.75(5.62)                             | 2.20                                   | 4.82               | 255                          | 3.11           | 24.26       | 26.39                                                   |
| M2                            |           | 5.79               | 13.29              | 377                          | 351                          | 2.92           | 13.2        | 75                     | 44.56(6.65)                             | 1.72                                   | 4.17               | 228                          | 2.97           | 24.09       | 31.56                                                   |
| C.D. (0.05)                   |           | NS                 | 2.48               | NS                           | 42.87                        | 0.55           | NS          | 0.20                   | NS                                      | NS                                     | 0.29               | 11.47                        | 0.11           | 0.08        | 3.3                                                     |
| C.V. (%)                      |           | 20.69              | 20.39              | 12.23                        | 10.18                        | 15.04          | 6.99        | 0.22                   | 21.92                                   | 40.15                                  | 6.42               | 4.72                         | 3.45           | 0.34        | 11.32                                                   |
| Method of Sub plots           |           |                    |                    |                              |                              |                |             |                        |                                         |                                        |                    |                              |                |             |                                                         |
| S1                            |           | 6.63               | 11.46              | 487                          | 398                          | 3.14           | 13.1        | 80                     | 48.13(6.81)                             | 1.88                                   | 4.24               | 233                          | 3.03           | 24.15       | 33                                                      |
| S2                            |           | 5.97               | 10.75              | 340                          | 368                          | 3.11           | 13.3        | 80                     | 34.13(5.77)                             | 2.51                                   | 4.4                | 239                          | 3.12           | 24.21       | 22.2                                                    |
| S3                            |           | 7.05               | 11.32              | 423                          | 399                          | 3.44           | 12.6        | 79                     | 31.25(5.52)                             | 1.57                                   | 4.93               | 261                          | 3.05           | 24.21       | 29.8                                                    |
| S4                            |           |                    |                    |                              |                              |                |             |                        |                                         |                                        | 3.89               | 208                          | 2.84           | 24.09       | 38.2                                                    |
| S5                            |           | 5.41               | 9.67               | 338                          | 333                          | 3.40           | 12.6        | 85                     | 41.13(6.43)                             | 1.87                                   | 5.01               | 267                          | 3.15           | 24.23       | 21.68                                                   |
| CD (0.05)                     |           | NS                 | NS                 | 72.88                        | NS                           | NS             | NS          | 0.40                   | NS                                      | NS                                     | 0.42               | 16.97                        | 0.14           | 0.09        | 6.91                                                    |
| C.V. (%)                      |           | 21.62              | 16.77              | 17.47                        | 15.82                        | 13.94          | 7.67        | 0.47                   | 18.40                                   | 43.74                                  | 8.99               | 6.82                         | 4.4            | 0.36        | 23.12                                                   |
| Experimental Mean             |           | 6.27               | 10.80              | 397                          | 374                          | 3.27           | 12.9        | 81                     | 6.13                                    | 1.96                                   | 4.49               | 241                          | 3.04           | 24.18       | 28.98                                                   |
| Soil type                     |           | Clay loam          |                    |                              |                              |                |             |                        |                                         |                                        | Clay Loam          |                              |                |             |                                                         |
| pH                            |           | 7.60               |                    |                              |                              |                |             |                        |                                         |                                        | 6.10               |                              |                |             |                                                         |
| Variety                       |           | RNR 15048          |                    |                              |                              |                |             |                        |                                         |                                        | IR 64 drt1         |                              |                |             |                                                         |
| Available NPK kg/ha           |           | 226:102:481        |                    |                              |                              |                |             |                        |                                         |                                        | 227:39:285         |                              |                |             |                                                         |

S1: Broadcasting of seeds

S2: Manual line sowing of seeds (20-25 cm row spacing sown in solid row)

S3: Mechanized line sowing of seeds (Dribbler, Happy seeder or any Drum Seeder: Spacing as per the equipment specifications)

S4: Any improved system in that particular location

S5: Normal transplanting

\*S4- Rice + Sesbania was broadcasted (Sesbania was broadcasted at the rate of 40 kg/ha and then rice was sown in lines 20 cm apart. At 25th DAS sesbania was uprooted and placed in between rice rows.

Table-4.2.3: Contd....

| Treatment                     |           | REWA               |                    |                |             |                        |                                                          |                                                         |                                           |                                           |
|-------------------------------|-----------|--------------------|--------------------|----------------|-------------|------------------------|----------------------------------------------------------|---------------------------------------------------------|-------------------------------------------|-------------------------------------------|
| Main Plot                     | Sub-plots | Grain yield (t/ha) | Straw yield (t/ha) | Panicle wt (g) | Test wt (g) | Days for 50% flowering | Weed population at active tillering (no/m <sup>2</sup> ) | Weed population panicle initiation (no/m <sup>2</sup> ) | Weed dry weight at AT (g/m <sup>2</sup> ) | Weed dry weight at PI (g/m <sup>2</sup> ) |
| M1- Normal sowing time        | S1        | 3.98               | 4.65               | 2.43           | 24.75       | 72.8                   | 26.48(5.19)                                              | 6.25(2.59)                                              | 9.60                                      | 3.42                                      |
|                               | S2        | 4.38               | 4.95               | 2.67           | 25.45       | 77.5                   | 25.28(5.08)                                              | 6.25(2.60)                                              | 9.30                                      | 3.95                                      |
|                               | S3        | 4.57               | 5.15               | 2.93           | 24.98       | 80.8                   | 26.03(5.15)                                              | 6.75(2.69)                                              | 10.77                                     | 3.80                                      |
|                               | S4        | 5.38               | 5.63               | 3.45           | 26.35       | 84.5                   | 11.30(3.43)                                              | 7.25(2.78)                                              | 4.55                                      | 2.72                                      |
|                               | S5        | 4.82               | 5.48               | 3.15           | 25.50       | 81.5                   | 24.03(4.94)                                              | 5.75(2.50)                                              | 11.32                                     | 3.33                                      |
| M2- Delayed sowing by 30 days | S1        | 3.63               | 4.20               | 2.10           | 24.98       | 69.0                   | 25.60(5.11)                                              | 4.75(2.28)                                              | 7.30                                      | 2.55                                      |
|                               | S2        | 4.07               | 4.60               | 2.25           | 26.35       | 72.0                   | 24.45(4.99)                                              | 4.50(2.23)                                              | 7.35                                      | 2.38                                      |
|                               | S3        | 4.13               | 4.82               | 2.55           | 25.50       | 75.5                   | 25.17(5.06)                                              | 5.00(2.34)                                              | 9.07                                      | 2.78                                      |
|                               | S4        | 5.05               | 5.40               | 2.98           | 24.75       | 78.0                   | 10.88(3.37)                                              | 5.25(2.39)                                              | 3.50                                      | 2.58                                      |
|                               | S5        | 4.48               | 5.15               | 2.88           | 25.45       | 78.5                   | 23.00(4.84)                                              | 4.50(2.23)                                              | 9.02                                      | 2.83                                      |
| Interaction                   |           |                    |                    |                |             |                        |                                                          |                                                         |                                           |                                           |
| I and M                       |           | NS                 | NS                 | NS             | NS          | NS                     | NS                                                       | NS                                                      | NS                                        | NS                                        |
| M and I                       |           | NS                 | NS                 | NS             | NS          | NS                     | NS                                                       | NS                                                      | NS                                        | NS                                        |
| Mean of Main plot             |           |                    |                    |                |             |                        |                                                          |                                                         |                                           |                                           |
| M1                            |           | 4.62               | 5.17               | 2.93           | 25.40       | 79.4                   | 22.62(4.76)                                              | 6.45(2.63)                                              | 9.11                                      | 3.45                                      |
| M2                            |           | 4.27               | 4.83               | 2.55           | 25.41       | 74.6                   | 21.82(4.68)                                              | 4.80(2.30)                                              | 7.25                                      | 2.62                                      |
| C.D. (0.05)                   |           | 0.09               | 0.03               | 0.05           | NS          | 1.45                   | NS                                                       | 0.06                                                    | 0.80                                      | 0.39                                      |
| C.V. (%)                      |           | 2.04               | 0.61               | 1.73           | 0.45        | 1.87                   | 2.87                                                     | 2.28                                                    | 9.73                                      | 12.84                                     |
| Method of Sub plots           |           |                    |                    |                |             |                        |                                                          |                                                         |                                           |                                           |
| S1                            |           | 3.80               | 4.42               | 2.26           | 24.86       | 70.9                   | 26.04(5.15)                                              | 5.50(2.44)                                              | 8.45                                      | 2.99                                      |
| S2                            |           | 4.22               | 4.78               | 2.46           | 25.90       | 74.8                   | 24.86(5.03)                                              | 5.38(2.42)                                              | 8.33                                      | 3.16                                      |
| S3                            |           | 4.35               | 4.99               | 2.74           | 25.24       | 78.1                   | 25.60(5.11)                                              | 5.88(2.52)                                              | 9.92                                      | 3.29                                      |
| S4                            |           | 5.21               | 5.51               | 3.21           | 25.55       | 81.3                   | 11.09(3.40)                                              | 6.25(2.59)                                              | 4.02                                      | 2.65                                      |
| S5                            |           | 4.65               | 5.31               | 3.01           | 25.48       | 80.0                   | 23.51(4.89)                                              | 5.13(2.37)                                              | 10.17                                     | 3.08                                      |
| CD (0.05)                     |           | 0.19               | 0.08               | 0.11           | NS          | 2.30                   | 0.17                                                     | NS                                                      | 1.57                                      | NS                                        |
| C.V. (%)                      |           | 4.19               | 1.52               | 3.76           | 3.38        | 2.90                   | 3.43                                                     | 6.81                                                    | 18.60                                     | 15.69                                     |
| Experimental Mean             |           | 4.45               | 5.00               | 2.74           | 25.41       | 77.0                   | 4.72                                                     | 2.46                                                    | 8.18                                      | 3.03                                      |
| Soil type                     |           | -                  |                    |                |             |                        |                                                          |                                                         |                                           |                                           |
| pH                            |           | 6.10               |                    |                |             |                        |                                                          |                                                         |                                           |                                           |
| Variety                       |           | RNR 15048          |                    |                |             |                        |                                                          |                                                         |                                           |                                           |
| Available NPK kg/ha           |           | 292:18:423         |                    |                |             |                        |                                                          |                                                         |                                           |                                           |

S1: Broadcasting of seeds

S2: Manual line sowing of seeds (20-25 cm row spacing sown in solid row)

S3: Mechanized line sowing of seeds (Dribbler, Happy seeder or any Drum Seeder: Spacing as per the equipment specifications)

S4: Any improved system in that particular location

S<sub>5</sub>: Normal transplanting

Table-4.2.3: Contd....

| Treatment                     |           | TITABAR            |                              |                |                        |                                            |                                           | WARANGAL           |                    |                              |                              |                |             | Over all Mean | Rank |
|-------------------------------|-----------|--------------------|------------------------------|----------------|------------------------|--------------------------------------------|-------------------------------------------|--------------------|--------------------|------------------------------|------------------------------|----------------|-------------|---------------|------|
| Main Plot                     | Sub-plots | Grain yield (t/ha) | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Days for 50% flowering | Weed population at PI (no/m <sup>2</sup> ) | Weed dry weight at PI (g/m <sup>2</sup> ) | Grain yield (t/ha) | Straw yield (t/ha) | Tillers/m <sup>2</sup> (No.) | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) |               |      |
| M1- Normal sowing time        | S1        | 2.42               | 255                          | 2.92           | 70                     | 45.50(6.73)                                | 78.55                                     | 5.80               | 6.70               | 388                          | 263                          | 14.67          | 12.60       | 4.65          | 7    |
|                               | S2        | 2.53               | 265                          | 3.56           | 65                     | 36.50(6.00)                                | 70.35                                     | 6.27               | 7.45               | 408                          | 297                          | 15.27          | 12.33       | 4.93          | 4    |
|                               | S3        | 3.28               | 222                          | 3.84           | 63                     | 20.50(4.53)                                | 42.03                                     | 6.60               | 7.63               | 454                          | 350                          | 15.80          | 12.58       | 5.42          | 3    |
|                               | S4        |                    |                              |                |                        |                                            |                                           | 6.70               | 7.80               | 473                          | 357                          | 16.13          | 12.43       | 5.57          | 1    |
|                               | S5        | 4.41               | 306                          | 4.19           | 71                     | 11.50(3.41)                                | 26.27                                     | 7.00               | 8.77               | 475                          | 355                          | 17.00          | 12.43       | 5.46          | 2    |
| M2- Delayed sowing by 30 days | S1        | 2.11               | 188                          | 3.01           | 76                     | 53.50(7.32)                                | 66.55                                     | 1.94               | 2.75               | 325                          | 225                          | 14.00          | 12.32       | 3.82          | 10   |
|                               | S2        | 2.52               | 208                          | 3.24           | 74                     | 39.00(6.22)                                | 49.45                                     | 3.95               | 6.40               | 327                          | 219                          | 14.33          | 12.21       | 4.05          | 9    |
|                               | S3        | 2.93               | 212                          | 3.48           | 72                     | 25.75(5.08)                                | 44.10                                     | 4.15               | 5.27               | 378                          | 295                          | 14.67          | 12.17       | 4.56          | 8    |
|                               | S4        |                    |                              |                |                        |                                            |                                           | 4.48               | 5.33               | 395                          | 300                          | 14.43          | 12.16       | 4.72          | 5    |
|                               | S5        | 3.55               | 244                          | 3.64           | 75                     | 18.00(4.30)                                | 24.35                                     | 5.54               | 6.43               | 399                          | 305                          | 15.43          | 12.38       | 4.65          | 6    |
| Interaction                   |           |                    |                              |                |                        |                                            |                                           |                    |                    |                              |                              |                |             |               |      |
| I and M                       |           | NS                 | 23.60                        | NS             | 1.29                   | NS                                         | NS                                        | NS                 | 0.94               | NS                           | NS                           | 0.36           | NS          |               |      |
| M and I                       |           | NS                 | 27.31                        | NS             | 1.39                   | NS                                         | NS                                        | NS                 | 1.12               | NS                           | NS                           | 0.82           | NS          |               |      |
| Mean of Main plot             |           |                    |                              |                |                        |                                            |                                           |                    |                    |                              |                              |                |             |               |      |
| M1                            |           | 3.16               | 262                          | 3.63           | 67                     | 28.50(5.17)                                | 54.30                                     | 6.47               | 7.67               | 440                          | 325                          | 15.77          | 12.48       | 5.22          | 1    |
| M2                            |           | 2.78               | 213                          | 3.34           | 74                     | 34.06(5.73)                                | 46.11                                     | 4.01               | 5.24               | 365                          | 269                          | 14.57          | 12.25       | 4.36          | 2    |
| C.D. (0.05)                   |           | 0.14               | 23.01                        | NS             | 1.05                   | NS                                         | NS                                        | 0.90               | 0.95               | 70.37                        | NS                           | 1.00           | NS          |               |      |
| C.V. (%)                      |           | 4.19               | 8.62                         | 8.16           | 1.32                   | 16.08                                      | 50.24                                     | 10.90              | 9.38               | 11.13                        | 25.19                        | 4.18           | 2.23        |               |      |
| Method of Sub plots           |           |                    |                              |                |                        |                                            |                                           |                    |                    |                              |                              |                |             |               |      |
| S1                            |           | 2.26               | 222                          | 2.97           | 73                     | 49.50(7.03)                                | 72.55                                     | 3.87               | 4.73               | 357                          | 244                          | 14.33          | 12.46       | 4.23          | 5    |
| S2                            |           | 2.52               | 236                          | 3.40           | 69                     | 37.75(6.11)                                | 59.90                                     | 5.11               | 6.93               | 368                          | 258                          | 14.80          | 12.27       | 4.49          | 4    |
| S3                            |           | 3.11               | 217                          | 3.66           | 68                     | 23.13(4.81)                                | 43.06                                     | 5.38               | 6.45               | 416                          | 323                          | 15.23          | 12.38       | 4.99          | 3    |
| S4                            |           |                    |                              |                |                        |                                            |                                           | 5.59               | 6.57               | 434                          | 329                          | 15.28          | 12.30       | 5.14          | 1    |
| S5                            |           | 3.98               | 275                          | 3.92           | 73                     | 14.75(3.85)                                | 25.31                                     | 6.27               | 7.60               | 437                          | 330                          | 16.22          | 12.41       | 5.05          | 2    |
| CD (0.05)                     |           | 0.41               | 16.69                        | 0.22           | 0.91                   | 0.53                                       | 14.36                                     | 1.28               | 0.66               | 42.35                        | 36.32                        | 0.25           | NS          |               |      |
| C.V. (%)                      |           | 13.10              | 6.69                         | 6.11           | 1.23                   | 9.34                                       | 27.21                                     | 19.95              | 8.40               | 8.60                         | 10.00                        | 1.37           | 1.69        |               |      |
| Experimental Mean             |           | 2.97               | 237                          | 3.49           | 71                     | 5.45                                       | 50.21                                     | 5.24               | 6.45               | 402                          | 297                          | 15.17          | 12.36       | 4.79          |      |
| Soil type                     |           | Clay loam          |                              |                |                        |                                            |                                           | Clay Loam          |                    |                              |                              |                |             |               |      |
| pH                            |           | 5.20               |                              |                |                        |                                            |                                           | 7.30               |                    |                              |                              |                |             |               |      |
| Variety                       |           | LUIT               |                              |                |                        |                                            |                                           | WGL 962            |                    |                              |                              |                |             |               |      |
| Available NPK kg/ha           |           | 302:19:321         |                              |                |                        |                                            |                                           | 276:80:360         |                    |                              |                              |                |             |               |      |

S1: Broadcasting of seeds

S2: Manual line sowing of seeds (20-25 cm row spacing sown in solid row)

S3: Mechanized line sowing of seeds (Dribbler, Happy seeder or any Drum Seeder: Spacing as per the equipment specifications)

S4: Any improved system in that particular location

S5: Normal transplanting

\*S4 - Semi dry rice 20 x 15 cm

Table-4.2.3: Contd....

| Treatment                            |           | Cost of Cultivation (Rs./ha) |           |         |           |            |       | Total Water Input mm/ha |         |
|--------------------------------------|-----------|------------------------------|-----------|---------|-----------|------------|-------|-------------------------|---------|
| Main Plot                            | Sub-plots | COIMBATORE                   | MANDYA    | NAVSARI | NAWAGAM   | PUDUCHERRY | REWA  | RAGOLU                  | NAVSARI |
| <b>M1- Normal sowing time</b>        | S1        | 35423                        | 53822     | 29330   | 38884     | 43250      | 20500 | 1135                    | 435     |
|                                      | S2        | 38224                        |           | 31158   | 39890     | 43900      | 24300 | 1135                    | 175     |
|                                      | S3        | 36032                        | 55850     | 30710   | 38642     | 43125      | 22800 | 1135                    | 150     |
|                                      | S4        | 37122                        |           | 42750   | 42571     |            | 26800 | 1135                    | 440     |
|                                      | S5        | 42321                        | 59717     | 42505   |           | 46375      | 24200 | 1223                    | 445     |
| <b>M2- Delayed sowing by 30 days</b> | S1        | 35946                        | 53166     | 29508   | 38785     | 43250      | 20500 | 1151                    | 435     |
|                                      | S2        | 38878                        |           | 31514   | 39782     | 43900      | 24300 | 1151                    | 175     |
|                                      | S3        | 36325                        | 54634     | 31066   | 38668     | 43125      | 22800 | 1151                    | 150     |
|                                      | S4        | 37145                        |           | 42928   | 42671     |            | 26800 | 1151                    | 435     |
|                                      | S5        | 42978                        | 58263     | 42683   |           | 46375      | 24200 | 1242                    | 445     |
| <b>Interaction</b>                   |           |                              |           |         |           |            |       |                         |         |
| <i>I and M</i>                       |           |                              |           |         |           |            |       |                         |         |
| <i>M and I</i>                       |           |                              |           |         |           |            |       |                         |         |
| <b>Mean of Main plot</b>             |           |                              |           |         |           |            |       |                         |         |
| M1                                   |           | 37824.4                      | 56463     | 35291   | 39996     | 44163      | 23720 | 1153                    | 329     |
| M2                                   |           | 38254.4                      | 55354     | 35540   | 39976     | 44163      | 23720 | 1169                    | 328     |
| <b>C.D. (0.05)</b>                   |           |                              |           |         |           |            |       |                         |         |
| <b>C.V. (%)</b>                      |           |                              |           |         |           |            |       |                         |         |
| <b>Method of Sub plots</b>           |           |                              |           |         |           |            |       |                         |         |
| S1                                   |           | 35684.5                      | 53494     | 29419   | 38834     | 43250      | 20500 | 1143                    | 435     |
| S2                                   |           | 38551                        |           | 31336   | 39836     | 43900      | 24300 | 1143                    | 175     |
| S3                                   |           | 36178.5                      | 55242     | 30888   | 38655     | 43125      | 22800 | 1143                    | 150     |
| S4                                   |           | 37133.5                      |           | 42839   | 42621     |            | 26800 | 1143                    | 438     |
| S5                                   |           | 42649.5                      | 58990     | 42594   |           | 46375      | 24200 | 1233                    | 445     |
| <b>CD (0.05)</b>                     |           |                              |           |         |           |            |       |                         |         |
| <b>C.V. (%)</b>                      |           |                              |           |         |           |            |       |                         |         |
| <b>Experimental Mean</b>             |           | 38039.4                      | 55908.685 | 35415.1 | 39986.345 | 44162.5    | 23720 | 1160.9                  | 328.5   |

S1: Broadcasting of seeds

S2: Manual line sowing of seeds (20-25 cm row spacing sown in solid row)

S3: Mechanized line sowing of seeds (Dribbler, Happy seeder of any Drum Seeder: Spacing as per the equipment specifications)

S4: Any improved system in that particular location

S5: Normal transplanting

Table-4.2.3: Contd....

| Treatment                                 |                            | PUSA               |                              |                |
|-------------------------------------------|----------------------------|--------------------|------------------------------|----------------|
| Main Plot-Irrigation management practices | Crop establishment methods | Grain yield (t/ha) | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) |
| <b>M1- Normal sowing time</b>             | S1                         | 3.55               | 296                          | 2.99           |
|                                           | S2                         | 3.98               | 311                          | 2.94           |
|                                           | S3                         | 4.00               | 314                          | 2.91           |
|                                           | S4                         | 4.17               | 323                          | 2.77           |
|                                           | S5                         | 4.32               | 320                          | 2.89           |
| <b>Exp. mean</b>                          |                            | 4.00               | 313                          | 2.9            |
| <b>CD(0.05)</b>                           |                            | 0.33               | 25.16                        | 0.31           |
| <b>CV</b>                                 |                            | 6.23               | 6                            | 7.93           |
| <b>res(t)</b>                             |                            | **                 | NS                           | NS             |
| Soil type                                 |                            | Silty loam         |                              |                |
| pH                                        |                            | 7.80               |                              |                |
| Variety                                   |                            | Abhishek           |                              |                |
| Available NPK kg/ha                       |                            | -                  |                              |                |

S1: Broadcasting of seeds

\*S4 - Broad casting of seed (20% higher than S1)

S2: Manual line sowing of seeds (20-25 cm row spacing sown in solid row)

S3: Mechanized line sowing of seeds (Dribbler, Happy seeder of any Drum Seeder: Spacing as per the equipment specifications)

S4: Any improved system in that particular location (RANDOM TRANSPLANTING)

S5: Normal transplanting

#### 4.2.4. Evaluation of IRON coated seed for direct seeded rice for enhancing the crop establishment as well as productivity

Seed treatment of soaking, incubation, and drying increases the germination rate of rice even at low temperatures or under anoxia and that the treatment is effective not only in Japonica but also in Indica cultivars (Yamauchi, 2002; Mori et al., 2012). Andoh and Kobata (2002) reported that seeds that had been soaked and then dried have increased  $\alpha$ -amylase activity and a high germination rate. Thus, the treatment of soaking, incubation, and drying is a useful priming method. Primed rice seeds could be utilized in direct seeding in view of pre-germinated seeds. The high density Fe-coated seeds are resistant to birds and seed borne diseases. Iron-coated seeds exhibit improved anchorage in water seeding in puddled fields. Hence, the field trial was initiated to study effect of Fe-coating on growth and yield parameters of rice in 2018 in AICRIP programme. The trial during 2019 was continued and laid out in split plot design at 5 locations (**ICAR-IIRR& JFE-India, Coimbatore, Chiplima, Karjat and Raipur**) with 4 date of sowings with one week interval as main plots and five establishment methods (T<sub>1</sub>- Iron coated seed, seed rate 25 kg/ha, broadcasting in 1-2mm water level condition (Direct sowing) T<sub>2</sub>- Iron coated seed, seed rate 25 kg/ha, broadcasting in wet Condition (Direct sowing) T<sub>3</sub> – Un-coated seed, seed rate 25 kg/ha, broadcasting in 1-2mm water level condition (Direct sowing) T<sub>4</sub> – Un-coated seed, seed rate 25 kg/ha, broadcasting in wet condition (Direct sowing) T<sub>5</sub> – Normal transplanting 21-25 days after sowing as subplots in 3 replications.

At **ICAR-IIRR**, Rajendranagar, 1<sup>st</sup> date of sowing (24.08.2019) recorded significantly higher grain yield (5.67 t/ha) over other delayed sowings. However, normal transplanting of rice (5.60 t/ha) out performed all the iron coated treatments. Among the seed coating treatments, Fe coated recorded significantly higher grain yield (4.71 to 5.02 t/ha) over uncoated seeds and yield improvement ranged to the tune of 12%. At **Coimbatore**, 1<sup>st</sup> date of sowing (09.08.2019) and 2<sup>nd</sup> date of sowing (16.08.2019) resulted the highest grain yield (5.23 & 5.27 t/ha) than those of delayed sowings. There was significant reduction in grain yield due to delay of one week from 2<sup>nd</sup> sowing. However, transplanting method showed its superiority (5.60 t/ha) over all other treatments including iron coating treatment. However, Fe coating significantly increased grain yield (5.14 to 5.26 t/ha) over non-coating. At **Chiplima** also 1<sup>st</sup> date of sowing (29.06.2019) showed best result in terms of grain yield (6.21 t/ha) compared to those of other delayed date of sowings. Iron coating did not result in higher grain yield over without iron coating (normal transplanting). Similar effect of date of sowing on grain yield was also observed at **Karjat**. The highest grain yield was recorded at 1<sup>st</sup> date of sowing (3.81 t/ha). Iron coated and broadcasted on 1-2 cm water level resulted higher grain yield (3.29 t/ha) closely followed by transplanting method (3.19 t/ha). Similar yield trend was observed among date of sowing treatments at **Raipur**. The highest grain yield was 5.56 t/ha at 1<sup>st</sup> date of sowing (19.07.2019). Iron coated and broadcasted in wet condition resulted in the highest grain yield (5.55 t/ha). Over all mean grain yield across all the 5 locations revealed that **1<sup>st</sup> date of sowing was the best time of sowing for all the locations resulting the highest yield of rice (5.30 t/ha)** followed by 2<sup>nd</sup> (4.87 t/ha), 3<sup>rd</sup> (4.19 t/ha) and 4<sup>th</sup> (3.71 t/ha) date of sowing. Iron coated treatments performed better than without coated

treatments with a yield advantage of 5.72 to 9.85%. Iron coated seed with seed rate of 25 kg/ha and broadcasted in 1-2cm water level condition and iron coated wet seeding recorded higher grain yield (4.59 & 4.58 t/ha) than (4.33 & 4.18 t/ha) uncoated seeds. **There is an increase of 5.72 to 9.55% grain yield due to iron coating of seeds.**

Major pest and diseases were listed below location wise (Table.10).

Material was also supplied to **Maruteru** center, Andhra Pradesh, but plant population was seriously affected by high rain fall and severe snail problem at this center. Hence not reported in this report.

In order to enhance the productivity of DSR, iron coating of seeds was done and evaluated at 5 locations consequently viz., **IIRR, Coimbatore, Karjat** and **Raipur** with 4 date of sowings with one week interval as main plots and five establishment methods(T<sub>1</sub>- Iron coated seed, seed rate 25 kg/ha, broadcasting in 1-2mm water level condition (Direct sowing) T<sub>2</sub>- Iron coated seed, seed rate 25 kg/ha, broadcasting in wet Condition (Direct sowing) T<sub>3</sub> – Un-coated seed, seed rate 25 kg/ha, broadcasting in 1-2mm water level condition (Direct sowing) T<sub>4</sub> – Un-coated seed, seed rate 25 kg/ha, broadcasting in wet condition (Direct sowing) T<sub>5</sub> – Normal transplanting 21-25 days after sowing as subplots in 3 replications. Among the date of the sowing, 1<sup>st</sup> date of sowing (6.21 t/ha at **Chiplima**, 5.67 t/ha at **IIRR** , 3.81 t/ha at **Karjat**) gave significantly higher grain yield and over 15 days delay reduced mean grain yield reduced yield by 8.1%, 21% and 30% respectively. There is an significant increase of grain yield to the tune of 5.72 to 9.85% due to iron coating of seeds which felicitated better system of establishment and growth. The results are inconformity with previous year.

Table 4.2.4: Enhancing the productivity of Direct seeded rice with Iron coating under different rice ecologies, Kharif-2019.

| Main methods                     | Treatments | CHIPLIMA                      |                |             |                        |                    |                    | % gy Increase over Non Coated |
|----------------------------------|------------|-------------------------------|----------------|-------------|------------------------|--------------------|--------------------|-------------------------------|
|                                  |            | No of panicles/m <sup>2</sup> | Panicle wt (g) | Test wt (g) | Days for 50% Flowering | Grain Yield (t/ha) | Straw Yield (t/ha) |                               |
| 1 <sup>st</sup> sowing           | T1         | 264                           | 5.78           | 27.33       | 108                    | 5.86               | 6.60               | -11.21                        |
|                                  | T2         | 262                           | 4.92           | 28.33       | 108                    | 5.67               | 6.68               | -13.83                        |
|                                  | T3         | 276                           | 5.33           | 27.00       | 107                    | 6.60               | 7.51               |                               |
|                                  | T4         | 237                           | 5.08           | 28.67       | 106                    | 6.58               | 7.79               |                               |
|                                  | T5         | 316                           | 5.17           | 26.67       | 109                    | 6.35               | 6.18               |                               |
| 2 <sup>nd</sup> sowing           | T1         | 230                           | 5.15           | 27.67       | 102                    | 4.73               | 5.60               | -28.01                        |
|                                  | T2         | 244                           | 4.83           | 27.67       | 103                    | 5.67               | 5.78               | -2.58                         |
|                                  | T3         | 246                           | 4.92           | 27.67       | 103                    | 6.57               | 7.51               |                               |
|                                  | T4         | 265                           | 4.33           | 28.67       | 103                    | 5.82               | 6.82               |                               |
|                                  | T5         | 304                           | 4.33           | 26.67       | 105                    | 5.84               | 7.28               |                               |
| 3 <sup>rd</sup> sowing           | T1         | 224                           | 5.00           | 27.67       | 103                    | 4.39               | 5.38               | -7.77                         |
|                                  | T2         | 220                           | 4.77           | 28.00       | 103                    | 4.75               | 5.98               | 13.10                         |
|                                  | T3         | 232                           | 4.73           | 27.33       | 103                    | 4.76               | 5.84               |                               |
|                                  | T4         | 247                           | 5.83           | 27.33       | 102                    | 4.20               | 5.00               |                               |
|                                  | T5         | 276                           | 4.50           | 26.67       | 105                    | 5.09               | 6.42               |                               |
| 4 <sup>th</sup> sowing           | T1         | 254                           | 4.52           | 26.00       | 98                     | 4.40               | 5.18               | 7.58                          |
|                                  | T2         | 212                           | 4.45           | 26.67       | 98                     | 4.61               | 5.44               | 14.96                         |
|                                  | T3         | 214                           | 4.83           | 25.33       | 99                     | 4.09               | 5.00               |                               |
|                                  | T4         | 236                           | 5.42           | 26.00       | 97                     | 4.01               | 4.87               |                               |
|                                  | T5         | 241                           | 4.92           | 26.33       | 102                    | 4.35               | 5.40               |                               |
| Interaction M and T              |            | 27.91                         | NS             | NS          | 1.1                    | NS                 | NS                 |                               |
| T and M                          |            | 28.75                         | NS             | NS          | 1.12                   | NS                 | NS                 |                               |
| Mean of Main methods             |            |                               |                |             |                        |                    |                    |                               |
| M1                               |            | 271                           | 5.26           | 27.60       | 108                    | 6.21               | 6.95               |                               |
| M2                               |            | 258                           | 4.71           | 27.67       | 103                    | 5.73               | 6.60               |                               |
| M3                               |            | 240                           | 4.97           | 27.40       | 103                    | 4.64               | 5.72               |                               |
| M4                               |            | 231                           | 4.83           | 26.07       | 99                     | 4.29               | 5.18               |                               |
| CD(0.05)                         |            | 18.47                         | NS             | 0.37        | 0.69                   | 0.63               | 0.59               |                               |
| CV(%)                            |            | 8.27                          | 11.72          | 1.53        | 0.75                   | 13.48              | 10.80              |                               |
| Mean of Sub methods              |            |                               |                |             |                        |                    |                    |                               |
| T1-Fe coated 1-2 cm water level  |            | 243                           | 5.11           | 27.17       | 103                    | 4.85               | 5.69               | -11.82                        |
| T2-Fe coated wet                 |            | 234                           | 4.74           | 27.67       | 103                    | 5.18               | 5.97               | 0.58                          |
| T3-Non coated 1-2 cm water level |            | 242                           | 4.95           | 26.83       | 103                    | 5.50               | 6.47               |                               |
| T4-Non coated wet                |            | 246                           | 5.17           | 27.67       | 102                    | 5.15               | 6.12               |                               |
| T5-NTP                           |            | 285                           | 4.73           | 26.58       | 105                    | 5.41               | 6.32               |                               |
| CD(0.05)                         |            | 13.95                         | NS             | 0.84        | 0.55                   | 0.44               | NS                 |                               |
| CV(%)                            |            | 6.76                          | 9.77           | 3.75        | 0.64                   | 10.20              | 10.85              |                               |
| Experimental Mean                |            | 250                           | 4.94           | 27.18       | 103                    | 5.22               | 6.11               |                               |

| DOS      | Rain fall for specific week |
|----------|-----------------------------|
| 29.06.19 | -                           |
| 07.07.19 | -                           |
| 13.07.19 | -                           |
| 21.07.19 | -                           |

Table 4.2.4: Contd...

| Main methods                     | Treatments | COIMBATORE                    |                |             |                    |                    | % gy Increase over Non Coated |
|----------------------------------|------------|-------------------------------|----------------|-------------|--------------------|--------------------|-------------------------------|
|                                  |            | No of panicles/m <sup>2</sup> | Panicle wt (g) | Test wt (g) | Grain Yield (t/ha) | Straw Yield (t/ha) |                               |
| 1 <sup>st</sup> sowing           | T1         | 353                           | 2.64           | 19.43       | 5.52               | 7.33               | 14.29                         |
|                                  | T2         | 338                           | 2.48           | 19.33       | 5.34               | 7.24               | 12.42                         |
|                                  | T3         | 328                           | 2.27           | 19.47       | 4.83               | 6.43               |                               |
|                                  | T4         | 318                           | 1.97           | 19.33       | 4.75               | 6.27               |                               |
|                                  | T5         | 356                           | 2.72           | 19.57       | 5.69               | 7.59               |                               |
| 2 <sup>nd</sup> sowing           | T1         | 361                           | 2.73           | 19.57       | 5.65               | 7.45               | 19.20                         |
|                                  | T2         | 343                           | 2.56           | 19.43       | 5.55               | 7.32               | 18.84                         |
|                                  | T3         | 337                           | 2.36           | 19.43       | 4.74               | 6.54               |                               |
|                                  | T4         | 319                           | 2.04           | 19.37       | 4.67               | 6.37               |                               |
|                                  | T5         | 367                           | 2.78           | 19.70       | 5.76               | 7.78               |                               |
| 3 <sup>rd</sup> sowing           | T1         | 327                           | 2.29           | 19.40       | 5.04               | 7.05               | 11.26                         |
|                                  | T2         | 323                           | 2.17           | 19.33       | 4.89               | 6.84               | 11.90                         |
|                                  | T3         | 314                           | 2.10           | 19.27       | 4.53               | 6.43               |                               |
|                                  | T4         | 302                           | 1.91           | 19.40       | 4.37               | 6.24               |                               |
|                                  | T5         | 336                           | 2.59           | 19.53       | 5.59               | 7.45               |                               |
| 4 <sup>th</sup> sowing           | T1         | 318                           | 2.17           | 19.43       | 4.84               | 6.77               | 10.50                         |
|                                  | T2         | 316                           | 2.10           | 19.30       | 4.77               | 6.54               | 13.57                         |
|                                  | T3         | 310                           | 1.88           | 19.27       | 4.38               | 6.33               |                               |
|                                  | T4         | 300                           | 1.73           | 19.33       | 4.20               | 6.15               |                               |
|                                  | T5         | 328                           | 2.42           | 19.57       | 5.35               | 7.33               |                               |
| Interaction M and T              |            | NS                            | NS             | NS          | 0.11               | 0.15               |                               |
| T and M                          |            | NS                            | NS             | NS          | 0.14               | 0.15               |                               |
| Mean of Main methods             |            |                               |                |             |                    |                    |                               |
| M1                               |            | 339                           | 2.42           | 19.43       | 5.23               | 6.97               |                               |
| M2                               |            | 345                           | 2.49           | 19.50       | 5.27               | 7.09               |                               |
| M3                               |            | 320                           | 2.21           | 19.39       | 4.88               | 6.80               |                               |
| M4                               |            | 314                           | 2.06           | 19.38       | 4.71               | 6.62               |                               |
| CD(0.05)                         |            | 7.06                          | 0.05           | 0.04        | 0.13               | 0.10               |                               |
| CV(%)                            |            | 2.40                          | 2.63           | 0.25        | 2.88               | 1.63               |                               |
| Mean of Sub methods              |            |                               |                |             |                    |                    |                               |
| T1-Fe coated 1-2 cm water level  |            | 340                           | 2.46           | 19.46       | 5.26               | 7.15               | 13.85                         |
| T2-Fe coated wet                 |            | 330                           | 2.33           | 19.35       | 5.14               | 6.98               | 14.22                         |
| T3-Non coated 1-2 cm water level |            | 322                           | 2.15           | 19.36       | 4.62               | 6.43               |                               |
| T4-Non coated wet                |            | 310                           | 1.91           | 19.36       | 4.50               | 6.26               |                               |
| T5-NTP                           |            | 347                           | 2.63           | 19.59       | 5.60               | 7.54               |                               |
| CD(0.05)                         |            | 5.37                          | 0.06           | 0.06        | 0.06               | 0.08               |                               |
| CV(%)                            |            | 1.98                          | 3.21           | 0.39        | 1.37               | 1.32               |                               |
| Experimental Mean                |            | 330                           | 2.30           | 19.42       | 5.02               | 6.87               |                               |
| DOS                              |            | Rain fall for specific week   |                |             |                    |                    |                               |
| 09.08.19                         |            | -                             |                |             |                    |                    |                               |
| 16.08.19                         |            | -                             |                |             |                    |                    |                               |
| 23.08.19                         |            | -                             |                |             |                    |                    |                               |
| 30.08.19                         |            | -                             |                |             |                    |                    |                               |

Table 4.2.4: Contd...

| Main methods                     | Treatment<br>s | IIRR                     |                      |                |                              |                          |                          | % gy<br>Incras<br>e over<br>Non<br>Coated |
|----------------------------------|----------------|--------------------------|----------------------|----------------|------------------------------|--------------------------|--------------------------|-------------------------------------------|
|                                  |                | No of<br>panicles/m<br>2 | Panicle<br>wt<br>(g) | Test<br>wt (g) | Days for<br>50%<br>Flowering | Grain<br>Yield<br>(t/ha) | Straw<br>Yield<br>(t/ha) |                                           |
| 1 <sup>st</sup> sowing           | T1             | 543                      | 3.17                 | 22.20          | 102                          | 5.95                     | 7.14                     | 11.21                                     |
|                                  | T2             | 567                      | 3.14                 | 22.03          | 102                          | 5.68                     | 6.67                     | 13.83                                     |
|                                  | T3             | 490                      | 2.67                 | 20.70          | 103                          | 5.35                     | 6.27                     |                                           |
|                                  | T4             | 528                      | 2.64                 | 20.77          | 103                          | 4.99                     | 5.80                     |                                           |
|                                  | T5             | 603                      | 2.92                 | 22.20          | 109                          | 6.37                     | 7.38                     |                                           |
| 2 <sup>nd</sup> sowing           | T1             | 471                      | 2.75                 | 21.93          | 102                          | 5.14                     | 6.08                     | 17.62                                     |
|                                  | T2             | 342                      | 2.76                 | 21.80          | 102                          | 4.67                     | 5.60                     | 15.88                                     |
|                                  | T3             | 158                      | 2.60                 | 20.60          | 103                          | 4.37                     | 5.23                     |                                           |
|                                  | T4             | 212                      | 2.65                 | 20.67          | 103                          | 4.03                     | 4.82                     |                                           |
|                                  | T5             | 612                      | 2.65                 | 22.90          | 109                          | 5.86                     | 6.81                     |                                           |
| 3 <sup>rd</sup> sowing           | T1             | 420                      | 2.68                 | 21.60          | 103                          | 4.66                     | 5.42                     | 9.65                                      |
|                                  | T2             | 506                      | 2.47                 | 20.67          | 102                          | 4.54                     | 5.37                     | 9.66                                      |
|                                  | T3             | 356                      | 2.33                 | 19.87          | 102                          | 4.25                     | 5.10                     |                                           |
|                                  | T4             | 321                      | 2.45                 | 19.77          | 101                          | 4.14                     | 5.04                     |                                           |
|                                  | T5             | 532                      | 2.60                 | 22.57          | 106                          | 5.34                     | 6.41                     |                                           |
| 4 <sup>th</sup> sowing           | T1             | 477                      | 2.39                 | 20.80          | 101                          | 4.34                     | 5.20                     | 12.44                                     |
|                                  | T2             | 394                      | 2.55                 | 20.97          | 101                          | 3.95                     | 4.85                     | 8.82                                      |
|                                  | T3             | 279                      | 2.39                 | 19.80          | 101                          | 3.86                     | 4.74                     |                                           |
|                                  | T4             | 309                      | 2.39                 | 20.50          | 101                          | 3.63                     | 4.41                     |                                           |
|                                  | T5             | 531                      | 2.46                 | 22.67          | 105                          | 4.83                     | 5.73                     |                                           |
| Interaction                      |                |                          |                      |                |                              |                          |                          |                                           |
| M and T                          |                | NS                       | NS                   | NS             | NS                           | NS                       | NS                       |                                           |
| T and M                          |                | NS                       | NS                   | NS             | NS                           | NS                       | NS                       |                                           |
| Mean of Main methods             |                |                          |                      |                |                              |                          |                          |                                           |
| M1                               |                | 546                      | 2.91                 | 21.58          | 104                          | 5.67                     | 6.65                     |                                           |
| M2                               |                | 359                      | 2.68                 | 21.58          | 104                          | 4.82                     | 5.71                     |                                           |
| M3                               |                | 427                      | 2.50                 | 20.89          | 103                          | 4.59                     | 5.47                     |                                           |
| M4                               |                | 398                      | 2.44                 | 20.95          | 102                          | 4.12                     | 4.99                     |                                           |
| CD(0.05)                         |                | 68.87                    | 0.19                 | 0.39           | 0.79                         | 0.26                     | 0.23                     |                                           |
| CV(%)                            |                | 17.82                    | 8.02                 | 2.05           | 0.86                         | 6.06                     | 4.52                     |                                           |
| Mean of Sub methods              |                |                          |                      |                |                              |                          |                          |                                           |
| T1-Fe coated 1-2 cm water level  |                | 477                      | 2.75                 | 21.63          | 102                          | 5.02                     | 5.96                     | 12.56                                     |
| T2-Fe coated wet                 |                | 452                      | 2.73                 | 21.37          | 102                          | 4.71                     | 5.62                     | 12.14                                     |
| T3-Non coated 1-2 cm water level |                | 321                      | 2.50                 | 20.24          | 102                          | 4.46                     | 5.34                     |                                           |
| T4-Non coated wet                |                | 343                      | 2.53                 | 20.43          | 102                          | 4.20                     | 5.01                     |                                           |
| T5-NTP                           |                | 570                      | 2.66                 | 22.58          | 108                          | 5.60                     | 6.58                     |                                           |
| CD(0.05)                         |                | 85.79                    | 0.13                 | 0.62           | 0.81                         | 0.34                     | 0.37                     |                                           |
| CV(%)                            |                | 24.04                    | 6.02                 | 3.56           | 0.96                         | 8.59                     | 7.96                     |                                           |
| Experimental Mean                |                | 433                      | 2.63                 | 21.25          | 103                          | 4.80                     | 5.70                     |                                           |

DOS  
24.08.19 42.0  
30.08.19 76.0  
07.09.19 9.0  
13.09.19 31.6

Rain fall for specific week

Table 4.2.4: Contd...

| Main methods                     | Treatments | KARZAT                        |                |             |                        |                    |                    | % gy Increase over Non Coated |
|----------------------------------|------------|-------------------------------|----------------|-------------|------------------------|--------------------|--------------------|-------------------------------|
|                                  |            | No of panicles/m <sup>2</sup> | Panicle wt (g) | Test wt (g) | Days for 50% Flowering | Grain Yield (t/ha) | Straw Yield (t/ha) |                               |
| 1 <sup>st</sup> sowing           | T1         | 300                           | 2.06           | 17.43       | 105                    | 4.09               | 5.56               | 16.19                         |
|                                  | T2         | 282                           | 1.94           | 17.42       | 103                    | 3.84               | 5.23               | 14.97                         |
|                                  | T3         | 257                           | 1.78           | 17.38       | 105                    | 3.52               | 4.78               |                               |
|                                  | T4         | 240                           | 1.69           | 17.37       | 104                    | 3.34               | 4.55               |                               |
|                                  | T5         | 267                           | 2.15           | 17.43       | 106                    | 4.27               | 5.80               |                               |
| 2 <sup>nd</sup> sowing           | T1         | 244                           | 1.90           | 17.40       | 103                    | 3.77               | 5.28               | 18.93                         |
|                                  | T2         | 224                           | 1.81           | 17.40       | 105                    | 3.57               | 5.00               | 21.02                         |
|                                  | T3         | 200                           | 1.60           | 17.36       | 108                    | 3.17               | 4.44               |                               |
|                                  | T4         | 196                           | 1.49           | 17.35       | 105                    | 2.95               | 4.13               |                               |
|                                  | T5         | 241                           | 1.60           | 17.40       | 108                    | 3.16               | 4.42               |                               |
| 3 <sup>rd</sup> sowing           | T1         | 182                           | 1.42           | 17.40       | 108                    | 2.80               | 4.01               | 11.11                         |
|                                  | T2         | 179                           | 1.36           | 17.40       | 102                    | 2.69               | 3.85               | 22.83                         |
|                                  | T3         | 174                           | 1.27           | 17.36       | 107                    | 2.52               | 3.60               |                               |
|                                  | T4         | 168                           | 1.10           | 17.35       | 108                    | 2.19               | 3.12               |                               |
|                                  | T5         | 182                           | 1.42           | 17.40       | 104                    | 2.81               | 4.01               |                               |
| 4 <sup>th</sup> sowing           | T1         | 137                           | 1.26           | 17.34       | 105                    | 2.49               | 3.63               | 20.29                         |
|                                  | T2         | 127                           | 1.08           | 17.29       | 103                    | 2.15               | 3.14               | 14.97                         |
|                                  | T3         | 119                           | 1.04           | 17.27       | 104                    | 2.07               | 3.02               |                               |
|                                  | T4         | 112                           | 0.94           | 17.25       | 103                    | 1.87               | 2.72               |                               |
|                                  | T5         | 139                           | 1.27           | 17.33       | 104                    | 2.53               | 3.69               |                               |
| Interaction                      |            |                               |                |             |                        |                    |                    |                               |
| M and T                          |            | 9.62                          | 0.08           | NS          | 0.83                   | 0.16               | 0.23               |                               |
| T and M                          |            | 8.79                          | 0.08           | NS          | 0.87                   | 0.16               | 0.22               |                               |
| Mean of Main methods             |            |                               |                |             |                        |                    |                    |                               |
| M1                               |            | 269                           | 1.92           | 17.41       | 105                    | 3.81               | 5.18               |                               |
| M2                               |            | 221                           | 1.68           | 17.38       | 106                    | 3.32               | 4.66               |                               |
| M3                               |            | 177                           | 1.31           | 17.38       | 106                    | 2.60               | 3.72               |                               |
| M4                               |            | 127                           | 1.12           | 17.30       | 104                    | 2.22               | 3.24               |                               |
| CD(0.05)                         |            | 2.31                          | 0.04           | 0.01        | 0.6                    | 0.08               | 0.11               |                               |
| CV(%)                            |            | 1.3                           | 2.76           | 0.08        | 0.64                   | 2.88               | 2.84               |                               |
| Mean of Sub methods              |            |                               |                |             |                        |                    |                    |                               |
| T1-Fe coated 1-2 cm water level  |            | 216                           | 1.66           | 17.39       | 105                    | 3.29               | 4.62               | 16.67                         |
| T2-Fe coated wet                 |            | 203                           | 1.55           | 17.38       | 104                    | 3.06               | 4.31               | 18.15                         |
| T3-Non coated 1-2 cm water level |            | 187                           | 1.42           | 17.34       | 106                    | 2.82               | 3.96               |                               |
| T4-Non coated wet                |            | 179                           | 1.31           | 17.33       | 105                    | 2.59               | 3.63               |                               |
| T5-NTP                           |            | 207                           | 1.61           | 17.39       | 106                    | 3.19               | 4.48               |                               |
| CD(0.05)                         |            | 4.81                          | 0.04           | 0.02        | 0.41                   | 0.08               | 0.11               |                               |
| CV(%)                            |            | 2.94                          | 3.32           | 0.15        | 0.48                   | 3.25               | 3.29               |                               |
| Experimental Mean                |            | 198                           | 1.51           | 17.37       | 105                    | 2.99               | 4.20               |                               |
| DOS                              |            | Rain fall for specific week   |                |             |                        |                    |                    |                               |
|                                  |            | 03.07.19                      | 0.0            |             |                        |                    |                    |                               |
|                                  |            | 10.07.19                      | 70.0           |             |                        |                    |                    |                               |
|                                  |            | 17.07.19                      | 18.8           |             |                        |                    |                    |                               |
|                                  |            | 24.07.19                      | 531.4          |             |                        |                    |                    |                               |

Table 4.2.4: Contd...

| Main methods                     | Treatments | RAIPUR                        |                |             |                        |                    |                    | % gy Increase over Non Coated | Over all Mean | Rank | Mean % gy Increase over Non Coated |
|----------------------------------|------------|-------------------------------|----------------|-------------|------------------------|--------------------|--------------------|-------------------------------|---------------|------|------------------------------------|
|                                  |            | No of panicles/m <sup>2</sup> | Panicle wt (g) | Test wt (g) | Days for 50% Flowering | Grain Yield (t/ha) | Straw Yield (t/ha) |                               |               |      |                                    |
| 1 <sup>st</sup> sowing           | T1         | 349                           | 2.94           | 20.33       | 104                    | 5.55               | 5.95               | 6.73                          | 5.39          | 2    | 5.76                               |
|                                  | T2         | 356                           | 3.02           | 20.90       | 104                    | 5.94               | 6.29               | 15.34                         | 5.29          | 3    | 6.69                               |
|                                  | T3         | 332                           | 2.72           | 21.13       | 104                    | 5.20               | 5.58               |                               | 5.10          | 5    |                                    |
|                                  | T4         | 342                           | 2.84           | 21.03       | 104                    | 5.15               | 5.88               |                               | 4.96          | 7    |                                    |
|                                  | T5         | 298                           | 2.92           | 20.70       | 111                    | 5.94               | 6.11               |                               | 5.72          | 1    |                                    |
| 2 <sup>nd</sup> sowing           | T1         | 345                           | 2.65           | 20.57       | 96                     | 5.24               | 5.89               | 7.82                          | 4.91          | 8    | 3.46                               |
|                                  | T2         | 350                           | 2.75           | 20.37       | 96                     | 5.54               | 6.12               | 10.36                         | 5.00          | 6    | 11.16                              |
|                                  | T3         | 324                           | 2.58           | 20.93       | 95                     | 4.86               | 5.43               |                               | 4.74          | 9    |                                    |
|                                  | T4         | 332                           | 2.61           | 20.67       | 96                     | 5.02               | 5.56               |                               | 4.50          | 11   |                                    |
|                                  | T5         | 284                           | 2.64           | 20.30       | 103                    | 5.30               | 5.80               |                               | 5.18          | 4    |                                    |
| 3 <sup>rd</sup> sowing           | T1         | 281                           | 2.35           | 19.73       | 93                     | 4.06               | 4.72               | 2.78                          | 4.19          | 13   | 4.70                               |
|                                  | T2         | 318                           | 2.55           | 20.27       | 93                     | 4.53               | 5.22               | 2.03                          | 4.28          | 12   | 10.65                              |
|                                  | T3         | 278                           | 2.27           | 20.17       | 93                     | 3.95               | 4.49               |                               | 4.00          | 15   |                                    |
|                                  | T4         | 307                           | 2.46           | 20.17       | 93                     | 4.44               | 5.20               |                               | 3.87          | 16   |                                    |
|                                  | T5         | 263                           | 2.41           | 19.57       | 99                     | 4.28               | 5.01               |                               | 4.62          | 10   |                                    |
| 4 <sup>th</sup> sowing           | T1         | 264                           | 2.18           | 19.43       | 90                     | 3.05               | 3.90               | 0.99                          | 3.82          | 17   | 9.76                               |
|                                  | T2         | 287                           | 2.22           | 19.97       | 90                     | 3.50               | 4.58               | 6.71                          | 3.80          | 18   | 11.71                              |
|                                  | T3         | 260                           | 2.09           | 20.03       | 90                     | 3.02               | 4.04               |                               | 3.48          | 19   |                                    |
|                                  | T4         | 270                           | 2.14           | 19.40       | 89                     | 3.28               | 4.30               |                               | 3.40          | 20   |                                    |
|                                  | T5         | 252                           | 2.19           | 20.00       | 95                     | 3.16               | 4.17               |                               | 4.04          | 14   |                                    |
| Interaction                      |            |                               |                |             |                        |                    |                    |                               |               |      |                                    |
| M and T                          |            | NS                            | NS             | NS          | NS                     | NS                 | NS                 |                               |               |      |                                    |
| T and M                          |            | NS                            | NS             | NS          | NS                     | NS                 | NS                 |                               |               |      |                                    |
| Mean of Main methods             |            |                               |                |             |                        |                    |                    |                               |               |      |                                    |
| M1                               |            | 335                           | 2.89           | 20.82       | 105                    | 5.56               | 5.96               |                               | 5.30          | 1    |                                    |
| M2                               |            | 327                           | 2.64           | 20.57       | 97                     | 5.19               | 5.76               |                               | 4.87          | 2    |                                    |
| M3                               |            | 290                           | 2.41           | 19.98       | 94                     | 4.25               | 4.93               |                               | 4.19          | 3    |                                    |
| M4                               |            | 267                           | 2.17           | 19.77       | 91                     | 3.20               | 4.20               |                               | 3.71          | 4    |                                    |
| CD(0.05)                         |            | 16.55                         | 0.10           | NS          | 0.7                    | 0.28               | 0.46               |                               |               |      |                                    |
| CV(%)                            |            | 6.08                          | 4.36           | 5.54        | 0.81                   | 6.91               | 9.83               |                               |               |      |                                    |
| Mean of Sub methods              |            |                               |                |             |                        |                    |                    |                               |               |      |                                    |
| T1-Fe coated 1-2 cm water level  |            | 310                           | 2.53           | 20.02       | 96                     | 4.48               | 5.12               | 5.16                          | 4.58          | 2    | 5.72                               |
| T2-Fe coated wet                 |            | 328                           | 2.64           | 20.38       | 96                     | 4.88               | 5.55               | 9.17                          | 4.59          | 3    | 9.85                               |
| T3-Non coated 1-2 cm water level |            | 299                           | 2.42           | 20.57       | 95                     | 4.26               | 4.88               |                               | 4.33          | 4    |                                    |
| T4-Non coated wet                |            | 313                           | 2.51           | 20.32       | 96                     | 4.47               | 5.24               |                               | 4.18          | 5    |                                    |
| T5-NTP                           |            | 274                           | 2.54           | 20.14       | 102                    | 4.67               | 5.27               |                               | 4.89          | 1    |                                    |
| CD(0.05)                         |            | 13.15                         | NS             | NS          | 0.85                   | 0.27               | 0.27               |                               |               |      |                                    |
| CV(%)                            |            | 5.23                          | 7.04           | 4.51        | 1.06                   | 7.06               | 6.31               |                               |               |      |                                    |
| Experimental Mean                |            | 305                           | 2.53           | 20.28       | 97                     | 4.55               | 5.21               |                               | 4.52          |      |                                    |

DOS

Rain fall for specific week

19.07.19

26.1

26.07.19

8.4

02.08.19

99

09.08.19

185.6

Table 4.2.4: Contd...

| Percent Grain Yield Increase in Iron coated over non coated treatments |    |            |          |       |        |        |                         |
|------------------------------------------------------------------------|----|------------|----------|-------|--------|--------|-------------------------|
|                                                                        |    | Coimbatore | Chiplima | IIRR  | Karjat | Raipur | Mean over all locations |
| <b>1<sup>st</sup> sowing</b>                                           | T1 | 14.29      | -11.21   | 11.21 | 16.19  | 6.73   | <b>5.76</b>             |
|                                                                        | T2 | 12.42      | -13.83   | 13.83 | 14.97  | 15.34  | <b>6.69</b>             |
| <b>2<sup>nd</sup> sowing</b>                                           | T1 | 19.20      | -28.01   | 17.62 | 18.93  | 7.82   | <b>3.46</b>             |
|                                                                        | T2 | 18.84      | -2.58    | 15.88 | 21.02  | 10.36  | <b>11.16</b>            |
| <b>3<sup>rd</sup> sowing</b>                                           | T1 | 11.26      | -7.77    | 9.65  | 11.11  | 2.78   | <b>4.70</b>             |
|                                                                        | T2 | 11.90      | 13.10    | 9.66  | 22.83  | 2.03   | <b>10.65</b>            |
| <b>4<sup>th</sup> sowing</b>                                           | T1 | 10.50      | 7.58     | 12.44 | 20.29  | 0.99   | <b>9.76</b>             |
|                                                                        | T2 | 13.57      | 14.96    | 8.82  | 14.97  | 6.71   | <b>11.71</b>            |
| T1-Fe coated 1-2 cm water level                                        |    | 13.85      | -11.82   | 12.56 | 16.67  | 5.16   | <b>5.72</b>             |
| T2-Fe coated wet                                                       |    | 14.22      | 0.58     | 12.14 | 18.15  | 9.17   | <b>9.85</b>             |

## **b) Effect of Iron seed coating on insect pest incidence (ESCP) ( Collaborative: Agronomy and Entomology)**

Seed priming and seed coating treatments which help to increase the germination rate and improve the anchorage are essential in direct seeding in puddle soils. The high density Fe coated seeds have also been reported to be resistant to bird damage and seed borne diseases. Keeping this in view, a collaborative trial with Agronomy (YET 4 – Enhancing the productivity of direct seeded rice with iron coating under different rice ecologies) was initiated with an objective to assess and generate useful information on the impact of iron seed coating on insect pest incidence.

During *Kharif* 2019, observations on insect pest incidence were recorded at 3 locations, viz., **Raipur, Karjat and Chiplima**. The field trial was laid out , in split plot design with 4 dates of sowings at one week interval as main plots and 5 establishment methods (T1- Iron coated seed, seed rate 25 kg/ha, broadcasting in 1-2 mm water level condition (Direct sowing) T2- Iron coated seed, seed rate 25 kg/ha, broadcasting in wet Condition (Direct sowing) T3 – Un-coated seed, seed rate 25 kg/ha, broadcasting in 1-2 mm water level condition (Direct sowing) T4 – Uncoated seed, seed rate 25 kg/ha, broadcasting in wet condition (Direct sowing) T5 – Normal transplanting 21-25 days after sowing as subplots in 3 replications. Standard procedures were followed to record observations on insect pest incidence in all treatments. The results are summarized below.

At **Raipur**, there was low to moderate incidence of stem borer (5.2-16.7% DH & 8.4-3.3% WE) and low incidence of leaf folder (0.5–3.7% LFDL), whorl maggot (0.5-3.0% WMDL), case worm (0.0-4.0% CWDL), hispa (0.4–3.9% HDL), brown planthopper (3 – 9 hoppers/hill) and green leaf hopper (0 – 5 hoppers/hill) in Swarna variety grown in this trial. Dead heart and white ear damage by stem borer was at par in different dates of sowings whereas sub plot T1 (Iron coated seed, seed rate 25 kg/ha, broadcasting in 1-2 mm water level condition -Direct sowing) recorded significantly lowest dead heart damage (7.7% DH) compared to other sub plots. White ear damage was at par in all the sub plots. Interaction effects are almost at par with each other in different treatments. Observations on natural enemies were also recorded to know the impact of seed coating. Data revealed that Spiders (0-4/hill) and Coccinellids (0-4/hill) were relatively higher than Staphylinid and Rove beetles (0-3/hill).

At **Karjat**, only stem borer incidence was observed in different sowings and treatments in Swarna variety. Though the dead heart incidence was significantly high in first sowing starting from 15 DAT to 45 DAT (2.0-6.4% DH) and 7.1% WE at pre-harvest compared to other sowings, the stem borer damage did not reach ETL. Similarly, dead heart damage was at par in different sub-plot treatments while white ears were relatively high (7.1% WE) in T3 subplot (Broadcasting of uncoated seed in 1-2 mm water).

At **Chiplima**, stem borer, gall midge and brown planthopper incidence was observed in first sowing in different treatments in Swarna variety grown in this trial. Gall midge incidence was very high in normal transplanting (18.9-30.3% SS) and was at par with T3

(hydro primed flooded treatment – 20.3-24.8% SS) compared to other treatments during 55 to 75 DAT. Similarly, BPH incidence was significantly high in normal transplanting (26-39 hoppers/hill) which was at par with T3 (25-39 hoppers/hill). Stem borer incidence was low both at vegetative and reproductive stages in all the treatments.

Pest incidence data from only **Karjat** and **Raipur** were included for analysis of impact of sowing on pest occurrence. The stem borer damage across the sowings was not significant with dead heart damage of 0.1 to 10.8% and 4.1 to 16.4% white ears across the treatments. Data from all three locations were considered for analysis of effect of iron coating on pest incidence. The different iron coated seed treatments across locations revealed no significant differences in dead heart damage of 0.5 to 10.6% and white ear damage of 3.9 to 16.6% across all the locations. Gall midge incidence recorded only at **Chiplima**, was lowest in T2 treatment (9.2% SS) and significantly superior to remaining treatments. It was high in T5- normal transplanting (24.6% SS) on par with T3 treatment with uncoated seed (22.6% SS). Similarly, BPH population was lowest in T2 treatment (11 hoppers/hill) followed by other Iron seed coated treatments (19 hoppers/hill) compared to normal (33 hoppers/hill) transplanting and uncoated seed treatments (32 hoppers/hill). Incidence of other pests like leaf folder, whorl maggot, case worm and hispa was very low (<5%) to draw valid conclusions.

Across the locations, there were no significant differences with respect to stem borer damage (0.5 – 10.6% DH & 3.9 – 16.6% WE). However at Chiplima, T2 treatment (Fe coated seed in dry condition) showed significantly lower incidence of gall midge (9.2 – 13.9% SS) and BPH (11 – 19 hoppers/ hill).

Table.... Effect of Iron Seed Coating on Pest Incidence (ESCP) at Raipur, Kharif 2019

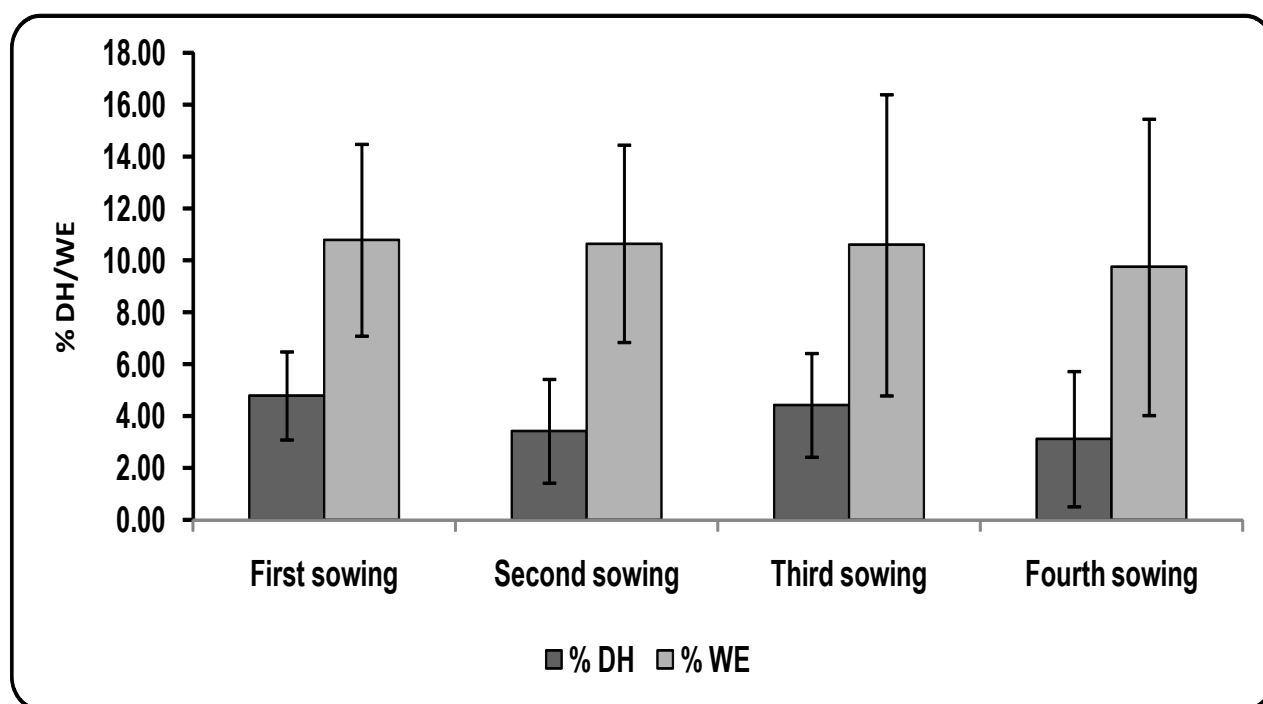
| Main plots                                                  |            | %DH          | %WE          | %LFDL         | %WMDL      | BPH<br>(No./hill) |
|-------------------------------------------------------------|------------|--------------|--------------|---------------|------------|-------------------|
| 1 <sup>st</sup> sowing (19.07.2019)                         |            | 8.7(3.0)a    | 14.5(3.9)a   | 1.3(1.3)b     | 1.5(1.4)b  | 5(2)ab            |
| 2 <sup>nd</sup> sowing (26.07.2019)                         |            | 8.7(3.0)a    | 14.4(3.8)a   | 1.9(1.5)a     | 1.5(1.4)b  | 6(2)a             |
| 3 <sup>rd</sup> sowing (02.08.2019)                         |            | 9.8(3.2)a    | 16.4(4.1)a   | 1.8(1.5)ab    | 1.8(1.5)a  | 5(2)b             |
| 4 <sup>th</sup> sowing (09.08.2019)                         |            | 10.8 (3.3)a  | 15.4(3.9)a   | 1.9(1.5)a     | 1.7(1.5)ab | 6(2)a             |
| LSD (0.05)                                                  | Main plots | 0.32         | 0.38         | 0.17          | 0.07       | 0.63              |
| CV(%)                                                       |            | 11.39        | 10.9         | 13.01         | 5.28       | 6.13              |
| Sub plots                                                   |            |              |              |               |            |                   |
| T1 = Broadcasting of Iron coated seed in 1-2 mm water level |            | 7.7(2.8)b    | 15.0(3.9)a   | 1.6(1.4)a     | 1.3(1.3)b  | 5(2)ab            |
| T2 = Broadcasting of Iron coated seed in wet soil condition |            | 10.6(3.3)a   | 14.6(3.9)a   | 1.5(1.4)a     | 1.6(1.4)ab | 5(2)ab            |
| T3 = Broadcasting of un coated seed in 1-2 mm water level   |            | 9.5(3.1)ab   | 16.6(4.1)a   | 1.6(1.4)a     | 1.8(1.5)a  | 6(3)a             |
| T4 = Broadcasting of un coated seed in wet soil condition   |            | 10.1(3.2)a   | 14.4(3.9)a   | 2.0(1.6)a     | 1.5(1.4)ab | 5(2)b             |
| T5 = Normal transplanting                                   |            | 9.6(3.1)ab   | 15.3(4.0)a   | 2.0(1.6)a     | 1.9(1.5)a  | 6(3)a             |
| LSD (0.05)                                                  | Sub plots  | 0.33         | 0.29         | 0.21          | 0.16       | 1.14              |
| CV(%)                                                       |            | 12.64        | 8.79         | 17.56         | 13.5       | 11.83             |
| 1 <sup>st</sup> sowing<br>(19.07.2019)                      | T1         | 6.1(2.6)d    | 14.4(3.8)abc | 1.1(1.2)de    | 1.2(1.3)b  | 5(2)abc           |
|                                                             | T2         | 11.2(3.4)abc | 14.1(3.8)abc | 1.5(1.4)abcde | 1.8(1.5)a  | 5(2)bc            |
|                                                             | T3         | 8.9(3.0)abcd | 14.7(3.9)abc | 0.6(1.1)e     | 1.6(1.4)a  | 6(3)abc           |
|                                                             | T4         | 7.9(2.9)bcd  | 15.5(4.0)abc | 1.3(1.4)abcde | 1.2(1.3)b  | 4(2)c             |
|                                                             | T5         | 9.5(3.2)abcd | 13.8(3.8)abc | 2.1(1.6)abcd  | 1.9(1.5)a  | 6(2)abc           |
| 2 <sup>nd</sup> sowing<br>(26.07.2019)                      | T1         | 8.3(2.9)abcd | 14.8(3.9)abc | 1.1(1.3)cde   | 1.6(1.5)a  | 5(2)abc           |
|                                                             | T2         | 9.5(3.2)abcd | 15.6(4.0)abc | 1.6(1.4)abcde | 1.6(1.4)a  | 7(3)ab            |
|                                                             | T3         | 8.9(3.0)abcd | 15.6(4.0)abc | 1.8(1.5)abcde | 2.0(1.6)a  | 6(3)abc           |
|                                                             | T4         | 7.8(2.9)bcd  | 13.7(3.8)abc | 2.3(1.7)abc   | 1.0(1.2)b  | 4(2)c             |
|                                                             | T5         | 9.0(3.1)abcd | 12.5(3.6)bc  | 2.6(1.8)a     | 1.5(1.4)a  | 7(3)a             |
| 3 <sup>rd</sup> sowing<br>(02.08.2019)                      | T1         | 7.4(2.8)cd   | 15.7(4.0)abc | 1.7(1.4)abcde | 1.5(1.4)a  | 5(2)bc            |
|                                                             | T2         | 10.3(3.3)abc | 15.9(4.0)abc | 1.6(1.4)abcde | 1.6(1.4)a  | 5(2)abc           |
|                                                             | T3         | 9.6(3.2)abcd | 18.5(4.4)a   | 2.2(1.6)abcd  | 1.6(1.5)a  | 5(2)abc           |
|                                                             | T4         | 12.1(3.5)ab  | 15.3(4.0)abc | 2.1(1.6)abcd  | 1.8(1.5)a  | 5(2)bc            |
|                                                             | T5         | 9.5(3.2)abcd | 16.7(4.1)abc | 1.5(1.4)abcde | 2.2(1.6)a  | 5(2)abc           |
| 4 <sup>th</sup> sowing<br>(09.08.2019)                      | T1         | 9.0(3.1)abcd | 14.9(3.9)abc | 2.4(1.7)ab    | 1.0(1.2)b  | 6(2)abc           |
|                                                             | T2         | 11.3(3.4)abc | 13.0(3.6)c   | 1.2(1.3)bcde  | 1.4(1.3)b  | 5(2)abc           |
|                                                             | T3         | 10.7(3.3)abc | 17.7(4.3)ab  | 1.7(1.5)abcde | 2.0(1.5)a  | 7(3)ab            |
|                                                             | T4         | 12.5(3.6)a   | 13.3(3.7)bc  | 2.4(1.7)abcd  | 2.2(1.6)a  | 5(2)abc           |
|                                                             | T5         | 10.3(3.3)abc | 17.8(4.3)ab  | 1.8(1.5)abcd  | 1.9(1.5)a  | 5(2)abc           |
| LSD (0.05)                                                  | M in S     | 0.66         | 0.58         | 0.43          | 0.32       | 0.47              |
|                                                             | S in M     | 0.67         | 0.64         | 0.42          | 0.3        | 0.44              |

Table... Effect of Iron seed coating on pest incidence (ESCP) at Karjat, Kharif 2019

| Main plots                                                  |        | % DH         |              |             | % WE         |
|-------------------------------------------------------------|--------|--------------|--------------|-------------|--------------|
|                                                             |        | 15 DAT       | 30 DAT       | 45 DAT      | Pre har      |
| 1 <sup>st</sup> sowing (03.07.2019)                         |        | 6.4(2.5)a    | 2.0(1.4)a    | 2.1(1.5)a   | 7.1(2.7)a    |
| 2 <sup>nd</sup> sowing (10.07.2019)                         |        | 4.2(2.1)a    | 0.11(0.7)b   | 0.7(1.0)b   | 6.9(2.6)a    |
| 3 <sup>rd</sup> sowing (17.07.2019)                         |        | 4.9(2.1)a    | 1.7(1.4)a    | 1.3(1.3)ab  | 4.8(2.3)b    |
| 4 <sup>th</sup> sowing (24.07.2019)                         |        | 0.8(1.0)b    | 0.2(0.8)b    | 0.7(1.0)b   | 4.1(2.1)b    |
| LSD (0.05)                                                  |        | 0.92         | 0.53         | 0.32        | 0.23         |
| CV(%)                                                       |        | 13.39        | 14.75        | 29.88       | 10.85        |
| Sub plots                                                   |        |              |              |             |              |
| T1 = Broadcasting of Iron coated seed in 1-2 mm water level |        | 4.8(2.1)a    | 1.4(1.2)a    | 1.9(1.5)a   | 6.0(2.5)ab   |
| T2 = Broadcasting of Iron coated seed in wet soil           |        | 4.3(2.0)a    | 1.6(1.3)a    | 0.8(1.1)b   | 4.8(2.2)b    |
| T3 = Broadcasting of un coated seed in 1-2 mm water level   |        | 3.7(1.7)a    | 0.5(0.9)a    | 0.7(1.1)b   | 7.1(2.7)a    |
| T4 = Broadcasting of un coated seed in wet soil             |        | 3.2(1.8)a    | 0.9(1.1)a    | 1.5(1.3)ab  | 4.7(2.2)b    |
| T5 = Normal transplanting                                   |        | 4.4(2.0)a    | 0.5(0.9)a    | 1.0(1.1)b   | 6.0(2.5)ab   |
| LSD (0.05)                                                  |        | 0.57         | 0.36         | 0.30        | 0.42         |
| CV(%)                                                       |        | 15.36        | 10.15        | 30.53       | 20.74        |
| Interactions                                                |        |              |              |             |              |
| 1 <sup>st</sup> sowing (03.07.2019)                         | T1     | 4.6(2.2)abc  | 3.4(1.8)ab   | 3.1(1.9)a   | 6.2(2.6)abcd |
|                                                             | T2     | 5.3(2.4)abc  | 4.3(1.9)a    | 1.8(1.4)abc | 4.6(2.2)bcd  |
|                                                             | T3     | 10.3(3.2)a   | 0.8(1.0)cd   | 2.1(1.6)ab  | 9.6(3.1)a    |
|                                                             | T4     | 4.9(2.2)abc  | 1.3(1.3)abcd | 1.7(1.5)abc | 6.4(2.6)abcd |
|                                                             | T5     | 6.6(2.5)abc  | 0.0(0.7)d    | 1.7(1.4)abc | 8.3(2.9)ab   |
| 2 <sup>nd</sup> sowing (10.07.2019)                         | T1     | 5.2(2.4)abc  | 0.0(0.7)d    | 1.0(1.2)bcd | 6.5(2.6)abcd |
|                                                             | T2     | 4.6(2.2)abc  | 0.0(0.7)d    | 1.0(1.2)bcd | 8.0(2.9)abc  |
|                                                             | T3     | 3.1(1.9)abcd | 0.0(0.7)d    | 0.0(0.7)d   | 8.8(3.0)ab   |
|                                                             | T4     | 3.5(1.8)abcd | 0.6(1.0)cd   | 0.5(1.0)cd  | 4.9(2.3)bcd  |
|                                                             | T5     | 4.8(2.3)abc  | 0.0(0.7)d    | 1.1(1.2)bcd | 6.2(2.5)abcd |
| 3 <sup>rd</sup> sowing (17.07.2019)                         | T1     | 8.4(2.8)a    | 2.2(1.6)abc  | 1.7(1.5)abc | 6.0(2.5)abcd |
|                                                             | T2     | 5.5(2.2)abc  | 1.3(1.3)abcd | 0.5(0.9)cd  | 3.3(1.9)d    |
|                                                             | T3     | 1.2(1.1)cd   | 1.1(1.2)abcd | 1.0(1.2)bcd | 6.6(2.7)abcd |
|                                                             | T4     | 3.2(1.9)abcd | 1.8(1.5)abc  | 2.6(1.7)ab  | 3.5(2.0)cd   |
|                                                             | T5     | 6.1(2.5)ab   | 2.1(1.5)abcd | 0.5(1.0)cd  | 4.7(2.3)bcd  |
| 4 <sup>th</sup> sowing (24.07.2019)                         | T1     | 1.0(1.1)cd   | 0.0(0.7)d    | 2.0(1.6)abc | 5.3(2.4)abcd |
|                                                             | T2     | 1.8(1.3)bcd  | 0.9(1.1)bcd  | 0.0(0.7)d   | 3.3(1.9)d    |
|                                                             | T3     | 0.0(0.7)d    | 0.0(0.7)d    | 0.0(0.7)d   | 3.4(2.0)d    |
|                                                             | T4     | 1.1(1.1)cd   | 0.0(0.7)d    | 1.0(1.2)bcd | 3.8(2.1)cd   |
|                                                             | T5     | 0.0(0.7)d    | 0.0(0.7)d    | 0.6(0.9)cd  | 4.8(2.3)bcd  |
| LSD (0.05)                                                  | M in S | 1.14         | 0.72         | 0.62        | 0.84         |
|                                                             | S in M | 1.37         | 0.83         | 0.64        | 0.38         |

Table.... Effect of Iron seed coating on insect pest incidence (ESCP) at Chiplima, *Kharif* 2019

| Treatments               | % DH      |           | % WE      | % SS       |            | BPH     |        |
|--------------------------|-----------|-----------|-----------|------------|------------|---------|--------|
|                          | 55 DAT    | 75 DAT    | Pre har   | 55 DAT     | 75 DAT     | 55 DAT  | 75 DAT |
| T1: Fe coated flooded    | 3.0(1.9)b | 5.5(2.4)b | 6.2(2.6)a | 16.0(4.0)b | 11.8(3.5)b | 17(4)bc | 21(5)b |
| T2: Fe coated dry        | 2.4(1.7)b | 1.6(1.4)c | 3.9(2.1)b | 11.0(3.4)c | 7.4(2.8)c  | 9(3)d   | 12(3)c |
| T3: Hydro primed flooded | 5.6(2.5)a | 7.6(2.9)a | 7.6(2.9)a | 24.8(5.0)a | 20.3(4.6)a | 25(5)ab | 39(6)a |
| T4: Hydro primed dry     | 2.6(1.7)b | 5.0(2.3)b | 7.8(2.9)a | 14.8(3.9)b | 10.5(3.3)b | 16(4)cd | 22(5)b |
| T5: Normal transplanting | 7.4(2.8)a | 5.5(2.4)b | 6.3(2.6)a | 30.3(5.5)a | 18.9(4.4)a | 26(5)a  | 39(6)a |
| LSD (0.05)               | 0.56      | 0.47      | 0.38      | 0.54       | 0.46       | 0.84    | 1.03   |
| CV(%)                    | 14.01     | 10.83     | 7.84      | 6.6        | 6.63       | 10.16   | 10.81  |

Fig... Effect of seed coating on pest incidence in different sowings across locations, *Kharif* 2019

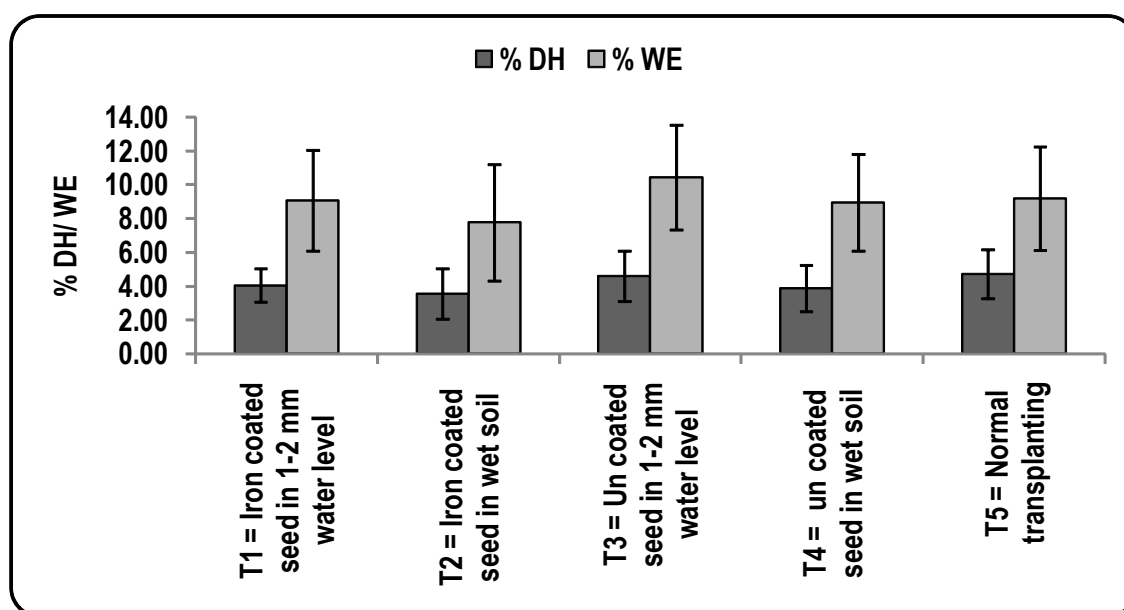


Fig... Effect of seed coating on pest incidence across locations, Kharif 2019

Effect of iron seed coating on insect pest incidence (ESCP), initiated this year in collaboration with agronomy revealed, low pest incidence across the locations in different treatments. Stem borer incidence was at par in different seed coated treatments (0.5 – 10.6% DH & 3.9 – 16.6% WE) and also in different sowings (0.1 – 10.8% DH & 4.1 - 16.4% WE). However, gall midge (9.2 – 13.9% SS) and BPH incidence (11-19/hoppers hill) was found low in seed coated treatments compared to normal transplanting (24.6% SS & 33/hill) and T3 treatment with uncoated seed (22.6%SS & 32/hill).

