PLANT PHYSIOLOGY

6. PLANT PHYSIOLOGY

CONTENTS

6. Plant Physiology

Summary

Physiological studies under All India Co-Ordinated Rice Improvement Program were conducted at eight funded centres, (Coimbatore, Maruteru, Pantnagar, Pattambi, Rewa, Raipur, Karjat and Titabar), two ICAR institutions (IIRR Hyderabad and NRRI Cuttack) and five voluntary centres (RARS Chinsurah, NDUAT Faizabad, PJNAR Karaikal, RARS Karjat and IGKV RAIPUR). The trials conducted during 2017 are given as below.

Star Chart of Plant Physiology Coordinated Studies for the Year Kharif 2017

Locations	Trials						Allotted	Conducted	Conducted (%)	Not conducted	Grand Total
	Silicon	Heat Tolerance	RFU	MAS	RNUE	LLS					
CHN	√	√	√	-	-	-	3	2	66.7	1	3
CBT	√	-	-	√	√	-	3	3	100	-	3
NRRI	√	-	-	√	-	√	3	3	100	-	3
IIRR	√	√	-	√	√	√	5	5	100	-	5
FZB	-	-	√	-	-	-	1	1	100	-	1
KJT	√	-	-	√	√	√	4	4	100	-	4
KRK	√	-	-	√	-	-	2	2	100	-	2
MTU	√	√	-	√	√	√	5	5	100	-	5
PNR	√	√	-	-	√	√	4	4	100	-	4
PTB	√	√	√	√	√	-	5	5	100	-	5
REWA	-	√	√	√	-	-	3	3	100	-	3
TTB	√	√	-	√	√	√	5	5	100	-	5
RPUR	-	-	√	-	√	√	3	3	100	-	3
Total	**10**	**7**	**5**	**9**	**8**	**7**	**46**	**45**		**1**	**46**

The salient findings of the experimental research are presented below:

6.1 Influence of silicon solubilises on induced stress tolerance in rice genotypes

Plants vary in the capacity to absorb silicon, plants that can absorb and accumulate silicon in their tissues are known as silicon accumulators. There plants accumulate up to 4 – 7 % silicon in them. In contrary, silicon non accumulators can only absorb and store 0.5 – 1.5% silicon. Rice exhibits the greatest uptake of silicic acid in the grass family With application of large quantities of silicon fertilizers, rice can accumulate silicon in the stem and leaves up to 10 – 15 % of dry weight. In view of the importance of silica in rice cultivation, a trail was conducted at different AICRIP locations spread across the country to investigate the role of silicon in plant nutrition and increasing the productivity of rice with four hybrids and two varieties i.e Sahabhagidhan and IR64 at ten locations with the objective to study the effect of silixol, a commercial formulation on uptake of silicon by rice and its influence on yield. Four hybrids and two varieties were taken up for the study to understand the influence of silixol application on rice plant under water stress situation. Silixol had positive role with reference to enhanced total dry matter, grain yield/m^2 and Harvest index. Silixol application has

positive role in improving the total dry matter and grain yield under water stress. Among the tested varieties, PHB-71 and IR64 responded well to silixol application with reference to total dry matter, whereas grain yield response and harvest index were more in KRH-4. Even with the imposition of water stress, Sahabhagidhan (total dry matter), PA-6129 (grain yield/m^2 and harvest index) were able to maintain good total dry matter, grain yield and harvest index.

6.2 Screening of elite rice cultures for drought tolerance:

Rice is the important food crops of the world for more than half of the world population grown mainly under irrigated conditions in Asia, about 45% of the total rice area is estimated to have no irrigation input. Yield of rainfed lowland rice, which occupies about 25% of the world‘s rice areas, are drastically reduced by drought due to unpredictable, insufficient and uneven rainfall during the growing period. To reduce yield losses of rice crops in rainfed lowland areas and to increase overall rice production, new rice varieties with greater adaptation to drought are essential. Hence, the development of drought resistant cultivars with a higher yield potential is one of the main objectives of rainfed lowland rice breeding programmes. A trail was conducted with 42 varieties and two treatments (rainfed and irrigated) at PTB, RPUR, REWA and FZB locations to study the drought tolerance traits of rice varieties. Grain yield and its components were greatly influenced by the irrigation regimes. Among the tested varieties, reduction in grain yield was less than the average for 19 varieties with a mean of 21%. Among all the tested locations, lowest reduction in mean grain yield was at REWA. The mean grain yield g/m^2 was maximum in IET 26617 and IET 26616 under irrigated and rainfed conditions. The entries with high grain yield under rainfed conditions are suitable for rainfed limited water supply cultivation.

6.3 Evaluation of rice genotypes for terminal heat stress tolerance suitable for future climate

In the scenario of global climate change, farming community felt hard to attain self sufficiency and to meet the ever increasing demand for food grain production on existing farm lands. Increased atmospheric CO_2 and emission of Non-CO_2 Green House Gases (Non CO_2 GHG’s) – methane (CH_4) and nitrous oxide (N_2O) - resulted from an anthropogenic activity of applying excessive nitrogen (N) fertilizer doses to the field crops are the grounds for increasing the global temperature. Furthermore, global climate change is likely to be intensify the current vulnerability of the rice crop to high temperatures, with a projected global average surface temperature increase of 1.4 - 5.8^oC by the end of 21st century and the possibility of increased variability about this mean (IPCC, 2013). The crop was exposed to

elevated temperature from PI stage to maturity by covering with polythene tunnel. Under elevated temperature regime, the mean grain yield for all entries and locations was reduced by > 60%. The reduction in mean grain yield for all entries were maximum at IIRR location followed by PTB, PNR and TTB, conversely minimum grain yield was noticed at REWA, CHN and MTU. The reduction in grain yield under high temperature was less (< 30% over control) in IET26768, IET26778, 175-2(K), IET26763, IET26776, S-458 and IET 26772. Furthermore it was observed that, IET 26768 has less (< 20%) reduction in filled grain number per panicle and panicle number per square meter under elevated temperature. Among the better yielding genotypes under heat stress conditions, IET 26778 and IET 26763 maintained good harvest index (<10% reduction) under heat stress.

6.4 Physiological characterization of selected rice genotypes for multiple abiotic stress Tolerance

Rice is one of the important food crops of the world, based on its food supplementation and source of income. At least 25% increase in rice production by the next decade has to be achieved despite of the various factors adversely affecting the rice production. Among all the problems associated with rice production, abiotic stress tolerance is a major objective in majority of rice breeding programs around the world. The present study shows that, imposition of different abotic stresses shows detrimental effect on the seedling germination and growth. Under 1% mannitol water stress condition, MAS317,MAS 314, MAS319 and MAS306 were superior in the measured traits. With the imposition of 2% mannitol stress, MAS303, MAS308, MAS302, MAS304 were better performers. Similarly under salt stress, anaerobic stress and cold stress, MAS 317 showed higher seedling vigour. Varieties such as MAS306, MAS314, MAS319, MAS304 showed better growth characters under control. Across all the stresses, MAS306, MAS314 and MAS 317 showed superior performance among all the varieties tested.