#### 4.2.5. Yield maximization in farmers' field using Nutrient Expert

To validate NE<sup>®</sup> tool, this collaborative trial was constituted along with IPNI during *kharif* 2014 and continued in *kharif* 2019 at 2 locations viz. **Chinsurah, and Titabar**. This year the trial was conducted in farmers' field. The treatments were as follows: T<sub>1</sub> – Recommended fertilizer recommendation of that region, T<sub>2</sub> – SSNM based on Nutrient Expert (Varies for each location), T<sub>3</sub> – Farmers fertilizer practice and T<sub>4</sub>: Absolute control (Without NPK). SSNM based on Nutrient Expert treatment resulted in highest yield at Chinsurah (5.28 t/ha) and Titabar (5.76 t/ha).

#### 4.2.5(R). Management practices for enhancing grain yield with green manure and nutrient management in rainfed upland rice

The present investigation was taken up to study the effect of phosphorus and green manure on productivity of rice at one locations (**Pattambi**). Experiment was laid out in factorial RBD design {M<sub>1</sub>: Rice alone, M<sub>2</sub>: Rice + GM (Sunhemp/Dhaincha/Green leaf manuring) and 5 subplots of phosphorus treatment (S<sub>1</sub>: 0 kg P<sub>2</sub>O<sub>5</sub>/ha, S<sub>2</sub>: 20 kg P<sub>2</sub>O<sub>5</sub>/ha, S<sub>3</sub>: 40 kg P<sub>2</sub>O<sub>5</sub>/ha, S<sub>4</sub>: Optional and S<sub>5</sub>: Farmers practice.

In red lateritic soils of **Pattambi** the highest grain yield (5.08 t/ha) was observed under rice + green manure crop without phosphorus application to soil.

Table- 4.2.5.: Summary of data on grain yield and ancillary characters of rice from the trial on yield maximisation of rice through SSNM, Kharif-2019

| Treatments                      | CHINSURAH                                |                        |                            |                | TITABAR                                   |                       |                            |                |              | Over all mean | Rank |
|---------------------------------|------------------------------------------|------------------------|----------------------------|----------------|-------------------------------------------|-----------------------|----------------------------|----------------|--------------|---------------|------|
|                                 | Grain Yield (t/ha)                       | Tillers/m <sup>2</sup> | Panicle No./m <sup>2</sup> | Panicle wt (g) | Grain Yield (t/ha)                        | filled grains/panicle | Panicle No./m <sup>2</sup> | Panicle wt (g) | Test wt (g)  |               |      |
| <b>T1</b>                       | 5.19                                     | 352                    | 308                        | 3.08           | 5.22                                      | 257                   | 240                        | 5.09           | 21.53        | 5.21          | 2    |
| <b>T2</b>                       | 5.28                                     | 386                    | 327                        | 3.20           | 5.76                                      | 281                   | 264                        | 5.40           | 22.93        | 5.52          | 1    |
| <b>T3</b>                       | 4.66                                     | 345                    | 276                        | 2.93           | 4.26                                      | 220                   | 219                        | 4.41           | 18.63        | 4.46          | 3    |
| <b>T4</b>                       | 4.16                                     | 328                    | 285                        | 2.24           | 3.44                                      | 168                   | 184                        | 3.59           | 17.60        | 3.80          | 4    |
| <b>Expt. Mean</b>               | <b>4.82</b>                              | <b>353</b>             | <b>299</b>                 | <b>2.86</b>    | <b>4.67</b>                               | <b>231</b>            | <b>227</b>                 | <b>4.62</b>    | <b>20.18</b> | <b>4.75</b>   |      |
| <b>CD(0.05)</b>                 | 0.3                                      | 51.1                   | 27.84                      | 0.39           | 0.35                                      | 27.44                 | 14.63                      | 0.4            | 1.33         |               |      |
| <b>CV(%)</b>                    | 3.15                                     | 7.25                   | 4.66                       | 6.86           | 3.74                                      | 5.94                  | 3.23                       | 4.38           | 3.3          |               |      |
| <b>Variety</b>                  | -                                        |                        |                            |                | Ranjit Sub-1                              |                       |                            |                |              |               |      |
| <b>Available NPK kg/ha</b>      | 296:73.3: 280.4                          |                        |                            |                | 405kg, 16kg, 222kg                        |                       |                            |                |              |               |      |
| <b>Fertilizer applied kg/ha</b> | 80:40:40(T1), 91:35:38(T2), 70:35:35(T3) |                        |                            |                | 60:20:40(T1), 118:37:59(T2), 40:20:10(T3) |                       |                            |                |              |               |      |

T1 Recommended fertilizer recommendations of that region :

T2 SSNM based on Nutrient Expert (Varies for each location) :

T3 Farmers Fertilizer Practice

T4 Absolute control

**Table 4.2.5: (Rabi YET-5)Management practices for enhancing grain yield with green manure and nutrient management in rainfed upland rice, Rabi - 2018-19.**

| Factor-I                                              | Factor -II(NPK Schedules) | PATTAMBI           |      |                    |                              |              |                       |
|-------------------------------------------------------|---------------------------|--------------------|------|--------------------|------------------------------|--------------|-----------------------|
|                                                       |                           | Grain Yield (t/ha) | Rank | Straw Yield (t/ha) | Panicle/m <sup>2</sup> (No.) | Test wt(g)   | Filled grains/Panicle |
| M1 Rice alone                                         | T1: 90-0-40               | 4.67               | 7    | 9.00               | 354                          | 23.28        | 106                   |
|                                                       | T2: 90-23-45              | 5.01               | 2    | 8.77               | 361                          | 22.38        | 104                   |
|                                                       | T3: 90-45-45              | 4.62               | 8    | 9.08               | 337                          | 25.96        | 118                   |
|                                                       | T4: Optional              | 4.87               | 4    | 9.18               | 334                          | 24.82        | 103                   |
|                                                       | T5: Farmer practice       | 4.77               | 5    | 8.67               | 340                          | 22.40        | 118                   |
| M2- Rice+GM<br>(Sunhemp/Dhaincha/Green leaf manuring) | T1: 90-0-40               | 5.08               | 1    | 10.60              | 365                          | 24.31        | 74                    |
|                                                       | T2: 90-23-45              | 4.58               | 9    | 9.60               | 353                          | 24.60        | 107                   |
|                                                       | T3: 90-45-45              | 4.77               | 5    | 10.77              | 344                          | 25.72        | 97                    |
|                                                       | T4: Optional              | 4.93               | 3    | 9.82               | 360                          | 27.72        | 105                   |
|                                                       | T5: Farmer practice       | 4.58               | 9    | 9.33               | 352                          | 26.37        | 103                   |
| Interaction                                           |                           |                    |      |                    |                              |              |                       |
| C.D.(0.05)                                            |                           | N/A                |      | N/A                | N/A                          | 1.66         | N/A                   |
| SE(m)                                                 |                           | 0.14               |      | 0.54               | 24                           | N/A          | 12.7                  |
| F1                                                    |                           | 4.79               | 2    | 8.94               | 345                          | 23.77        | 110                   |
| F2                                                    |                           | 4.79               | 1    | 10.02              | 355                          | 25.74        | 97                    |
| Mean of Factor I                                      |                           |                    |      |                    |                              |              |                       |
| C.D.(0.05)                                            |                           | 0.19               |      | 0.73               | N/A                          | N/A          | N/A                   |
| SE(m)                                                 |                           | 0.06               |      | 0.24               | 11                           | 0.74         | 5.7                   |
| Mean of Factor II                                     |                           |                    |      |                    |                              |              |                       |
| T1: 90-0-40                                           |                           | 4.88               | 2    | 9.80               | 359                          | 23.79        | 90                    |
| T2: 90-23-45                                          |                           | 4.80               | 3    | 9.18               | 357                          | 23.49        | 106                   |
| T3: 90-45-45                                          |                           | 4.69               | 4    | 9.93               | 341                          | 25.84        | 108                   |
| T4: Optional                                          |                           | 4.90               | 1    | 9.50               | 347                          | 26.27        | 104                   |
| T5: Farmer practice                                   |                           | 4.68               | 5    | 9.00               | 346                          | 24.38        | 110                   |
| C.D.(0.05)                                            |                           | N/A                |      | N/A                | N/A                          | N/A          | N/A                   |
| SE(m)                                                 |                           | 0.10               |      | 0.39               | 17                           | 1.17         | 8.9                   |
| <b>Expt. Mean</b>                                     |                           | <b>4.79</b>        |      | <b>9.48</b>        | <b>350</b>                   | <b>24.76</b> | <b>103</b>            |
| Soil type                                             |                           | Red Lатарitic      |      |                    |                              |              |                       |
| pH                                                    |                           | -                  |      |                    |                              |              |                       |
| Variety                                               |                           | -                  |      |                    |                              |              |                       |
| Available N:P:K of soil (kg/ha)                       |                           | -                  |      |                    |                              |              |                       |

Optional:

Optional: PSB 2L/ha

#### 4.2.6. Water management for enhancing water use efficiency and weed control efficiency in different rice establishment methods

Increasing water scarcity is becoming real threat to rice cultivation. Hence water-saving technology needs to be developed which not only economically beneficial but also maintains soil health. Any approach that would lessen the amount of water use without compromising the rice yield would certainly be a welcome strategy. Introduction of SRI is an alternative practice to solve water crisis, and as a methodology for increasing the productivity of irrigated rice. AWD is also called ‘intermittent irrigation’ or ‘controlled irrigation’ which can reduce the water requirement by 30 % in irrigated rice system. To evaluate the suitable and promising irrigation management practices in different crop establishment methods a trial was formulated and conducted at 5 locations (**Chatha, Faizabad, Mandya, Pusa, and Varanasi**). Split plot design was adopted with 3 main plots of irrigation management {I<sub>1</sub>: Flooding throughout crop growth (3 + / - 2 cm), I<sub>2</sub>: Saturation maintenance up to PI and (3 + / - 2 cm) after PI and I<sub>3</sub>: Alternate wetting and drying (irrigation at 5 -7 days interval with 5 cm/ha of water (5 cm irrigation at 3 DADPW) up to PI and (3 + / - 2 cm) after PI} and 6 subplots of crop establishment methods {T<sub>1</sub>: Mechanical Transplanting method on puddled soil (crop management methods same as for puddled transplanted rice), T<sub>2</sub>: Direct wet seeding on puddled soil (Use of Drum seeder/ dibbling of sprouted seed at 25 x 25 cm) fb crop management practices as per direct wet seeded rice, T<sub>3</sub>: Normal hand transplanting (20 x15 cm with flooding water management, 3-4 seedlings transplanted at 25-30 days old seedlings), T<sub>4</sub>: Aerobic rice T<sub>5</sub>: Direct broadcast dry seeding on well prepared unpuddled soil fb crop management practices for direct dry drill seeded rice and T<sub>6</sub>: Optional- Location specific} and replicated thrice. The results were summarized and presented in **Table 4.2.3** and the salient findings are as followed.

At **Chatha**, Alternate wetting and drying recorded the highest grain yield (3.21 t/ha). Among establishment methods normal transplanting recorded the highest grain yield (3.23 t/ha). However, the lowest weed population and dry weight were observed under flooding throughout crop growth treatment and under normal transplanting method. In sandy loam soils of **Faizabad** Direct seeding (use of Drum seeder/dibbling of sprouted seed at 25 x 25 cm) long with saturation maintenance upto PI and (3 +/- 2 cm) after PI resulted the highest grain yield (5.44 t/ha). Among irrigation management treatments, saturation maintenance upto PI and (3 +/- 2 cm) after PI method resulted the highest grain yield (4.07 t/ha) than those of other treatments. Among establishment methods direct seeding (use of Drum seeder/dibbling of sprouted seed at 25 x 25 cm) fb crop management practices as per direct wet seeded rice resulted the highest yield (4.65 t/ha). In red sandy loam soils of **Mandya**, interaction, main plots effect and sub plots effect were found to be non-significant. At **Pusa**, flooding throughout crop growth gave higher grain yield of 3.77 t/ha and normal transplanting was the best (4.13 t/ha) among all the establishment methods. In sandy loam soils of **Varanasi**, location specific wet broadcasting in puddle soil with alternate wet and drying gave the highest grain yield (5.1 t/ha). Weed population and dry weight were lower under flooding throughout crop growth treatment.

Higher cost of cultivation was recorded under flooding throughout crop growth at Mandya (Rs. 56717/-) and Varanasi (Rs. 32943/-). Similarly, input water was saved due to adoption of alternate wetting and drying was 49.0 cm at Varanasi and 66.9 cm at Mandya.

Grain yield across all the centers revealed that **alternate wetting and drying** resulted the highest grain yield among irrigation management treatments.

**Table-4.2.6: Evaluation of Water management for enhancing Water use efficiency and Weed control efficiency in different rice establishment methods, Kharif-2019**

| Treatment                                                            |    | CHATHA             |                    |                              |                              |                |              |                        |                                                          |                                                         |                                                         |                                                           |
|----------------------------------------------------------------------|----|--------------------|--------------------|------------------------------|------------------------------|----------------|--------------|------------------------|----------------------------------------------------------|---------------------------------------------------------|---------------------------------------------------------|-----------------------------------------------------------|
|                                                                      |    | Grain yield (t/ha) | Straw yield (t/ha) | Tillers/m <sup>2</sup> (No.) | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g)  | Days for 50% flowering | Weed population at active tillering (no/m <sup>2</sup> ) | Weed population panicle initiation (no/m <sup>2</sup> ) | Weed dry weight at active tillering (g/m <sup>2</sup> ) | Weed dry weight at panicle initiation (g/m <sup>2</sup> ) |
| <b>I 1- Flooding throughout crop growth (3 +/- 2cm)</b>              | M1 | -                  | -                  | -                            | -                            | -              | -            | -                      | -                                                        | -                                                       | -                                                       | -                                                         |
|                                                                      | M2 | 2.61               | 3.66               | 235                          | 207                          | 1.45           | 18.63        | 102                    | 0.00(0.71)                                               | 24.67(5.02)                                             | 0.00                                                    | 24.27                                                     |
|                                                                      | M3 | 3.01               | 4.22               | 251                          | 222                          | 1.45           | 19.17        | 105                    | 0.00(0.71)                                               | 20.67(4.60)                                             | 0.00                                                    | 19.77                                                     |
|                                                                      | M4 | 2.75               | 3.87               | 244                          | 219                          | 1.45           | 18.87        | 102                    | 1.00(1.22)                                               | 23.33(4.88)                                             | 0.58                                                    | 20.97                                                     |
|                                                                      | M5 | 2.46               | 3.52               | 214                          | 190                          | 1.44           | 18.20        | 102                    | 1.00(1.22)                                               | 20.33(4.56)                                             | 0.47                                                    | 18.98                                                     |
|                                                                      | M6 | -                  | -                  | -                            | -                            | -              | -            | -                      | -                                                        | -                                                       | -                                                       | -                                                         |
| <b>I 2- Saturation maintenance upto PI and (3 +/- 2 cm) after PI</b> | M1 | -                  | -                  | -                            | -                            | -              | -            | -                      | -                                                        | -                                                       | -                                                       | -                                                         |
|                                                                      | M2 | 2.88               | 4.03               | 237                          | 212                          | 1.46           | 19.17        | 98                     | 2.00(1.56)                                               | 49.33(7.06)                                             | 0.83                                                    | 45.33                                                     |
|                                                                      | M3 | 3.18               | 4.48               | 256                          | 225                          | 1.53           | 19.40        | 103                    | 2.00(1.56)                                               | 45.67(6.79)                                             | 0.97                                                    | 42.83                                                     |
|                                                                      | M4 | 2.95               | 4.13               | 250                          | 216                          | 1.53           | 19.23        | 98                     | 4.67(2.27)                                               | 45.67(6.79)                                             | 2.78                                                    | 42.33                                                     |
|                                                                      | M5 | 2.63               | 3.71               | 221                          | 192                          | 1.43           | 19.13        | 98                     | 4.33(2.20)                                               | 46.67(6.87)                                             | 2.48                                                    | 44.00                                                     |
|                                                                      | M6 | -                  | -                  | -                            | -                            | -              | -            | -                      | -                                                        | -                                                       | -                                                       | -                                                         |
| <b>I 3- Alternate wetting and drying</b>                             | M1 | -                  | -                  | -                            | -                            | -              | -            | -                      | -                                                        | -                                                       | -                                                       | -                                                         |
|                                                                      | M2 | 3.21               | 3.51               | 243                          | 207                          | 1.52           | 19.23        | 95                     | 4.67(2.27)                                               | 51.67(7.22)                                             | 2.58                                                    | 49.67                                                     |
|                                                                      | M3 | 3.49               | 4.89               | 260                          | 229                          | 1.54           | 19.50        | 102                    | 4.33(2.20)                                               | 46.00(6.82)                                             | 2.80                                                    | 43.33                                                     |
|                                                                      | M4 | 3.27               | 4.57               | 253                          | 222                          | 1.53           | 19.23        | 92                     | 7.67(2.86)                                               | 48.00(6.96)                                             | 4.92                                                    | 45.67                                                     |
|                                                                      | M5 | 2.86               | 4.05               | 225                          | 206                          | 1.44           | 19.17        | 93                     | 8.67(3.03)                                               | 51.33(7.20)                                             | 5.35                                                    | 48.25                                                     |
|                                                                      | M6 | -                  | -                  | -                            | -                            | -              | -            | -                      | -                                                        | -                                                       | -                                                       | -                                                         |
| <b>Interaction</b>                                                   |    |                    |                    |                              |                              |                |              |                        |                                                          |                                                         |                                                         |                                                           |
| <i>I and M</i>                                                       |    | NS                 | NS                 | NS                           | 5.31                         | 0.02           | 0.12         | 0.86                   | NS                                                       | 0.11                                                    | 0.41                                                    | 1.48                                                      |
| <i>M and I</i>                                                       |    | NS                 | NS                 | NS                           | 5.11                         | 0.02           | 0.11         | 0.83                   | NS                                                       | 0.1                                                     | 0.37                                                    | 1.31                                                      |
| <b>Mean of Irrigation</b>                                            |    |                    |                    |                              |                              |                |              |                        |                                                          |                                                         |                                                         |                                                           |
| I1                                                                   |    | 2.71               | 3.82               | 236                          | 210                          | 1.45           | 18.72        | 103                    | 0.50(0.97)                                               | 22.25(4.77)                                             | 0.26                                                    | 21.00                                                     |
| I2                                                                   |    | 2.91               | 4.09               | 241                          | 211                          | 1.49           | 19.23        | 99                     | 3.25(1.90)                                               | 46.83(6.88)                                             | 1.77                                                    | 43.62                                                     |
| I3                                                                   |    | 3.21               | 4.26               | 245                          | 216                          | 1.51           | 19.28        | 95                     | 6.33(2.59)                                               | 49.25(7.05)                                             | 3.91                                                    | 46.73                                                     |
| <b>C.D. (0.05)</b>                                                   |    | 0.04               | NS                 | 2.21                         | NS                           | 0.01           | 0.07         | 0.59                   | 0.09                                                     | 0.03                                                    | 0.19                                                    | 0.42                                                      |
| <b>C.V. (%)</b>                                                      |    | 1.96               | 12.95              | 1.26                         | 2.37                         | 0.68           | 0.49         | 0.82                   | 6.46                                                     | 0.74                                                    | 13.27                                                   | 1.55                                                      |
| <b>Method of Methods</b>                                             |    |                    |                    |                              |                              |                |              |                        |                                                          |                                                         |                                                         |                                                           |
| M1                                                                   |    | -                  | -                  | -                            | -                            | -              | -            | -                      | -                                                        | -                                                       | -                                                       | -                                                         |
| M2                                                                   |    | 2.90               | 3.73               | 238                          | 209                          | 1.48           | 19.01        | 98                     | 2.22(1.51)                                               | 41.89(6.43)                                             | 1.14                                                    | 39.76                                                     |
| M3                                                                   |    | 3.23               | 4.53               | 256                          | 225                          | 1.51           | 19.36        | 103                    | 2.11(1.49)                                               | 37.44(6.07)                                             | 1.26                                                    | 35.31                                                     |
| M4                                                                   |    | 2.99               | 4.19               | 249                          | 219                          | 1.50           | 19.11        | 97                     | 4.44(2.12)                                               | 39.00(6.21)                                             | 2.76                                                    | 36.32                                                     |
| M5                                                                   |    | 2.65               | 3.76               | 220                          | 196                          | 1.44           | 18.83        | 98                     | 4.67(2.15)                                               | 39.44(6.21)                                             | 2.77                                                    | 37.08                                                     |
| M6                                                                   |    | -                  | -                  | -                            | -                            | -              | -            | -                      | -                                                        | -                                                       | -                                                       | -                                                         |
| <b>CD (0.05)</b>                                                     |    | 0.05               | 0.51               | 4.23                         | 3.06                         | 0.01           | 0.07         | 0.5                    | 0.17                                                     | 0.06                                                    | 0.24                                                    | 0.86                                                      |
| <b>C.V. (%)</b>                                                      |    | 1.64               | 12.67              | 1.77                         | 1.46                         | 0.70           | 0.36         | 0.5                    | 9.27                                                     | 1.03                                                    | 12.06                                                   | 2.33                                                      |
| <b>Experimental Mean</b>                                             |    | <b>2.94</b>        | <b>4.05</b>        | <b>241</b>                   | <b>212</b>                   | <b>1.48</b>    | <b>19.08</b> | <b>99</b>              | <b>1.82</b>                                              | <b>6.23</b>                                             | <b>1.98</b>                                             | <b>37.12</b>                                              |
| Soil type                                                            |    | -                  |                    |                              |                              |                |              |                        |                                                          |                                                         |                                                         |                                                           |
| Variety                                                              |    | -                  |                    |                              |                              |                |              |                        |                                                          |                                                         |                                                         |                                                           |
| Available NPK kg/ha                                                  |    | -                  |                    |                              |                              |                |              |                        |                                                          |                                                         |                                                         |                                                           |

M1- Mechanical Transplanting method on puddled soil (crop management methods same as for puddled transplanted rice)

M2- Direct seeding (Use of Drum seeder/dibbling of sprouted seed at 25 x 25 cm) fb crop management practices as per direct wet seeded rice

M3- Normal Transplanting (20 x 15 cm with flooding water management, transplanting of 3-4 seedlings of 25-30 days old)

M4-Aerobic rice

M5- Direct broadcast dry seeding on well prepared unpuddled soil fb crop management practices for direct dry drill seeded rice (semi dry)

M6- Optional - Location specific

Table-4.2.6: Contd.

| Treatment                                                            |                            | FAIZABAD           |                    |                              |                              |                |              |                                                          |                                                         |                                                         |                                                           |
|----------------------------------------------------------------------|----------------------------|--------------------|--------------------|------------------------------|------------------------------|----------------|--------------|----------------------------------------------------------|---------------------------------------------------------|---------------------------------------------------------|-----------------------------------------------------------|
| Main Plot-Irrigation management practices                            | Crop establishment methods | Grain yield (t/ha) | Straw yield (t/ha) | Tillers/m <sup>2</sup> (No.) | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g)  | Weed population at active tillering (no/m <sup>2</sup> ) | Weed population panicle initiation (no/m <sup>2</sup> ) | Weed dry weight at active tillering (g/m <sup>2</sup> ) | Weed dry weight at panicle initiation (g/m <sup>2</sup> ) |
| <b>I 1- Flooding throughout crop growth (3 +/- 2cm)</b>              | M1                         | 3.73               | 12.13              | 208                          | 180                          | 3.39           | 24.95        | 5.25(2.39)                                               | 33.75(5.85)                                             | 4.38                                                    | 10.10                                                     |
|                                                                      | M2                         | 4.24               | 11.77              | 287                          | 212                          | 3.46           | 25.40        | 1.50(1.40)                                               | 24.50(4.99)                                             | 1.17                                                    | 4.65                                                      |
|                                                                      | M3                         | 2.53               | 7.95               | 205                          | 162                          | 3.69           | 24.45        | 6.25(2.59)                                               | 35.00(5.95)                                             | 5.22                                                    | 12.75                                                     |
|                                                                      | M4                         | 2.23               | 7.13               | 201                          | 133                          | 3.46           | 24.60        | 8.25(2.96)                                               | 42.75(6.57)                                             | 5.63                                                    | 13.55                                                     |
|                                                                      | M5                         | 2.68               | 8.70               | 178                          | 118                          | 3.26           | 24.72        | 12.25(3.56)                                              | 55.00(7.43)                                             | 5.02                                                    | 14.10                                                     |
|                                                                      | M6                         | -                  | -                  | -                            | -                            | -              | -            | -                                                        | -                                                       | -                                                       | -                                                         |
| <b>I 2- Saturation maintenance upto PI and (3 +/- 2 cm) after PI</b> | M1                         | 4.38               | 13.82              | 199                          | 180                          | 3.71           | 25.25        | 4.25(2.17)                                               | 32.50(5.60)                                             | 2.57                                                    | 8.23                                                      |
|                                                                      | M2                         | 5.44               | 14.67              | 298                          | 274                          | 3.38           | 26.15        | 0.50(0.97)                                               | 16.50(4.12)                                             | 0.47                                                    | 3.45                                                      |
|                                                                      | M3                         | 3.62               | 11.48              | 213                          | 171                          | 3.63           | 25.35        | 5.50(2.44)                                               | 45.00(6.74)                                             | 5.02                                                    | 10.30                                                     |
|                                                                      | M4                         | 3.40               | 10.52              | 227                          | 165                          | 3.46           | 25.40        | 8.25(2.95)                                               | 55.75(7.50)                                             | 4.25                                                    | 12.20                                                     |
|                                                                      | M5                         | 3.54               | 11.14              | 207                          | 143                          | 3.49           | 25.02        | 8.25(2.95)                                               | 60.00(7.77)                                             | 4.10                                                    | 13.32                                                     |
|                                                                      | M6                         | -                  | -                  | -                            | -                            | -              | -            | -                                                        | -                                                       | -                                                       | -                                                         |
| <b>I 3- Alternate wetting and drying</b>                             | M1                         | 4.27               | 12.90              | 225                          | 178                          | 3.57           | 24.33        | 12.75(3.63)                                              | 55.75(7.50)                                             | 3.73                                                    | 12.80                                                     |
|                                                                      | M2                         | 4.28               | 13.42              | 294                          | 210                          | 3.53           | 74.97        | 8.25(2.95)                                               | 27.50(5.26)                                             | 1.70                                                    | 3.88                                                      |
|                                                                      | M3                         | 2.92               | 9.10               | 198                          | 175                          | 3.16           | 24.13        | 9.50(3.15)                                               | 65.75(8.14)                                             | 4.13                                                    | 13.77                                                     |
|                                                                      | M4                         | 3.68               | 9.26               | 208                          | 139                          | 3.56           | 24.17        | 14.25(3.84)                                              | 73.25(8.58)                                             | 5.85                                                    | 15.10                                                     |
|                                                                      | M5                         | 3.79               | 10.44              | 185                          | 140                          | 3.36           | 24.40        | 16.50(4.12)                                              | 85.00(9.24)                                             | 5.47                                                    | 14.92                                                     |
|                                                                      | M6                         | -                  | -                  | -                            | -                            | -              | -            | -                                                        | -                                                       | -                                                       | -                                                         |
| <b>Interaction</b>                                                   |                            |                    |                    |                              |                              |                |              |                                                          |                                                         |                                                         |                                                           |
| <i>I and M</i>                                                       |                            | 0.26               | NS                 | 16.47                        | 12.29                        | NS             | NS           | 0.26                                                     | 0.72                                                    | NS                                                      | NS                                                        |
| <i>M and I</i>                                                       |                            | 0.29               | NS                 | 16.58                        | 11.96                        | NS             | NS           | 0.27                                                     | 0.73                                                    | NS                                                      | NS                                                        |
| <b>Mean of Irrigation</b>                                            |                            |                    |                    |                              |                              |                |              |                                                          |                                                         |                                                         |                                                           |
| I1                                                                   |                            | 3.08               | 9.53               | 216                          | 161                          | 3.45           | 24.82        | 6.70(2.58)                                               | 38.20(6.16)                                             | 4.28                                                    | 11.03                                                     |
| I2                                                                   |                            | 4.07               | 12.33              | 229                          | 186                          | 3.53           | 25.44        | 5.35(2.29)                                               | 41.95(6.35)                                             | 3.28                                                    | 9.50                                                      |
| I3                                                                   |                            | 3.79               | 11.02              | 222                          | 168                          | 3.44           | 34.40        | 12.25(3.54)                                              | 61.45(7.74)                                             | 4.18                                                    | 12.09                                                     |
| <b>C.D. (0.05)</b>                                                   |                            | 0.22               | 0.39               | 9.81                         | 6.04                         | NS             | NS           | 0.17                                                     | 0.46                                                    | NS                                                      | 0.75                                                      |
| <b>C.V. (%)</b>                                                      |                            | 7.73               | 4.59               | 5.71                         | 4.54                         | 6.27           | 90.55        | 7.8                                                      | 8.77                                                    | 40.34                                                   | 8.88                                                      |
| <b>Method of Methods</b>                                             |                            |                    |                    |                              |                              |                |              |                                                          |                                                         |                                                         |                                                           |
| M1                                                                   |                            | 4.12               | 12.95              | 211                          | 179                          | 3.56           | 24.84        | 7.42(2.73)                                               | 40.67(6.32)                                             | 3.56                                                    | 10.38                                                     |
| M2                                                                   |                            | 4.65               | 13.29              | 293                          | 232                          | 3.46           | 42.17        | 3.42(1.77)                                               | 22.83(4.79)                                             | 1.12                                                    | 3.99                                                      |
| M3                                                                   |                            | 3.02               | 9.51               | 205                          | 169                          | 3.50           | 24.64        | 7.08(2.73)                                               | 48.58(6.94)                                             | 4.79                                                    | 12.27                                                     |
| M4                                                                   |                            | 3.10               | 8.97               | 212                          | 146                          | 3.49           | 24.72        | 10.25(3.25)                                              | 57.25(7.55)                                             | 5.24                                                    | 13.62                                                     |
| M5                                                                   |                            | 3.33               | 10.09              | 190                          | 133                          | 3.37           | 24.72        | 12.33(3.54)                                              | 66.67(8.15)                                             | 4.87                                                    | 14.12                                                     |
| M6                                                                   |                            | -                  | -                  | -                            | -                            | -              | -            | -                                                        | -                                                       | -                                                       | -                                                         |
| <b>CD (0.05)</b>                                                     |                            | 0.15               | 0.6                | 9.51                         | 7.1                          | NS             | NS           | 0.15                                                     | 0.41                                                    | 0.74                                                    | 0.93                                                      |
| <b>C.V. (%)</b>                                                      |                            | 5.05               | 6.6                | 5.19                         | 5.01                         | 8.14           | 91.75        | 6.49                                                     | 7.43                                                    | 22.91                                                   | 10.35                                                     |
| <b>Experimental Mean</b>                                             |                            | <b>3.65</b>        | <b>10.96</b>       | <b>222</b>                   | <b>172</b>                   | <b>3.47</b>    | <b>28.22</b> | <b>2.80</b>                                              | <b>6.75</b>                                             | <b>3.92</b>                                             | <b>10.88</b>                                              |
| Soil type                                                            |                            | Sandy loam         |                    |                              |                              |                |              |                                                          |                                                         |                                                         |                                                           |
| pH                                                                   |                            | 7.60               |                    |                              |                              |                |              |                                                          |                                                         |                                                         |                                                           |
| Variety                                                              |                            | NDR 2065           |                    |                              |                              |                |              |                                                          |                                                         |                                                         |                                                           |
| Available NPK kg/ha                                                  |                            | 200:24:234         |                    |                              |                              |                |              |                                                          |                                                         |                                                         |                                                           |

M1- Mechanical Transplanting method on puddled soil (crop management methods same as for puddled transplanted rice)

M2- Direct seeding (Use of Drum seeder/dibbling of sprouted seed at 25 x 25 cm) fb crop management practices as per direct wet seeded rice

M3- Normal Transplanting (20 x 15 cm with flooding water management, transplanting of 3-4 seedlings of 25-30 days old)

M4- Aerobic rice

M5- Direct broadcast dry seeding on well prepared unpuddled soil fb crop management practices for direct dry drill seeded rice (semi dry)

M6- Optional - Location specific

Table-4.2.6: Contd...

| Treatment                                                            |                            | MANDYA             |                    |                              |                |              |                        |                                                          |                                                         |                                                         |                                                           |
|----------------------------------------------------------------------|----------------------------|--------------------|--------------------|------------------------------|----------------|--------------|------------------------|----------------------------------------------------------|---------------------------------------------------------|---------------------------------------------------------|-----------------------------------------------------------|
| Main Plot-Irrigation management practices                            | Crop establishment methods | Grain yield (t/ha) | Straw yield (t/ha) | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g)  | Days for 50% flowering | Weed population at active tillering (no/m <sup>2</sup> ) | Weed population panicle initiation (no/m <sup>2</sup> ) | Weed dry weight at active tillering (g/m <sup>2</sup> ) | Weed dry weight at panicle initiation (g/m <sup>2</sup> ) |
| <b>I 1- Flooding throughout crop growth (3 +/- 2cm)</b>              | M1                         | 7.31               | 8.19               | 407                          | 3.01           | 27.09        | 96                     | 3.33(1.93)                                               | 7.00(2.67)                                              | 0.75                                                    | 1.33                                                      |
|                                                                      | M2                         | 7.14               | 8.70               | 337                          | 3.15           | 27.30        | 93                     | 7.00(2.73)                                               | 7.33(2.78)                                              | 1.47                                                    | 1.99                                                      |
|                                                                      | M3                         | 7.01               | 7.93               | 321                          | 3.67           | 26.44        | 96                     | 2.67(1.65)                                               | 6.33(2.59)                                              | 0.38                                                    | 1.68                                                      |
|                                                                      | M4                         | -                  | -                  | -                            | -              | -            | -                      | -                                                        | -                                                       | -                                                       | -                                                         |
|                                                                      | M5                         | -                  | -                  | -                            | -              | -            | -                      | -                                                        | -                                                       | -                                                       | -                                                         |
|                                                                      | M6                         | 6.52               | 6.35               | 331                          | 2.96           | 27.38        | 92                     | 9.33(3.09)                                               | 9.00(3.02)                                              | 1.51                                                    | 1.68                                                      |
| <b>I 2- Saturation maintenance upto PI and (3 +/- 2 cm) after PI</b> | M1                         | 7.11               | 8.31               | 408                          | 3.08           | 28.11        | 96                     | 5.00(2.34)                                               | 7.00(2.72)                                              | 0.64                                                    | 1.64                                                      |
|                                                                      | M2                         | 6.78               | 7.97               | 349                          | 3.28           | 27.62        | 93                     | 8.67(3.00)                                               | 11.67(3.48)                                             | 0.98                                                    | 2.43                                                      |
|                                                                      | M3                         | 7.69               | 8.89               | 375                          | 3.71           | 27.70        | 95                     | 6.33(2.60)                                               | 6.67(2.68)                                              | 0.88                                                    | 1.46                                                      |
|                                                                      | M4                         | -                  | -                  | -                            | -              | -            | -                      | -                                                        | -                                                       | -                                                       | -                                                         |
|                                                                      | M5                         | -                  | -                  | -                            | -              | -            | -                      | -                                                        | -                                                       | -                                                       | -                                                         |
|                                                                      | M6                         | 6.58               | 7.76               | 355                          | 2.31           | 28.30        | 92                     | 7.67(2.82)                                               | 10.33(3.29)                                             | 1.52                                                    | 2.45                                                      |
| <b>I 3- Alternate wetting and drying</b>                             | M1                         | 6.69               | 8.29               | 409                          | 2.89           | 27.57        | 95                     | 6.33(2.59)                                               | 8.00(2.90)                                              | 0.98                                                    | 1.48                                                      |
|                                                                      | M2                         | 7.41               | 8.31               | 375                          | 3.81           | 26.99        | 92                     | 7.67(2.81)                                               | 12.00(3.51)                                             | 1.29                                                    | 2.53                                                      |
|                                                                      | M3                         | 6.83               | 8.71               | 353                          | 3.64           | 27.48        | 96                     | 5.33(2.40)                                               | 9.00(3.08)                                              | 0.72                                                    | 1.43                                                      |
|                                                                      | M4                         | -                  | -                  | -                            | -              | -            | -                      | -                                                        | -                                                       | -                                                       | -                                                         |
|                                                                      | M5                         | -                  | -                  | -                            | -              | -            | -                      | -                                                        | -                                                       | -                                                       | -                                                         |
|                                                                      | M6                         | 7.33               | 8.72               | 380                          | 2.87           | 28.76        | 93                     | 7.00(2.69)                                               | 11.33(3.42)                                             | 1.27                                                    | 2.86                                                      |
| <b>Interaction</b>                                                   |                            |                    |                    |                              |                |              |                        |                                                          |                                                         |                                                         |                                                           |
| <i>I and M</i>                                                       |                            | NS                 | NS                 | NS                           | NS             | NS           | NS                     | NS                                                       | NS                                                      | NS                                                      | NS                                                        |
| <i>M and I</i>                                                       |                            | NS                 | NS                 | NS                           | NS             | NS           | NS                     | NS                                                       | NS                                                      | NS                                                      | NS                                                        |
| <b>Mean of Irrigation</b>                                            |                            |                    |                    |                              |                |              |                        |                                                          |                                                         |                                                         |                                                           |
| I1                                                                   |                            | 6.99               | 7.79               | 349                          | 3.20           | 27.05        | 94                     | 5.58(2.35)                                               | 7.42(2.76)                                              | 1.03                                                    | 1.67                                                      |
| I2                                                                   |                            | 7.04               | 8.23               | 372                          | 3.10           | 27.93        | 94                     | 6.92(2.69)                                               | 8.92(3.04)                                              | 1.01                                                    | 2.00                                                      |
| I3                                                                   |                            | 7.06               | 8.51               | 379                          | 3.30           | 27.70        | 94                     | 6.58(2.62)                                               | 10.08(3.23)                                             | 1.07                                                    | 2.07                                                      |
| <b>C.D. (0.05)</b>                                                   |                            | NS                 | 0.27               | 13.47                        | NS             | NS           | NS                     | NS                                                       | NS                                                      | NS                                                      | NS                                                        |
| <b>C.V. (%)</b>                                                      |                            | 8.23               | 4.57               | 5.07                         | 11.63          | 3.65         | 0.52                   | 23.62                                                    | 17.41                                                   | 53.5                                                    | 17.64                                                     |
| <b>Method of Methods</b>                                             |                            |                    |                    |                              |                |              |                        |                                                          |                                                         |                                                         |                                                           |
| M1                                                                   |                            | 7.04               | 8.26               | 408                          | 2.99           | 27.59        | 96                     | 4.89(2.29)                                               | 7.33(2.76)                                              | 0.79                                                    | 1.48                                                      |
| M2                                                                   |                            | 7.11               | 8.33               | 354                          | 3.41           | 27.31        | 93                     | 7.78(2.85)                                               | 10.33(3.26)                                             | 1.25                                                    | 2.32                                                      |
| M3                                                                   |                            | 7.18               | 8.51               | 350                          | 3.68           | 27.21        | 96                     | 4.78(2.22)                                               | 7.33(2.78)                                              | 0.66                                                    | 1.52                                                      |
| M4                                                                   |                            | -                  | -                  | -                            | -              | -            | -                      | -                                                        | -                                                       | -                                                       | -                                                         |
| M5                                                                   |                            | -                  | -                  | -                            | -              | -            | -                      | -                                                        | -                                                       | -                                                       | -                                                         |
| M6                                                                   |                            | 6.81               | 7.61               | 355                          | 2.71           | 28.15        | 92                     | 8.00(2.87)                                               | 10.22(3.24)                                             | 1.43                                                    | 2.33                                                      |
| <b>CD (0.05)</b>                                                     |                            | NS                 | NS                 | 44.01                        | 0.43           | NS           | 0.67                   | 0.46                                                     | 0.43                                                    | 0.44                                                    | 0.56                                                      |
| <b>C.V. (%)</b>                                                      |                            | 13.96              | 13.92              | 12.11                        | 13.71          | 2.69         | 0.72                   | 18.11                                                    | 14.45                                                   | 43.06                                                   | 29.51                                                     |
| <b>Experimental Mean</b>                                             |                            | <b>7.03</b>        | <b>8.18</b>        | <b>367</b>                   | <b>3.20</b>    | <b>27.56</b> | <b>94</b>              | <b>2.56</b>                                              | <b>3.01</b>                                             | <b>1.03</b>                                             | <b>1.91</b>                                               |
| Soil type                                                            |                            | Red Sandy loam     |                    |                              |                |              |                        |                                                          |                                                         |                                                         |                                                           |
| pH                                                                   |                            | 6.93               |                    |                              |                |              |                        |                                                          |                                                         |                                                         |                                                           |
| Variety                                                              |                            | MTU 1001           |                    |                              |                |              |                        |                                                          |                                                         |                                                         |                                                           |
| Available NPK kg/ha                                                  |                            | 367:106:262        |                    |                              |                |              |                        |                                                          |                                                         |                                                         |                                                           |

M1- Mechanical Transplanting method on puddled soil (crop management methods same as for puddled transplanted rice)

M2- Direct seeding (Use of Drum seeder/dibbling of sprouted seed at 25 x 25 cm) fb crop management practices as per direct wet seeded rice

M3- Normal Transplanting (20 x 15 cm with flooding water management, transplanting of 3-4 seedlings of 25-30 days old

M4-Aerobic

rice

M5- Direct broadcast dry seeding on well prepared unpuddled soil fb crop management practices for direct dry drill seeded rice (semi dry)

M6- Optional - Location specific (Sprouted rice or wet direct seeded rice- broadcasting of sprouted seed in puddled soil fb crop management practices as per direct wet seeded rice)

Table-4.2.6: Contd...

| Treatment                                                            |                            | VARANASI           |                    |                              |                |             |                        |                                                          |                                                         |
|----------------------------------------------------------------------|----------------------------|--------------------|--------------------|------------------------------|----------------|-------------|------------------------|----------------------------------------------------------|---------------------------------------------------------|
| Main Plot- Irrigation management practices                           | Crop establishment methods | Grain yield (t/ha) | Straw yield (t/ha) | Panicle/m <sup>2</sup> (No.) | Panicle wt (g) | Test wt (g) | Days for 50% flowering | Weed population at active tillering (no/m <sup>2</sup> ) | Weed dry weight at active tillering (g/m <sup>2</sup> ) |
| <b>I 1- Flooding throughout crop growth (3 +/- 2cm)</b>              | M1                         | 4.71               | 6.35               | 244                          | 3.72           | 21.0        | 94.08                  | 7.55(2.84)                                               | 8.35                                                    |
|                                                                      | M2                         | 4.73               | 6.38               | 249                          | 3.74           | 21.3        | 94.08                  | 7.50(2.83)                                               | 8.31                                                    |
|                                                                      | M3                         |                    |                    |                              |                |             |                        |                                                          |                                                         |
|                                                                      | M4                         | 4.48               | 6.11               | 242                          | 3.58           | 20.7        | 92.77                  | 10.14(3.26)                                              | 11.24                                                   |
|                                                                      | M5                         | 4.76               | 6.82               | 215                          | 3.25           | 20.1        | 93.1                   | 8.99(3.08)                                               | 10.37                                                   |
|                                                                      | M6                         | 3.99               | 5.6                | 223                          | 3.54           | 19.5        | 92.45                  | 8.46(2.99)                                               | 9.46                                                    |
| <b>I 2- Saturation maintenance upto PI and (3 +/- 2 cm) after PI</b> | M1                         | 4.86               | 6.64               | 260                          | 3.71           | 21.4        | 92.45                  | 8.97(3.08)                                               | 10.83                                                   |
|                                                                      | M2                         | 5.04               | 6.91               | 233                          | 3.52           | 21.1        | 89.83                  | 7.77(2.87)                                               | 8.95                                                    |
|                                                                      | M3                         |                    |                    |                              |                |             |                        |                                                          |                                                         |
|                                                                      | M4                         | 4.71               | 6.52               | 236                          | 3.64           | 20.2        | 91.14                  | 11.47(3.46)                                              | 13.21                                                   |
|                                                                      | M5                         | 4.18               | 6                  | 243                          | 3.67           | 19.3        | 91.14                  | 9.13(3.10)                                               | 10.76                                                   |
|                                                                      | M6                         | 4.09               | 5.8                | 248                          | 3.32           | 21.7        | 91.79                  | 8.23(2.95)                                               | 10.09                                                   |
| <b>I 3- Alternate wetting and drying</b>                             | M1                         | 5.08               | 6.91               | 291                          | 3.74           | 22.3        | 91.47                  | 6.90(2.72)                                               | 7.79                                                    |
|                                                                      | M2                         | 4.76               | 6.43               | 291                          | 3.85           | 21.1        | 90.16                  | 7.51(2.83)                                               | 8.81                                                    |
|                                                                      | M3                         |                    |                    |                              |                |             |                        |                                                          |                                                         |
|                                                                      | M4                         | 4.75               | 6.52               | 253                          | 3.71           | 21.5        | 89.18                  | 10.35(3.29)                                              | 12                                                      |
|                                                                      | M5                         | 4.02               | 5.7                | 220                          | 3.29           | 21.6        | 91.14                  | 8.79(3.05)                                               | 9.96                                                    |
|                                                                      | M6                         | 5.1                | 7.28               | 252                          | 3.65           | 20.4        | 90.49                  | 8.34(2.97)                                               | 10.09                                                   |
| <b>Interaction</b>                                                   |                            |                    |                    |                              |                |             |                        |                                                          |                                                         |
| <i>I and M</i>                                                       |                            | 0.14               | 0.15               | 17.61                        | 0.23           | 0.5         | NS                     | 0.09                                                     | 0.55                                                    |
| <i>M and I</i>                                                       |                            | 0.14               | 0.14               | 16.92                        | 0.31           | 0.46        | NS                     | 0.08                                                     | 0.51                                                    |
| <b>Mean of Irrigation</b>                                            |                            |                    |                    |                              |                |             |                        |                                                          |                                                         |
| I1                                                                   |                            | 4.54               | 6.25               | 235                          | 3.56           | 20.5        | 93.3                   | 8.53(3.00)                                               | 9.54                                                    |
| I2                                                                   |                            | 4.58               | 6.38               | 244                          | 3.57           | 20.7        | 91.27                  | 9.11(3.09)                                               | 10.77                                                   |
| I3                                                                   |                            | 4.74               | 6.57               | 262                          | 3.65           | 21.4        | 90.49                  | 8.38(2.97)                                               | 9.73                                                    |
| <b>C.D. (0.05)</b>                                                   |                            | 0.07               | 0.08               | 10.1                         | NS             | 0.14        | 0.87                   | 0.04                                                     | 0.22                                                    |
| <b>C.V. (%)</b>                                                      |                            | 2.28               | 1.86               | 6.31                         | 14.94          | 1.05        | 1.47                   | 1.98                                                     | 3.41                                                    |
| <b>Method of Methods</b>                                             |                            |                    |                    |                              |                |             |                        |                                                          |                                                         |
| M1                                                                   |                            | 4.88               | 6.63               | 265                          | 3.72           | 21.5        | 92.66                  | 7.81(2.88)                                               | 8.99                                                    |
| M2                                                                   |                            | 4.85               | 6.57               | 258                          | 3.7            | 21.2        | 91.36                  | 7.59(2.84)                                               | 8.69                                                    |
| M3                                                                   |                            |                    |                    |                              |                |             |                        |                                                          |                                                         |
| M4                                                                   |                            | 4.64               | 6.39               | 244                          | 3.65           | 20.8        | 91.03                  | 10.65(3.34)                                              | 12.15                                                   |
| M5                                                                   |                            | 4.32               | 6.17               | 226                          | 3.4            | 20.3        | 91.79                  | 8.97(3.08)                                               | 10.36                                                   |
| M6                                                                   |                            | 4.4                | 6.23               | 241                          | 3.5            | 20.5        | 91.58                  | 8.34(2.97)                                               | 9.88                                                    |
| <b>CD (0.05)</b>                                                     |                            | 0.08               | 0.09               | 10.17                        | 0.13           | 0.29        | NS                     | 0.05                                                     | 0.32                                                    |
| <b>C.V. (%)</b>                                                      |                            | 1.85               | 1.41               | 4.23                         | 3.78           | 1.43        | 1.23                   | 1.69                                                     | 3.25                                                    |
| <b>Experimental Mean</b>                                             |                            | 4.62               | 6.4                | 247                          | 3.59           | 20.9        | 91.68                  | 3.02                                                     | 10.01                                                   |
| Soil type                                                            |                            | Sandy loam         |                    |                              |                |             |                        |                                                          |                                                         |
| pH                                                                   |                            | 7.32               |                    |                              |                |             |                        |                                                          |                                                         |
| Variety                                                              |                            | HUR 4-3            |                    |                              |                |             |                        |                                                          |                                                         |
| Available NPK kg/ha                                                  |                            | 239:19:186         |                    |                              |                |             |                        |                                                          |                                                         |

M1- Mechanical Transplanting method on puddled soil (crop management methods same as for puddled transplanted rice)

M2- Direct seeding (Use of Drum seeder/dibbling of sprouted seed at 25 x 25 cm) fb crop management practices as per direct wet seeded rice

M3- Normal Transplanting (20 x 15 cm with flooding water management, transplanting of 3-4 seedlings of 25-30 days old)

M4- Aerobic rice

M5- Direct broadcast dry seeding on well prepared unpuddled soil fb crop management practices for direct dry drill seeded rice (semi dry)

M6- Optional

\* M6- Wet Broad casting

Table-4.2.6: Contd...

| Treatment                                                            |                            | PUSA               |                  |                | Over all Mean | Rank | Cost of Cultivation Rs/ha |          | Water input mm/ha |          |
|----------------------------------------------------------------------|----------------------------|--------------------|------------------|----------------|---------------|------|---------------------------|----------|-------------------|----------|
| Main Plot-Irrigation management practices                            | Crop establishment methods | Grain yield (t/ha) | Panicle/m2 (No.) | Panicle wt (g) |               |      | MANDYA                    | VARANASI | MANDYA            | VARANASI |
| <b>I 1- Flooding throughout crop growth (3 +/- 2cm)</b>              | M1                         |                    |                  |                | 5.25          | 6    | 56966                     | 37985    | 1800.4            | 1450     |
|                                                                      | M2                         | 3.83               | 219              | 2.91           | 4.51          | 10   | 55734                     | 32472    | 1829.29           | 1450     |
|                                                                      | M3                         | 4.24               | 231              | 2.89           | 4.20          | 12   | 59526                     |          | 1929.29           |          |
|                                                                      | M4                         | 3.72               | 221              | 2.91           | 3.30          | 18   |                           | 31385    |                   | 1450     |
|                                                                      | M5                         | 3.32               | 212              | 3.03           | 3.31          | 17   |                           | 29985    |                   | 1450     |
|                                                                      | M6                         |                    |                  |                | 5.26          | 5    | 54641                     | 32885    | 1894.29           | 1450     |
| <b>I 2- Saturation maintenance upto PI and (3 +/- 2 cm) after PI</b> | M1                         |                    |                  |                | 5.45          | 2    | 56009                     | 37645    | 1331.51           | 1210     |
|                                                                      | M2                         | 3.53               | 214              | 2.93           | 4.73          | 7    | 54652                     | 32132    | 1400.96           | 1210     |
|                                                                      | M3                         | 4.15               | 223              | 2.92           | 4.66          | 8    | 59265                     |          | 1505.96           |          |
|                                                                      | M4                         | 3.44               | 215              | 2.93           | 3.63          | 14   |                           | 31045    |                   | 1210     |
|                                                                      | M5                         | 3.04               | 200              | 2.95           | 3.35          | 16   |                           | 29645    |                   | 1210     |
|                                                                      | M6                         |                    |                  |                | 5.34          | 4    | 53894                     | 32545    | 1410.4            | 1210     |
| <b>I 3- Alternate wetting and drying</b>                             | M1                         |                    |                  |                | 5.35          | 3    | 55279                     | 37305    | 1092.62           | 960      |
|                                                                      | M2                         | 3.41               | 212              | 2.93           | 4.61          | 9    | 54742                     | 31792    | 1186.18           | 960      |
|                                                                      | M3                         | 4.02               | 220              | 2.91           | 4.32          | 11   | 58188                     |          | 1292.62           |          |
|                                                                      | M4                         | 3.34               | 210              | 2.94           | 3.76          | 13   |                           | 30705    |                   | 960      |
|                                                                      | M5                         | 3.04               | 202              | 2.96           | 3.43          | 15   |                           | 29305    |                   | 960      |
|                                                                      | M6                         |                    |                  |                | 6.22          | 1    | 54081                     | 32205    | 1203.73           | 960      |
| <b>Interaction</b>                                                   |                            |                    |                  |                |               |      |                           |          |                   |          |
| <i>I and M</i>                                                       |                            | NS                 | NS               | NS             |               |      |                           |          |                   |          |
| <i>M and I</i>                                                       |                            | NS                 | NS               | NS             |               |      |                           |          |                   |          |
| <b>Mean of Irrigation</b>                                            |                            |                    |                  |                |               |      |                           |          |                   |          |
| I1                                                                   |                            | 3.77               | 220.75           | 2.94           | 4.22          | 3    | 56717                     | 32943    | 1863.32           | 1450     |
| I2                                                                   |                            | 3.54               | 213              | 2.93           | 4.43          | 2    | 55955                     | 32603    | 1412.21           | 1210     |
| I3                                                                   |                            | 3.45               | 211.08           | 2.93           | 4.45          | 1    | 55573                     | 32263    | 1193.79           | 960      |
| <b>C.D. (0.05)</b>                                                   |                            | 0.13               | NS               | NS             |               |      |                           |          |                   |          |
| <b>C.V. (%)</b>                                                      |                            | 4.89               | 4.9              | 0.99           |               |      |                           |          |                   |          |
| <b>Method of Methods</b>                                             |                            |                    |                  |                |               |      |                           |          |                   |          |
| M1                                                                   |                            |                    |                  |                | 5.35          | 2    | 56085                     | 37645    | 1408.18           | 1207     |
| M2                                                                   |                            | 3.59               | 215              | 2.92           | 4.62          | 3    | 55043                     | 32132    | 1472.14           | 1207     |
| M3                                                                   |                            | 4.13               | 224.67           | 2.91           | 4.39          | 4    | 58993                     |          | 1575.96           |          |
| M4                                                                   |                            | 3.5                | 215.44           | 2.93           | 3.56          | 5    |                           | 31045    |                   | 1207     |
| M5                                                                   |                            | 3.13               | 204.67           | 2.98           | 3.36          | 6    |                           | 29645    |                   | 1207     |
| M6                                                                   |                            |                    |                  |                | 5.61          | 1    | 54206                     | 32545    | 1502.81           | 1207     |
| <b>CD (0.05)</b>                                                     |                            | 0.19               | 12.39            | NS             |               |      |                           |          |                   |          |
| <b>C.V. (%)</b>                                                      |                            | 5.28               | 5.82             | 7.25           |               |      |                           |          |                   |          |
| <b>Experimental Mean</b>                                             |                            | 3.59               | 214.94           | 2.93           | 4.37          |      | 56081                     | 32603    | 1489.77           | 1207     |
| Soil type                                                            |                            | -                  |                  |                |               |      |                           |          |                   |          |
| pH                                                                   |                            | -                  |                  |                |               |      |                           |          |                   |          |
| Variety                                                              |                            | Abhishek           |                  |                |               |      |                           |          |                   |          |
| Available NPK kg/ha                                                  |                            | -                  |                  |                |               |      |                           |          |                   |          |

M1- Mechanical Transplanting method on puddled soil (crop management methods same as for puddled transplanted rice)

M2- Direct seeding (Use of Drum seeder/dibbling of sprouted seed at 25 x 25 cm) fb crop management practices as per direct wet seeded rice

M3- Normal Transplanting (20 x 15 cm with flooding water management, transplanting of 3-4 seedlings of 25-30 days old)

M4-Aerobic rice

M5- Direct broadcast dry seeding on well prepared unpuddled soil fb crop management practices for direct dry drill seeded rice (semi dry)

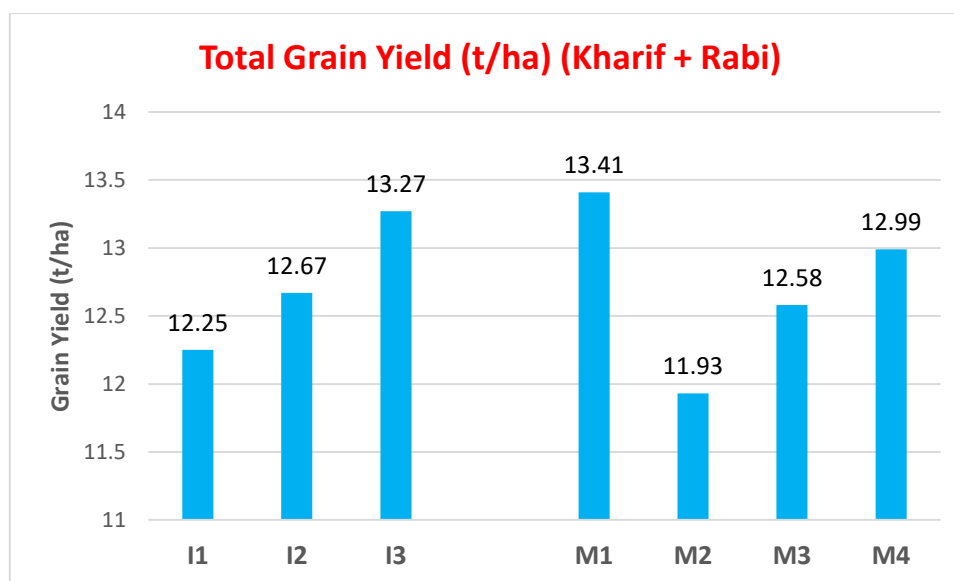
M6- Optional

#### 4.2.6(Rabi) Water management for enhancing water use efficiency and weed control efficiency in different rice establishment methods (Rabi 2018-19)

Increasing water scarcity is becoming real threat to rice cultivation. Hence water-saving technology needs to be developed which not only economically beneficial but also maintains soil health. Any approach that would lessen the amount of water use without compromising the rice yield would certainly be a welcome strategy. Introduction of SRI is an alternative practice to solve water crisis, and as a methodology for increasing the productivity of irrigated rice. AWD is also called ‘intermittent irrigation’ or ‘controlled irrigation’ which can reduce the water requirement by 30 % in irrigated rice system. To evaluate the suitable and promising irrigation management practices in different crop establishment methods a trial was formulated and conducted at **Puducherry** during both *Kharif* 2018 and continued in *Rabi* 2018-19. Split plot design was adopted with 3 main plots of irrigation management {I<sub>1</sub>: Flooding throughout crop growth (3 + / - 2 cm), I<sub>2</sub>: Saturation maintenance upto PI and (3 + / - 2 cm) after PI and I<sub>3</sub>: Alternate wetting and drying (irrigation at 5 -7 days interval with 5 cm/ha of water (5 cm irrigation at 3 DADPW) up to PI and (3 + / - 2 cm) after PI} and 4 subplots of crop establishment methods {T<sub>1</sub>: Mechanical Transplanting method on puddled soil (crop management methods same as for puddled transplanted rice), T<sub>2</sub>: Direct wet seeding on puddled soil (Use of Drum seeder/ dibbling of sprouted seed at 25 x 25 cm) fb crop management practices as per direct wet seeded rice, T<sub>3</sub>: Normal hand transplanting (20 x15 cm with flooding water management, 3-4 seedlings transplanted at 25-30 days old seedlings), and T<sub>4</sub>: Optional- Location specific} and replicated thrice. The results were summarized and presented in **Table 4.2.6(R)** and the salient findings are as followed.

In **Puducherry**, alternate wetting and drying and mechanical transplanting resulted in the highest grain yield of 6.21 and 6.17 t/ha, respectively. Similarly, during *Rabi* also alternate wetting and drying method and mechanical transplanting recorded the highest grain yield of 7.06 t/ha and 7.24 t/ha respectively. Total rice production was highest (K+R with AWD method (13.27 t/ha) over saturation (12.67) and normal flooding (12.25). Among the crop establishment methods, mechanical transplanting recorded as significant. Water input was significantly reduced in AWD method 1593 mm/ha as compared to saturation and flooding throughout crop growth 1603 and 1613 mm/ha respectively. Lower weed population and dry weight were observed in alternate wetting and drying treated plots. Mechanical transplanted plots also registered the lowest weed population and dry weight.

Higher cost of cultivation was recorded in normal transplanting method 46375 Rs/ha as compared to DSR in puddle (43755 Rs/ha) and mechanical transplanting (44425 Rs/ha). There is a saving of 5% cost of cultivation due to mechanical transplanting.



**Fig. Mean rice grain yield as affected by irrigation management and crop establishment methods**

Over all mean grain yield of the trial revealed that **alternate wetting and drying** resulted the highest grain yield (7.06 t/ha) among irrigation management treatments. At **Puducherry**, mean grain yield of 13.41 t/ha over other methods (11.93 t/ha to 12.99 t/ha) was recorded with mechanical transplanting,. Higher grain yield was recorded with different crop establishment methods (6.79 to 7.36 t/ha) under alternate wetting and drying method over other irrigation methods. Similarly, among crop establishment methods **mechanical transplanting** resulted the highest grain yield (7.24t/ha) and 6.17 t/ha and an average grain yield increase was to the tune of 7 % over normal transplanting method.

Table-4.2.6: (Rabi) Evaluation of Water management for enhancing Water use efficiency and Weed control efficiency in different rice establishments methods, Rabi-2018-19

| Treatment                                                     |                            | PUDUCHERRY                     |                                 |                    |       |                |                                      |             |             |                                     |                           |                   |
|---------------------------------------------------------------|----------------------------|--------------------------------|---------------------------------|--------------------|-------|----------------|--------------------------------------|-------------|-------------|-------------------------------------|---------------------------|-------------------|
|                                                               |                            | Kharif 2018 Grain yield (t/ha) | Rabi 2018-19 Grain yield (t/ha) | Straw yield (t/ha) | REY   | Panicle wt (g) | Weed population (no/m <sup>2</sup> ) |             |             | Weed dry weight (g/m <sup>2</sup> ) | Cost of Cultivation Rs/ha | Water input mm/ha |
| Main Plot-Irrigation management practices                     | Crop establishment methods |                                |                                 |                    |       |                | Grasses                              | Sedges      | BLW         |                                     |                           |                   |
| I 1- Flooding throughout crop growth (3 +/- 2cm)              | M1                         | 5.82                           | 7.09                            | 12.07              | 12.91 | 4.02           | 9.36(3.14)                           | 16.11(4.07) | 10.57(3.33) | 34.35                               | 44425                     | 1552              |
|                                                               | M2                         | 5.21                           | 6.26                            | 10.65              | 11.47 | 3.56           | 10.60(3.33)                          | 22.22(4.77) | 14.04(3.81) | 41.88                               | 43755                     | 1530              |
|                                                               | M3                         | 5.43                           | 6.55                            | 11.15              | 11.98 | 3.69           | 10.03(3.24)                          | 19.25(4.44) | 13.38(3.72) | 38.85                               | 46375                     | 1617              |
|                                                               | M4                         | 5.72                           | 6.88                            | 11.72              | 12.60 | 3.84           | 9.82(3.21)                           | 17.40(4.23) | 12.59(3.62) | 36.74                               | 50450                     | 1753              |
| I 2- Saturation maintenance upto PI and (3 +/- 2 cm) after PI | M1                         | 6.22                           | 7.26                            | 12.36              | 13.48 | 4.34           | 6.99(2.74)                           | 14.19(3.83) | 9.99(3.24)  | 32.05                               | 44425                     | 1542              |
|                                                               | M2                         | 5.32                           | 6.37                            | 10.84              | 11.69 | 3.84           | 8.86(3.06)                           | 17.88(4.29) | 12.68(3.63) | 39.01                               | 43755                     | 1520              |
|                                                               | M3                         | 5.73                           | 6.84                            | 11.65              | 12.57 | 4.05           | 7.93(2.90)                           | 16.27(4.09) | 11.72(3.50) | 37.45                               | 46375                     | 1607              |
|                                                               | M4                         | 6.02                           | 6.92                            | 11.79              | 12.94 | 4.15           | 7.47(2.82)                           | 15.15(3.96) | 10.86(3.37) | 34.86                               | 50450                     | 1743              |
| I 3- Alternate wetting and drying                             | M1                         | 6.46                           | 7.36                            | 12.52              | 13.82 | 4.44           | 5.57(2.46)                           | 11.15(3.41) | 8.31(2.97)  | 28.68                               | 44425                     | 1532              |
|                                                               | M2                         | 5.86                           | 6.79                            | 11.54              | 12.65 | 4.12           | 7.01(2.74)                           | 17.28(4.22) | 11.08(3.40) | 35.92                               | 43755                     | 1510              |
|                                                               | M3                         | 6.19                           | 7.01                            | 11.94              | 13.20 | 4.21           | 6.77(2.70)                           | 15.15(3.96) | 10.50(3.32) | 34.13                               | 46375                     | 1597              |
|                                                               | M4                         | 6.32                           | 7.10                            | 12.76              | 13.42 | 4.26           | 6.26(2.60)                           | 13.13(3.69) | 9.90(3.22)  | 32.95                               | 50450                     | 1733              |
| Interaction                                                   |                            |                                |                                 |                    |       |                |                                      |             |             |                                     |                           |                   |
| I and M                                                       |                            | NS                             | NS                              | NS                 |       | NS             | 0.04                                 | 0.05        | 0.05        | 0.81                                |                           |                   |
| M and I                                                       |                            | NS                             | NS                              | NS                 |       | NS             | 0.04                                 | 0.05        | 0.04        | 0.75                                |                           |                   |
| Mean of Irrigation                                            |                            |                                |                                 |                    |       |                |                                      |             |             |                                     |                           |                   |
| I1                                                            |                            | 5.55                           | 6.70                            | 11.40              | 12.25 | 3.77           | 9.96(3.23)                           | 18.74(4.38) | 12.64(3.62) | 37.96                               | 46251                     | 1613              |
| I2                                                            |                            | 5.82                           | 6.85                            | 11.66              | 12.67 | 4.09           | 7.81(2.88)                           | 15.87(4.04) | 11.31(3.43) | 35.84                               | 46251                     | 1603              |
| I3                                                            |                            | 6.21                           | 7.06                            | 12.19              | 13.27 | 4.26           | 6.40(2.63)                           | 14.18(3.82) | 9.95(3.23)  | 32.92                               | 46251                     | 1593              |
| C.D. (0.05)                                                   |                            | 0.11                           | 0.08                            | 0.34               |       | 0.03           | 0.02                                 | 0.02        | 0.02        | 0.42                                |                           |                   |
| C.V. (%)                                                      |                            | 2.57                           | 1.52                            | 3.93               |       | 1.16           | 1.02                                 | 0.78        | 0.92        | 1.62                                |                           |                   |
| Method of Methods                                             |                            |                                |                                 |                    |       |                |                                      |             |             |                                     |                           | 0                 |
| M1                                                            |                            | 6.17                           | 7.24                            | 12.31              | 13.41 | 4.27           | 7.31(2.78)                           | 13.81(3.77) | 9.62(3.18)  | 31.69                               | 44425                     | 1542              |
| M2                                                            |                            | 5.46                           | 6.47                            | 11.01              | 11.93 | 3.84           | 8.83(3.04)                           | 19.13(4.42) | 12.60(3.62) | 38.94                               | 43755                     | 1520              |
| M3                                                            |                            | 5.78                           | 6.80                            | 11.58              | 12.58 | 3.98           | 8.24(2.95)                           | 16.89(4.16) | 11.87(3.51) | 36.81                               | 46375                     | 1607              |
| M4                                                            |                            | 6.02                           | 6.97                            | 12.09              | 12.99 | 4.08           | 7.85(2.88)                           | 15.23(3.96) | 11.11(3.40) | 34.85                               | 50450                     | 1743              |
| CD (0.05)                                                     |                            | 0.17                           | 0.09                            | 0.34               |       | 0.05           | 0.02                                 | 0.03        | 0.03        | 0.47                                |                           |                   |
| C.V. (%)                                                      |                            | 2.86                           | 1.37                            | 2.96               |       | 1.26           | 0.76                                 | 0.73        | 0.79        | 1.33                                |                           |                   |
| Experimental Mean                                             |                            | 5.86                           | 6.87                            | 11.75              | 12.73 | 4.04           | 2.91                                 | 4.08        | 3.43        | 35.57                               | 46251                     | 1603              |
| Soil type                                                     |                            | Clay loam                      | -                               |                    |       |                |                                      |             |             |                                     |                           |                   |
| pH                                                            |                            | 6.62                           | 8.02                            |                    |       |                |                                      |             |             |                                     |                           |                   |
| Variety                                                       |                            | CO-52                          | ADT-53                          |                    |       |                |                                      |             |             |                                     |                           |                   |
| Available NPK kg/ha                                           |                            | 324.8:363:200                  | 134:37:205                      |                    |       |                |                                      |             |             |                                     |                           |                   |

M1:Mechanical Transplanting method on puddled soil (Crop management methods same as for puddled transplanted rice)

M2:Direct wet seeding on puddled soil (Drum seeder /dibbling of sprouted seed at 25x25)fb crop management practices as per direct wet seeded rice

M3:Normal hand Transplanting (20X15 cm with flooding water management, 3-4 seedlings transplanted at 25-30 days old seedlings)

M4:Optional -Location Specific



# WEED MANAGEMENT TRIALS





## WEED MANAGEMENT TRIAL

Among the various constraints, weed competition is going to be the major factor limiting higher productivity. In transplanted conditions, the yield loss due to weeds range from 15 to 30%. Most of the farmers in the intensive cropping areas are shifting to direct seeding practices, due to shortage of labour or scarcity of water, energy, electricity etc. Additionally, the late onset of monsoon and unpredictable rainfall patterns (which are indirectly due to global warming) during recent years are also prompting farmers to go for dry direct seeding or wet direct seeding under puddled conditions. In drill seeded or direct seeded rice under puddled conditions, the weeds grow vigorously and the level of infestation and competitiveness are going to be the major challenges to farmers and researchers alike and the grain yield losses in these rice ecosystems are much more (30-91%). Therefore, it is necessary to incorporate the chemical methods aimed at inhibiting the metabolic processes, in integrated weed management practices. A total of four weed management studies were carried out during Kharif 2019 to assess the performance of new herbicides, long term weed dynamics in different crop establishment methods, identifying weed resistant cultivars and Integrated Pest Management (a collaboration trial).

### 4.3.1: Evaluation of Bio efficiency of Thiobencarb in wet direct sown rice

Thiobencarb is a systemic, pre emergence herbicide that acts by inhibiting shoots of emerging weed seedlings. It controls many annual grasses and some selected broad leaves, with good selectivity between rice and weeds, with the objective of evaluating the bio efficiency of thiobencarb at different doses in wet direct sown rice in comparison to the promising pre and post emergence herbicides at different locations viz., **ICAR-Indian Institute of Rice Research- Hyderabad, Malan, Puducherry and Raipur** during *kharif* 2019, The results of second consecutive season are presented in the table 4.3.1 and discussed here under.

The dominant weed flora of the test locations comprised *Echinochloa colona*, *E.crusgalli*, *Dinebra retroflexa*, *Panicum sps.*, *Cyperus rotundus*, *Cyperus difformis*, *Fimbristylis miliaceae*, *Eclipta alba*, *Ammania baccifera* etc.

At all the test locations, the treatment of two hand weedings has recorded highest grain yield followed by standard check of bispyribacsodium application, test herbicide Thiobencarb @ 5 lit/ha (higher dose), and superior over other treatments. The higher dose of thiobencarb statistically on par with standard check of post emergence herbicide and hand weeding twice at all the test locations except **Malan**. The result of data analysis on straw yield showed that hand weeding twice recorded was superior followed by the test herbicide thiobencarb @ 5 lit/ha, post emergence herbicide bispyribacsodium application. The results of data analysis on yield attributes viz., no. of panicles per m<sup>2</sup>, panicle weight, filled grain percentage, test weight have clearly indicated the trend of grain yield and straw yield and contributed to the yield performance.

The grain yield loss (%) by different locations ranged from 15.36 to 41.16% in unweeded control plots. The treatments showed minimum loss of 2.13% & 2.98% at **Puducherry** with thiobencarb @ 5 lit/ha, post-emergence herbicide bispyribacsodium application respectively. The test herbicide thiobencarb @ 5 lit/ha recorded minimum yield loss at all the locations and comparable with standard post-emergence check.

The data on weed population indicated the dominance of broad leaf weeds followed by grasses at IIRR Hyderabad; dominance of grasses followed by broad leaf weeds at Malan and Puducherry; dominance of sedges followed by grasses at **Raipur**. The weed population before herbicide application was considerably higher at **ICAR-IIRR, Hyderabad; Malan, Puducherry** and **Raipur**. The weed population at 10-15 days after herbicide application showed reduction in weed population of all the groups. The weed population before herbicide application at 45-50 days after planting/sowing also recorded lower weed population than the population of all groups. This result has indicated that the herbicides tested have residual effect for nearly 1 month after application. The data on weed biomass exhibited similar trend as that of weed population before herbicide application, 10-15 days after herbicide application and 45-50 days after herbicide application.