In the study conducted at 9 locations under AICRIP-Plant Physiology program for multiple abiotic stress tolerance viz., 1%mannitol, 2% mannitol, anaerobic stress, salt stress and cold stress, three cultures (MAS 306, MAS 314, MAS 317) were identified based on their performance in terms of germination, shoot, root growth and seedling vigour.

6.5 Evaluation of Radiation and Nitrogen use efficient promising rice genotypes

The high yield potential of improved rice plant types is mostly expressed with adequate solar radiation during the dry season. Grain yield is comparatively low during the

wet season due to cloudy days with inadequate light intensity. It is reported that grain yield correlates positively with solar radiation, especially during later stages of crop growth. It is estimated that, a cumulative solar radiation of 200 hrs bright sunshine during the 30 day before harvest could be optimum for grain yield. Nitrogen is one of the important factors influencing the rice productivity and the increase in food production during the past four decades is associated with ~7 fold increase in the N fertilizers application. Increased application of N fertilizers may not necessarily increase the grain yield always. The genotypic potential in absorbing and utilization of applied nitrogen plays important role in the grain yield improvement of rice crop. Nitrogen use efficiency is a complex phenomenon which is defined as increase in grain yield produced per unit of applied nitrogen. Increasing nitrogen use efficiency is imperative to future sustainable agriculture. The trail was conducted with three nitrogen treatments (0,100 and 50% RDNN) and 12 varieties. Among the tested varieties, varadhan x MTU 1010/2 showed minimum reduction in grain yield/m^2 with N limitation. Among the tested varieties, highest grain yield (g/m^2) was observed in BPT-5204, Varadhan x BPT 5204/6 (0% RDN) and varadhan x BPT 5204/6, varadhan x MTU 1010/2 (50% RDN) and Sampada, Varadhan x BPT 5204/6 (100% RDN). Among the high yielding varieties under three N levels, Varadhan x BPT 5204/6 performed well under all the three N levels.

6.6 Screening of rice varieties for tolerance to low light stress

The present study was formulated during 51st ARGM of AICRIP to understand low light tolerance and to identify rice genotypes with low light tolerance. The trail was conducted at seven locations with 21 varieties, including Swarnaprabha as check variety. Results indicated low light stress resulted in significant loss in yield and its components. Under low light stress higher grain yield was shown by check Swarnaprabha, followed by IET 25865. Among the tested varieties, IET 25206, IET 25814, IET 23356 showed lesser reduction in grain yield (33%, 34%, 35% reduction) under low light stress conditions. Inspire of the better grain yield (g/m2), varieties such as IET 23356 and IET 25835 showed lower extent of reduction in stem weight and shoot weight at maturity under low light stress conditions. IET 25876 under low light stress maintained better grain yield (36% reduction), panicle weight at flowering (11% reduction), TDM (10% reduction) at flowering and harvest index (1% reduction).

6.1 Influence of silicon solubilises on induced stress tolerance in rice genotypes

Locations: CBT, CHN, NRRI, IIRR, KRK, MTU, PNT, PTB, TTB and KJT

Plants vary in the capacity to absorb silicon, plants that can absorb and accumulate silicon in their tissues are known as silicon accumulators. There plants accumulate up to 4 – 7 % silicon in them. In contrary, silicon non accumulators can only absorb and store 0.5 – 1.5% silicon. Rice exhibits the greatest uptake of silicic acid in the grass family With application of large quantities of silicon fertilizers, rice can accumulate silicon in the stem and leaves up to 10 – 15 % of dry weight. In view of the importance of silica in rice cultivation, a trail was conducted at different AICRIP locations spread across the country to investigate the role of silicon in plant nutrition and increasing the productivity of rice with four hybrids and two varieties i.e Sahabhagidhan and IR64 at ten locations with the objective to study the effect of silixol, a commercial formulation on uptake of silicon by rice and its influence on yield. Silixol at the rate of 400 ml in 200 litres of water per acre (as spray) were used at active tillering, panicle initiation, 50% flowering and milky grain stages. The experimental layout was RBD with three replications. In the present experiment, four treatments were given as control, spray at 0.6% silixol at four stages. A water stress treatment was included were in water stress was imposed after anthesis stage by withdrawing irrigation and no irrigation was provided upto physiological maturity. The fourth treatment was only water stress. In this study emphasis was laid on the effect of water stress and the role of silixol in overcoming the imposed stress. Efforts were made to understand the role of silicon in ameliorating water stress and application of silixol in understanding abiotic stress tolerance.

Significant differences were observed among the varieties ($p<0.05$) with respect to Days to 50% flowering (DFF). Even though the effect of slicon application on DFF was not significant, across the locations, silicon application revealed significant variation in DFF. Interaction was found to be significant for silicon x location ($p<0.01$) and location x variety ($p<0.01$). DFF was varied from 86 – 99 days under control conditions. Varietal variation in DFF with the application of silixol was observed and the mean DFF was varied from 87 – 99 days, with slight increase in DFF at IIRR, KRK locations and reduction at MTU, TTB locations, however there was no variation in DFF in the remaining locations with silixol application. Water stress showed 4% reduction in mean DFF and varied from 79 – 98 days. Application of silixol has increased DFF under water stress from 89 to 93 days and the

increase was more at CBT and CTK locations. Among all the genotypes, PA6129 and IR64 showed greater response to the silixol application by increasing the DFF (12%).

Application of silioxl has no significant effect on days to maturity, however the variation was significant for varieties ($p<0.05$) and the interaction was found to be significant for location x silicon ($p<0.01$) and location x variety ($p<0.01$). Days to maturity was varied form 118-129 and days with a mean of 124 days under control and silixol applied conditions. Imposition of water stress has resulted in marginal reduction in mean days to maturity time. Reduction in days to maturity was varied widely among the genotypes and ranged from 106-128 with a mean of 120 days. Among the varieties, KRH-4 and PA-6129 showed early maturity, whereas sahabhagidhan, US-312 and IR64 showed no variation under the water stress. Application of silixol showed improvement of the days to maturity time in PA-6129 and KRH-4, however there was no much variation in other varieties with the application of silixol under water stress.

Silicon application has significant influence on shoot dry weight among the varieties ($p<0.01$) and locations and the interaction was found to be significant ($p<0.01$) except for silicon x variety. Shoot dry weight was varied from 591 – 1016 g/m^2 and 574 – 1016 g/m^2 under control and silixol treatments. Among the locations, greater shoot dry weight was recorded in CHN followed by CBT and KJT locations. Application of silixol resulted in 7% increase in shoot dry weight/m^2 in CHN, CTK, PTB and KJT.

Panicle number/m^2 at harvest was increased with the application of silixol and the interaction of silixol application and location was found to be significant ($p<0.01$). Across locations, greater panicle numbers were detected at MTU and PTB. Panicle number/m^2 was ranged from 265 – 318 and 279 – 347 with a mean of 298/m^2 and 313/m^2 under control and silixol treatments respectively. Imposition of water stress showed reduction in panicle number/m^2 (288/m^2) compared to control (298/m^2). Application of silixol under water stress showed varied response among the genotypes and it has alleviated water stress by increasing the panicle number/m^2 by 13% and 4% in PA-6129 and IR64. Among the tested varieties, greater panicle number/m^2 were observed in IR64 and KRH-4 (water stress and silixol + water stress), KRH-4 (control) and IR64 (silixol).