Among the herbicide treatments at **ICAR-IIRR**, standard pre-emergence check and Thiobencarb @ 5 lit/ha recorded lower no of broad leaf weeds & sedges at 10-15 days after herbicide application; lower no. of grasses and sedges at **Puducherry** whereas at **Malan** and **Raipur** standard post-emergence check and Thiobencarb @ 5 lit/ha recorded lower population of grasses and sedges. At 45-50 days after sowing/planting, standard post emergence check and thiobencarb @ 5 lit/ha recorded lower weed population and weed biomass which are statistically on par with hand weeding twice.

The results of weed control efficiency showed highest with hand weeding twice at all the test locations. Among the herbicide treatments, standard post-emergence check herbicide followed by thiobencarb @ 5 lit/ha at **ICAR-IIRR, Malan** and **Raipur**. Whereas, at **Puducherry**, thiobencarb @ 5 lit/ha followed by standard pre-emergence check herbicide recorded higher weed control efficiency.

Pooled analysis of the multi locational data indicated that the loss of grain yield due to weeds was lowest (4.97%) with standard check post emergence herbicide bispyribacsodium @ 300ml/ha and highest (31.79%) with unweeded control. Among the dosages of thiobencarb, 5l/ha has contributed to higher grain yield of 5.30 t/ha resulting in lower grain yield loss of 5.86% and was statistically on par with standard check herbicide bispyribacsodium. Thiobencarb@ 4 l/ha and pre emergence standard check herbicide Pyrazosulfuron-ethyl @ 200g/ha were on par and inferior to higher dose i.e., 5 l/ha. The hand weeding twice significantly out yielded other treatment combinations. Straw yield was significantly higher with hand weeding twice and post emergence standard check herbicide bispyribacsodium @ 300 ml/ha.

The data on weed population showed that standard check pre-emergence herbicide pyrazosulfuron resulted in significant low weed population and weed biomass before post

emergence herbicides application. The data on weed population and weed biomass at 15 days after herbicide application showed that among the post-emergence herbicides, thiobencarb @ 5 lit/ha.

Based on the second season (kharif 2019) multi-location study at **ICAR-IIRR Hyderabad, Malan, Puducherry and Raipur**, the systemic post emergence herbicide thiobencarb @5 l/ha was found superior resulting in higher weed control efficiency; higher grain yields; and the performance was comparable to hand weeding twice and standard post emergence herbicide bispyribacsodium@ 300 ml/ha.

Based on the multi-locational two consecutive season study (kharif 2018 and kharif 2019), the results showed that, the systemic post emergence herbicide thiobencarb @5 l/ha was found superior resulting in higher weed control efficiency; higher grain yields; and the performance was comparable to hand weeding twice and standard post emergence herbicide bispyribacsodium@ 300 ml/ha.

Table-4.3.1: Summary of data on grain yield, yield attributes, weed parameters &amp; weed control efficiency in the trial on "Evaluation of bioefficacy of Thiobencarb 80 EC in puddled DSR", Kharif - 2019.

| Treatments                                       | Grain Yield ( t/ha) |                 |             |             | Straw Yield (t/ha) |             |             |            | No. of panicles/m <sup>2</sup> |            |            |            |
|--------------------------------------------------|---------------------|-----------------|-------------|-------------|--------------------|-------------|-------------|------------|--------------------------------|------------|------------|------------|
|                                                  | ICAR-IIRR           | Malan           | Puducherry  | Raipur      | ICAR-IIRR          | Malan       | Puducherry  | Raipur     | ICAR-IIRR                      | Malan      | Puducherry | Raipur     |
| <b>T1</b>                                        | 6.08                | 2.20            | 6.56        | 3.80        | 6.83               | 3.02        | 8.69        | 5.07       | 379                            | 231        | 347        | 226        |
| <b>T2</b>                                        | 6.20                | 2.21            | 6.65        | 4.60        | 7.03               | 3.09        | 8.72        | 5.61       | 384                            | 250        | 351        | 244        |
| <b>T3</b>                                        | 6.68                | 2.74            | 6.88        | 4.91        | 7.59               | 3.84        | 8.87        | 5.61       | 400                            | 299        | 374        | 270        |
| <b>T4</b>                                        | 6.29                | 2.46            | 6.45        | 4.55        | 7.74               | 3.44        | 8.41        | 5.48       | 363                            | 265        | 331        | 235        |
| <b>T5</b>                                        | 6.9                 | 2.95            | 6.82        | 4.74        | 7.79               | 4.03        | 8.91        | 5.48       | 389                            | 301        | 357        | 262        |
| <b>T6</b>                                        | 4.17                | 1.94            | 5.95        | 3.32        | 5.23               | 2.63        | 7.62        | 4.65       | 277                            | 173        | 313        | 215        |
| <b>T7</b>                                        | 7.15                | 3.06            | 7.03        | 5.31        | 8.22               | 4.13        | 9.07        | 5.91       | 421                            | 303        | 388        | 279        |
| <b>Exp. mean</b>                                 | <b>6.21</b>         | <b>2.51</b>     | <b>6.62</b> | <b>4.46</b> | <b>7.21</b>        | <b>3.45</b> | <b>8.61</b> | <b>5.4</b> | <b>373</b>                     | <b>260</b> | <b>352</b> | <b>247</b> |
| <b>CD(0.05)</b>                                  | 0.63                | 0.23            | 0.23        | 0.32        | 0.7                | 0.36        | 0.33        | 0.53       | 32.29                          | 13.92      | 14.65      | 33.43      |
| <b>Applied fertilizer doses (N-P-K-Zn kg/ha)</b> | 120:50:60           | 90:40:40        | 120:40:40   | 100:60:40   |                    |             |             |            |                                |            |            |            |
| <b>Name of the variety</b>                       | DRR Dhan 52         | HPR 2880        | DRR Dhan 52 | IGKV R1     |                    |             |             |            |                                |            |            |            |
| <b>Soil type</b>                                 | Clay                | Slity clay loam | Clay        | Clay loam   |                    |             |             |            |                                |            |            |            |
| <b>pH</b>                                        | 7.2                 | 5.7             | 6.62        | 7.19        |                    |             |             |            |                                |            |            |            |
| <b>EC</b>                                        | -                   |                 | 0.2         | 0.21        |                    |             |             |            |                                |            |            |            |

T1-Thiobencarb @ 4.00 L/ha post-emergence application at 20 DAS

T2-Thiobencarb @ 4.50 L/ha post-emergence application at 20 DAS

T3-Thiobencarb @ 5.00 L/ha post-emergence application at 20 DAS

T4-Standard check(Recommended herbicide)pyrazosulfuron ethyl 10 % @ 200 g/ha. Pre-emergence application

T5-Standard check(Recommended herbicide) Bispyribacsodium 10 % @ 300 ml/ha. Post-emergence application

T6- Control (weedy)

T7- Hand weeding twice

Table-4.3.1: Contd.

| Treatments       | Panicle weight(g) |             |             |             | Filled grains % per panicle |              |              |              | Test weight (g) |              |              |              | Grain yield loss % |       |            |        |
|------------------|-------------------|-------------|-------------|-------------|-----------------------------|--------------|--------------|--------------|-----------------|--------------|--------------|--------------|--------------------|-------|------------|--------|
|                  | ICAR-IIRR         | Malan       | Puducherry  | Raipur      | ICAR-IIRR                   | Malan        | Puducherry   | Raipur       | ICAR-IIRR       | Malan        | Puducherry   | Raipur       | ICAR-IIRR          | Malan | Puducherry | Raipur |
| <b>T1</b>        | 3.99              | 1.73        | 4.95        | 2.55        | 92.81                       | 82.43        | 93.46        | 88.63        | 27.41           | 24.20        | 27.00        | 33.13        | 14.96              | 28.10 | 6.68       | 28.43  |
| <b>T2</b>        | 4.63              | 1.80        | 5.57        | 2.73        | 92.92                       | 85.33        | 94.43        | 89.20        | 27.86           | 24.87        | 27.68        | 33.25        | 13.28              | 27.77 | 5.40       | 13.37  |
| <b>T3</b>        | 4.88              | 1.88        | 5.62        | 3.26        | 94.39                       | 91.50        | 95.13        | 89.50        | 27.88           | 26.37        | 27.96        | 33.56        | 6.57               | 10.45 | 2.13       | 7.53   |
| <b>T4</b>        | 3.90              | 1.80        | 4.60        | 2.67        | 93.51                       | 86.93        | 90.39        | 89.70        | 26.30           | 25.77        | 26.53        | 33.14        | 12.02              | 19.60 | 8.25       | 14.31  |
| <b>T5</b>        | 3.95              | 2.00        | 5.69        | 3.07        | 93.38                       | 93.33        | 94.91        | 89.07        | 29.02           | 26.60        | 27.86        | 33.35        | 3.49               | 3.59  | 2.98       | 10.73  |
| <b>T6</b>        | 3.79              | 1.67        | 4.25        | 2.43        | 88.11                       | 78.47        | 87.41        | 85.00        | 25.92           | 22.70        | 25.35        | 32.95        | 41.16              | 36.60 | 15.36      | 37.47  |
| <b>T7</b>        | 4.96              | 2.04        | 5.79        | 3.40        | 95.21                       | 93.70        | 96.20        | 90.17        | 30.64           | 26.80        | 28.77        | 33.76        | -                  | -     | -          | -      |
| <b>Exp. mean</b> | <b>4.3</b>        | <b>1.85</b> | <b>5.21</b> | <b>2.87</b> | <b>92.9</b>                 | <b>87.39</b> | <b>93.13</b> | <b>88.75</b> | <b>27.86</b>    | <b>25.33</b> | <b>27.31</b> | <b>33.31</b> |                    |       |            |        |
| <b>CD(0.05)</b>  | 0.82              | 0.09        | 0.22        | 0.32        | 3.58                        | 1.9          | 3.82         | 1.88         | 1.74            | 0.54         | 1.01         | 1.1          |                    |       |            |        |

T1-Thiobencarb @ 4.00 L/ha post-emergence application at 20 DAS

T2-Thiobencarb @ 4.50 L/ha post-emergence application at 20 DAS

T3-Thiobencarb @ 5.00 L/ha post-emergence application at 20 DAS

T4-Standard check(Recommended herbicide)pyrazosulfuron ethyl 10 % @ 200 g/ha. Pre-emergence application

T5-Standard check(Recommended herbicide) Bispyribacsodium 10 % @ 300 ml/ha. Post-emergence application

T6- Control (weedy)

T7- Hand weeding twice

Table-4.3.1: Contd.

| Treatments       | ICAR-IIRR                                                   |                  |              |             |                                                 |             |                  |              |               |
|------------------|-------------------------------------------------------------|------------------|--------------|-------------|-------------------------------------------------|-------------|------------------|--------------|---------------|
|                  | Weed population before herbicide spraying no/m <sup>2</sup> |                  |              |             | Weed population at 10-15 DAHA no/m <sup>2</sup> |             |                  |              |               |
|                  | Grasses                                                     | Sedges           | BLW          | Total weeds | Grasses                                         |             | Sedges           | BLWs         | Total weeds   |
|                  | Echinocloa colona                                           | Cyperus rotundus | Eclipta alba |             | Echinocloa colona                               | Dinebra     | Cyperus rotundus | Eclipta alba | G+S+Blw       |
| <b>T1</b>        | 28.00(5.32)                                                 | 9.67(3.15)       | 56.67(7.55)  | 94.33(9.73) | 15.33(3.97)                                     | 0.00(0.71)  | 8.67(3.02)       | 47.33(6.91)  | 71.33(8.47)   |
| <b>T2</b>        | 17.00(4.17)                                                 | 5.33(2.31)       | 48.00(6.95)  | 70.33(8.40) | 11.33(3.41)                                     | 0.00(0.71)  | 4.00(1.91)       | 44.67(6.70)  | 60.00(7.76)   |
| <b>T3</b>        | 19.00(4.39)                                                 | 10.67(2.92)      | 47.00(6.88)  | 76.67(8.78) | 10.67(3.34)                                     | 0.00(0.71)  | 2.67(1.44)       | 41.33(6.47)  | 54.67(7.42)   |
| <b>T4</b>        | -                                                           | -                | -            | -           | 21.33(4.60)                                     | 4.00(1.65)  | 2.67(1.44)       | 30.67(5.58)  | 58.67(7.65)   |
| <b>T5</b>        | 21.00(4.62)                                                 | 7.00(2.02)       | 34.67(5.86)  | 62.67(7.94) | 6.00(2.29)                                      | 4.67(2.06)  | 8.67(3.02)       | 32.67(5.69)  | 52.00(7.23)   |
| <b>T6</b>        | 20.00(4.47)                                                 | 12.00(3.43)      | 28.00(5.28)  | 60.00(7.73) | 29.33(5.45)                                     | 15.33(3.89) | 21.33(4.56)      | 66.00(8.15)  | 132.00(11.47) |
| <b>T7</b>        | 14.67(3.89)                                                 | 4.00(2.06)       | 26.00(5.15)  | 44.67(6.72) | 2.00(1.47)                                      | 0.00(0.71)  | 2.00(1.32)       | 4.00(1.91)   | 8.00(2.83)    |
| <b>Exp. mean</b> | 4.48                                                        | 2.65             | 6.28         | 8.22        | 3.5                                             | 1.49        | 2.39             | 5.92         | 7.55          |
| <b>CD(0.05)</b>  | <b>0.89</b>                                                 | <b>1.76</b>      | <b>1.04</b>  | <b>1.05</b> | <b>1.15</b>                                     | <b>1.41</b> | <b>1.82</b>      | <b>1.24</b>  | <b>1.4</b>    |

\*Values in parentheses are transformed figures.

T1-Thiobencarb @ 4.00 L/ha post-emergence application at 20 DAS

T2-Thiobencarb @ 4.50 L/ha post-emergence application at 20 DAS

T3-Thiobencarb @ 5.00 L/ha post-emergence application at 20 DAS

T4-Standard check(Recommended herbicide)pyrazosulfuron ethyl 10 % @ 200 g/ha. Pre-emergence application

T5-Standard check(Recommended herbicide) Bispyribacsodium 10 % @ 300 ml/ha. Post-emergence application

T6- Control (weedy)

T7- Hand weeding twice

Table-4.3.1: Contd.

| Treatments       | ICAR-IIRR                                      |             |                  |                        |               |              |               |
|------------------|------------------------------------------------|-------------|------------------|------------------------|---------------|--------------|---------------|
|                  | Weed population at 45-50 DAS no/m <sup>2</sup> |             |                  |                        |               |              |               |
|                  | Grasses                                        |             | Sedges           |                        | BLWs          |              | Total weeds   |
|                  | (Echinocloa colona)                            | Denibra     | Cyperus rotundus | Fimbristylis acuminata | Alternanthera | Eclipta alba | G+S+Blw       |
| <b>T1</b>        | 18.67(4.34)                                    | 0.00(0.71)  | 17.33(4.18)      | 0.00(0.71)             | 4.00(1.91)    | 49.33(7.04)  | 89.33(9.47)   |
| <b>T2</b>        | 14.67(3.89)                                    | 0.00(0.71)  | 6.67(2.39)       | 0.00(0.71)             | 1.33(1.18)    | 48.00(6.96)  | 70.67(8.44)   |
| <b>T3</b>        | 12.00(3.39)                                    | 0.00(0.71)  | 4.00(1.91)       | 1.33(1.18)             | 0.00(0.71)    | 42.67(6.56)  | 60.00(7.78)   |
| <b>T4</b>        | 24.00(4.90)                                    | 5.33(2.12)  | 6.67(2.39)       | 2.67(1.44)             | 8.00(2.86)    | 28.00(5.25)  | 74.67(8.65)   |
| <b>T5</b>        | 6.67(2.39)                                     | 4.00(1.91)  | 16.00(3.99)      | 6.67(2.39)             | 1.33(1.18)    | 26.67(5.17)  | 61.33(7.82)   |
| <b>T6</b>        | 32.00(5.67)                                    | 18.67(4.31) | 46.67(6.81)      | 12.00(3.10)            | 10.67(2.94)   | 66.67(8.06)  | 186.67(13.66) |
| <b>T7</b>        | 4.00(1.91)                                     | 2.67(1.44)  | 4.00(1.91)       | 5.33(1.83)             | 0.00(0.71)    | 5.33(1.83)   | 21.33(4.45)   |
| <b>Exp. mean</b> | 3.79                                           | 1.7         | 3.37             | 1.62                   | 1.64          | 5.84         | 8.61          |
| <b>CD(0.05)</b>  | <b>1.76</b>                                    | <b>1.67</b> | <b>1.81</b>      | <b>2.47</b>            | <b>1.34</b>   | <b>2.12</b>  | <b>1.7</b>    |

\*Values in parentheses are transformed figures.

T1-Thiobencarb @ 4.00 L/ha post-emergence application at 20 DAS

T2-Thiobencarb @ 4.50 L/ha post-emergence application at 20 DAS

T3-Thiobencarb @ 5.00 L/ha post-emergence application at 20 DAS

T4-Standard check(Recommended herbicide)pyrazosulfuron ethyl 10 % @ 200 g/ha. Pre-emergence application

T5-Standard check(Recommended herbicide) Bispyribacsodium 10 % @ 300 ml/ha. Post-emergence application

T6- Control (weedy)

T7- Hand weeding twice

Table-4.3.1: Contd.

| Treatments       | ICAR-IIRR                                                      |             |             |             |                                                 |             |             |               |                                                |             |             |               |
|------------------|----------------------------------------------------------------|-------------|-------------|-------------|-------------------------------------------------|-------------|-------------|---------------|------------------------------------------------|-------------|-------------|---------------|
|                  | Weed population at before herbicide spraying no/m <sup>2</sup> |             |             |             | Weed population at 10-15 DAHA no/m <sup>2</sup> |             |             |               | Weed population at 45-50 DAS no/m <sup>2</sup> |             |             |               |
|                  | Grasses                                                        | Sedges      | BLW         | Total weeds | Grasses                                         | Sedges      | BLW         | Total weeds   | Grasses                                        | Sedges      | BLW         | Total weeds   |
| <b>T1</b>        | 28.00(5.32)                                                    | 9.67(3.15)  | 56.67(7.55) | 94.33(9.73) | 15.33(3.97)                                     | 8.67(3.02)  | 47.33(6.91) | 71.33(8.47)   | 18.67(4.34)                                    | 17.33(4.18) | 53.33(7.32) | 89.33(9.47)   |
| <b>T2</b>        | 17.00(4.17)                                                    | 5.33(2.31)  | 48.00(6.95) | 70.33(8.40) | 11.33(3.41)                                     | 4.00(1.91)  | 44.67(6.70) | 60.00(7.76)   | 14.67(3.89)                                    | 6.67(2.39)  | 49.33(7.06) | 70.67(8.44)   |
| <b>T3</b>        | 19.00(4.39)                                                    | 10.67(2.92) | 47.00(6.88) | 76.67(8.78) | 10.67(3.34)                                     | 2.67(1.44)  | 41.33(6.47) | 54.67(7.42)   | 12.00(3.39)                                    | 5.33(2.39)  | 42.67(6.56) | 60.00(7.78)   |
| <b>T4</b>        | -                                                              | -           | -           | -           | 25.33(4.93)                                     | 2.67(1.44)  | 30.67(5.58) | 58.67(7.65)   | 29.33(5.38)                                    | 9.33(2.77)  | 36.00(6.00) | 74.67(8.65)   |
| <b>T5</b>        | 21.00(4.62)                                                    | 7.00(2.02)  | 34.67(5.86) | 62.67(7.94) | 10.67(3.32)                                     | 8.67(3.02)  | 32.67(5.69) | 52.00(7.23)   | 10.67(3.24)                                    | 22.67(4.76) | 28.00(5.30) | 61.33(7.82)   |
| <b>T6</b>        | 20.00(4.47)                                                    | 12.00(3.43) | 28.00(5.28) | 60.00(7.73) | 44.67(6.69)                                     | 21.33(4.56) | 66.00(8.15) | 132.00(11.47) | 50.67(7.14)                                    | 58.67(7.57) | 77.33(8.76) | 186.67(13.66) |
| <b>T7</b>        | 14.67(3.89)                                                    | 4.00(2.06)  | 26.00(5.15) | 44.67(6.72) | 2.00(1.47)                                      | 2.00(1.32)  | 4.00(1.91)  | 8.00(2.83)    | 6.67(2.65)                                     | 9.33(2.72)  | 5.33(1.83)  | 21.33(4.45)   |
| <b>Exp. mean</b> | 4.48                                                           | 2.65        | 6.28        | 8.22        | 3.87                                            | 2.39        | 5.92        | 7.55          | 4.29                                           | 3.82        | 6.12        | 8.61          |
| <b>CD(0.05)</b>  | <b>0.89</b>                                                    | <b>1.76</b> | <b>1.04</b> | <b>1.05</b> | <b>1.03</b>                                     | <b>1.82</b> | <b>1.24</b> | <b>1.4</b>    | <b>1.54</b>                                    | <b>2.24</b> | <b>1.9</b>  | <b>1.7</b>    |

\*Values in parentheses are transformed figures.

T1-Thiobencarb @ 4.00 L/ha post-emergence application at 20 DAS

T2-Thiobencarb @ 4.50 L/ha post-emergence application at 20 DAS

T3-Thiobencarb @ 5.00 L/ha post-emergence application at 20 DAS

T4-Standard check(Recommended herbicide)pyrazosulfuron ethyl 10 % @ 200 g/ha. Pre-emergence application

T5-Standard check(Recommended herbicide) Bispyribacsodium 10 % @ 300 ml/ha. Post-emergence application

T6- Control (weedy)

T7- Hand weeding twice

Table-4.3.1: Contd.

| Treatments       | MALAN                                                          |             |             |             |                                                 |             |             |               |                                                |             |             |               |
|------------------|----------------------------------------------------------------|-------------|-------------|-------------|-------------------------------------------------|-------------|-------------|---------------|------------------------------------------------|-------------|-------------|---------------|
|                  | Weed population at before herbicide spraying no/m <sup>2</sup> |             |             |             | Weed population at 10-15 DAHA no/m <sup>2</sup> |             |             |               | Weed population at 45-50 DAS no/m <sup>2</sup> |             |             |               |
|                  | Grasses                                                        | Sedges      | BLW         | Total weeds | Grasses                                         | Sedges      | BLW         | Total weeds   | Grasses                                        | Sedges      | BLW         | Total weeds   |
| <b>T1</b>        | 32.33(5.70)                                                    | 23.67(4.91) | 29.67(5.48) | 85.67(9.28) | 16.00(4.02)                                     | 13.67(3.73) | 21.00(4.61) | 50.67(7.11)   | 17.00(4.17)                                    | 16.33(4.07) | 24.00(4.95) | 57.33(7.60)   |
| <b>T2</b>        | 32.33(5.72)                                                    | 23.00(4.83) | 33.33(5.80) | 88.67(9.42) | 16.00(4.06)                                     | 13.67(3.75) | 20.33(4.55) | 50.00(7.10)   | 19.33(4.45)                                    | 17.67(4.25) | 19.67(4.48) | 56.67(7.56)   |
| <b>T3</b>        | 33.33(5.80)                                                    | 23.33(4.85) | 38.33(6.21) | 95.00(9.76) | 13.67(3.76)                                     | 11.33(3.42) | 14.33(3.84) | 39.33(6.31)   | 16.00(4.06)                                    | 16.00(4.06) | 15.33(3.97) | 47.33(6.92)   |
| <b>T4</b>        | 35.33(5.97)                                                    | 24.33(4.96) | 31.33(5.64) | 91.00(9.56) | 19.00(4.41)                                     | 13.67(3.75) | 14.00(3.80) | 46.67(6.87)   | 22.67(4.80)                                    | 19.00(4.41) | 13.00(3.66) | 54.67(7.42)   |
| <b>T5</b>        | 31.33(5.61)                                                    | 21.33(4.65) | 32.33(5.72) | 85.00(9.22) | 10.67(3.33)                                     | 8.33(2.93)  | 6.67(2.62)  | 25.67(5.07)   | 15.00(3.92)                                    | 10.67(3.31) | 10.33(3.22) | 36.00(5.99)   |
| <b>T6</b>        | 36.67(6.08)                                                    | 21.33(4.62) | 26.67(5.20) | 84.67(9.20) | 53.00(7.30)                                     | 32.67(5.72) | 38.00(6.19) | 123.67(11.11) | 64.33(8.04)                                    | 43.33(6.58) | 45.33(6.76) | 153.00(12.36) |
| <b>T7</b>        | 30.67(5.58)                                                    | 19.67(4.48) | 23.67(4.86) | 74.00(8.60) | 3.67(2.00)                                      | 2.00(1.56)  | 4.33(2.12)  | 10.00(3.18)   | 5.00(2.34)                                     | 5.67(2.46)  | 8.67(3.01)  | 19.33(4.45)   |
| <b>Exp. mean</b> | 5.78                                                           | 4.76        | 5.56        | 9.29        | 4.13                                            | 3.55        | 3.96        | 6.68          | 4.54                                           | 4.16        | 4.29        | 7.47          |
| <b>CD(0.05)</b>  | 1.02                                                           | 1.14        | 0.98        | 1.4         | 0.74                                            | 0.98        | 1.01        | 1.31          | 0.64                                           | 0.91        | 0.85        | 0.93          |

\*Values in parentheses are transformed figures.

T1-Thiobencarb @ 4.00 L/ha post-emergence application at 20 DAS

T2-Thiobencarb @ 4.50 L/ha post-emergence application at 20 DAS

T3-Thiobencarb @ 5.00 L/ha post-emergence application at 20 DAS

T4-Standard check(Recommended herbicide)pyrazosulfuron ethyl 10 % @ 200 g/ha. Pre-emergence application

T5-Standard check(Recommended herbicide) Bispyribacsodium 10 % @ 300 ml/ha. Post-emergence application

T6- Control (weedy)

T7- Hand weeding twice

Table-4.3.1: Contd.

| Treatments       | PUDUCHERRY                                                     |             |             |             |                                                 |            |            |             |                                                |             |             |             |
|------------------|----------------------------------------------------------------|-------------|-------------|-------------|-------------------------------------------------|------------|------------|-------------|------------------------------------------------|-------------|-------------|-------------|
|                  | Weed population at before herbicide spraying no/m <sup>2</sup> |             |             |             | Weed population at 10-15 DAHA no/m <sup>2</sup> |            |            |             | Weed population at 45-50 DAS no/m <sup>2</sup> |             |             |             |
|                  | Grasses                                                        | Sedges      | BLW         | Total weeds | Grasses                                         | Sedges     | BLW        | Total weeds | Grasses                                        | Sedges      | BLW         | Total weeds |
| <b>T1</b>        | 26.48(5.19)                                                    | 11.18(3.42) | 13.12(3.69) | 50.78(7.16) | 8.46(2.99)                                      | 4.04(2.13) | 4.37(2.21) | 16.87(4.17) | 16.01(4.06)                                    | 6.06(2.56)  | 5.80(2.51)  | 27.86(5.33) |
| <b>T2</b>        | 25.13(5.06)                                                    | 10.75(3.35) | 12.33(3.58) | 48.21(6.98) | 7.30(2.79)                                      | 3.86(2.09) | 4.11(2.15) | 15.26(3.97) | 15.30(3.97)                                    | 5.79(2.51)  | 5.04(2.35)  | 26.13(5.16) |
| <b>T3</b>        | 23.24(4.87)                                                    | 9.56(3.17)  | 11.05(3.40) | 43.85(6.66) | 5.26(2.40)                                      | 3.50(2.00) | 3.32(1.95) | 12.08(3.55) | 12.71(3.64)                                    | 4.73(2.29)  | 4.19(2.17)  | 21.64(4.71) |
| <b>T4</b>        | 12.54(3.61)                                                    | 5.26(2.40)  | 6.19(2.59)  | 23.99(4.95) | 4.21(2.17)                                      | 1.91(1.55) | 7.32(2.80) | 13.44(3.73) | 26.49(5.19)                                    | 9.90(3.22)  | 8.99(3.08)  | 45.37(6.77) |
| <b>T5</b>        | 25.35(5.08)                                                    | 10.78(3.36) | 12.50(3.61) | 48.63(7.01) | 6.87(2.71)                                      | 3.88(2.09) | 3.74(2.06) | 14.49(3.87) | 13.43(3.73)                                    | 5.09(2.36)  | 4.66(2.27)  | 23.18(4.87) |
| <b>T6</b>        | 30.81(5.59)                                                    | 13.09(3.69) | 15.35(3.98) | 59.25(7.73) | 37.88(6.19)                                     | 4.71(2.28) | 9.60(3.18) | 52.18(7.26) | 34.74(5.94)                                    | 13.11(3.69) | 12.99(3.67) | 60.85(7.83) |
| <b>T7</b>        | 20.33(4.56)                                                    | 8.59(3.01)  | 10.08(3.25) | 39.00(6.28) | 5.13(2.37)                                      | 3.10(1.90) | 2.07(1.60) | 10.31(3.29) | 10.27(3.28)                                    | 3.89(2.09)  | 3.56(2.02)  | 17.72(4.27) |
| <b>Exp. mean</b> | 4.85                                                           | 3.2         | 3.44        | 6.68        | 3.09                                            | 2.01       | 2.28       | 4.26        | 4.26                                           | 2.68        | 2.58        | 5.56        |
| <b>CD(0.05)</b>  | 0.07                                                           | 0.04        | 0.05        | 0.09        | 0.07                                            | 0.03       | 0.04       | 0.08        | 0.08                                           | 0.05        | 0.06        | 0.11        |

\*Values in parentheses are transformed figures.

T1-Thiobencarb @ 4.00 L/ha post-emergence application at 20 DAS

T2-Thiobencarb @ 4.50 L/ha post-emergence application at 20 DAS

T3-Thiobencarb @ 5.00 L/ha post-emergence application at 20 DAS

T4-Standard check(Recommended herbicide)pyrazosulfuron ethyl 10 % @ 200 g/ha. Pre-emergence application

T5-Standard check(Recommended herbicide) Bispyribacsodium 10 % @ 300 ml/ha. Post-emergence application

T6- Control (weedy)

T7- Hand weeding twice

Table-4.3.1: Contd.

| Treatments       | RAIPUR                                                         |               |             |               |                                                 |               |             |               |
|------------------|----------------------------------------------------------------|---------------|-------------|---------------|-------------------------------------------------|---------------|-------------|---------------|
|                  | Weed population at before herbicide spraying no/m <sup>2</sup> |               |             |               | Weed population at 10-15 DAHA no/m <sup>2</sup> |               |             |               |
|                  | Grasses                                                        | Sedges        | BLW         | Total weeds   | Grasses                                         | Sedges        | BLW         | Total weeds   |
| <b>T1</b>        | 37.53(6.14)                                                    | 167.43(12.94) | 9.27(3.11)  | 214.23(14.64) | 32.93(5.76)                                     | 121.10(11.02) | 11.70(3.48) | 165.73(12.89) |
| <b>T2</b>        | 36.93(6.11)                                                    | 169.73(13.04) | 10.10(3.23) | 216.77(14.74) | 26.53(5.20)                                     | 87.67(9.33)   | 5.73(2.47)  | 119.93(10.94) |
| <b>T3</b>        | 40.90(6.41)                                                    | 169.13(13.02) | 9.40(3.12)  | 219.43(14.82) | 6.13(2.55)                                      | 88.40(9.43)   | 4.17(2.15)  | 98.70(9.96)   |
| <b>T4</b>        | -                                                              | -             | -           | -             | 28.67(5.38)                                     | 79.97(8.95)   | 0.90(1.07)  | 109.53(10.48) |
| <b>T5</b>        | 38.53(6.24)                                                    | 167.47(12.95) | 9.60(3.16)  | 215.60(14.69) | 11.97(3.52)                                     | 138.23(11.75) | 9.17(3.10)  | 159.37(12.63) |
| <b>T6</b>        | -                                                              | -             | -           | -             | 34.23(5.87)                                     | 190.80(13.83) | 12.20(3.56) | 237.23(15.41) |
| <b>T7</b>        | -                                                              | -             | -           | -             | 20.23(4.53)                                     | 26.77(5.18)   | 3.13(1.90)  | 50.13(7.11)   |
| <b>Exp. mean</b> | 6.75                                                           | 12.99         | 3.16        | 14.72         | 4.69                                            | 9.93          | 2.53        | 11.35         |
| <b>CD(0.05)</b>  | 1.17                                                           | 1.29          | 0.92        | 1.31          | 0.89                                            | 1.49          | 0.66        | 1.16          |

\*Values in parentheses are transformed figures.

T1-Thiobencarb @ 4.00 L/ha post-emergence application at 20 DAS

T2-Thiobencarb @ 4.50 L/ha post-emergence application at 20 DAS

T3-Thiobencarb @ 5.00 L/ha post-emergence application at 20 DAS

T4-Standard check(Recommended herbicide)pyrazosulfuron ethyl 10 % @ 200 g/ha. Pre-emergence application

T5-Standard check(Recommended herbicide) Bispyribacsodium 10 % @ 300 ml/ha. Post-emergence application

T6- Control (weedy)

T7- Hand weeding twice

Table-4.3.1: Contd.

| Treatments       | IIRR                                                           |                  |              |             |                                                 |             |                  |              |             |                                                |             |                  |                        |               |              |              |
|------------------|----------------------------------------------------------------|------------------|--------------|-------------|-------------------------------------------------|-------------|------------------|--------------|-------------|------------------------------------------------|-------------|------------------|------------------------|---------------|--------------|--------------|
|                  | Weed dry biomass at before herbicide spraying g/m <sup>2</sup> |                  |              |             | Weed dry biomass at 10-15 DAHA g/m <sup>2</sup> |             |                  |              |             | Weed dry biomass at 45-50 DAS g/m <sup>2</sup> |             |                  |                        |               |              |              |
|                  | Grasses                                                        | Sedges           | BLW          | Total weeds | Grasses                                         |             | Sedges           | BLWs         | Total weeds | Grasses                                        |             | Sedges           |                        | BLWs          |              | Total weeds  |
|                  | Echinocloa colona                                              | Cyperus rotundus | Eclipta alba |             | Echinocloa colona                               | Dinebra     | Cyperus rotundus | Eclipta alba | G+S+Blw     | (Echinocloa colona)                            | Denibra     | Cyperus rotundus | Fimbristylis acuminata | Alternanthera | Eclipta alba | G+S+Blw      |
| <b>T1</b>        | 0.47                                                           | 2.04             | 0.16         | 2.67        | 2.11                                            | 0.00        | 1.21             | 4.84         | 8.16        | 12.23                                          | 0.00        | 15.83            | 0.00                   | 4.32          | 46.26        | 78.63        |
| <b>T2</b>        | 0.49                                                           | 0.61             | 0.30         | 1.40        | 2.07                                            | 0.00        | 0.74             | 4.22         | 7.04        | 11.48                                          | 0.00        | 12.35            | 0.00                   | 2.07          | 41.27        | 67.16        |
| <b>T3</b>        | 0.74                                                           | 0.92             | 0.30         | 1.96        | 1.82                                            | 0.00        | 0.72             | 3.68         | 6.22        | 10.04                                          | 0.00        | 11.30            | 0.28                   | 0.00          | 16.28        | 37.90        |
| <b>T4</b>        | -                                                              | -                | -            | -           | 6.87                                            | 0.29        | 1.23             | 1.34         | 9.74        | 11.03                                          | 2.63        | 12.00            | 0.17                   | 4.59          | 19.71        | 50.12        |
| <b>T5</b>        | 0.77                                                           | 0.53             | 0.40         | 1.70        | 1.43                                            | 0.45        | 1.41             | 2.50         | 5.79        | 4.25                                           | 2.49        | 4.37             | 4.87                   | 1.49          | 10.14        | 27.63        |
| <b>T6</b>        | 0.83                                                           | 1.40             | 0.33         | 2.56        | 15.16                                           | 3.48        | 4.89             | 8.12         | 31.65       | 16.40                                          | 7.33        | 21.33            | 17.32                  | 15.52         | 44.55        | 122.45       |
| <b>T7</b>        | 0.28                                                           | 0.31             | 0.21         | 0.80        | 0.45                                            | 0.00        | 0.56             | 1.65         | 2.67        | 2.71                                           | 2.07        | 2.67             | 0.00                   | 0.00          | 1.61         | 9.05         |
| <b>Exp. mean</b> | 0.6                                                            | 0.97             | 0.28         | 1.85        | 4.27                                            | 0.60        | 1.54             | 3.76         | 10.18       | 9.73                                           | 2.07        | 11.41            | 3.23                   | 4.00          | 25.69        | 56.13        |
| <b>CD(0.05)</b>  | <b>0.57</b>                                                    | <b>1.01</b>      | <b>0.43</b>  | <b>1.15</b> | <b>3.65</b>                                     | <b>1.04</b> | <b>2.03</b>      | <b>1.83</b>  | <b>4.84</b> | <b>5.68</b>                                    | <b>6.71</b> | <b>6.60</b>      | <b>6.80</b>            | <b>9.06</b>   | <b>14.06</b> | <b>16.97</b> |

T1-Thiobencarb @ 4.00 L/ha post-emergence application at 20 DAS

T2-Thiobencarb @ 4.50 L/ha post-emergence application at 20 DAS

T3-Thiobencarb @ 5.00 L/ha post-emergence application at 20 DAS

T4-Standard check(Recommended herbicide)pyrazosulfuron ethyl 10 % @ 200 g/ha. Pre-emergence application

T5-Standard check(Recommended herbicide) Bispyribacsodium 10 % @ 300 ml/ha. Post-emergence application

T6- Control (weedy)

T7- Hand weeding twice

Table-4.3.1: Contd.

| Treatments       | IIRR                                                           |             |             |             |                                                 |             |             |             |                                                |             |              |              |
|------------------|----------------------------------------------------------------|-------------|-------------|-------------|-------------------------------------------------|-------------|-------------|-------------|------------------------------------------------|-------------|--------------|--------------|
|                  | Weed dry biomass at before herbicide spraying g/m <sup>2</sup> |             |             |             | Weed dry biomass at 10-15 DAHA g/m <sup>2</sup> |             |             |             | Weed dry biomass at 45-50 DAS g/m <sup>2</sup> |             |              |              |
|                  | Grasses                                                        | Sedges      | BLW         | Total weeds | Grasses                                         | Sedges      | BLW         | Total weeds | Grasses                                        | Sedges      | BLW          | Total weeds  |
| <b>T1</b>        | 0.47                                                           | 2.04        | 0.16        | 2.67        | 2.11                                            | 1.21        | 4.84        | 8.16        | 12.23                                          | 15.83       | 50.58        | 78.63        |
| <b>T2</b>        | 0.49                                                           | 0.61        | 0.30        | 1.40        | 2.07                                            | 0.74        | 4.22        | 7.04        | 11.48                                          | 12.35       | 43.33        | 67.16        |
| <b>T3</b>        | 0.74                                                           | 0.92        | 0.30        | 1.96        | 1.82                                            | 0.72        | 3.68        | 6.22        | 10.04                                          | 11.58       | 16.28        | 37.90        |
| <b>T4</b>        | -                                                              | -           | -           | -           | 7.17                                            | 1.23        | 1.34        | 9.74        | 13.65                                          | 12.17       | 24.29        | 50.12        |
| <b>T5</b>        | 0.77                                                           | 0.53        | 0.40        | 1.70        | 1.88                                            | 1.41        | 2.50        | 5.79        | 6.75                                           | 9.25        | 11.63        | 27.63        |
| <b>T6</b>        | 0.83                                                           | 1.40        | 0.33        | 2.56        | 18.64                                           | 4.89        | 8.12        | 31.65       | 23.73                                          | 38.65       | 60.07        | 122.45       |
| <b>T7</b>        | 0.28                                                           | 0.31        | 0.21        | 0.80        | 0.45                                            | 0.56        | 1.65        | 2.67        | 4.77                                           | 2.67        | 1.61         | 9.05         |
| <b>Exp. mean</b> | 0.6                                                            | 0.97        | 0.28        | 1.85        | 4.88                                            | 1.54        | 3.76        | 10.18       | 11.81                                          | 14.64       | 29.69        | 56.13        |
| <b>CD(0.05)</b>  | <b>0.57</b>                                                    | <b>1.01</b> | <b>0.43</b> | <b>1.15</b> | <b>4.46</b>                                     | <b>2.03</b> | <b>1.83</b> | <b>4.84</b> | <b>8.87</b>                                    | <b>9.28</b> | <b>18.63</b> | <b>16.97</b> |

T1-Thiobencarb @ 4.00 L/ha post-emergence application at 20 DAS

T2-Thiobencarb @ 4.50 L/ha post-emergence application at 20 DAS

T3-Thiobencarb @ 5.00 L/ha post-emergence application at 20 DAS

T4-Standard check(Recommended herbicide)pyrazosulfuron ethyl 10 % @ 200 g/ha. Pre-emergence application

T5-Standard check(Recommended herbicide) Bispyribacsodium 10 % @ 300 ml/ha. Post-emergence application

T6- Control (weedy)

T7- Hand weeding twice

Table-4.3.1: Contd.

| Treatments       | MALAN                                                          |        |       |             |                                                 |        |       |             |                                                |        |       |             |
|------------------|----------------------------------------------------------------|--------|-------|-------------|-------------------------------------------------|--------|-------|-------------|------------------------------------------------|--------|-------|-------------|
|                  | Weed dry biomass at before herbicide spraying g/m <sup>2</sup> |        |       |             | Weed dry biomass at 10-15 DAHA g/m <sup>2</sup> |        |       |             | Weed dry biomass at 45-50 DAS g/m <sup>2</sup> |        |       |             |
|                  | Grasses                                                        | Sedges | BLW   | Total weeds | Grasses                                         | Sedges | BLW   | Total weeds | Grasses                                        | Sedges | BLW   | Total weeds |
| <b>T1</b>        | 29.27                                                          | 20.70  | 26.83 | 76.80       | 11.90                                           | 11.27  | 18.33 | 41.50       | 13.80                                          | 13.77  | 20.67 | 48.23       |
| <b>T2</b>        | 28.37                                                          | 20.90  | 30.67 | 79.93       | 13.03                                           | 10.93  | 17.40 | 41.37       | 16.07                                          | 14.87  | 16.50 | 47.43       |
| <b>T3</b>        | 33.27                                                          | 21.03  | 35.60 | 89.90       | 10.43                                           | 8.47   | 11.10 | 30.00       | 13.33                                          | 13.60  | 12.77 | 39.70       |
| <b>T4</b>        | 32.13                                                          | 20.73  | 28.63 | 81.50       | 16.47                                           | 10.80  | 11.43 | 38.70       | 19.37                                          | 15.97  | 10.07 | 45.40       |
| <b>T5</b>        | 24.80                                                          | 18.77  | 29.83 | 73.40       | 8.03                                            | 5.87   | 4.27  | 18.17       | 13.40                                          | 7.87   | 7.37  | 28.63       |
| <b>T6</b>        | 32.47                                                          | 18.90  | 23.83 | 75.20       | 47.50                                           | 29.90  | 35.13 | 112.53      | 59.87                                          | 40.53  | 42.23 | 142.63      |
| <b>T7</b>        | 27.03                                                          | 16.93  | 20.63 | 64.60       | 1.97                                            | 1.17   | 2.47  | 5.60        | 4.17                                           | 3.27   | 5.60  | 13.03       |
| <b>Exp. mean</b> | 29.62                                                          | 19.71  | 28    | 77.33       | 15.62                                           | 11.20  | 14.30 | 41.12       | 20                                             | 15.70  | 16.46 | 52.15       |
| <b>CD(0.05)</b>  | 11.77                                                          | 11     | 10.84 | 25.44       | 7.13                                            | 8.09   | 7.51  | 19.63       | 7.06                                           | 9.99   | 6.44  | 18.38       |

T1-Thiobencarb @ 4.00 L/ha post-emergence application at 20 DAS

T2-Thiobencarb @ 4.50 L/ha post-emergence application at 20 DAS

T3-Thiobencarb @ 5.00 L/ha post-emergence application at 20 DAS

T4-Standard check(Recommended herbicide)pyrazosulfuron ethyl 10 % @ 200 g/ha. Pre-emergence application

T5-Standard check(Recommended herbicide) Bispyribacsodium 10 % @ 300 ml/ha. Post-emergence application

T6- Control (weedy)

T7- Hand weeding twice

Table-4.3.1: Contd.

| Treatments       | PUDUCHERRY                                                     |        |      |             |                                                 |        |      |             |                                                |        |      |             |
|------------------|----------------------------------------------------------------|--------|------|-------------|-------------------------------------------------|--------|------|-------------|------------------------------------------------|--------|------|-------------|
|                  | Weed dry biomass at before herbicide spraying g/m <sup>2</sup> |        |      |             | Weed dry biomass at 10-15 DAHA g/m <sup>2</sup> |        |      |             | Weed dry biomass at 45-50 DAS g/m <sup>2</sup> |        |      |             |
|                  | Grasses                                                        | Sedges | BLW  | Total weeds | Grasses                                         | Sedges | BLW  | Total weeds | Grasses                                        | Sedges | BLW  | Total weeds |
| <b>T1</b>        | 7.84                                                           | 3.61   | 5.56 | 17.01       | 2.83                                            | 1.48   | 1.53 | 5.84        | 5.00                                           | 2.29   | 2.28 | 9.58        |
| <b>T2</b>        | 7.49                                                           | 3.47   | 5.22 | 16.18       | 2.44                                            | 1.42   | 1.51 | 5.37        | 4.78                                           | 2.19   | 1.99 | 8.97        |
| <b>T3</b>        | 6.79                                                           | 3.08   | 4.68 | 14.55       | 1.71                                            | 1.26   | 1.2  | 4.17        | 3.97                                           | 1.76   | 1.61 | 7.34        |
| <b>T4</b>        | 3.7                                                            | 3.69   | 2.62 | 10.01       | 1.39                                            | 0.69   | 2.6  | 4.68        | 8.28                                           | 3.70   | 3.52 | 15.50       |
| <b>T5</b>        | 7.53                                                           | 3.37   | 5.3  | 16.2        | 2.3                                             | 1.42   | 1.43 | 5.15        | 4.20                                           | 1.93   | 1.79 | 7.91        |
| <b>T6</b>        | 9.15                                                           | 4.22   | 6.51 | 19.88       | 12.63                                           | 1.73   | 3.49 | 17.85       | 10.86                                          | 4.95   | 5.11 | 20.91       |
| <b>T7</b>        | 6.02                                                           | 2.77   | 4.27 | 13.06       | 1.63                                            | 1.14   | 0.67 | 3.44        | 3.21                                           | 1.47   | 1.40 | 6.08        |
| <b>Exp. mean</b> | 6.93                                                           | 3.46   | 4.88 | 15.27       | 3.56                                            | 1.31   | 1.78 | 6.64        | 5.76                                           | 2.61   | 2.53 | 10.90       |
| <b>CD(0.05)</b>  | 0.22                                                           | 0.14   | 0.16 | 0.49        | 0.33                                            | 0.04   | 0.18 | 0.49        | 0.29                                           | 0.13   | 0.18 | 0.59        |

T1-Thiobencarb @ 4.00 L/ha post-emergence application at 20 DAS

T2-Thiobencarb @ 4.50 L/ha post-emergence application at 20 DAS

T3-Thiobencarb @ 5.00 L/ha post-emergence application at 20 DAS

T4-Standard check(Recommended herbicide)pyrazosulfuron ethyl 10 % @ 200 g/ha. Pre-emergence application

T5-Standard check(Recommended herbicide) Bispyribacsodium 10 % @ 300 ml/ha. Post-emergence application

T6- Control (weedy)

T7- Hand weeding twice

Table-4.3.1: Contd.

| Treatments       | RAIPUR                                                         |        |      |             |                                                 |        |      |             |
|------------------|----------------------------------------------------------------|--------|------|-------------|-------------------------------------------------|--------|------|-------------|
|                  | Weed dry biomass at before herbicide spraying g/m <sup>2</sup> |        |      |             | Weed dry biomass at 10-15 DAHA g/m <sup>2</sup> |        |      |             |
|                  | Grasses                                                        | Sedges | BLW  | Total weeds | Grasses                                         | Sedges | BLW  | Total weeds |
| <b>T1</b>        | 3.04                                                           | 2.15   | 0.98 | 6.17        | 48.87                                           | 28.99  | 1.28 | 79.14       |
| <b>T2</b>        | 3.00                                                           | 2.09   | 0.94 | 6.03        | 34.41                                           | 14.89  | 0.72 | 50.02       |
| <b>T3</b>        | 3.11                                                           | 2.06   | 0.97 | 6.14        | 25.91                                           | 7.14   | 0.43 | 33.48       |
| <b>T4</b>        | -                                                              | -      | -    | -           | 33.2                                            | 11.44  | 0.19 | 44.83       |
| <b>T5</b>        | 3.12                                                           | 2.10   | 0.96 | 6.17        | 15.42                                           | 14.83  | 0.82 | 31.07       |
| <b>T6</b>        | -                                                              | -      | -    | -           | 59.68                                           | 34.92  | 1.95 | 96.55       |
| <b>T7</b>        | -                                                              | -      | -    | -           | 2.64                                            | 6.52   | 0.76 | 9.92        |
| <b>Exp. mean</b> | 3.07                                                           | 1.2    | 0.55 | 6.13        | 31.45                                           | 16.96  | 0.88 | 49.29       |
| <b>CD(0.05)</b>  | 0.54                                                           | 0.34   | 0.15 | 0.72        | 8.06                                            | 5.72   | 0.46 | 6.16        |

T1-Thiobencarb @ 4.00 L/ha post-emergence application at 20 DAS

T2-Thiobencarb @ 4.50 L/ha post-emergence application at 20 DAS

T3-Thiobencarb @ 5.00 L/ha post-emergence application at 20 DAS

T4-Standard check(Recommended herbicide)pyrazosulfuron ethyl 10 % @ 200 g/ha. Pre-emergence application

T5-Standard check(Recommended herbicide) Bispyribacsodium 10 % @ 300 ml/ha. Post-emergence application

T6- Control (weedy)

T7- Hand weeding twice

Table-4.3.1: Contd.

| Treatments | Weed Control Efficiency 10-15 DAHA |       |            |        | Weed Control Efficiency 45-50 DAS |       |            |
|------------|------------------------------------|-------|------------|--------|-----------------------------------|-------|------------|
|            | IIRR                               | Malan | Puducherry | Raipur | IIRR                              | Malan | Puducherry |
| <b>T1</b>  | 74.21                              | 63.12 | 67.28      | 18.03  | 35.78                             | 66.18 | 54.18      |
| <b>T2</b>  | 77.75                              | 63.23 | 69.91      | 48.19  | 45.15                             | 66.74 | 57.10      |
| <b>T3</b>  | 80.34                              | 73.34 | 76.63      | 65.32  | 69.04                             | 72.16 | 64.89      |
| <b>T4</b>  | 69.22                              | 65.6  | 73.78      | 53.56  | 59.06                             | 68.16 | 25.87      |
| <b>T5</b>  | 81.7                               | 83.85 | 71.14      | 67.81  | 77.43                             | 79.92 | 62.17      |
| <b>T6</b>  | -                                  | -     | -          | -      | -                                 | -     | -          |
| <b>T7</b>  | 91.56                              | 95.02 | 80.72      | 89.72  | 92.60                             | 90.86 | 70.92      |

T1-Thiobencarb @ 4.00 L/ha post-emergence application at 20 DAS

T2-Thiobencarb @ 4.50 L/ha post-emergence application at 20 DAS

T3-Thiobencarb @ 5.00 L/ha post-emergence application at 20 DAS

T4-Standard check(Recommended herbicide)pyrazosulfuron ethyl 10 % @ 200 g/ha. Pre-emergence application

T5-Standard check(Recommended herbicide) Bispyribacsodium 10 % @ 300 ml/ha. Post-emergence application

T6- Control (weedy)

T7- Hand weeding twice

Table-4.3.1: Effect of different post-emergence herbicides on weed population, dry weight and yield of rice

| Treatments                                                                                              | Total weed population at before herbicide application no/m <sup>2</sup> | Total weed biomass at before herbicide application g/m <sup>2</sup> | Total weed population 15 days after herbicide application no/m <sup>2</sup> | Total weed dry biomass 15 days after herbicide application g/m <sup>2</sup> | Weed control efficiency | Panicles no/m <sup>2</sup> | Grain yield t/ha | Straw yield t/ha | Grain yield loss % |
|---------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|---------------------------------------------------------------------|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------|-------------------------|----------------------------|------------------|------------------|--------------------|
| T1-Thiobencarb @ 4.00 L/ha with 500 L water/ha post-emergence application at 20 DAS                     | 76.92 a                                                                 | 32.15 a                                                             | 76.15 b                                                                     | 33.66 b                                                                     | 47.92                   | 295 c                      | 4.66 c           | 5.90 d           | 17.22              |
| T2-Thiobencarb @ 4.50 L/ha with 500 L water/ha post-emergence application at 20 DAS                     | 69.06 a                                                                 | 32.50 a                                                             | 61.30 b                                                                     | 25.94 c                                                                     | 59.87                   | 307 bc                     | 4.91 c           | 6.11 cd          | 12.78              |
| T3-Thiobencarb @ 5.00 L/ha with 500 L water/ha post-emergence application at 20 DAS                     | 71.83 a                                                                 | 35.47 a                                                             | 51.20 c                                                                     | 18.46 de                                                                    | 71.44                   | 335 a                      | 5.30 b           | 6.47 abc         | 5.86               |
| T4-Standard check(Recommended herbicide)pyrazosulfuron ethyl 10 % @ 200 g/ha. Pre-emergence application | 38.33 c                                                                 | 30.50 a                                                             | 57.08 c                                                                     | 24.48 cd                                                                    | 62.12                   | 298 c                      | 4.93 c           | 6.26 bcd         | 12.43              |
| T5-Standard check(Recommended herbicide) Bispyribacsodium 10 % @ 300 ml/ha. Post-emergence application  | 65.43 ab                                                                | 30.43 a                                                             | 62.88 bc                                                                    | 15.04 e                                                                     | 76.73                   | 327 ab                     | 5.35 ab          | 6.55 ab          | 4.97               |
| T6- Control (weedy)                                                                                     | 67.97 a                                                                 | 32.54 a                                                             | 136.27 a                                                                    | 64.64 a                                                                     | -                       | 244 d                      | 3.84 d           | 5.03 e           | 31.79              |
| T7- Hand weeding twice                                                                                  | 52.55 b                                                                 | 26.15 a                                                             | 19.61 d                                                                     | 5.40 f                                                                      | 91.64                   | 347 a                      | 5.63 a           | 6.83 a           | -                  |
| <b>LSD( P =0.05)</b>                                                                                    | <b>13.51</b>                                                            | <b>11.90</b>                                                        | <b>14.06</b>                                                                | <b>7.09</b>                                                                 |                         | <b>23.17</b>               | <b>0.3</b>       | <b>0.43</b>      |                    |

#### 4.3.2: Long term trial on weed dynamics in mono or double cropped rice system under different establishment methods

With the objective of assessing the weed dynamics in different establishment methods on a long term basis of minimum five years, the trial was initiated during kharif 2019. The trial was conducted at 12 locations viz., **Aduthurai, Chiplima, Gangavathi, Ghaghraghat, Jagdalpur, Malan, Moncompu, Nawagam, Pantnagar, Puducherry, Varanasi and Titabar** in replicated split plot design. Though allotted, the trial was not conducted by **Chinsurah, Cuttack, Karaikal, Kota, Nagina, Prabhani, Pattambi, Pusa, Ranchi, Rewa, Tuljapur**. The treatments consisted of 3 main plots M1 – Mechanised planting/transplanting, M2 – Puddled direct seeding, M3 – Unpuddled dry direct seeding and four sub plots T1 – Weed free, T2 – Weedy check, T3 – Mechanical weeding using weeder and T4 – Chemical weed control of pre and post emergence herbicide application. The results of data on growth parameters, yield attributes, grain yield, weed parameters recorded by the locations are presented in **table 4.3.2**.

The results revealed that the grain yield loss due to weeds ranged from 7.14% at **Puducherry** to 65.26% at **Chiplima** depending on the weed intensity and weed flora distribution. The crop establishment methods did not show any significant difference in grain yield at **Ghaghraghat, Moncompu, Puducherry and Varanasi**. At **Jagdalpur, Nawagam and Puducherry** mechanical transplanting and puddle direct seeding performed on par. At **Aduthurai and Gangavathi**, puddle direct seeding out yielded other systems. At **Chiplima, Malan, Pantnagar and Titabar**, mechanical transplanting was found superior. Among the weed control treatments, weed free condition recorded highest grain yield at all the locations and significantly superior at five locations. Chemical weed control (pre & post emergence herbicide application) and weed free condition showed equal effectiveness at two locations. Both mechanical weeding and chemical weed control exhibited higher grain yields and on par at seven locations. Mechanical weeding was superior over chemical weed control at two locations. The interaction effect of establishment methods and weed control treatments were significant at four locations and non-significant at seven locations. At **Aduthurai and Moncompu**, chemical weed control and mechanical weeding were statistically on par under mechanical transplanting or puddle or unpuddled direct seeding. (**Table: 4.3.2**)

The mean grain yield ranged from 2.75 t/ha at Malan with HPR 1068 to 6.81 t/ha at **Gangavathi** with GNV 10-89 variety. Three locations have recorded mean grain yield of above 5 t/ha. Only three locations have recorded grain yield between 4-5 t/ha and other locations less than 4 t/ha indicating the need to increase productivity by adopting improved agronomic technologies. (**Table: 4.3.2**)

The results of straw yield was reported by seven locations viz., **Chiplima, Gangavathi, Jagdalpur, Malan, Moncompu, Nawagam and Puducherry**. The highest mean straw yield was by GNV 10-89 at Gangavathi 8.3 t/ha followed by **Jagdalpur** and **Puducherry** 7.5 t/ha. The straw yield followed similar trend as that of grain yield. The data

on one of the growth parameters i.e. plant height was reported by two locations viz., **Aduthurai** and **Nawagam**. The plant height was significantly low in weedy check, whereas weed free and chemical weed control treatments were statistically on par. The establishment method of mechanical transplanting recorded maximum and un-puddled direct seeding minimum. (Table: 4.3.2)

The data on important growth parameters i.e. no. of tillers per m<sup>2</sup> at maximum tillering stage and panicle initiation stage were reported by five locations viz., **Jagdarpur, Malan, Moncompu, Pantnagar** and **Puducherry** and eight locations viz., **Aduthurai, Gangavathi, Jagdarpur Malan, Moncompu, Nawagam, Pantnagar** and **Puducherry** respectively. The important finding was, at Jagdarpur puddled direct seeding has contributed to highest tiller number, whereas, mechanical transplanting at **Malan**. At **Moncompu** and **Pantnagar** un-puddled direct seeding recorded highest tiller number. At Aduthurai, Malan, Moncompu and Nawagam, mechanical transplanting has resulted in highest tiller no. at panicle initiation stage. Whereas, at **Gangavathi** and **Jagdarpur**, puddled direct seeding resulted in highest tiller no. and at **Pantnagar**, un-puddled dry direct seeding has contributed to highest tiller number. Among the weed control treatments, no significant difference was recorded at **Gangavathi** and **Jagdarpur**. At **Puducherry**, mechanical weeding resulted in highest no. of tillers, but, at other locations, weed free condition and chemical weed control were statistically on par. (Table: 4.3.2)

The data on yield attributes were reported by all the test locations. The results of data analysis on no. of panicles per sq. metre showed that highest mean panicle no. (500) was reported by **Gangavathi** and lowest of 134 by **Moncompu** followed by **Ghaghrahat**. Establishment methods didnot have significant differences at **Ghaghrahat, Moncompu** and **Puducherry**. Each system has contributed to highest number at two test locations and at **Varanasi**, unpuddled dry direct seeding has resulted in significantly higher no. of panicles. Among the weed control treatments, majority of the locations recorded superiority of weed free condition and chemical weed control. At **Puducherry, Pantnagar**, mechanical weeding was superior. At **Ghaghrahat, Jagdarpur, Nawagam, Pantnagar, Varanasi** and **Titabar**, Chemical weed control and mechanical weeding were comparable.

The results of multi-locational data on panicle weight showed that at **Chiplima, Gangavathi, Jagdarpur, Moncompu** and **Puducherry**, establishment methods had no significant differences. At **Ghaghrahat, Malan, Pantnagar, Varanasi** and **Titabar** mechanical transplanting recorded maximum values of panicle weight. At **Aduthurai**, puddle direct seeding and at **Nawagam**, mechanical transplanting and puddle direct seeding were found comparable and superior over others. (Table: 4.3.2). Most of the locations reported comparable panicle weight with mechanical weeding and chemical weed control.

Among the weed control treatments, weed free condition and mechanical weeding were comparable at **Ghaghrahat, Malan, Moncompu, Nawagam**. Mechanical weeding and chemical weed control were comparable at **Aduthurai, Malan**. Chemical weed control and weed free condition were superior at **Chiplima**.

The data on test weight was reported by nine locations viz., **Aduthurai, Chiplima, Gangavathi, Jagdalpur, Malan, Moncomopu, Nawagam, Pantnagar** and **Puducherry**. At majority of the test locations, establishment methods did not influence the test weight significantly except **Chiplima, Jagdalpur** and **Malan**. But significant differences among weed control treatments were reported by five locations with significantly low test weight under weedy check treatment. (Table: 4.3.2)

The data on one of the weed parameters i.e., weed population (group wise) at three stages viz., vegetative stage, panicle initiation stage and heading stage was reported by all the locations. The results revealed that at **Aduthurai**, grasses were dominant group followed by sedges followed by BLW; at **Gangavathi, Jagdalpur, Moncompu** sedges were dominant group followed by BLW followed by grasses; at **Varanasi** sedges were dominant group followed by grasses and BLW; at **Malan** and **Puducherry** grasses were dominant group followed by BLW followed by grasses; at **Nawagam**, three groups of grasses, sedges and BLW were equally infested the crop. Weed population at all the three critical crop growth stages were reported by **Chiplima, Ghaghraghar, Jagdalpur, Malan, Moncompu, Nawagam, Puducherry** and **Varanasi**. **Aduthurai** and **Titabar** locations reported the data of crop vegetative stage only; **Gangavathi** and **Pantnagar** reported the data of vegetative stage and panicle initiation stage. At **Chiplima, Gangavathi, Ghaghraghat**, grasses group; at **Moncompu** and **Pantnagar**, all the weed groups population showed increased trend from vegetative to heading stage of the crop. At **Moncompu**, sedges and BLW population decreased with crop growth stages. At **Nawagam**, results showed lowest weed population at crop vegetative stage and highest at panicle initiation stage, whereas, at **Puducherry** and **Varanasi** the weed population decreased with advancement in crop growth stages. At **Aduthurai**, grass weed population was significantly low under mechanical transplanting and the sedges, BLWs were not significantly different under different establishment methods. However relatively higher weed population was reported under puddle direct seeding. Among the weed control treatments, chemical weed control recorded lowest population. At **Chiplima**, total weed population was lowest under mechanical transplanting and highest under un-puddled dry direct seeding. At **Gangavathi**, puddle direct seeding and mechanical weeding or chemical weed control recorded lowest weed population of sedges and total. At **Aduthurai, Chiplima, Gangavathi, Ghaghraghat, Jagdalpur, Malan, Nawagam, Pantnagar, Varanasi** and **Titabar**, mechanical transplanting recorded lowest weed population. At **Moncompu**, un-puddled direct seeding recorded lowest weed population followed by puddle direct seeding. At **Aduthurai, Chiplima, Jagdalpur, Malan, Moncompu, Pantnagar** and **Varanasi**, chemical weed control was found superior with lowest weed population. At **Gangavathi, Ghaghraghat, Nawagam** and **Titabar**, both mechanical weeding and chemical weed control were equally effective and statistically on par. At **Puducherry** alone, mechanical weeding was superior over others and reduced weed population. (Table: 4.3.2)

The results of weed biomass data was reported by all locations viz., **Aduthurai, Chiplima, Gangavathi, Ghaghraghat, Jagdalpur, Malan, Moncomou, Nawagam,**

**Pantnagar, Puducherry and Titabar.** With advancement in crop growth stage, similar trend of increase in weed population was reflected at **Chiplima, Ghaghraghat, Moncompu Pantnagar and Varanasi**. At **Gangavathi, Nawagam and Varanasi**, weed biomass was highest at panicle initiation stage. At **Jagdarpur and Malan**, all the crop growth stages showed no major changes in total weed biomass. At **Puducherry**, the weed biomass decreased with advancement of crop growth stages. At majority of the locations, mechanical transplanting resulted in lowest weed biomass except **Gangavathi** where lowest weed biomass was recorded under puddle direct seeding and **Moncompu** with lowest weed biomass in un-puddled direct seeding. Among the weed control treatments, at **Aduthurai, Chiplima, Malan, Moncompu, Pantnagar and Varanasi** chemical weed control has contributed to reduce weed biomass. At **Gangavathi, Ghaghraghat, Jagdarpur, Nawagam and Titabar**, mechanical weeding and chemical weed control were statistically on par and have contributed to lower weed biomass. Only at **Puducherry**, mechanical weeding significantly reduced weed biomass and was superior over others. (Table: 4.3.2)

The first season study of long term trial reveals that at ten out of twelve locations, mechanical transplanting recorded lower weed population, dry weed biomass at maximum tillering, panicle initiation and heading stages of rice crop which in turn reflected in increased crop growth parameters, yield attributes and yield of rice. At two locations, puddle/un-puddled direct seeding has contributed to lower weed population and biomass. Among the weed control treatments, six out of twelve locations reported superiority of chemical weed control by pre and post emergence herbicide application and effective in controlling weeds and more resources were made available for improved crop growth and yield. At four locations, the performance of mechanical weeding using weeder and chemical weed control were comparable. At two locations, mechanical weeding using weeder resulted in significantly higher crop growth, yield attributes and grain yield. The results clearly indicate the necessity of adopting improved agronomic management technologies for reducing weed problems and for improving production potential of puddled and un-puddled direct seeding systems. The performance of mechanical weeding in different establishment methods is indicating the scope and potential of mechanical weeding methods and can be further exploited in view of scarce resources and changing climate.

Table 4.3.2: Summary of data on grain yield, yield attributes &amp; weed parameters from the trial on "Evaluation of long term trial on weed dynamics in mono or double cropped rice system under different establishment methods", Kharif – 2019

| Main Plot           | Sub Plots | Grain yield (t/ha) |          |           |            |              |                     |          |           |
|---------------------|-----------|--------------------|----------|-----------|------------|--------------|---------------------|----------|-----------|
|                     |           | ADT                | CHP      | GNG       | GGT        | JDP          | MLN                 | MNC      | NWG       |
| M1                  | T1        | 5.54               | 5.84     | 7.79      | 4.08       | 6.73         | 3.91                | 3.47     | 6.13      |
|                     | T2        | 1.91               | 2.40     | 3.89      | 2.63       | 5.47         | 1.84                | 0.55     | 3.90      |
|                     | T3        | 5.81               | 3.59     | 6.11      | 3.92       | 6.52         | 2.94                | 3.06     | 5.05      |
|                     | T4        | 5.31               | 5.12     | 5.74      | 3.22       | 6.15         | 3.71                | 2.16     | 5.13      |
| M2                  | T1        | 5.30               | 4.69     | 8.71      | 3.57       | 7.01         | 3.34                | 4.60     | 5.62      |
|                     | T2        | 2.32               | 1.53     | 6.92      | 1.72       | 5.19         | 1.81                | 2.90     | 3.87      |
|                     | T3        | 6.15               | 3.01     | 8.59      | 3.61       | 6.29         | 2.73                | 2.93     | 4.88      |
|                     | T4        | 5.67               | 4.32     | 8.38      | 3.12       | 6.16         | 3.17                | 2.05     | 4.30      |
| M3                  | T1        | 2.83               | 4.50     | 7.38      | 3.50       | 5.40         | 2.85                | 3.93     | 4.36      |
|                     | T2        | 1.89               | 1.28     | 4.09      | 1.58       | 4.63         | 1.61                | 2.63     | 3.34      |
|                     | T3        | 3.08               | 3.36     | 7.22      | 3.27       | 5.39         | 2.33                | 3.75     | 4.26      |
|                     | T4        | 2.65               | 4.00     | 6.84      | 3.06       | 5.45         | 2.76                | 4.03     | 4.42      |
| Mean of Factor-1    |           |                    |          |           |            |              |                     |          |           |
|                     | 1         | 4.64               | 4.24     | 5.88      | 3.46       | 6.22         | 3.10                | 2.31     | 5.05      |
|                     | 2         | 4.86               | 3.39     | 8.15      | 3.00       | 6.16         | 2.76                | 3.12     | 4.67      |
|                     | 3         | 2.61               | 3.29     | 6.38      | 2.85       | 5.22         | 2.39                | 3.59     | 4.10      |
|                     | CD(0.05)  | 0.18               | 0.20     | 0.30      | NS         | 0.26         | 0.14                | NS       | 0.44      |
| Mean of Factor-2    |           |                    |          |           |            |              |                     |          |           |
|                     | 1         | 4.56               | 5.01     | 7.96      | 3.72       | 6.38         | 3.37                | 4.00     | 5.37      |
|                     | 2         | 2.04               | 1.74     | 4.97      | 1.98       | 5.10         | 1.75                | 2.03     | 3.71      |
|                     | 3         | 5.01               | 3.32     | 7.31      | 3.60       | 6.07         | 2.66                | 3.25     | 4.73      |
|                     | 4         | 4.54               | 4.48     | 6.99      | 3.13       | 5.92         | 3.21                | 2.75     | 4.62      |
|                     | CD(0.05)  | 0.34               | 0.34     | 0.36      | 0.50       | 0.60         | 0.13                | 0.79     | 0.56      |
| Interaction         |           |                    |          |           |            |              |                     |          |           |
|                     | M and T   | 0.59               | NS       | 0.63      | NS         | NS           | 0.23                | NS       | NS        |
|                     | T and M   | 0.52               | NS       | 0.57      | NS         | NS           | 0.22                | NS       | NS        |
| Experimental Mean   |           | 4.04               | 3.64     | 6.81      | 3.11       | 5.87         | 2.75                | 3.01     | 4.61      |
| Name of the variety |           | ADT 53             | MTU-1156 | GNV-10-89 | NDR 359    | Durgeswari   | HPR 1068            | UMA      | GAR 14    |
| Soil type           |           |                    |          |           | Sandy loam | Alfisols     | Slity clay loam     |          | clay loam |
| pH                  |           |                    |          | 8.24      | 8.06       | 6.4          | 5.6                 |          | 7.63      |
| EC                  |           |                    |          | 1.12      |            | 0.42         |                     |          |           |
| Applied NPK kg/ha   |           |                    |          |           | 120-60-40  | 120-60-40    | 90:40:40 & 60:30:30 |          |           |
| Available NPK kg/ha |           |                    |          |           |            | 245;14.5;312 | 264;52.6;235        | 90:45:45 |           |

M1- Mechanized transplanting

M2 - Puddled direct seeding

M3 - Un puddled dry direct seeding

T1 – Weed free

T2 – Weedy check

T3 – Mechanical weeding using weeder

T4 – Chemical weed control (pre &amp; post emergence herbicide application)

Table 4.3.2: Contd.

| Main Plot           | Sub Plots | Grain yield (t/ha) |                |              |                      |
|---------------------|-----------|--------------------|----------------|--------------|----------------------|
|                     |           | PNT                | PDC            | TTB          | VAR                  |
| M1                  | T1        | 5.48               | 5.97           | 5.60         | 3.39                 |
|                     | T2        | 3.55               | 5.62           | 3.00         | 2.65                 |
|                     | T3        | 5.11               | 6.28           | 4.68         | 2.94                 |
|                     | T4        | 5.21               | 6.05           | 4.86         | 3.72                 |
| M2                  | T1        | 4.84               | 5.8            | 3.58         | 3.58                 |
|                     | T2        | 2.82               | 5.3            | 2.08         | 0.9                  |
|                     | T3        | 4.48               | 6.19           | 2.68         | 2.9                  |
|                     | T4        | 4.23               | 6.02           | 3.87         | 3.57                 |
| M3                  | T1        | 5.34               | -              | 2.66         | 3.31                 |
|                     | T2        | 2.62               | -              | 1.37         | 1.44                 |
|                     | T3        | 5.29               | -              | 2.36         | 2.93                 |
|                     | T4        | 5.04               | -              | 2.41         | 3.21                 |
| Mean of Factor-1    |           |                    |                |              |                      |
|                     | 1         | 4.84               | 5.98           | 4.54         | 3.18                 |
|                     | 2         | 4.09               | 5.83           | 3.05         | 2.74                 |
|                     | 3         | 4.57               | -              | 2.20         | 2.72                 |
| CD(0.05)            |           | 0.10               | NS             | 0.32         | NS                   |
| Mean of Factor-2    |           |                    |                |              |                      |
|                     | 1         | 5.22               | 3.92           | 3.95         | 3.42                 |
|                     | 2         | 2.99               | 3.64           | 2.15         | 1.66                 |
|                     | 3         | 4.96               | 4.16           | 3.24         | 2.92                 |
|                     | 4         | 4.82               | 4.02           | 3.71         | 3.5                  |
| CD(0.05)            |           | 0.23               | 0.17           | 0.54         | 0.22                 |
| Interaction         |           |                    |                |              |                      |
|                     | M and T   | 0.40               | NS             | NS           | 0.38                 |
|                     | T and M   | 0.35               | NS             | NS           | 0.41                 |
| Experimental Mean   |           | 4.50               | 5.9            | 3.26         | 2.88                 |
| Name of the variety |           |                    | TKM 13         | Swarna Sub-1 | HUR-3022             |
| Soil type           |           | Silt Loam          | Clay           | Clay loam    | Sandy Loam           |
| pH                  |           | 7.8                | 6.04           | 5.2          | 7.32                 |
| EC                  |           |                    |                |              |                      |
| Applied NPK kg/ha   |           | 120:60:40          | 120:40:40      |              | 120:60:60            |
| Available NPK kg/ha |           | 239:21.07:219      | 123.2:9.18:122 | 403:18:231   | 241.153:18.22:189.05 |

M1- Mechanized transplanting

M2 - Puddled direct seeding

M3 - Un puddled dry direct seeding

T1 – Weed free

T2 – Weedy check

T3 – Mechanical weeding using weeder

T4 – Chemical weed control (pre &amp; post emergence herbicide application)

Table 4.3.2: Contd.

| Main Plot         | Sub Plots | Straw yield (t/ha) |       |      |      |      |      |      | Plant height (cm) |        | No of Tillers /m <sup>2</sup> at Max. tillering stage |     |     |       |       |
|-------------------|-----------|--------------------|-------|------|------|------|------|------|-------------------|--------|-------------------------------------------------------|-----|-----|-------|-------|
|                   |           | CHP                | GNG   | JDP  | MLN  | MNC  | NWG  | PDC  | ADT               | NWG    | JDP                                                   | MLN | MNC | PNT   | PDC   |
| M1                | T1        | 6.44               | 9.46  | 8.21 | 5.28 | 7.47 | 7.05 | 7.58 | 155.80            | 120.93 | 397                                                   | 230 | 52  | 134   | 351   |
|                   | T2        | 3.10               | 4.73  | 6.68 | 2.48 | 1.17 | 4.39 | 7.14 | 84.73             | 107.05 | 339                                                   | 152 | 41  | 108   | 357   |
|                   | T3        | 4.17               | 7.42  | 7.95 | 3.97 | 5.99 | 5.81 | 7.98 | 143.73            | 115.20 | 375                                                   | 208 | 51  | 132   | 375   |
|                   | T4        | 5.29               | 6.98  | 7.51 | 5.00 | 4.30 | 5.90 | 7.68 | 150.33            | 114.53 | 364                                                   | 224 | 61  | 136   | 358   |
| M2                | T1        | 5.52               | 10.58 | 8.97 | 4.51 | 5.22 | 6.24 | 7.37 | 144.47            | 109.27 | 404                                                   | 214 | 148 | 156   | 354   |
|                   | T2        | 1.98               | 8.40  | 6.64 | 2.45 | 3.20 | 4.27 | 6.73 | 78.53             | 102.03 | 348                                                   | 144 | 98  | 135   | 329   |
|                   | T3        | 3.35               | 10.44 | 8.05 | 3.68 | 3.77 | 5.41 | 7.86 | 139.27            | 106.99 | 391                                                   | 205 | 80  | 161   | 383   |
|                   | T4        | 4.94               | 10.14 | 7.88 | 4.29 | 2.58 | 4.78 | 7.64 | 145.80            | 106.58 | 397                                                   | 206 | 148 | 155   | 368   |
| M3                | T1        | 4.97               | 8.97  | 7.24 | 3.88 | 4.90 | 4.80 | -    | 78.13             | 108.76 | 351                                                   | 207 | 182 | 160   | -     |
|                   | T2        | 1.79               | 4.97  | 6.20 | 2.17 | 3.87 | 3.68 | -    | 64.20             | 91.13  | 288                                                   | 140 | 148 | 184   | -     |
|                   | T3        | 3.96               | 8.77  | 7.23 | 3.17 | 4.95 | 4.68 | -    | 72.00             | 97.07  | 321                                                   | 199 | 109 | 186   | -     |
|                   | T4        | 4.69               | 8.28  | 7.31 | 3.73 | 4.83 | 4.86 | -    | 72.87             | 103.22 | 335                                                   | 204 | 175 | 184   | -     |
| Mean of Factor-1  |           |                    |       |      |      |      |      |      |                   |        |                                                       |     |     |       |       |
|                   | 1         | 4.75               | 7.15  | 7.59 | 4.18 | 4.73 | 5.79 | 7.6  | 133.65            | 114.43 | 369                                                   | 204 | 51  | 127   | 360   |
|                   | 2         | 3.95               | 9.89  | 7.89 | 3.73 | 3.69 | 5.17 | 7.4  | 127.02            | 106.22 | 385                                                   | 192 | 118 | 152   | 359   |
|                   | 3         | 3.85               | 7.75  | 6.99 | 3.24 | 4.64 | 4.51 | -    | 71.80             | 100.04 | 324                                                   | 188 | 153 | 179   | -     |
|                   | CD(0.05)  | 0.25               | 0.46  | 0.33 | 0.21 | NS   | 0.54 | NS   | 2.56              | 6.78   | 17                                                    | 2   | 30  | 3     | NS    |
| Mean of Factor-2  |           |                    |       |      |      |      |      |      |                   |        |                                                       |     |     |       |       |
|                   | 1         | 5.64               | 9.67  | 8.14 | 4.56 | 5.86 | 6.03 | 7.47 | 126.13            | 112.99 | 384                                                   | 217 | 127 | 150   | 352   |
|                   | 2         | 2.29               | 6.03  | 6.51 | 2.37 | 2.75 | 4.11 | 6.94 | 75.82             | 100.07 | 325                                                   | 145 | 96  | 142   | 343   |
|                   | 3         | 3.83               | 8.88  | 7.75 | 3.61 | 4.90 | 5.30 | 7.92 | 118.33            | 106.42 | 362                                                   | 204 | 80  | 159   | 379   |
|                   | 4         | 4.97               | 8.46  | 7.57 | 4.34 | 3.90 | 5.18 | 7.66 | 123.00            | 108.11 | 365                                                   | 212 | 128 | 158   | 363   |
|                   | CD(0.05)  | 0.45               | 0.42  | 0.77 | 0.17 | 1.07 | 0.61 | 0.22 | 2.88              | 5.13   | NS                                                    | 5   | 25  | 8     | 11    |
| Interaction       |           |                    |       |      |      |      |      |      |                   |        |                                                       |     |     |       |       |
|                   | M and T   | NS                 | 0.72  | NS   | 0.30 | 1.86 | NS   | NS   | 4.99              | NS     | NS                                                    | NS  | NS  | 13.88 | 14.88 |
|                   | T and M   | NS                 | 0.69  | NS   | 0.29 | 1.75 | NS   | NS   | 4.57              | NS     | NS                                                    | NS  | NS  | 12.15 | 21.33 |
| Experimental Mean |           | 4.18               | 8.26  | 7.49 | 3.72 | 4.35 | 5.16 | 7.5  | 110.82            | 106.90 | 359                                                   | 195 | 108 | 152   | 359   |

M1- Mechanized transplanting

M2 - Puddled direct seeding

M3 - Un puddled dry direct  
seeding

T1 – Weed free

T2 – Weedy check

T3 – Mechanical weeding using weeder

T4 – Chemical weed control (pre &amp; post emergence herbicide application)

Table 4.3.2: Contd.

| Main Plot         | Sub Plots | No of Tillers /m <sup>2</sup> at panicle initiation stage |       |     |     |     |     |       |     | Panicle no/m <sup>2</sup> |     |       |     |     |     |     |     |     |     |     |       |
|-------------------|-----------|-----------------------------------------------------------|-------|-----|-----|-----|-----|-------|-----|---------------------------|-----|-------|-----|-----|-----|-----|-----|-----|-----|-----|-------|
|                   |           | ADT                                                       | GNG   | JDP | MLN | MNC | NWG | PNT   | PDC | ADT                       | CHP | GNG   | GGT | JDP | MLN | MNC | NWG | PNT | PDC | TTB | VAR   |
| M1                | T1        | 341                                                       | 439   | 391 | 230 | 125 | 292 | 287   | 385 | 329                       | 250 | 431   | 162 | 367 | 226 | 149 | 228 | 269 | 360 | 236 | 232   |
|                   | T2        | 245                                                       | 433   | 363 | 151 | 96  | 233 | 190   | 383 | 220                       | 191 | 302   | 106 | 322 | 149 | 67  | 182 | 167 | 353 | 185 | 256   |
|                   | T3        | 354                                                       | 380   | 387 | 208 | 144 | 243 | 243   | 410 | 342                       | 220 | 380   | 155 | 360 | 206 | 113 | 190 | 241 | 378 | 233 | 278   |
|                   | T4        | 334                                                       | 461   | 387 | 223 | 131 | 275 | 259   | 393 | 324                       | 238 | 393   | 156 | 358 | 221 | 108 | 215 | 249 | 365 | 226 | 329   |
| M2                | T1        | 334                                                       | 913   | 438 | 212 | 95  | 172 | 371   | 380 | 325                       | 230 | 504   | 148 | 395 | 211 | 144 | 134 | 308 | 342 | 272 | 337   |
|                   | T2        | 216                                                       | 897   | 399 | 142 | 41  | 139 | 231   | 363 | 204                       | 164 | 473   | 98  | 358 | 141 | 104 | 109 | 228 | 336 | 198 | 226   |
|                   | T3        | 334                                                       | 849   | 443 | 203 | 33  | 160 | 288   | 409 | 324                       | 195 | 471   | 140 | 378 | 202 | 115 | 125 | 285 | 368 | 234 | 316   |
|                   | T4        | 322                                                       | 805   | 442 | 204 | 87  | 158 | 292   | 394 | 307                       | 204 | 469   | 144 | 395 | 203 | 103 | 123 | 273 | 352 | 246 | 374   |
| M3                | T1        | 273                                                       | 616   | 379 | 205 | 111 | 147 | 378   | -   | 253                       | 213 | 392   | 156 | 340 | 205 | 183 | 101 | 333 | -   | 260 | 393   |
|                   | T2        | 185                                                       | 553   | 318 | 138 | 96  | 129 | 232   | -   | 157                       | 156 | 325   | 84  | 295 | 137 | 171 | 89  | 213 | -   | 155 | 390   |
|                   | T3        | 245                                                       | 740   | 362 | 196 | 104 | 157 | 364   | -   | 224                       | 173 | 371   | 153 | 334 | 196 | 160 | 108 | 326 | -   | 233 | 360   |
|                   | T4        | 215                                                       | 644   | 348 | 203 | 85  | 149 | 347   | -   | 193                       | 202 | 404   | 147 | 320 | 202 | 189 | 103 | 308 | -   | 249 | 429   |
| Mean of Factor-1  |           |                                                           |       |     |     |     |     |       |     |                           |     |       |     |     |     |     |     |     |     |     |       |
|                   | 1         | 319                                                       | 428   | 382 | 203 | 124 | 261 | 245   | 393 | 304                       | 225 | 376   | 145 | 352 | 200 | 109 | 204 | 232 | 364 | 220 | 274   |
|                   | 2         | 301                                                       | 866   | 431 | 190 | 64  | 157 | 296   | 387 | 290                       | 198 | 479   | 133 | 381 | 189 | 116 | 123 | 273 | 349 | 238 | 313   |
|                   | 3         | 229                                                       | 638   | 352 | 186 | 99  | 145 | 330   | -   | 207                       | 186 | 373   | 135 | 322 | 185 | 176 | 100 | 295 | -   | 224 | 393   |
| CD(0.05)          |           | 11                                                        | 18    | 26  | 3   | 7   | 16  | 15    | NS  | 9                         | 4   | 10    | NS  | 22  | 2   | NS  | 13  | 11  | NS  | 6   | 1     |
| Mean of Factor-2  |           |                                                           |       |     |     |     |     |       |     |                           |     |       |     |     |     |     |     |     |     |     |       |
|                   | 1         | 316                                                       | 656   | 403 | 216 | 110 | 204 | 345   | 383 | 302                       | 231 | 442   | 155 | 367 | 214 | 159 | 155 | 303 | 351 | 256 | 321   |
|                   | 2         | 215                                                       | 627   | 360 | 144 | 78  | 167 | 218   | 373 | 194                       | 170 | 367   | 96  | 325 | 142 | 114 | 126 | 203 | 344 | 179 | 290   |
|                   | 3         | 311                                                       | 657   | 398 | 202 | 94  | 187 | 298   | 410 | 297                       | 196 | 407   | 149 | 358 | 201 | 129 | 141 | 284 | 373 | 233 | 318   |
|                   | 4         | 291                                                       | 637   | 392 | 210 | 101 | 194 | 299   | 394 | 275                       | 215 | 422   | 149 | 358 | 209 | 133 | 147 | 276 | 358 | 240 | 377   |
| CD(0.05)          |           | 10                                                        | NS    | NS  | 5   | 22  | 21  | 15    | 11  | 8                         | 8   | 22    | 12  | NS  | 5   | NS  | 16  | 21  | 13  | 14  | 10    |
| Interaction       |           |                                                           |       |     |     |     |     |       |     |                           |     |       |     |     |     |     |     |     |     |     |       |
|                   | M and T   | 16.8                                                      | 42.81 | NS  | NS  | NS  | NS  | 25.94 | NS  | 14.62                     | NS  | 38.04 | NS  | NS  | NS  | NS  | NS  | NS  | NS  | NS  | 16.47 |
|                   | T and M   | 15.91                                                     | 38.39 | NS  | NS  | NS  | NS  | 24.17 | NS  | 13.93                     | NS  | 33.4  | NS  | NS  | NS  | NS  | NS  | NS  | NS  | NS  | 14.27 |
| Experimental Mean |           | 283                                                       | 644   | 388 | 193 | 96  | 188 | 290   | 390 | 267                       | 203 | 410   | 138 | 352 | 191 | 134 | 142 | 267 | 356 | 227 | 327   |

M1- Mechanized transplanting

M2 - Puddled direct seeding

M3 - Un puddled dry direct seeding

T1 – Weed free

T2 – Weedy check

T3 – Mechanical weeding using weeder

T4 – Chemical weed control (pre &amp; post emergence herbicide application)

Table 4.3.2: Contd.

| Main Plot         | Sub Plots | Panicle weight (g) |      |      |      |      |      |      |      |      |      |      |      | Test weight (g) |       |       |       |       |       |       |       |       |  |
|-------------------|-----------|--------------------|------|------|------|------|------|------|------|------|------|------|------|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|--|
|                   |           | ADT                | CHP  | GNG  | GGT  | JDP  | MLN  | MNC  | NWG  | PNT  | PDC  | TTB  | VAR  | ADT             | CHP   | GNG   | JDP   | MLN   | MNC   | NWG   | PNT   | PDC   |  |
| M1                | T1        | 2.43               | 7.00 | 3.28 | 3.88 | 3.42 | 4.88 | 2.47 | 3.62 | 2.39 | 3.31 | 5.11 | 2.53 | 5.47            | 27.33 | 18.26 | 28.38 | 27.79 | 25.00 | 18.47 | 25.94 | 16.26 |  |
|                   | T2        | 1.90               | 6.04 | 3.36 | 2.53 | 3.17 | 2.96 | 0.87 | 2.91 | 2.45 | 3.2  | 3.08 | 2.57 | 5.17            | 23.67 | 17.65 | 26.82 | 24.76 | 24.00 | 17.27 | 25.3  | 16.09 |  |
|                   | T3        | 2.48               | 6.93 | 3.68 | 3.58 | 3.42 | 4.71 | 2.87 | 3.47 | 2.62 | 3.62 | 4.63 | 2.64 | 5.60            | 25.00 | 18.29 | 27.70 | 26.79 | 23.67 | 18.00 | 24.74 | 16.68 |  |
|                   | T4        | 2.36               | 7.31 | 3.75 | 3.50 | 3.27 | 4.77 | 1.40 | 3.08 | 2.41 | 3.46 | 4.80 | 2.52 | 5.70            | 25.00 | 17.82 | 27.60 | 26.91 | 24.33 | 18.27 | 25.14 | 16.44 |  |
| M2                | T1        | 2.35               | 7.18 | 3.03 | 3.15 | 3.54 | 4.64 | 5.33 | 3.37 | 1.92 | 3.27 | 4.52 | 3.17 | 5.50            | 25.33 | 18.86 | 26.84 | 26.65 | 25.33 | 18.07 | 26.21 | 16.19 |  |
|                   | T2        | 2.25               | 5.07 | 2.93 | 1.80 | 3.23 | 2.53 | 2.00 | 3.02 | 1.88 | 3.08 | 2.21 | 1.94 | 5.03            | 23.00 | 18.77 | 25.22 | 22.66 | 24.33 | 16.60 | 25.84 | 15.62 |  |
|                   | T3        | 2.34               | 5.86 | 3.27 | 2.96 | 3.68 | 4.44 | 2.73 | 2.96 | 1.93 | 3.59 | 4.20 | 2.24 | 5.47            | 25.00 | 18.61 | 26.23 | 25.90 | 26.00 | 17.07 | 25.49 | 16.59 |  |
|                   | T4        | 2.37               | 6.97 | 3.19 | 2.58 | 3.61 | 4.58 | 2.53 | 2.90 | 1.7  | 3.44 | 4.37 | 2.13 | 5.67            | 25.00 | 18.86 | 26.19 | 27.22 | 26.33 | 16.87 | 25.42 | 16.37 |  |
| M3                | T1        | 2.08               | 6.15 | 3.66 | 3.11 | 3.43 | 4.42 | 2.93 | 2.79 | 1.97 | -    | 4.19 | 2.14 | 5.33            | 25.00 | 18.42 | 24.75 | 26.63 | 24.67 | 17.80 | 25.9  | -     |  |
|                   | T2        | 1.96               | 4.96 | 3.69 | 2.23 | 3.17 | 2.24 | 3.87 | 2.46 | 1.78 | -    | 2.17 | 1.44 | 5.00            | 21.67 | 18.75 | 23.83 | 22.98 | 23.33 | 15.20 | 26.7  | -     |  |
|                   | T3        | 2.16               | 5.87 | 3.32 | 2.65 | 3.42 | 4.28 | 2.80 | 2.98 | 1.9  | -    | 3.24 | 1.82 | 5.37            | 23.33 | 18.87 | 24.38 | 25.33 | 25.33 | 16.94 | 24.92 | -     |  |
|                   | T4        | 2.17               | 6.30 | 3.42 | 2.73 | 3.32 | 4.37 | 2.75 | 2.79 | 2.05 | -    | 3.78 | 2.02 | 5.80            | 24.33 | 18.61 | 24.42 | 26.41 | 26.33 | 16.47 | 25.24 | -     |  |
| Mean of Factor-1  |           |                    |      |      |      |      |      |      |      |      |      |      |      |                 |       |       |       |       |       |       |       |       |  |
| 1                 |           | 2.29               | 6.82 | 3.52 | 3.37 | 3.32 | 4.33 | 1.90 | 3.27 | 2.47 | 3.4  | 4.41 | 2.57 | 5.48            | 25.25 | 18.01 | 27.62 | 26.56 | 24.25 | 18.00 | 25.28 | 16.37 |  |
| 2                 |           | 2.33               | 6.27 | 3.10 | 2.62 | 3.52 | 4.05 | 3.15 | 3.06 | 1.85 | 3.34 | 3.82 | 2.37 | 5.42            | 24.58 | 18.77 | 26.12 | 25.61 | 25.50 | 17.15 | 25.74 | 16.19 |  |
| 3                 |           | 2.09               | 5.82 | 3.52 | 2.68 | 3.34 | 3.83 | 3.09 | 2.75 | 1.93 | -    | 3.35 | 1.86 | 5.38            | 23.58 | 18.66 | 24.35 | 25.34 | 24.92 | 16.60 | 25.69 | -     |  |
| CD(0.05)          |           | 0.02               | NS   | NS   | 0.17 | NS   | 0.14 | NS   | 0.24 | 0.13 | NS   | 0.19 | 0.3  | NS              | 0.51  | NS    | 1.01  | 0.36  | NS    | NS    | NS    | NS    |  |
| Mean of Factor-2  |           |                    |      |      |      |      |      |      |      |      |      |      |      |                 |       |       |       |       |       |       |       |       |  |
| 1                 |           | 2.28               | 6.78 | 3.32 | 3.38 | 3.47 | 4.65 | 3.58 | 3.26 | 2.09 | 3.29 | 4.61 | 2.61 | 5.43            | 25.89 | 18.51 | 26.66 | 27.02 | 25.00 | 18.11 | 26.02 | 16.22 |  |
| 2                 |           | 2.03               | 5.35 | 3.32 | 2.19 | 3.19 | 2.58 | 2.24 | 2.80 | 2.04 | 3.14 | 2.49 | 1.98 | 5.07            | 22.78 | 18.39 | 25.29 | 23.47 | 23.89 | 16.36 | 25.95 | 15.85 |  |
| 3                 |           | 2.33               | 6.22 | 3.42 | 3.06 | 3.51 | 4.48 | 2.80 | 3.13 | 2.15 | 3.6  | 4.03 | 2.24 | 5.48            | 24.44 | 18.59 | 26.10 | 26.01 | 25.00 | 17.33 | 25.05 | 16.64 |  |
| 4                 |           | 2.30               | 6.86 | 3.45 | 2.94 | 3.40 | 4.57 | 2.23 | 2.92 | 2.05 | 3.45 | 4.32 | 2.22 | 5.72            | 24.78 | 18.43 | 26.07 | 26.85 | 25.67 | 17.20 | 25.27 | 16.41 |  |
| CD(0.05)          |           | 0.05               | 0.43 | NS   | 0.27 | NS   | 0.24 | 0.92 | 0.32 | NS   | 0.2  | 0.23 | 0.35 | NS              | 0.89  | NS    | 0.84  | 0.45  | NS    | 0.90  | 0.73  | 0.48  |  |
| Interaction       |           |                    |      |      |      |      |      |      |      |      |      |      |      |                 |       |       |       |       |       |       |       |       |  |
| M and T           |           | 0.09               | NS   | NS   | NS   | NS   | NS   | NS   | NS   | NS   | NS   | NS   | NS   | NS              | NS    | NS    | NS    | NS    | NS    | NS    | NS    | NS    |  |
| T and M           |           | 0.08               | NS   | NS   | NS   | NS   | NS   | NS   | NS   | NS   | NS   | NS   | NS   | NS              | NS    | NS    | NS    | NS    | NS    | NS    | NS    | NS    |  |
| Experimental Mean |           | 2.24               | 6.30 | 3.38 | 2.89 | 3.39 | 4.07 | 2.71 | 3.03 | 2.08 | 3.37 | 3.86 | 2.26 | 5.43            | 24.47 | 18.48 | 26.03 | 25.84 | 24.89 | 17.25 | 25.57 | 16.28 |  |

M1- Mechanized transplanting

M2 - Puddled direct seeding

M3 - Un puddled dry direct seeding

T1 – Weed free

T2 – Weedy check

T3 – Mechanical weeding using weeder

T4 – Chemical weed control (pre &amp; post emergence herbicide application)

Table 4.3.2: Contd.

| Main Plot | Sub Plots                                                                           | Grain yield loss % |       |       |       |       |       |       |       |       |       |       |       |
|-----------|-------------------------------------------------------------------------------------|--------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|           |                                                                                     | ADT                | CHP   | GNG   | GGT   | JDP   | MLN   | MNC   | NWG   | PNT   | PDC   | TTB   | VAR   |
|           | T <sub>1</sub> – Weed free                                                          | -                  | -     | -     | -     | -     | -     | -     | -     | -     | -     | -     | -     |
|           | T <sub>2</sub> – Weedy check                                                        | 55.26              | 65.26 | 37.56 | 46.77 | 20.06 | 48.07 | 49.25 | 30.91 | 42.72 | 7.14  | 45.56 | 51.46 |
|           | T <sub>3</sub> – Mechanical weeding using weeder                                    | -9.86              | 33.73 | 8.16  | 3.22  | 4.85  | 21.06 | 18.75 | 11.91 | 4.98  | -6.12 | 17.97 | 14.62 |
|           | T <sub>4</sub> – Chemical weed control (pre & post emergence herbicide application) | 0.43               | 10.57 | 12.18 | 15.86 | 7.21  | 4.74  | 31.25 | 13.96 | 6.89  | -2.55 | 6.07  | -2.34 |

M1- Mechanized transplanting

M2 - Puddled direct seeding

M3 - Un puddled dry direct seeding

T<sub>1</sub> – Weed freeT<sub>2</sub> – Weedy checkT<sub>3</sub> – Mechanical weeding using weederT<sub>4</sub> – Chemical weed control (pre & post emergence herbicide application)

Table 4.3.2: Contd.

| Main Plot         | Sub Plots | ADUTHURAI                                             |             |             |               | CHIPLIMA                              |                                               |                                    |
|-------------------|-----------|-------------------------------------------------------|-------------|-------------|---------------|---------------------------------------|-----------------------------------------------|------------------------------------|
|                   |           | Weed population at vegetative stage no/m <sup>2</sup> |             |             |               | Weed population no/m <sup>2</sup>     |                                               |                                    |
|                   |           | Grasses                                               | Sedges      | BLWs        | Total         | Vegetative stage(Grasses+Sedges+BLWs) | Panicle initiation stage(Grasses+Sedges+BLWs) | Heading stage(Grasses+Sedges+BLWs) |
| M1                | T1        | 4.33(2.18)                                            | 7.67(2.85)  | 3.33(1.93)  | 15.33(3.97)   | 0.00(0.71)                            | 0.00(0.71)                                    | 0.00(0.71)                         |
|                   | T2        | 38.33(6.21)                                           | 27.67(5.29) | 21.00(4.61) | 87.00(9.33)   | 36.53(6.08)                           | 51.33(7.19)                                   | 94.38(9.72)                        |
|                   | T3        | 14.33(3.84)                                           | 10.67(3.34) | 7.00(2.72)  | 32.00(5.70)   | 16.03(4.06)                           | 26.03(5.13)                                   | 41.63(6.47)                        |
|                   | T4        | 9.33(3.12)                                            | 10.33(3.27) | 5.33(2.40)  | 25.00(5.04)   | 10.93(3.38)                           | 17.20(4.17)                                   | 24.47(4.98)                        |
| M2                | T1        | 5.00(2.32)                                            | 11.00(3.38) | 6.33(2.58)  | 22.33(4.77)   | 0.00(0.71)                            | 0.00(0.71)                                    | 0.00(0.71)                         |
|                   | T2        | 46.33(6.84)                                           | 37.00(6.11) | 25.33(5.06) | 108.67(10.43) | 77.35(8.77)                           | 128.17(11.34)                                 | 162.80(12.77)                      |
|                   | T3        | 19.33(4.45)                                           | 13.67(3.75) | 11.67(3.47) | 44.67(6.72)   | 44.78(6.70)                           | 61.77(7.86)                                   | 79.44(8.87)                        |
|                   | T4        | 11.00(3.38)                                           | 12.33(3.56) | 8.67(3.02)  | 32.00(5.69)   | 17.03(4.16)                           | 30.85(5.56)                                   | 44.01(6.65)                        |
| M3                | T1        | 11.67(3.47)                                           | 7.67(2.83)  | 6.00(2.53)  | 25.33(5.05)   | 0.00(0.71)                            | 0.00(0.71)                                    | 0.00(0.71)                         |
|                   | T2        | 40.67(6.41)                                           | 31.33(5.63) | 25.33(5.06) | 97.33(9.88)   | 91.67(9.57)                           | 142.43(11.95)                                 | 190.67(13.81)                      |
|                   | T3        | 14.33(3.84)                                           | 10.67(3.34) | 7.00(2.72)  | 32.00(5.70)   | 55.45(7.46)                           | 72.40(8.51)                                   | 96.17(9.82)                        |
|                   | T4        | 16.00(4.04)                                           | 9.33(3.12)  | 7.33(2.79)  | 32.67(5.76)   | 24.44(4.96)                           | 38.68(6.24)                                   | 53.33(7.31)                        |
| Mean of Factor-1  |           |                                                       |             |             |               |                                       |                                               |                                    |
| 1                 |           | 16.58(3.84)                                           | 14.08(3.69) | 9.17(2.92)  | 39.83(6.01)   | 15.87(3.56)                           | 23.64(4.30)                                   | 40.12(5.47)                        |
| 2                 |           | 20.42(4.25)                                           | 18.50(4.20) | 13.00(3.53) | 51.92(6.90)   | 34.79(5.09)                           | 55.20(6.37)                                   | 71.56(7.25)                        |
| 3                 |           | 20.67(4.44)                                           | 14.75(3.73) | 11.42(3.27) | 46.83(6.60)   | 42.89(5.67)                           | 63.38(6.85)                                   | 85.04(7.91)                        |
| CD(0.05)          |           | 0.2                                                   | NS          | NS          | NS            | 0.36                                  | 0.31                                          | 0.58                               |
| Mean of Factor-2  |           |                                                       |             |             |               |                                       |                                               |                                    |
| 1                 |           | 7.00(2.66)                                            | 8.78(3.02)  | 5.22(2.35)  | 21.00(4.60)   | 0.00(0.71)                            | 0.00(0.71)                                    | 0.00(0.71)                         |
| 2                 |           | 41.78(6.49)                                           | 32.00(5.68) | 23.89(4.91) | 97.67(9.88)   | 68.52(8.14)                           | 107.31(10.16)                                 | 149.28(12.10)                      |
| 3                 |           | 16.00(4.05)                                           | 11.67(3.48) | 8.56(2.97)  | 36.22(6.04)   | 38.75(6.07)                           | 53.40(7.17)                                   | 72.41(8.39)                        |
| 4                 |           | 12.11(3.51)                                           | 10.67(3.32) | 7.11(2.74)  | 29.89(5.50)   | 17.47(4.17)                           | 28.91(5.32)                                   | 40.60(6.32)                        |
| CD(0.05)          |           | 0.39                                                  | 0.33        | 0.43        | 0.36          | 0.57                                  | 0.45                                          | 0.58                               |
| Interaction       |           |                                                       |             |             |               |                                       |                                               |                                    |
| M and T           |           | NS                                                    | NS          | NS          | NS            | 0.99                                  | 0.79                                          | 1                                  |
| T and M           |           | NS                                                    | NS          | NS          | NS            | 0.88                                  | 0.7                                           | 0.93                               |
| Experimental Mean |           | 4.18                                                  | 3.87        | 3.24        | 6.5           | 4.77                                  | 5.84                                          | 6.88                               |

(Values in parentheses are original)

M1- Mechanized transplanting

M2 - Puddled direct seeding

M3 - Un puddled dry direct seeding

T1 – Weed free

T2 – Weedy check

T3 – Mechanical weeding using weeder

T4 – Chemical weed control (pre &amp; post emergence herbicide application)

Table 4.3.2: Contd.

| Main Plot         | Sub Plots | GANGAVATHI                                            |             |             |             |                                                               |               |             |               | GHAGHRAGHAT                       |                          |               |
|-------------------|-----------|-------------------------------------------------------|-------------|-------------|-------------|---------------------------------------------------------------|---------------|-------------|---------------|-----------------------------------|--------------------------|---------------|
|                   |           | Weed population at vegetative stage no/m <sup>2</sup> |             |             |             | Weed population at panicle initiation stage no/m <sup>2</sup> |               |             |               | Weed population no/m <sup>2</sup> |                          |               |
|                   |           | Grasses                                               | Sedges      | BLWs        | Total       | Grasses                                                       | Sedges        | BLWs        | Total         | Active Vegetative stage           | Panicle initiation stage | Heading stage |
| M1                | T1        | 0.67(1.05)                                            | 8.33(2.94)  | 16.33(4.10) | 25.33(5.07) | 2.00(1.58)                                                    | 18.49(4.36)   | 23.17(4.83) | 43.65(6.63)   | -                                 | -                        | 34.67(5.91)   |
|                   | T2        | 3.33(1.88)                                            | 37.67(6.14) | 38.00(6.19) | 79.00(8.88) | 2.93(1.85)                                                    | 101.10(10.08) | 50.97(7.16) | 154.99(12.47) | 18.33(4.33)                       | 49.00(7.01)              | 73.00(8.55)   |
|                   | T3        | 0.33(0.88)                                            | 22.33(4.76) | 26.00(5.11) | 48.67(6.98) | 9.19(3.05)                                                    | 52.67(7.22)   | 40.77(6.24) | 102.63(10.06) | 22.33(4.76)                       | 32.33(5.58)              | 56.33(7.53)   |
|                   | T4        | 3.67(2.03)                                            | 7.67(2.84)  | 3.67(2.02)  | 15.00(3.93) | 1.85(1.44)                                                    | 43.67(6.61)   | 1.00(1.22)  | 46.52(6.84)   | 21.33(4.66)                       | 38.33(6.22)              | 51.33(7.19)   |
| M2                | T1        | 0.67(1.05)                                            | 4.67(2.24)  | 8.33(2.96)  | 13.67(3.76) | 2.93(1.85)                                                    | 31.33(5.57)   | 64.01(7.93) | 98.27(9.82)   | -                                 | -                        | 45.33(6.76)   |
|                   | T2        | 3.33(1.90)                                            | 29.67(5.48) | 25.67(5.08) | 58.67(7.67) | 8.34(2.91)                                                    | 126.00(11.23) | 58.20(7.66) | 192.54(13.88) | 27.33(5.25)                       | 77.33(8.81)              | 79.33(8.93)   |
|                   | T3        | 1.33(1.34)                                            | 7.33(2.67)  | 6.00(2.53)  | 14.67(3.81) | 6.49(2.47)                                                    | 24.08(4.96)   | 66.67(8.12) | 97.23(9.84)   | 25.67(5.08)                       | 46.33(6.83)              | 57.00(7.57)   |
|                   | T4        | 2.00(1.58)                                            | 10.67(3.29) | 6.67(2.58)  | 19.33(4.44) | 1.00(1.22)                                                    | 62.09(7.90)   | 43.00(6.57) | 106.09(10.30) | 26.00(5.13)                       | 42.00(6.51)              | 59.67(7.75)   |
| M3                | T1        | 2.00(1.58)                                            | 4.33(2.15)  | 9.33(3.13)  | 15.67(4.00) | 1.93(1.54)                                                    | 30.45(5.56)   | 52.94(7.29) | 85.32(9.25)   | -                                 | -                        | 47.67(6.93)   |
|                   | T2        | 8.00(2.90)                                            | 40.00(6.36) | 7.00(2.68)  | 55.00(7.45) | 38.92(6.16)                                                   | 106.67(10.34) | 41.75(6.44) | 187.34(13.69) | 30.00(5.50)                       | 75.33(8.70)              | 78.00(8.85)   |
|                   | T3        | 2.67(1.77)                                            | 10.67(3.33) | 7.33(2.79)  | 20.67(4.60) | 7.41(2.73)                                                    | 20.39(4.50)   | 22.23(4.72) | 50.03(7.07)   | 35.67(6.00)                       | 56.00(7.50)              | 61.00(7.82)   |
|                   | T4        | 10.33(3.27)                                           | 27.00(5.24) | 2.00(1.52)  | 39.33(6.31) | 18.30(4.31)                                                   | 76.13(8.74)   | 6.49(2.59)  | 100.92(10.06) | 28.00(5.29)                       | 56.67(7.54)              | 63.67(8.00)   |
| Mean of Factor-1  |           |                                                       |             |             |             |                                                               |               |             |               |                                   |                          |               |
| 1                 |           | 2.00(1.46)                                            | 19.00(4.17) | 21.00(4.35) | 42.00(6.21) | 3.99(1.98)                                                    | 53.98(7.07)   | 28.98(4.86) | 86.95(9.00)   | 20.67(4.59)                       | 39.89(6.27)              | 53.83(7.30)   |
| 2                 |           | 1.83(1.47)                                            | 13.08(3.42) | 11.67(3.29) | 26.58(4.92) | 4.69(2.11)                                                    | 60.88(7.42)   | 57.97(7.57) | 123.53(10.96) | 26.33(5.15)                       | 55.22(7.38)              | 60.33(7.75)   |
| 3                 |           | 5.75(2.38)                                            | 20.50(4.27) | 6.42(2.53)  | 32.67(5.59) | 16.64(3.69)                                                   | 58.41(7.29)   | 30.85(5.26) | 105.90(10.02) | 31.22(5.60)                       | 62.67(7.91)              | 62.58(7.90)   |
| CD(0.05)          |           | 0.26                                                  | 0.31        | 0.16        | 0.25        | 0.37                                                          | NS            | 0.84        | 0.92          | 0.23                              | 0.67                     | NS            |
| Mean of Factor-2  |           |                                                       |             |             |             |                                                               |               |             |               |                                   |                          |               |
| 1                 |           | 1.11(1.23)                                            | 5.78(2.44)  | 11.33(3.40) | 18.22(4.28) | 2.28(1.66)                                                    | 26.76(5.16)   | 46.71(6.68) | 75.75(8.57)   | -                                 | -                        | 42.56(6.53)   |
| 2                 |           | 4.89(2.23)                                            | 35.78(5.99) | 23.56(4.65) | 64.22(8.00) | 16.73(3.64)                                                   | 111.26(10.55) | 50.31(7.09) | 178.29(13.35) | 25.22(5.03)                       | 67.22(8.18)              | 76.78(8.78)   |
| 3                 |           | 1.44(1.33)                                            | 13.44(3.59) | 13.11(3.48) | 28.00(5.13) | 7.70(2.75)                                                    | 32.38(5.56)   | 43.22(6.36) | 83.30(8.99)   | 27.89(5.28)                       | 44.89(6.63)              | 58.11(7.64)   |
| 4                 |           | 5.33(2.29)                                            | 15.11(3.79) | 4.11(2.04)  | 24.56(4.89) | 7.05(2.33)                                                    | 60.63(7.75)   | 16.83(3.46) | 84.51(9.07)   | 25.11(5.03)                       | 45.67(6.76)              | 58.22(7.65)   |
| CD(0.05)          |           | 0.35                                                  | 0.59        | 0.54        | 0.62        | 0.79                                                          | 0.57          | 0.96        | 0.75          | NS                                | 0.65                     | 0.55          |
| Interaction       |           |                                                       |             |             |             |                                                               |               |             |               |                                   |                          |               |
| M and T           |           | NS                                                    | 1.02        | 0.94        | 1.07        | 1.36                                                          | 0.98          | 1.66        | 1.29          | NS                                | NS                       | NS            |
| T and M           |           | NS                                                    | 0.9         | 0.82        | 0.93        | 1.2                                                           | 0.88          | 1.52        | 1.26          | NS                                | NS                       | NS            |
| Experimental Mean |           | 1.77                                                  | 3.95        | 3.39        | 5.58        | 2.59                                                          | 7.26          | 5.9         | 9.99          | 5.11                              | 7.19                     | 7.65          |

(Values in parentheses are original)

M1- Mechanized transplanting

M2 - Puddled direct seeding

M3 - Un puddled dry direct seeding

T1 – Weed free

T2 – Weedy check

T3 – Mechanical weeding using weeder

T4 – Chemical weed control (pre &amp; post emergence herbicide application)

Table 4.3.2: Contd.

| Main Plot         | Sub Plots | JAGDALPUR                                          |             |             |             |                                                               |             |             |             |                                                    |             |             |             |
|-------------------|-----------|----------------------------------------------------|-------------|-------------|-------------|---------------------------------------------------------------|-------------|-------------|-------------|----------------------------------------------------|-------------|-------------|-------------|
|                   |           | Weed population at vegetative stage/m <sup>2</sup> |             |             |             | Weed population at panicle initiation stage no/m <sup>2</sup> |             |             |             | Weed population at heading stage no/m <sup>2</sup> |             |             |             |
|                   |           | Grasses                                            | Sedges      | BLWs        | Total       | Grasses                                                       | Sedges      | BLWs        | Total       | Grasses                                            | Sedges      | BLWs        | Total       |
| M1                | T1        | 4.33(2.16)                                         | 4.67(2.22)  | 4.33(2.15)  | 13.33(3.68) | 3.33(1.93)                                                    | 5.67(2.47)  | 3.67(2.00)  | 12.67(3.59) | 3.33(1.93)                                         | 5.67(2.40)  | 5.33(2.38)  | 14.33(3.78) |
|                   | T2        | 14.67(3.81)                                        | 8.33(2.95)  | 15.00(3.91) | 38.00(6.17) | 19.67(4.43)                                                   | 13.67(3.76) | 18.67(4.34) | 52.00(7.21) | 23.33(4.81)                                        | 17.00(4.18) | 22.00(4.70) | 62.33(7.87) |
|                   | T3        | 6.33(2.60)                                         | 4.67(2.22)  | 5.33(2.38)  | 16.33(4.09) | 5.00(2.32)                                                    | 7.67(2.82)  | 5.67(2.40)  | 18.33(4.32) | 6.33(2.60)                                         | 9.67(3.18)  | 5.67(2.47)  | 21.67(4.70) |
|                   | T4        | 6.67(2.67)                                         | 5.33(2.38)  | 8.67(3.01)  | 20.67(4.58) | 4.67(2.22)                                                    | 5.00(2.34)  | 5.33(2.40)  | 15.00(3.92) | 4.67(2.24)                                         | 7.00(2.72)  | 5.67(2.45)  | 17.33(4.22) |
| M2                | T1        | 5.33(2.40)                                         | 7.00(2.73)  | 6.33(2.59)  | 18.67(4.38) | 3.67(2.02)                                                    | 4.00(2.06)  | 6.33(2.56)  | 14.00(3.81) | 4.33(2.18)                                         | 8.00(2.86)  | 6.00(2.54)  | 18.33(4.34) |
|                   | T2        | 15.67(3.98)                                        | 16.67(4.11) | 15.33(3.96) | 47.67(6.90) | 21.33(4.65)                                                   | 18.00(4.28) | 20.00(4.52) | 59.33(7.71) | 20.67(4.59)                                        | 22.00(4.74) | 24.33(4.98) | 67.00(8.21) |
|                   | T3        | 8.33(2.95)                                         | 11.00(3.38) | 8.67(3.02)  | 28.00(5.32) | 6.33(2.58)                                                    | 5.00(2.32)  | 11.00(3.38) | 22.33(4.75) | 6.67(2.65)                                         | 5.67(2.46)  | 8.33(2.95)  | 20.67(4.58) |
|                   | T4        | 9.00(3.06)                                         | 12.33(3.57) | 7.33(2.77)  | 28.67(5.37) | 6.67(2.66)                                                    | 7.33(2.73)  | 7.00(2.71)  | 21.00(4.60) | 7.00(2.68)                                         | 6.33(2.56)  | 5.33(2.34)  | 18.67(4.30) |
| M3                | T1        | 7.33(2.79)                                         | 10.67(3.33) | 8.00(2.84)  | 26.00(5.13) | 7.67(2.85)                                                    | 6.33(2.60)  | 8.33(2.93)  | 22.33(4.78) | 8.33(2.95)                                         | 7.00(2.73)  | 6.33(2.58)  | 21.67(4.69) |
|                   | T2        | 31.67(5.67)                                        | 24.33(4.95) | 19.67(4.49) | 75.67(8.71) | 37.00(6.12)                                                   | 26.00(5.13) | 26.67(5.20) | 89.67(9.50) | 28.00(5.31)                                        | 31.33(5.64) | 33.00(5.78) | 92.33(9.63) |
|                   | T3        | 9.33(3.13)                                         | 13.00(3.64) | 11.33(3.37) | 33.67(5.84) | 10.00(3.23)                                                   | 9.33(3.13)  | 9.00(3.07)  | 28.33(5.37) | 10.67(3.34)                                        | 9.33(3.06)  | 8.33(2.94)  | 28.33(5.36) |
|                   | T4        | 8.33(2.96)                                         | 13.67(3.73) | 8.67(2.96)  | 30.67(5.58) | 11.33(3.43)                                                   | 12.67(3.62) | 7.67(2.81)  | 31.67(5.66) | 6.67(2.65)                                         | 8.33(2.93)  | 5.00(2.34)  | 20.00(4.51) |
| Mean of Factor-1  |           |                                                    |             |             |             |                                                               |             |             |             |                                                    |             |             |             |
| 1                 |           | 8.00(2.81)                                         | 5.75(2.44)  | 8.33(2.86)  | 22.08(4.63) | 8.17(2.72)                                                    | 8.00(2.85)  | 8.33(2.79)  | 24.50(4.76) | 9.42(2.90)                                         | 9.83(3.12)  | 9.67(3.00)  | 28.92(5.14) |
| 2                 |           | 9.58(3.10)                                         | 11.75(3.45) | 9.42(3.09)  | 30.75(5.49) | 9.50(2.98)                                                    | 8.58(2.85)  | 11.08(3.29) | 29.17(5.22) | 9.67(3.02)                                         | 10.50(3.16) | 11.00(3.20) | 31.17(5.36) |
| 3                 |           | 14.17(3.64)                                        | 15.42(3.91) | 11.92(3.42) | 41.50(6.32) | 16.50(3.91)                                                   | 13.58(3.62) | 12.92(3.50) | 43.00(6.33) | 13.42(3.56)                                        | 14.00(3.59) | 13.17(3.41) | 40.58(6.05) |
| CD(0.05)          |           | 0.32                                               | 0.3         | NS          | 0.53        | 0.34                                                          | 0.37        | NS          | 0.4         | NS                                                 | NS          | NS          | 0.43        |
| Mean of Factor-2  |           |                                                    |             |             |             |                                                               |             |             |             |                                                    |             |             |             |
| 1                 |           | 5.67(2.45)                                         | 7.44(2.76)  | 6.22(2.53)  | 19.33(4.40) | 4.89(2.27)                                                    | 5.33(2.38)  | 6.11(2.50)  | 16.33(4.06) | 5.33(2.35)                                         | 6.89(2.67)  | 5.89(2.50)  | 18.11(4.27) |
| 2                 |           | 20.67(4.49)                                        | 16.44(4.00) | 16.67(4.12) | 53.78(7.26) | 26.00(5.06)                                                   | 19.22(4.39) | 21.78(4.69) | 67.00(8.14) | 24.00(4.90)                                        | 23.44(4.85) | 26.44(5.15) | 73.89(8.57) |
| 3                 |           | 8.00(2.90)                                         | 9.56(3.08)  | 8.44(2.92)  | 26.00(5.09) | 7.11(2.71)                                                    | 7.33(2.76)  | 8.56(2.95)  | 23.00(4.81) | 7.89(2.86)                                         | 8.22(2.90)  | 7.44(2.79)  | 23.56(4.88) |
| 4                 |           | 8.00(2.89)                                         | 10.44(3.23) | 8.22(2.92)  | 26.67(5.18) | 7.56(2.77)                                                    | 8.33(2.90)  | 6.67(2.64)  | 22.56(4.73) | 6.11(2.52)                                         | 7.22(2.74)  | 5.33(2.37)  | 18.67(4.34) |
| CD(0.05)          |           | 0.39                                               | 0.52        | 0.43        | 0.48        | 0.41                                                          | 0.4         | 0.53        | 0.49        |                                                    |             |             |             |
| Interaction       |           |                                                    |             |             |             |                                                               |             |             |             | 13.96                                              | 13.77       | 15.15       | 9.23        |
| M and T           |           | NS                                                 | NS          | NS          | NS          | NS                                                            | NS          | NS          | NS          | NS                                                 | NS          | NS          | NS          |
| T and M           |           | NS                                                 | NS          | NS          | NS          | NS                                                            | NS          | NS          | NS          | NS                                                 | NS          | NS          | NS          |
| Experimental Mean |           | 3.18                                               | 3.27        | 3.12        | 5.48        | 3.2                                                           | 3.11        | 3.19        | 5.43        | 3.16                                               | 3.29        | 3.2         | 5.52        |

(Values in parentheses are original)

M1- Mechanized transplanting

M2 - Puddled direct seeding

M3 - Un puddled dry direct seeding

T1 – Weed free

T2 – Weedy check

T3 – Mechanical weeding using weeder

T4 – Chemical weed control (pre &amp; post emergence herbicide application)

Table 4.3.2: Contd.

| Main Plot         | Sub Plots | MALAN                                                 |             |             |               |                                                               |             |             |               |                                                    |             |             |               |
|-------------------|-----------|-------------------------------------------------------|-------------|-------------|---------------|---------------------------------------------------------------|-------------|-------------|---------------|----------------------------------------------------|-------------|-------------|---------------|
|                   |           | Weed population at vegetative stage no/m <sup>2</sup> |             |             |               | Weed population at panicle initiation stage no/m <sup>2</sup> |             |             |               | Weed population at heading stage no/m <sup>2</sup> |             |             |               |
|                   |           | Grasses                                               | Sedges      | BLWs        | Total         | Grasses                                                       | Sedges      | BLWs        | Total         | Grasses                                            | Sedges      | BLWs        | Total         |
| M1                | T1        | 0.00(0.71)                                            | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)    | 0.00(0.71)                                                    | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)    | 0.00(0.71)                                         | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)    |
|                   | T2        | 31.33(5.64)                                           | 14.00(3.80) | 18.00(4.29) | 63.33(7.99)   | 32.33(5.73)                                                   | 15.00(3.93) | 17.67(4.26) | 65.00(8.09)   | 27.00(5.24)                                        | 13.67(3.76) | 15.67(4.02) | 56.33(7.54)   |
|                   | T3        | 18.00(4.30)                                           | 7.00(2.73)  | 10.00(3.24) | 35.00(5.96)   | 23.67(4.91)                                                   | 8.67(3.01)  | 13.67(3.75) | 46.00(6.81)   | 23.67(4.90)                                        | 9.00(3.04)  | 14.00(3.80) | 46.67(6.84)   |
|                   | T4        | 3.00(1.86)                                            | 3.00(1.86)  | 3.00(1.86)  | 9.00(3.08)    | 5.33(2.40)                                                    | 6.33(2.59)  | 5.00(2.28)  | 16.67(4.12)   | 6.00(2.53)                                         | 6.67(2.65)  | 5.33(2.35)  | 18.00(4.29)   |
| M2                | T1        | 0.00(0.71)                                            | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)    | 0.00(0.71)                                                    | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)    | 0.00(0.71)                                         | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)    |
|                   | T2        | 48.00(6.96)                                           | 31.67(5.66) | 53.67(7.36) | 133.33(11.57) | 45.67(6.79)                                                   | 29.00(5.41) | 32.33(5.72) | 107.00(10.36) | 48.33(6.98)                                        | 27.33(5.27) | 28.67(5.40) | 104.33(10.24) |
|                   | T3        | 23.67(4.91)                                           | 18.67(4.37) | 26.00(5.15) | 68.33(8.29)   | 23.00(4.83)                                                   | 22.33(4.77) | 18.00(4.29) | 63.33(7.96)   | 23.67(4.90)                                        | 22.33(4.77) | 18.00(4.28) | 64.00(8.01)   |
|                   | T4        | 8.33(2.96)                                            | 4.67(2.26)  | 6.33(2.59)  | 19.33(4.44)   | 7.67(2.80)                                                    | 4.67(2.21)  | 3.67(2.00)  | 16.00(4.04)   | 8.33(2.96)                                         | 5.67(2.47)  | 5.00(2.32)  | 19.00(4.40)   |
| M3                | T1        | 0.00(0.71)                                            | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)    | 0.00(0.71)                                                    | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)    | 0.00(0.71)                                         | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)    |
|                   | T2        | 55.67(7.49)                                           | 67.00(8.21) | 62.67(7.94) | 185.33(13.63) | 55.33(7.47)                                                   | 55.67(7.49) | 66.00(8.15) | 177.00(13.32) | 57.33(7.60)                                        | 56.67(7.56) | 68.00(8.27) | 182.00(13.51) |
|                   | T3        | 34.33(5.90)                                           | 31.33(5.64) | 30.33(5.55) | 96.00(9.82)   | 34.67(5.93)                                                   | 30.33(5.55) | 28.67(5.40) | 93.67(9.70)   | 37.67(6.18)                                        | 33.00(5.78) | 30.00(5.52) | 100.67(10.06) |
|                   | T4        | 12.67(3.61)                                           | 6.67(2.67)  | 9.33(3.13)  | 28.67(5.40)   | 9.33(3.13)                                                    | 7.33(2.78)  | 10.67(3.33) | 27.33(5.25)   | 8.00(2.91)                                         | 5.33(2.39)  | 9.33(3.05)  | 22.67(4.76)   |
| Mean of Factor-1  |           |                                                       |             |             |               |                                                               |             |             |               |                                                    |             |             |               |
|                   | 1         | 13.08(3.13)                                           | 6.00(2.28)  | 7.75(2.52)  | 26.83(4.43)   | 15.33(3.44)                                                   | 7.50(2.56)  | 9.08(2.75)  | 31.92(4.93)   | 14.17(3.34)                                        | 7.33(2.54)  | 8.75(2.72)  | 30.25(4.85)   |
|                   | 2         | 20.00(3.88)                                           | 13.75(3.25) | 21.50(3.95) | 55.25(6.25)   | 19.08(3.78)                                                   | 14.00(3.27) | 13.50(3.18) | 46.58(5.77)   | 20.08(3.89)                                        | 13.83(3.31) | 12.92(3.18) | 46.83(5.84)   |
|                   | 3         | 25.67(4.43)                                           | 26.25(4.31) | 25.58(4.33) | 77.50(7.39)   | 24.83(4.31)                                                   | 23.33(4.13) | 26.33(4.40) | 74.50(7.25)   | 25.75(4.35)                                        | 23.75(4.11) | 26.83(4.39) | 76.33(7.26)   |
| CD(0.05)          |           | 0.19                                                  | 0.16        | 0.13        | 0.17          | 0.23                                                          | 0.22        | 0.16        | 0.23          | 0.13                                               | 0.1         | 0.23        | 0.11          |
| Mean of Factor-2  |           |                                                       |             |             |               |                                                               |             |             |               |                                                    |             |             |               |
|                   | 1         | 0.00(0.71)                                            | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)    | 0.00(0.71)                                                    | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)    | 0.00(0.71)                                         | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)    |
|                   | 2         | 45.00(6.70)                                           | 37.56(5.89) | 44.78(6.53) | 127.33(11.06) | 44.44(6.66)                                                   | 33.22(5.61) | 38.67(6.04) | 116.33(10.59) | 44.22(6.61)                                        | 32.56(5.53) | 37.44(5.90) | 114.22(10.43) |
|                   | 3         | 25.33(5.04)                                           | 19.00(4.25) | 22.11(4.64) | 66.44(8.02)   | 27.11(5.22)                                                   | 20.44(4.44) | 20.11(4.48) | 67.67(8.16)   | 28.33(5.33)                                        | 21.44(4.53) | 20.67(4.53) | 70.44(8.30)   |
|                   | 4         | 8.00(2.81)                                            | 4.78(2.26)  | 6.22(2.53)  | 19.00(4.31)   | 7.44(2.78)                                                    | 6.11(2.53)  | 6.44(2.54)  | 20.00(4.47)   | 7.44(2.80)                                         | 5.89(2.50)  | 6.56(2.57)  | 19.89(4.48)   |
| CD(0.05)          |           | 0.25                                                  | 0.23        | 0.26        | 0.21          | 0.26                                                          | 0.3         | 0.36        | 0.34          | 0.22                                               | 0.26        | 0.42        | 0.35          |
| Interaction       |           |                                                       |             |             |               |                                                               |             |             |               |                                                    |             |             |               |
|                   | M and T   | 0.43                                                  | 0.4         | 0.45        | 0.36          | 0.45                                                          | 0.52        | 0.63        | 0.58          | 0.38                                               | 0.44        | 0.73        | 0.61          |
|                   | T and M   | 0.39                                                  | 0.36        | 0.4         | 0.33          | 0.41                                                          | 0.47        | 0.55        | 0.52          | 0.34                                               | 0.39        | 0.65        | 0.53          |
| Experimental Mean |           | 3.81                                                  | 3.28        | 3.6         | 6.02          | 3.84                                                          | 3.32        | 3.44        | 5.98          | 3.86                                               | 3.32        | 3.43        | 5.98          |

(Values in parentheses are original)

M1- Mechanized transplanting

M2 - Puddled direct seeding

M3 - Un puddled dry direct seeding

T1 – Weed free

T2 – Weedy check

T3 – Mechanical weeding using weeder

T4 – Chemical weed control (pre &amp; post emergence herbicide application)

Table 4.3.2: Contd.

| Main Plot         | Sub Plots | MONCOMPU                                              |               |               |               |                                                               |               |             |               |                                                    |               |             |               |
|-------------------|-----------|-------------------------------------------------------|---------------|---------------|---------------|---------------------------------------------------------------|---------------|-------------|---------------|----------------------------------------------------|---------------|-------------|---------------|
|                   |           | Weed population at vegetative stage no/m <sup>2</sup> |               |               |               | Weed population at panicle initiation stage no/m <sup>2</sup> |               |             |               | Weed population at heading stage no/m <sup>2</sup> |               |             |               |
|                   |           | Grasses                                               | Sedges        | BLWs          | Total         | Grasses                                                       | Sedges        | BLWs        | Total         | Grasses                                            | Sedges        | BLWs        | Total         |
| M1                | T1        | 9.33(3.12)                                            | 2.67(1.65)    | 6.67(2.39)    | 18.67(4.37)   | 20.00(4.53)                                                   | 6.67(2.30)    | 14.67(3.89) | 41.33(6.46)   | 129.33(11.15)                                      | 0.00(0.71)    | 0.00(0.71)  | 129.33(11.15) |
|                   | T2        | 20.00(3.87)                                           | 137.33(11.54) | 65.33(8.05)   | 222.67(14.92) | 28.00(5.18)                                                   | 70.67(8.42)   | 16.00(2.79) | 114.67(10.61) | 238.67(15.26)                                      | 0.00(0.71)    | 16.00(2.79) | 254.67(15.89) |
|                   | T3        | 28.00(3.93)                                           | 36.00(5.47)   | 52.00(6.73)   | 116.00(10.05) | 40.00(6.26)                                                   | 20.00(3.87)   | 34.67(4.93) | 94.67(9.72)   | 124.00(11.00)                                      | 0.00(0.71)    | 10.67(2.37) | 134.67(11.55) |
|                   | T4        | 54.67(6.69)                                           | 44.00(6.36)   | 13.33(2.59)   | 112.00(9.78)  | 37.33(5.84)                                                   | 20.00(4.27)   | 6.67(1.98)  | 64.00(7.78)   | 153.33(12.25)                                      | 0.00(0.71)    | 10.67(2.37) | 164.00(12.75) |
| M2                | T1        | 5.33(1.83)                                            | 13.33(3.68)   | 29.33(5.00)   | 48.00(6.57)   | 5.33(2.18)                                                    | 8.00(2.12)    | 13.33(3.57) | 26.67(5.21)   | 4.00(1.65)                                         | 8.00(2.12)    | 12.00(3.39) | 24.00(4.86)   |
|                   | T2        | 25.33(4.30)                                           | 150.67(12.12) | 117.33(10.79) | 293.33(17.11) | 48.00(6.67)                                                   | 146.67(11.93) | 57.33(7.40) | 252.00(15.83) | 50.67(6.06)                                        | 98.67(8.34)   | 34.67(4.97) | 184.00(13.21) |
|                   | T3        | 10.67(3.19)                                           | 84.00(8.26)   | 61.33(7.85)   | 156.00(12.33) | 88.00(9.40)                                                   | 133.33(11.44) | 34.67(4.97) | 256.00(15.87) | 104.00(10.18)                                      | 125.33(11.11) | 21.33(3.91) | 250.67(15.71) |
|                   | T4        | 18.67(4.16)                                           | 45.33(6.23)   | 10.67(2.37)   | 74.67(8.17)   | 28.00(5.20)                                                   | 38.67(6.07)   | 8.00(2.56)  | 74.67(8.39)   | 10.67(2.92)                                        | 42.67(6.25)   | 8.00(2.12)  | 61.33(7.63)   |
| M3                | T1        | 1.33(1.18)                                            | 26.67(3.46)   | 12.00(3.50)   | 40.00(5.74)   | 5.33(2.18)                                                    | 6.67(2.59)    | 12.00(3.42) | 24.00(4.88)   | 0.00(0.71)                                         | 9.33(2.92)    | 5.33(1.83)  | 14.67(3.73)   |
|                   | T2        | 5.33(1.83)                                            | 82.67(8.99)   | 72.00(8.24)   | 160.00(12.63) | 18.67(3.71)                                                   | 77.33(8.55)   | 32.00(5.65) | 128.00(11.32) | 29.33(4.56)                                        | 90.67(9.42)   | 22.67(4.14) | 142.67(11.95) |
|                   | T3        | 6.67(2.65)                                            | 65.33(7.69)   | 62.67(7.84)   | 134.67(11.44) | 12.00(3.10)                                                   | 48.00(5.88)   | 22.67(4.78) | 82.67(8.72)   | 13.33(3.24)                                        | 34.67(4.73)   | 12.00(3.33) | 60.00(7.37)   |
|                   | T4        | 5.33(2.18)                                            | 32.00(5.62)   | 8.00(2.92)    | 45.33(6.70)   | 13.33(3.68)                                                   | 14.67(3.80)   | 9.33(2.25)  | 37.33(5.92)   | 13.33(3.68)                                        | 14.67(3.31)   | 5.33(1.83)  | 33.33(5.73)   |
| Mean of Factor-1  |           |                                                       |               |               |               |                                                               |               |             |               |                                                    |               |             |               |
| 1                 |           | 28.00(4.40)                                           | 55.00(6.26)   | 34.33(4.94)   | 117.33(9.78)  | 31.33(5.45)                                                   | 29.33(4.71)   | 18.00(3.40) | 78.67(8.64)   | 161.33(12.42)                                      | 0.00(0.71)    | 9.33(2.06)  | 170.67(12.84) |
| 2                 |           | 15.00(3.37)                                           | 73.33(7.57)   | 54.67(6.50)   | 143.00(11.05) | 42.33(5.86)                                                   | 81.67(7.89)   | 28.33(4.63) | 152.33(11.32) | 42.33(5.21)                                        | 68.67(6.95)   | 19.00(3.60) | 130.00(10.35) |
| 3                 |           | 4.67(1.96)                                            | 51.67(6.44)   | 38.67(5.63)   | 95.00(9.13)   | 12.33(3.17)                                                   | 36.67(5.20)   | 19.00(4.03) | 68.00(7.71)   | 14.00(3.05)                                        | 37.33(5.09)   | 11.33(2.78) | 62.67(7.19)   |
| CD(0.05)          |           | NS                                                    | NS            | NS            | NS            | 0.62                                                          | NS            | NS          | 1.23          | 1.24                                               | 2.17          | NS          | 2.12          |
| Mean of Factor-2  |           |                                                       |               |               |               |                                                               |               |             |               |                                                    |               |             |               |
| 1                 |           | 5.33(2.04)                                            | 14.22(2.93)   | 16.00(3.63)   | 35.56(5.56)   | 10.22(2.96)                                                   | 7.11(2.34)    | 13.33(3.62) | 30.67(5.51)   | 44.44(4.50)                                        | 5.78(1.92)    | 5.78(1.98)  | 56.00(6.58)   |
| 2                 |           | 16.89(3.33)                                           | 123.56(10.88) | 84.89(9.03)   | 225.33(14.88) | 31.56(5.19)                                                   | 98.22(9.63)   | 35.11(5.28) | 164.89(12.59) | 106.22(8.63)                                       | 63.11(6.15)   | 24.44(3.97) | 193.78(13.68) |
| 3                 |           | 15.11(3.26)                                           | 61.78(7.14)   | 58.67(7.47)   | 135.56(11.28) | 46.67(6.25)                                                   | 67.11(7.06)   | 30.67(4.90) | 144.44(11.43) | 80.44(8.14)                                        | 53.33(5.51)   | 14.67(3.20) | 148.44(11.54) |
| 4                 |           | 26.22(4.34)                                           | 40.44(6.07)   | 10.67(2.63)   | 77.33(8.22)   | 26.22(4.91)                                                   | 24.44(4.71)   | 8.00(2.26)  | 58.67(7.36)   | 59.11(6.28)                                        | 19.11(3.42)   | 8.00(2.11)  | 86.22(8.70)   |
| CD(0.05)          |           | NS                                                    | 2.63          | 1.67          | 2.7           | 1.58                                                          | 2.41          | NS          | 1.75          | 2.61                                               | 2.77          | NS          | 2.01          |
| Interaction       |           |                                                       |               |               |               |                                                               |               |             |               |                                                    |               |             |               |
| M and T           |           | NS                                                    | NS            | NS            | NS            | NS                                                            | NS            | NS          | NS            | NS                                                 | NS            | NS          | 3.49          |
| T and M           |           | NS                                                    | NS            | NS            | NS            | NS                                                            | NS            | NS          | NS            | NS                                                 | NS            | NS          | 3.28          |
| Experimental Mean |           | 3.24                                                  | 6.76          | 5.69          | 9.98          | 4.83                                                          | 5.94          | 4.02        | 9.22          | 6.89                                               | 4.25          | 2.81        | 10.13         |

(Values in parentheses are original)

M1- Mechanized transplanting

M2 - Puddled direct seeding

M3 - Un puddled dry direct seeding

T1 – Weed free

T2 – Weedy check

T3 – Mechanical weeding using weeder

T4 – Chemical weed control (pre &amp; post emergence herbicide application)

Table 4.3.2: Contd.

| Main Plot         | Sub Plots | NAWAGAM                                               |             |             |             |                                                               |             |             |               |                                                    |             |             |               |
|-------------------|-----------|-------------------------------------------------------|-------------|-------------|-------------|---------------------------------------------------------------|-------------|-------------|---------------|----------------------------------------------------|-------------|-------------|---------------|
|                   |           | Weed population at vegetative stage no/m <sup>2</sup> |             |             |             | Weed population at panicle initiation stage no/m <sup>2</sup> |             |             |               | Weed population at heading stage no/m <sup>2</sup> |             |             |               |
|                   |           | Grasses                                               | Sedges      | BLWs        | Total       | Grasses                                                       | Sedges      | BLWs        | Total         | Grasses                                            | Sedges      | BLWs        | Total         |
| M1                | T1        | 4.00(2.00)                                            | 4.67(2.26)  | 4.67(2.26)  | 13.33(3.70) | 36.00(5.98)                                                   | 31.33(5.59) | 35.00(5.91) | 102.33(10.10) | 21.33(4.66)                                        | 13.67(3.73) | 19.33(4.41) | 54.33(7.36)   |
|                   | T2        | 12.67(3.60)                                           | 9.00(3.01)  | 11.00(3.32) | 32.67(5.68) | 59.33(7.71)                                                   | 61.33(7.80) | 66.33(8.16) | 187.00(13.68) | 32.33(5.70)                                        | 37.33(6.14) | 32.33(5.72) | 102.00(10.12) |
|                   | T3        | 6.67(2.64)                                            | 5.67(2.47)  | 8.00(2.88)  | 20.33(4.56) | 45.00(6.68)                                                   | 46.33(6.83) | 37.33(6.14) | 128.67(11.35) | 29.33(5.42)                                        | 28.33(5.35) | 27.67(5.27) | 85.33(9.22)   |
|                   | T4        | 6.00(2.53)                                            | 4.33(2.16)  | 4.67(2.22)  | 15.00(3.93) | 37.67(6.17)                                                   | 41.67(6.48) | 33.67(5.82) | 113.00(10.65) | 26.33(5.11)                                        | 33.00(5.77) | 33.00(5.78) | 92.33(9.63)   |
| M2                | T1        | 2.00(1.56)                                            | 6.00(2.51)  | 9.67(3.18)  | 17.67(4.25) | 35.33(5.97)                                                   | 36.33(6.07) | 43.00(6.57) | 114.67(10.73) | 26.00(5.11)                                        | 28.33(5.36) | 27.00(5.20) | 81.33(9.00)   |
|                   | T2        | 14.00(3.73)                                           | 10.67(3.32) | 14.33(3.80) | 39.00(6.27) | 75.33(8.61)                                                   | 59.33(7.72) | 69.67(8.36) | 204.33(14.27) | 40.67(6.41)                                        | 42.33(6.54) | 36.33(6.05) | 119.33(10.94) |
|                   | T3        | 4.67(2.26)                                            | 6.33(2.61)  | 7.67(2.85)  | 18.67(4.37) | 43.33(6.61)                                                   | 34.67(5.92) | 33.33(5.82) | 111.33(10.57) | 36.33(6.05)                                        | 31.00(5.60) | 32.67(5.74) | 100.00(9.99)  |
|                   | T4        | 5.33(2.40)                                            | 7.00(2.71)  | 6.33(2.61)  | 18.67(4.36) | 29.67(5.48)                                                   | 37.33(6.13) | 34.33(5.90) | 101.33(10.09) | 36.67(6.10)                                        | 30.00(5.52) | 29.33(5.44) | 96.00(9.82)   |
| M3                | T1        | 4.33(2.15)                                            | 10.33(3.22) | 5.33(2.34)  | 20.00(4.51) | 41.67(6.49)                                                   | 30.67(5.55) | 32.00(5.66) | 104.33(10.24) | 37.67(6.15)                                        | 33.00(5.76) | 34.33(5.88) | 105.00(10.27) |
|                   | T2        | 16.33(4.08)                                           | 19.67(4.46) | 15.33(3.93) | 51.33(7.18) | 69.00(8.23)                                                   | 71.00(8.38) | 78.00(8.82) | 218.00(14.72) | 43.67(6.63)                                        | 38.33(6.19) | 42.67(6.53) | 124.67(11.18) |
|                   | T3        | 9.67(3.17)                                            | 3.67(2.00)  | 9.67(3.18)  | 23.00(4.84) | 38.00(6.19)                                                   | 36.67(6.09) | 36.67(6.08) | 111.33(10.56) | 35.00(5.93)                                        | 40.33(6.38) | 27.33(5.24) | 102.67(10.16) |
|                   | T4        | 7.00(2.72)                                            | 7.00(2.72)  | 4.67(2.26)  | 18.67(4.35) | 49.67(6.99)                                                   | 38.67(6.23) | 44.33(6.58) | 132.67(11.48) | 34.33(5.89)                                        | 40.33(6.37) | 30.67(5.54) | 105.33(10.29) |
| Mean of Factor-1  |           |                                                       |             |             |             |                                                               |             |             |               |                                                    |             |             |               |
| 1                 |           | 7.33(2.69)                                            | 5.92(2.47)  | 7.08(2.67)  | 20.33(4.47) | 44.50(6.63)                                                   | 45.17(6.68) | 43.08(6.51) | 132.75(11.44) | 27.33(5.22)                                        | 28.08(5.25) | 28.08(5.29) | 83.50(9.08)   |
| 2                 |           | 6.50(2.49)                                            | 7.50(2.79)  | 9.50(3.11)  | 23.50(4.81) | 45.92(6.67)                                                   | 41.92(6.46) | 45.08(6.66) | 132.92(11.42) | 34.92(5.91)                                        | 32.92(5.75) | 31.33(5.61) | 99.17(9.94)   |
| 3                 |           | 9.33(3.03)                                            | 10.17(3.10) | 8.75(2.92)  | 28.25(5.22) | 49.58(6.98)                                                   | 44.25(6.56) | 47.75(6.78) | 141.58(11.75) | 37.67(6.15)                                        | 38.00(6.17) | 33.75(5.80) | 109.42(10.47) |
| CD(0.05)          |           | NS                                                    | 0.27        | NS          | 0.14        | NS                                                            | NS          | NS          | NS            | 0.27                                               | 0.4         | 0.19        | 0.23          |
| Mean of Factor-2  |           |                                                       |             |             |             |                                                               |             |             |               |                                                    |             |             |               |
| 1                 |           | 3.44(1.90)                                            | 7.00(2.66)  | 6.56(2.59)  | 17.00(4.15) | 37.67(6.15)                                                   | 32.78(5.73) | 36.67(6.05) | 107.11(10.36) | 28.33(5.31)                                        | 25.00(4.95) | 26.89(5.16) | 80.22(8.88)   |
| 2                 |           | 14.33(3.80)                                           | 13.11(3.60) | 13.56(3.68) | 41.00(6.38) | 67.89(8.18)                                                   | 63.89(7.97) | 71.33(8.44) | 203.11(14.22) | 38.89(6.24)                                        | 39.33(6.29) | 37.11(6.10) | 115.33(10.75) |
| 3                 |           | 7.00(2.69)                                            | 5.22(2.36)  | 8.44(2.97)  | 20.67(4.59) | 42.11(6.49)                                                   | 39.22(6.28) | 35.78(6.01) | 117.11(10.83) | 33.56(5.80)                                        | 33.22(5.78) | 29.22(5.42) | 96.00(9.79)   |
| 4                 |           | 6.11(2.55)                                            | 6.11(2.53)  | 5.22(2.36)  | 17.44(4.21) | 39.00(6.21)                                                   | 39.22(6.28) | 37.44(6.10) | 115.67(10.74) | 32.44(5.70)                                        | 34.44(5.88) | 31.00(5.59) | 97.89(9.91)   |
| CD(0.05)          |           | 0.47                                                  | 0.54        | 0.58        | 0.49        | 1.04                                                          | 0.67        | 0.82        | 0.98          | NS                                                 | 0.57        | 0.63        | 0.64          |
| Interaction       |           |                                                       |             |             |             |                                                               |             |             |               |                                                    |             |             |               |
| M and T           |           | NS                                                    | NS          | NS          | NS          | NS                                                            | NS          | NS          | NS            | NS                                                 | NS          | NS          | NS            |
| T and M           |           | NS                                                    | NS          | NS          | NS          | NS                                                            | NS          | NS          | NS            | NS                                                 | NS          | NS          | NS            |
| Experimental Mean |           | 2.74                                                  | 2.79        | 2.9         | 4.83        | 6.76                                                          | 6.57        | 6.65        | 11.54         | 5.76                                               | 5.72        | 5.57        | 9.83          |

(Values in parentheses are original)

M1- Mechanized transplanting

M2 - Puddled direct seeding

M3 - Un puddled dry direct seeding

T1 – Weed free

T2 – Weedy check

T3 – Mechanical weeding using weeder

T4 – Chemical weed control (pre &amp; post emergence herbicide application)

Table 4.3.2: Contd.

| Main Plot         | Sub Plots | PUDUCHERRY                                            |             |             |             |                                                               |             |             |             |                                                    |             |             |             |
|-------------------|-----------|-------------------------------------------------------|-------------|-------------|-------------|---------------------------------------------------------------|-------------|-------------|-------------|----------------------------------------------------|-------------|-------------|-------------|
|                   |           | Weed population at vegetative stage no/m <sup>2</sup> |             |             |             | Weed population at panicle initiation stage no/m <sup>2</sup> |             |             |             | Weed population at heading stage no/m <sup>2</sup> |             |             |             |
|                   |           | Grasses                                               | Sedges      | BLWs        | Total       | Grasses                                                       | Sedges      | BLWs        | Total       | Grasses                                            | Sedges      | BLWs        | Total       |
| M1                | T1        | 26.19(5.17)                                           | 16.49(4.12) | 18.43(4.35) | 61.11(7.85) | 20.37(4.57)                                                   | 11.64(3.48) | 10.67(3.34) | 42.68(6.57) | 13.58(3.75)                                        | 8.73(3.04)  | 8.73(3.04)  | 31.04(5.62) |
|                   | T2        | 29.80(5.50)                                           | 18.87(4.40) | 22.85(4.83) | 71.52(8.49) | 22.85(4.83)                                                   | 13.91(3.80) | 13.91(3.80) | 50.66(7.15) | 16.89(4.17)                                        | 10.93(3.38) | 10.93(3.38) | 38.74(6.26) |
|                   | T3        | 20.37(4.57)                                           | 10.67(3.34) | 12.61(3.62) | 43.65(6.64) | 12.61(3.62)                                                   | 8.73(3.04)  | 6.79(2.70)  | 28.13(5.35) | 7.76(2.87)                                         | 4.85(2.31)  | 4.85(2.31)  | 17.46(4.24) |
|                   | T4        | 24.25(4.97)                                           | 13.58(3.75) | 15.52(4.00) | 53.35(7.34) | 14.55(3.88)                                                   | 9.70(3.19)  | 8.73(3.04)  | 32.98(5.79) | 10.67(3.34)                                        | 7.76(2.87)  | 7.76(2.87)  | 26.19(5.17) |
| M2                | T1        | 29.80(5.50)                                           | 17.88(4.29) | 21.85(4.73) | 69.53(8.37) | 20.86(4.62)                                                   | 13.91(3.80) | 14.90(3.92) | 49.67(7.08) | 15.89(4.05)                                        | 10.93(3.38) | 10.93(3.38) | 37.75(6.18) |
|                   | T2        | 32.98(5.79)                                           | 22.31(4.78) | 25.22(5.07) | 80.51(9.00) | 24.25(4.97)                                                   | 15.52(4.00) | 16.49(4.12) | 56.26(7.53) | 19.40(4.46)                                        | 12.61(3.62) | 12.61(3.62) | 44.62(6.72) |
|                   | T3        | 24.83(5.03)                                           | 12.91(3.66) | 14.90(3.92) | 52.65(7.29) | 13.91(3.80)                                                   | 9.93(3.23)  | 10.93(3.38) | 34.77(5.94) | 8.94(3.07)                                         | 6.95(2.73)  | 6.95(2.73)  | 22.85(4.83) |
|                   | T4        | 27.81(5.32)                                           | 14.90(3.92) | 17.88(4.29) | 60.59(7.82) | 17.88(4.29)                                                   | 11.92(3.52) | 12.91(3.66) | 42.71(6.57) | 11.92(3.52)                                        | 8.94(3.07)  | 8.94(3.07)  | 29.80(5.50) |
| M3                | T1        | -                                                     | -           | -           | -           | -                                                             | -           | -           | -           | -                                                  | -           | -           | -           |
|                   | T2        | -                                                     | -           | -           | -           | -                                                             | -           | -           | -           | -                                                  | -           | -           | -           |
|                   | T3        | -                                                     | -           | -           | -           | -                                                             | -           | -           | -           | -                                                  | -           | -           | -           |
|                   | T4        | -                                                     | -           | -           | -           | -                                                             | -           | -           | -           | -                                                  | -           | -           | -           |
| Mean of Factor-1  |           |                                                       |             |             |             |                                                               |             |             |             |                                                    |             |             |             |
| 1                 |           | 25.15(5.05)                                           | 14.90(3.90) | 17.35(4.20) | 57.41(7.58) | 17.59(4.22)                                                   | 10.99(3.38) | 10.02(3.22) | 38.61(6.21) | 12.22(3.53)                                        | 8.07(2.90)  | 8.07(2.90)  | 28.36(5.32) |
| 2                 |           | 28.86(5.41)                                           | 17.00(4.16) | 19.96(4.50) | 65.82(8.12) | 19.22(4.42)                                                   | 12.82(3.64) | 13.81(3.77) | 45.85(6.78) | 14.04(3.78)                                        | 9.86(3.20)  | 9.86(3.20)  | 33.75(5.81) |
| 3                 |           | -                                                     | -           | -           | -           | -                                                             | -           | -           | -           | -                                                  | -           | -           | -           |
| CD(0.05)          |           | 0.14                                                  | 0.1         | 0.11        | 0.2         | 0.11                                                          | 0.09        | 0.09        | 0.17        | 0.08                                               | 0.07        | 0.07        | 0.14        |
| Mean of Factor-2  |           |                                                       |             |             |             |                                                               |             |             |             |                                                    |             |             |             |
| 1                 |           | 28.00(5.34)                                           | 17.18(4.20) | 20.14(4.54) | 65.32(8.11) | 20.62(4.59)                                                   | 12.77(3.64) | 12.79(3.63) | 46.17(6.83) | 14.74(3.90)                                        | 9.83(3.21)  | 9.83(3.21)  | 34.39(5.90) |
| 2                 |           | 31.39(5.65)                                           | 20.59(4.59) | 24.03(4.95) | 76.01(8.74) | 23.55(4.90)                                                   | 14.71(3.90) | 15.20(3.96) | 53.46(7.34) | 18.14(4.32)                                        | 11.77(3.50) | 11.77(3.50) | 41.68(6.49) |
| 3                 |           | 22.60(4.80)                                           | 11.79(3.50) | 13.76(3.77) | 48.15(6.97) | 13.26(3.71)                                                   | 9.33(3.13)  | 8.86(3.04)  | 31.45(5.64) | 8.35(2.97)                                         | 5.90(2.52)  | 5.90(2.52)  | 20.15(4.53) |
| 4                 |           | 26.03(5.15)                                           | 14.24(3.84) | 16.70(4.14) | 56.97(7.58) | 16.21(4.08)                                                   | 10.81(3.36) | 10.82(3.35) | 37.85(6.18) | 11.30(3.43)                                        | 8.35(2.97)  | 8.35(2.97)  | 28.00(5.34) |
| CD(0.05)          |           | 0.08                                                  | 0.06        | 0.07        | 0.12        | 0.07                                                          | 0.05        | 0.05        | 0.1         | 0.06                                               | 0.05        | 0.05        | 0.09        |
| Interaction       |           |                                                       |             |             |             |                                                               |             |             |             |                                                    |             |             |             |
| M and T           |           | NS                                                    | 0.09        | NS          | NS          | 0.09                                                          | NS          | 0.07        | 0.14        | NS                                                 | 0.06        | 0.06        | NS          |
| T and M           |           | NS                                                    | 0.11        | NS          | NS          | 0.12                                                          | NS          | 0.09        | 0.18        | NS                                                 | 0.08        | 0.08        | NS          |
| Experimental Mean |           | 5.23                                                  | 4.03        | 4.35        | 7.85        | 4.32                                                          | 3.51        | 3.5         | 6.5         | 3.66                                               | 3.05        | 3.05        | 5.56        |

(Values in parentheses are original)

M1- Mechanized transplanting

M2 - Puddled direct seeding

M3 - Un puddled dry direct seeding

T1 – Weed free

T2 – Weedy check

T3 – Mechanical weeding using weeder

T4 – Chemical weed control (pre &amp; post emergence herbicide application)

Table 4.3.2: Contd.