Panicle weight was found to be influenced by treatments and significant variation was observed among varieties ($p<0.01$). The mean panicle weight was 515, 550, 540 and 429 g/m^2 under control, silixol application, water stress and silixol + water stress conditions.

Panicle weight was varied from 695 – 911 g/m^2 and 735 – 970 g/m^2 under control and silixol treatments. Imposition of water stress resulted in reduction in panicle weight/m^2 (31%), and among the varieties, lowest and highest reduction was detected in PA-6129 (12%) and IR64 (40%) respectively. Across the locations, higher reduction in panicle weight/m^2 was observed in TTB (22%), followed by MTU and PNT (17%), CBT (15%) and PTB (13%). Application of silixol increased the mean panicle weight/m^2 by 35% and among the varieties, US-312 and IR64 showed maximum response in panicle weight/m^2 and among the locations, greater increase was detected in PNT (21%), MTU (10%), TTB (7%), PTB and CBT (4%). Among the varieties, greater panicle weight/m^2 was observed in KRH-4 (control), PA-6129 (water stress) and PHB-71 (silixol and silixol + water stress).

Grain number per panicle was varied significantly ($p<0.01$) among the tested varieties, and the trait was found to be location specific with greater grain number per panicle at KJT and PNT locations across three treatments along with control. The mean grain number per panicle was not varied much with the application of silixol, however wide variation among genotypes were seen with silixol application (110 – 178) with a mean of 142 per panicle. Imposition of water stress showed reduction in grain number per panicle by 21% and among the genotypes, lowest and highest reduction was observed in US-312 and PHB-71 with a mean of 22% reduction over control. Silixol spray has increased the grain number per panicle under water stress by 11% and among the tested varieties, PHB-71 (23% increase) showed good response.

Spikelet number per panicle was non significantly varied with the application of silixol, whereas the differences were significant ($p<0.01$) among varieties under study. Interaction was found to be significant for location, silicon and variety. Among the genotypes, KRH-4 showed greater number of spikelets per panicle under all the treatments along with control. PNT showed higher spikelet number per panicle among all the locations. Spikelet number per panicle was varied from 107 – 173 with a mean of 151 under control conditions. With the application of silixol, diverse response was observed among the genotypes and the spikelet number was varied from 104 – 189 with a mean of 152. With the imposition of water stress, the spikelet number was reduced by 12% and varied from 95 – 163 with a mean of 133. Among the tested varieties under water stress, higher and lower reduction in spikelet number was observed in PHB-71 (22%) and US-312 (4%). Application of silixol under water stress has varied response in spikelet number, increase in spikelet number was observed at CBT, PNT and PTB locations. Among the genotypes, improvement

in spikelet number was observed in PHB-71 (4%) and Sahabhagidhan (2%) under water stress with silixol application, while in other genotypes it was not detected.

Spikelet number/m^2 was varied from 26284 – 43925 with a mean of 36144 under control conditions. Application of silixol improved the spikelet number/m^2 by 9% and among the tested varieties silixol application improved spikelet number to the great extent in PA-6129 (23%). Among the genotypes, greater spikelet number/m^2 was observed in KRH-4 under all the treatments. Imposition of water stress resulted in reduction of spikelet number/m^2 (12%) and the reduction was more in PHB-71 (16%) followed by IR64 and Sahabhagidhan (15%), US-312 (13%), KRH-4 (11%) and PA-6129 (3%). Application of silixol resulted in increase of spikelet number/m^2 and the increase was more in sahabhagidhan (7%), IR 64 (5%).

Significant differences were observed in total dry matter/m^2 (TDM) with the application of silicon ($p<0.01$) and the interaction was found to be significant except for the silicon x variety. Among the locations, wide variation was observed in total dry matter /m^2 (Figure 1). TDM was varied from 1072 – 1461 g/m^2 with a mean of 1241 g/m^2 under control conditions. TDM was improved with the application of silixol (Fig. 2) and the increase was more in PHB-71 and IR64 with a mean of 1301 g/m^2. Imposition of water stress resulted in significant reduction in TDM (Figure 2) and the reduction was >9% in all the varieties and among the varieties, PA-6129 (19%) and Sahabhagidhan (17%) showed more reduction. With the application of silixol, mean TDM was improved by 6% under water stress situation, and among all the varieties, Sahabhagidhan and PA-6129 showed good response in TDM (19% and 14% increase) to the silixol application, indicating the positive effect of silixol in alleviating the water stress by improving the TDM.

Significant differences were observed in grain yield/m^2 between the treatments ($p<0.01$) and the interaction was found to be significant. Mean grain yield was 553, 592, 499, 443 g/m^2 under control, silixol, silixol+water stress and water stress conditions respectively (Fig. 2). Among the genotypes, KRH-4 showed higher grain yield under all the treatments. Application of silixol increased the grain yield/m^2 by 7% and the increase was varied among the tested varieties. Among the tested varieties, US-312 (11% increase), Sahabhagidhan (10% increase) and KRH-4 (10% increase) showed good response to the silixol application. With the imposition of water stress, grain yield was reduced significantly, and varied from 382 – 487 g/m^2 with a mean of 434 g/m^2. Among the tested varieties, less reduction in grain yield

was detected in IR64 and KRH-4 (18% reduction), whereas higher reduction was noted in PA-6129 (34% reduction) and PHB-71(20% reduction). Among the locations, higher grain yield/m^2 was observed at IIRR location (Figure 1). Grain yield/m^2 was improved with the application of silixol and the increase was more at CTK, followed by PNT and TTB. Grain yield/m^2 was varied from 415 – 540 g/m^2 with a mean of 499 g/m^2 under silixol + water stress treatment. All the tested varieties showed response to silixol application and increase in grain yield/m^2 (15% increase) was detected. Among the tested varieties, PA-6129 (35% increase) showed good response, followed by Sahabhagidhan (15% increase), US-312 (14% increase), KRH-4 (11% increase), PHB-71 (11% increase) and IR64 (7% increase).

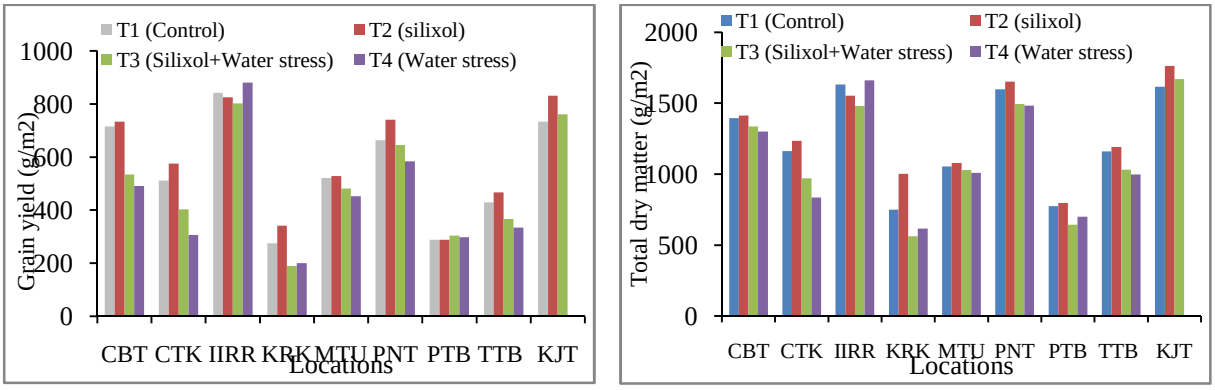


Fig. 1: Variation in grain yield and total dry matter (g/m^2) under different locations