| Main Plot         | Sub Plots | PANTNAGAR                                                |                                                               | TITABAR                                               |            |             |             |
|-------------------|-----------|----------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------|------------|-------------|-------------|
|                   |           | Total weeds                                              | Total weeds                                                   | Weed population at vegetative stage no/m <sup>2</sup> |            |             |             |
|                   |           | Weed population at mid-tillering stage no/m <sup>2</sup> | Weed population at panicle initiation stage no/m <sup>2</sup> | Grasses                                               | Sedges     | BLWs        | Total       |
| M1                | T1        | 2.00(1.56)                                               | 7.33(2.80)                                                    | 2.67(1.76)                                            | 1.33(1.29) | 4.00(2.09)  | 8.00(2.91)  |
|                   | T2        | 13.33(3.72)                                              | 27.67(5.30)                                                   | 16.67(4.06)                                           | 3.00(1.86) | 13.67(3.75) | 33.33(5.76) |
|                   | T3        | 5.33(2.39)                                               | 6.67(2.68)                                                    | 8.67(3.03)                                            | 1.00(1.17) | 6.67(2.62)  | 16.33(4.08) |
|                   | T4        | 5.33(2.41)                                               | 3.33(1.95)                                                    | 7.00(2.72)                                            | 1.33(1.18) | 7.00(2.71)  | 15.33(3.96) |
| M2                | T1        | 5.00(2.34)                                               | 5.33(2.41)                                                    | 2.33(1.68)                                            | 1.00(1.17) | 5.67(2.46)  | 9.00(3.06)  |
|                   | T2        | 22.33(4.78)                                              | 34.00(5.87)                                                   | 19.00(4.41)                                           | 7.33(2.79) | 22.67(4.81) | 49.00(7.03) |
|                   | T3        | 9.00(3.08)                                               | 5.00(2.34)                                                    | 12.67(3.60)                                           | 3.00(1.86) | 10.33(3.22) | 26.00(5.15) |
|                   | T4        | 7.33(2.80)                                               | 2.33(1.68)                                                    | 10.67(3.27)                                           | 2.00(1.52) | 13.33(3.68) | 26.00(5.10) |
| M3                | T1        | 8.00(2.92)                                               | 6.33(2.61)                                                    | 5.33(2.41)                                            | 1.33(1.29) | 3.67(2.03)  | 10.33(3.28) |
|                   | T2        | 41.33(6.47)                                              | 48.33(6.98)                                                   | 27.67(5.29)                                           | 8.67(3.01) | 34.00(5.85) | 70.33(8.41) |
|                   | T3        | 9.67(3.19)                                               | 6.33(2.61)                                                    | 14.00(3.80)                                           | 6.00(2.49) | 14.67(3.88) | 34.67(5.90) |
|                   | T4        | 6.67(2.67)                                               | 3.67(2.04)                                                    | 13.00(3.67)                                           | 4.67(2.26) | 10.67(3.34) | 28.33(5.37) |
| Mean of Factor-1  |           |                                                          |                                                               |                                                       |            |             |             |
| 1                 |           | 6.50(2.52)                                               | 11.25(3.18)                                                   | 8.75(2.89)                                            | 1.67(1.37) | 7.83(2.79)  | 18.25(4.18) |
| 2                 |           | 10.92(3.25)                                              | 11.67(3.08)                                                   | 11.17(3.24)                                           | 3.33(1.84) | 13.00(3.54) | 27.50(5.08) |
| 3                 |           | 16.42(3.81)                                              | 16.17(3.56)                                                   | 15.00(3.79)                                           | 5.17(2.26) | 15.75(3.77) | 35.92(5.74) |
| CD(0.05)          |           | 0.2                                                      | 0.1                                                           | 0.29                                                  | NS         | 0.25        | 0.46        |
| Mean of Factor-2  |           |                                                          |                                                               |                                                       |            |             |             |
| 1                 |           | 5.00(2.27)                                               | 6.33(2.61)                                                    | 3.44(1.95)                                            | 1.22(1.25) | 4.44(2.19)  | 9.11(3.08)  |
| 2                 |           | 25.67(4.99)                                              | 36.67(6.05)                                                   | 21.11(4.59)                                           | 6.33(2.55) | 23.44(4.80) | 50.89(7.07) |
| 3                 |           | 8.00(2.88)                                               | 6.00(2.54)                                                    | 11.78(3.48)                                           | 3.33(1.84) | 10.56(3.24) | 25.67(5.04) |
| 4                 |           | 6.44(2.63)                                               | 3.11(1.89)                                                    | 10.22(3.22)                                           | 2.67(1.66) | 10.33(3.24) | 23.22(4.81) |
| CD(0.05)          |           | 0.21                                                     | 0.2                                                           | 0.48                                                  | 0.37       | 0.49        | 0.51        |
| Interaction       |           |                                                          |                                                               |                                                       |            |             |             |
| M and T           |           | 0.37                                                     | 0.34                                                          | NS                                                    | NS         | NS          | NS          |
| T and M           |           | 0.34                                                     | 0.3                                                           | NS                                                    | NS         | NS          | NS          |
| Experimental Mean |           | 3.19                                                     | 3.27                                                          | 3.31                                                  | 1.82       | 3.37        | 5           |

(Values in parentheses are original)

M1- Mechanized transplanting

M2 - Puddled direct seeding

M3 - Un puddled dry direct seeding

T1 – Weed free

T2 – Weedy check

T3 – Mechanical weeding using weeder

T4 – Chemical weed control (pre &amp; post emergence herbicide application)

Table 4.3.2: Contd.

| Main Plot         | Sub Plots | VARANASI                                              |             |             |               |                                                               |             |             |             |                                                    |             |             |             |
|-------------------|-----------|-------------------------------------------------------|-------------|-------------|---------------|---------------------------------------------------------------|-------------|-------------|-------------|----------------------------------------------------|-------------|-------------|-------------|
|                   |           | Weed population at vegetative stage no/m <sup>2</sup> |             |             |               | Weed population at panicle initiation stage no/m <sup>2</sup> |             |             |             | Weed population at heading stage no/m <sup>2</sup> |             |             |             |
|                   |           | Grasses                                               | Sedges      | BLWs        | Total         | Grasses                                                       | Sedges      | BLWs        | Total       | Grasses                                            | Sedges      | BLWs        | Total       |
| M1                | T1        | 13.00(3.66)                                           | 8.33(2.96)  | 10.00(3.24) | 31.33(5.63)   | 9.00(3.08)                                                    | 9.67(3.19)  | 4.00(2.11)  | 22.67(4.81) | 8.67(3.03)                                         | 8.67(3.03)  | 0.00(0.71)  | 17.33(4.22) |
|                   | T2        | 19.33(4.44)                                           | 67.67(8.25) | 13.00(3.67) | 100.00(10.02) | 17.33(4.22)                                                   | 50.00(7.10) | 3.67(2.04)  | 71.00(8.45) | 13.33(3.72)                                        | 30.00(5.52) | 13.00(3.67) | 56.33(7.54) |
|                   | T3        | 7.67(2.85)                                            | 12.00(3.52) | 11.00(3.39) | 30.67(5.58)   | 6.67(2.68)                                                    | 10.67(3.34) | 3.00(1.87)  | 20.33(4.56) | 2.67(1.77)                                         | 2.67(1.77)  | 3.33(1.95)  | 8.67(3.03)  |
|                   | T4        | 7.67(2.85)                                            | 3.00(1.86)  | 1.00(1.22)  | 11.67(3.49)   | 7.67(2.85)                                                    | 7.00(2.73)  | 0.00(0.71)  | 14.67(3.89) | 6.67(2.68)                                         | 6.67(2.68)  | 0.00(0.71)  | 13.33(3.72) |
| M2                | T1        | 4.00(2.11)                                            | 13.33(3.71) | 7.67(2.86)  | 25.00(5.04)   | 2.00(1.58)                                                    | 14.00(3.81) | 7.67(2.86)  | 23.67(4.91) | 0.00(0.71)                                         | 0.00(0.71)  | 1.00(1.22)  | 1.00(1.22)  |
|                   | T2        | 18.67(4.37)                                           | 69.67(8.37) | 9.67(3.18)  | 98.00(9.92)   | 18.00(4.30)                                                   | 53.00(7.31) | 16.67(4.14) | 87.67(9.39) | 13.67(3.76)                                        | 41.00(6.44) | 11.00(3.39) | 65.67(8.13) |
|                   | T3        | 13.00(3.66)                                           | 29.67(5.48) | 14.00(3.81) | 56.67(7.55)   | 12.67(3.63)                                                   | 11.00(3.39) | 10.67(3.34) | 34.33(5.90) | 9.67(3.19)                                         | 9.67(3.18)  | 3.33(1.95)  | 22.67(4.81) |
|                   | T4        | 11.67(3.48)                                           | 3.67(2.04)  | 4.67(2.27)  | 20.00(4.52)   | 8.67(3.03)                                                    | 3.00(1.86)  | 0.00(0.71)  | 11.67(3.49) | 5.67(2.48)                                         | 5.67(2.48)  | 1.00(1.22)  | 12.33(3.58) |
| M3                | T1        | 13.67(3.76)                                           | 20.00(4.53) | 8.67(3.03)  | 42.33(6.54)   | 10.00(3.24)                                                   | 17.00(4.18) | 6.67(2.68)  | 33.67(5.85) | 8.67(3.03)                                         | 8.67(3.03)  | 1.67(1.46)  | 19.00(4.41) |
|                   | T2        | 17.67(4.26)                                           | 67.33(8.23) | 16.67(4.14) | 101.67(10.10) | 17.00(4.18)                                                   | 43.33(6.62) | 19.00(4.41) | 79.33(8.93) | 15.67(4.02)                                        | 42.33(6.54) | 10.00(3.24) | 68.00(8.28) |
|                   | T3        | 17.67(4.26)                                           | 58.00(7.65) | 12.67(3.62) | 88.33(9.42)   | 7.67(2.86)                                                    | 18.00(4.30) | 19.00(4.41) | 44.67(6.72) | 7.00(2.73)                                         | 7.00(2.73)  | 5.33(2.41)  | 19.33(4.45) |
|                   | T4        | 11.00(3.36)                                           | 23.67(4.92) | 3.67(2.04)  | 38.33(6.23)   | 9.67(3.19)                                                    | 10.00(3.24) | 8.67(3.03)  | 28.33(5.37) | 7.67(2.86)                                         | 7.67(2.86)  | 0.00(0.71)  | 15.33(3.98) |
| Mean of Factor-1  |           |                                                       |             |             |               |                                                               |             |             |             |                                                    |             |             |             |
| 1                 |           | 11.92(3.45)                                           | 22.75(4.15) | 8.75(2.88)  | 43.42(6.18)   | 10.17(3.21)                                                   | 19.33(4.09) | 2.67(1.68)  | 32.17(5.43) | 7.83(2.80)                                         | 12.00(3.25) | 4.08(1.76)  | 23.92(4.63) |
| 2                 |           | 11.83(3.41)                                           | 29.08(4.90) | 9.00(3.03)  | 49.92(6.76)   | 10.33(3.13)                                                   | 20.25(4.09) | 8.75(2.76)  | 39.33(5.92) | 7.25(2.53)                                         | 14.08(3.20) | 4.08(1.95)  | 25.42(4.44) |
| 3                 |           | 15.00(3.91)                                           | 42.25(6.33) | 10.42(3.21) | 67.67(8.07)   | 11.08(3.37)                                                   | 22.08(4.58) | 13.33(3.63) | 46.50(6.72) | 9.75(3.16)                                         | 16.42(3.79) | 4.25(1.96)  | 30.42(5.28) |
| CD(0.05)          |           | NS                                                    | 0.21        | 0.14        | 0.32          | 0.06                                                          | 0.12        | 0.09        | 0.13        | 0.08                                               | 0.08        | NS          | 0.09        |
| Mean of Factor-2  |           |                                                       |             |             |               |                                                               |             |             |             |                                                    |             |             |             |
| 1                 |           | 10.22(3.18)                                           | 13.89(3.73) | 8.78(3.04)  | 32.89(5.74)   | 7.00(2.63)                                                    | 13.56(3.73) | 6.11(2.55)  | 26.67(5.19) | 5.78(2.25)                                         | 5.78(2.25)  | 0.89(1.13)  | 12.44(3.29) |
| 2                 |           | 18.56(4.36)                                           | 68.22(8.28) | 13.11(3.67) | 99.89(10.01)  | 17.44(4.23)                                                   | 48.78(7.01) | 13.11(3.53) | 79.33(8.92) | 14.22(3.83)                                        | 37.78(6.17) | 11.33(3.43) | 63.33(7.98) |
| 3                 |           | 12.78(3.59)                                           | 33.22(5.55) | 12.56(3.61) | 58.56(7.52)   | 9.00(3.05)                                                    | 13.22(3.68) | 10.89(3.21) | 33.11(5.73) | 6.44(2.57)                                         | 6.44(2.56)  | 4.00(2.11)  | 16.89(4.10) |
| 4                 |           | 10.11(3.23)                                           | 10.11(2.94) | 3.11(1.84)  | 23.33(4.74)   | 8.67(3.02)                                                    | 6.67(2.61)  | 2.89(1.48)  | 18.22(4.25) | 6.67(2.67)                                         | 6.67(2.67)  | 0.33(0.88)  | 13.67(3.76) |
| CD(0.05)          |           | 0.32                                                  | 0.32        | 0.13        | 0.34          | 0.16                                                          | 0.21        | 0.13        | 0.2         | 0.14                                               | 0.14        | 0.1         | 0.13        |
| Interaction       |           |                                                       |             |             |               |                                                               |             |             |             |                                                    |             |             |             |
| M and T           |           | 0.55                                                  | 0.55        | 0.22        | 0.59          | 0.28                                                          | 0.37        | 0.22        | 0.34        | 0.24                                               | 0.25        | 0.17        | 0.23        |
| T and M           |           | 0.5                                                   | 0.49        | 0.21        | 0.55          | 0.25                                                          | 0.33        | 0.2         | 0.3         | 0.21                                               | 0.22        | 0.17        | 0.21        |
| Experimental Mean |           | 3.59                                                  | 5.13        | 3.04        | 7             | 3.24                                                          | 4.26        | 2.69        | 6.02        | 2.83                                               | 3.41        | 1.89        | 4.78        |

(Values in parentheses are transformed figures)

M1- Mechanized transplanting

M2 - Puddled direct seeding

M3 - Un puddled dry direct seeding

T1 – Weed free

T2 – Weedy check

T3 – Mechanical weeding using weeder

T4 – Chemical weed control (pre &amp; post emergence herbicide application)

Table 4.3.2: Contd.

| Main Plot         | Sub Plots | ADUTHURAI                                             |        |      |       | CHIPLIMA                              |                                               |                                    |
|-------------------|-----------|-------------------------------------------------------|--------|------|-------|---------------------------------------|-----------------------------------------------|------------------------------------|
|                   |           | Weed dry biomass at vegetative stage g/m <sup>2</sup> |        |      |       | Weed biomass g/m <sup>2</sup>         |                                               |                                    |
|                   |           | Grasses                                               | Sedges | BLWs | Total | Vegetative stage(Grasses+Sedges+BLWs) | Panicle initiation stage(Grasses+Sedges+BLWs) | Heading stage(Grasses+Sedges+BLWs) |
| M1                | T1        | 1.30                                                  | 1.55   | 1.16 | 4.01  | 0.00                                  | 0.00                                          | 0.00                               |
|                   | T2        | 2.61                                                  | 1.92   | 1.62 | 6.15  | 14.44                                 | 32.34                                         | 82.41                              |
|                   | T3        | 1.53                                                  | 1.25   | 1.15 | 3.93  | 7.16                                  | 15.50                                         | 36.50                              |
|                   | T4        | 1.36                                                  | 1.23   | 1.07 | 3.67  | 4.35                                  | 10.38                                         | 20.88                              |
| M2                | T1        | 1.37                                                  | 1.88   | 1.40 | 4.65  | 0.00                                  | 0.00                                          |                                    |
|                   | T2        | 2.79                                                  | 2.26   | 2.12 | 7.18  | 31.76                                 | 89.80                                         | 140.85                             |
|                   | T3        | 1.68                                                  | 1.53   | 1.39 | 4.60  | 17.99                                 | 45.50                                         | 67.23                              |
|                   | T4        | 1.58                                                  | 1.24   | 1.15 | 3.97  | 6.81                                  | 21.84                                         | 37.98                              |
| M3                | T1        | 1.32                                                  | 1.25   | 1.16 | 3.73  | 0.00                                  | 0.00                                          | 0.00                               |
|                   | T2        | 2.81                                                  | 1.65   | 1.58 | 6.04  | 35.57                                 | 97.65                                         | 157.82                             |
|                   | T3        | 1.43                                                  | 1.28   | 1.13 | 3.84  | 23.99                                 | 49.37                                         | 80.47                              |
|                   | T4        | 1.52                                                  | 1.25   | 1.28 | 4.04  | 9.62                                  | 25.25                                         | 41.98                              |
| Mean of Factor-1  |           |                                                       |        |      |       |                                       |                                               |                                    |
|                   | 1         | 1.70                                                  | 1.49   | 1.25 | 4.44  | 6.49                                  | 14.55                                         | 34.95                              |
|                   | 2         | 1.86                                                  | 1.73   | 1.52 | 5.10  | 14.14                                 | 39.28                                         | 82.02                              |
|                   | 3         | 1.77                                                  | 1.36   | 1.29 | 4.41  | 17.30                                 | 43.07                                         | 70.07                              |
| CD(0.05)          |           | NS                                                    | 0.11   | 0.08 | 0.20  | 2.32                                  | 2.90                                          | 8.06                               |
| Mean of Factor-2  |           |                                                       |        |      |       |                                       |                                               |                                    |
|                   | 1         | 2.74                                                  | 1.94   | 1.78 | 6.46  | 0.00                                  | 0.00                                          | 0.00                               |
|                   | 2         | 1.55                                                  | 1.35   | 1.22 | 4.13  | 27.25                                 | 73.26                                         | 127.02                             |
|                   | 3         | 1.49                                                  | 1.24   | 1.17 | 3.89  | 16.38                                 | 36.79                                         | 61.40                              |
|                   | 4         |                                                       |        |      |       | 6.93                                  | 19.16                                         | 33.61                              |
| CD(0.05)          |           | 0.12                                                  | 0.08   | 0.13 | 0.20  | 3.17                                  | 4.01                                          | 8.85                               |
| Interaction       |           |                                                       |        |      |       |                                       |                                               |                                    |
|                   | M and T   | NS                                                    | 0.14   | NS   | 0.35  | 5.49                                  | 6.94                                          | 15.33                              |
|                   | T and M   | NS                                                    | 0.14   | NS   | 0.32  | 4.94                                  | 6.24                                          | 14.11                              |
| Experimental Mean |           | 1.78                                                  | 1.52   | 1.35 | 4.65  | 12.64                                 | 32.30                                         | 55.51                              |

M1- Mechanized transplanting

M2 - Puddled direct seeding

M3 - Un puddled dry direct seeding

T1 – Weed free

T2 – Weedy check

T3 – Mechanical weeding using weeder

T4 – Chemical weed control (pre &amp; post emergence herbicide application)

Table 4.3.2: Contd.

| Main Plot         | Sub Plots | GANGAVATHI                                        |        |       |        |                                                           |        |        |        | GHAGHRAGHAT                   |                          |               |
|-------------------|-----------|---------------------------------------------------|--------|-------|--------|-----------------------------------------------------------|--------|--------|--------|-------------------------------|--------------------------|---------------|
|                   |           | Weed biomass at vegetative stage g/m <sup>2</sup> |        |       |        | Weed biomass at panicle initiation stage g/m <sup>2</sup> |        |        |        | Weed biomass g/m <sup>2</sup> |                          |               |
|                   |           | Grasses                                           | Sedges | BLWs  | Total  | Grasses                                                   | Sedges | BLWs   | Total  | Active Vegetative stage       | Panicle initiation stage | Heading stage |
| M1                | T1        | 3.24                                              | 2.23   | 3.15  | 8.62   | 4.17                                                      | 7.78   | 1.39   | 13.34  | -                             | -                        | 22.57         |
|                   | T2        | 10.84                                             | 32.53  | 40.40 | 83.77  | 3.61                                                      | 50.69  | 112.96 | 167.26 | 2.23                          | 3.23                     | 33.84         |
|                   | T3        | 0.28                                              | 13.07  | 15.94 | 29.28  | 22.05                                                     | 18.44  | 11.86  | 52.35  | 2.55                          | 2.95                     | 28.19         |
|                   | T4        | 11.95                                             | 36.70  | 0.93  | 49.58  | 3.34                                                      | 18.81  | 0.00   | 22.15  | 1.81                          | 3                        | 26.59         |
| M2                | T1        | 3.06                                              | 2.41   | 0.65  | 6.12   | 2.16                                                      | 4.08   | 2.22   | 8.46   | -                             | -                        | 22.06         |
|                   | T2        | 3.06                                              | 29.01  | 6.21  | 38.27  | 28.82                                                     | 52.36  | 6.02   | 87.20  | 2.41                          | 4.6                      | 38.45         |
|                   | T3        | 2.23                                              | 4.54   | 0.37  | 7.13   | 8.06                                                      | 7.32   | 1.85   | 17.24  | 2.2                           | 3.26                     | 25.75         |
|                   | T4        | 11.31                                             | 8.98   | 0.93  | 21.21  | 0.74                                                      | 20.11  | 1.58   | 22.42  | 2.1                           | 3.05                     | 28.34         |
| M3                | T1        | 4.17                                              | 1.02   | 0.65  | 5.84   | 1.69                                                      | 3.43   | 6.76   | 11.89  | -                             | -                        | 23.85         |
|                   | T2        | 41.79                                             | 56.25  | 12.88 | 110.92 | 69.69                                                     | 39.66  | 13.25  | 122.60 | 2.42                          | 5.24                     | 33.41         |
|                   | T3        | 3.52                                              | 6.49   | 0.65  | 10.66  | 13.71                                                     | 3.80   | 1.85   | 19.37  | 1.69                          | 3.93                     | 29.68         |
|                   | T4        | 21.96                                             | 37.16  | 2.13  | 61.25  | 16.40                                                     | 20.11  | 0.65   | 37.16  | 1.99                          | 4.26                     | 31.16         |
| Mean of Factor-1  |           |                                                   |        |       |        |                                                           |        |        |        |                               |                          |               |
|                   | 1         | 6.58                                              | 21.13  | 15.10 | 42.81  | 8.29                                                      | 23.93  | 31.55  | 63.78  | 2.2                           | 3.06                     | 27.8          |
|                   | 2         | 4.91                                              | 11.23  | 2.04  | 18.18  | 9.94                                                      | 20.97  | 2.92   | 33.83  | 2.24                          | 3.64                     | 28.65         |
|                   | 3         | 17.86                                             | 25.23  | 4.08  | 47.17  | 25.37                                                     | 16.75  | 5.63   | 47.75  | 2.04                          | 4.47                     | 29.52         |
| CD(0.05)          |           | 3.48                                              | 2.22   | 2.52  | 2.62   | 2.87                                                      | NS     | 2.31   | 5.21   | NS                            | 0.27                     | NS            |
| Mean of Factor-2  |           |                                                   |        |       |        |                                                           |        |        |        |                               |                          |               |
|                   | 1         | 3.49                                              | 1.88   | 1.48  | 6.86   | 2.67                                                      | 5.10   | 3.46   | 11.23  | -                             | -                        | 22.83         |
|                   | 2         | 18.56                                             | 39.26  | 19.83 | 77.65  | 34.04                                                     | 47.57  | 44.08  | 125.69 | 2.36                          | 4.36                     | 35.23         |
|                   | 3         | 2.01                                              | 8.03   | 5.65  | 15.69  | 14.61                                                     | 9.85   | 5.19   | 29.65  | 2.15                          | 3.38                     | 27.87         |
|                   | 4         | 15.07                                             | 27.61  | 1.33  | 44.01  | 6.83                                                      | 19.68  | 0.74   | 27.24  | 1.97                          | 3.44                     | 28.69         |
| CD(0.05)          |           | 5.43                                              | 6.38   | 3.58  | 8.96   | 3.99                                                      | 5.04   | 5.04   | 8.06   | 0.2                           | 0.33                     | 3.51          |
| Interaction       |           |                                                   |        |       |        |                                                           |        |        |        |                               |                          |               |
|                   | M and T   | 9.40                                              | 11.05  | 6.20  | 15.51  | 6.90                                                      | NS     | 8.73   | 13.96  | NS                            | NS                       | NS            |
|                   | T and M   | 8.37                                              | 9.64   | 5.56  | 13.50  | 6.20                                                      | NS     | 7.66   | 12.44  | NS                            | NS                       | NS            |
| Experimental Mean |           | 9.78                                              | 19.20  | 7.07  | 36.05  | 14.54                                                     | 20.55  | 13.37  | 48.45  | 2.16                          | 3.72                     | 28.66         |

M1- Mechanized transplanting

M2 - Puddled direct seeding

M3 - Un puddled dry direct seeding

T1 – Weed free

T2 – Weedy check

T3 – Mechanical weeding using weeder

T4 – Chemical weed control (pre &amp; post emergence herbicide application)

Table 4.3.2: Contd.

| Main Plot         | Sub Plots | JAGDALPUR                                         |        |       |        |                                                           |        |       |        |                                                |        |       |        |
|-------------------|-----------|---------------------------------------------------|--------|-------|--------|-----------------------------------------------------------|--------|-------|--------|------------------------------------------------|--------|-------|--------|
|                   |           | Weed biomass at vegetative stage g/m <sup>2</sup> |        |       |        | Weed biomass at panicle initiation stage g/m <sup>2</sup> |        |       |        | Weed biomass at Heading stage g/m <sup>2</sup> |        |       |        |
|                   |           | Grasses                                           | Sedges | BLWs  | Total  | Grasses                                                   | Sedges | BLWs  | Total  | Grasses                                        | Sedges | BLWs  | Total  |
| M1                | T1        | 10.33                                             | 10.97  | 11.17 | 32.47  | 7.83                                                      | 13.67  | 8.67  | 30.17  | 7.83                                           | 13.50  | 13.00 | 34.33  |
|                   | T2        | 35.73                                             | 21.80  | 36.50 | 94.03  | 47.33                                                     | 34.67  | 45.17 | 127.17 | 56.33                                          | 42.17  | 53.33 | 151.83 |
|                   | T3        | 15.63                                             | 12.17  | 13.00 | 40.80  | 12.17                                                     | 19.50  | 14.83 | 46.50  | 15.50                                          | 23.50  | 14.67 | 53.67  |
|                   | T4        | 16.67                                             | 13.00  | 22.17 | 51.83  | 11.17                                                     | 12.33  | 13.00 | 36.50  | 11.17                                          | 17.17  | 14.67 | 43.00  |
| M2                | T1        | 13.30                                             | 17.17  | 16.50 | 46.97  | 9.00                                                      | 9.33   | 16.50 | 34.83  | 10.50                                          | 19.17  | 15.50 | 45.17  |
|                   | T2        | 38.17                                             | 40.83  | 39.00 | 118.00 | 51.50                                                     | 44.33  | 49.83 | 145.67 | 51.17                                          | 54.50  | 60.50 | 166.17 |
|                   | T3        | 20.63                                             | 26.83  | 21.17 | 68.63  | 15.33                                                     | 12.17  | 26.83 | 54.33  | 16.17                                          | 13.50  | 21.17 | 50.83  |
|                   | T4        | 22.37                                             | 31.17  | 18.67 | 72.20  | 16.50                                                     | 17.50  | 18.17 | 52.17  | 16.67                                          | 15.17  | 13.83 | 45.67  |
| M3                | T1        | 18.20                                             | 27.17  | 21.50 | 66.87  | 18.83                                                     | 16.00  | 21.50 | 56.33  | 21.17                                          | 17.17  | 15.50 | 53.83  |
|                   | T2        | 78.53                                             | 59.17  | 48.67 | 186.37 | 91.50                                                     | 63.67  | 68.33 | 223.50 | 70.67                                          | 79.00  | 82.00 | 231.67 |
|                   | T3        | 23.37                                             | 31.50  | 30.17 | 85.03  | 24.50                                                     | 23.00  | 23.17 | 70.67  | 26.33                                          | 22.17  | 21.83 | 70.33  |
|                   | T4        | 21.07                                             | 32.67  | 23.17 | 76.90  | 28.67                                                     | 31.00  | 19.83 | 79.50  | 17.17                                          | 21.50  | 12.83 | 51.50  |
| Mean of Factor-1  |           |                                                   |        |       |        |                                                           |        |       |        |                                                |        |       |        |
|                   | 1         | 19.59                                             | 14.48  | 20.71 | 54.78  | 19.62                                                     | 20.04  | 20.42 | 60.08  | 22.71                                          | 24.08  | 23.92 | 70.71  |
|                   | 2         | 23.62                                             | 29.00  | 23.83 | 76.45  | 23.08                                                     | 20.83  | 27.83 | 71.75  | 23.63                                          | 25.58  | 27.75 | 76.96  |
|                   | 3         | 35.29                                             | 37.63  | 30.88 | 103.79 | 40.88                                                     | 33.42  | 33.21 | 107.50 | 33.83                                          | 34.96  | 33.04 | 101.83 |
| CD(0.05)          |           | 6.27                                              | 2.83   | NS    | 17.30  | 7.19                                                      | 4.90   | NS    | 17.13  | NS                                             | NS     | NS    | NS     |
| Mean of Factor-2  |           |                                                   |        |       |        |                                                           |        |       |        |                                                |        |       |        |
|                   | 1         | 13.94                                             | 18.43  | 16.39 | 48.77  | 11.89                                                     | 13.00  | 15.56 | 40.44  | 13.17                                          | 16.61  | 14.67 | 44.44  |
|                   | 2         | 50.81                                             | 40.60  | 41.39 | 132.80 | 63.44                                                     | 47.56  | 54.44 | 165.44 | 59.39                                          | 58.56  | 65.28 | 183.22 |
|                   | 3         | 19.88                                             | 23.50  | 21.44 | 64.82  | 17.33                                                     | 18.22  | 21.61 | 57.17  | 19.33                                          | 19.72  | 19.22 | 58.28  |
|                   | 4         | 20.03                                             | 25.61  | 21.33 | 66.98  | 18.78                                                     | 20.28  | 17.00 | 56.06  | 15.00                                          | 17.94  | 13.78 | 46.72  |
| CD(0.05)          |           | 6.89                                              | 8.67   | 6.05  | 12.90  | 6.84                                                      | 6.37   | 8.42  | 14.62  |                                                |        |       |        |
| Interaction       |           |                                                   |        |       |        |                                                           |        |       |        |                                                |        |       |        |
|                   | M and T   | 11.93                                             | NS     | NS    | 22.34  | 11.84                                                     | NS     | NS    | 25.32  | 36.41                                          | 33.89  | 28.72 | 23.90  |
|                   | T and M   | 10.97                                             | NS     | NS    | 22.18  | 11.14                                                     | NS     | NS    | 24.32  | NS                                             | NS     | NS    | NS     |
| Experimental Mean |           | 26.17                                             | 27.04  | 25.14 | 78.34  | 27.86                                                     | 24.76  | 27.15 | 79.78  | 26.72                                          | 28.21  | 28.24 | 83.17  |

M1- Mechanized transplanting

M2 - Puddled direct seeding

M3 - Un puddled dry direct seeding

T1 – Weed free

T2 – Weedy check

T3 – Mechanical weeding using weeder

T4 – Chemical weed control (pre &amp; post emergence herbicide application)

Table 4.3.2: Contd.

| Main Plot         | Sub Plots | MALAN                                             |        |       |        |                                                           |        |       |        |                                                |        |       |        |
|-------------------|-----------|---------------------------------------------------|--------|-------|--------|-----------------------------------------------------------|--------|-------|--------|------------------------------------------------|--------|-------|--------|
|                   |           | Weed biomass at vegetative stage g/m <sup>2</sup> |        |       |        | Weed biomass at panicle initiation stage g/m <sup>2</sup> |        |       |        | Weed biomass at Heading stage g/m <sup>2</sup> |        |       |        |
|                   |           | Grasses                                           | Sedges | BLWs  | Total  | Grasses                                                   | Sedges | BLWs  | Total  | Grasses                                        | Sedges | BLWs  | Total  |
| M1                | T1        | 0.00                                              | 0.00   | 0.00  | 0.00   | 0.00                                                      | 0.00   | 0.00  | 0.00   | 0.00                                           | 0.00   | 0.00  | 0.00   |
|                   | T2        | 28.20                                             | 12.60  | 16.20 | 57.00  | 29.10                                                     | 13.50  | 15.90 | 58.50  | 24.30                                          | 12.30  | 14.10 | 50.70  |
|                   | T3        | 16.20                                             | 6.30   | 9.00  | 31.50  | 21.30                                                     | 7.80   | 12.30 | 41.40  | 21.30                                          | 8.10   | 12.60 | 42.00  |
|                   | T4        | 2.70                                              | 2.70   | 2.70  | 8.10   | 4.80                                                      | 5.70   | 4.50  | 15.00  | 5.40                                           | 6.00   | 4.80  | 16.20  |
| M2                | T1        | 0.00                                              | 0.00   | 0.00  | 0.00   | 0.00                                                      | 0.00   | 0.00  | 0.00   | 0.00                                           | 0.00   | 0.00  | 0.00   |
|                   | T2        | 43.20                                             | 28.50  | 48.30 | 120.00 | 41.10                                                     | 26.10  | 29.10 | 96.30  | 43.50                                          | 24.60  | 25.57 | 93.67  |
|                   | T3        | 21.30                                             | 16.80  | 23.40 | 61.50  | 20.70                                                     | 20.10  | 16.20 | 57.00  | 21.30                                          | 20.10  | 16.20 | 57.60  |
|                   | T4        | 7.50                                              | 4.20   | 5.70  | 17.40  | 6.90                                                      | 4.20   | 3.30  | 14.40  | 7.50                                           | 5.10   | 4.50  | 17.10  |
| M3                | T1        | 0.00                                              | 0.00   | 0.00  | 0.00   | 0.00                                                      | 0.00   | 0.00  | 0.00   | 0.00                                           | 0.00   | 0.00  | 0.00   |
|                   | T2        | 50.10                                             | 60.30  | 56.40 | 166.80 | 49.80                                                     | 50.10  | 59.40 | 159.30 | 51.60                                          | 51.00  | 61.20 | 163.80 |
|                   | T3        | 30.90                                             | 28.20  | 27.30 | 86.40  | 31.20                                                     | 26.30  | 25.80 | 83.30  | 33.90                                          | 29.63  | 27.00 | 90.53  |
|                   | T4        | 11.40                                             | 6.00   | 8.60  | 26.00  | 8.40                                                      | 6.60   | 9.60  | 24.60  | 7.20                                           | 4.80   | 8.40  | 20.40  |
| Mean of Factor-1  |           |                                                   |        |       |        |                                                           |        |       |        |                                                |        |       |        |
|                   | 1         | 11.77                                             | 5.40   | 6.97  | 24.15  | 13.80                                                     | 6.75   | 8.18  | 28.72  | 12.75                                          | 6.60   | 7.88  | 27.22  |
|                   | 2         | 18.00                                             | 12.38  | 19.35 | 49.72  | 17.18                                                     | 12.60  | 12.15 | 41.92  | 18.08                                          | 12.45  | 11.57 | 42.09  |
|                   | 3         | 23.10                                             | 23.62  | 23.08 | 69.80  | 22.35                                                     | 20.75  | 23.70 | 66.80  | 23.18                                          | 21.36  | 24.15 | 68.68  |
| CD(0.05)          |           | 1.72                                              | 1.24   | 1.21  | 2.42   | 1.72                                                      | 1.66   | 1.55  | 3.72   | 1.05                                           | 0.70   | 1.40  | 1.68   |
| Mean of Factor-2  |           |                                                   |        |       |        |                                                           |        |       |        |                                                |        |       |        |
|                   | 1         | 0.00                                              | 0.00   | 0.00  | 0.00   | 0.00                                                      | 0.00   | 0.00  | 0.00   | 0.00                                           | 0.00   | 0.00  | 0.00   |
|                   | 2         | 40.50                                             | 33.80  | 40.30 | 114.60 | 40.00                                                     | 29.90  | 34.80 | 104.70 | 39.80                                          | 29.30  | 33.62 | 102.72 |
|                   | 3         | 22.80                                             | 17.10  | 19.90 | 59.80  | 24.40                                                     | 18.07  | 18.10 | 60.57  | 25.50                                          | 19.28  | 18.60 | 63.38  |
|                   | 4         | 7.20                                              | 4.30   | 5.67  | 17.17  | 6.70                                                      | 5.50   | 5.80  | 18.00  | 6.70                                           | 5.30   | 5.90  | 17.90  |
| CD(0.05)          |           | 2.39                                              | 1.79   | 2.30  | 3.60   | 1.99                                                      | 2.05   | 2.36  | 4.39   | 1.95                                           | 1.47   | 2.58  | 3.88   |
| Interaction       |           |                                                   |        |       |        |                                                           |        |       |        |                                                |        |       |        |
|                   | M and T   | 4.14                                              | 3.10   | 3.99  | 6.24   | 3.44                                                      | 3.55   | 4.08  | 7.60   | 3.38                                           | 2.54   | 4.46  | 6.71   |
|                   | T and M   | 3.72                                              | 2.77   | 3.52  | 5.58   | 3.15                                                      | 3.22   | 3.64  | 6.93   | 2.98                                           | 2.24   | 3.94  | 5.89   |
| Experimental Mean |           | 17.63                                             | 13.80  | 16.47 | 47.89  | 17.78                                                     | 13.37  | 14.68 | 45.82  | 18.00                                          | 13.47  | 14.53 | 46.00  |

M1- Mechanized transplanting

M2 - Puddled direct seeding

M3 - Un puddled dry direct seeding

T1 – Weed free

T2 – Weedy check

T3 – Mechanical weeding using weeder

T4 – Chemical weed control (pre &amp; post emergence herbicide application)

Table 4.3.2: Contd.

| Main Plot         | Sub Plots | MONCOMPU                                         |        |       |        |                                                           |        |       |        |                                                |        |       |        |
|-------------------|-----------|--------------------------------------------------|--------|-------|--------|-----------------------------------------------------------|--------|-------|--------|------------------------------------------------|--------|-------|--------|
|                   |           | Weed biomass at vegetative stage /m <sup>2</sup> |        |       |        | Weed biomass at panicle initiation stage g/m <sup>2</sup> |        |       |        | Weed biomass at Heading stage g/m <sup>2</sup> |        |       |        |
|                   |           | Grasses                                          | Sedges | BLWs  | Total  | Grasses                                                   | Sedges | BLWs  | Total  | Grasses                                        | Sedges | BLWs  | Total  |
| M1                | T1        | 2.00                                             | 0.40   | 1.73  | 4.13   | 4.80                                                      | 1.73   | 3.60  | 10.13  | 70.40                                          | 0.00   | 0.00  | 70.40  |
|                   | T2        | 11.73                                            | 97.47  | 25.87 | 135.07 | 7.47                                                      | 75.07  | 11.07 | 93.60  | 242.00                                         | 0.00   | 1.33  | 243.33 |
|                   | T3        | 7.60                                             | 19.20  | 19.47 | 46.27  | 8.67                                                      | 25.60  | 16.00 | 50.27  | 43.07                                          | 0.00   | 3.20  | 46.27  |
|                   | T4        | 22.67                                            | 37.47  | 8.67  | 68.80  | 16.67                                                     | 23.60  | 1.33  | 41.60  | 136.13                                         | 0.00   | 1.47  | 137.60 |
| M2                | T1        | 0.67                                             | 2.67   | 4.00  | 7.33   | 1.33                                                      | 1.60   | 2.13  | 5.07   | 0.67                                           | 1.60   | 1.87  | 4.13   |
|                   | T2        | 7.60                                             | 126.67 | 40.53 | 174.80 | 34.27                                                     | 104.13 | 24.27 | 162.67 | 37.33                                          | 84.40  | 28.13 | 149.87 |
|                   | T3        | 1.87                                             | 43.33  | 7.33  | 52.53  | 58.67                                                     | 95.33  | 8.40  | 162.40 | 85.33                                          | 94.67  | 4.00  | 184.00 |
|                   | T4        | 3.87                                             | 16.67  | 0.80  | 21.33  | 16.00                                                     | 16.67  | 2.40  | 35.07  | 2.53                                           | 37.87  | 1.20  | 41.60  |
| M3                | T1        | 0.13                                             | 16.13  | 2.13  | 18.40  | 0.67                                                      | 3.47   | 1.33  | 5.47   | 0.00                                           | 1.07   | 0.80  | 1.87   |
|                   | T2        | 1.07                                             | 40.80  | 17.20 | 59.07  | 10.00                                                     | 77.33  | 6.67  | 94.00  | 32.80                                          | 74.00  | 4.93  | 111.73 |
|                   | T3        | 1.60                                             | 24.53  | 23.73 | 49.87  | 12.00                                                     | 43.20  | 9.60  | 64.80  | 2.67                                           | 22.13  | 1.33  | 26.13  |
|                   | T4        | 1.07                                             | 4.00   | 2.80  | 7.87   | 6.67                                                      | 5.33   | 1.33  | 13.33  | 2.13                                           | 2.40   | 1.20  | 5.73   |
| Mean of Factor-1  |           |                                                  |        |       |        |                                                           |        |       |        |                                                |        |       |        |
|                   | 1         | 11.00                                            | 38.63  | 13.93 | 63.57  | 9.40                                                      | 31.50  | 8.00  | 48.90  | 122.90                                         | 0.00   | 1.50  | 124.40 |
|                   | 2         | 3.50                                             | 47.33  | 13.17 | 64.00  | 27.57                                                     | 54.43  | 9.30  | 91.30  | 31.47                                          | 54.63  | 8.80  | 94.90  |
|                   | 3         | 0.97                                             | 21.37  | 11.47 | 33.80  | 7.33                                                      | 32.33  | 4.73  | 44.40  | 9.40                                           | 24.90  | 2.07  | 36.37  |
| CD(0.05)          |           | NS                                               | NS     | NS    | NS     | 4.02                                                      | NS     | NS    | NS     | 22.85                                          | NS     | NS    | NS     |
| Mean of Factor-2  |           |                                                  |        |       |        |                                                           |        |       |        |                                                |        |       |        |
|                   | 1         | 0.93                                             | 6.40   | 2.62  | 9.96   | 2.27                                                      | 2.27   | 2.36  | 6.89   | 23.69                                          | 0.89   | 0.89  | 25.47  |
|                   | 2         | 6.80                                             | 88.31  | 27.87 | 122.98 | 17.24                                                     | 85.51  | 14.00 | 116.76 | 104.04                                         | 52.80  | 11.47 | 168.31 |
|                   | 3         | 3.69                                             | 29.02  | 16.84 | 49.56  | 26.44                                                     | 54.71  | 11.33 | 92.49  | 43.69                                          | 38.93  | 2.84  | 85.47  |
|                   | 4         | 9.20                                             | 19.38  | 4.09  | 32.67  | 13.11                                                     | 15.20  | 1.69  | 30.00  | 46.93                                          | 13.42  | 1.29  | 61.64  |
| CD(0.05)          |           | 5.98                                             | 26.91  | 11.97 | 33.17  | 11.60                                                     | 32.73  | 10.22 | 40.58  | 44.93                                          | 30.03  | 7.25  | 52.39  |
| Interaction       |           |                                                  |        |       |        |                                                           |        |       |        |                                                |        |       |        |
|                   | M and T   | NS                                               | NS     | NS    | NS     | NS                                                        | NS     | NS    | NS     | 77.81                                          | NS     | NS    | NS     |
|                   | T and M   | NS                                               | NS     | NS    | NS     | NS                                                        | NS     | NS    | NS     | 68.54                                          | NS     | NS    | NS     |
| Experimental Mean |           | 5.16                                             | 35.78  | 12.86 | 53.79  | 14.77                                                     | 39.42  | 7.34  | 61.53  | 54.59                                          | 26.51  | 4.12  | 85.22  |

M1- Mechanized transplanting

M2 - Puddled direct seeding

M3 - Un puddled dry direct seeding

T1 – Weed free

T2 – Weedy check

T3 – Mechanical weeding using weeder

T4 – Chemical weed control (pre &amp; post emergence herbicide application)

Table 4.3.2: Contd.

| Main Plot                | Sub Plots | NAWAGAM                                           |        |       |       |                                                           |        |       |        |                                                |        |       |       |
|--------------------------|-----------|---------------------------------------------------|--------|-------|-------|-----------------------------------------------------------|--------|-------|--------|------------------------------------------------|--------|-------|-------|
|                          |           | Weed biomass at vegetative stage g/m <sup>2</sup> |        |       |       | Weed biomass at panicle initiation stage g/m <sup>2</sup> |        |       |        | Weed biomass at Heading stage g/m <sup>2</sup> |        |       |       |
|                          |           | Grasses                                           | Sedges | BLWs  | Total | Grasses                                                   | Sedges | BLWs  | Total  | Grasses                                        | Sedges | BLWs  | Total |
| <b>M1</b>                | T1        | 1.64                                              | 1.79   | 2.73  | 6.16  | 15.30                                                     | 11.87  | 20.73 | 47.89  | 9.07                                           | 5.20   | 11.42 | 25.68 |
|                          | T2        | 5.11                                              | 3.46   | 6.5   | 15.07 | 25.22                                                     | 23.40  | 38.96 | 87.57  | 13.74                                          | 14.20  | 19.09 | 47.02 |
|                          | T3        | 2.72                                              | 2.17   | 4.68  | 9.57  | 19.13                                                     | 17.72  | 22.07 | 58.92  | 12.47                                          | 10.77  | 16.46 | 39.69 |
|                          | T4        | 2.4                                               | 1.63   | 2.72  | 6.75  | 16.01                                                     | 15.93  | 20.00 | 51.93  | 11.19                                          | 12.62  | 19.54 | 43.35 |
| <b>M2</b>                | T1        | 0.86                                              | 2.4    | 5.91  | 9.17  | 17.17                                                     | 15.04  | 26.04 | 58.25  | 12.64                                          | 11.73  | 16.54 | 40.91 |
|                          | T2        | 6.05                                              | 4.25   | 8.81  | 19.1  | 36.61                                                     | 24.56  | 42.23 | 103.41 | 19.76                                          | 17.53  | 21.98 | 59.27 |
|                          | T3        | 2.01                                              | 2.53   | 4.63  | 9.17  | 21.06                                                     | 14.35  | 20.28 | 55.69  | 17.66                                          | 12.83  | 20.00 | 50.49 |
|                          | T4        | 2.3                                               | 2.78   | 3.85  | 8.93  | 14.42                                                     | 15.46  | 20.93 | 50.80  | 17.82                                          | 12.42  | 17.96 | 48.20 |
| <b>M3</b>                | T1        | 2.06                                              | 4.26   | 3.4   | 9.72  | 21.00                                                     | 13.25  | 20.49 | 54.74  | 18.98                                          | 14.26  | 22.33 | 55.57 |
|                          | T2        | 7.77                                              | 8.23   | 10.04 | 26.04 | 34.78                                                     | 30.67  | 50.60 | 116.05 | 22.01                                          | 16.56  | 27.82 | 66.39 |
|                          | T3        | 4.6                                               | 1.51   | 6.2   | 12.31 | 19.15                                                     | 15.84  | 23.61 | 58.60  | 17.64                                          | 17.42  | 17.48 | 52.54 |
|                          | T4        | 3.33                                              | 2.9    | 3.05  | 9.28  | 25.03                                                     | 16.70  | 29.10 | 70.84  | 17.30                                          | 17.42  | 19.99 | 54.72 |
| <b>Mean of Factor-1</b>  |           |                                                   |        |       |       |                                                           |        |       |        |                                                |        |       |       |
|                          | 1         | 2.97                                              | 2.26   | 4.16  | 9.39  | 18.91                                                     | 17.23  | 25.44 | 61.58  | 11.62                                          | 10.70  | 16.63 | 38.94 |
|                          | 2         | 2.81                                              | 2.99   | 5.8   | 11.6  | 22.32                                                     | 17.35  | 27.37 | 67.04  | 16.97                                          | 13.63  | 19.12 | 49.72 |
|                          | 3         | 4.44                                              | 4.22   | 5.67  | 14.34 | 24.99                                                     | 19.12  | 30.95 | 75.06  | 18.98                                          | 16.42  | 21.90 | 57.30 |
| <b>CD(0.05)</b>          |           | NS                                                | 0.44   | NS    | 0.66  | NS                                                        | NS     | NS    | 3.95   | 1.55                                           | 1.92   | 1.59  | 1.27  |
| <b>Mean of Factor-2</b>  |           |                                                   |        |       |       |                                                           |        |       |        |                                                |        |       |       |
|                          | 1         | 1.52                                              | 2.82   | 4.01  | 8.35  | 17.82                                                     | 13.39  | 22.42 | 53.63  | 13.56                                          | 10.40  | 16.76 | 40.72 |
|                          | 2         | 6.31                                              | 5.31   | 8.45  | 20.07 | 32.20                                                     | 26.21  | 43.93 | 102.34 | 18.50                                          | 16.09  | 22.96 | 57.56 |
|                          | 3         | 3.11                                              | 2.07   | 5.17  | 10.35 | 19.78                                                     | 15.97  | 21.99 | 57.74  | 15.92                                          | 13.67  | 17.98 | 47.57 |
|                          | 4         | 2.68                                              | 2.44   | 3.21  | 8.32  | 18.49                                                     | 16.03  | 23.34 | 57.86  | 15.44                                          | 14.15  | 19.17 | 48.76 |
| <b>CD(0.05)</b>          |           | 1.29                                              | 1.43   | 2.34  | 2.68  | 7.47                                                      | 3.90   | 7.29  | 12.58  | NS                                             | 2.76   | 4.40  | 6.04  |
| <b>Interaction</b>       |           |                                                   |        |       |       |                                                           |        |       |        |                                                |        |       |       |
|                          | M and T   | NS                                                | NS     | NS    | NS    | NS                                                        | NS     | NS    | NS     | NS                                             | NS     | NS    | NS    |
|                          | T and M   | NS                                                | NS     | NS    | NS    | NS                                                        | NS     | NS    | NS     | NS                                             | NS     | NS    | NS    |
| <b>Experimental Mean</b> |           | 3.41                                              | 3.16   | 5.21  | 11.77 | 22.07                                                     | 17.90  | 27.92 | 67.89  | 15.86                                          | 13.58  | 19.22 | 48.65 |

M1- Mechanized transplanting

M2 - Puddled direct seeding

M3 - Un puddled dry direct seeding

T1 – Weed free

T2 – Weedy check

T3 – Mechanical weeding using weeder

T4 – Chemical weed control (pre &amp; post emergence herbicide application)

Table 4.3.2: Contd.

| Main Plot         | Sub Plots | PUDUCHERRY                                        |        |       |       |                                                           |        |      |       |                                                |        |      |       |
|-------------------|-----------|---------------------------------------------------|--------|-------|-------|-----------------------------------------------------------|--------|------|-------|------------------------------------------------|--------|------|-------|
|                   |           | Weed biomass at vegetative stage g/m <sup>2</sup> |        |       |       | Weed biomass at panicle initiation stage g/m <sup>2</sup> |        |      |       | Weed biomass at Heading stage g/m <sup>2</sup> |        |      |       |
|                   |           | Grasses                                           | Sedges | BLWs  | Total | Grasses                                                   | Sedges | BLWs | Total | Grasses                                        | Sedges | BLWs | Total |
| M1                | T1        | 14.11                                             | 8.89   | 9.77  | 32.77 | 10.98                                                     | 6.27   | 5.72 | 22.97 | 7.32                                           | 4.7    | 4.65 | 16.68 |
|                   | T2        | 16                                                | 10.13  | 12.4  | 38.54 | 12.27                                                     | 7.47   | 7.63 | 27.37 | 9.07                                           | 5.87   | 5.96 | 20.9  |
|                   | T3        | 10.62                                             | 5.56   | 6.68  | 22.87 | 6.58                                                      | 4.55   | 3.64 | 14.77 | 4.05                                           | 2.53   | 2.58 | 9.16  |
|                   | T4        | 12.78                                             | 7.16   | 8.23  | 28.17 | 7.67                                                      | 5.11   | 4.68 | 17.46 | 5.62                                           | 4.09   | 4.14 | 13.85 |
| M2                | T1        | 16.18                                             | 9.71   | 11.86 | 37.74 | 11.32                                                     | 7.55   | 8.18 | 27.05 | 8.63                                           | 5.93   | 5.96 | 20.52 |
|                   | T2        | 17.58                                             | 11.89  | 13.37 | 42.84 | 12.92                                                     | 8.27   | 8.84 | 30.03 | 10.34                                          | 6.72   | 6.72 | 23.78 |
|                   | T3        | 13.33                                             | 6.93   | 8.09  | 28.36 | 7.47                                                      | 5.33   | 6    | 18.8  | 4.8                                            | 3.73   | 3.8  | 12.33 |
|                   | T4        | 14.77                                             | 7.91   | 9.71  | 32.39 | 9.5                                                       | 6.33   | 7.09 | 22.92 | 6.33                                           | 4.75   | 4.88 | 15.96 |
| M3                | T1        | -                                                 | -      | -     | -     | -                                                         | -      | -    | -     | -                                              | -      | -    | -     |
|                   | T2        | -                                                 | -      | -     | -     | -                                                         | -      | -    | -     | -                                              | -      | -    | -     |
|                   | T3        | -                                                 | -      | -     | -     | -                                                         | -      | -    | -     | -                                              | -      | -    | -     |
|                   | T4        | -                                                 | -      | -     | -     | -                                                         | -      | -    | -     | -                                              | -      | -    | -     |
| Mean of Factor-1  |           |                                                   |        |       |       |                                                           |        |      |       |                                                |        |      |       |
|                   | 1         | 13.38                                             | 7.94   | 9.27  | 30.59 | 9.37                                                      | 5.85   | 5.42 | 20.64 | 6.51                                           | 4.3    | 4.33 | 15.15 |
|                   | 2         | 15.47                                             | 9.11   | 10.76 | 35.33 | 10.3                                                      | 6.87   | 7.52 | 24.7  | 7.52                                           | 5.28   | 5.34 | 18.15 |
|                   | 3         | -                                                 | -      | -     | -     | -                                                         | -      | -    | -     | -                                              | -      | -    | -     |
| CD(0.05)          |           | 0.73                                              | 0.37   | 0.44  | 1.54  | 0.43                                                      | 0.3    | 0.31 | 1.03  | 0.27                                           | 0.21   | 0.21 | 0.68  |
| Mean of Factor-2  |           |                                                   |        |       |       |                                                           |        |      |       |                                                |        |      |       |
|                   | 1         | 15.14                                             | 9.3    | 10.82 | 35.26 | 11.15                                                     | 6.91   | 6.95 | 25.01 | 7.97                                           | 5.32   | 5.31 | 18.6  |
|                   | 2         | 16.79                                             | 11.01  | 12.88 | 40.69 | 12.6                                                      | 7.87   | 8.23 | 28.7  | 9.7                                            | 6.29   | 6.34 | 22.34 |
|                   | 3         | 11.98                                             | 6.25   | 7.39  | 25.61 | 7.02                                                      | 4.94   | 4.82 | 16.78 | 4.42                                           | 3.13   | 3.19 | 10.74 |
|                   | 4         | 13.78                                             | 7.54   | 8.97  | 30.28 | 8.58                                                      | 5.72   | 5.88 | 20.19 | 5.98                                           | 4.42   | 4.51 | 14.91 |
| CD(0.05)          |           | 0.45                                              | 0.28   | 0.33  | 1.06  | 0.32                                                      | 0.21   | 0.21 | 0.74  | 0.24                                           | 0.16   | 0.16 | 0.56  |
| Interaction       |           |                                                   |        |       |       |                                                           |        |      |       |                                                |        |      |       |
|                   | M and T   | NS                                                | 0.39   | NS    | NS    | 0.46                                                      | NS     | 0.3  | NS    | NS                                             | 0.23   | 0.23 | NS    |
|                   | T and M   | NS                                                | 0.45   | NS    | NS    | 0.52                                                      | NS     | 0.36 | NS    | NS                                             | 0.25   | 0.26 | NS    |
| Experimental Mean |           | 14.42                                             | 8.52   | 10.01 | 32.96 | 9.84                                                      | 6.36   | 6.47 | 22.67 | 7.02                                           | 4.79   | 4.84 | 16.65 |

M1- Mechanized transplanting

M2 - Puddled direct seeding

M3 - Un puddled dry direct seeding

T1 – Weed free

T2 – Weedy check

T3 – Mechanical weeding using weeder

T4 – Chemical weed control (pre &amp; post emergence herbicide application)

Table 4.3.2: Contd.

| Main Plot         | Sub Plots | PANTNAGAR                                            |                                                           | TITABAR                                           | VARNASI                             |                          |               |
|-------------------|-----------|------------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|-------------------------------------|--------------------------|---------------|
|                   |           | Weed biomass at mid-tillering stage g/m <sup>2</sup> | Weed biomass at panicle initiation stage g/m <sup>2</sup> | Weed dry weight vegetative stage g/m <sup>2</sup> | Total Weed biomass g/m <sup>2</sup> |                          |               |
|                   |           | Total weeds                                          | Total weeds                                               |                                                   | Vegetative stage                    | Panicle initiation stage | Heading stage |
| M1                | T1        | 0.83                                                 | 1.80                                                      | 2.76                                              | 14.42                               | 5.35                     | 5.24          |
|                   | T2        | 4.50                                                 | 13.13                                                     | 23.06                                             | 62                                  | 85.47                    | 5.68          |
|                   | T3        | 2.67                                                 | 4.67                                                      | 9.27                                              | 33.51                               | 36.07                    | 4.19          |
|                   | T4        | 1.58                                                 | 2.33                                                      | 8.37                                              | 32.45                               | 15.33                    | 4.36          |
| M2                | T1        | 2.08                                                 | 2.73                                                      | 2.03                                              | 6.57                                | 23.86                    | 15.58         |
|                   | T2        | 16.75                                                | 23.80                                                     | 22.01                                             | 102.61                              | 100.06                   | 63.12         |
|                   | T3        | 1.42                                                 | 3.50                                                      | 6.36                                              | 13.98                               | 45.88                    | 32.23         |
|                   | T4        | 1.50                                                 | 1.63                                                      | 5.29                                              | 28.45                               | 7.54                     | 5.43          |
| M3                | T1        | 1.50                                                 | 2.77                                                      | 2.11                                              | 38.32                               | 46.2                     | 22.62         |
|                   | T2        | 31.00                                                | 33.83                                                     | 16.79                                             | 238.33                              | 280.25                   | 150.07        |
|                   | T3        | 3.58                                                 | 4.43                                                      | 4.95                                              | 73.57                               | 111.21                   | 9.68          |
|                   | T4        | 3.42                                                 | 3.57                                                      | 4.95                                              | 37.73                               | 30.5                     | 8.06          |
| Mean of Factor-1  |           |                                                      |                                                           |                                                   |                                     |                          |               |
|                   | 1         | 2.40                                                 | 5.48                                                      | 10.87                                             | 35.6                                | 35.56                    | 4.87          |
|                   | 2         | 5.44                                                 | 7.92                                                      | 8.92                                              | 37.91                               | 44.33                    | 29.09         |
|                   | 3         | 9.88                                                 | 11.15                                                     | 7.20                                              | 96.99                               | 117.04                   | 47.61         |
|                   | CD(0.05)  | 0.67                                                 | 0.61                                                      | 1.13                                              | 6.44                                | 3.27                     | 3.15          |
| Mean of Factor-2  |           |                                                      |                                                           |                                                   |                                     |                          |               |
|                   | 1         | 1.47                                                 | 2.43                                                      | 2.30                                              | 19.77                               | 25.14                    | 14.48         |
|                   | 2         | 17.42                                                | 23.59                                                     | 20.62                                             | 134.32                              | 155.26                   | 72.96         |
|                   | 3         | 2.56                                                 | 4.20                                                      | 6.86                                              | 40.36                               | 64.39                    | 15.37         |
|                   | 4         | 2.17                                                 | 2.51                                                      | 6.21                                              | 32.88                               | 17.79                    | 5.95          |
|                   | CD(0.05)  | 0.86                                                 | 1.35                                                      | 1.37                                              | 5.99                                | 7.48                     | 3.58          |
| Interaction       |           |                                                      |                                                           |                                                   |                                     |                          |               |
|                   | M and T   | 1.49                                                 | 2.33                                                      | NS                                                | 10.38                               | 12.96                    | 6.2           |
|                   | T and M   | 1.35                                                 | 2.05                                                      | NS                                                | 9.8                                 | 11.36                    | 5.68          |
| Experimental Mean |           | 5.90                                                 | 8.18                                                      | 9.00                                              | 56.83                               | 65.64                    | 27.19         |

M1- Mechanized transplanting

M2 - Puddled direct seeding

M3 - Un puddled dry direct seeding

T1 – Weed free

T2 – Weedy check

T3 – Mechanical weeding using weeder

T4 – Chemical weed control (pre &amp; post emergence herbicide application)

## **Influence of Establishment Methods on Pest Incidence (IEMP)**

In India, rice is grown traditionally by manual transplanting method which requires more water and labour leading to high crop production costs. To overcome these constraints, the farmers are gradually shifting to alternative methods of rice cultivation like direct seeding, aerobic rice, mechanical transplanting etc. Hence, a collaborative trial with Agronomy section was initiated in order to assess the influence of crop establishment methods and weed management strategies on pest incidence.

The field trial was laid out in split plot design with three replications. Main plot treatments comprised of three different crop establishment methods (M1: Mechanised transplanting, M2: Puddled direct seeding and M3: Unpuddled dry direct seeding. The sub plot treatments comprised of four weed management treatments (S1 = Weed free; S2 = Weedy check; S3 = Mechanical weeding using weeder; S4 = Chemical weed control (pre and post emergence herbicide application))

During *Kharif* 2019, the trial was conducted at eight locations, viz, Aduthurai, Chiplima, Jagdalpur, Ludhiana, Malan, Mandya, Moncompu and Rajendranagar. Standard procedures were adopted to record insect pest incidence in different main and sub plot treatments. The results are summarized below.

At **Aduthurai**, the three main plots included mechanical transplanting, puddled direct seeding and unpuddled direct seeding methods of crop establishment, while the four sub plots consisted of weed free, weedy check, mechanical weeding and chemical weed control treatments. Incidence of stem borer, hispa, whorl maggot and BPH was observed. Dead heart incidence was low in different crop establishment methods and sub-plots with weed management treatments except in weedy check which recorded 10.70% DH exceeding ETL. However, white ear damage was high in all the main plots (15.74-27.54%) and sub plots (17.44 to 24.24%). Lowest white ear damage was recorded in Mechanised transplanting (15.74% WE) followed by puddled direct seeding (19.73% WE), while maximum white ear damage was observed in unpuddled direct seeding (27.54% WE). There were significant differences among the treatments. Among the sub-plots, weed free plot exhibited least white ear incidence (17.44%) significantly superior to mechanical weeding (20.30% WE), chemical weed treatment (22.02% WE), while weedy check treatment recorded highest incidence (24.24%). Interactive effects revealed that mechanised transplanting with weed free subplot showed the least white ear incidence (10.50%) followed by mechanical weeding subplot (15.50% WE) which was at par with puddled direct sowing with weed free sub plot (16.33% WE). These three treatments were significantly superior to rest of the treatments. Similarly, hispa damage was also significantly low in mechanised transplanting main plot (8.47% DL) and weed free sub plot (10.23% DL) while highest damage was recorded in unpuddled direct sowing (27.54% DL) and weedy check sub plot (24.24% DL). Whorl maggot (maximum of 8.23% DL and BPH (2.16 hoppers/hill) incidence was very low across main and sub plots.

Though there were significant differences, no trends were discernible on the effect of the treatments on these two pests.

**Table Influence of Crop Establishment Methods on Pest Incidence at Aduthurai, Kharif 2019**

| Treatments                    |                       | % DH        | % WE        | % HDL       | % WMDL       | BPH/hill     |
|-------------------------------|-----------------------|-------------|-------------|-------------|--------------|--------------|
| Mechanised transplanting      | Weed free             | 6.73g       | 10.50i      | 3.67j       | 2.67h        | 0.60g        |
|                               | Weedy check           | 9.43cd      | 19.43f      | 13.57f      | 6.17e        | 1.53de       |
|                               | Mechanical weeding    | 7.07g       | 15.50h      | 17.03i      | 2.27g        | 0.97f        |
|                               | Chemical weed control | 7.93f       | 17.53g      | 9.60h       | 4.27f        | 1.10f        |
| Puddled direct seeding        | Weed free             | 7.23g       | 16.33h      | 11.97g      | 5.47e        | 1.30ef       |
|                               | Weedy check           | 10.73b      | 23.67d      | 17.07c      | 8.43ab       | 2.17b        |
|                               | Mechanical weeding    | 8.70e       | 18.20g      | 14.47e      | 7.17d        | 1.60de       |
|                               | Chemical weed control | 8.97de      | 20.70e      | 15.50d      | 7.57cd       | 1.83cd       |
| Unpuddled direct seeding      | Weed free             | 8.60e       | 25.50c      | 15.07de     | 7.37d        | 1.57de       |
|                               | Weedy check           | 11.93a      | 29.63a      | 18.83a      | 8.83a        | 2.80a        |
|                               | Mechanical weeding    | 9.33cd      | 27.20b      | 16.60c      | 8.13bc       | 2.00bc       |
|                               | Chemical weed control | 9.97c       | 27.83b      | 17.83b      | 8.60ab       | 2.27b        |
| <b>LSD (0.05)</b>             |                       | <b>0.67</b> | <b>0.66</b> | <b>0.63</b> | <b>0.48</b>  | <b>0.32</b>  |
| <b>S in M</b>                 |                       | <b>0.62</b> | <b>0.84</b> | <b>0.71</b> | <b>0.84</b>  | <b>0.34</b>  |
| <b>Main plots</b>             |                       |             |             |             |              |              |
| M1 = Mechanised transplanting |                       | 7.79c       | 15.74c      | 8.47c       | 4.09c        | 1.05c        |
| M2 = Puddled direct seeding   |                       | 8.91b       | 19.73b      | 14.75b      | 7.16b        | 1.73b        |
| M3 = Unpuddled direct seeding |                       | 9.96a       | 27.54a      | 17.08a      | 8.23a        | 2.16a        |
| <b>LSD (0.05)</b>             |                       | <b>0.23</b> | <b>0.63</b> | <b>0.47</b> | <b>0.74</b>  | <b>0.20</b>  |
| <b>CV (%)</b>                 |                       | <b>2.27</b> | <b>2.64</b> | <b>3.06</b> | <b>10.08</b> | <b>10.87</b> |
| <b>Sub plots</b>              |                       |             |             |             |              |              |
| S1 = Weed free                |                       | 7.52d       | 17.44d      | 10.23d      | 5.17d        | 1.15d        |
| S2 = Weedy check              |                       | 10.70a      | 24.24a      | 16.49a      | 7.81a        | 2.17a        |
| S3 = Mechanical weeding       |                       | 8.37c       | 20.30c      | 12.70c      | 6.19c        | 1.52c        |
| S4 = Chemical weed control    |                       | 8.96b       | 22.02b      | 14.31b      | 6.81b        | 1.73b        |
| <b>LSD (0.05)</b>             |                       | <b>0.39</b> | <b>0.38</b> | <b>0.37</b> | <b>0.28</b>  | <b>0.19</b>  |
| <b>CV (%)</b>                 |                       | <b>4.39</b> | <b>1.83</b> | <b>2.74</b> | <b>4.35</b>  | <b>11.45</b> |

At **Chiplima**, five crop establishment methods, viz., normal transplanting, sowing behind the plough, mechanical line sowing, manual line sowing and broadcasting were evaluated with MTU 1156 variety. Low incidence of stem borer (2.07 to 6.62 DH% during 55 to 75 DAT & up to 6.91% WE), gall midge (3.09 to 7.33 SS% during 55 to 75 DAT) and BPH (29-33 to 38.00 hoppers/5 hills) was observed in all the establishment methods. Broadcasting method showed pest damage at par with normal transplanting method, however there were no discernible trends among the treatments.

**Table Influence of Crop Establishment Methods on Pest Incidence at Chiplima, Kharif 2019**

| Treatments                    | % DH         |               | % WE          | % SS          |               | BPH/ 5 hills   |
|-------------------------------|--------------|---------------|---------------|---------------|---------------|----------------|
|                               | 55 DAT       | 75 DAT        | Pre har       | 55 DAT        | 75 DAT        | 75 DAT         |
| T1 = Normal transplanting     | 5.00 (2.11)a | 4.47 (2.09)ab | 2.97 (1.69)b  | 7.33 (2.71)a  | 5.95 (2.42)ab | 31.00 (5.56)b  |
| T2 = Sowing behind the plough | 4.33 (2.07)a | 4.71 (2.15)ab | 5.88 (2.39)ab | 7.39 (2.71)a  | 8.34 (2.89)a  | 34.67 (5.88)ab |
| T3 = Mechanical line sowing   | 2.23 (1.47)b | 4.53 (2.12)ab | 6.91 (2.61)a  | 3.09 (1.75)c  | 4.94 (2.21)b  | 29.33 (5.41)b  |
| T4 = Manual line sowing       | 2.07 (1.42)b | 3.71 (1.92)b  | 3.89 (1.97)ab | 5.22 (2.28)b  | 6.04 (2.46)ab | 30.67 (5.53)b  |
| T5 = Broadcasting             | 5.47 (2.32)a | 6.62 (2.55)a  | 5.91 (2.43)a  | 5.91 (2.43)ab | 6.63 (2.55)ab | 38.00 (6.16)a  |
| <b>LSD 0.05</b>               | <b>0.53</b>  | <b>0.61</b>   | <b>0.73</b>   | <b>0.37</b>   | <b>0.54</b>   | <b>0.58</b>    |
| <b>CV (%)</b>                 | <b>14.91</b> | <b>14.79</b>  | <b>17.40</b>  | <b>8.32</b>   | <b>11.43</b>  | <b>5.40</b>    |

At **Jagdalpur**, the trial was carried out with Durgeshwary variety and included three main plots with mechanical transplanting, puddled direct seeding and unpuddled dry direct seeding methods of crop establishment and four sub plots with weed free, weedy check, mechanical weeding and chemical weed control treatments. Observations were recorded on incidence of stem borer, leaf folder, whorl maggot and GLH. Low incidence of stem borer was recorded in all the treatments (0.7 to 9.7% DH) except in weedy check sub plot of unpuddled dry direct seeding which showed 17.9% dead heart damage at 70 DAT. Leaf folder (up to 8.7 % DL), whorl maggot (maximum of 10.7% DL) and GLH (highest of 12.7 hoppers/10 hills) incidence was also low and there were no significant trends in the impact of treatments on pest incidence.

At **Ludhiana**, three establishment methods, viz., ridge planting, flat planting and bed planting were practiced at three plant densities of 33 plants, 25 plants and 20 plants per square meter with PR 121 variety. Very low incidence of stem borer, leaf folder and planthoppers was observed in all the treatments.

**Table Influence of Crop Establishment Methods on Pest Incidence at Jagdalpur, Kharif 2019**

| Treatments                    |                       | % DH         |              | %LFDL        | % WMDL       | GLH/10 hills |
|-------------------------------|-----------------------|--------------|--------------|--------------|--------------|--------------|
|                               |                       | 50 DAT       | 70 DAT       | 70 DAT       | 70 DAT       | 70 DAT       |
| Mechanised transplanting      | Weed free             | 0.8(1.0)b    | 2.5(1.6)b    | 8.2(3.0)a    | 9.4(3.1)ab   | 9.3(3.1)a    |
|                               | Weedy check           | 0.7(1.0)b    | 6.7(2.6)ab   | 6.1(2.5)a    | 13.7(3.8)a   | 7.0(2.7)a    |
|                               | Mechanical weeding    | 0.8(1.0)b    | 2.7(1.7)b    | 8.1(2.7)a    | 9.8(3.2)ab   | 10.7(3.3)a   |
|                               | Chemical weed control | 5.5(2.3)a    | 3.8(1.6)b    | 5.0(2.3)a    | 10.0(3.2)ab  | 8.3(2.8)a    |
| Puddled direct seeding        | Weed free             | 0.0(0.7)b    | 1.7(1.4)b    | 7.3(2.8)a    | 8.3(2.9)ab   | 5.0(2.3)b    |
|                               | Weedy check           | 1.0(1.1)b    | 4.5(2.0)ab   | 8.7(3.0)a    | 7.7(2.8)ab   | 8.7(3.0)a    |
|                               | Mechanical weeding    | 1.8(1.3)ab   | 5.8(2.4)ab   | 6.0(2.5)a    | 5.5(2.4)b    | 8.0(2.8)a    |
|                               | Chemical weed control | 0.0(0.7)b    | 0.9(1.1)b    | 7.8(2.9)a    | 9.2(3.1)ab   | 2.3(1.7)b    |
| Unpuddled dry direct seeding  | Weed free             | 2.3(1.4)ab   | 3.5(2.0)ab   | 7.7(2.8)a    | 10.5(3.3)ab  | 3.7(1.9)b    |
|                               | Weedy check           | 0.0(0.7)b    | 17.9(4.0)a   | 5.9(2.5)a    | 9.7(3.2)ab   | 6.7(2.6)a    |
|                               | Mechanical weeding    | 0.0(0.7)b    | 5.0(2.0)ab   | 8.6(3.0)a    | 9.7(3.2)ab   | 12.7(3.5)a   |
|                               | Chemical weed control | 1.3(1.3)ab   | 0.9(1.1)b    | 6.0(2.5)a    | 10.5(3.2)ab  | 8.0(2.7)a    |
| <b>LSD (0.05) M in S</b>      |                       | <b>0.93</b>  | <b>2.05</b>  | <b>1.13</b>  | <b>0.97</b>  | <b>1.14</b>  |
| <b>S in M</b>                 |                       | <b>1.1</b>   | <b>2.04</b>  | <b>1.14</b>  | <b>1.23</b>  | <b>1.55</b>  |
| <b>Main plots</b>             |                       |              |              |              |              |              |
| M1 = Mechanised transplanting |                       | 2.0(1.4)a    | 3.9(1.9)a    | 6.9(2.6)a    | 10.7(3.3)a   | 8.8(3.0)a    |
| M2 = Puddled direct seeding   |                       | 0.7(0.9)a    | 3.2(1.7)a    | 7.5(2.8)a    | 7.7(2.8)a    | 6.0(2.5)a    |
| M3 = Unpuddled direct seeding |                       | 0.9(1.0)a    | 6.8(2.3)a    | 7.0(2.7)a    | 10.0(3.2)a   | 7.8(2.7)a    |
| <b>LSD (0.05)</b>             |                       | <b>0.82</b>  | <b>1.02</b>  | <b>0.59</b>  | <b>0.91</b>  | <b>1.22</b>  |
| <b>CV (%)</b>                 |                       | <b>15.92</b> | <b>16.25</b> | <b>19.10</b> | <b>25.73</b> | <b>39.76</b> |
| <b>Sub plots</b>              |                       |              |              |              |              |              |
| S1 = Weed free                |                       | 1.0(1.0)a    | 2.6(1.7)b    | 7.7(2.9)a    | 9.4(3.1)a    | 6.0(2.4)b    |
| S2 = Weedy check              |                       | 0.6(0.9)a    | 9.7(2.8)a    | 6.9(2.7)a    | 10.3(3.3)a   | 7.4(2.8)ab   |
| S3 = Mechanical weeding       |                       | 0.8(1.0)a    | 4.5(2.0)ab   | 7.6(2.7)a    | 8.3(2.9)a    | 10.4(3.2)a   |
| S4 = Chemical weed control    |                       | 2.3(1.4)a    | 1.8(1.3)b    | 6.3(2.6)a    | 9.9(3.2)a    | 6.2(2.4)a    |
| <b>LSD (0.05)</b>             |                       | <b>0.54</b>  | <b>1.18</b>  | <b>0.66</b>  | <b>0.56</b>  | <b>0.66</b>  |
| <b>CV (%)</b>                 |                       | <b>19.20</b> | <b>21.42</b> | <b>24.52</b> | <b>18.14</b> | <b>24.55</b> |

At **Malan**, Direct seeding, normal transplanting and semi dry rice methods were evaluated in this trial. Incidence of leaf folder was observed ranging from 13.89 to 23.24% DL during 45 to 90 DAT in different crop establishment methods with maximum damage in normal transplanting method (17.68 – 23.24% LFDL) followed by semi dry rice and direct seeding.

**Table Influence of Crop Establishment Methods on Pest Incidence at Ludhiana, Kharif 2019**

| Establishment methods | Plants/m <sup>2</sup> (Spacing) | % DH      | % LFDL    | PH/hill   |
|-----------------------|---------------------------------|-----------|-----------|-----------|
|                       |                                 | 40 DAT    | 40 DAT    | 40 DAT    |
| Ridge planting        | 33 plants (30 x 10 cm)          | 1.9 ± 0.2 | 2.3 ± 0.5 | 2.4 ± 0.5 |
|                       | 25 plants (30 x 13 cm)          | 1.6 ± 0.3 | 2.0 ± 0.5 | 2.0 ± 0.4 |
|                       | 20 plants (30 x 16 cm)          | 1.5 ± 0.3 | 1.6 ± 0.4 | 1.9 ± 0.5 |
| Flat planting         | 33 plants (15 x 20 cm)          | 2.1 ± 0.4 | 2.4 ± 0.6 | 1.3 ± 0.3 |
|                       | 25 plants (20 x 20 cm)          | 2.1 ± 0.3 | 1.7 ± 0.3 | 1.3 ± 0.3 |
|                       | 20 plants (25 x 20 cm)          | 1.3 ± 0.4 | 1.5 ± 0.3 | 1.2 ± 0.3 |
| Bed planting          | 33 plants (33.75 x 9 cm)        | 3.2 ± 0.5 | 4.1 ± 0.8 | 1.1 ± 0.3 |
|                       | 25 plants (33.75 x 12 cm)       | 3.2 ± 0.5 | 3.1 ± 0.6 | 1.0 ± 0.2 |
|                       | 20 plants (33.75 x 15 cm)       | 2.3 ± 0.3 | 2.3 ± 0.5 | 0.9 ± 0.2 |

**Table Influence of Crop Establishment Methods on Pest Incidence at Malan, Kharif 2019**

| Establishment methods | % Leaf folder damaged leaves |                |               |                |
|-----------------------|------------------------------|----------------|---------------|----------------|
|                       | 45 DAT                       | 60 DAT         | 75 DAT        | 90 DAT         |
| Direct seeding        | 13.89 (3.71)a                | 14.44 (3.78)b  | 14.72 (3.82)a | 17.85 (4.21)ab |
| Normal transplanting  | 17.68 (4.20)a                | 19.55 (4.42)a  | 17.00 (4.11)a | 23.24 (4.81)a  |
| Semi dry rice         | 15.65 (3.94)a                | 15.74 (3.94)ab | 15.19 (3.89)a | 16.32 (4.01)b  |
| <b>LSD 0.05</b>       | 0.56                         | 0.62           | 0.59          | 0.61           |
| <b>CV (%)</b>         | 9.68                         | 10.47          | 10.27         | 9.69           |

At **Mandya**, three crop establishment methods, viz., mechanical transplanting, direct seeding and normal transplanting were assessed. Low incidence of stem borer (3.31-5.75% DH & 5.29 to 9.54% WE), leaf folder and case worm (<5.00% DL) as well as BPH (up to 9.00 hoppers/5 hills) was observed in all the methods in KMP 175 variety.

At **Moncompu**, drum seeding and normal transplanting methods were practiced with cono weeding and chemical weed control by spraying pre and post emergence herbicides. Uma variety was grown in this trial. Low incidence of stem borer (<9.0% DH & <5% WE), leaf folder (<1% LFDL), BPH (<8/hill), WBPH (<4/hill) and GLH (<2/hill) was observed in both the crop establishment methods and weed management sub plots. Incidence of gall midge was also observed but only in chemical weed control sub plot of normal transplanting method (<2% SS).