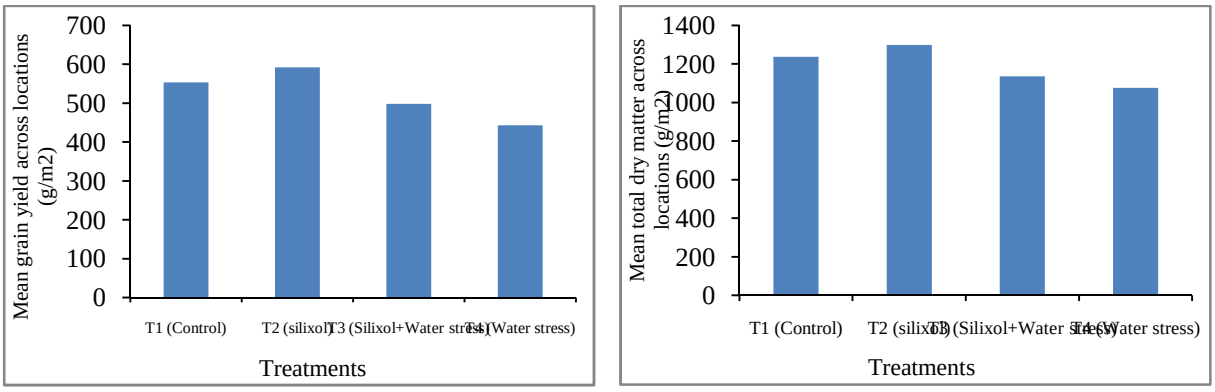


Fig. 2: Variation in grain yield and total dry matter (g/m^2) across locations under different treatments

Significant differences were observed in 1000 grain weight (TGW) between treatments ($p<0.01$) and the interaction was found to be significant except for variety and silicon x variety. Mean TGW was 21.4 g, 21.8 g, 20.5 g and 19.7 g under control, silixol spray, silixol + water stress and water stress treatments respectively. TGW was slightly increased with the application of silixol and varietal variation was ranged from 19.6 g to 23 g with a mean of 21.7 g. Among the varieties, KRH-4 and sahabhagidhan showed better

increase in TGW followed by PA-6129 and PHB-71. All the genotypes showed reduction (10%) in TGW under water stress condition and the genotypes IR 64 (21.1 g) and PHB-71 (20.6 g) maintained better TGW under water stress condition. TGW was varied from 17.4 – 21.1 g under water stress condition. Application of silixol resulted in increase in TGW in all the tested varieties, indicating the positive effect of the silixol in increasing TGW even under drought conditions. Among the tested varieties, silixol response was more in Sahabhagidhan (13%) and PA-6129 (11%).

Harvest index (%) was varied significantly between treatments ($p<0.01$) and the interaction was significant except for variety and silicon x variety. Silicon application showed significant interaction with locations. Overall mean harvest index was ranged from 39.36 – 43.94 % and 40.69 – 45.69 % with a mean of 42.22 % and 42.80% under control and silixol treatments respectively. Application of silixol increased the mean harvest index and among the genotypes, the increase was more in KRH-4, Sahabhagidhan and PHB-71. Imposition of water stress resulted in significant reduction in harvest index, among the genotypes Sahabhagidhan maintained better harvest index under water stress situations, with lowest reduction in comparison to control. Application of silixol resulted in increased harvest index in all the tested varieties and the increase was more in PA-6129 (18% increase) followed by US-312 (14% increase) in comparison with water stress situation, which was indicating the efficiency of these genotypes in maintaining better harvest index with silixol application.

Summary and conclusion:

Four hybrids and two varieties were taken up for the study to understand the influence of silixol application on rice plant under water stress situation. Silixol had positive role with reference to enhanced total dry matter, grain yield/m^2 and Harvest index. Silixol application has positive role in improving the total dry matter and grain yield under water stress. Among the tested varieties, PHB-71 and IR64 responded well to silixol application with reference to total dry matter, whereas grain yield response and harvest index were more in KRH-4. Even with the imposition of water stress, Sahabhagidhan (total dry matter), PA-6129 (grain yield/m^2 and harvest index) were able to maintain good total dry matter, grain yield and harvest index.

Table 6.1.1 Influence of Silica application days to flowering at different locations Kharif 2017

Treat.	S.No.	Varieties	CBT	CHN	CTK	IIRR	KRK	MTU	PNT	PTB	TTB	KJT	Grand Mean
T1 (Control)	1	IR-64	89	91	82	91	80	91	82	90	100	95	89
	2	KRH-4	94	105	91	99	91	98	105	90	109	99	98
	3	PA-6129	89	86	85	97	95	0	82	93	75	91	88
	4	PHB-71	94	110	94	98	96	98	100	92	101	103	99
	5	Sahabhagidhan	85	86	75	90	84	87	82	88	95	90	86
	6	US-312	94	106	92	98	93	96	85	90	104	96	95
		T1 Mean	91	97	87	96	90	94	89	91	97	95	93
T2 (0.6% Silixol)	1	IR-64	89	91	82	92	79	89	82	90	100	95	89
	2	KRH-4	94	105	91	98	92	99	105	90	106	99	98
	3	PA-6129	89	86	85	97	97	0	80	93	75	92	88
	4	PHB-71	94	110	94	100	97	96	100	92	101	102	99
	5	Sahabhagidhan	85	86	75	91	86	88	82	88	95	90	87
	6	US-312	94	106	92	99	94	95	85	91	104	96	96
		T2 Mean	**91**	**97**	**87**	**96**	**91**	**93**	**89**	**91**	**97**	**95**	**93**
T3 (Silixol + water stress)	1	IR-64	89	91	84	92	80	89	82	90	98	95	89
	2	KRH-4	99	105	94	100	91	98	105	90	106	97	98
	3	PA-6129	91	86	87	97	96	0	80	93	75	92	89
	4	PHB-71	97	110	96	100	96	97	100	92	98	103	99
	5	Sahabhagidhan	92	86	75	91	86	89	82	88	93	90	87
	6	US-312	98	106	96	99	92	96	85	91	102	96	96
		T3 Mean	**94**	**97**	**89**	**97**	**90**	**94**	**89**	**91**	**95**	**95**	**93**
T4 (Water stress)	1	IR-64	89	91	84	92	77	87	82	90	97	0	79
	2	KRH-4	98	105	94	99	90	97	105	90	106	0	98
	3	PA-6129	92	86	87	99	96	0	82	93	75	0	79
	4	PHB-71	94	110	96	99	96	96	100	92	98	0	98
	5	Sahabhagidhan	85	86	75	92	86	88	82	88	93	0	86
	6	US-312	96	106	96	100	92	95	85	91	102	0	96
		T4 Mean	**92**	**97**	**89**	**97**	**90**	**93**	**89**	**91**	**95**	**0**	**89**
		Grand Mean	**92**	**97**	**88**	**96**	**90**	**93**	**89**	**91**	**96**	**72**	**92**
		LSD (Silicon)					NS						
		LSD (Center x Silicon)					0.88**						
		LSD (Variety)					0.32*						
		LSD (Center x Variety)					1.29**						
		LSD (Silicon x Variety)					ns						
		LSD (Center x Silicon x Variety)					ns						
		CV (%)					1.37						