Table .....Influence of Crop Establishment Methods on Pest Incidence at Mandya, Kharif 2019

| Establishment methods    | % Dead hearts               |             |             |             |             | % WE        |
|--------------------------|-----------------------------|-------------|-------------|-------------|-------------|-------------|
|                          | 30 DAT                      | 45 DAT      | 60 DAT      | 75 DAT      | 90 DAT      | Pre har     |
| Mechanical transplanting | 3.31 ± 1.97                 | 6.15 ± 1.64 | 3.33 ± 0.76 | 2.50 ± 0.91 | 1.24 ± 0.32 | 5.29 ± 1.44 |
| Direct seeding           | 3.58 ± 1.44                 | 4.22 ± 1.02 | 4.92 ± 1.15 | 3.50 ± 1.03 | 1.83 ± 0.27 | 9.29 ± 2.31 |
| Normal transplanting     | 5.74 ± 2.26                 | 5.24 ± 1.00 | 5.75 ± 0.78 | 4.44 ± 1.22 | 3.65 ± 0.80 | 9.54 ± 1.97 |
| Establishment methods    | % Leafroller damaged leaves |             |             |             |             |             |
|                          | 15 DAT                      | 30 DAT      | 45 DAT      | 60 DAT      | 75 DAT      | 90 DAT      |
| Mechanical transplanting | 0.54 ± 0.22                 | 1.55 ± 0.49 | 4.19 ± 0.57 | 2.02 ± 0.69 | 1.02 ± 0.32 |             |
| Direct seeding           |                             | 1.76 ± 0.35 | 3.40 ± 0.72 | 2.91 ± 0.69 | 1.92 ± 0.56 | 0.67 ± 0.30 |
| Normal transplanting     | 0.61 ± 0.28                 | 2.35 ± 0.76 | 4.61 ± 0.73 | 3.36 ± 0.57 | 2.15 ± 0.69 | 0.52 ± 0.13 |
| Establishment methods    | % Case worm damaged leaves  |             |             |             |             |             |
|                          | 15 DAT                      | 30 DAT      | 45 DAT      | 60 DAT      | 75 DAT      | 90 DAT      |
| Mechanical transplanting | 0.36 ± 0.22                 | 0.62 ± 0.20 | 0.92 ± 0.19 | 1.58 ± 0.38 | 1.26 ± 0.36 | 0.40 ± 0.16 |
| Direct seeding           |                             | 0.37 ± 0.15 | 1.08 ± 0.40 | 1.44 ± 0.29 | 0.58 ± 0.18 |             |
| Normal transplanting     | 0.32 ± 0.20                 | 0.82 ± 0.14 | 1.32 ± 0.32 | 1.97 ± .41  | 1.52 ± 0.33 | 1.15 ± 0.24 |
| Establishment methods    | BPH numbers per 5 hills     |             |             |             |             |             |
|                          | 45 DAT                      | 60 DAT      | 75 DAT      | 90 DAT      | 105 DAT     |             |
| Mechanical transplanting | 0.40 ± 0.24                 | 2.80 ± 0.86 | 5.60 ± 1.29 | 4.60 ± 0.93 | 2.40 ± 0.51 |             |
| Direct seeding           | 0.80 ± 0.37                 | 2.20 ± 0.80 | 5.00 ± 1.30 | 5.60 ± 1.50 | 1.80 ± 0.58 |             |
| Normal transplanting     | 2.60 ± 1.21                 | 4.00 ± 1.30 | 9.00 ± 1.73 | 8.20 ± 1.66 | 3.20 ± 0.86 |             |

Table Influence of Crop Establishment Methods on Pest Incidence at Moncompu, Kharif 2019

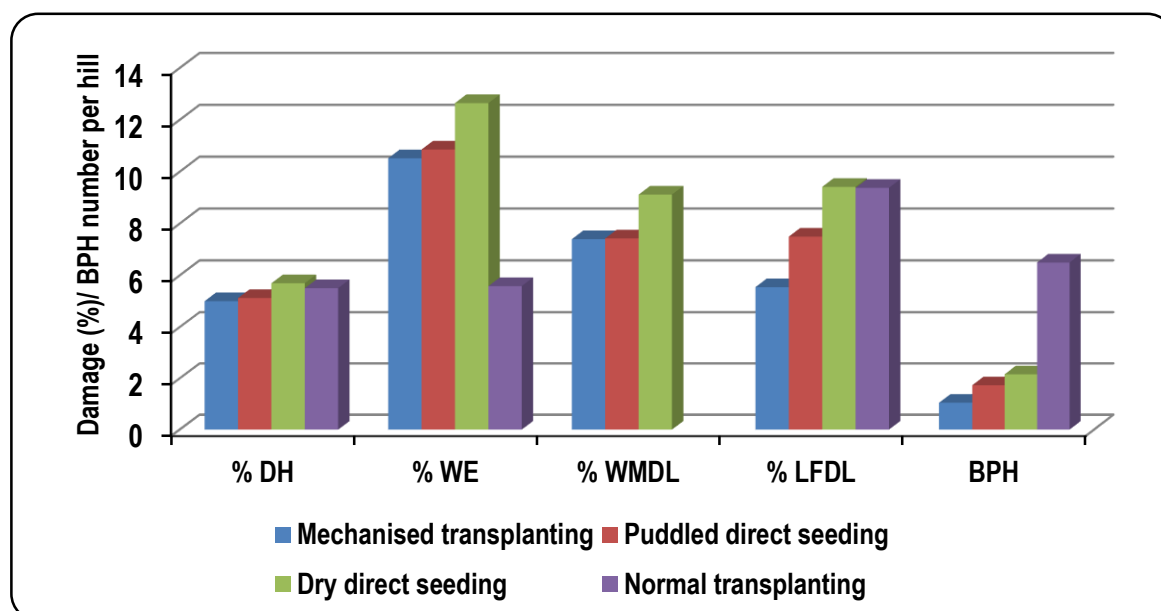
| Main plots           | Sub plots             | % DH       |            | % WE       | % SS       | % LFDL     | BPH/hill   |
|----------------------|-----------------------|------------|------------|------------|------------|------------|------------|
|                      |                       | 30 DAT     | 90 DAT     | Pre har    | 60 DAT     | 60 DAT     | 90 DAT     |
| Drum seeding         | Cono weeding          |            | 1.42 ± 0.6 | 4.33 ± 0.5 |            | 0.25 ± 0.1 | 6.80 ± 3.0 |
|                      | Chemical weed control |            | 1.58 ± 0.8 | 3.08 ± 0.9 |            | 0.14 ± 0.1 | 5.80 ± 2.5 |
| Normal Transplanting | Cono weeding          | 1.55 ± 1.0 | 8.06 ± 3.5 | 2.82 ± 1.2 |            | 0.30 ± 0.2 | 7.00 ± 1.2 |
|                      | Chemical weed control | 1.47 ± 0.9 | 3.58 ± 1.0 | 4.36 ± 0.8 | 1.79 ± 0.9 | 0.16 ± 0.2 | 6.00 ± 2.9 |

At **Rajendranagar**, the three establishment methods included normal transplanting, wet seeding (line sowing under puddle condition) and dry sowing converted to wet method. RNR 15048 (Telangana sona) variety was grown in this trial in all the methods. Very low incidence of stem borer was observed in all the three methods.

**Table Influence of Crop Establishment Methods on Pest Incidence at Rajendranagar, Kharif 2019**

| Establishment methods                            | % DH        | % WE        |
|--------------------------------------------------|-------------|-------------|
|                                                  | 55 DAT      | 97 DAT      |
| Normal transplanting                             | 3.75 ± 0.11 | 5.49 ± 1.86 |
| Wet seeding (Line sowing under puddle condition) | 3.27 ± 0.13 | 1.99 ± 1.08 |
| Dry sowing converted to wet                      | 1.11 ± 0.05 | 1.12 ± 0.22 |

Among the crop establishment methods, across the locations, the pest incidence was found relatively high in dry direct seeding followed by normal transplanting method. White ears caused by stem borer were found high in dry direct seeding followed by puddled direct seeding which might be due to very high incidence at Aduthurai, resulting in skewness. BPH population was observed high in normal transplanting method compared to other methods.



**Fig .....Influence of crop establishment methods on pest incidence (IEMP) across locations, Kharif 2019**

*Influence of crop establishment methods on pest incidence (IEMP) trial, initiated this year in collaboration with Agronomy, revealed that dry direct seeding recorded relatively high stem borer (12.65% WE), leaf folder (9.42% LFDL) and whorl maggot (9.12% WMDL) damage followed by normal transplanting method (10.86% WE; 9.38% LFDL). BPH numbers were found high in normal transplanting (6.5/hill) method as compared to dry direct seeding, puddle direct seeding and mechanised transplanting methods. Since this was the first year of this trial the findings need further years of observation, testing and validation.*

#### 4.3.3: Evaluation of cultivars for weed competitiveness under direct seeded rice system

With the objective of evaluating the performance of recently released high yielding varieties for weed competitive ability and yield performance, multilocal trial was conducted at five locations viz., **Chinsurah, Ghaghraghat, Malan, Nellore and Tuljapur** during kharif 2019. At **Monompu, Pantnagar, Pattambi and Parbhani**, the trial was conducted with different technical programme cannot fit in this trial report. The treatments consisted of four weed control treatments (T1-Weed free, T2-Weedy check, T3-Mechanical weeding using weeder and T4-Chemical weed control (pre & post emergence herbicide application)) as main plots and three varieties (V1 - DRRDhan 50, V2 - DRRDhan 52 and V3 - Latest released state variety) as sub plot treatments in replicated split plot design. The results of the data recorded on crop growth, yield attributes, yield and weed parameters are presented in table 4.3.3.

The results of yield attributes and yield showed that the mean grain yield ranged from 1.75 t/ha at **Ghaghraghat** to 4.42 t/ha at **Nellore**. At **Nellore**, the results showed no significant differences among weed control treatments including weedy check, indicating that there is no considerable weed problem. But, among the test varieties, both DRRDhan 50 and DRRDhan 52 were significantly superior over the NLR 3449 irrespective of the uniformity in adoption cultivation technology in the trial. **(Table 4.3.3)**

In clay loam soils of **Chinsurah**, results showed that the weed free treatment, mechanical weeding using weeder, chemical weed control were statistically on par and significantly superior over weedy check. The treatment of mechanical weeding using weeder showed comparable performance with chemical weed control and weed free condition. Mechanical weeding was highly economical method compared to other methods and this non-chemical and economic method need to be further fine tuned and popularized among the farmers. Among the test varieties, DRRDhan 50 has recorded superior grain yield over DRRDhan 52 and local high yielding variety (Manisha). **(Table 4.3.3)**

In sandy loam soils of **Ghaghraghat**, the treatments of weed free and mechanical weeding using weeder were significantly superior in-terms of grain yield over chemical weed control and weedy check indicating the scope of using mechanical power in weed control which is highly economic and environmental friendly. Among the test varieties, NDR 2064 (local high yielding variety) and DRRDhan 52 recorded similar and higher grain yields. **(Table 4.3.3)**

At **Malan**, Weed free treatment and chemical weed control were significantly superior. The mechanical weeding method has not contributed significantly and not suitable for this region of study. The local high yielding variety HPR 2880 was found superior over DRRDhan 52.

At **Tuljapur**, under un-puddled dry direct seeding system, except weedy check all weed control treatments were comparable indicating that, mechanical weeding and chemical control were equally effective as that of weed free treatment. Among the test varieties TJP-48 has recorded significantly high yield and superior over DRRDhan 52 and DRRDhan 50. The results of data on straw yield recorded by **Malan**, **Nellore** and **Tuljapur** reflected same trend as that of grain yield. (Table 4.3.3)

The results of data on growth parameters i.e., no. of tillers per m<sup>2</sup> at maximum tillering stage and panicle initiation stage were reported by **Chinsurah**, **Malan**, **Nellore** and **Tuljapur**. Among weed control treatments, weed free condition and chemical weed control were superior at **Chinsurah** and **Tuljapur**. At **Malan**, weed free treatment was significantly superior over others. The second recorder was chemical weed control treatment. At **Nellore**, no significant difference among weed control treatments was reported. Similar trend was observed at panicle initiation stage also. Among the test varieties, no significant difference was reported by **Malan**, DRRDhan 50 and DRRDhan 52 at **Chinsurah**, DRRDhan 50 and NLR 3449 at **Nellore** and TJP 48 at **Tuljapur** showed superiority over others. At panicle initiation stage, significant differences were reported among test varieties. (Table 4.3.3)

The data on one of the yield attributes i.e., no. of panicle per m<sup>2</sup> reported by **Chinsurah**, **Gahghraghat**, **Malan**, **Nellore** and **Tuljapur** showed that, no significant difference among weed control methods at **Nellore**; superiority of weed free treatment at **Chinsurah**, **Ghaghraghat** and **Malan**; superiority of weed free treatment and chemical weed control at **Tuljapur**. Among the test varieties, local high yielding variety at **Malan**, DRRDhan 52 and local high yielding variety at **Ghaghraghat** and **Tuljapur**, DRRDhan 50 and local high yielding variety at **Nellore** exhibited superiority. (Table 4.3.3)

The data on panicle weight was reported by **Chinsurah**, **Ghaghraghat**, **Malan** and **Tuljapur**, indicated similar trend as that of panicle no. per m<sup>2</sup>. The data on test weight was reported by **Malan**, **Nellore** and **Tuljapur**. Except at **Malan** DRRDhan 52 and local high yielding variety recorded higher and comparable panicle weight at other locations. The test weight was not influenced by weed control treatments at **Nellore** and **Tuljapur**. At **Malan**, test weight was significantly high and comparable under weed free treatment and chemical weed control. (Table 4.3.3)

The data on weed population at vegetative stage, panicle initiation stage and heading stage was reported by four locations viz., **Chinsurah**, **Ghaghraghat**, **Malan** and **Nellore**. At vegetative stage, the relative dominance of weed groups was in the order of grasses, sedges and broad leaf weeds (BLW) at all the three stages of observation at **Chinsurah**. At **Malan**, BLW followed by grasses were dominant, at **Nellore** grasses followed by sedges, at **Chinsurah** sedges followed by BLW. The weed population density increased from vegetative stage to heading stage at **Ghaghraghat** whereas, at **Chinsurah**, increased from vegetative stage to panicle initiation stage and no considerable change was noticed at heading stage. At **Malan** and **Nellore**, the population increased from vegetative stage to panicle initiation stage and decreased at heading stage. At vegetative stage, among the weed control treatments at

**Chinsurah**, chemical weed control recorded lower weed population closely followed by mechanical weeding but at panicle initiation and heading stages, mechanical weeding treatment alone has recorded lower weed population. Initially local high yielding variety recorded lower total weed population but at panicle initiation and heading stages, DRRDhan 50 recorded lowest weed population of all weed groups individually as well as combined. Contrarily, at **Ghaghrahat**, the lowest total weed population was observed under mechanical weeding using weeder closely followed by chemical weed control and test varieties showed no significant difference. Similarly, at **Malan**, the test varieties did not differ significantly. But, weed control treatment showed significant difference with lowest under chemical weed control. At **Nellore**, the weed control treatments had significant influence on grasses, sedges and total weed population at vegetative and panicle initiation stages. The chemical weed control treatment was on par with weed free treatment at vegetative stage and closely followed by at panicle initiation and heading stages. Among the varieties tested, no significant difference was observed among all groups individually and combined at vegetative stage, BLW and total weeds at panicle initiation and heading stages. Grass weeds were significantly low under DRRDhan 50 and sedges were significantly high. (Table 4.3.3)

The data on weed biomass at vegetative stage, panicle initiation stage and heading stage was reported by four locations viz., **Chinsurah**, **Ghaghrahat**, **Malan** and **Nellore**. The interaction effect of weed control treatments and varieties was significant. At **Chinsurah**, sedges recorded highest weed biomass followed by BLW's and the weed biomass increased from vegetative stage to heading stage. Similarly, the total weed biomass increased at **Ghaghrahat** also. At **Malan**, the weed biomass was highest with BLW followed by grasses and progressive increase was recorded from vegetative stage to heading stage. At **Nellore**, grasses recorded highest weed biomass followed by sedges. The weed biomass increased from vegetative stage to panicle initiation stage and decreased at heading stage. At vegetative stage, among the test varieties at **Chinsurah**, DRRDhan 52 & local high yielding variety recorded lowest weed biomass, where as DRRDhan 50 at panicle initiation and heading stages. At **Ghaghrahat** and **Malan**, no significant difference among test varieties was noticed. At **Nellore**, DRRDhan 52 and NLR 34449 recorded lowest weed biomass. (Table 4.3.3)

Under Direct Seeded Rice systems, the multi-locational results of kharif 2019 revealed that, at the test locations, the trend in usual relative dominance of weed groups varied from the earlier order of grasses-BLW-sedges to sedges-BLW-grasses and/or BLW-grasses-sedges. At majority of the locations, in clay loam and clay soils, chemical weed control using pre and post emergence herbicides was found superior and in sandy loam soils, mechanical weeding using weeder showed superior performance. Varietal performance varied among the test locations. DRRDhan 50 at two locations, DRRDhan 52 at two locations, local high yielding varieties at two locations showed superior performance with lower weed population, weed biomass, higher crop growth parameters, yield attributes and grain yield.

Table 4.3.3: Summary of data on grain yield, yield attributes and weed parameters in the trial on "Evaluation of cultivars for weed competitiveness under direct seeded rice systems", Kharif - 2019.

| Main Plot                       | Sub Plots | Grain yield (t/ha) |             |              |                 |             |
|---------------------------------|-----------|--------------------|-------------|--------------|-----------------|-------------|
|                                 |           | CHN                | GGT         | MLN          | NLR             | TJP         |
| T1                              | V1        | 5.26               | 1.93        | -            | 4.58            | 1.31        |
|                                 | V2        | 4.17               | 2.20        | 2.52         | 4.51            | 1.83        |
|                                 | V3        | 4.10               | 2.42        | 2.86         | 4.19            | 1.97        |
| T2                              | V1        | 3.56               | 0.87        | -            | 4.52            | 0.62        |
|                                 | V2        | 2.98               | 1.11        | 1.43         | 4.43            | 0.65        |
|                                 | V3        | 2.94               | 1.29        | 1.42         | 4.11            | 0.87        |
| T3                              | V1        | 5.28               | 1.85        | -            | 4.42            | 0.99        |
|                                 | V2        | 4.05               | 1.95        | 1.80         | 4.87            | 1.57        |
|                                 | V3        | 3.78               | 2.18        | 1.96         | 3.94            | 1.82        |
| T4                              | V1        | 5.04               | 1.58        | -            | 4.52            | 0.98        |
|                                 | V2        | 4.48               | 1.80        | 2.44         | 4.65            | 1.66        |
|                                 | V3        | 3.62               | 1.87        | 2.76         | 4.26            | 2.03        |
| Mean of Factor-1                |           |                    |             |              |                 |             |
|                                 | 1         | 4.51               | 2.18        | 2.69         | 4.43            | 1.70        |
|                                 | 2         | 3.16               | 1.09        | 1.43         | 4.36            | 0.71        |
|                                 | 3         | 4.37               | 1.99        | 1.88         | 4.41            | 1.46        |
|                                 | 4         | 4.38               | 1.75        | 2.60         | 4.48            | 1.56        |
|                                 | CD(0.05)  | 0.40               | 0.26        | 0.12         | NS              | 0.27        |
| Mean of Factor-2                |           |                    |             |              |                 |             |
|                                 | 1         | 4.78               | 1.56        | -            | 4.51            | 0.97        |
|                                 | 2         | 3.92               | 1.77        | 2.05         | 4.62            | 1.43        |
|                                 | 3         | 3.61               | 1.94        | 2.25         | 4.13            | 1.67        |
|                                 | CD(0.05)  | 0.23               | 0.20        | 0.07         | 0.19            | 0.15        |
| Interaction                     |           |                    |             |              |                 |             |
|                                 | M and T   | NS                 | NS          | 0.13         | NS              | NS          |
|                                 | T and M   | NS                 | NS          | 0.13         | NS              | NS          |
| Experimental Mean               |           | <b>4.10</b>        | <b>1.75</b> | <b>2.15</b>  | <b>4.42</b>     | <b>1.36</b> |
| Name of latest released variety |           | Manisha            | NDR-2064    | HPR 2880     | NLR 34449       | TJP-48      |
| Soil type                       |           | Clay loam          | Sandy loam  | -            | Sandy clay loam | -           |
| pH                              |           | 7.87               | 8.06        | 5.6          | 7.48            | 7.6         |
| EC                              |           | 0.49               | -           | -            | -               | -           |
| Applied NPK kg/ha               |           | 80:40:40           | 120:60:40   | 60-30-30     | -               | -           |
| Available NPK kg/ha             |           | 560:54.9:307.5     |             | 317:47.1:232 | 213:34:530      | -           |

T1-Weed free

T2-Weedy check

T3-Mechanical weeding using weeder

T4-Chemical weed control (pre &amp; post emergence herbicide application)

V1 - DRRDhan 50

V2 - DRRDhan 52

V3 - Latest released state variety

Table 4.3.3: Contd.

| Main Plot         | Sub Plots | Straw yield (t/ha) |      |      | No of tillers /m <sup>2</sup> at max tillering stage |     |       |       | No of tillers /m <sup>2</sup> at panicle initiation stage |     |       |
|-------------------|-----------|--------------------|------|------|------------------------------------------------------|-----|-------|-------|-----------------------------------------------------------|-----|-------|
|                   |           | MLN                | NLR  | TJP  | CHN                                                  | MLN | NLR   | TJP   | CHN                                                       | MLN | NLR   |
| T1                | V1        | -                  | 7.17 | 2.66 | 388                                                  | 268 | 370   | 455   | 325                                                       | 267 | 359   |
|                   | V2        | 2.80               | 7.10 | 2.74 | 358                                                  | 267 | 324   | 578   | 303                                                       | 266 | 315   |
|                   | V3        | 3.17               | 7.27 | 3.14 | 394                                                  | 273 | 363   | 538   | 335                                                       | 271 | 343   |
| T2                | V1        | -                  | 6.73 | 1.68 | 288                                                  | 233 | 419   | 272   | 264                                                       | 233 | 403   |
|                   | V2        | 1.58               | 6.40 | 1.97 | 282                                                  | 237 | 268   | 371   | 249                                                       | 237 | 248   |
|                   | V3        | 1.58               | 7.83 | 1.96 | 280                                                  | 238 | 286   | 354   | 225                                                       | 243 | 274   |
| T3                | V1        | -                  | 7.83 | 1.82 | 417                                                  | 238 | 361   | 273   | 354                                                       | 238 | 342   |
|                   | V2        | 2.01               | 7.93 | 2.46 | 370                                                  | 241 | 282   | 389   | 313                                                       | 241 | 265   |
|                   | V3        | 2.17               | 7.87 | 2.67 | 322                                                  | 241 | 392   | 403   | 271                                                       | 245 | 378   |
| T4                | V1        | -                  | 7.67 | 1.80 | 409                                                  | 254 | 368   | 339   | 347                                                       | 254 | 358   |
|                   | V2        | 2.71               | 7.93 | 2.64 | 402                                                  | 255 | 264   | 551   | 341                                                       | 256 | 244   |
|                   | V3        | 3.07               | 7.37 | 2.94 | 380                                                  | 256 | 396   | 559   | 322                                                       | 257 | 386   |
| Mean of Factor-1  |           |                    |      |      |                                                      |     |       |       |                                                           |     |       |
|                   | 1         | 2.99               | 7.18 | 2.84 | 380                                                  | 269 | 352   | 524   | 321                                                       | 268 | 339   |
|                   | 2         | 1.58               | 6.99 | 1.87 | 283                                                  | 236 | 324   | 332   | 246                                                       | 238 | 309   |
|                   | 3         | 2.09               | 7.88 | 2.32 | 370                                                  | 240 | 345   | 355   | 313                                                       | 241 | 328   |
|                   | 4         | 2.89               | 7.66 | 2.46 | 397                                                  | 255 | 343   | 483   | 336                                                       | 256 | 329   |
|                   | CD(0.05)  | 0.15               | 0.59 | 0.38 | 18                                                   | 3   | NS    | 48    | 13                                                        | 4   | NS    |
| Mean of Factor-2  |           |                    |      |      |                                                      |     |       |       |                                                           |     |       |
|                   | 1         | -                  | 7.35 | 1.99 | 376                                                  | 248 | 380   | 335   | 323                                                       | 248 | 365   |
|                   | 2         | 2.28               | 7.34 | 2.45 | 353                                                  | 250 | 285   | 472   | 302                                                       | 250 | 268   |
|                   | 3         | 2.50               | 7.58 | 2.68 | 344                                                  | 252 | 359   | 464   | 288                                                       | 254 | 346   |
|                   | CD(0.05)  | 0.07               | NS   | 0.19 | 22                                                   | NS  | 30    | 25    | 13                                                        | 3   | 29    |
| Interaction       |           |                    |      |      |                                                      |     |       |       |                                                           |     |       |
|                   | M and T   | 0.15               | NS   | NS   | NS                                                   | NS  | 59.15 | 50.01 | 25.6                                                      | NS  | 58.01 |
|                   | T and M   | 0.15               | NS   | NS   | NS                                                   | NS  | 58.94 | 54.21 | 23.13                                                     | NS  | 58.6  |
| Experimental Mean |           | 2.39               | 7.43 | 2.37 | 358                                                  | 250 | 341   | 423   | 304                                                       | 251 | 326   |

T1-Weed free

T2-Weedy check

T3-Mechanical weeding using weeder

T4-Chemical weed control (pre &amp; post emergence herbicide application)

V1 - DRRDhan 50

V2 - DRRDhan 52

V3 - Latest released state variety

Table 4.3.3: Contd.

| Main Plot         | Sub Plots | Panicle No/m <sup>2</sup> |     |       |       |     | Panicle weight (g) |      |      |      | Test weight (g) |       |       |
|-------------------|-----------|---------------------------|-----|-------|-------|-----|--------------------|------|------|------|-----------------|-------|-------|
|                   |           | CHN                       | GGT | MLN   | NLR   | TJP | CHN                | GGT  | MLN  | TJP  | MLN             | NLR   | TJP   |
| T1                | V1        | 334                       | 164 | -     | 351   | 223 | 3.79               | 2.94 | -    | 2.07 | -               | 22.13 | 23.03 |
|                   | V2        | 300                       | 168 | 263   | 301   | 307 | 3.30               | 3.01 | 2.46 | 2.20 | 26.38           | 26.73 | 24.07 |
|                   | V3        | 265                       | 195 | 272   | 332   | 315 | 3.46               | 3.37 | 2.67 | 2.52 | 27.04           | 19.53 | 25.80 |
| T2                | V1        | 228                       | 65  | -     | 388   | 160 | 2.92               | 1.98 | -    | 1.37 | -               | 23.33 | 23.40 |
|                   | V2        | 206                       | 80  | 170   | 227   | 190 | 2.83               | 2.43 | 1.43 | 1.58 | 22.26           | 31.83 | 23.93 |
|                   | V3        | 207                       | 67  | 183   | 262   | 218 | 2.88               | 2.69 | 1.82 | 1.64 | 22.63           | 18.97 | 24.93 |
| T3                | V1        | 226                       | 140 | -     | 322   | 221 | 3.78               | 2.54 | -    | 2.03 | -               | 22.10 | 23.90 |
|                   | V2        | 225                       | 147 | 236   | 242   | 250 | 3.42               | 2.79 | 2.15 | 1.94 | 24.06           | 29.17 | 23.60 |
|                   | V3        | 254                       | 158 | 246   | 366   | 264 | 3.43               | 2.91 | 2.17 | 2.06 | 25.24           | 21.21 | 24.93 |
| T4                | V1        | 230                       | 117 | -     | 346   | 267 | 3.80               | 2.40 | -    | 2.16 | -               | 23.70 | 23.40 |
|                   | V2        | 232                       | 130 | 258   | 231   | 329 | 3.56               | 2.68 | 2.32 | 2.59 | 26.17           | 25.43 | 24.27 |
|                   | V3        | 273                       | 139 | 265   | 369   | 323 | 3.39               | 2.52 | 2.27 | 2.64 | 26.25           | 20.67 | 25.73 |
| Mean of Factor-1  |           |                           |     |       |       |     |                    |      |      |      |                 |       |       |
|                   | 1         | 300                       | 176 | 267   | 328   | 282 | 3.52               | 3.11 | 2.56 | 2.26 | 26.71           | 22.80 | 24.30 |
|                   | 2         | 214                       | 71  | 176   | 292   | 189 | 2.88               | 2.37 | 1.63 | 1.53 | 22.44           | 24.71 | 24.09 |
|                   | 3         | 235                       | 149 | 241   | 310   | 245 | 3.54               | 2.74 | 2.16 | 2.01 | 24.65           | 24.16 | 24.14 |
|                   | 4         | 245                       | 129 | 261   | 315   | 306 | 3.59               | 2.54 | 2.30 | 2.46 | 26.21           | 23.27 | 24.47 |
|                   | CD(0.05)  | 17                        | 18  | 5     | NS    | 31  | 0.31               | 0.19 | 0.15 | 0.31 | 0.46            | NS    | NS    |
| Mean of Factor-2  |           |                           |     |       |       |     |                    |      |      |      |                 |       |       |
|                   | 1         | 255                       | 122 | -     | 352   | 218 | 3.57               | 2.47 | -    | 1.91 | -               | 22.82 | 23.43 |
|                   | 2         | 241                       | 131 | 231.5 | 250   | 269 | 3.28               | 2.73 | 2.09 | 2.08 | 24.71           | 28.29 | 23.97 |
|                   | 3         | 250                       | 140 | 241.5 | 332   | 280 | 3.29               | 2.87 | 2.23 | 2.21 | 25.29           | 20.09 | 25.35 |
|                   | CD(0.05)  | NS                        | 11  | 4     | 31    | 22  | 0.19               | 0.19 | 0.10 | 0.20 | 0.48            | 1.38  | 0.62  |
| Interaction       |           |                           |     |       |       |     |                    |      |      |      |                 |       |       |
|                   | M and T   | 26.21                     | NS  | NS    | 61.4  | NS  | NS                 | NS   | NS   | NS   | NS              | 2.76  | NS    |
|                   | T and M   | 24.89                     | NS  | NS    | 60.72 | NS  | NS                 | NS   | NS   | NS   | NS              | 2.66  | NS    |
| Experimental Mean |           | 248                       | 131 | 237   | 311   | 256 | 3.38               | 2.69 | 2.16 | 2.07 | 25.00           | 23.73 | 24.25 |

T1-Weed free

T2-Weedy check

T3-Mechanical weeding using

weeder

T4-Chemical weed control (pre &amp; post emergence herbicide application)

V1 - DRRDhan 50

V2 - DRRDhan 52

V3 - Latest released state variety

Table 4.3.3: Contd.

| Main Plot         | Sub Plots | CHINSURAH                                             |             |            |             |                                                               |             |             |             |                                                    |             |             |             |
|-------------------|-----------|-------------------------------------------------------|-------------|------------|-------------|---------------------------------------------------------------|-------------|-------------|-------------|----------------------------------------------------|-------------|-------------|-------------|
|                   |           | Weed population at vegetative stage no/m <sup>2</sup> |             |            |             | Weed population at panicle initiation stage no/m <sup>2</sup> |             |             |             | Weed population at heading stage no/m <sup>2</sup> |             |             |             |
|                   |           | Grasses                                               | Sedges      | BLWs       | Total       | Grasses                                                       | Sedges      | BLWs        | Total       | Grasses                                            | Sedges      | BLWs        | Total       |
| T1                | V1        | 0.00(0.71)                                            | 0.00(0.71)  | 0.00(0.71) | 0.00(0.71)  | 1.67(1.39)                                                    | 0.67(1.05)  | 0.67(1.05)  | 3.00(1.81)  | 1.33(1.27)                                         | 0.33(0.88)  | 0.67(1.00)  | 2.33(1.60)  |
|                   | V2        | 0.00(0.71)                                            | 0.00(0.71)  | 0.00(0.71) | 0.00(0.71)  | 1.67(1.46)                                                    | 0.67(1.05)  | 1.00(1.17)  | 3.33(1.95)  | 0.33(0.88)                                         | 0.33(0.88)  | 1.33(1.29)  | 2.00(1.56)  |
|                   | V3        | 0.00(0.71)                                            | 0.00(0.71)  | 0.00(0.71) | 0.00(0.71)  | 1.67(1.46)                                                    | 1.00(1.17)  | 0.67(1.05)  | 3.33(1.95)  | 1.00(1.17)                                         | 1.00(1.17)  | 0.67(1.05)  | 2.67(1.74)  |
| T2                | V1        | 8.00(2.90)                                            | 19.33(4.45) | 6.67(2.68) | 34.00(5.86) | 19.33(4.44)                                                   | 13.67(3.72) | 9.00(3.07)  | 42.00(6.51) | 26.00(5.14)                                        | 16.67(4.11) | 14.33(3.85) | 57.00(7.57) |
|                   | V2        | 14.33(3.85)                                           | 5.33(2.41)  | 8.33(2.95) | 28.00(5.33) | 34.33(5.89)                                                   | 22.00(4.61) | 11.67(3.47) | 68.00(8.28) | 34.33(5.89)                                        | 19.00(4.41) | 18.33(4.32) | 71.67(8.48) |
|                   | V3        | 12.00(3.53)                                           | 11.67(3.48) | 8.00(2.90) | 31.67(5.66) | 41.33(6.42)                                                   | 24.67(4.93) | 14.67(3.89) | 80.67(9.00) | 41.33(6.42)                                        | 24.33(4.96) | 23.00(4.83) | 88.67(9.43) |
| T3                | V1        | 5.33(2.41)                                            | 6.33(2.46)  | 5.33(2.25) | 17.00(4.18) | 2.67(1.77)                                                    | 8.67(3.03)  | 4.33(2.18)  | 15.67(4.02) | 3.67(2.02)                                         | 10.00(3.22) | 4.33(2.18)  | 18.00(4.30) |
|                   | V2        | 5.33(2.40)                                            | 3.33(1.85)  | 6.33(2.60) | 15.00(3.92) | 9.67(3.19)                                                    | 9.33(3.13)  | 3.67(2.04)  | 22.67(4.81) | 7.33(2.73)                                         | 10.00(3.24) | 3.67(2.04)  | 21.00(4.62) |
|                   | V3        | 2.00(1.56)                                            | 1.67(1.46)  | 3.00(1.81) | 6.67(2.67)  | 6.33(2.58)                                                    | 8.67(3.02)  | 7.00(2.71)  | 22.00(4.72) | 8.33(2.96)                                         | 9.67(3.17)  | 8.33(2.91)  | 26.33(5.13) |
| T4                | V1        | 4.33(2.16)                                            | 4.33(2.18)  | 3.00(1.87) | 11.67(3.48) | 4.33(2.12)                                                    | 2.00(1.56)  | 2.00(1.52)  | 8.33(2.94)  | 4.00(2.06)                                         | 2.00(1.56)  | 2.00(1.52)  | 8.00(2.89)  |
|                   | V2        | 3.67(2.04)                                            | 5.00(2.32)  | 3.00(1.84) | 11.67(3.47) | 8.33(2.97)                                                    | 5.67(2.46)  | 5.00(2.32)  | 19.00(4.40) | 8.33(2.97)                                         | 5.67(2.46)  | 5.00(2.32)  | 19.00(4.40) |
|                   | V3        | 3.67(2.04)                                            | 5.00(2.32)  | 3.00(1.84) | 11.67(3.47) | 5.33(2.39)                                                    | 6.33(2.60)  | 4.00(2.10)  | 15.67(4.02) | 5.33(2.39)                                         | 6.33(2.60)  | 4.00(2.10)  | 15.67(4.02) |
| Mean of Factor-1  |           |                                                       |             |            |             |                                                               |             |             |             |                                                    |             |             |             |
| 1                 |           | 0.00(0.71)                                            | 0.00(0.71)  | 0.00(0.71) | 0.00(0.71)  | 1.67(1.44)                                                    | 0.78(1.09)  | 0.78(1.09)  | 3.22(1.91)  | 0.89(1.11)                                         | 0.56(0.98)  | 0.89(1.11)  | 2.33(1.63)  |
| 2                 |           | 11.44(3.43)                                           | 12.11(3.45) | 7.67(2.84) | 31.22(5.62) | 31.67(5.58)                                                   | 20.11(4.42) | 11.78(3.48) | 63.56(7.93) | 33.89(5.82)                                        | 20.00(4.49) | 18.56(4.33) | 72.44(8.49) |
| 3                 |           | 4.22(2.12)                                            | 3.78(1.92)  | 4.89(2.22) | 12.89(3.59) | 6.22(2.52)                                                    | 8.89(3.06)  | 5.00(2.31)  | 20.11(4.52) | 6.44(2.57)                                         | 9.89(3.21)  | 5.44(2.38)  | 21.78(4.68) |
| 4                 |           | 3.89(2.08)                                            | 4.78(2.27)  | 3.00(1.85) | 11.67(3.47) | 6.00(2.49)                                                    | 4.67(2.21)  | 3.67(1.98)  | 14.33(3.79) | 5.89(2.47)                                         | 4.67(2.21)  | 3.67(1.98)  | 14.22(3.77) |
| CD(0.05)          |           | 0.34                                                  | 0.62        | 0.47       | 0.51        | 0.49                                                          | 0.67        | 0.49        | 0.44        | 0.69                                               | 0.41        | 0.52        | 0.71        |
| Mean of Factor-2  |           |                                                       |             |            |             |                                                               |             |             |             |                                                    |             |             |             |
| 1                 |           | 4.42(2.05)                                            | 7.50(2.45)  | 3.75(1.87) | 15.67(3.56) | 7.00(2.43)                                                    | 6.25(2.34)  | 4.00(1.96)  | 17.25(3.82) | 8.75(2.62)                                         | 7.25(2.44)  | 5.33(2.14)  | 21.33(4.09) |
| 2                 |           | 5.83(2.25)                                            | 3.42(1.82)  | 4.42(2.02) | 13.67(3.36) | 13.50(3.38)                                                   | 9.42(2.81)  | 5.33(2.25)  | 28.25(4.86) | 12.58(3.12)                                        | 8.75(2.75)  | 7.08(2.49)  | 28.42(4.77) |
| 3                 |           | 4.42(1.96)                                            | 4.58(1.99)  | 3.50(1.82) | 12.50(3.12) | 13.67(3.21)                                                   | 10.17(2.93) | 6.58(2.44)  | 30.42(4.93) | 14.00(3.23)                                        | 10.33(2.97) | 9.00(2.72)  | 33.33(5.08) |
| CD(0.05)          |           | 0.2                                                   | 0.35        | NS         | 0.24        | 0.41                                                          | 0.5         | 0.27        | 0.3         | 0.44                                               | 0.38        | 0.39        | 0.41        |
| Interaction       |           |                                                       |             |            |             |                                                               |             |             |             |                                                    |             |             |             |
| M and T           |           | 0.41                                                  | 0.71        | NS         | 0.47        | NS                                                            | NS          | NS          | 0.6         | NS                                                 | NS          | NS          | NS          |
| T and M           |           | 0.42                                                  | 0.74        | NS         | 0.54        | NS                                                            | NS          | NS          | 0.6         | NS                                                 | NS          | NS          | NS          |
| Experimental Mean |           | 2.08                                                  | 2.09        | 1.9        | 3.35        | 3.01                                                          | 2.7         | 2.21        | 4.54        | 2.99                                               | 2.72        | 2.45        | 4.65        |

(Values in parentheses are transformed figures)

T1-Weed free

T2-Weedy check

T3-Mechanical weeding using weeder

T4-Chemical weed control (pre &amp; post emergence herbicide application)

V1 - DRRDhan 50

V2 - DRRDhan 52

V3 - Latest released state variety

Table 4.3.3: Contd.

| Main Plot        | Sub Plots | MALAN                                                 |            |             |               |                                                               |            |             |             |                                                    |            |             |             |
|------------------|-----------|-------------------------------------------------------|------------|-------------|---------------|---------------------------------------------------------------|------------|-------------|-------------|----------------------------------------------------|------------|-------------|-------------|
|                  |           | Weed population at vegetative stage no/m <sup>2</sup> |            |             |               | Weed population at panicle initiation stage no/m <sup>2</sup> |            |             |             | Weed population at heading stage no/m <sup>2</sup> |            |             |             |
|                  |           | Grasses                                               | Sedges     | BLWs        | Total         | Grasses                                                       | Sedges     | BLWs        | Total       | Grasses                                            | Sedges     | BLWs        | Total       |
| T1               | V1        | 0.00(0.71)                                            | 0.00(0.71) | 0.00(0.71)  | 0.00(0.71)    | 0.00(0.71)                                                    | 0.00(0.71) | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)                                         | 0.00(0.71) | 0.00(0.71)  | 0.00(0.71)  |
|                  | V2        | 0.00(0.71)                                            | 0.00(0.71) | 0.00(0.71)  | 0.00(0.71)    | 0.00(0.71)                                                    | 0.00(0.71) | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)                                         | 0.00(0.71) | 0.00(0.71)  | 0.00(0.71)  |
|                  | V3        | 0.00(0.71)                                            | 0.00(0.71) | 0.00(0.71)  | 0.00(0.71)    | 0.00(0.71)                                                    | 0.00(0.71) | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)                                         | 0.00(0.71) | 0.00(0.71)  | 0.00(0.71)  |
| T2               | V1        | 40.00(6.36)                                           | 0.67(1.05) | 77.00(8.79) | 117.67(10.86) | 28.67(5.39)                                                   | 0.67(1.05) | 56.00(7.51) | 85.33(9.26) | 23.33(4.80)                                        | 0.67(1.05) | 36.67(6.08) | 60.67(7.82) |
|                  | V2        | 38.33(6.23)                                           | 2.67(1.77) | 66.33(8.16) | 107.33(10.38) | 30.33(5.53)                                                   | 1.00(1.17) | 56.00(7.48) | 87.33(9.37) | 21.67(4.69)                                        | 1.00(1.17) | 46.67(6.87) | 69.33(8.35) |
|                  | V3        | 55.67(7.46)                                           | 1.67(1.35) | 70.67(8.39) | 128.00(11.29) | 34.67(5.87)                                                   | 2.33(1.68) | 60.67(7.82) | 97.67(9.89) | 20.67(4.52)                                        | 1.00(1.17) | 41.33(6.40) | 63.00(7.95) |
| T3               | V1        | 12.00(3.50)                                           | 2.33(1.60) | 13.67(3.75) | 28.00(5.33)   | 14.00(3.78)                                                   | 0.67(1.05) | 16.33(4.08) | 31.00(5.57) | 10.67(3.30)                                        | 0.33(0.88) | 13.33(3.67) | 24.33(4.92) |
|                  | V2        | 13.67(3.76)                                           | 1.33(1.29) | 20.33(4.54) | 35.33(5.96)   | 16.00(4.04)                                                   | 1.00(1.17) | 18.33(4.33) | 35.33(5.97) | 8.67(3.00)                                         | 0.33(0.88) | 15.33(3.96) | 24.33(4.98) |
|                  | V3        | 15.33(3.96)                                           | 2.00(1.56) | 19.67(4.48) | 37.00(6.12)   | 7.67(2.82)                                                    | 1.33(1.34) | 8.33(2.96)  | 17.33(4.19) | 9.67(3.19)                                         | 1.33(1.34) | 17.33(4.21) | 28.33(5.36) |
| T4               | V1        | 5.33(2.38)                                            | 3.00(1.86) | 4.67(2.24)  | 13.00(3.66)   | 5.33(2.36)                                                    | 0.67(1.05) | 3.00(1.86)  | 9.00(3.03)  | 3.00(1.84)                                         | 0.67(1.00) | 2.67(1.72)  | 6.33(2.56)  |
|                  | V2        | 7.33(2.79)                                            | 2.00(1.56) | 2.33(1.64)  | 11.67(3.47)   | 3.00(1.79)                                                    | 1.00(1.17) | 6.00(2.54)  | 10.00(3.23) | 2.00(1.52)                                         | 0.67(1.05) | 2.67(1.76)  | 5.33(2.36)  |
|                  | V3        | 4.00(2.11)                                            | 3.00(1.86) | 6.00(2.50)  | 13.00(3.64)   | 3.67(2.02)                                                    | 1.00(1.17) | 5.67(2.45)  | 10.33(3.28) | 4.00(2.08)                                         | 0.67(1.05) | 4.33(2.18)  | 9.00(3.08)  |
| Mean of Factor-1 |           |                                                       |            |             |               |                                                               |            |             |             |                                                    |            |             |             |
|                  | 1         | 0.00(0.71)                                            | 0.00(0.71) | 0.00(0.71)  | 0.00(0.71)    | 0.00(0.71)                                                    | 0.00(0.71) | 0.00(0.71)  | 0.00(0.71)  | 0.00(0.71)                                         | 0.00(0.71) | 0.00(0.71)  | 0.00(0.71)  |
|                  | 2         | 44.67(6.68)                                           | 1.67(1.39) | 71.33(8.45) | 117.67(10.84) | 31.22(5.60)                                                   | 1.33(1.30) | 57.56(7.60) | 90.11(9.51) | 21.89(4.67)                                        | 0.89(1.13) | 41.56(6.45) | 64.33(8.04) |
|                  | 3         | 13.67(3.74)                                           | 1.89(1.48) | 17.89(4.26) | 33.44(5.81)   | 12.56(3.55)                                                   | 1.00(1.19) | 14.33(3.79) | 27.89(5.24) | 9.67(3.16)                                         | 0.67(1.03) | 15.33(3.95) | 25.67(5.09) |
|                  | 4         | 5.56(2.43)                                            | 2.67(1.76) | 4.33(2.13)  | 12.56(3.59)   | 4.00(2.05)                                                    | 0.89(1.13) | 4.89(2.28)  | 9.78(3.18)  | 3.00(1.81)                                         | 0.67(1.03) | 3.22(1.89)  | 6.89(2.67)  |
|                  | CD(0.05)  | 0.4                                                   | 0.34       | 0.85        | 0.77          | 0.76                                                          | 0.36       | 0.53        | 0.67        | 0.8                                                | NS         | 0.66        | 0.63        |
| Mean of Factor-2 |           |                                                       |            |             |               |                                                               |            |             |             |                                                    |            |             |             |
|                  | 1         | 14.33(3.24)                                           | 1.50(1.30) | 23.83(3.87) | 39.67(5.14)   | 12.00(3.06)                                                   | 0.50(0.97) | 18.83(3.54) | 31.33(4.64) | 9.25(2.66)                                         | 0.42(0.91) | 13.17(3.04) | 22.83(4.00) |
|                  | 2         | 14.83(3.37)                                           | 1.50(1.33) | 22.25(3.76) | 38.58(5.13)   | 12.33(3.02)                                                   | 0.75(1.06) | 20.08(3.77) | 33.17(4.82) | 8.08(2.48)                                         | 0.50(0.95) | 16.17(3.32) | 24.75(4.10) |
|                  | 3         | 18.75(3.56)                                           | 1.67(1.37) | 24.08(4.02) | 44.50(5.44)   | 11.50(2.85)                                                   | 1.17(1.22) | 18.67(3.48) | 31.33(4.52) | 8.58(2.63)                                         | 0.75(1.07) | 15.75(3.38) | 25.08(4.27) |
|                  | CD(0.05)  | NS                                                    | NS         | NS          | NS            | NS                                                            | NS         | NS          | NS          | NS                                                 | NS         | NS          | NS          |
| Interaction      |           |                                                       |            |             |               |                                                               |            |             |             |                                                    |            |             |             |
|                  | M and T   | NS                                                    | NS         | NS          | NS            | NS                                                            | NS         | NS          | NS          | NS                                                 | NS         | NS          | NS          |
|                  | T and M   | NS                                                    | NS         | NS          | NS            | NS                                                            | NS         | NS          | NS          | NS                                                 | NS         | NS          | NS          |
| Expert. Mean     |           | 3.39                                                  | 1.34       | 3.89        | 5.24          | 2.98                                                          | 1.08       | 3.6         | 4.66        | 2.59                                               | 0.98       | 3.25        | 4.13        |

(Values in parentheses are transformed figures)

T1-Weed free

T2-Weedy check

T3-Mechanical weeding using weeder

T4-Chemical weed control (pre &amp; post emergence herbicide application)

V1 - DRRDhan 50

V2 - DRRDhan 52

V3 - Latest released state variety

Table 4.3.3: Contd.

| Main Plot         | Sub Plots | NELLORE                                               |             |            |               |                                                               |             |            |               |                                                    |             |            |               |
|-------------------|-----------|-------------------------------------------------------|-------------|------------|---------------|---------------------------------------------------------------|-------------|------------|---------------|----------------------------------------------------|-------------|------------|---------------|
|                   |           | Weed population at vegetative stage no/m <sup>2</sup> |             |            |               | Weed population at panicle initiation stage no/m <sup>2</sup> |             |            |               | Weed population at heading stage no/m <sup>2</sup> |             |            |               |
|                   |           | Grasses                                               | Sedges      | BLWs       | Total         | Grasses                                                       | Sedges      | BLWs       | Total         | Grasses                                            | Sedges      | BLWs       | Total         |
| T1                | V1        | 2.67(1.61)                                            | 1.00(1.17)  | 0.00(0.71) | 3.67(1.83)    | 3.67(1.91)                                                    | 7.00(2.73)  | 1.33(1.34) | 12.00(3.51)   | 0.67(1.05)                                         | 0.33(0.88)  | 0.00(0.71) | 1.00(1.17)    |
|                   | V2        | 4.67(2.21)                                            | 3.00(1.84)  | 0.00(0.71) | 7.67(2.81)    | 3.67(2.02)                                                    | 8.67(3.02)  | 2.33(1.64) | 14.67(3.88)   | 0.00(0.71)                                         | 0.00(0.71)  | 0.00(0.71) | 0.00(0.71)    |
|                   | V3        | 4.00(2.08)                                            | 1.67(1.44)  | 0.00(0.71) | 5.67(2.45)    | 3.67(1.97)                                                    | 1.67(1.46)  | 1.33(1.27) | 6.67(2.68)    | 0.00(0.71)                                         | 0.33(0.88)  | 0.33(0.88) | 0.67(1.05)    |
| T2                | V1        | 80.00(8.84)                                           | 20.00(4.29) | 0.00(0.71) | 100.00(10.00) | 45.67(6.72)                                                   | 92.00(9.33) | 0.00(0.71) | 137.67(11.67) | 40.00(6.34)                                        | 93.33(9.40) | 0.00(0.71) | 133.33(11.45) |
|                   | V2        | 89.00(9.41)                                           | 10.67(3.03) | 0.00(0.71) | 99.67(9.92)   | 88.00(9.32)                                                   | 24.67(4.90) | 0.33(0.88) | 113.00(10.62) | 81.33(9.00)                                        | 24.33(4.93) | 4.67(2.11) | 110.33(10.51) |
|                   | V3        | 131.33(11.35)                                         | 3.33(1.85)  | 0.33(0.88) | 135.00(11.52) | 81.33(9.04)                                                   | 23.33(4.86) | 2.67(1.44) | 107.33(10.37) | 80.00(8.96)                                        | 28.33(5.36) | 5.67(2.39) | 114.00(10.70) |
| T3                | V1        | 29.00(5.37)                                           | 8.67(2.74)  | 0.00(0.71) | 37.67(6.05)   | 10.00(3.21)                                                   | 14.33(3.84) | 3.33(1.67) | 27.67(5.30)   | 14.33(3.83)                                        | 16.00(4.04) | 5.67(2.29) | 36.00(5.98)   |
|                   | V2        | 34.00(5.72)                                           | 14.67(3.80) | 0.00(0.71) | 48.67(6.98)   | 9.67(3.13)                                                    | 14.67(3.89) | 2.00(1.56) | 26.33(5.17)   | 12.33(3.56)                                        | 14.67(3.87) | 3.67(2.02) | 30.67(5.57)   |
|                   | V3        | 13.00(3.64)                                           | 5.00(2.26)  | 0.00(0.71) | 18.00(4.23)   | 13.33(3.72)                                                   | 8.67(2.88)  | 2.00(1.32) | 24.00(4.89)   | 11.67(3.48)                                        | 6.67(2.58)  | 2.67(1.76) | 21.00(4.62)   |
| T4                | V1        | 3.00(1.68)                                            | 2.00(1.32)  | 0.00(0.71) | 5.00(1.99)    | 0.00(0.71)                                                    | 0.00(0.71)  | 0.00(0.71) | 0.00(0.71)    | 0.00(0.71)                                         | 0.00(0.71)  | 0.00(0.71) | 0.00(0.71)    |
|                   | V2        | 4.33(2.12)                                            | 0.00(0.71)  | 0.00(0.71) | 4.33(2.12)    | 1.33(1.18)                                                    | 0.00(0.71)  | 0.00(0.71) | 1.33(1.18)    | 0.67(1.00)                                         | 0.00(0.71)  | 0.00(0.71) | 0.67(1.00)    |
|                   | V3        | 0.00(0.71)                                            | 0.00(0.71)  | 0.00(0.71) | 0.00(0.71)    | 1.33(1.29)                                                    | 4.00(1.65)  | 0.67(1.00) | 6.00(2.12)    | 0.67(1.05)                                         | 3.33(1.55)  | 0.67(1.00) | 4.67(1.87)    |
| Mean of Factor-1  |           |                                                       |             |            |               |                                                               |             |            |               |                                                    |             |            |               |
|                   | 1         | 3.78(1.97)                                            | 1.89(1.48)  | 0.00(0.71) | 5.67(2.37)    | 3.67(1.96)                                                    | 5.78(2.41)  | 1.67(1.42) | 11.11(3.35)   | 0.22(0.82)                                         | 0.22(0.82)  | 0.11(0.76) | 0.56(0.98)    |
|                   | 2         | 100.11(9.87)                                          | 11.33(3.06) | 0.11(0.76) | 111.56(10.48) | 71.67(8.36)                                                   | 46.67(6.36) | 1.00(1.01) | 119.33(10.89) | 67.11(8.10)                                        | 48.67(6.56) | 3.44(1.74) | 119.22(10.89) |
|                   | 3         | 25.33(4.91)                                           | 9.44(2.93)  | 0.00(0.71) | 34.78(5.76)   | 11.00(3.35)                                                   | 12.56(3.54) | 2.44(1.52) | 26.00(5.12)   | 12.78(3.62)                                        | 12.44(3.50) | 4.00(2.02) | 29.22(5.39)   |
|                   | 4         | 2.44(1.50)                                            | 0.67(0.91)  | 0.00(0.71) | 3.11(1.61)    | 0.89(1.06)                                                    | 1.33(1.02)  | 0.22(0.80) | 2.44(1.33)    | 0.44(0.92)                                         | 1.11(0.99)  | 0.22(0.80) | 1.78(1.19)    |
| CD(0.05)          |           | 2.06                                                  | 0.75        | NS         | 1.8           | 0.59                                                          | 1.08        | NS         | 1.09          | 0.48                                               | 1.09        | 0.77       | 1             |
| Mean of Factor-2  |           |                                                       |             |            |               |                                                               |             |            |               |                                                    |             |            |               |
|                   | 1         | 28.67(4.38)                                           | 7.92(2.38)  | 0.00(0.71) | 36.58(4.97)   | 14.83(3.14)                                                   | 28.33(4.15) | 1.17(1.11) | 44.33(5.30)   | 13.75(2.98)                                        | 27.42(3.76) | 1.42(1.10) | 42.58(4.83)   |
|                   | 2         | 33.00(4.86)                                           | 7.08(2.34)  | 0.00(0.71) | 40.08(5.46)   | 25.67(3.91)                                                   | 12.00(3.13) | 1.17(1.20) | 38.83(5.21)   | 23.58(3.57)                                        | 9.75(2.55)  | 2.08(1.39) | 35.42(4.45)   |
|                   | 3         | 37.08(4.45)                                           | 2.50(1.56)  | 0.08(0.75) | 39.67(4.73)   | 24.92(4.00)                                                   | 9.42(2.71)  | 1.67(1.26) | 36.00(5.01)   | 23.08(3.55)                                        | 9.67(2.59)  | 2.33(1.51) | 35.08(4.56)   |
| CD(0.05)          |           | NS                                                    | NS          | NS         | NS            | 0.72                                                          | 1.02        | NS         | NS            | 0.48                                               | 0.95        | NS         | NS            |
| Interaction       |           |                                                       |             |            |               |                                                               |             |            |               |                                                    |             |            |               |
| M and T           |           | 1.47                                                  | NS          | NS         | NS            | NS                                                            | NS          | NS         | NS            | 0.96                                               | 1.9         | NS         | NS            |
| T and M           |           | 1.93                                                  | NS          | NS         | NS            | NS                                                            | NS          | NS         | NS            | 0.87                                               | 1.76        | NS         | NS            |
| Experimental Mean |           | 4.56                                                  | 2.1         | 0.72       | 5.05          | 3.68                                                          | 3.33        | 1.19       | 5.17          | 3.37                                               | 2.97        | 1.33       | 4.61          |

(Values in parentheses are transformed figures)

T1-Weed free

T2-Weedy check

T3-Mechanical weeding using weeder

T4-Chemical weed control (pre &amp; post emergence herbicide application)

V1 - DRRDhan 50

V2 - DRRDhan 52

V3 - Latest released state variety

Table 4.3.3: Contd.

| Main Plot         | Sub Plots   | GHAGHRAGHAT                       |                          |               |
|-------------------|-------------|-----------------------------------|--------------------------|---------------|
|                   |             | Weed population no/m <sup>2</sup> |                          |               |
|                   |             | Active vegetative stage           | Panicle initiation stage | Heading stage |
| T1                | V1          | -                                 | -                        | 53.67(7.35)   |
|                   | V2          | -                                 | -                        | 54.33(7.40)   |
|                   | V3          | -                                 | -                        | 50.00(7.09)   |
| T2                | V1          | 54.67(7.41)                       | 75.33(8.70)              | 89.67(9.48)   |
|                   | V2          | 58.33(7.66)                       | 69.00(8.33)              | 95.67(9.80)   |
|                   | V3          | 57.67(7.62)                       | 68.67(8.31)              | 91.00(9.56)   |
| T3                | V1          | 42.67(6.56)                       | 54.00(7.37)              | 62.33(7.92)   |
|                   | V2          | 37.67(6.16)                       | 46.67(6.84)              | 57.33(7.59)   |
|                   | V3          | 39.67(6.33)                       | 56.33(7.53)              | 65.00(8.08)   |
| T4                | V1          | 37.00(6.09)                       | 46.00(6.80)              | 62.67(7.93)   |
|                   | V2          | 51.33(7.17)                       | 56.00(7.49)              | 75.67(8.72)   |
|                   | V3          | 45.00(6.71)                       | 54.00(7.37)              | 67.33(8.22)   |
| Mean of Factor-1  |             |                                   |                          |               |
|                   | 1           | -                                 | -                        | 52.67(7.28)   |
|                   | 2           | 56.89(7.57)                       | 71.00(8.45)              | 92.11(9.61)   |
|                   | 3           | 40.00(6.35)                       | 52.33(7.25)              | 61.56(7.86)   |
|                   | 4           | 44.44(6.66)                       | 52.00(7.22)              | 68.56(8.29)   |
|                   | CD(0.05)    | 0.48                              | 0.43                     | 0.46          |
| Mean of Factor-2  |             |                                   |                          |               |
|                   | 1           | 44.78(6.69)                       | 58.44(7.63)              | 67.08(8.17)   |
|                   | 2           | 49.11(6.99)                       | 57.22(7.55)              | 70.75(8.38)   |
|                   | 3           | 47.44(6.88)                       | 59.67(7.74)              | 68.33(8.24)   |
|                   | CD(0.05)    | NS                                | NS                       | NS            |
|                   | Interaction |                                   |                          |               |
|                   | M and T     | NS                                | NS                       | NS            |
|                   | T and M     | NS                                | NS                       | NS            |
| Experimental Mean |             | 6.86                              | 7.64                     | 8.26          |

(Values in parentheses are transformed figures)

T1-Weed free

T2-Weedy check

T3-Mechanical weeding using weeder

T4-Chemical weed control (pre &amp; post emergence herbicide application)

V1 - DRRDhan 50

V2 - DRRDhan 52

V3 - Latest released state variety

Table 4.3.3: Contd.

| Main Plot         | Sub Plots | CHINSURAH                                         |        |      |       |                                                           |        |      |       |                                              |        |      |       |
|-------------------|-----------|---------------------------------------------------|--------|------|-------|-----------------------------------------------------------|--------|------|-------|----------------------------------------------|--------|------|-------|
|                   |           | Weed biomass at vegetative stage g/m <sup>2</sup> |        |      |       | Weed biomass at panicle initiation stage g/m <sup>2</sup> |        |      |       | Weed biomass at heading stage/m <sup>2</sup> |        |      |       |
|                   |           | Grasses                                           | Sedges | BLWs | Total | Grasses                                                   | Sedges | BLWs | Total | Grasses                                      | Sedges | BLWs | Total |
| T1                | V1        | 0.00                                              | 0.00   | 0.00 | 0.00  | 0.13                                                      | 0.25   | 0.10 | 0.48  | 0.12                                         | 0.14   | 0.15 | 0.42  |
|                   | V2        | 0.00                                              | 0.00   | 0.00 | 0.00  | 0.13                                                      | 0.25   | 0.15 | 0.53  | 0.03                                         | 0.14   | 0.30 | 0.47  |
|                   | V3        | 0.00                                              | 0.00   | 0.00 | 0.00  | 0.13                                                      | 0.38   | 0.10 | 0.61  | 0.09                                         | 0.43   | 0.15 | 0.67  |
| T2                | V1        | 0.40                                              | 7.39   | 1.06 | 8.85  | 1.45                                                      | 5.23   | 1.35 | 8.03  | 2.44                                         | 7.21   | 3.20 | 12.85 |
|                   | V2        | 0.72                                              | 2.04   | 1.33 | 4.08  | 2.58                                                      | 8.41   | 1.75 | 12.74 | 3.23                                         | 8.21   | 4.09 | 15.53 |
|                   | V3        | 0.60                                              | 4.46   | 1.27 | 6.33  | 3.10                                                      | 9.43   | 2.20 | 14.73 | 3.88                                         | 10.52  | 5.13 | 19.53 |
| T3                | V1        | 0.27                                              | 2.42   | 0.85 | 3.54  | 0.20                                                      | 3.31   | 0.65 | 4.17  | 0.35                                         | 4.32   | 0.97 | 5.64  |
|                   | V2        | 0.27                                              | 1.27   | 1.01 | 2.55  | 0.73                                                      | 3.57   | 0.55 | 4.84  | 0.69                                         | 4.32   | 0.82 | 5.83  |
|                   | V3        | 0.10                                              | 0.63   | 0.48 | 1.21  | 0.48                                                      | 3.31   | 1.05 | 4.84  | 0.78                                         | 4.18   | 1.86 | 6.82  |
| T4                | V1        | 0.22                                              | 1.66   | 0.48 | 2.35  | 0.33                                                      | 0.76   | 0.30 | 1.39  | 0.38                                         | 0.86   | 0.44 | 1.68  |
|                   | V2        | 0.18                                              | 1.91   | 0.48 | 2.58  | 0.63                                                      | 2.17   | 0.75 | 3.54  | 0.78                                         | 2.45   | 1.12 | 4.35  |
|                   | V3        | 0.18                                              | 1.91   | 0.48 | 2.58  | 0.40                                                      | 2.42   | 0.60 | 3.42  | 0.50                                         | 2.74   | 0.89 | 4.13  |
| Mean of Factor-1  |           |                                                   |        |      |       |                                                           |        |      |       |                                              |        |      |       |
|                   | 1         | 0.00                                              | 0.00   | 0.00 | 0.00  | 0.13                                                      | 0.30   | 0.12 | 0.54  | 0.08                                         | 0.24   | 0.20 | 0.52  |
|                   | 2         | 0.57                                              | 4.63   | 1.22 | 6.42  | 2.38                                                      | 7.69   | 1.77 | 11.83 | 3.18                                         | 8.65   | 4.14 | 15.97 |
|                   | 3         | 0.21                                              | 1.44   | 0.78 | 2.43  | 0.47                                                      | 3.40   | 0.75 | 4.62  | 0.61                                         | 4.28   | 1.21 | 6.10  |
|                   | 4         | 0.19                                              | 1.83   | 0.48 | 2.50  | 0.45                                                      | 1.78   | 0.55 | 2.78  | 0.55                                         | 2.02   | 0.82 | 3.39  |
|                   | CD(0.05)  | 0.09                                              | 1.07   | 0.36 | 0.98  | 0.33                                                      | 2.29   | 0.40 | 1.96  | 0.39                                         | 0.80   | 0.52 | 1.34  |
| Mean of Factor-2  |           |                                                   |        |      |       |                                                           |        |      |       |                                              |        |      |       |
|                   | 1         | 0.22                                              | 2.87   | 0.60 | 3.69  | 0.53                                                      | 2.39   | 0.60 | 3.52  | 0.82                                         | 3.13   | 1.19 | 5.15  |
|                   | 2         | 0.29                                              | 1.31   | 0.70 | 2.30  | 1.01                                                      | 3.60   | 0.80 | 5.41  | 1.18                                         | 3.78   | 1.58 | 6.55  |
|                   | 3         | 0.22                                              | 1.75   | 0.56 | 2.53  | 1.03                                                      | 3.89   | 0.99 | 5.90  | 1.32                                         | 4.47   | 2.01 | 7.79  |
|                   | CD(0.05)  | 0.05                                              | 0.63   | NS   | 0.58  | 0.27                                                      | NS     | 0.16 | 1.31  | 0.37                                         | NS     | 0.50 | 1.31  |
| Interaction       |           |                                                   |        |      |       |                                                           |        |      |       |                                              |        |      |       |
|                   | M and T   | 0.10                                              | 1.25   | NS   | 1.16  | 0.54                                                      | NS     | 0.32 | NS    | NS                                           | NS     | NS   | NS    |
|                   | T and M   | 0.11                                              | 1.30   | NS   | 1.20  | 0.51                                                      | NS     | 0.39 | NS    | NS                                           | NS     | NS   | NS    |
| Experimental Mean |           | 0.24                                              | 1.98   | 0.62 | 2.84  | 0.86                                                      | 3.29   | 0.80 | 4.94  | 1.11                                         | 3.79   | 1.59 | 6.49  |

T1-Weed free

T2-Weedy check

T3-Mechanical weeding using weeder

T4-Chemical weed control (pre &amp; post emergence herbicide application)

V1 - DRRDhan 50

V2 - DRRDhan 52

V3 - Latest released state variety

Table 4.3.3: Contd.

| Main Plot         | Sub Plots | GHAGHRAGHAT                       |                          |               | MALAN                                              |        |       |        |                                                           |        |       |       |                                                |        |       |       |
|-------------------|-----------|-----------------------------------|--------------------------|---------------|----------------------------------------------------|--------|-------|--------|-----------------------------------------------------------|--------|-------|-------|------------------------------------------------|--------|-------|-------|
|                   |           | Weed dry biomass g/m <sup>2</sup> |                          |               | Weed biomass at vegetative stage no/m <sup>2</sup> |        |       |        | Weed biomass at panicle initiation stage g/m <sup>2</sup> |        |       |       | Weed biomass at heading stage g/m <sup>2</sup> |        |       |       |
|                   |           | Active vegetative stage           | Panicle initiation stage | Heading stage | Grasses                                            | Sedges | BLWs  | Total  | Grasses                                                   | Sedges | BLWs  | Total | Grasses                                        | Sedges | BLWs  | Total |
| T1                | V1        | -                                 | -                        | 33.33         | 0.00                                               | 0.00   | 0.00  | 0.00   | 0.00                                                      | 0.00   | 0.00  | 0.00  | 0.00                                           | 0.00   | 0.00  | 0.00  |
|                   | V2        | -                                 | -                        | 31.96         | 0.00                                               | 0.00   | 0.00  | 0.00   | 0.00                                                      | 0.00   | 0.00  | 0.00  | 0.00                                           | 0.00   | 0.00  | 0.00  |
|                   | V3        | -                                 | -                        | 27.62         | 0.00                                               | 0.00   | 0.00  | 0.00   | 0.00                                                      | 0.00   | 0.00  | 0.00  | 0.00                                           | 0.00   | 0.00  | 0.00  |
| T2                | V1        | 3.2                               | 4.52                     | 46.45         | 36.00                                              | 0.57   | 68.33 | 104.90 | 25.47                                                     | 0.53   | 50.17 | 76.17 | 21.00                                          | 0.57   | 32.97 | 54.53 |
|                   | V2        | 3.22                              | 4.51                     | 46.74         | 34.50                                              | 2.37   | 58.50 | 95.37  | 27.20                                                     | 0.90   | 49.97 | 78.07 | 19.50                                          | 1.47   | 42.00 | 62.97 |
|                   | V3        | 3.13                              | 4.33                     | 40.37         | 49.80                                              | 1.50   | 62.57 | 113.87 | 30.73                                                     | 2.03   | 54.60 | 87.37 | 18.57                                          | 0.57   | 37.13 | 56.27 |
| T3                | V1        | 2.55                              | 3.95                     | 44.96         | 10.80                                              | 2.10   | 12.13 | 25.03  | 12.57                                                     | 0.83   | 14.70 | 28.10 | 9.50                                           | 0.30   | 12.00 | 21.80 |
|                   | V2        | 2.39                              | 3.26                     | 33.56         | 12.30                                              | 1.20   | 18.27 | 31.77  | 14.27                                                     | 0.83   | 16.50 | 31.60 | 7.73                                           | 0.00   | 13.80 | 21.53 |
|                   | V3        | 2.46                              | 3.39                     | 35.65         | 13.80                                              | 1.77   | 17.60 | 33.17  | 6.83                                                      | 1.23   | 7.50  | 15.57 | 8.70                                           | 1.20   | 15.50 | 25.40 |
| T4                | V1        | 2.26                              | 2.8                      | 29.49         | 4.80                                               | 3.00   | 4.40  | 12.20  | 4.73                                                      | 0.53   | 2.70  | 7.97  | 2.67                                           | 0.57   | 2.40  | 5.63  |
|                   | V2        | 2.66                              | 3.14                     | 31.91         | 6.60                                               | 1.77   | 2.03  | 10.40  | 2.63                                                      | 0.90   | 5.40  | 8.93  | 1.77                                           | 0.83   | 2.40  | 5.00  |
|                   | V3        | 2.54                              | 3.35                     | 29.55         | 3.60                                               | 2.67   | 5.33  | 11.60  | 3.27                                                      | 0.87   | 5.10  | 9.23  | 3.57                                           | 0.57   | 3.87  | 8.00  |
| Mean of Factor-1  |           |                                   |                          |               |                                                    |        |       |        |                                                           |        |       |       |                                                |        |       |       |
|                   | 1         |                                   |                          | 30.97         | 0.00                                               | 0.00   | 0.00  | 0.00   | 0.00                                                      | 0.00   | 0.00  | 0.00  | 0.00                                           | 0.00   | 0.00  | 0.00  |
|                   | 2         | 3.18                              | 4.45                     | 44.52         | 40.10                                              | 1.48   | 63.13 | 104.71 | 27.80                                                     | 1.16   | 51.58 | 80.53 | 19.69                                          | 0.87   | 37.37 | 57.92 |
|                   | 3         | 2.47                              | 3.53                     | 38.06         | 12.30                                              | 1.69   | 16.00 | 29.99  | 11.22                                                     | 0.97   | 12.90 | 25.09 | 8.64                                           | 0.50   | 13.77 | 22.91 |
|                   | 4         | 2.49                              | 3.1                      | 30.32         | 5.00                                               | 2.48   | 3.92  | 11.40  | 3.54                                                      | 0.77   | 4.40  | 8.71  | 2.67                                           | 0.66   | 2.89  | 6.21  |
|                   | CD(0.05)  | 0.1                               | 0.09                     | 7.04          | 5.20                                               | 1.07   | 10.70 | 14.83  | 6.10                                                      | 0.68   | 5.47  | 7.62  | 6.97                                           | NS     | 6.03  | 5.44  |
| Mean of Factor-2  |           |                                   |                          |               |                                                    |        |       |        |                                                           |        |       |       |                                                |        |       |       |
|                   | 1         | 2.67                              | 3.76                     | 38.56         | 12.90                                              | 1.42   | 21.22 | 35.53  | 10.69                                                     | 0.48   | 16.89 | 28.06 | 8.29                                           | 0.36   | 11.84 | 20.49 |
|                   | 2         | 2.75                              | 3.64                     | 36.04         | 13.35                                              | 1.33   | 19.70 | 34.38  | 11.02                                                     | 0.66   | 17.97 | 29.65 | 7.25                                           | 0.57   | 14.55 | 22.37 |
|                   | 3         | 2.71                              | 3.69                     | 33.3          | 16.80                                              | 1.48   | 21.37 | 39.66  | 10.21                                                     | 1.03   | 16.80 | 28.04 | 7.71                                           | 0.58   | 14.12 | 22.42 |
|                   | CD(0.05)  | NS                                | NS                       | NS            | 3.39                                               | NS     | NS    | NS     | NS                                                        | NS     | NS    | NS    | NS                                             | NS     | NS    | NS    |
| Interaction       |           |                                   |                          |               |                                                    |        |       |        |                                                           |        |       |       |                                                |        |       |       |
|                   | M and T   | NS                                | 0.31                     | NS            | NS                                                 | NS     | NS    | NS     | NS                                                        | NS     | NS    | NS    | NS                                             | NS     | NS    | NS    |
|                   | T and M   | NS                                | 0.26                     | NS            | NS                                                 | NS     | NS    | NS     | NS                                                        | NS     | NS    | NS    | NS                                             | NS     | NS    | NS    |
| Experimental Mean |           | 2.71                              | 3.69                     | 35.97         | 14.35                                              | 1.41   | 20.76 | 36.53  | 10.64                                                     | 0.72   | 17.22 | 28.58 | 7.75                                           | 0.51   | 13.51 | 21.76 |

T1-Weed free

T2-Weedy check

T3-Mechanical weeding using weeder

T4-Chemical weed control (pre &amp; post emergence herbicide application)

V1 - DRRDhan 50

V2 - DRRDhan 52

V3 - Latest released state variety

Table 4.3.3: Contd.

| Main Plot         | Sub Plots | NELLORE                                           |        |      |       |                                                           |        |      |       |                                                |        |      |       |
|-------------------|-----------|---------------------------------------------------|--------|------|-------|-----------------------------------------------------------|--------|------|-------|------------------------------------------------|--------|------|-------|
|                   |           | Weed biomass at vegetative stage g/m <sup>2</sup> |        |      |       | Weed biomass at panicle initiation stage g/m <sup>2</sup> |        |      |       | Weed biomass at Heading stage g/m <sup>2</sup> |        |      |       |
|                   |           | Grasses                                           | Sedges | BLWs | Total | Grasses                                                   | Sedges | BLWs | Total | Grasses                                        | Sedges | BLWs | Total |
| T1                | V1        | 2.00                                              | 1.00   | 0.00 | 3.00  | 1.67                                                      | 3.00   | 1.00 | 5.67  | 0.67                                           | 0.33   | 0.00 | 1.00  |
|                   | V2        | 3.00                                              | 1.00   | 0.00 | 4.00  | 1.67                                                      | 3.33   | 1.33 | 6.33  | 0.00                                           | 0.00   | 0.00 | 0.00  |
|                   | V3        | 1.67                                              | 1.67   | 0.00 | 3.33  | 1.33                                                      | 1.00   | 1.00 | 3.33  | 0.00                                           | 0.33   | 0.33 | 0.67  |
| T2                | V1        | 24.00                                             | 11.67  | 0.00 | 35.67 | 32.67                                                     | 46.33  | 0.00 | 79.00 | 19.00                                          | 45.00  | 0.00 | 64.00 |
|                   | V2        | 37.67                                             | 10.00  | 0.00 | 47.67 | 47.33                                                     | 13.67  | 0.33 | 61.33 | 38.33                                          | 14.33  | 2.67 | 55.33 |
|                   | V3        | 85.33                                             | 1.67   | 0.33 | 87.33 | 36.33                                                     | 11.67  | 1.33 | 49.33 | 39.67                                          | 14.00  | 2.33 | 56.00 |
| T3                | V1        | 16.00                                             | 4.33   | 0.00 | 20.33 | 4.33                                                      | 6.00   | 1.67 | 12.00 | 5.33                                           | 8.33   | 2.67 | 16.33 |
|                   | V2        | 17.33                                             | 6.67   | 0.00 | 24.00 | 5.00                                                      | 7.33   | 1.33 | 13.67 | 5.67                                           | 8.00   | 1.67 | 15.33 |
|                   | V3        | 3.67                                              | 1.33   | 0.00 | 5.00  | 6.33                                                      | 4.33   | 1.00 | 11.67 | 6.00                                           | 3.33   | 1.33 | 10.67 |
| T4                | V1        | 1.00                                              | 0.67   | 0.00 | 1.67  | 0.00                                                      | 0.00   | 0.00 | 0.00  | 0.00                                           | 0.00   | 0.00 | 0.00  |
|                   | V2        | 1.67                                              | 0.00   | 0.00 | 1.67  | 0.33                                                      | 0.00   | 0.00 | 0.33  | 0.33                                           | 0.00   | 0.00 | 0.33  |
|                   | V3        | 0.00                                              | 0.00   | 0.00 | 0.00  | 0.67                                                      | 1.33   | 0.33 | 2.33  | 0.67                                           | 1.33   | 0.33 | 2.33  |
| Mean of Factor-1  |           |                                                   |        |      |       |                                                           |        |      |       |                                                |        |      |       |
|                   | 1         | 2.22                                              | 1.22   | 0.00 | 3.44  | 1.56                                                      | 2.44   | 1.11 | 5.11  | 0.22                                           | 0.22   | 0.11 | 0.56  |
|                   | 2         | 49.00                                             | 7.78   | 0.11 | 56.89 | 38.78                                                     | 23.89  | 0.56 | 63.22 | 32.33                                          | 24.44  | 1.67 | 58.44 |
|                   | 3         | 12.33                                             | 4.11   | 0.00 | 16.44 | 5.22                                                      | 5.89   | 1.33 | 12.44 | 5.67                                           | 6.56   | 1.89 | 14.11 |
|                   | 4         | 0.89                                              | 0.22   | 0.00 | 1.11  | 0.33                                                      | 0.44   | 0.11 | 0.89  | 0.33                                           | 0.44   | 0.11 | 0.89  |
|                   | CD(0.05)  | 20.18                                             | NS     | NS   | 19.99 | 10.87                                                     | 7.79   | NS   | 11.86 | 2.95                                           | 9.47   | 1.46 | 9.45  |
| Mean of Factor-2  |           |                                                   |        |      |       |                                                           |        |      |       |                                                |        |      |       |
|                   | 1         | 10.75                                             | 4.42   | 0.00 | 15.17 | 9.67                                                      | 13.83  | 0.67 | 24.17 | 6.25                                           | 13.42  | 0.67 | 20.33 |
|                   | 2         | 14.92                                             | 4.42   | 0.00 | 19.33 | 13.58                                                     | 6.08   | 0.75 | 20.42 | 11.08                                          | 5.58   | 1.08 | 17.75 |
|                   | 3         | 22.67                                             | 1.17   | 0.08 | 23.92 | 11.17                                                     | 4.58   | 0.92 | 16.67 | 11.58                                          | 4.75   | 1.08 | 17.42 |
|                   | CD(0.05)  | 7.03                                              | 2.56   | NS   | NS    | NS                                                        | NS     | NS   | 6.09  | 2.82                                           | NS     | NS   | NS    |
| Interaction       |           |                                                   |        |      |       |                                                           |        |      |       |                                                |        |      |       |
|                   | M and T   | 14.06                                             | NS     | NS   | 14.98 | NS                                                        | NS     | NS   | NS    | 5.64                                           | NS     | NS   | NS    |
|                   | T and M   | 18.69                                             | NS     | NS   | 19.09 | NS                                                        | NS     | NS   | NS    | 5.12                                           | NS     | NS   | NS    |
| Experimental Mean |           | 16.11                                             | 3.33   | 0.03 | 19.47 | 11.47                                                     | 8.17   | 0.78 | 20.42 | 9.64                                           | 7.92   | 0.94 | 18.50 |

T1-Weed free

T2-Weedy check

T3-Mechanical weeding using weeder

T4-Chemical weed control (pre &amp; post emergence herbicide application)

V1 - DRRDhan 50

V2 - DRRDhan 52

V3 - Latest released state variety

#### 4.3.4 Integrated Pest Management

In recent years, intensive cultivation of rice has resulted in the frequent occurrence of biotic stresses that formed major constraint in rice production. Although, IPM has been accepted as the most effective option for protection of crops from the ravages of pests, however, its implementation at the farmer's level has been limited. As IPM involves a number of components, farmers must have capability of taking decisions and selecting IPM options accordingly for economical and long term management. Most of these options also need to be refined at individual farm level keeping in view the availability of resources and feasibility to farmers. Therefore, IPM involves working with the farmers in their fields and devising technologies suitable to their conditions. Keeping this in view, IPM special trial was conducted with an aim to manage pests (including insects, diseases and weeds) in a holistic way in farmers' fields involving them in a participatory way and allowing them to select IPM practices from a basket of options available. The IPM practices recommended for weed management is given in the below table.

| Treatment              | IPM block                                                                                                                                                                                                                                                                                                                        | FP block                                                                                                                                                                                                                   |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Nursery                | <ul style="list-style-type: none"> <li>❖ Apply <b>butachlor</b> or <b>pretilachlor</b> + <b>safener @ 5 ml/lt</b> water at 8-10 days after sowing.</li> <li>❖ If weed intensity is more apply <b>bispyribacsodium @ 8 ml/lt</b> water at 2-3 leaf stage of weeds</li> </ul>                                                      | <ul style="list-style-type: none"> <li>❖ As per the local farmers practice.</li> <li>❖ Please record the practices followed by farmers whenever you go for observation / visit</li> </ul>                                  |
| Main field             | <ul style="list-style-type: none"> <li>❖ Transplant seedlings at a spacing of 20 x 15 cm.</li> <li>❖ Leave alleyways of 30 cm after every 2 m or 10 rows.</li> <li>❖ Fertilizers should be applied as per local recommended fertilizer dose.</li> <li>❖ Apply herbicide within one week after transplanting the crop.</li> </ul> | <ul style="list-style-type: none"> <li>❖ As per the local farmers practice</li> <li>❖ Please record the practices followed by farmers whenever you go for observation / visit</li> </ul>                                   |
| 30 – 59DAT             | <ul style="list-style-type: none"> <li>❖ Depending on weed intensity spray post emergence herbicide as given N top dressing to be taken up as given in protocol using Leaf Color Chart</li> <li>❖ Mid season drainage</li> </ul>                                                                                                 | <ul style="list-style-type: none"> <li>❖ As per the local farmers practice (mention the quantities)</li> <li>❖ Please record the practices followed by farmers whenever you go for observation / visit</li> </ul>          |
| > 90 DAT up to harvest | <ul style="list-style-type: none"> <li>❖ Mark 5 x 5 m<sup>2</sup> area and take yield, at 5 places (5 repl.) in this block</li> </ul>                                                                                                                                                                                            | <ul style="list-style-type: none"> <li>❖ Mark 5 x 5 m<sup>2</sup> and take yield, at 5 places (5 repl.) in this block</li> </ul>                                                                                           |
|                        | <ul style="list-style-type: none"> <li>❖ Also record the cost involved for each practice/ operation taken in IPM starting from nursery to harvest to estimate cost of cultivation as given in data sheet</li> </ul>                                                                                                              | <ul style="list-style-type: none"> <li>❖ Also record the cost involved for each practice/ operation taken up by farmers starting from nursery to harvest to estimate cost of cultivation as given in data sheet</li> </ul> |

During kharif 2019, the trial was conducted at 11 locations viz., **Chatha, Chinsurah, Gangavathi, Malan, Mandya, Navsari, Nellore, Puducherry, Raipur, Titabar and Vadgaon**. The data on weed parameters during critical period of crop weed competition and grain yield were reported and the results are summarized and presented in **Table 4.3.4**.