Table 6.1.2 Influence of Silica application days to maturity at different locations Kharif 2017

Treat.	S.No.	Varieties	CBT	CHN	CTK	IIRR	KRK	MTU	PNT	PTB	TTB	KJT	Grand Mean
T1 (Control)	1	IR-64	129	120	114	118	113	123	101	125	131	124	120
	2	KRH-4	126	135	124	128	124	133	120	130	143	128	129
	3	PA-6129	127	115	116	126	128	0	104	124	110	121	119
	4	PHB-71	129	133	126	127	126	130	120	136	130	133	129
	5	Sahabhagidhan	117	115	107	117	116	120	109	134	125	120	118
	6	US-312	128	135	126	127	121	130	107	133	138	126	127
		T1 Mean	**126**	**125**	**119**	**124**	**121**	**127**	**110**	**130**	**130**	**125**	**124**
T2 (0.6% Silixol)	1	IR-64	129	120	114	119	115	121	101	134	131	124	121
	2	KRH-4	126	135	124	126	122	131	118	131	143	128	128
	3	PA-6129	127	115	116	126	128	0	103	126	110	122	119
	4	PHB-71	129	133	127	128	126	131	120	136	130	132	129
	5	Sahabhagidhan	118	115	107	118	115	121	109	135	125	120	118
	6	US-312	128	135	126	127	124	131	107	134	138	128	128
		T2 Mean	**126**	**125**	**119**	**124**	**122**	**127**	**110**	**133**	**130**	**126**	**124**
T3 (Silixol + water stress)	1	IR-64	132	120	114	119	113	118	101	128	127	124	120
	2	KRH-4	130	135	127	129	123	128	122	133	139	129	129
	3	PA-6129	130	115	119	125	126	0	103	125	106	122	119
	4	PHB-71	133	133	127	128	128	128	124	136	127	133	130
	5	Sahabhagidhan	116	115	107	119	117	117	109	133	123	120	118
	6	US-312	130	135	127	127	122	127	110	134	134	127	127
		T3 Mean	**129**	**125**	**120**	**125**	**122**	**124**	**112**	**131**	**126**	**126**	**124**
T4 (Water stress)	1	IR-64	130	120	116	118	112	114	101	132	127	0	119
	2	KRH-4	127	135	96	127	123	125	120	134	139	0	125
	3	PA-6129	127	115	119	127	125	0	104	129	106	0	106
	4	PHB-71	131	133	130	127	125	127	120	136	127	0	128
	5	Sahabhagidhan	120	115	107	119	115	115	109	132	123	0	117
	6	US-312	131	135	130	129	123	126	107	135	134	0	128
		T4 Mean	**128**	**125**	**116**	**125**	**120**	**121**	**110**	**133**	**126**	**0**	**123**
		Grand Mean	**127**	**125**	**119**	**124**	**121**	**125**	**110**	**132**	**128**	**94**	**124**
		LSD (Silicon)					NS						
		LSD (Center x Silicon)					1.38**						
		LSD (Variety)					0.48*						
		LSD (Center x Variety)					1.65**						
		LSD (Silicon x Variety)					NS						
		LSD (Center x Silicon x Variety)					3.3**						
		CV (%)					1.29						

Table 6.1.3 Influence of Silica application shoot weight (g/m2) at maturity at different locations Kharif 2017

Treat.	S.No.	Varieties	CBT	CHN	CTK	IIRR	KRK	MTU	PNT	PTB	TTB	KJT	Grand Mean
T1 (Control)	1	IR-64	510	1423	134	454	0	0	567	455	598	732	591
	2	KRH-4	1531	1951	181	791	0	0	925	888	844	970	1016
	3	PA-6129	1176	1874	149	691	0	0	467	439	571	755	767
	4	PHB-71	940	2247	177	764	0	0	633	705	727	872	885
	5	Sahabhagidhan	1469	1154	166	470	0	0	492	490	478	871	674
	6	US-312	1092	2048	175	732	0	0	717	670	650	1025	869
		T1 Mean	1120	1783	164	650	0	0	633	608	645	871	800
T2 (0.6% Silixol)	1	IR-64	551	1915	196	448	0	0	492	690	582	860	696
	2	KRH-4	1773	2392	181	627	0	0	1050	669	773	1041	1066
	3	PA-6129	725	1558	144	664	0	0	442	421	617	725	653
	4	PHB-71	751	2318	183	593	0	0	717	637	751	951	850
	5	Sahabhagidhan	657	1441	174	489	0	0	345	439	476	1083	574
	6	US-312	1038	2246	164	757	0	0	625	873	652	938	908
		T2 Mean	**916**	**1978**	**174**	**596**	**0**	**0**	**612**	**621**	**642**	**933**	**791**
T3 (Silixol + water stress)	1	IR-64	644	1724	142	439	0	0	358	519	646	801	639
	2	KRH-4	1743	2586	134	643	0	0	767	803	625	1061	1043
	3	PA-6129	1026	1418	152	581	0	0	608	439	432	688	665
	4	PHB-71	821	2344	163	468	0	0	517	502	666	957	783
	5	Sahabhagidhan	502	1385	105	586	0	0	475	422	451	1003	561
	6	US-312	1323	2348	154	678	0	0	567	524	689	951	897
		T3 Mean	**1010**	**1968**	**142**	**566**	**0**	**0**	**549**	**535**	**585**	**910**	**765**
T4 (Water stress)	1	IR-64	656	2049	107	576	0	0	442	462	708	0	714
	2	KRH-4	1137	2741	127	786	0	0	800	836	732	0	1023
	3	PA-6129	887	1729	127	610	0	0	392	506	407	0	665
	4	PHB-71	874	2830	145	528	0	0	683	518	731	0	901
	5	Sahabhagidhan	610	2090	102	619	0	0	475	470	418	0	683
	6	US-312	1274	2786	168	782	0	0	808	618	578	0	1002
		T4 Mean	**906**	**2371**	**129**	**650**	**0**	**0**	**600**	**568**	**596**	**0**	**832**
		Grand Mean	**988**	**2025**	**152**	**616**	**0**	**0**	**598**	**583**	**617**	**679**	**797**
		LSD (Silicon)								*ns*			
		LSD (Center x Silicon)								*156***			
		LSD (Variety)								*49***			
		LSD (Center x Variety)								*149***			
		LSD (Silicon x Variety)								*ns*			
		LSD (Center x Silicon x Variety)								*298***			
		CV (%)								*22.75*			

Table 6.1.4 Influence of Silica application panicle number/m2 maturity at different locations Kharif 2017

Treat.	S.No.	Varieties	CBT	CHN	CTK	IIRR	KRK	MTU	PNT	PTB	TTB	KJT	Grand Mean
T1 (Control)	1	IR-64	262	232	324	310	0	385	233	367	260	301	297
	2	KRH-4	402	236	223	397	0	407	300	383	228	286	318
	3	PA-6129	332	261	219	387	0	0	217	183	263	261	265
	4	PHB-71	357	275	247	337	0	319	250	433	243	299	307
	5	Sahabhagidhan	250	235	221	280	0	473	300	350	280	334	303
	6	US-312	297	238	241	413	0	352	233	367	233	299	297
		T1 Mean	**317**	**246**	**246**	**354**	**0**	**387**	**256**	**347**	**251**	**297**	**298**
T2 (0.6% Silixol)	1	IR-64	273	239	302	307	0	396	317	750	284	254	347
	2	KRH-4	405	227	217	317	0	429	417	317	243	293	318
	3	PA-6129	343	224	208	407	0	0	317	217	291	226	279
	4	PHB-71	378	231	260	363	0	341	333	333	252	256	305
	5	Sahabhagidhan	258	219	239	380	0	462	367	317	303	244	310
	6	US-312	308	214	246	417	0	352	350	500	264	230	320
		T2 Mean	**328**	**226**	**245**	**365**	**0**	**396**	**350**	**406**	**273**	**250**	**313**
T3 (Silixol + water stress)	1	IR-64	257	215	301	367	0	374	183	633	245	272	316
	2	KRH-4	393	232	241	317	0	363	267	450	215	269	305
	3	PA-6129	327	217	266	313	0	0	250	217	218	260	258
	4	PHB-71	362	218	229	343	0	297	250	383	222	274	286
	5	Sahabhagidhan	242	206	259	370	0	429	267	267	263	245	283
	6	US-312	292	205	278	387	0	341	250	300	220	250	280
		T3 Mean	**312**	**216**	**262**	**349**	**0**	**361**	**244**	**375**	**231**	**262**	**288**
T4 (Water stress)	1	IR-64	255	215	274	420	0	330	183	517	233	0	303
	2	KRH-4	359	231	272	370	0	363	250	567	203	0	327
	3	PA-6129	320	240	237	337	0	0	217	283	200	0	229
	4	PHB-71	337	233	267	317	0	286	250	400	222	0	289
	5	Sahabhagidhan	240	220	190	397	0	495	267	267	248	0	290
	6	US-312	290	239	244	330	0	330	217	450	208	0	289
		T4 Mean	**300**	**230**	**247**	**362**	**0**	**361**	**231**	**414**	**219**	**0**	**288**
		Grand Mean	314	229	250	358	0	314	270	385	243	0	295
		LSD (Silicon)						*ns*					
		LSD (Center x Silicon)						*44***					
		LSD (Variety)						*ns*					
		LSD (Center x Variety)						*60***					
		LSD (Silicon x Variety)						*ns*					
		LSD (Center x Silicon x Variety)						*91**					
		CV (%)						*21.7*					

Table 6.1.5 Influence of Silica application panicle weight (g/m2) maturity at different locations Kharif 2017

Treat.	S.No.	Varieties	CBT	CHN	CTK	IIRR	KRK	MTU	PNT	PTB	TTB	KJT	Grand Mean
T1 (Control)	1	IR-64	1125	0	0	656	0	432	872	283	468	989	695
	2	KRH-4	1354	983	0	1033	0	517	1420	467	612	1097	911
	3	PA-6129	1390	777	0	1246	0	0	1130	183	504	951	773
	4	PHB-71	1518	964	0	1066	0	605	1317	200	493	1043	863
	5	SAHABHAGIDHAN	1428	608	0	802	0	715	1333	283	499	924	864
	6	US-312	1427	792	0	1088	0	591	1137	483	514	983	856
		T1 Mean	**1374**	**766**	**0**	**982**	**0**	**477**	**1201**	**317**	**515**	**515**	**515**
T2 (0.6% Silixol)	1	IR-64	1138	463	0	662	0	435	1184	283	456	916	735
	2	KRH-4	1367	859	0	940	0	503	1833	433	657	961	959
	3	PA-6129	1473	497	0	1139	0	0	1528	183	555	1024	768
	4	PHB-71	1531	1093	0	974	0	622	1723	350	572	1022	970
	5	Sahabhagidhan	1375	562	0	883	0	726	1530	200	538	956	887
	6	US-312	1440	828	0	1137	0	609	1658	500	521	1013	957
		T2 Mean	**1387**	**717**	**0**	**956**	**0**	**482**	**1576**	**325**	**550**	**550**	**550**
T3 (Silixol + water stress)	1	IR-64	952	446	0	665	0	407	708	167	364	947	591
	2	KRH-4	1181	849	0	950	0	480	1250	450	447	975	797
	3	PA-6129	1287	655	0	961	0	0	1300	183	435	1027	731
	4	PHB-71	1345	890	0	884	0	528	1406	300	452	1029	843
	5	Sahabhagidhan	1232	536	0	936	0	682	1258	217	427	982	800
	6	US-312	1254	810	0	1097	0	515	1290	400	451	1023	822
		T3 Mean	**1208**	**698**	**0**	**915**	**0**	**435**	**1202**	**286**	**429**	**429**	**429**
T4 (Water stress)	1	IR-64	896	509	0	863	0	380	563	317	355	0	418
	2	KRH-4	1125	1062	0	1150	0	461	1175	400	448	0	601
	3	PA-6129	1231	810	0	1019	0	0	1020	283	371	0	676
	4	PHB-71	1289	1014	0	873	0	451	1207	250	438	0	606
	5	Sahabhagidhan	1266	646	0	1015	0	638	1070	183	377	0	589
	6	US-312	1198	1094	0	1139	0	455	938	217	424	0	539
		T4 Mean	**1168**	**856**	**0**	**1010**	**0**	**397**	**996**	**275**	**402**	**0**	**540**
		Grand Mean	**1284**	**759**	**0**	**966**	**0**	**448**	**1244**	**301**	**474**	**374**	**508**
		LSD (Silicon)								NS			
		LSD (Center x Silicon)								*110***			
		LSD (Variety)								*42***			
		LSD (Center x Variety)								*127***			
		LSD (Silicon x Variety)								*NS*			
		LSD (Center x Silicon x Variety)								*NS*			
		CV (%)								*19.5*			

Table 6.1.6 Influence of Silica application grain number per panicle at different locations Kharif 2017