At **Chatha**, the data on weed population and biomass were recorded at 30 & 60 DAT; with relatively lower weed intensity in IPM adopted fields (14.87 & 33.07% lower weed population; 15.37 and 32.26% lower biomass than that of farmers practice).

At **Chinsurah**, The trial was conducted in the village Bele, Pandua, Block of Hoogly District. The data on weed population and biomass showed significant decrease in IPM by 42.58 and 32.57%; 52.85 and 33.33% respectively than in farmers practice. The significant decrease in weed population and biomass had resulted in higher crop growth, yield attributes and grain yield increase (12%) by variety Swarna.

At **Gangavathi**, BPT 5204 has recorded a mean grain yield increase of 12.8% in IPM adopted fields with significantly low weed intensity 63.48 & 50% in weed population and 40.51% in weed biomass. **Table 4.3.4.**

At **Malan**, the variety HPR 2880 resulted in higher grain yield by 51.86% than Raftar in farmers fields. The weed population was 63-65% lower in IPM implemented fields.

At **Mandya**, variety MTU 1001 was tested under IPM program. The variety showed 12.77% yield advantage under IPM adoption compared to farmers practice. The weed population data recorded at 30 & 60 DAT showed drastic reduction in IPM fields with 71 and 79% respectively. The weed biomass was 69.82 and 81.40% higher in farmers practice adopted fields.

At **Navsari**, the IPM and farmers practice have recorded similar weed intensity showing the farmers are practicing good weed management measures and recorded only 10 and 4% higher than IPM implemented fields with weed biomass of 5% higher than IPM fields. The yield gap of farmers practice and IPM fields also was only 1.7% indicating the implementation of latest technologies by farmers commonly.

At **Nellore**, variety BPT 5204 has recorded 72 & 58% lower weed population, 60 & 70% lower weed biomass at 30 and 60 DAT in IPM adopted fields resulting in yield advantage of 13% over farmers practice. The yield gap was low indicating the adoption of IPM practices timely especially weed control practices.

At **Puducherry**, ADT 53 has recorded highest grain yield in IPM implemented fields and resulted in 7.6% yield advantage. IPM fields recorded 31.5 and 29% lower weed population at 30 & 60 DAT respectively. Similarly the weed biomass was lower by 35.5 and 26.3% at 30 and 60 DAT respectively compared to farmers practice.

At **Raipur**, under wet direct sown system, Swarna has 8.49% higher grain yields in IPM implemented fields compared to farmers practice adopted fields. The weed population was 14 and 16.6% higher at 30 and 60 DAS respectively in farmers practice adopted fields. The weed biomass was also 18% and 10% higher in farmers practice fields than IPM implemented fields.

At **Titabar**, Rajit Sub-1 variety was tested under IPM and farmers practice implemented fields. IPM implementation resulted in 25% higher grain yields compared to farmers practice adopted fields. IPM implemented fields recorded 63% lower weed population and 47% lower weed biomass compared to farmers practice adopted fields.

At **Vadgaon**, Phule Samrudhi was cultivated in both IPM and farmers practice implemented fields. Same variety showed highest yield advantage of 44.7% in IPM implemented fields. The weed intensity was high and IPM implemented fields showed 67 and 50% lower weed population at 30 & 60 DAT in IPM implemented fields was lower by 58 and 65% compared to farmers practice adopted fields indicating the necessity of timely weed control in farmers fields. **Table 4.3.4.**

Integrated Pest Management (IPMs) trial was conducted at 11 locations during *Kharif*2019 with an objective of managing all pests i.e., weeds, insects, diseases in a holistic way in farmers' fields involving them in a participatory mode. Across the locations, weeds, insect pests, and disease incidence was low in IPM plots. The mean weed population was considerably reduced by 9 to 71% at 30 DAT, 4 to 79% at 60 DAT; resulting in reduction of the mean weed biomass by 5 to 70% at 30 DAT, 5 to 81% at 60 DAT respectively. The mean grain yield advantage in IPM implemented plots compared to farmers practice is 2 to 52% among the test locations.

(For more details regarding pest and diseases please see Volume.2 Progress Report 2019 (**Entomology–IPMspecial trial**)).

Table 4.3.4: Summary of data on weed parameters, yield parameters and grain yield of IPM trial as influenced by IPM vs Farmers Practice in Kharif - 2019.

| Location   | Mean/<br>standa<br>rd<br>error | Treatments              | Panicle<br>No/m <sup>2</sup> | Panicle<br>wt<br>(g) | Grain<br>Yield<br>(t/ha) | Yield<br>Advantage | Straw<br>Yield<br>(t/ha) | Weed Population No/m <sup>2</sup> |                |           |                | Weed Dry Biomass g/m <sup>2</sup> |             |           |             |
|------------|--------------------------------|-------------------------|------------------------------|----------------------|--------------------------|--------------------|--------------------------|-----------------------------------|----------------|-----------|----------------|-----------------------------------|-------------|-----------|-------------|
|            |                                |                         |                              |                      |                          |                    |                          | 30<br>DAT                         | %<br>Reduction | 60<br>DAT | %<br>Reduction | 30<br>DAT                         | % Reduction | 60<br>DAT | % Reduction |
| CHATHA     | Mean                           | IPM<br>Farmers Practice | 312                          | 1.82                 | 3.79                     | 11.60              | 5.22                     | 21.00                             | 14.87          | 29.67     | 33.07          | 11.28                             | 15.37       | 31.14     | 32.26       |
|            |                                |                         | 235                          | 1.69                 | 3.35                     |                    | 4.53                     | 24.67                             |                | 44.33     |                | 13.33                             |             | 45.97     |             |
|            | Standard errors                |                         | 2.52                         | 0.06                 | 0.03                     |                    | 0.10                     | 1.00                              |                | 1.53      |                | 1.17                              |             | 1.59      |             |
| CHINSURAH  | Mean                           | IPM<br>Farmers Practice | 348                          | 3.20                 | 4.53                     | 12.14              |                          | 36.40                             | 42.58          | 65.40     | 32.57          | 3.41                              | 52.85       | 6.23      | 33.33       |
|            |                                |                         | 293                          | 3.13                 | 3.98                     |                    |                          | 63.40                             |                | 97.00     |                | 6.66                              |             | 9.34      |             |
|            | Standard errors                |                         | 17                           | 0.08                 | 0.25                     |                    |                          | 9.02                              |                | 10.14     |                | 0.97                              |             | 1.76      |             |
| GANGAVATHI | Mean                           | IPM<br>Farmers Practice | 496                          | 2.56                 | 5.86                     | 12.79              | 6.73                     | 3.40                              | 63.48          | 2.20      | 50.00          | 5.82                              | 40.00       | 5.32      | 51.10       |
|            |                                |                         | 429                          | 1.74                 | 5.11                     |                    | 5.94                     | 8.60                              |                | 4.40      |                | 9.70                              |             | 10.88     |             |
|            | Standard errors                |                         | 60                           | 0.23                 | 0.41                     |                    | 0.49                     | 2.51                              |                | 0.84      |                | 2.41                              |             | 3.08      |             |
| LUDHIANA   | Mean                           | IPM<br>Farmers Practice | 367                          | 3.26                 | 7.47                     | 3.34               | 10.63                    | 2.05                              | 75.15          | 2.63      | 74.43          | -                                 | -           | -         | -           |
|            |                                |                         | 346                          | 3.24                 | 7.23                     |                    | 10.20                    | 8.25                              |                | 10.25     |                | -                                 |             | -         |             |
|            | Standard errors                |                         | 23                           | 0.09                 | 0.21                     |                    | 0.33                     | 1.28                              |                | 1.56      |                | -                                 |             | -         |             |
| MALAN      | Mean                           | IPM<br>Farmers Practice | 225                          | 2.06                 | 3.49                     | 51.86              | 4.01                     | 12.00                             | 64.91          | 16.40     | 63.06          | 10.40                             | 64.86       | 14.80     | 63.00       |
|            |                                |                         | 187                          | 1.74                 | 1.68                     |                    | 1.96                     | 34.20                             |                | 44.40     |                | 29.60                             |             | 40.00     |             |
|            | Standard errors                |                         | 5.87                         | 0.11                 | 0.28                     |                    | 0.31                     | 2.92                              |                | 3.36      |                | 2.51                              |             | 3.49      |             |
| MANDYA     | Mean                           | IPM<br>Farmers Practice | 367                          | 3.43                 | 7.75                     | 12.77              | 8.67                     | 2.30                              | 71.25          | 2.20      | 79.24          | 0.51                              | 69.82       | 1.03      | 81.40       |
|            |                                |                         | 356                          | 3.01                 | 6.76                     |                    | 7.65                     | 8.00                              |                | 10.60     |                | 1.69                              |             | 5.54      |             |
|            | Standard errors                |                         | 33                           | 0.34                 | 0.65                     |                    | 0.54                     | 1.48                              |                | 1.48      |                | 0.32                              |             | 0.59      |             |
|            |                                |                         | 10                           | 0.36                 | 0.39                     |                    | 0.32                     | 3.00                              |                | 2.30      |                | 1.22                              |             | 1.39      |             |

Table 4.3.4: Contd.

| Location   | Mean/<br>standard<br>error | Treatments              | Panicle<br>No/m <sup>2</sup> | Panicle<br>wt<br>(g) | Grain<br>Yield<br>(t/ha) | Yield<br>Advantage | Straw<br>Yield<br>(t/ha) | Weed Population No/m <sup>2</sup> |                |           |                | Weed Dry Biomass g/m <sup>2</sup> |                |           |                |
|------------|----------------------------|-------------------------|------------------------------|----------------------|--------------------------|--------------------|--------------------------|-----------------------------------|----------------|-----------|----------------|-----------------------------------|----------------|-----------|----------------|
|            |                            |                         |                              |                      |                          |                    |                          | 30<br>DAT                         | %<br>Reduction | 60<br>DAT | %<br>Reduction | 30<br>DAT                         | %<br>Reduction | 60<br>DAT | %<br>Reduction |
| NAVASARI   | Mean                       | IPM<br>Farmers Practice | 215                          | 3.82                 | 5.15                     | 1.74               | 7.75                     | 19.92                             |                | 34.28     |                | 34.08                             |                | 50.90     |                |
|            |                            |                         | 202                          | 3.63                 | 5.06                     |                    | 7.66                     | 21.98                             | 9.37           | 35.86     | 4.40           | 35.98                             | 5.28           | 53.38     | 4.64           |
|            | Standard errors            |                         | 4                            | 0.20                 | 0.16                     |                    | 0.15                     | 0.97                              |                | 1.49      |                | 0.65                              |                | 1.28      |                |
|            |                            |                         | 9                            | 0.11                 | 0.16                     |                    | 0.17                     | 0.77                              |                | 1.06      |                | 0.33                              |                | 1.68      |                |
| NELLORE    | Mean                       | IPM<br>Farmers Practice | 447                          | 2.46                 | 6.53                     | 12.90              | 8.40                     | 2.60                              |                | 3.00      |                | 3.00                              |                | 10.40     |                |
|            |                            |                         | 380                          | 2.42                 | 6.28                     |                    | 7.92                     | 9.20                              | 71.73          | 7.20      | 58.33          | 7.60                              | 60.52          | 34.40     | 69.76          |
|            | Standard errors            |                         | 31                           | 0.456                | 0.31                     |                    | 0.29                     | 1.14                              |                | 0.71      |                | 1.87                              |                | 3.13      |                |
|            |                            |                         | 26                           | 0.319                | 0.27                     |                    | 0.56                     | 2.28                              |                | 1.79      |                | 2.07                              |                | 9.56      |                |
| PUDUCHERRY | Mean                       | IPM<br>Farmers Practice | 357                          | 4.00                 | 6.31                     | 7.60               | 8.21                     | 28.20                             | 31.55          | 33.60     |                | 15.60                             |                | 17.40     |                |
|            |                            |                         | 332                          | 3.75                 | 5.83                     |                    | 7.58                     | 41.20                             |                | 47.40     | 29.11          | 24.20                             | 35.53          | 23.60     | 26.27          |
|            | Standard errors            |                         | 15                           | 0.21                 | 0.18                     |                    | 0.24                     | 2.59                              |                | 3.36      |                | 2.41                              |                | 2.07      |                |
|            |                            |                         | 8                            | 0.17                 | 0.10                     |                    | 0.13                     | 5.81                              |                | 4.83      |                | 5.72                              |                | 2.70      |                |
|            | Mean                       | IPM<br>Farmers Practice | 371                          | 2.61                 | 5.06                     | 8.49               | 5.80                     | 16.64                             |                | 28.18     |                | 8.63                              |                | 40.23     |                |
|            |                            |                         | 362                          | 2.50                 | 4.63                     |                    | 5.41                     | 19.40                             | 14.22          | 33.78     | 16.57          | 10.54                             | 18.12          | 44.87     | 10.34          |
| RAIPUR     | Standard errors            |                         | 28                           | 0.183                | 0.22                     |                    | 0.17                     | 4.18                              |                | 5.45      |                | 1.33                              |                | 3.42      |                |
|            |                            |                         | 22                           | 0.075                | 0.26                     |                    | 0.33                     | 4.73                              |                | 5.22      |                | 1.52                              |                | 2.74      |                |
| TITABAR    | Mean                       | IPM<br>Farmers Practice | 195                          | 5.10                 | 5.22                     | 25.28              | -                        | -                                 |                | 15.60     |                | -                                 |                | 16.45     |                |
|            |                            |                         | 129                          | 4.32                 | 3.90                     |                    | -                        | -                                 | -              | 41.80     | 62.67          | -                                 | -              | 30.99     | 46.91          |
|            | Standard errors            |                         | 19                           | 0.486                | 0.41                     |                    | -                        | -                                 |                | 2.79      |                | -                                 |                | 15.73     |                |
|            |                            |                         | 7                            | 0.093                | 0.32                     |                    | -                        | -                                 |                | 8.23      |                | -                                 |                | 31.40     |                |
| VADAGOAN   | Mean                       | IPM<br>Farmers Practice | 241                          | 5.25                 | 5.79                     | 44.73              | 6.10                     | 4.83                              |                | 10.71     |                | 7.46                              |                | 8.07      |                |
|            |                            |                         | 172                          | 2.97                 | 3.20                     |                    | 4.01                     | 14.47                             | 66.62          | 21.46     | 50.09          | 17.93                             | 58.39          | 23.36     | 65.45          |
|            | Standard errors            |                         | 12                           | 0.336                | 0.27                     |                    | 0.25                     | 2.05                              |                | 0.88      |                | 1.65                              |                | 1.58      |                |
|            |                            |                         | 8                            | 0.139                | 0.28                     |                    | 0.34                     | 2.60                              |                | 4.40      |                | 2.69                              |                | 3.50      |                |

# **(RESOURCE CONSERVATION TECHNOLOGIES)**

in

## **RICE BASED CROPPING SYSTEMS**





#### 4.4. RESOURCE CONSERVATION TECHNOLOGIES in RBCS

Indian Agriculture faces the dual challenge of feeding more than a billion people in changing climatic and economic scenario. Agriculture is the main source of livelihood for almost 60% of the country's total population. The impact of climate change on agriculture was severely felt in India. It has been projected that under the scenario of a 2.5°C to 4.9°C temperature rise, rice yields will drop by 32-40% and wheat yields by 41 to 52%. As Indian agriculture is highly dependent on specific climatic conditions, the research on the impact of climate change on agriculture in general and rice production in specific is a high priority in India. There is an urgent need to focus on climate resilient input management practices for improving use efficiency and sustaining the rice and rice based cropping systems across the country. A total of four trials i.e., Conservation Agriculture, cultivars for late planting, exploration of rice fallow with millers (Sorghum) and pulses were conducted during Rabi 2018-19 and Kharif 2019

##### 4.4.1. Conservation Agriculture/system base management practices in rice and rice based cropping systems (crop diversification) to utilise the resources and enhancing the profitability and productivity

**Conservation agriculture** systems utilize soils for the production of crops with the aim of reducing excessive mixing of the soil and maintaining crop residues on the soil surface in order to minimize damage to the environment. **The three principles** of CA are: minimum tillage and soil disturbance, permanent soil cover with crop residues live mulches and crop rotation and intercropping.

Among the various cropping systems being practiced in India, Rice based cropping systems is considered to be the most important because of its large area coverage and contribution to total food grain production. Transplanting is the most dominant and traditional method of establishment in irrigated lowland rice. However, due to non-availability of irrigation water, shortage of labour during peak period of transplanting and escalating labour costs make the transplanting technique more expensive which invariably leads to delay in transplanting and resulting in reduction of yield. Crop residue especially Rice-Straw containing about 1-2% of 'K' a good source of nutrient especially for intensively cropped soils. Residue incorporation is known to help *Rabi* crops in rice-based cropping systems. To address this problem, alternate methods of crop establishment need to be evolved to substitute manual transplanting method under various agro-ecologies. Hence, this trial was initiated with a view to evaluate systems of rice crop establishment under different residue management during 2017 and continued in *kharif* 2019 to realize the production potential of alternate systems of crop establishment under different residue retention.

The trial was laid out in split plot design with four replications during *Kharif* 2017 at three locations continued at **Vadagaon, Ghaghraghat, Krajat, Rajendranagar** and **Titabar** during 2019 to assess the effect of different crop establishment methods under various residue/straw management practices. Main plot treatments comprised of three different crop establishment methods (M<sub>1</sub>: Transplanting, M<sub>2</sub>: Wet seeding (line sowing under puddled

conditions) and M3: Aerobic rice – Dry rice cultivation). The sub plot treatments comprised of three different residue/straw management (S<sub>1</sub>: No residue, S<sub>2</sub>: 15cm height of rice straw from ground, S<sub>3</sub>: 30cm height of rice straw from ground) to be superimposed for *Rabi* crops. The results are summarized and presented in Table 4.4.1 and the salient findings are summarized below.

Crop establishment methods influenced the grain yield significantly at all locations. At **Vadagaon**, results revealed that M<sub>3</sub>: Aerobic of rice recorded significantly higher yield attributes and grain yield (5.49 t/ha) as compared to other crop establishment methods. Similarly at **Rajendranagar**, the grain yields were higher (7.12 t/ha), **Titabar** (4.49 t/ha), **Ghaghrahat** (3.33 t/ha) and **Karjat** (3.94 t/ha) also during kharif 2019. However, at **Vadagaon**, aerobic rice method gave significantly higher grain yield (5.65 t/ha) over other methods of crop establishment during kharif 2018. Suitability of wet seeding and Aerobic rice at **Vadagaon** location under clay loam soil. Transplanting method showed its significant superiority in minimizing the weed population and weed dry biomass at 45 and 60 DAS over wet seeding at most of the locations. Among the residue management practices, rice straw incorporation during *Rabi* season gave better yields over no residue at **Vadagaon**, **Rajendranagar** and **Karjat** with reduced weed population and weed dry matter.

The system productivity analysis (kharif and rabi) clearly indicated superiority of transplanting at **Rajendranagar** (8.62 t/ha) and **Karjat** (8.68 t/ha) based on the REY while three systems were comparable at **Vadagaon**. Rice residue incorporation was found to be superior at all three locations with higher REY values (9.26 t/ha, 7.54 t/ha and 8.71 t/ha at **Vadagaon**, **Rajendranagar** and **Karjat** respectively).

Among crop establishment methods transplanting exhibit significant differences with respect to growth and yield attributes at **Titabar**, **Rajendranagar**, **Ghaghrahat** and **Karjat**. However, aerobic rice method found promising over transplanting and wet seeding in puddle rice at **Vadagaon**. The REY of the system productivity indicated superiority over the residue application at all three locations (**Vadagaon**, **Rajendranagar** and **Karjat**).

Table 4.4.1: Summary of data on grain yield and ancillary characters of conservation Agriculture/system based management practices in rice and rice based cropping systems to utilise the resources and enhancing the profitability and productivity, Kharif - 2019.

| Main plot                   | Sub plots | VADAGAON                         |                                  |      |               |                       | RAJENDRANAGAR                    |                                   |      |               |                          | KARJAT                           |                                  |      |               |                          | TITABAR                  |                       | GGT                      |
|-----------------------------|-----------|----------------------------------|----------------------------------|------|---------------|-----------------------|----------------------------------|-----------------------------------|------|---------------|--------------------------|----------------------------------|----------------------------------|------|---------------|--------------------------|--------------------------|-----------------------|--------------------------|
|                             |           | Kh-18                            | Rb18-19                          | REY  | K +R<br>(REY) | Kh-19                 | Kh-18                            | Rb 18-19                          | REY  | K +R<br>(REY) | Kh-19                    | Kh-18                            | Rb 18-19                         | REY  | K +R<br>(REY) | Kh-19                    | Kh-18                    | Kh-19                 | Kh-19                    |
|                             |           | Grain<br>Yield<br>(t/ha)<br>Rice | Grain<br>Yield<br>(t/ha)<br>Gram |      |               | Grain Yield<br>(t/ha) | Grain<br>Yield<br>(t/ha)<br>Rice | Grain<br>Yield<br>(t/ha)<br>Maize |      |               | Grain<br>Yield<br>(t/ha) | Grain<br>Yield<br>(t/ha)<br>Rice | Grain<br>Yield<br>(t/ha)<br>Gram |      |               | Grain<br>Yield<br>(t/ha) | Grain<br>Yield<br>(t/ha) | Grain Yield<br>(t/ha) | Grain<br>Yield<br>(t/ha) |
| M1-<br>Transplanting        | S1        | 4.89                             | 0.90                             | 2.92 | 7.81          | 4.96                  | 5.67                             | 4.02                              | 3.91 | 9.58          | 7.12                     | 4.89                             | 0.99                             | 3.21 | 8.10          | 3.94                     | 4.96                     | 4.96                  | 3.33                     |
|                             | S2        | 5.61                             | 1.03                             | 3.34 | 8.95          | 5.68                  |                                  | 2.48                              | 2.41 | 8.08          |                          |                                  | 1.14                             | 3.70 | 8.59          |                          | 4.59                     | 4.93                  |                          |
|                             | S3        | 5.72                             | 1.06                             | 3.44 | 9.16          | 5.83                  |                                  | 2.84                              | 2.76 | 8.43          |                          |                                  | 1.37                             | 4.44 | 9.33          |                          | 3.91                     | 4.64                  |                          |
| M2- Wet<br>seeding          | S1        | 4.7                              | 0.85                             | 2.76 | 7.46          | 4.69                  | 5.00                             | 4.41                              | 4.28 | 9.28          | 6.75                     | 4.51                             | 1.00                             | 3.24 | 7.75          | 3.83                     | 3.69                     | 3.01                  | 3.17                     |
|                             | S2        | 5.78                             | 0.99                             | 3.21 | 8.99          | 5.47                  |                                  | 3.84                              | 3.73 | 8.73          |                          |                                  | 1.13                             | 3.66 | 8.17          |                          | 3.5                      | 3.17                  |                          |
|                             | S3        | 5.89                             | 1.04                             | 3.37 | 9.26          | 5.73                  |                                  | 2.34                              | 2.27 | 7.27          |                          |                                  | 1.29                             | 4.18 | 8.69          |                          | 2.95                     | 3.12                  |                          |
| M3- Aerobic<br>rice         | S1        | 4.91                             | 0.82                             | 2.66 | 7.57          | 4.52                  | 3.73                             | 2.33                              | 2.26 | 5.99          | 3.44                     | 4.09                             | 0.93                             | 3.02 | 7.11          | 3.66                     | 2.19                     | 2.09                  | 2.92                     |
|                             | S2        | 5.97                             | 0.97                             | 3.15 | 9.12          | 5.31                  |                                  | 1.83                              | 1.78 | 5.51          |                          |                                  | 1.12                             | 3.63 | 7.72          |                          | 2.16                     | 2.21                  |                          |
|                             | S3        | 6.07                             | 1.01                             | 3.28 | 9.35          | 5.55                  |                                  | 1.69                              | 1.64 | 5.37          |                          |                                  | 1.23                             | 3.99 | 8.08          |                          | 2.01                     | 2.13                  |                          |
| Mean of main plots          |           |                                  |                                  |      |               |                       |                                  |                                   |      | 0.00          |                          |                                  |                                  |      |               |                          |                          |                       |                          |
|                             | M1        | 5.41                             | 1.00                             | 3.24 | 8.65          | 5.49                  | 5.67                             | 3.11                              | 3.02 | 8.69          | 7.12                     | 4.89                             | 1.17                             | 3.79 | 8.68          | 3.94                     | 4.49                     | 4.84                  | 3.33                     |
|                             | M2        | 5.45                             | 0.96                             | 3.11 | 8.56          | 5.30                  | 5.00                             | 3.53                              | 3.43 | 8.43          | 6.75                     | 4.51                             | 1.14                             | 3.70 | 8.21          | 3.83                     | 3.38                     | 3.10                  | 3.17                     |
|                             | M3        | 5.65                             | 0.93                             | 3.02 | 8.67          | 5.13                  | 3.73                             | 1.95                              | 1.89 | 5.62          | 3.44                     | 4.09                             | 1.09                             | 3.53 | 7.62          | 3.66                     | 2.12                     | 2.14                  | 2.92                     |
| C.D.(0.05)                  |           | 0.16                             | 0.00                             |      |               | 0.00                  | 0.57                             | 0.45                              |      |               | 0.84                     | 0.06                             | NS                               |      |               | 0.10                     | 0.14                     | 0.27                  | 0.54                     |
| C.V.(%)                     |           | 2.85                             | 0.10                             |      |               | 0.10                  | 8.16                             | 18.64                             |      |               | 10.06                    | 0.97                             | 4.65                             |      |               | 1.88                     | 4.96                     | 9.71                  | 11.85                    |
| Mean of Sub plots           |           |                                  |                                  |      |               |                       |                                  |                                   |      |               |                          |                                  |                                  |      |               |                          |                          |                       |                          |
|                             | S1        | 4.83                             | 0.86                             | 2.79 | 7.62          | 4.72                  | 3.79                             | 3.59                              | 3.49 | 7.28          |                          | 4.50                             | 0.97                             | 3.15 | 7.64          |                          | 3.61                     | 3.35                  |                          |
|                             | S2        | 5.78                             | 1.00                             | 3.24 | 9.02          | 5.49                  | 4.52                             | 2.72                              | 2.64 | 7.16          |                          |                                  | 1.13                             | 3.66 | 8.16          |                          | 3.42                     | 3.43                  |                          |
|                             | S3        | 5.89                             | 1.04                             | 3.37 | 9.26          | 5.70                  | 5.32                             | 2.29                              | 2.22 | 7.54          |                          |                                  | 1.30                             | 4.22 | 8.71          |                          | 2.95                     | 3.30                  |                          |
| C.D.(0.05)                  |           | 0.19                             | 0.03                             |      |               | 0.14                  |                                  | 0.92                              |      |               |                          |                                  | 0.12                             |      |               |                          | 0.23                     | NS                    |                          |
| C.V. (%)                    |           | 3.93                             | 2.57                             |      |               | 2.57                  |                                  | 31.27                             |      |               |                          |                                  | 10.36                            |      |               |                          | 6.74                     | 3.48                  |                          |
| Interaction                 |           |                                  |                                  |      |               |                       |                                  |                                   |      |               |                          |                                  |                                  |      |               |                          |                          |                       |                          |
| N at same V                 |           | NS                               | NS                               |      |               | NS                    |                                  | NS                                |      |               |                          |                                  | NS                               |      |               |                          | NS                       | NS                    |                          |
| V at same N                 |           | NS                               | NS                               |      |               | NS                    |                                  | NS                                |      |               |                          |                                  | NS                               |      |               |                          | NS                       | NS                    |                          |
| Expt. Mean                  |           | 5.50                             | 0.96                             | 3.11 | 8.61          | 5.31                  | 4.54                             | 2.86                              | 2.78 | 7.32          |                          | 4.50                             | 1.13                             | 3.66 | 8.16          |                          | 3.33                     | 3.36                  |                          |
| Variety                     |           |                                  | Gram                             |      |               | Phule samruddhi       |                                  | -                                 |      |               |                          |                                  | -                                |      |               |                          | Shraboni                 | Numoli                |                          |
| Soil type                   |           |                                  | Clay loam                        |      |               | -                     |                                  | -                                 |      |               |                          |                                  | -                                |      |               |                          | -                        | Clay loam             |                          |
| pH                          |           |                                  | 7.2                              |      |               | 7.8                   |                                  | -                                 |      |               |                          |                                  | -                                |      |               |                          | -                        | 5.2                   |                          |
| RDF N:P:K (kg/ha)           |           |                                  | 152:15:210                       |      |               | 100:50:50             |                                  | -                                 |      |               |                          |                                  | -                                |      |               |                          | -                        | 60:20:40              |                          |
| Aval. N:P:K of soil (kg/ha) |           |                                  | Rice-Gram                        |      |               | 172:16:219            |                                  | Rice-Maize                        |      |               |                          |                                  | Rice-Gram                        |      |               |                          | -                        | 440:21:335            |                          |

S1 - No residue

S2 - 15cm height of rice straw from ground

S3 - 30cm height of rice straw from ground

Table 4.4.1: Cntd...

| Main plot                   | Sub plots | VADGAON            |                  |                    |                 |                    |               |                                   |                              |                                   |                              |
|-----------------------------|-----------|--------------------|------------------|--------------------|-----------------|--------------------|---------------|-----------------------------------|------------------------------|-----------------------------------|------------------------------|
|                             |           | Grain Yield (t/ha) | Panicle/m2 (No.) | Panicle weight (g) | Test weight (g) | Days 50% flowering | Germination % | Weed population at 30 DAS (No/m2) | Weed Dry wt at 30 DAS (g/m2) | Weed population at 60 DAS (No/m2) | Weed Dry wt at 60 DAS (g/m2) |
| M1- Transplanting           | S1        | 4.96               | 238              | 2.91               | 21.57           | 97                 | 99.3          | 9.33(3.13)                        | 16.58                        | 11.19(3.40)                       | 19.98                        |
|                             | S2        | 5.68               | 273              | 3.34               | 22.17           | 98                 | 98.3          | 5.33(2.41)                        | 9.41                         | 6.33(2.61)                        | 11.22                        |
|                             | S3        | 5.83               | 280              | 3.43               | 22.76           | 99                 | 99.0          | 3.67(2.04)                        | 6.41                         | 4.33(2.20)                        | 7.62                         |
| M2- Wet seeding             | S1        | 4.69               | 220              | 2.53               | 20.63           | 97                 | 98.0          | 11.33(3.44)                       | 16.97                        | 13.57(3.74)                       | 20.12                        |
|                             | S2        | 5.47               | 257              | 2.96               | 21.87           | 98                 | 98.0          | 5.00(2.34)                        | 7.47                         | 6.01(2.54)                        | 8.88                         |
|                             | S3        | 5.73               | 269              | 3.10               | 22.92           | 99                 | 97.7          | 3.67(2.04)                        | 10.95                        | 4.39(2.20)                        | 12.63                        |
| M3- Aerobic rice            | S1        | 4.52               | 208              | 2.27               | 20.36           | 100                | 97.7          | 13.00(3.67)                       | 18.85                        | 15.52(4.00)                       | 22.48                        |
|                             | S2        | 5.31               | 244              | 2.67               | 21.26           | 100                | 98.0          | 5.33(2.41)                        | 7.73                         | 6.33(2.61)                        | 9.17                         |
|                             | S3        | 5.55               | 255              | 2.79               | 22.19           | 100                | 98.0          | 3.67(2.04)                        | 6.23                         | 4.37(2.20)                        | 7.38                         |
| Mean of main plots          |           |                    |                  |                    |                 |                    |               |                                   |                              |                                   |                              |
|                             | M1        | 5.49               | 264              | 3.23               | 22.16           | 98                 | 98.9          | 6.11(2.53)                        | 10.80                        | 7.28(2.74)                        | 12.94                        |
|                             | M2        | 5.30               | 249              | 2.86               | 21.81           | 98                 | 97.9          | 6.67(2.60)                        | 11.80                        | 7.99(2.83)                        | 13.88                        |
|                             | M3        | 5.13               | 236              | 2.58               | 21.27           | 100                | 97.9          | 7.33(2.71)                        | 10.94                        | 8.74(2.94)                        | 13.01                        |
| C.D.(0.05)                  |           | 0.00               | 0.33             | 0.01               | 0.23            | NS                 | NS            | NS                                | NS                           | NS                                | NS                           |
| C.V.(%)                     |           | 0.10               | 0.16             | 0.38               | 1.26            | 1.74               | 0.72          | 5.37                              | 36.39                        | 5.59                              | 35.84                        |
| Mean of Sub plots           |           |                    |                  |                    |                 |                    |               |                                   |                              |                                   |                              |
|                             | S1        | 4.72               | 222              | 2.57               | 20.85           | 98                 | 98.3          | 11.22(3.41)                       | 17.47                        | 13.43(3.71)                       | 20.86                        |
|                             | S2        | 5.49               | 258              | 2.99               | 21.76           | 99                 | 98.1          | 5.22(2.39)                        | 8.20                         | 6.23(2.59)                        | 9.76                         |
|                             | S3        | 5.70               | 268              | 3.11               | 22.62           | 99                 | 98.2          | 3.67(2.04)                        | 7.86                         | 4.36(2.20)                        | 9.21                         |
| C.D.(0.05)                  |           | 0.14               | 6.60             | 0.07               | 0.59            | NS                 | NS            | 0.17                              | 3.66                         | 0.21                              | 4.45                         |
| C.V. (%)                    |           | 2.57               | 2.58             | 2.52               | 2.65            | 1.74               | 0.93          | 6.40                              | 31.89                        | 7.14                              | 32.60                        |
| Interaction                 |           |                    |                  |                    |                 |                    |               |                                   |                              |                                   |                              |
| N at same V                 |           | NS                 | NS               | NS                 | NS              | NS                 | NS            | NS                                | NS                           | NS                                | NS                           |
| V at same N                 |           | NS                 | NS               | NS                 | NS              | NS                 | NS            | NS                                | NS                           | NS                                | NS                           |
| Expt. Mean                  |           | 5.31               | 249              | 2.89               | 21.74           | 99                 | 98.2          | 2.61                              | 11.18                        | 2.83                              | 13.28                        |
| Variety                     |           | Phulesamruddhi     |                  |                    |                 |                    |               |                                   |                              |                                   |                              |
| Soil type                   |           | -                  |                  |                    |                 |                    |               |                                   |                              |                                   |                              |
| pH                          |           | 7.8                |                  |                    |                 |                    |               |                                   |                              |                                   |                              |
| RDF N:P:K (kg/ha)           |           | 100;50;50          |                  |                    |                 |                    |               |                                   |                              |                                   |                              |
| Aval. N:P:K of soil (kg/ha) |           | 172:16:219         |                  |                    |                 |                    |               |                                   |                              |                                   |                              |

S1 - No residue

S2 - 15cm height of rice straw from ground

S3 - 30cm height of rice straw from ground

Table 4.4.1: Cntd...

| Main plot                   | Sub plots | TITABAR            |                  |                    |                    |                              | Over all mean | Rank |
|-----------------------------|-----------|--------------------|------------------|--------------------|--------------------|------------------------------|---------------|------|
|                             |           | Grain Yield (t/ha) | Panicle/m2 (No.) | Panicle weight (g) | Days 50% flowering | Weed Dry wt at 60 DAS (g/m2) |               |      |
| M1- Transplanting           | S1        | 4.96               | 225              | 5.41               | 105                | 40.50(6.40)                  | 4.96          | 3    |
|                             | S2        | 4.93               | 233              | 5.26               | 105                | 34.97(5.95)                  | 5.31          | 1    |
|                             | S3        | 4.64               | 220              | 5.21               | 107                | 30.03(5.52)                  | 5.24          | 2    |
| M2- Wet seeding             | S1        | 3.01               | 271              | 4.85               | 94                 | 67.63(8.22)                  | 3.85          | 6    |
|                             | S2        | 3.17               | 288              | 4.84               | 94                 | 60.80(7.83)                  | 4.32          | 5    |
|                             | S3        | 3.12               | 255              | 4.85               | 95                 | 55.80(7.50)                  | 4.43          | 4    |
| M3- Aerobic rice            | S1        | 2.09               | 252              | 3.87               | 105                | 119.57(10.95)                | 3.31          | 9    |
|                             | S2        | 2.21               | 233              | 3.29               | 106                | 113.73(10.68)                | 3.76          | 8    |
|                             | S3        | 2.13               | 212              | 3.29               | 107                | 114.83(10.72)                | 3.84          | 7    |
| Mean of main plots          |           |                    |                  |                    |                    |                              |               |      |
| M1                          |           | 4.84               | 226              | 5.29               | 106                | 35.17(5.96)                  | 5.17          | 1    |
| M2                          |           | 3.10               | 271              | 4.85               | 94                 | 61.41(7.85)                  | 4.20          | 2    |
| M3                          |           | 2.14               | 232              | 3.48               | 106                | 116.04(10.78)                | 3.64          | 3    |
| C.D.(0.05)                  |           | 0.27               | 13.47            | 0.45               | 0.95               | 0.37                         |               |      |
| C.V.(%)                     |           | 9.71               | 6.62             | 11.89              | 1.11               | 5.36                         |               |      |
| Mean of Sub plots           |           |                    |                  |                    |                    |                              |               |      |
| S1                          |           | 3.35               | 249              | 4.71               | 101                | 75.90(8.52)                  | 4.04          | 3    |
| S2                          |           | 3.43               | 251              | 4.46               | 101                | 69.83(8.15)                  | 4.46          | 2    |
| S3                          |           | 3.30               | 229              | 4.45               | 103                | 66.89(7.91)                  | 4.50          | 1    |
| C.D.(0.05)                  |           | NS                 | 19.09            | NS                 | 1.27               | 0.36                         |               |      |
| C.V. (%)                    |           | 3.48               | 7.64             | 7.30               | 1.21               | 4.28                         |               |      |
| Interaction                 |           |                    |                  |                    |                    |                              |               |      |
| N at same V                 |           | NS                 | NS               | NS                 | NS                 | NS                           |               |      |
| V at same N                 |           | NS                 | NS               | NS                 | NS                 | NS                           |               |      |
| Expt. Mean                  |           | 3.36               | 243              | 4.54               | 102                | 8.20                         | 4.34          |      |
| Variety                     |           | Numoli             |                  |                    |                    |                              |               |      |
| Soil type                   |           | Clay loam          |                  |                    |                    |                              |               |      |
| pH                          |           | 5.2                |                  |                    |                    |                              |               |      |
| RDF N:P:K (kg/ha)           |           | 60:20:40           |                  |                    |                    |                              |               |      |
| Aval. N:P:K of soil (kg/ha) |           | 440:21:335         |                  |                    |                    |                              |               |      |

S1 - No residue

S2 - 15cm height of rice straw from ground

S3 - 30cm height of rice straw from ground

Table 4.4.1: Cntd...

| Main Methods                       | GHAGHRAGHAT        |                  |                    | KARJAT             |                  |                    |                 |                    |               |                                   |                              |                                   |                              |
|------------------------------------|--------------------|------------------|--------------------|--------------------|------------------|--------------------|-----------------|--------------------|---------------|-----------------------------------|------------------------------|-----------------------------------|------------------------------|
|                                    | Grain Yield (t/ha) | Panicle/m2 (No.) | Panicle weight (g) | Grain Yield (t/ha) | Panicle/m2 (No.) | Panicle weight (g) | Test weight (g) | Days 50% flowering | Germination % | Weed population at 30 DAS (No/m2) | Weed Dry wt at 30 DAS (g/m2) | Weed population at 60 DAS (No/m2) | Weed Dry wt at 60 DAS (g/m2) |
| <b>M1- Transplanting</b>           | 3.33               | 116              | 2.9                | 3.94               | 226.37           | 2.63               | 23.4            | 87                 | 98.67         | 7.33(2.80)                        | 1.17                         | 5.53(2.46)                        | 1.00                         |
| <b>M2- Wet seeding</b>             | 3.17               | 108              | 2.72               | 3.83               | 220.10           | 2.56               | 23.4            | 87                 | 94.67         | 8.43(2.99)                        | 1.27                         | 6.43(2.63)                        | 1.10                         |
| <b>M3- Aerobic rice</b>            | 2.92               | 104              | 2.38               | 3.66               | 210.07           | 2.44               | 23.4            | 87                 | 94.33         | 9.50(3.16)                        | 1.33                         | 7.50(2.83)                        | 1.20                         |
| <b>Exp. mean</b>                   | 3.14               | 109              | 2.67               | 3.81               | 218.84           | 2.54               | 23.4            | 87                 | 95.89         | 2.98                              | 1.26                         | 2.64                              | 1.10                         |
| <b>CD(0.05)</b>                    | 0.54               | 13.06            | 0.11               | 0.10               | 5.58             | 0.07               | 0.05            | 0.84               | 0.48          | 0.17                              | 0.15                         | 0.10                              | 0.09                         |
| <b>CV</b>                          | 11.85              | 8.24             | 2.81               | 1.88               | 1.76             | 1.78               | 0.15            | 0.66               | 0.35          | 3.88                              | 8.25                         | 2.58                              | 5.47                         |
| <b>res(t)</b>                      | NS                 | NS               | **                 | *                  | *                | *                  | NS              | NS                 | **            | *                                 | NS                           | **                                | *                            |
| <b>Variety</b>                     | <b>NDR 359</b>     |                  |                    | -                  |                  |                    |                 |                    |               |                                   |                              |                                   |                              |
| <b>Soil type</b>                   | <b>Sandy loam</b>  |                  |                    | -                  |                  |                    |                 |                    |               |                                   |                              |                                   |                              |
| <b>pH</b>                          | <b>8.06</b>        |                  |                    | -                  |                  |                    |                 |                    |               |                                   |                              |                                   |                              |
| <b>RDF N:P:K (kg/ha)</b>           | <b>100:50:30</b>   |                  |                    | -                  |                  |                    |                 |                    |               |                                   |                              |                                   |                              |
| <b>Aval. N:P:K of soil (kg/ha)</b> | <b>-</b>           |                  |                    | -                  |                  |                    |                 |                    |               |                                   |                              |                                   |                              |

Table 4.4.1: Cntd...

| Main Methods                       | RAJENDRANAGAR-ARI     |                     |                       |                    |                  |                                            |                                    |                                            |                                    |
|------------------------------------|-----------------------|---------------------|-----------------------|--------------------|------------------|--------------------------------------------|------------------------------------|--------------------------------------------|------------------------------------|
|                                    | Grain Yield<br>(t/ha) | Panicle/m2<br>(No.) | Panicle<br>weight (g) | Test weight<br>(g) | Germination<br>% | Weed<br>population at<br>30 DAS<br>(No/m2) | Weed Dry wt<br>at 30 DAS<br>(g/m2) | Weed<br>population at<br>60 DAS<br>(No/m2) | Weed Dry wt<br>at 60 DAS<br>(g/m2) |
| <b>M1- Transplanting</b>           | 7.12                  | 425                 | 4.36                  | 12.43              | 97.33            | 18.00(4.30)                                | 5.53                               | 5.44(2.44)                                 | 2.85                               |
| <b>M2- Wet seeding</b>             | 6.75                  | 405                 | 4.21                  | 11.87              | 83.00            | 40.00(6.35)                                | 5.69                               | 9.44(3.15)                                 | 11.36                              |
| <b>M3- Aerobic rice</b>            | 3.44                  | 399                 | 3.86                  | 11.40              | 70.00            | 49.00(7.03)                                | 11.12                              | 10.33(3.26)                                | 16.00                              |
| <b>Exp. mean</b>                   | 5.77                  | 410                 | 4.14                  | 11.90              | 83.44            | 5.89                                       | 7.45                               | 2.95                                       | 10.07                              |
| <b>CD(0.05)</b>                    | 0.84                  | 49.19               | 0.62                  | 0.75               | 12.17            | 0.32                                       | 2.75                               | 0.35                                       | 4.37                               |
| <b>CV</b>                          | 10.06                 | 8.28                | 10.31                 | 4.34               | 10.06            | 3.69                                       | 25.47                              | 8.25                                       | 29.95                              |
| <b>res(t)</b>                      | **                    | NS                  | NS                    | NS                 | *                | **                                         | *                                  | *                                          | *                                  |
| <b>Variety</b>                     | -                     |                     |                       |                    |                  |                                            |                                    |                                            |                                    |
| <b>Soil type</b>                   | Clay loam             |                     |                       |                    |                  |                                            |                                    |                                            |                                    |
| <b>pH</b>                          | 7.9                   |                     |                       |                    |                  |                                            |                                    |                                            |                                    |
| <b>RDF N:P:K (kg/ha)</b>           | 120:60:40             |                     |                       |                    |                  |                                            |                                    |                                            |                                    |
| <b>Aval. N:P:K of soil (kg/ha)</b> | 213:88:750            |                     |                       |                    |                  |                                            |                                    |                                            |                                    |

Table 4.4.1: (Rabi) Summary of data on grain yield and ancillary characters of conservation Agriculture/system based management practices in rice and rice based cropping systems to utilise the resources and enhancing the profitability and productivity, Rabi 2018-19.

| Main plot                   | Sub plots | KARJAT             |                    |                                |               |                                                |                                           |                                                |                                           |                             |      |            |
|-----------------------------|-----------|--------------------|--------------------|--------------------------------|---------------|------------------------------------------------|-------------------------------------------|------------------------------------------------|-------------------------------------------|-----------------------------|------|------------|
|                             |           | Grain Yield (t/ha) | Straw yield (t/ha) | Kharif Grain Yield (t/ha) Rice | Germination % | Weed population at 30 DAS (No/m <sup>2</sup> ) | Weed Dry wt at 30 DAS (g/m <sup>2</sup> ) | Weed population at 60 DAS (No/m <sup>2</sup> ) | Weed Dry wt at 60 DAS (g/m <sup>2</sup> ) | Cost of cultivation (Rs/ha) | REY  | K +R (REY) |
| M1- Transplanting           | S1        | 0.99               | 3.85               | 4.89                           | 92.67         | 6.00(2.55)                                     | 1.17                                      | 7.13(2.76)                                     | 1.47                                      | 109937                      | 3.21 | 8.10       |
|                             | S2        | 1.14               | 4.56               | 4.89                           | 93.00         | 5.70(2.49)                                     | 1.07                                      | 7.03(2.74)                                     | 1.40                                      | 109937                      | 3.70 | 8.59       |
|                             | S3        | 1.37               | 5.63               | 4.89                           | 93.00         | 5.87(2.48)                                     | 1.03                                      | 6.97(2.73)                                     | 1.33                                      | 109937                      | 4.44 | 9.33       |
| M2- Wet seeding             | S1        | 1.00               | 3.90               | 4.51                           | 93.00         | 7.63(2.84)                                     | 1.47                                      | 8.17(2.94)                                     | 1.63                                      | 96797                       | 3.24 | 7.75       |
|                             | S2        | 1.13               | 4.52               | 4.51                           | 93.33         | 7.13(2.75)                                     | 1.33                                      | 7.77(2.87)                                     | 1.53                                      | 96797                       | 3.66 | 8.17       |
|                             | S3        | 1.29               | 5.31               | 4.51                           | 93.33         | 5.53(2.45)                                     | 0.97                                      | 7.07(2.75)                                     | 3.13                                      | 96797                       | 4.18 | 8.69       |
| M3- Aerobic rice            | S1        | 0.93               | 3.63               | 4.09                           | 93.00         | 8.80(3.05)                                     | 1.70                                      | 8.63(3.02)                                     | 1.70                                      | 96437                       | 3.02 | 7.11       |
|                             | S2        | 1.12               | 4.47               | 4.09                           | 89.67         | 6.00(2.55)                                     | 1.13                                      | 8.27(2.96)                                     | 1.63                                      | 96437                       | 3.63 | 7.72       |
|                             | S3        | 1.23               | 5.03               | 4.09                           | 93.00         | 6.00(2.53)                                     | 1.07                                      | 7.50(2.83)                                     | 1.40                                      | 96437                       | 3.99 | 8.08       |
| Mean of main plots          |           |                    |                    |                                |               |                                                |                                           |                                                |                                           |                             |      |            |
| M1                          |           | 1.17               | 4.68               | 4.89                           | 92.89         | 5.86(2.51)                                     | 1.09                                      | 7.04(2.75)                                     | 1.40                                      | 109937                      | 3.79 | 8.68       |
| M2                          |           | 1.14               | 4.57               | 4.51                           | 93.22         | 6.77(2.68)                                     | 1.26                                      | 7.67(2.86)                                     | 2.10                                      | 96797                       | 3.70 | 8.21       |
| M3                          |           | 1.09               | 4.38               | 4.09                           | 91.89         | 6.93(2.71)                                     | 1.30                                      | 8.13(2.94)                                     | 1.58                                      | 96437                       | 3.53 | 7.62       |
| C.D.(0.05)                  |           | NS                 | NS                 |                                | NS            | NS                                             | NS                                        | 0.04                                           | 0.19                                      | 0                           |      |            |
| C.V.(%)                     |           | 4.65               | 4.67               |                                | 1.90          | 12.57                                          | 29.60                                     | 1.68                                           | 13.55                                     | 0                           |      |            |
| Mean of Sub plots           |           |                    |                    |                                |               |                                                |                                           |                                                |                                           |                             |      |            |
| S1                          |           | 0.97               | 3.79               | 4.50                           | 92.89         | 7.48(2.81)                                     | 1.44                                      | 7.98(2.91)                                     | 1.60                                      | 101057                      | 3.15 | 7.64       |
| S2                          |           | 1.13               | 4.52               | 4.50                           | 92.00         | 6.28(2.59)                                     | 1.18                                      | 7.69(2.86)                                     | 1.52                                      | 101057                      | 3.66 | 8.16       |
| S3                          |           | 1.30               | 5.32               | 4.50                           | 93.11         | 5.80(2.49)                                     | 1.02                                      | 7.18(2.77)                                     | 1.96                                      | 101057                      | 4.22 | 8.71       |
| C.D.(0.05)                  |           | 0.12               | 0.48               |                                | NS            | NS                                             | 0.32                                      | 0.11                                           | 0.27                                      | 0                           |      |            |
| C.V. (%)                    |           | 10.36              | 10.37              |                                | 2.07          | 10.75                                          | 25.32                                     | 3.60                                           | 15.55                                     | 0                           |      |            |
| Interaction                 |           |                    |                    |                                |               |                                                |                                           |                                                |                                           |                             |      |            |
| N at same V                 |           | NS                 | NS                 |                                | NS            | NS                                             | NS                                        | NS                                             | 0.47                                      | 0                           |      |            |
| V at same N                 |           | NS                 | NS                 |                                | NS            | NS                                             | NS                                        | NS                                             | 0.40                                      | 0                           |      |            |
| Expt. Mean                  |           | 1.13               | 4.54               | 4.50                           | 92.67         | 2.63                                           | 1.21                                      | 2.85                                           | 1.69                                      | 0                           | 3.66 | 8.16       |
| Variety                     | -         |                    |                    |                                |               |                                                |                                           |                                                |                                           |                             |      |            |
| Soil type                   | -         |                    |                    |                                |               |                                                |                                           |                                                |                                           |                             |      |            |
| RDF N:P:K (kg/ha)           | -         |                    |                    |                                |               |                                                |                                           |                                                |                                           |                             |      |            |
| Aval. N:P:K of soil (kg/ha) | -         |                    |                    |                                |               |                                                |                                           |                                                |                                           |                             |      |            |
| System                      | Rice-Gram |                    |                    |                                |               |                                                |                                           |                                                |                                           |                             |      |            |

S1 - No residue

\*Gram MSP = Rs 56750/t

\*Rice MSP for Kharif 2018 = Rs. 17500/t

S2 - 15cm height of rice straw from ground

S3 - 30cm height of rice straw from ground

Table 4.4.1(R): Cntd....

| Main plot                 | Sub plots | RAJENDRANAGAR-ARI  |                    |                           |               |                                                |                                           |                                                |                                           |      |            | VADAGAON           |                           |               |      |            | Over all mean | Rank |
|---------------------------|-----------|--------------------|--------------------|---------------------------|---------------|------------------------------------------------|-------------------------------------------|------------------------------------------------|-------------------------------------------|------|------------|--------------------|---------------------------|---------------|------|------------|---------------|------|
|                           |           | Grain Yield (t/ha) | Straw yield (t/ha) | Kharif Grain Yield (t/ha) | Germination % | Weed population at 30 DAS (No/m <sup>2</sup> ) | Weed Dry wt at 30 DAS (g/m <sup>2</sup> ) | Weed population at 60 DAS (No/m <sup>2</sup> ) | Weed Dry wt at 60 DAS (g/m <sup>2</sup> ) | REY  | K +R (REY) | Grain Yield (t/ha) | Kharif Grain Yield (t/ha) | Germination % | REY  | K +R (REY) |               |      |
| M1- Transplanting         | S1        | 4.02               | 6.90               | 5.67                      | 92.00         | 49.33(6.92)                                    | 49.04                                     | 80.67(8.96)                                    | 53.11                                     | 3.91 | 9.58       | 0.90               | 4.89                      | 97.00         | 2.92 | 7.81       | 1.97          | 1    |
|                           | S2        | 2.48               | 7.29               | 5.67                      | 89.33         | 50.00(6.68)                                    | 73.48                                     | 95.67(9.65)                                    | 94.56                                     | 2.41 | 8.08       | 1.03               | 5.61                      | 98.00         | 3.34 | 8.95       | 1.09          | 5    |
|                           | S3        | 2.84               | 7.29               | 5.67                      | 87.33         | 41.67(6.27)                                    | 39.57                                     | 29.67(4.71)                                    | 25.82                                     | 2.76 | 8.43       | 1.06               | 5.72                      | 97.33         | 3.44 | 9.16       | 1.22          | 2    |
| M2- Wet seeding           | S1        | 4.41               | 9.00               | 5.00                      | 85.33         | 41.33(6.43)                                    | 26.78                                     | 73.33(8.00)                                    | 28.06                                     | 4.28 | 9.28       | 0.85               | 4.7                       | 96.33         | 2.76 | 7.46       | 0.93          | 8    |
|                           | S2        | 3.84               | 10.71              | 5.00                      | 89.00         | 58.67(7.67)                                    | 64.46                                     | 68.33(7.75)                                    | 66.58                                     | 3.73 | 8.73       | 0.99               | 5.78                      | 97.33         | 3.21 | 8.99       | 1.06          | 6    |
|                           | S3        | 2.34               | 12.14              | 5.00                      | 89.33         | 34.67(5.93)                                    | 47.14                                     | 55.67(6.31)                                    | 38.98                                     | 2.27 | 7.27       | 1.04               | 5.89                      | 98.00         | 3.37 | 9.26       | 1.17          | 3    |
| M3- Aerobic rice          | S1        | 2.33               | 13.81              | 3.73                      | 85.67         | 32.67(5.73)                                    | 385.76                                    | 59.33(7.00)                                    | 33.17                                     | 2.26 | 5.99       | 0.82               | 4.91                      | 96.33         | 2.66 | 7.57       | 0.88          | 9    |
|                           | S2        | 1.83               | 11.62              | 3.73                      | 88.67         | 46.67(6.77)                                    | 31.92                                     | 24.67(4.26)                                    | 17.85                                     | 1.78 | 5.51       | 0.97               | 5.97                      | 97.33         | 3.15 | 9.12       | 1.05          | 7    |
|                           | S3        | 1.69               | 13.14              | 3.73                      | 85.33         | 42.33(6.49)                                    | 32.96                                     | 66.67(6.33)                                    | 29.29                                     | 1.64 | 5.37       | 1.01               | 6.07                      | 97.00         | 3.28 | 9.35       | 1.12          | 4    |
| Mean of main plots        |           |                    |                    |                           |               |                                                |                                           |                                                |                                           |      | 0.00       |                    |                           |               |      |            |               |      |
| M1                        |           | 3.11               | 7.16               | 5.67                      | 89.56         | 47.00(6.62)                                    | 54.03                                     | 68.67(7.77)                                    | 57.83                                     | 3.02 | 8.69       | 1.00               | 5.41                      | 97.44         | 3.24 | 8.65       | 1.09          | 1    |
| M2                        |           | 3.53               | 10.62              | 5.00                      | 87.89         | 44.89(6.67)                                    | 46.13                                     | 65.78(7.35)                                    | 44.54                                     | 3.43 | 8.43       | 0.96               | 5.45                      | 97.22         | 3.11 | 8.56       | 1.05          | 2    |
| M3                        |           | 1.95               | 12.86              | 3.73                      | 86.56         | 40.56(6.33)                                    | 150.21                                    | 50.22(5.87)                                    | 26.77                                     | 1.89 | 5.62       | 0.93               | 5.65                      | 96.89         | 3.02 | 8.67       | 1.01          | 3    |
| C.D.(0.05)                |           | 0.45               | 1.46               |                           | NS            | NS                                             | NS                                        | NS                                             | NS                                        |      |            | 0.00               | 0.16                      | NS            |      |            |               |      |
| C.V.(%)                   |           | 18.64              | 17.03              |                           | 6.18          | 34.98                                          | 239.09                                    | 33.63                                          | 79.87                                     |      |            | 0.10               | 2.85                      | 0.63          |      |            |               |      |
| Mean of Sub plots         |           |                    |                    |                           |               |                                                |                                           |                                                |                                           |      |            |                    |                           |               |      |            |               |      |
| S1                        |           | 3.59               | 9.90               | 3.79                      | 87.67         | 41.11(6.36)                                    | 153.86                                    | 71.11(7.99)                                    | 38.11                                     | 3.49 | 7.28       | 0.86               | 4.83                      | 96.56         | 2.79 | 7.62       | 0.92          | 3    |
| S2                        |           | 2.72               | 9.87               | 4.52                      | 89.00         | 51.78(7.04)                                    | 56.62                                     | 62.89(7.22)                                    | 59.66                                     | 2.64 | 7.16       | 1.00               | 5.78                      | 97.56         | 3.24 | 9.02       | 1.07          | 2    |
| S3                        |           | 2.29               | 10.86              | 5.32                      | 87.33         | 39.56(6.23)                                    | 39.89                                     | 50.67(5.78)                                    | 31.36                                     | 2.22 | 7.54       | 1.04               | 5.89                      | 97.44         | 3.37 | 9.26       | 1.17          | 1    |
| C.D.(0.05)                |           | 0.92               | NS                 |                           | NS            | NS                                             | NS                                        | NS                                             | NS                                        |      |            | 0.03               | 0.19                      | NS            |      |            |               |      |
| C.V. (%)                  |           | 31.27              | 22.24              |                           | 3.41          | 17.62                                          | 240.14                                    | 61.45                                          | 82.62                                     |      |            | 2.57               | 3.93                      | 1.41          |      |            |               |      |
| Interaction               |           |                    |                    |                           |               |                                                |                                           |                                                |                                           |      |            |                    |                           |               |      |            |               |      |
| N at same V               |           | NS                 | NS                 |                           | NS            | NS                                             | NS                                        | NS                                             | NS                                        |      |            | NS                 | NS                        | NS            |      |            |               |      |
| V at same N               |           | NS                 | NS                 |                           | NS            | NS                                             | NS                                        | NS                                             | NS                                        |      |            | NS                 | NS                        | NS            |      |            |               |      |
| Expt. Mean                |           | 2.86               | 10.21              | 4.54                      | 88.00         | 6.54                                           | 83.46                                     | 7.00                                           | 43.05                                     | 2.78 | 7.32       | 0.96               | 5.50                      | 97.19         | 3.11 | 8.61       | 1.05          |      |
| Variety                   |           | -                  |                    |                           |               |                                                |                                           |                                                |                                           |      |            | -                  |                           |               |      |            |               |      |
| Soil type                 |           | -                  |                    |                           |               |                                                |                                           |                                                |                                           |      |            | -                  |                           |               |      |            |               |      |
| pH                        |           | -                  |                    |                           |               |                                                |                                           |                                                |                                           |      |            | -                  |                           |               |      |            |               |      |
| RDF N:P:K (kg/ha)         |           | -                  |                    |                           |               |                                                |                                           |                                                |                                           |      |            | -                  |                           |               |      |            |               |      |
| AvalN:P:K of soil (kg/ha) |           | -                  |                    |                           |               |                                                |                                           |                                                |                                           |      |            | -                  |                           |               |      |            |               |      |
| System                    |           | Rice-              |                    |                           |               |                                                |                                           |                                                |                                           |      |            | 152:15:210         |                           |               |      |            |               |      |
|                           |           | Maize              |                    |                           |               |                                                |                                           |                                                |                                           |      |            | Rice-Gram          |                           |               |      |            |               |      |

S1 - No residue \*Maize MSP = Rs 17000/t

S2 - 15cm height of rice straw from ground

S3 - 30cm height of rice straw from ground

\*Gram MSP = Rs 56750/t

## Cropping Systems Influence on Pest Incidence (CSIP)

Rice based cropping system is the major crop production system being practiced by Indian farmers involving rotation with crops like other cereals, pulses, cotton and vegetables. Generally, normal transplanting method is followed in raising the rice crop. However, due to the constraints in water and labour availability, farmers have been forced to look into the alternative methods like direct seeding in wet and dry conditions, aerobic rice etc. Similarly, incorporation of crop residues is known to help *Rabi* crops in rice based cropping systems. As rice straw contains about 1-2% of Potassium, incorporation of rice straw acts as a good source of nutrients for crops grown after rice. Keeping these in view, a trial on cropping systems influence on pest incidence (CSIP) was initiated in collaboration with Agronomy section to evaluate the influence of different rice crop establishment methods under different residue management strategies with the main aim of realising the potential of the sequence crop to improve the overall productivity of the rice based cropping system.

*During Kharif 2019, the trial was conducted at, Karjat and Jagdalpur. At both these locations, incidence of stem borer, leaf folder, whorl maggot and GLH was too low to draw valid conclusions.*

The field trial was laid out in split plot design with three replications. Main plot treatments comprised of three different crop establishment methods (M1: Transplanting, M2: Wet seeding (line sowing under puddled conditions) and M3: Aerobic rice – Dry rice cultivation). The sub plot treatments comprised of three different Residue/straw management techniques (S1: No residue, S2: Incorporation of 15 cm height of rice straw from ground, S3: Incorporation of 30 cm height of rice straw from ground) to be superimposed for *Rabi* crops. During *Kharif* 2019, the trial was conducted at two locations, viz, Karjat, and Jagdalpur. Standard procedures were followed to record observations on insect pest incidence in all treatments. The results are summarized below.

At **Karjat**, only stem borer was observed and incidence was low in all the three methods of crop establishment and residue management strategies. However, the incidence crossed ETL in M3 - aerobic rice (10.2% DH) and S1- No residue sub-plot (10.9% DH), at 60 DAT. The white ear incidence ranged from 8.1 to 10.8 across main plot and sub plot treatments. There were no significant differences among the treatments in pest incidence at both vegetative and reproductive stages.

At **Jagdalpur**, incidence of stem borer, leaf folder, whorl maggot and GLH was observed. Stem borer incidence at vegetative stage did not exceed 7.0% DH across the treatments, while leaf folder damage was also low ranging between 4.5 and 7.3% DL. Whorl maggot incidence was observed up to a maximum of 11.1% and GLH populations were recorded up to 12.7 hoppers/5 hills. Due to low pest incidence all the treatments were on par and no trends were discernible.

Table.... Influence of cropping systems on pest incidence at Karjat, Kharif 2019

| Treatments                   |               | % DH         |              |              |              | % WE        |
|------------------------------|---------------|--------------|--------------|--------------|--------------|-------------|
|                              |               | 15 DAT       | 30 DAT       | 45 DAT       | 60 DAT       | 90 DAT      |
| M1= Transplanting            | S1            | 8.0(2.8)a    | 8.3(2.8)a    | 10.3(3.2)a   | 14.2(3.8)a   | 14.1(3.7)a  |
|                              | S2            | 6.2(2.5)a    | 6.4(2.5)a    | 7.7(2.7)a    | 7.8(2.8)a    | 8.0(2.8)b   |
|                              | S3            | 4.5(2.1)a    | 5.3(2.2)a    | 6.8(2.6)a    | 7.3(2.7)a    | 7.0(2.7)b   |
| M2 = Wet seeding             | S1            | 5.9(2.4)a    | 6.1(2.4)a    | 6.8(2.6)a    | 8.6(2.9)a    | 8.7(2.9)ab  |
|                              | S2            | 5.6(2.3)a    | 5.9(2.3)a    | 6.5(2.5)a    | 8.7(2.9)a    | 8.6(2.9)ab  |
|                              | S3            | 2.4(1.5)a    | 4.5(2.1)a    | 5.2(2.3)a    | 7.6(2.8)a    | 7.3(2.7)b   |
| M3 = Aerobic rice            | S1            | 5.4(2.3)a    | 4.4(2.1)a    | 5.8(2.4)a    | 9.9(3.1)a    | 9.6(3.1)ab  |
|                              | S2            | 5.8(2.4)a    | 5.6(2.3)a    | 6.1(2.5)a    | 10.1(3.2)a   | 10.5(3.2)ab |
|                              | S3            | 5.4(2.3)a    | 4.2(2.0)a    | 6.7(2.6)a    | 10.5(3.2)a   | 10.1(3.2)ab |
| <b>LSD (0.05)</b>            | <b>M in S</b> | <b>1.23</b>  | <b>1.58</b>  | <b>1.00</b>  | <b>1.00</b>  | <b>0.87</b> |
|                              | <b>S in M</b> | <b>1.27</b>  | <b>1.84</b>  | <b>1.42</b>  | <b>1.13</b>  | <b>0.97</b> |
| <b>Main plots</b>            |               |              |              |              |              |             |
| M1= Transplanting            |               | 6.2(2.5)a    | 6.6(2.5)a    | 8.3(2.8)a    | 9.8(3.1)a    | 9.7(3.1)a   |
| M2 = Wet seeding             |               | 4.6(2.1)a    | 5.5(2.3)a    | 6.2(2.5)a    | 8.3(2.9)a    | 8.2(2.8)a   |
| M3 = Aerobic rice            |               | 5.5(2.3)a    | 4.7(2.1)a    | 6.2(2.5)a    | 10.2(3.2)a   | 10.1(3.2)a  |
| <b>LSD (0.05)</b>            |               | <b>0.54</b>  | <b>0.90</b>  | <b>0.79</b>  | <b>0.54</b>  | <b>0.46</b> |
| <b>CV (%)</b>                |               | <b>13.97</b> | <b>23.14</b> | <b>18.15</b> | <b>10.56</b> | <b>8.96</b> |
| <b>Sub plots</b>             |               |              |              |              |              |             |
| S1 = No residue              |               | 6.4(2.5)a    | 6.2(2.4)a    | 7.6(2.7)a    | 10.9(3.3)a   | 10.8(3.2)a  |
| S2 = 15 cm ht. of rice straw |               | 5.9(2.4)a    | 5.9(2.4)a    | 6.8(2.6)a    | 8.9(2.9)a    | 9.0(3.0)a   |
| S3 = 30 cm ht of rice straw  |               | 4.1(2.0)a    | 4.6(2.1)a    | 6.2(2.5)a    | 8.5(2.9)a    | 8.1(2.8)a   |
| <b>LSD (0.05)</b>            |               | <b>0.51</b>  | <b>0.66</b>  | <b>0.42</b>  | <b>0.41</b>  | <b>0.36</b> |
| <b>CV (%)</b>                |               | <b>17.67</b> | <b>22.53</b> | <b>12.72</b> | <b>10.81</b> | <b>9.44</b> |

Table.... Influence of cropping systems on pest incidence at Jagdalpur, Kharif 2019

| Treatments                        |        | % DH      | % LFDL    |            | % WMDL     |           | GLH<br>(N0./10 hills) |
|-----------------------------------|--------|-----------|-----------|------------|------------|-----------|-----------------------|
|                                   |        | 70 DAT    | 50 DAT    | 70 DAT     | 50 DAT     | 70 DAT    | 70 DAT                |
| M1= Transplanting                 | S1     | 4.5(2.2)a | 7.1(2.7)a | 5.9(2.5)a  | 6.7(2.7)b  | 4.5(2.2)a | 7.0(2.3)ab            |
|                                   | S2     | 4.5(2.1)a | 7.0(2.7)a | 2.6(1.7)b  | 6.6(2.6)b  | 4.6(2.2)a | 10.3(3.0)a            |
|                                   | S3     | 1.5(1.1)a | 7.2(2.8)a | 5.1(2.4)a  | 7.3(2.7)b  | 6.0(2.5)a | 12.7(3.7)a            |
| M2 = Puddled direct seeding       | S1     | 3.6(1.8)a | 5.6(2.4)a | 4.6(2.2)ab | 9.8(3.2)a  | 6.5(2.5)a | 7.7(2.7)ab            |
|                                   | S2     | 7.6(2.5)a | 5.3(2.4)a | 7.2(2.8)a  | 8.3(3.0)a  | 8.6(3.0)a | 7.3(2.7)ab            |
|                                   | S3     | 2.0(1.3)a | 9.0(3.1)a | 6.3(2.6)a  | 10.4(3.3)a | 5.8(2.5)a | 5.7(2.3)ab            |
| M3 = Unpuddled dry direct seeding | S1     | 5.1(1.8)a | 4.1(2.1)a | 5.0(2.3)ab | 11.2(3.4)a | 5.1(2.4)a | 1.7(1.3)b             |
|                                   | S2     | 8.9(2.9)a | 7.5(2.8)a | 5.6(2.5)a  | 9.9(3.2)a  | 8.5(2.9)a | 9.3(3.0)ab            |
|                                   | S3     | 2.7(1.8)a | 5.6(2.4)a | 5.6(2.5)a  | 12.2(3.6)a | 8.4(2.9)a | 7.3(2.7)ab            |
| LSD (0.05)                        | M in S | 1.95      | 1.01      | 0.64       | 0.34       | 1.25      | 1.76                  |
|                                   | S in M | 1.93      | 1.02      | 0.65       | 0.59       | 1.13      | 1.64                  |
| Main plots                        |        |           |           |            |            |           |                       |
| M1= Transplanting                 |        | 3.5(1.9)a | 7.1(2.7)a | 4.5(2.2)a  | 6.9(2.7)b  | 5.1(2.3)a | 10.0(3.0)a            |
| M2 = Puddled direct seeding       |        | 4.4(1.9)a | 6.6(2.6)a | 6.0(2.5)a  | 9.5(3.2)ab | 6.9(2.6)a | 6.9(2.6)a             |
| M3 = Unpuddled dry direct seeding |        | 5.6(2.2)a | 5.8(2.4)a | 5.4(2.4)a  | 11.1(3.4)a | 7.3(2.7)a | 6.1(2.3)a             |
| LSD (0.05)                        |        | 1.12      | 0.61      | 0.38       | 0.52       | 0.50      | 0.80                  |
| CV (%)                            |        | 23.25     | 18.00     | 12.25      | 12.93      | 14.73     | 23.14                 |
| Sub plots                         |        |           |           |            |            |           |                       |
| S1 = No residue                   |        | 4.4(1.9)a | 5.6(2.4)a | 5.2(2.3)a  | 9.3(3.1)ab | 5.4(2.4)a | 5.4(2.1)a             |
| S2 = 15 cm ht. of rice straw      |        | 7.0(2.5)a | 6.6(2.6)a | 5.2(2.3)a  | 8.3(2.9)b  | 7.2(2.7)a | 9.0(2.9)a             |
| S3 = 30 cm ht of rice straw       |        | 2.1(1.4)a | 7.3(2.8)a | 5.7(2.5)a  | 10.0(3.2)a | 6.7(2.6)a | 8.6(2.9)a             |
| LSD (0.05)                        |        | 1.12      | 0.58      | 0.37       | 0.19       | 0.72      | 1.02                  |
| CV (%)                            |        | 25.40     | 21.87     | 15.25      | 6.13       | 27.32     | 37.67                 |

#### 4.4.2 (Rabi CA/SM 2) Enhancing productivity of rice-pulse system under different crop establishment methods

Among the various cropping systems being practiced in India, Rice based cropping systems is considered to be the most important because of its large area coverage and contribution to total food grain production.

On an average, 30% of area under rice production during *kharif* season in India remains fallow in the subsequent *rabi* due to number of biotic, abiotic and socio-economic constraints. A large area (11.6 m ha) of rice fallow under rain-fed condition can be brought under pulse provided availability of land water resources.

Pulses are the ideal crops that can be grown in the areas vacated after rice, because of their property to establish with the surface seeding and suitability for relay/para cropping and resistance against soil moisture and temperature stress. The suitable pulse crops are lentil, lathyrus, urd bean, mung bean and chick pea.

Transplanting is the most dominant and traditional method of establishment in irrigated lowland rice. However, due to non-availability of irrigation water, shortage of labour during peak period of transplanting and escalating labour costs make the transplanting technique more expensive which invariably leads to delay in transplanting and resulting in reduction of yield. To mitigate this problem, alternate methods need to be evolved to substitute manual transplanting method under various agro-ecologies. Hence, this trial was initiated with a view to evaluate systems of rice crop establishment under different cropping systems (especially rice-pulse) to realize the production potential of alternate systems (inclusion of pulses) of crop establishment under different sequences.

This trial was initiated with a view to evaluate system productivity of rice crop establishment under rice-pulse systems to realize the production potential of alternate systems of crop establishment at one location viz. **Mandya**. The results revealed that higher average higher system productivity (11.06 t/ha) was recorded under rice-cowpea system at **Mandya**. Wet seeding was comparable at this location. Rice-pulse system increases grain yield significantly over rice-rice system at both the method of cultivation.

Among the cropping sequences, rice-cowpea exhibited significant differences with respect to grain yield (REY) at **Mandya** (10.65 t/ha) during 2018-19. *Post-kharif* pulse increased grain yield significantly over rice-rice system. Among method of establishment, wet seeding method found promising at and comparable with transplanting at Mandya and rice-cowpea systems (10.65 t/ha) increased grain yield significantly over rice-rice system alone (7.65 t/ha).