Treat.	S.No.	Varieties	CBT	CHN	CTK	IIRR	KRK	MTU	PNT	PTB	KJT	TTB	Grand Mean
T1 (Control)	1	IR-64	154	86	89	78	55	102	146	28	282	102	112
	2	KRH-4	213	176	150	123	99	99	267	66	290	190	167
	3	PA-6129	174	122	132	125	98	0	254	25	228	162	132
	4	PHB-71	182	148	158	122	52	101	250	109	242	167	153
	5	Sahabhagidhan	209	116	126	110	68	112	168	25	263	147	134
	6	US-312	206	154	142	114	63	118	203	57	302	186	155
		T1 Mean	**190**	**134**	**133**	**112**	**72**	**107**	**215**	**52**	**268**	**159**	**142**
T2 (0.6% Silixol)	1	IR-64	156	69	89	76	61	103	127	22	290	101	110
	2	KRH-4	221	174	200	136	129	99	304	80	273	168	178
	3	PA-6129	182	92	167	106	74	0	269	35	245	134	130
	4	PHB-71	190	182	166	102	88	105	271	71	250	180	160
	5	Sahabhagidhan	213	67	103	94	50	120	170	35	219	157	123
	6	US-312	214	180	121	119	62	118	228	78	236	151	151
		T2 Mean	**196**	**127**	**141**	**105**	**77**	**109**	**228**	**54**	**252**	**149**	**142**
T3 (Silixol + water stress)	1	IR-64	121	78	20	67	45	91	136	34	220	111	92
	2	KRH-4	177	158	70	143	113	90	259	79	215	193	150
	3	PA-6129	141	106	53	123	88	0	245	19	241	147	116
	4	PHB-71	149	166	51	100	74	91	243	37	260	168	134
	5	Sahabhagidhan	176	96	43	100	73	103	168	41	231	136	117
	6	US-312	173	164	57	127	63	92	226	44	246	155	135
		T3 Mean	**156**	**128**	**49**	**110**	**76**	**93**	**213**	**42**	**236**	**152**	**124**
T4 (Water stress)	1	IR-64	113	86	26	73	66	84	122	33	0	121	80
	2	KRH-4	169	186	67	151	126	84	233	50	0	200	141
	3	PA-6129	133	141	51	120	107	0	213	29	0	168	107
	4	PHB-71	141	152	44	108	104	84	178	37	0	133	109
	5	Sahabhagidhan	168	147	34	102	71	95	142	28	0	134	103
	6	US-312	164	200	69	145	104	88	203	40	0	196	134
		T4 Mean	**148**	**152**	**49**	**116**	**96**	**87**	**182**	**36**	**0**	**159**	**112**
		Grand Mean	**173**	**135**	**93**	**111**	**80**	**99**	**209**	**46**	**189**	**154**	**130**
		LSD (Silicon)						NS					
		LSD (Center x Silicon)						*16.8***					
		LSD (Variety)						*7.2***					
		LSD (Center x Variety)						*21.7***					
		LSD (Silicon x Variety)						*14.9***					
		LSD (Center x Silicon x Variety)						*NS*					
		CV (%)						*17.06*					

Table 6.1.7 Influence of Silica application spikelet number per panicle at different locations Kharif 2017

Treat.	S.No.	Varieties	CBT	CTK	IIRR	KRK	MTU	PNT	PTB	TTB	Grand Mean
T1 (Control)	1	IR-64	176	96	92	59	116	160	36	120	107
	2	KRH-4	235	168	160	106	114	305	72	226	173
	3	PA-6129	196	149	153	102	0	280	64	190	162
	4	PHB-71	204	169	177	57	115	287	117	200	166
	5	Sahabhagidhan	231	149	142	72	122	187	31	172	138
	6	US-312	228	160	148	64	131	228	73	228	158
		T1 Mean	**211**	**148**	**146**	**77**	**120**	**241**	**66**	**189**	**151**
T2 (0.6% Silixol)	1	IR-64	184	98	92	63	116	138	26	115	104
	2	KRH-4	243	219	185	135	113	319	91	210	189
	3	PA-6129	204	185	145	76	0	284	42	160	157
	4	PHB-71	212	190	144	92	118	284	83	223	168
	5	Sahabhagidhan	239	120	119	56	129	188	42	191	135
	6	US-312	236	138	140	69	133	244	98	189	156
		T2 Mean	**219**	**158**	**138**	**82**	**122**	**243**	**64**	**181**	**152**
T3 (Silixol + water stress)	1	IR-64	146	27	78	46	111	145	47	125	91
	2	KRH-4	205	84	177	90	111	288	92	252	162
	3	PA-6129	166	72	155	89	0	263	26	158	133
	4	PHB-71	174	75	139	78	111	262	43	198	135
	5	Sahabhagidhan	201	57	124	76	119	189	44	157	121
	6	US-312	198	78	149	66	107	253	53	192	137
		T3 Mean	**181**	**66**	**137**	**74**	**112**	**233**	**51**	**180**	**130**
T4 (Water stress)	1	IR-64	135	38	85	68	109	134	46	147	95
	2	KRH-4	194	98	179	141	109	268	53	262	163
	3	PA-6129	155	78	149	117	0	234	51	205	141
	4	PHB-71	163	70	138	140	110	206	42	166	129
	5	Sahabhagidhan	190	43	133	77	115	190	36	169	119
	6	US-312	187	97	171	118	113	233	47	245	151
		T4 Mean	**170**	**71**	**143**	**110**	**111**	**211**	**46**	**199**	**133**
		Grand Mean	**196**	**111**	**141**	**86**	**116**	**232**	**56**	**187**	**141**
		LSD (Silicon)					NS				
		LSD (Center x Silicon)					*16.8***				
		LSD (Variety)					*7.2***				
		LSD (Center x Variety)					*21.7***				
		LSD (Silicon x Variety)					*14.9***				
		LSD (Center x Silicon x Variety)					*NS*				
		CV (%)					*17.06*				

Table 6.1.8 Influence of Silica application grain number/m2 at different locations Kharif 2017

Treat.	S.No.	Varieties	CBT	CHN	CTK	IIRR	KRK	MTU	PNT	PTB	TTB	Grand Mean
T1 (Control)	1	IR-64	33108	19206	31125	23944	23775	39226	33000	1417	26825	25736
	2	KRH-4	55985	40935	37309	48989	37400	40447	80200	3300	43470	43115
	3	PA-6129	42125	32050	32657	48487	25025	0	55050	1250	41828	34809
	4	PHB-71	52485	40865	41407	40998	26850	31174	62583	5450	40527	38038
	5	Sahabhagidhan	60109	27374	32838	30935	56688	53152	49967	1267	41233	39285
	6	US-312	43210	35831	38491	47293	31038	41646	47317	2867	43467	36795
		T1 Mean	**47837**	**32710**	**35638**	**40108**	**33463**	**41129**	**54686**	**2592**	**39558**	**36296**
T2 (0.6% Silixol)	1	IR-64	33209	16709	29575	23357	24738	40821	39650	1117	28431	26401
	2	KRH-4	56086	39380	47495	43105	25013	42647	126550	3983	40963	47247
	3	PA-6129	42226	20916	38424	42820	54588	0	85167	1750	38970	40608
	4	PHB-71	52586	42384	49286	36738	18300	35431	90367	3550	45482	41569
	5	Sahabhagidhan	60210	14227	28593	34380	26225	55110	62233	1767	47667	36712
	6	US-312	43311	38709	33858	49611	49475	41547	79750	3817	39797	42208
		T2 Mean	**47938**	**28721**	**37872**	**38335**	**33056**	**43111**	**80619**	**2664**	**40218**	**39124**
T3 (Silixol + water stress)	1	IR-64	30652	16808	8202	24588	34050	33957	25083	1700	26821	22429
	2	KRH-4	53529	37689	20283	44978	49888	32626	68883	3933	41582	39266
	3	PA-6129	39669	23668	19021	37143	60125	0	61617	967	32485	34337
	4	PHB-71	50029	36033	17312	34288	35875	27060	60750	1833	37205	33376
	5	Sahabhagidhan	57653	19892	14761	37021	57050	43879	44717	2050	35800	34758
	6	US-312	40754	33329	21576	48934	29900	31152	56467	2183	34432	33192
		T3 Mean	**45381**	**27903**	**16859**	**37825**	**44481**	**33735**	**52919**	**2111**	**34721**	**32893**
T4 (Water stress)	1	IR-64	27546	18350	10582	30777	24388	27720	22600	1650	28461	21342
	2	KRH-4	50423	42946	26801	55939	41163	30371	58167	2500	40890	38800
	3	PA-6129	36563	33795	18455	39407	62588	0	45600	1317	33373	33887
	4	PHB-71	46923	35302	18751	33362	51600	24101	44467	1833	29503	31760
	5	Sahabhagidhan	54547	31666	8140	40530	30775	47047	37967	1417	33757	31761
	6	US-312	37648	48947	23802	47731	29100	29051	43933	1983	40763	33662
		T4 Mean	**42275**	**35168**	**17755**	**41291**	**39935**	**31658**	**42122**	**1783**	**34458**	**31869**
		Grand Mean	**45858**	**31125**	**27031**	**39390**	**37734**	**37408**	**57587**	**2288**	**37239**	**35046**
		LSD (Silicon)					NS					
		LSD (Center x Silicon)					*5618***					
		LSD (Variety)					*2036***					
		LSD (Center x Variety)					*6108***					
		LSD (Silicon x Variety)					*NS*					
		LSD (Center x Silicon x Variety)					*12217***					
		CV (%)					*18.4*					