Table-4.4.2: (Rabi) Summary of data on grain yield characters of rice from enhancing productivity of rice-pulse system under different establishment methods in during Rabi 2018-19

| Treatment                                             | Cropping Sequence    | MANDYA                         |                                 |                   |                        |      |                  |
|-------------------------------------------------------|----------------------|--------------------------------|---------------------------------|-------------------|------------------------|------|------------------|
|                                                       |                      | Grain yield (t/ha) Kharif 2018 | Grain yield (t/ha) Rabi 2018-19 | Germination % (R) | Plant population No.m2 | REY  | Total REY (K+ R) |
| M1- Transplanting                                     | S1 - Rice-Cowpea     | 5.60                           | 1.08                            | 93                | 20.7                   | 4.64 | 10.24            |
|                                                       | S2 - Rice-Greengram  | 6.15                           | 0.89                            | 97                | 31.7                   | 3.55 | 9.70             |
|                                                       | S3 - Rice-Black gram | 6.33                           | 0.83                            | 100               | 32.0                   | 2.66 | 8.99             |
|                                                       | S4 - Rice-Soybean    | 6.40                           | 0.84                            | 90                | 32.0                   | 1.63 | 8.03             |
|                                                       | S5 - Rice-Avare      | 5.52                           | 0.73                            | 94                | 14.3                   | 1.93 | 7.45             |
| M2- Wet Seeding (line sowing under puddled condition) | S1 - Rice-Cowpea     | 6.38                           | 1.09                            | 90                | 20.0                   | 4.68 | 11.06            |
|                                                       | S2 - Rice-Greengram  | 5.99                           | 0.88                            | 93                | 31.3                   | 3.51 | 9.50             |
|                                                       | S3 - Rice-Black gram | 5.56                           | 0.87                            | 90                | 29.7                   | 2.78 | 8.34             |
|                                                       | S4 - Rice-Soybean    | 6.04                           | 0.97                            | 90                | 29.0                   | 1.88 | 7.92             |
|                                                       | S5 - Rice-Avare      | 5.80                           | 0.78                            | 100               | 14.7                   | 2.06 | 7.86             |
| Interaction                                           |                      |                                |                                 |                   |                        |      |                  |
| M and S                                               |                      | NS                             | NS                              | NS                | NS                     | -    |                  |
| S and M                                               |                      | NS                             | NS                              | NS                | NS                     | -    |                  |
| Mean of Factor-1                                      |                      |                                |                                 |                   |                        |      |                  |
| M1                                                    |                      | 6.00                           | 0.87                            | 95                | 26.1                   | 2.88 | 8.88             |
| M2                                                    |                      | 5.95                           | 0.92                            | 93                | 24.9                   | 2.98 | 8.94             |
| C.D. (0.05)                                           |                      | NS                             | NS                              | NS                | NS                     | -    |                  |
| C.V. (%)                                              |                      | 36.72                          | 29.51                           | 14.05             | 6.55                   | -    |                  |
| Mean of Factor-2                                      |                      |                                |                                 |                   |                        |      |                  |
| S1                                                    |                      | 5.99                           | 1.09                            | 92                | 20.3                   | 4.66 | 10.65            |
| S2                                                    |                      | 6.07                           | 0.89                            | 95                | 31.5                   | 3.53 | 9.60             |
| S3                                                    |                      | 5.94                           | 0.85                            | 95                | 30.8                   | 2.72 | 8.67             |
| S4                                                    |                      | 6.22                           | 0.90                            | 90                | 30.5                   | 1.76 | 7.98             |
| S5                                                    |                      | 5.66                           | 0.76                            | 97                | 14.5                   | 1.99 | 7.65             |
| CD (0.05)                                             |                      | NS                             | NS                              | NS                | 2.57                   | -    | -                |
| C.V. (%)                                              |                      | 7.38                           | 26.78                           | 6.47              | 8.22                   | -    | -                |
| Experimental Mean                                     |                      | 5.98                           | 0.90                            | 94                | 25.5                   | 2.93 | 8.91             |
| Soil type                                             |                      | Red sandy loam                 |                                 |                   |                        |      |                  |
| Applied fertiliser dose (N-P-K-Zn kg/ha)              |                      | 100:50:50:20                   | 25:50:25                        |                   |                        |      |                  |
| pH                                                    |                      | 6.95                           |                                 |                   |                        |      |                  |
| Available soil nutrient status                        |                      | 107:30:216                     |                                 |                   |                        |      |                  |
| Variety                                               |                      | MTU 1001                       |                                 |                   |                        |      |                  |

S1  
 S2  
 S3  
 S4  
 S5

Rice: IR-64  
 (MSP = Rs.  
 1750/Q)

Cowpea:PGCP 6 (MSP Rs.7511/Q)  
 Green gram: KKM-3 (MSP Rs.6975/Q)  
 Black gram: KU-14-8 (MSP Rs.5600/Q)  
 Soybean: J-5-335 (MSP Rs.3399/Q)  
 Avare: HA-4 (MSP Rs.4620)

#### 4.4.3. Evaluation of promising cultivars for late planting and management for higher productivity and mitigate the effect climate change

Late planting of rice is becoming very common due to number of reasons such as weather, late on set of monsoon, machinery breakdown, water availability. There is a yield reduction due to delay in planting. Late planting also delay harvest, reduces the turn around time for second crop. There is a need to find out superior cultivars adopted to late planting and to minimize the loss in productivity of rice with suitable management practices.

The trial to evaluate promising cultivars for late planting at **Aduthurai**, **Mandya** and two fertilizer doses application in late planting situation at **Gangavathi** was conducted during this season ( Date of sowing is 04.09.2019)..

The trial on late planting at **Aduthurai** was conducted during kharif 2019 with Five cultivars viz., AD 16019, AD 17036, AD 17037, AD 17130 and ADT 53 were evaluated at 100% and 125% RDF at Normal and late sown (i.e., 30 days after normal sowing), Fifteen cultivars (IR-64, MTU 1010, Rasi, CTH-1, CTH-3, KMP-175, RNR-15048, Co-51, CR Dhan 201, Samalashwari, NLR-40024, NLR-34449, US 314 (HC), Indira Barani Dhan-1 and DRR Dhan-42) at three dates of sowing ( M1-Normal 01.09.2019, M2- 15 days late 15.09.2019 and M3- 30 days late 31.09.2019) were tested at **Mandya**. Two fertilizer combinations i.e., 100% NPK (150:75:75) and 125% NPK (187.5:93.75:93.75) were tested with eleven cultivars (MTU-1010, IR-64, CRDHAN-201, Indiraero-1, Co-51, PR-124, RNR-15048, Anjali, NLR-40024, GVT-05-01 and GNV-10-89) at **Gangavathi**.

The results of the trial indicate that planting on 11.08.2019 gave significantly higher grain yield (4.78 t/ha) over normal planting (4.28 t/ha) at **Aduthurai**. Application of 125% RDF gave significantly higher grain yield (4.76 t/ha) over 100% RDF. Among the cultures tested AD 17037 (5.48 t/ha) followed by ADT 53 (5.44 t/ha) found promising over other cultivars. Hence, AD 17037 and ADT 53 can be recommended under late planting situation. and transplanting can be delayed up to 11.08.2019 at this location.

At **Mandya**, three dates of sowing 1, 15 and 30<sup>th</sup> September was tested with 15 cultivars viz., IR-64, MTU 1010, Rasi, CTH-1, CTH-3, KMP-175, RNR-15048, Co-51, CR Dhan 201, Samalashwari, NLR-40024, NLR-34449, US 314 (HC), Indira Barani Dhan-1 and DRR Dhan-42. The results indicate that, the delay in transplanting from normal (01.09.2019) decreased grain yield significantly by 16% and 53% due to 15 days (15.09.2019) and 30 days (31.09.2019) respectively from normal date of sowing. Mean over the dates of sowing, cultivar KMP 175 (4.12 t/ha) followed by Samleshwari (3.69 t/ha), CR Dhan 201 and CO-51 (3.59 t/ha) and CTH-3 (3.48 t/ha) were promising and can be recommended for late planting.

At **Gangavathi**, under late planting situation (4<sup>th</sup> September 2019), application of higher dose of NPK (125% of NPK) did not influence the grain yield of cultivars. The top most cultivars were Indiraero-1 (8.29 t/ha) > MTU 1010 (7.69 t/ha) > CO-51 (7.61 t/ha) > IR 64 (7.44 t/ha) and GNV-1089 (7.36 t/ha) which can be recommended for late planting due to better grain yield.

The results indicated that, AD 17037, ADT 53 at **Aduthurai**, Indiraero-1, MTU 1010, Co-51, IR 64, GNV-1089 at **Gangavathi** and KMP 175, Samleshwari, CR Dhan 201, Co-51 and CTH-3 at **Mandya** were found promising with better yields.

Table 4.4.3. (RCT-3) - Evaluation of promising cultivars for late planting and management for higher productivity &amp; mitigate the effect of climate change, Kharif-2019.

| ADUTHURAI                                                     |                                    |                           |                          |                              |                                  |                |                 |
|---------------------------------------------------------------|------------------------------------|---------------------------|--------------------------|------------------------------|----------------------------------|----------------|-----------------|
| Main plot:<br>Crop<br>Establishing<br>methods                 | Sub plot: Fertilizer<br>treatments | Cultures                  | Grain<br>yield<br>(t/ha) | No<br>tillers/m <sup>2</sup> | No of<br>panicles/m <sup>2</sup> | Test wt<br>(g) | Grains/panicles |
| M <sub>1</sub> : Normal<br>Sowing                             | S <sub>1</sub> - 20 x 15 100 % RDF | V <sub>1</sub> - AD 16019 | 2.87                     | 275                          | 257                              | 18.67          | 152             |
|                                                               | S <sub>1</sub> - 20 x 15 100 % RDF | V <sub>2</sub> - AD 17036 | 3.47                     | 304                          | 291                              | 17.37          | 127             |
|                                                               | S <sub>1</sub> - 20 x 15 100 % RDF | V <sub>3</sub> - AD 17037 | 5.14                     | 326                          | 310                              | 16.77          | 153             |
|                                                               | S <sub>1</sub> - 20 x 15 100 % RDF | V <sub>4</sub> - AD 17130 | 3.75                     | 314                          | 304                              | 16.67          | 149             |
|                                                               | S <sub>1</sub> - 20 x 15 100 % RDF | V <sub>5</sub> - ADT 53   | 4.89                     | 344                          | 330                              | 17.50          | 180             |
|                                                               | S <sub>3</sub> - 20 x 15 125 % RDF | V <sub>1</sub> - AD 16019 | 3.42                     | 291                          | 278                              | 18.93          | 164             |
|                                                               | S <sub>3</sub> - 20 x 15 125 % RDF | V <sub>2</sub> - AD 17036 | 4.09                     | 319                          | 303                              | 17.77          | 141             |
|                                                               | S <sub>3</sub> - 20 x 15 125 % RDF | V <sub>3</sub> - AD 17037 | 5.39                     | 343                          | 329                              | 17.33          | 172             |
|                                                               | S <sub>3</sub> - 20 x 15 125 % RDF | V <sub>4</sub> - AD 17130 | 4.21                     | 333                          | 316                              | 17.10          | 164             |
|                                                               | S <sub>3</sub> - 20 x 15 125 % RDF | V <sub>5</sub> - ADT 53   | 5.56                     | 363                          | 343                              | 17.77          | 191             |
| M <sub>2</sub> : Late<br>Sowing ( 30<br>days after<br>normal) | S <sub>1</sub> - 20 x 15 100 % RDF | V <sub>1</sub> - AD 16019 | 3.30                     | 284                          | 269                              | 18.50          | 166             |
|                                                               | S <sub>1</sub> - 20 x 15 100 % RDF | V <sub>2</sub> - AD 17036 | 4.17                     | 334                          | 316                              | 17.50          | 132             |
|                                                               | S <sub>1</sub> - 20 x 15 100 % RDF | V <sub>3</sub> - AD 17037 | 5.53                     | 341                          | 327                              | 16.97          | 175             |
|                                                               | S <sub>1</sub> - 20 x 15 100 % RDF | V <sub>4</sub> - AD 17130 | 4.35                     | 334                          | 321                              | 16.67          | 158             |
|                                                               | S <sub>1</sub> - 20 x 15 100 % RDF | V <sub>5</sub> - ADT 53   | 5.48                     | 359                          | 347                              | 17.67          | 181             |
|                                                               | S <sub>3</sub> - 20 x 15 125 % RDF | V <sub>1</sub> - AD 16019 | 3.83                     | 312                          | 303                              | 19.33          | 159             |
|                                                               | S <sub>3</sub> - 20 x 15 125 % RDF | V <sub>2</sub> - AD 17036 | 4.77                     | 349                          | 339                              | 17.97          | 151             |
|                                                               | S <sub>3</sub> - 20 x 15 125 % RDF | V <sub>3</sub> - AD 17037 | 5.85                     | 354                          | 340                              | 17.37          | 124             |
|                                                               | S <sub>3</sub> - 20 x 15 125 % RDF | V <sub>4</sub> - AD 17130 | 4.66                     | 353                          | 341                              | 17.27          | 169             |
|                                                               | S <sub>3</sub> - 20 x 15 125 % RDF | V <sub>5</sub> - ADT 53   | 5.83                     | 374                          | 359                              | 17.93          | 190             |
| Mean of main plot                                             |                                    |                           |                          |                              |                                  |                |                 |
| M <sub>1</sub>                                                |                                    |                           | 4.28                     | 321                          | 306                              | 17.59          | 159             |
| M <sub>2</sub>                                                |                                    |                           | 4.78                     | 339                          | 326                              | 17.72          | 160             |
| C.D.                                                          |                                    |                           | 0.284                    | 18.192                       | 15.337                           | N/A            | N/A             |
| SE(m)                                                         |                                    |                           | 0.046                    | 2.949                        | 2.486                            | 0.045          | 3.761           |
| Mean of sub plot                                              |                                    |                           |                          |                              |                                  |                |                 |
| S <sub>1</sub>                                                |                                    |                           | 4.30                     | 321                          | 307                              | 17.43          | 157             |
| S <sub>3</sub>                                                |                                    |                           | 4.76                     | 339                          | 325                              | 17.88          | 163             |
| C.D.                                                          |                                    |                           | 0.131                    | 4.003                        | 4.419                            | 0.158          | N/A             |
| SE(m)                                                         |                                    |                           | 0.033                    | 1.025                        | 1.132                            | 0.041          | 3.982           |
| Mean of sub-sub plot                                          |                                    |                           |                          |                              |                                  |                |                 |
| V <sub>1</sub> - AD 16019                                     |                                    |                           | 3.36                     | 291                          | 277                              | 18.86          | 160             |
| V <sub>2</sub> - AD 17036                                     |                                    |                           | 4.13                     | 327                          | 312                              | 17.65          | 138             |
| V <sub>3</sub> - AD 17037                                     |                                    |                           | 5.48                     | 341                          | 326                              | 17.11          | 156             |
| V <sub>4</sub> - AD 17130                                     |                                    |                           | 4.24                     | 333                          | 320                              | 16.93          | 160             |
| V <sub>5</sub> - ADT 53                                       |                                    |                           | 5.44                     | 360                          | 345                              | 17.72          | 185             |
| C.D.                                                          |                                    |                           | 0.208                    | 5.556                        | 5.496                            | 0.144          | 17.225          |
| SE(m)                                                         |                                    |                           | 0.072                    | 1.928                        | 1.907                            | 0.05           | 5.978           |
| Interactiona                                                  |                                    |                           |                          |                              |                                  |                |                 |
| C.D.                                                          |                                    |                           | N/A                      | N/A                          | N/A                              | N/A            | N/A             |
| SE(m)                                                         |                                    |                           | 0.144                    | 3.856                        | 3.815                            | 0.1            | 11.956          |
| Experimental mean                                             |                                    |                           | 4.53                     | 330                          | 316                              | 17.65          | 160             |

S<sub>1</sub>: Optimum fertiliser dose with Normal spacing (20x15cm)S<sub>2</sub>: Optimum fertiliser dose with Closed spacing (15x10cm)S<sub>3</sub>: Higher fertiliser dose (125% of Recommended) with Normal spacing (20x15cm)S<sub>4</sub>: Higher fertiliser dose (125% of Recommended) with Closed spacing (15x10cm)

Table 4.4.3. Contd....

| Gangavathi (Normal sowing time)        |                     |                    |                               |                |                |              |                        |
|----------------------------------------|---------------------|--------------------|-------------------------------|----------------|----------------|--------------|------------------------|
| Main plot: Fertilizer treatments       | Sub plot: Cultivars | Grain yield (t/ha) | No of panicles/m <sup>2</sup> | Panicle wt (g) | Grains/panicle | Test wt (g)  | Days for 50% flowering |
| <b>M1:100%NPK(150:75:75)</b>           | V1:MTU-1010         | 7.84               | 484                           | 2.11           | 75             | 25.52        | 87                     |
|                                        | V2:IR-64            | 7.47               | 481                           | 2.22           | 72             | 28.28        | 88                     |
|                                        | V3:CRDHAN-201       | 6.57               | 419                           | 2.50           | 93             | 23.46        | 89                     |
|                                        | V4:Indiraero-1      | 8.80               | 301                           | 3.87           | 169            | 20.72        | 88                     |
|                                        | V5:Co-51            | 7.39               | 468                           | 2.76           | 135            | 18.62        | 87                     |
|                                        | V6:PR-124           | 6.14               | 469                           | 3.06           | 99             | 27.57        | 90                     |
|                                        | V7:RNR-15048        | 6.25               | 400                           | 2.72           | 188            | 13.19        | 87                     |
|                                        | V8:Anjali           | 5.72               | 350                           | 2.53           | 89             | 26.32        | 79                     |
|                                        | V9:NLR-40024        | 6.11               | 654                           | 1.74           | 81             | 18.69        | 91                     |
|                                        | V10:GVT-05-01       | 5.74               | 411                           | 2.41           | 129            | 15.27        | 97                     |
|                                        | V11:GNV-10-89       | 7.81               | 423                           | 3.49           | 174            | 17.49        | 88                     |
| <b>M2: 125%NPK (187.5:93.75:93.75)</b> | V1:MTU-1010         | 7.55               | 464                           | 2.49           | 90             | 25.21        | 87                     |
|                                        | V2:IR-64            | 7.41               | 473                           | 2.20           | 75             | 27.00        | 88                     |
|                                        | V3:CRDHAN-201       | 6.29               | 430                           | 2.18           | 82             | 23.38        | 88                     |
|                                        | V4:Indiraero-1      | 7.79               | 324                           | 3.55           | 158            | 20.42        | 88                     |
|                                        | V5:Co-51            | 7.82               | 463                           | 2.54           | 129            | 18.06        | 87                     |
|                                        | V6:PR-124           | 6.91               | 521                           | 2.66           | 85             | 27.88        | 91                     |
|                                        | V7:RNR-15048        | 7.33               | 370                           | 2.87           | 206            | 12.50        | 87                     |
|                                        | V8:Anjali           | 5.69               | 349                           | 2.54           | 90             | 27.65        | 79                     |
|                                        | V9:NLR-40024        | 6.07               | 628                           | 1.84           | 86             | 18.95        | 91                     |
|                                        | V10:GVT-05-01       | 7.21               | 369                           | 2.93           | 159            | 15.40        | 97                     |
|                                        | V11:GNV-10-89       | 6.90               | 456                           | 2.87           | 143            | 17.14        | 88                     |
| Mean of Factor-1                       |                     |                    |                               |                |                |              |                        |
| M1                                     |                     | 6.89               | 442                           | 2.67           | 118            | 21.38        | 88                     |
| M2                                     |                     | 7.00               | 441                           | 2.61           | 119            | 21.23        | 88                     |
| CD(0.05)                               |                     | NS                 | NS                            | NS             | NS             | NS           | NS                     |
| CV(%)                                  |                     | 8.30               | 4.60                          | 15.07          | 18.59          | 1.77         | 1.12                   |
| Mean of Factor-2                       |                     |                    |                               |                |                |              |                        |
| V1:MTU-1010                            |                     | 7.69               | 474                           | 2.30           | 82             | 25.37        | 87                     |
| V2:IR-64                               |                     | 7.44               | 477                           | 2.21           | 73             | 27.64        | 88                     |
| V3:CRDHAN-201                          |                     | 6.43               | 425                           | 2.34           | 88             | 23.42        | 89                     |
| V4:Indiraero-1                         |                     | 8.29               | 313                           | 3.71           | 164            | 20.57        | 88                     |
| V5:Co-51                               |                     | 7.61               | 466                           | 2.65           | 132            | 18.34        | 87                     |
| V6:PR-124                              |                     | 6.53               | 495                           | 2.86           | 92             | 27.73        | 90                     |
| V7:RNR-15048                           |                     | 6.79               | 385                           | 2.79           | 197            | 12.84        | 87                     |
| V8:Anjali                              |                     | 5.70               | 350                           | 2.54           | 90             | 26.98        | 79                     |
| V9:NLR-40024                           |                     | 6.09               | 641                           | 1.79           | 84             | 18.82        | 91                     |
| V10:GVT-05-01                          |                     | 6.48               | 390                           | 2.67           | 144            | 15.33        | 97                     |
| V11:GNV-10-89                          |                     | 7.36               | 439                           | 3.18           | 159            | 17.31        | 88                     |
| CD(0.05)                               |                     | 0.37               | 26.39                         | 0.29           | 10.19          | 0.68         | 0.96                   |
| CV(%)                                  |                     | 4.56               | 5.13                          | 9.37           | 7.37           | 2.74         | 0.93                   |
| Interaction                            |                     |                    |                               |                |                |              |                        |
| M and T                                |                     | 0.52               | NS                            | 0.41           | 14.42          | NS           | NS                     |
| T and M                                |                     | 0.69               | NS                            | 0.51           | 22.71          | NS           | NS                     |
| <b>Experimental Mean</b>               |                     | <b>6.95</b>        | <b>441</b>                    | <b>2.64</b>    | <b>119</b>     | <b>21.31</b> | <b>88</b>              |

Table 4.4.3. Contd....

| MANDYA                                                     |                      |                          |                                      |                   |                |                            |                    |                           |
|------------------------------------------------------------|----------------------|--------------------------|--------------------------------------|-------------------|----------------|----------------------------|--------------------|---------------------------|
| Main plot:<br>Fertilizer<br>treatments                     | Sub plot: Cultivars  | Grain<br>yield<br>(t/ha) | No of<br>panicles/<br>m <sup>2</sup> | Panicle<br>wt (g) | Test<br>wt (g) | spikelet<br>sterility<br>% | Grains/p<br>anicle | Days for 50%<br>flowering |
| <b>M1: Normal<br/>Sowing</b>                               | IR-64                | 3.62                     | 322                                  | 2.78              | 27.57          | 9.89                       | 96                 | 91                        |
|                                                            | MTU 1010             | 3.78                     | 332                                  | 3.39              | 24.28          | 11.91                      | 131                | 90                        |
|                                                            | Rasi                 | 4.40                     | 354                                  | 3.53              | 24.27          | 7.20                       | 137                | 91                        |
|                                                            | CTH-1                | 3.42                     | 221                                  | 5.09              | 29.67          | 14.74                      | 187                | 93                        |
|                                                            | CTH-3                | 4.33                     | 380                                  | 2.77              | 20.64          | 18.53                      | 125                | 94                        |
|                                                            | KMP-175              | 5.08                     | 303                                  | 5.07              | 22.41          | 12.61                      | 215                | 93                        |
|                                                            | RNR-15048            | 3.82                     | 382                                  | 3.45              | 13.52          | 10.50                      | 243                | 91                        |
|                                                            | Co-51                | 4.87                     | 401                                  | 3.33              | 20.02          | 10.43                      | 153                | 90                        |
|                                                            | CR Dhan 201          | 4.42                     | 364                                  | 3.15              | 25.19          | 13.58                      | 118                | 91                        |
|                                                            | Samalashwari         | 4.34                     | 272                                  | 4.76              | 21.79          | 7.59                       | 204                | 94                        |
|                                                            | NLR-40024            | 3.29                     | 310                                  | 4.69              | 25.08          | 11.30                      | 177                | 93                        |
|                                                            | NLR-34449            | 4.79                     | 388                                  | 3.29              | 16.20          | 10.00                      | 190                | 100                       |
|                                                            | US 314 (HC)          | 4.14                     | 343                                  | 4.99              | 22.99          | 10.13                      | 207                | 84                        |
|                                                            | Indira Barani Dhan-1 | 3.56                     | 330                                  | 3.43              | 22.97          | 14.70                      | 141                | 80                        |
|                                                            | DRR Dhan-42          | 4.06                     | 322                                  | 4.12              | 26.23          | 20.21                      | 143                | 96                        |
| <b>M2: Late<br/>Sowing (15<br/>days after<br/>normal)</b>  | IR-64                | 2.97                     | 261                                  | 2.72              | 27.03          | 14.35                      | 94                 | 90                        |
|                                                            | MTU 1010             | 3.58                     | 273                                  | 3.19              | 24.03          | 15.73                      | 124                | 91                        |
|                                                            | Rasi                 | 3.64                     | 256                                  | 2.59              | 28.27          | 15.88                      | 83                 | 91                        |
|                                                            | CTH-1                | 3.93                     | 228                                  | 3.59              | 27.36          | 19.20                      | 126                | 93                        |
|                                                            | CTH-3                | 3.93                     | 279                                  | 2.55              | 21.52          | 27.01                      | 110                | 93                        |
|                                                            | KMP-175              | 4.47                     | 231                                  | 4.76              | 23.09          | 13.83                      | 194                | 92                        |
|                                                            | RNR-15048            | 2.77                     | 256                                  | 2.99              | 15.26          | 13.67                      | 182                | 91                        |
|                                                            | Co-51                | 3.80                     | 233                                  | 2.81              | 18.72          | 12.24                      | 138                | 90                        |
|                                                            | CR Dhan 201          | 4.15                     | 259                                  | 3.09              | 27.57          | 23.54                      | 105                | 90                        |
|                                                            | Samalashwari         | 4.73                     | 249                                  | 4.32              | 24.31          | 16.32                      | 166                | 92                        |
|                                                            | NLR-40024            | 2.54                     | 232                                  | 4.32              | 26.96          | 25.15                      | 149                | 93                        |
|                                                            | NLR-34449            | 3.00                     | 303                                  | 2.64              | 16.79          | 20.50                      | 146                | 100                       |
|                                                            | US 314 (HC)          | 3.34                     | 243                                  | 3.89              | 24.78          | 18.63                      | 149                | 84                        |
|                                                            | Indira Barani Dhan-1 | 2.29                     | 248                                  | 3.19              | 23.75          | 22.08                      | 128                | 81                        |
|                                                            | DRR Dhan-42          | 2.83                     | 243                                  | 3.97              | 29.02          | 27.52                      | 127                | 96                        |
| <b>M3: Late<br/>sowing of 30<br/>days after<br/>normal</b> | IR-64                | 1.88                     | 210                                  | 2.24              | 25.94          | 20.72                      | 79                 | 98                        |
|                                                            | MTU 1010             | 1.54                     | 206                                  | 2.16              | 25.36          | 22.55                      | 76                 | 96                        |
|                                                            | Rasi                 | 2.22                     | 231                                  | 2.73              | 24.84          | 17.17                      | 100                | 93                        |
|                                                            | CTH-1                | 2.07                     | 199                                  | 3.78              | 26.34          | 18.09                      | 126                | 95                        |
|                                                            | CTH-3                | 2.19                     | 221                                  | 1.95              | 19.21          | 29.88                      | 92                 | 91                        |
|                                                            | KMP-175              | 2.79                     | 214                                  | 4.02              | 22.35          | 18.55                      | 165                | 91                        |
|                                                            | RNR-15048            | 2.06                     | 211                                  | 2.43              | 14.11          | 26.57                      | 154                | 91                        |
|                                                            | Co-51                | 2.10                     | 233                                  | 2.71              | 18.80          | 26.42                      | 120                | 91                        |
|                                                            | CR Dhan 201          | 2.21                     | 220                                  | 2.30              | 24.86          | 29.12                      | 81                 | 92                        |
|                                                            | Samalashwari         | 2.00                     | 200                                  | 3.25              | 23.95          | 23.67                      | 123                | 95                        |
|                                                            | NLR-40024            | 1.59                     | 200                                  | 3.59              | 26.84          | 23.97                      | 120                | 92                        |
|                                                            | NLR-34449            | 1.98                     | 236                                  | 2.42              | 17.21          | 28.60                      | 124                | 102                       |
|                                                            | US 314 (HC)          | 1.48                     | 202                                  | 2.89              | 23.23          | 29.27                      | 115                | 92                        |
|                                                            | Indira Barani Dhan-1 | 1.68                     | 195                                  | 2.53              | 25.24          | 46.50                      | 87                 | 92                        |
|                                                            | DRR Dhan-42          | 1.49                     | 184                                  | 2.72              | 27.81          | 33.45                      | 89                 | 102                       |

Table 4.4.3. Contd....

| Main plot:<br>Fertilizer<br>treatments | Sub plot:<br>Cultivars      | Grain<br>yield<br>(t/ha) | No of<br>panicles/m <sup>2</sup> | Panicle<br>wt (g) | Test<br>wt (g) | spikelet<br>sterility % | Grains/panicle | Days for<br>50%<br>flowering |
|----------------------------------------|-----------------------------|--------------------------|----------------------------------|-------------------|----------------|-------------------------|----------------|------------------------------|
| Mean of Factor-1                       |                             |                          |                                  |                   |                |                         |                |                              |
|                                        | M1                          | 4.13                     | 335.04                           | 3.86              | 22.85          | 12.22                   | 164            | 91.24                        |
|                                        | M2                          | 3.47                     | 252.98                           | 3.37              | 23.90          | 19.04                   | 135            | 91.18                        |
|                                        | M3                          | 1.95                     | 210.82                           | 2.78              | 23.07          | 26.30                   | 110            | 94.02                        |
|                                        | CD(0.05)                    | 0.35                     | 19.39                            | 0.19              | NS             | 2.56                    | 8.81           | 0.24                         |
|                                        | CV(%)                       | 29.12                    | 19.45                            | 15.39             | 7.34           | 35.68                   | 17.25          | 0.70                         |
| Mean of Factor-2                       |                             |                          |                                  |                   |                |                         |                |                              |
|                                        | V1 IR-64                    | 2.82                     | 264                              | 2.58              | 26.85          | 14.99                   | 90             | 93                           |
|                                        | V2 MTU 1010                 | 2.97                     | 271                              | 2.91              | 24.55          | 16.73                   | 110            | 92                           |
|                                        | V3 Rasi                     | 3.42                     | 280                              | 2.95              | 25.79          | 13.42                   | 107            | 92                           |
|                                        | V4 CTH-1                    | 3.14                     | 216                              | 4.15              | 27.79          | 17.35                   | 146            | 93                           |
|                                        | V5 CTH-3                    | 3.48                     | 293                              | 2.42              | 20.45          | 25.14                   | 109            | 93                           |
|                                        | V6 KMP-175                  | 4.12                     | 249                              | 4.62              | 22.62          | 15.00                   | 191            | 92                           |
|                                        | V7 RNR-15048                | 2.88                     | 283                              | 2.96              | 14.29          | 16.92                   | 193            | 91                           |
|                                        | V8 Co-51                    | 3.59                     | 289                              | 2.95              | 19.18          | 16.36                   | 137            | 90                           |
|                                        | V9 CR Dhan 201              | 3.59                     | 281                              | 2.85              | 25.87          | 22.08                   | 101            | 91                           |
|                                        | V10 Samalashwari            | 3.69                     | 241                              | 4.11              | 23.35          | 15.86                   | 164            | 94                           |
|                                        | V11 NLR-40024               | 2.47                     | 248                              | 4.20              | 26.29          | 20.14                   | 149            | 92                           |
|                                        | V12 NLR-34449               | 3.25                     | 309                              | 2.78              | 16.73          | 19.70                   | 154            | 101                          |
|                                        | V13 US 314 (HC)             | 2.99                     | 263                              | 3.92              | 23.67          | 19.34                   | 157            | 87                           |
|                                        | V14 Indira Barani<br>Dhan-1 | 2.51                     | 258                              | 3.05              | 23.99          | 27.76                   | 119            | 84                           |
|                                        | V15 DRR Dhan-42             | 2.79                     | 250                              | 3.60              | 27.69          | 27.06                   | 120            | 98                           |
|                                        | CD(0.05)                    | 0.56                     | 32.55                            | 0.47              | 1.49           | 3.09                    | 17.23          | 0.67                         |
|                                        | CV(%)                       | 18.91                    | 13.10                            | 15.03             | 6.88           | 17.26                   | 13.53          | 0.78                         |
| Interaction                            |                             |                          |                                  |                   |                |                         |                |                              |
|                                        | M and T                     | NS                       | NS                               | NS                | NS             | 5.36                    | NS             | 1.16                         |
|                                        | T and M                     | NS                       | NS                               | NS                | NS             | 5.42                    | NS             | 1.13                         |
| Experimental Mean                      |                             | 3.18                     | 266                              | 3.34              | 23.27          | 19.19                   | 136            | 92                           |

#### 4.4.4 . Assessing the performance and yielding ability of *kharif* sorghum hybrids in Rice-Sorghum sequence cropping system

In rice-fallows, sorghum cultivation was found to be high yield potential with labour and inputs intensive crop system. It is found that use of high inputs viz., pesticides, weedicides, fertilizers, labourers, and skillful management of all the innovative practices including irrigations, were resulted into the high yield. It is implied that the farmers were highly profit oriented and obtained high returns from the sorghum cultivation. Their profit margin could be further increased by mechanization and introducing standard package of practices. Keeping the yield benefits in view, the farmers innovative knowledge should be validated on their fields to develop standardize location-specific production technologies so that the productivity and soil health will sustain in long run. These innovative farmers would be able to educate and transfer the viable technologies more effectively among the other sorghum growers in rice-fallows as change agent. Further very efficient genotypes had been developed which are very much suitable for rice fallows. There is need to test in them in rice fallows of different locations to gain the benefit of the Rice sorghum cropping system.

A trial was laid out with four replications during *Kharif* 2019 at three locations continued at **Chinsurah, Mandya and Ragolu** to assess the effect of different crop establishment methods (M<sub>1</sub>: Transplanting, M<sub>2</sub>: Wet seeding (line sowing under puddled conditions) and M<sub>3</sub>: Dry DSR – Dry rice cultivation method). The sub plot treatments comprised of different promising cultures viz., IIMRH 2, IIMRH 3, IIMRH 4, IIMRH 5, IIMRH 6, CSH16 (C), CSH 25 (C), CSH 30 (C) and CSH 41 (C) will be tested under split plot design during *rabi* season. The results are summarized and presented in Table 4.4.3.

Crop establishment methods did not influence the grain yield significantly at all locations. The grain yield ranged from 2.56 t/ha to 6.80 t/ha at **Chinsurah** and **Mandya** during *kharif* 2019.

Among crop establishment methods, transplanting gave comparable yields with wet DSR method at **Chinsurah, Mandya** and **Ragolu**. However, the effect of promising cultivars of sorghum in the rice fallows need to be assessed during *rabi* (2019-20) season. Grain yield data of sorghum did not receive to assess the effect cultures in rice fallows.

Table- 4.4.4: Assessing the performance and yielding ability of kharif sorghum hybrids in Rice-Sorghum sequence cropping system, Kharif-2019

| Treatments               | CHINSURAH          |                            |                | MANDYA             |                            |                |                     |                       |             |                        | RAGOLU             |                            |                |                     |                       |             | Over all mean | Rank |
|--------------------------|--------------------|----------------------------|----------------|--------------------|----------------------------|----------------|---------------------|-----------------------|-------------|------------------------|--------------------|----------------------------|----------------|---------------------|-----------------------|-------------|---------------|------|
|                          | Grain Yield (t/ha) | Panicle No./m <sup>2</sup> | Panicle wt (g) | Grain Yield (t/ha) | Panicle No./m <sup>2</sup> | Panicle wt (g) | Panicle length (cm) | filled grains/panicle | Test wt (g) | Days for 50% flowering | Grain Yield (t/ha) | Panicle No./m <sup>2</sup> | Panicle wt (g) | Panicle length (cm) | filled grains/panicle | Test wt (g) |               |      |
| T1                       | 2.53               | 204                        | 2.48           | 6.74               | 348                        | 3.68           | 23.79               | 161                   | 26.22       | 96                     | 5.11               | 298.6                      | 3.26           | 22.57               | 111.6                 | 23.82       | 4.79          | 1    |
| T2                       | 2.59               | 227                        | 2.54           | 6.86               | 354                        | 3.29           | 23.54               | 162                   | 26.72       | 93                     | 4.24               | 272.8                      | 2.63           | 21.22               | 85                    | 22.9        | 4.56          | 2    |
| T3                       |                    |                            |                |                    |                            |                |                     |                       |             |                        |                    |                            |                |                     |                       |             |               |      |
| Expt. Mean               | 2.56               | 215                        | 2.51           | 6.80               | 351                        | 3.49           | 23.66               | 162                   | 26.47       | 94                     | 4.68               | 285.7                      | 2.95           | 21.89               | 98.3                  | 23.36       | 4.68          |      |
| CD(0.05)                 | 0.21               | 28.39                      | 0.11           | 1.03               | 16.93                      | 0.23           | 0.23                | 0.85                  | 0.63        | 0.44                   | 0.66               | 14.15                      | 0.43           | 0.4                 | 19.52                 | 0.27        |               |      |
| CV(%)                    | 7.16               | 11.74                      | 3.96           | 13.53              | 4.29                       | 5.91           | 0.88                | 0.47                  | 2.12        | 0.41                   | 12.54              | 4.41                       | 12.92          | 1.61                | 17.68                 | 1.01        |               |      |
| res(t)                   | NS                 | NS                         | NS             | NS                 | NS                         | *              | NS                  | NS                    | NS          | **                     | NS                 | *                          | NS             | **                  | NS                    | **          |               |      |
| Variety                  | Gobindabhog        |                            |                | MTU 1001           |                            |                |                     |                       |             |                        | -                  |                            |                |                     |                       |             |               |      |
| Soil type                | -                  |                            |                | Red sandy loam     |                            |                |                     |                       |             |                        | Red sandy loam     |                            |                |                     |                       |             |               |      |
| pH                       | 7.77               |                            |                | 6.99               |                            |                |                     |                       |             |                        | 7.82               |                            |                |                     |                       |             |               |      |
| Available NPK kg/ha      | 515:87:342         |                            |                | 385:115:274        |                            |                |                     |                       |             |                        | 240:26:308         |                            |                |                     |                       |             |               |      |
| Fertilizer applied kglha | 50:25:25           |                            |                | 100:50:50          |                            |                |                     |                       |             |                        | 120:60:50          |                            |                |                     |                       |             |               |      |

T1: Transplanting

T2: Wet DSR

T3: Dry DSR

**Annexure - I****Major weeds observed during Kharif 2019**

| <b>Grasses</b>                | <b>Sedges</b>                | <b>BLW</b>                        |
|-------------------------------|------------------------------|-----------------------------------|
| <i>Brachiariaeruciformis</i>  | <i>Cyperusdiffformis</i>     | <i>Alternantheraphiloxeroides</i> |
| <i>Chloris barbata</i>        | <i>Cyperusesculentus</i>     | <i>Aeschynomeneindica</i>         |
| <i>Cynodondactylon</i>        | <i>Cyperusiria</i>           | <i>Ammaniabaccifera</i>           |
| <i>Dactyloctameumspp</i>      | <i>Cyperusrotundus</i>       | <i>Celosia argentea</i>           |
| <i>Digitariasanguinalis</i>   | <i>Fimbristylislitoralis</i> | <i>Caesuliaaxilaris</i>           |
| <i>Echinochloacolona</i>      | <i>Fimbristylismiliacea</i>  | <i>Commelinabenghalensis</i>      |
| <i>Echinochloacrusgalli</i>   |                              | <i>Eclipta alba</i>               |
| <i>Eleusineindica</i>         |                              | <i>Ludwigiaparviflora</i>         |
| <i>Ischaemumrugosum</i>       |                              | <i>Marseliaquadrifolia</i>        |
| <i>Paspalumdilatum</i>        |                              | <i>Phyllanthusniruri</i>          |
| <i>Panicumdichotomiflorum</i> |                              | <i>Rotaladensiflor</i>            |
| <i>Panicumrepens</i>          |                              | <i>Spilanthesacmela</i>           |
| <i>Setariaglauca</i>          |                              | <i>Trianthemaportulacastrum</i>   |

***Annexure - II***

**WEATHER DATA – KHARIF 2019**

***Please refer volume-I Plant Breeding Progress Report for Weather data of Kharif-2019***

**Annexure - III****a. Details of herbicide manufacturers *Kharif* - 2019**

| S.No. | Name of the herbicides                       | Agro-Input-Agency                                                                                                             |
|-------|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| 1     | Bispyribac sodium 10% SC                     | PI Industries Ltd,<br>Bayer Crop Science                                                                                      |
| 2     | Pretilachlor 50 %EC                          | Dhanuka, Nagarjunaagrichem Ltd, Crop<br>chemicals India ltd, SWAL corporation<br>India, Agro care , Paramount Pesticides Ltd. |
| 3     | Metsulfuronmethyl+chlorimuronehtyl-<br>20%WP | DuPont India Ltd                                                                                                              |
| 4     | Pyrazosulfuronethyl 10 WP                    | UPL                                                                                                                           |

**b. Details of product/material provided by private company/organization in *Rabi*- 2017-18 and *Kharif* - 2018**

| S.No. | Name of the product | Agro-Input-Agency                                                                                                                                       |
|-------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1     | Iron coated seed    | JFE Steel India Pvt. Ltd., 806,<br>8 <sup>th</sup> Floor, Tower-B, Unitech Signature<br>Towers, South City-I, NH-8,<br>Gurgaon – 122001, Haryana, India |
| 2     | Thiobencarb 5 l/ha  | India Pesticides Limited                                                                                                                                |
| 3     | Nutrient Expert®    | International Plant Nutrition Institute,<br>Gurgaon, India                                                                                              |

**Annexure - IV****ABBREVIATIONS**

|            |                   |            |                    |
|------------|-------------------|------------|--------------------|
| <b>ADT</b> | Aduthurai         | <b>MNC</b> | Moncompu           |
| <b>ALM</b> | Almora (VPKAS)    | <b>MND</b> | Mandya             |
| <b>ARD</b> | Arundhutinagar    | <b>MTU</b> | Maruteru           |
| <b>BNK</b> | Bankura           | <b>NGN</b> | Nagina             |
| <b>CBT</b> | Coimbatore        | <b>NLR</b> | Nellore            |
| <b>CHN</b> | Chinsura          | <b>NVS</b> | Navsari            |
| <b>CHP</b> | Chiplima          | <b>NWG</b> | Nawagam            |
| <b>CHT</b> | Chatha            | <b>PDG</b> | Phondaghat         |
| <b>CKD</b> | Chakdha           | <b>PNT</b> | Pantnagar          |
| <b>CNG</b> | Canning (CSSRI)   | <b>PNV</b> | Panvel             |
| <b>CTK</b> | Cuttak (NRRI)     | <b>POB</b> | Port Blair (CIARI) |
| <b>FZB</b> | Faizabad(Masodha) | <b>PSA</b> | Pusa               |
| <b>GER</b> | Gerua (NRRI)      | <b>PTB</b> | Pattambi           |
| <b>GGT</b> | Ghaghraghat       | <b>PTN</b> | Patna (Dhangain)   |
| <b>GNV</b> | Gangavati         | <b>PDC</b> | Puducherry         |
| <b>GRD</b> | Giridih           | <b>RCI</b> | Ranchi             |
| <b>HZB</b> | Hazaribagh (NRRI) | <b>REW</b> | Rewa               |
| <b>JDP</b> | Jagadapur         | <b>RGL</b> | Ragolu             |
| <b>KHD</b> | Khudwani          | <b>RNR</b> | Rajendranagar      |
| <b>KJT</b> | Karjat            | <b>RPR</b> | Raipur             |
| <b>KNP</b> | Kanpur            | <b>SBR</b> | Sabour             |
| <b>KRK</b> | Karaikal          | <b>TLJ</b> | Tuljapur           |
| <b>KRL</b> | Karnal(CSSRI)     | <b>TTB</b> | Titabar            |
| <b>KTA</b> | Kota              | <b>USG</b> | Upper Shillong     |
| <b>KUL</b> | Kaul              | <b>VDG</b> | Vadagaon           |
| <b>LCK</b> | Lucknow           | <b>VRN</b> | Varanasi           |
| <b>LDN</b> | Ludhiana          | <b>VTL</b> | Vytilla            |
| <b>MLN</b> | Malan             | <b>WBL</b> | Wangbal (Imphal)   |
| <b>MDZ</b> | Medziphema        |            |                    |

## Annexure - V

**ADDRESSES OF COOPERATORS - AGRONOMY  
2019-20120**

**FUNDED CENTRES:**

|   |                                                                                                                                                                                                                                                                                                                                      |   |                                                                                                                                                                                                                                                                                                                                                       |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Dr.S.Elamathi,<br>Asst professor (Agronomy)<br>Rice Agronomist -AICRIP<br>Tamil Nadu Rice Res. Institute<br><b>ADUTHURAI</b> - 612 101<br>(Tamil Nadu)<br>Phone: 0435 – 2472098 (O)<br>FAX: 0435 – 2472881<br>Mobile: 08973649570<br>Email: <a href="mailto:elamathi_aadiu@yahoo.co.in">elamathi_aadiu@yahoo.co.in</a>               | 2 | Dr. Goutham Kumar Mallick<br>Joint Director of Agriculture (Mycology)<br>W.B.A.S. (Research)<br>Rice Research Station, Natunchati,<br><b>BANKURA</b> – 722 101<br>(West Bengal)<br>Phone: 03242-251306<br>Email: <a href="mailto:rrsbankura@gmail.com">rrsbankura@gmail.com</a>                                                                       |
| 3 | <b>Dr. Anuradha Saha,</b><br><b>Sr. Scientist/Assoc. Professor</b><br>Division of Agronomy, SKUAST – J,<br><b>CHATHA</b> - 181 009, JAMMU<br>(Jammu & Kashmir)<br>Phone : 0191-2434716 (R)<br>Mobile : 09419202983<br>Email: <a href="mailto:anuradha_agron@yahoo.co.in">anuradha_agron@yahoo.co.in</a>                              | 4 | Dr. Sangeet Sekhar Deb<br>Agronomist (AICRIP)<br><b>Rice Research Station</b><br>Govt. of West Bengal<br>P.O. <b>CHINSURAH</b> RS - 712 102<br>Hoogly Dist. (West Bengal)<br>Phone: 033 – 26862484<br>FAX : 033 – 26861149<br>Mobile : 8420244711, 9433378200<br>E-mail: <a href="mailto:isangeet.sd@gmail.com">isangeet.sd@gmail.com</a>             |
| 5 | <b>Dr. Sanjukta Mohapatra</b><br>Sr. Agronomist (AICRIP)<br>Regional Research & Technology<br>Transfer Station,<br><b>CHiplima</b> - 768 025<br>Sambalpur (Orissa)<br>Phone - 0663-2460515<br>Mobile No. 9938254935,<br>9439918935<br>E-<br>mail: <a href="mailto:sanjukta.mohapatra34@gmail.com">sanjukta.mohapatra34@gmail.com</a> | 6 | <b>Dr. G. Senthil Kumar, Ph. D.,</b><br>Assistant Professor (Agronomy),<br>Department of Rice,<br>Tamil Nadu Agricultural University,<br><b>Coimbatore</b> - 641 003<br>Tamil Nadu.<br>Mobile: 94439 16294<br>Email: <a href="mailto:senthilkolathur@gmail.com">senthilkolathur@gmail.com</a><br><a href="mailto:rice@tnau.ac.in">rice@tnau.ac.in</a> |
| 7 | Dr. Kamlesh Kumar Prasad<br>Scientist (Agronomy)<br>Botanical Research Unit (BRU)<br>PO: Bikramganj, Dist. Rohtas,<br><b>Dhangain</b> – 802 212<br>Mobile : 09430220110, 7739079713<br>Email:<br><a href="mailto:dr.kamleshkprasad.agron@gmail.com">dr.kamleshkprasad.agron@gmail.com</a>                                            | 8 | <b>Dr. D.K. Verma</b><br>Agronomist<br>Crop Research Station, Masodha,<br>P.O.: Dabhasemar,<br><b>FAIZABAD</b> -224 133 (Uttar Pradesh)<br>Phone: 05278 – 254153<br>FAX: 05278 – 244242 / 243033<br>Mobile: 09838326468<br>Email: <a href="mailto:aicripmasodhafzd@gmail.com">aicripmasodhafzd@gmail.com</a>                                          |

|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |    |                                                                                                                                                                                                                                                                                                                                                                                       |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9  | <p>Dr. B. G. Masthana Reddy<br/>Professor of Agronomy<br/>ARS<br/><b>GANGAVATHI</b> – 583 227<br/>Dist. Bellary (Karnataka)<br/><i>Phone: 08533-270144 (O)</i><br/><i>Fax: 08533-270130</i><br/><i>Mobile: 09448440518, 09480696332</i><br/><i>Email: <a href="mailto:bgmreddy2006@gmail.com">bgmreddy2006@gmail.com</a></i></p>                                                                                                                                                                                                                                                                | 10 | <p>Dr. Ram Adhar Singh<br/>Assistant Professor (Agronomy)<br/>Crop Research Station<br/><b>GHAGHRAGHAT</b> - 271 901<br/>P.O. Jarwal Road,<br/>Bahraich Dist. (Uttar Pradesh)<br/><i>Phone: 05270 – 262066 (O)</i><br/><i>Fax: 05270-262917,262097</i><br/><i>Mobile : 09415332006, 6392217329</i><br/><i>Email: <a href="mailto:rasingh54@gmail.com">rasingh54@gmail.com</a></i></p> |
| 11 | <p>Dr. Manish Kumar<br/>Senior Scientist (Agronomy)<br/>S.G. College of Agriculture and Res.<br/>Station (IGAU) Kumhrawand,<br/><b>JAGDALPUR</b> - 494 005, (Chattisgarh)<br/><i>Phone: 07782 – 229150, 229360 (O)</i><br/><i>FAX : 07782 – 229360, 229046</i><br/><i>Mobile: 09993441213, 09424280919</i><br/><i>Email : <a href="mailto:manish7march1972@yahoo.com">manish7march1972@yahoo.com</a></i></p>                                                                                                                                                                                    | 12 | <p>Dr. A.S.Dalvi<br/>Agronomist,<br/>Reg. Agri. Res. Station,<br/><b>KARJAT</b> - 410 201<br/>Dist. Rajgad (Maharashtra)<br/><i>Phone: 02148 - 222031</i><br/><i>FAX: 02148 – 222035</i><br/><i>Mobile: 09404302826</i><br/><i>Email : <a href="mailto:nntdalvi@gmail.com">nntdalvi@gmail.com</a>,<br/><a href="mailto:adrkarjat@rediffmail.com">adrkarjat@rediffmail.com</a></i></p> |
| 13 | <p>Dr. Hari Ram<br/>Assistant Professor (Agronomy),<br/>AICRIP on Rice, C.S. Azad University<br/>of Agriculture<br/><b>KANPUR</b> (Uttar Pradesh)-208 002<br/><i>Mobile : 09450340573</i><br/><i>Email: <a href="mailto:vk Yadu@gmail.com">vk Yadu@gmail.com</a></i></p> <p>Dr. P. K. Singh<br/><b>Professor (GPB)/ Officer-in-charge,<br/>AICRIP and Former Project<br/>Coordinator Linseed<br/>C. S. Azad University of Agriculture<br/>&amp; Technology<br/>Kanpur-208002, UP, India<br/>Mb No. 9415172323<br/>Email: <a href="mailto:pk_singh65@yahoo.com">pk_singh65@yahoo.com</a></b></p> | 14 | <p>Dr. Mangat Ram,<br/>Principal Scientist (Agronomy)<br/>Rice Res Station (HAU)<br/><b>KAUL (KAITHAL)</b> - 136 021<br/>(Haryana)<br/><i>Phone: 01746 – 254550 (O)</i><br/><i>FAX: 01746 - 254946</i><br/><i>Mobile- 09466240052</i><br/><i>Email: <a href="mailto:mangatram004@yahoo.com">mangatram004@yahoo.com</a></i></p>                                                        |
| 15 | <p>Dr. Manzoor Ahmed Ganai<br/>Senior Scientist (Agronomy)<br/>MRCFC, SKUAST-K<br/><b>KHUDWANI</b> - 192 102 P.O. Vanpoh,<br/>Anantnag Dist. (Jammu &amp; Kashmir)<br/><i>FAX : 01931 – 238246</i><br/><i>Mobile: 9906530596, 07006053580</i><br/><i>Email: <a href="mailto:ganai95@gmail.com">ganai95@gmail.com</a></i></p>                                                                                                                                                                                                                                                                    | 16 | <p>In-Charge<br/>Directorate of Agriculture<br/>AG Colony,<br/><b>KOHIMA</b>, Nagaland – 797001<br/><i>Phone: 0370-2243116</i><br/><i>Email: <a href="mailto:agrilan-ngl@gov.in">agrilan-ngl@gov.in</a></i></p>                                                                                                                                                                       |

|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |    |                                                                                                                                                                                                                                                                                                                                                                                      |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 17 | <p>Dr. Chandra Prakash<br/>Associate Professor (AICRIP)<br/>Agri. Res. Station, UMMEDGANJ<br/>Post Box No. 7, GPO. Nayapura,<br/><b>KOTA</b> - 324 001(Rajasthan)<br/><i>Phone: 0744 – 2844369 (O)</i><br/><i>FAX: 0744 – 2844306</i><br/><i>Mobile: 07597432529</i><br/><i>Email.: <a href="mailto:arskota@hotmail.com">arskota@hotmail.com</a></i></p> <p><b>Dr. N.R.Koli</b><br/><b>Assoc.Prof.(Plant Breeding)</b><br/><b>Agricultural Research Station,</b><br/><b>Ummedganj</b><br/><b>(PO Box No. 7, Nayapura Post Office,</b><br/><b>Kota)</b><br/><b>Agricultural University, Kota</b><br/><b>Rajasthan</b><br/><b>Phone No: 0744-2844369</b><br/><b>Fax No : 0744-2844306</b><br/><b>Mobile : 09413530031</b><br/><b>Email: <a href="mailto:nanag70@yahoo.co.in">nanag70@yahoo.co.in</a></b></p> | 18 | <p>Dr. Buta Singh Dhillon<br/>Asstt. Agronomist (Rice)<br/>Punjab Agriculture University<br/>Ludhiana, PAU,<br/><b>LUDHIANA</b> – 141 004 (Punjab)<br/><i>FAX : 0161-2400945</i><br/><i>Mobile : 9463805324, 8146100360</i><br/><i>Email: <a href="mailto:bsdhillon@pau.edu">bsdhillon@pau.edu</a></i><br/><i><a href="mailto:dhillonbs1@gmail.com">dhillonbs1@gmail.com</a></i></p> |
| 19 | <p>AD Bindra<br/>Principal Scientist (Agronomy),<br/>CSKHPKV<br/>Rice and Wheat Research Centre,<br/><b>MALAN</b>, Nagrota Bagwan<br/>District Kangra (H.P.) – 176 047<br/><i>Phone : 01892252306</i><br/><i>Mobile : 9459083612</i><br/><i>E mail: <a href="mailto:adbindra03@yahoo.co.in">adbindra03@yahoo.co.in</a></i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 20 | <p>Dr. Denesh. G.R.<br/>Agronomist<br/>ZARS, V.C.Farm,<br/><b>MANDYA</b><br/>Karnataka-571045<br/><i>Mobile: 9448980134</i><br/><i>E-mail : <a href="mailto:grdesnesh@rediffmail.com">grdesnesh@rediffmail.com</a></i></p>                                                                                                                                                           |
| 21 | <p>Dr. C. Venkata Reddy,<br/>Principal Scientist &amp; Head,<br/>Dept of Agronomy, ANGRAU,<br/>Regional Agricultural Research Station<br/><b>MARUTERU</b> - 534 122,<br/>West Godavari Dist<br/>Andhra Pradesh, India.<br/><i>Mobile: 09441045863</i><br/><i>Phone: 08819 – 2462483</i><br/><i>Email : <a href="mailto:adr.godavarizone@gmail.com">adr.godavarizone@gmail.com</a></i></p>                                                                                                                                                                                                                                                                                                                                                                                                                  | 22 | <p>Dr Vandana Venugopal<br/>Professor &amp; Head<br/>Rice Res. Station (KAU),<br/>Thekkekkara Post<br/><b>MONCOMPU</b> - 688 503<br/>Alapuzha Dist. (Kerala)<br/><i>Phone: 0477 – 2702245</i><br/><i>Mobile: 08547885608</i><br/><i>E-mail: <a href="mailto:vandana.v@kau.in">vandana.v@kau.in</a>,</i><br/><i><a href="mailto:rrsmoncompu@kau.in">rrsmoncompu@kau.in</a></i></p>    |
| 23 | <p>Dr. Vivek Yadav<br/>Asst. Agronomist<br/>Rice Res.Station(SVBPUA&amp;T)<br/><b>NAGINA</b> - 246 762</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 24 | <p><b>Dr. Darpana Patel</b><br/>Assistant Professor (Agronomy),<br/>Main Rice Research station, Soil &amp;<br/>Water Management Res Unit (SWMRU),</p>                                                                                                                                                                                                                                |

|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                              |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | <p>Bijnor Dist., (U.P.)<br/> Phone: 01343 – 250271 (O)<br/> FAX: 01343-2411505<br/> Mobile: 07017199335<br/> Email : <a href="mailto:vivekzrsnagina@gmail.com">vivekzrsnagina@gmail.com</a></p>                                                                                                                                                                                                                                                              |    | <p>Navsari Agricultural University,<br/> <b>NAVSARI</b> – 396 450 (Gujarat)<br/> Mobile: 09925508070<br/> Email: <a href="mailto:darpana_srs@yahoo.com">darpana_srs@yahoo.com</a><br/> <a href="mailto:darpana-rsr@yahoo.com">darpana-rsr@yahoo.com</a></p>                                                                                                                                                                                                                                                                             |
| 25 | <p>Shri D. J. Kacha,<br/> Assistant Res. Scientist (Agronomy)<br/> Main Rice Research Station<br/> Anand Agricultural University (AAU)<br/> <b>NAWAGAM</b> – 387 540<br/> Kheda Dist. Ta. (Kheda) (Gujarat)<br/> Phone-: 02694 – 284278 (O):<br/> Fax: 02694 – 284208<br/> Mobile: 09825598707<br/> E-mail: <a href="mailto:kacha_dharmesh@yahoo.com">kacha_dharmesh@yahoo.com</a><br/> <a href="mailto:rsrice_mrrs@yahoo.com">rsrice_mrrs@yahoo.com</a></p> | 26 | <p>Dr. D.K. Singh<br/> Professor Agronomy<br/> Department of Agronomy<br/> College of Agriculture (GBPUAT)<br/> <b>PANTNAGAR</b> - 263 145<br/> Dist: U.S. Nagar (Uttaranchal)<br/> Phone: 05944 – 233034 (O) 233239 (R)<br/> FAX: 05944 – 233473<br/> Mobile : 09411320066<br/> Email: <a href="mailto:ghananjay_rahul@rediffmail.com">ghananjay_rahul@rediffmail.com</a></p>                                                                                                                                                          |
| 27 | <p>Dr Gracy Mathew<br/> Professor (Agronomy)<br/> <b>Reg. Agril. Res. Station</b><br/> <b>PATTAMBI</b> - 679 306<br/> Palakkad Dist. (Kerala)<br/> Phone: 0466 – 2212275<br/> FAX : 0466 – 2 212228<br/> Mobile : 09447 873 891<br/> <b>Email:</b> <a href="mailto:gracy.mathew@kau.in">gracy.mathew@kau.in</a></p>                                                                                                                                          | 28 | <p>Dr. S. Ravi<br/> Junior Agronomist<br/> Perunthalavar Kamaraj Krishi Vigyan<br/> Kendra (PKKVK), Kurumbapet,<br/> <b>PUDUCHERRY</b> - 605 009<br/> Phone: 0413 – 2271292<br/> FAX: 0413 – 2279758<br/> Mobile: 09443293376, 09442526994<br/> Email: <a href="mailto:drsrajapkkvk@gmail.com">drsrajapkkvk@gmail.com</a><br/> <a href="mailto:pkkvk.py@gov.in">pkkvk.py@gov.in</a><br/> <a href="mailto:pkkvk.py@gmail.com">pkkvk.py@gmail.com</a><br/> <a href="mailto:pondicherrykvk@yahoo.co.in">pondicherrykvk@yahoo.co.in</a></p> |
| 29 | <p>Dr. S.K. Chaudhary<br/> Rice Agronomist<br/> Department of Agronomy<br/> Dr. Rajendra Prasad Central<br/> Agricultural University<br/> <b>PUSA (SAMASTIPUR)</b> - 848 125<br/> (Bihar)<br/> FAX: 06274 – 240255<br/> Mobile: 09431834082<br/> Email: <a href="mailto:skcrau@gmail.com">skcrau@gmail.com</a></p>                                                                                                                                           | 30 | <p>Dr. H. L. Sonboir<br/> Scientist, AICRIP, Agronomy<br/> Department of Agronomy<br/> College of Agriculture (IGAUA)<br/> <b>RAIPUR</b> - 492 006 (Chhattisgarh)<br/> Tel fax: 0771 – 2443035 (O)<br/> Mobile : 09589236296<br/> Email: <a href="mailto:sonboir@rediffmail.com">sonboir@rediffmail.com</a></p>                                                                                                                                                                                                                         |
| 31 | <p>Dr. P. Spandana Bhatt,<br/> Scientist (Agronomy),<br/> AICRIP on Rice Research centre.<br/> PJ TSAU,<br/> Agricultural Research Institute,<br/> <b>ARI RAJENDRANAGAR</b>,<br/> Hyderabad-500 030,<br/> Ph No : 040-2401 5817(O),<br/> Mobile : 9705162962</p>                                                                                                                                                                                             | 32 | <p>Dr. Ashok Kumar Singh<br/> Junior Agronomist (Rice)<br/> Birma Agricultural University, Kanke,<br/> <b>RANCHI</b> – 834 006 (Jharkhand)<br/> Ph. 0651-2450608 (Office)<br/> Mobile: 08789333028<br/> Email : <a href="mailto:aksinghbau65@gmail.com">aksinghbau65@gmail.com</a></p>                                                                                                                                                                                                                                                  |

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                              |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     | Email : <a href="mailto:spandana9119@gmail.com">spandana9119@gmail.com</a>                                                                                                                                                                                                                                                                                                                                                                   |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 33. | Dr. R. K. Tiwari<br>Senior Scientist<br>JNKVV, College of Agriculture,<br><b>REWA</b> - 486 001 (Madhya Pradesh)<br>FAX: 07662 – 220857, 07662 - 220732<br>Mobile: 09827003237<br>Email: <a href="mailto:rktkvkrewa@rediffmail.com">rktkvkrewa@rediffmail.com</a>                                                                                                                                                                            | 34. | Dr. N.T. Rafique<br>Principal scientist (Agronomy)<br>Regional Agricultural Research Station<br>(AAU), <b>TITABAR</b> – 785 630<br>DIST.JORHAT (ASSAM)<br>Phone : 03771-, 248453 (O)<br>Fax : 0376 – 2340044<br>Mobile : 09954465049<br>Email : <a href="mailto:munrafique@gmail.com">munrafique@gmail.com</a>                                                                                                                                           |
| 35. | Dr. L .S. Deshmukh<br>Agronomist, Rainfed Paddy Res. Station<br><b>TULJAPUR</b> - 413 601<br>Osmanabad Dist. (MS)<br>Phone: 02471 – 242060 (O)<br>Mobile: 09422378482<br>Email: <a href="mailto:deshmukh_ls@rediffmail.com">deshmukh_ls@rediffmail.com</a><br><a href="mailto:rprstuljapur@gmail.com">rprstuljapur@gmail.com</a>                                                                                                             | 36. | Mr. Ban Shylla<br>Research Officer (AICRIP),<br>Govt. of Meghalaya,<br>Dist. & Local Res. Stations &<br>Laboratories,<br><b>UPPER SHILLONG</b> - 793 009<br>East Khasi Hills (Meghalaya)<br>Phone: 0364 – 2224713 (O) 2521114 (R)<br>Mobile: 09856129239 (M)<br>Email: <a href="mailto:banshylla@gmail.com">banshylla@gmail.com</a><br><a href="mailto:agriroshq@gmail.com">agriroshq@gmail.com</a><br><br><b>Lakyntiew Warjri</b> <lakyn_w@yahoo.co.in> |
| 37. | Dr. V.K. Srivastava<br>Professor, Department of Agronomy<br>Institute of Agricultural Sciences<br>Banaras Hindu University<br><b>VARANASI</b> -221 005(Uttar Pradesh)<br>Phone:0542 –2 30712(O),2224519 (R)<br>FAX: 0542 – 2312059 236838<br>Mobile: 09415819900<br>Email: <a href="mailto:vksrivastava_bhu@rediffmail.com">vksrivastava_bhu@rediffmail.com</a> , <a href="mailto:vksrivastava_bhu@gmail.com">vksrivastava_bhu@gmail.com</a> | 38. | Dr. Nimai Singh,<br>Junior Agronomist,<br>AICRIP<br>Rice Research Station<br><b>WANGBAL</b> - 7595138<br>Khangabok BPO, Thoubal (Manipur)<br>Mobile: 07085990132<br>Email: <a href="mailto:nnimai15n@gmail.com">nnimai15n@gmail.com</a>                                                                                                                                                                                                                  |
| 39. | Dr. U. Nagabhushnam,<br>Senior Scientist (Agro)<br>AICICP on Rice,<br><b>RARS, Warangal,</b><br>PJTSAU, Rajendranagar,<br>Hyderabad – 500030<br>Mob: 9010104998<br>Email: <a href="mailto:bhushanagro@gmail.com">bhushanagro@gmail.com</a><br>Warangal-506 007 Dist: Warangal Ph: 0870-2100236                                                                                                                                               |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

**VOLUNTARY CENTRES:**

|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |    |                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | Dr. B. Gangaiah, Ph D (IARI), FISPRD, FISA<br>Principal Scientist (Agronomy) & Head<br>Division of Natural Resource Management<br>ICAR-Central Island Agricultural Research<br>Institute<br><b>Port Blair-744 101</b><br><b>Andaman &amp; Nicobar Islands</b><br>03192--250239(O) Ext: 149<br>Mobile: 9531808744<br>E-mail: <a href="mailto:bandla_gan@hotmail.com">bandla_gan@hotmail.com</a><br><a href="mailto:bandlaqangaiah1167@gmail.com">bandlaqangaiah1167@gmail.com</a> | 2. | Dr. Vijay Singh Meena,<br>Scientist (Soil Science)<br>ICAR - V.P.K.A.S.<br><b>ALMORA</b> - 263 601<br>(Uttaranchal)<br>Phone: 91-8004851723;<br>FAX: 91-5962-241250<br>Mobile : 91-9410971469<br>E-mail: <a href="mailto:vijayssac.bhu@gmail.com">vijayssac.bhu@gmail.com</a><br><a href="mailto:vijayssac.bhu@hotmail.com">vijayssac.bhu@hotmail.com</a><br><b><a href="mailto:vijay.meena@icar.gov.in">vijay.meena@icar.gov.in</a></b> |
| 3. | Darpan VR Bisvas,<br>Sr. Agronomist,<br>State Agricultural Research Station<br><b>ARUNDATINAGAR (P0) - 799 003</b><br>Agartala (Tripura)<br>Tele-Fax: 0381 – 2370249 (O)<br>Mobile: 07005437445<br>E-mail: <a href="mailto:sarstripura@gmail.com">sarstripura@gmail.com</a>                                                                                                                                                                                                      | 4. | Dr. S.K. Sarangi,<br>Principal Scientist,<br>ICAR-Central Soil Salinity Research<br>Institute,<br>Regional Research Station,<br><b>CANNING TOWN – 743329,</b><br>West Bengal                                                                                                                                                                                                                                                             |
| 5. | Dr. Sukanta Pal,<br>Professor, Agronomy & In-charge<br>(AICRIP trials)<br>RRSS - NAZ, Chakdaha - BCKV<br>P.O. <b>CHAKDAHA</b> - 741 222<br>Dist. Nadia (West Bengal)<br>Phone : 033-25809456 (R)03473-207365<br>(O)<br>Mobile No. 09051339686<br>E-mail : <a href="mailto:sukanta.agron@rediffmail.com">sukanta.agron@rediffmail.com</a>                                                                                                                                         | 6. | Dr. Sanjay Saha,<br>Weed Scientist,<br>Principal Scientist (Agronomy)<br>Division of Crop Production<br>ICAR-National Rice Research Institute<br><b>CUTTACK</b> - 753 006, (Odisha)<br>Phone: 0671 – 2367768- 212 (O)<br>FAX : 0671 – 2367733<br>Mobile : 07377121726<br>Email: <a href="mailto:ssahacrri@gmail.com">ssahacrri@gmail.com</a>                                                                                             |
| 7. | Dr. Teekam Singh<br>Senior Scientist (Agronomy)<br>Regional Rainfed Lowland Rice Research<br>station<br>(National Rice Research Institute, Cuttack)<br><b>GERUA,</b><br>Hajo, Kamrup, Assam-781102<br>Phone: 0361-280370, 2820334<br>Mobile: 09435397121<br>Email: <a href="mailto:tiku_agron@yahoo.co.in">tiku_agron@yahoo.co.in</a>                                                                                                                                            | 8. | Dr. Shiv Mangal Prasad,<br>Principal Scientist (Agronomy)<br>Central Rainfed Upland Rice Research<br>Station, Post Box 48,<br><b>HAZARIBAG – 825 301 (Jharkhand)</b><br>Phone: 06546 – 222263 (O)<br>Mobile: 09437542295<br>Email: <a href="mailto:smp_crri@yahoo.co.in">smp_crri@yahoo.co.in</a>                                                                                                                                        |

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                     |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9.  | <p>Dr. P. Revatti,<br/>Scientist (Agro)<br/>Regional Agricultural Research Station,<br/>PJ TSAU,<br/>Polasa – 505529,<br/><b>JAGTIAL</b>,<br/>Mob: 9912944880<br/>Email: <a href="mailto:revathi.pallakanda5@gmail.com">revathi.pallakanda5@gmail.com</a></p> <p>P. Madhukar Rao,<br/>Scientist (Agronomy)<br/>RARS, PJ TSAU,<br/><b>JAGTIAL</b>,<br/>Mob: 9505507995<br/>Email: <a href="mailto:agro_madhu@yahoo.com">agro_madhu@yahoo.com</a></p> | 10. | <p>Dr. V. Sridevi,<br/>Assistant Professor (Agronomy),<br/>Department of Agronomy<br/>PAJANCOA &amp; RI<br/><b>KARAIKAL</b>.609 603<br/>Mobile: 09344833782<br/>Phone: 04368-261372 (O)<br/>Email: <a href="mailto:srideviagr@gmail.com">srideviagr@gmail.com</a></p>                                                                                                                                                                                                                                                                   |
| 11. | <p>Dr. Krishna Murthy<br/>Scientist<br/>Central Soil Salinity Research Institute<br/>(CSSRI) Kachwa Road,<br/><b>KARNAL</b> – 132001, Haryana<br/>0184-2291218 Ext.216 (o)<br/>Mobile: 08053726399<br/>FAX: 0184 - 2290480<br/>Phone: 0184 – 2290501 Director<br/>Email: <a href="mailto:krishnagene@gmail.com">krishnagene@gmail.com</a></p>                                                                                                       | 12. | <p>Dr. Y.P. Singh<br/>Principal Scientist (Agronomy)<br/>Central Soil Salinity Research Institute<br/>Regional Research Station P.O. Dilkusha,<br/><b>LUCKNOW</b>-226002 (U.P.)<br/>Mobile: +91-7309563010<br/>Email: <a href="mailto:ypsingh_5@yahoo.co.in">ypsingh_5@yahoo.co.in</a></p>                                                                                                                                                                                                                                              |
| 13. | <p>Dr. P.K. Singh<br/>Assistant Professor,<br/>Dept. of Agril. Chemi. &amp; Soil Science,<br/>SASRD, <b>MEDZIPHEMA</b> Campus,<br/>Nagaland University, Nagaland-797 106<br/>Fax: 03862-247255<br/>Phone: 03862-247102<br/>Mobile: 09436264179<br/>Email: <a href="mailto:drpk Singh274@rediffmail.com">drpk Singh274@rediffmail.com</a></p>                                                                                                        | 14. | <p>Dr. U. Vineeta<br/>Senior Scientist &amp; Head (Agronomy),<br/>Agriculture Research Station,<br/>Near Akuthota, Muthukuru Road,<br/><b>NELLORE</b> – 542 003,<br/>Tel ; 08612327803,<br/>Mobile: 9885364406<br/>Email: <a href="mailto:vineethaharanath@yahoo.co.in">vineethaharanath@yahoo.co.in</a><br/><a href="mailto:Vineethaharanath5@gmail.com">Vineethaharanath5@gmail.com</a><br/><a href="mailto:arsnellore@yahoo.co.in">arsnellore@yahoo.co.in</a><br/><a href="mailto:arsnellore@gmail.com">arsnellore@gmail.com</a></p> |
| 15. | <p>Dr. Anand .K. Gore<br/>Agronomist &amp; Officer In-Charge<br/>Upland Paddy Research Scheme<br/>Vasanthrao Naik Marathwada Krishi<br/>Vidyapeeth (VNMKV)<br/><b>PARBHANI</b> – 431402 (M.S.)<br/>Ph No: 02452-220121<br/>Fax: 02452-220121<br/>Mobile: 09588648242, 07588082874<br/>E-mail: <a href="mailto:uprsmkv@gmail.com">uprsmkv@gmail.com</a><br/><a href="mailto:akgoremkv@gmail.com">akgoremkv@gmail.com</a></p>                         | 16. | <p>Dr. K.V. Ramana Murthy<br/>Principal Scientist &amp; Head,<br/>Agricultural Research Station,<br/><b>RAGOLU</b>, Srikakulam district - 532484<br/>Phone: 08942 279836<br/>Email: <a href="mailto:arsragolu@yahoo.co.in">arsragolu@yahoo.co.in</a></p>                                                                                                                                                                                                                                                                                |

|     |                                                                                                                                                                                                                                                                                                                                                                                                          |     |                                                                                                                                                                                                                                                  |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 17. | Dr.Birendra kumar,<br>Assistant Professor- cu Junior Scientist,<br>Agronomy,<br>Bihar Agricultural University, <b>SABOUR</b> ,<br>Bhagalpur- 813 210 (Bihar)<br><i>Mob: 9431925801</i><br><i>Phone: 0641 – 2451400 (O)</i><br><i>FAX: 0641 – 2451400</i><br><i>Email: <a href="mailto:agrobacbr76@rediffmail.com">agrobacbr76@rediffmail.com</a></i>                                                     | 18. | Dr. Thoithoi Devi<br>Scientist (Agronomy),<br>Divn. Of NRM,<br>ICAR Research Complex for NEH Region,<br>Umroi Road,<br><b>Umiam</b> (Barapani) – 793 103 (Meghalaya)<br><i>Email: <a href="mailto:thoiagri@gmail.com">thoiagri@gmail.com</a></i> |
| 19. | Dr. Narendra V. Kashid<br>Officer in charge<br>Agricultural Research Station,<br><b>VADGAON</b> Maval, Tal. Maval,<br>Dist. Pune – 412 106, Maharashtra<br><i>Phone: 02114-235229</i><br><i>Mob: 09422851505, 09881590745</i><br><i>Email: <a href="mailto:ars_vadgaonmaval@rediffmail.com">ars_vadgaonmaval@rediffmail.com</a></i><br><i><a href="mailto:kashidnv@gmail.com">kashidnv@gmail.com</a></i> | 20. |                                                                                                                                                                                                                                                  |

**Department of Agronomy, Indian Institute of Rice Research,  
Rajendranagar, Hyderabad – 500 030**

|                                                                    |                                             |                                               |
|--------------------------------------------------------------------|---------------------------------------------|-----------------------------------------------|
| <b>1. Dr. R. MahenderKumar</b>                                     | Principal Scientist and Head<br>(Agronomy)  | kumarm21364@gmail.com<br>(Mobile: 9440476493) |
| <b>2. Dr. B. Sreedevi</b>                                          | Principal Scientist (Agronomy)              | sreedevipalakolanu@gmail.com                  |
| <b>3. Dr. T.Vidhan Singh</b>                                       | Principial Scientist<br>(Agril.Engineering) | vidhan_singh@yahoo.com                        |
| <b>4. Dr.Mangal Deep Tuti</b>                                      | Scientist (Agronomy)                        | mangal.iari@gmail.com<br>(Mobile: 9456108509) |
| <b>5. Mr. SoumyaSaha</b>                                           | Scientist (Agronomy)                        | saha.soumya5@gmail.com                        |
| <b>6. Dr.Aarti Singh</b>                                           | Scientist (Agronomy)                        | aartisingh810@gmail.com                       |
| <b>7. Dr. M.N. Arun</b>                                            | ACTO (Agronomy)                             | arun_tulasi2011@yahoo.in                      |
| <b>Other Scientists Involved</b>                                   |                                             |                                               |
| Dr. B. Shailaja, Senior Scientist, Computer Application, ICAR-IIRR |                                             |                                               |

For Correspondence: aicripiagronomy@gmail.com, kumarm21364@gmail.com,  
**director.iirr@icar.gov.in**

Fax: 040-24591217, Office No. 040-24591236, Mob: 09440476493

### **ACKNOWLEDGEMENT**

*This is the 55<sup>th</sup> year of successful conduct of Agronomy trials in All India Coordinated Rice Improvement Project and expect very innovative programme in the coming (2019-20) Year. Our sincere thanks are due to all Agronomy co-operating scientists and their technical staff located at different centers and also of IIRR. Our thanks are also due to **Dr. B. Sailaja** Computer Scientist, **Mrs Gayathri** for their timely help in the statistical analysis of the data (the software used for statistical analysis is **DRRstat**). Thanks are also due to **Mr. D. Srinivas**, Research Associate, **Mrs. A. Sandhya Rani**, Young Professional-II, **Mr. B. Venkatanna**, Technical Assistant, **E. Giri Prasad** Project Assistant for their pertinacious efforts. We also appreciate the efforts of Technical Staff of Department –**Mr. S.Vijay Kumar** for their unstinted technical support in conduct of AICRIP field trials. We thank immensely our Director, IIRR for his constant guidance and support for Agronomy section.*