Table 6.1.9 Influence of Silica application spikelet number/m2 at different locations Kharif 2017

Treat.	S.No.	Varieties	CBT	CHN	CTK	IIRR	KRK	MTU	PNT	PTB	TTB	Grand Mean
T1 (Control)	1	IR-64	34765	1688	28732	28692	28483	44561	36300	1817	31518	26284
	2	KRH-4	57642	2264	33367	63744	45225	46475	91500	3617	51495	43925
	3	PA-6129	43782	2127	28962	59282	30025	0	60750	2023	49182	34517
	4	PHB-71	54142	2570	38500	59308	32142	35552	71667	5850	48486	38691
	5	Sahabhagidhan	61766	1839	27647	39607	67575	57827	55700	1533	48293	40199
	6	US-312	44867	2126	34453	61065	42217	4327	53250	3650	53273	33248
		T1 Mean	**49494**	**2102**	**31944**	**51950**	**40944**	**37748**	**61528**	**3082**	**47041**	**36144**
T2 (0.6% Silixol)	1	IR-64	34866	1524	26826	27979	31625	45815	43300	1317	32547	27311
	2	KRH-4	57743	2075	43549	58650	32175	48576	132850	4567	51180	47930
	3	PA-6129	43883	2124	34700	59309	60283	0	90033	2083	46333	42344
	4	PHB-71	54243	2516	43087	52670	24275	39864	94700	4150	56186	41299
	5	Sahabhagidhan	61867	1533	24543	43941	34283	59510	69033	2083	58100	39433
	6	US-312	44968	2102	29782	58300	56267	4385	85250	4883	49829	37307
		T2 Mean	**49595**	**1979**	**33748**	**50141**	**39818**	**39630**	**85861**	**3181**	**49029**	**39271**
T3 (Silixol + water stress)	1	IR-64	32309	1503	5909	28706	41642	41294	26667	2367	30483	23431
	2	KRH-4	55186	2636	17034	55687	56783	40183	76717	4600	54182	40334
	3	PA-6129	41326	1938	14182	47096	70000	0	66483	1300	35047	34672
	4	PHB-71	51686	2595	11717	47918	43258	33209	65417	2133	43880	33535
	5	Sahabhagidhan	59310	1859	11129	45790	65608	50611	50383	2200	41287	36464
	6	US-312	42411	2431	15879	57342	36558	3529	63550	5333	42398	29937
		T3 Mean	**47038**	**2160**	**12642**	**47090**	**52308**	**33765**	**58203**	**2989**	**41213**	**33062**
T4 (Water stress)	1	IR-64	29203	1640	7106	35821	29633	35640	24717	2283	34438	22276
	2	KRH-4	52080	2535	18343	66520	49425	39545	66917	2650	53413	39048
	3	PA-6129	38220	2561	12149	49427	72575	0	50250	2833	41103	33640
	4	PHB-71	48580	2804	11726	42756	64733	31515	51017	2100	36853	32454
	5	Sahabhagidhan	56204	2212	6470	52684	38358	56859	50750	1800	42531	34208
	6	US-312	39305	2857	16900	56306	37883	3714	50650	2350	51037	29000
		T4 Mean	**43932**	**2435**	**12116**	**50586**	**48768**	**33455**	**49050**	**2336**	**43229**	**31771**
		Grand Mean	**47515**	**2169**	**22612**	**49942**	**45460**	**36150**	**63660**	**2897**	**45128**	**35062**
		LSD (Silicon)				*NS*						
		LSD (Center x Silicon)				*6606***						
		LSD (Variety)				*1658**						
		LSD (Center x Variety)				*6549***						
		LSD (Silicon x Variety)				*NS*						
		LSD (Center x Silicon x Variety)				*1309***						
		CV (%)				*21.6*						

Table 6.1.10 Influence of Silica application total dry matter (g/m2) at different locations Kharif 2017

Treat.	S.No.	Varieties	CBT	CTK	IIRR	KRK	MTU	PNT	PTB	TTB	KJT	Grand Mean
T1 (Control)	1	IR-64	1354	1011	1110	667	1124	1333	583	1067	1397	1072
	2	KRH-4	1484	1271	1824	1133	1092	1942	1200	1457	1747	1461
	3	PA-6129	1474	1141	1937	767	0	1450	467	1075	1380	1211
	4	PHB-71	1392	1254	1830	833	858	1675	750	1220	1516	1259
	5	Sahabhagidhan	1408	1110	1272	400	1150	1492	650	977	1629	1121
	6	US-312	1255	1187	1820	700	1045	1692	1000	1163	2032	1322
		T1 Mean	1395	1162	1632	750	1054	1597	775	1160	1617	1238
T2 (0.6% Silixol)	1	IR-64	1209	1248	1109	867	1144	1300	833	1038	1642	1154
	2	KRH-4	1632	1369	1567	1167	1091	2292	950	1430	1981	1498
	3	PA-6129	1509	1111	1802	867	0	1508	450	1173	1268	1211
	4	PHB-71	1399	1302	1567	1367	902	1900	833	1325	1739	1371
	5	Sahabhagidhan	1460	1153	1372	600	1181	1303	483	1014	2141	1190
	6	US-312	1264	1220	1895	1150	1078	1608	1233	1173	1812	1382
		T2 Mean	**1413**	**1234**	**1552**	**1003**	**1079**	**1652**	**797**	**1192**	**1764**	**1298**
T3 (Silixol + water stress)	1	IR-64	1152	880	1103	467	1121	1042	533	1010	1516	981
	2	KRH-4	1353	997	1593	667	1086	1733	1100	1072	1974	1286
	3	PA-6129	1542	1078	1541	400	0	1775	450	934	1255	1122
	4	PHB-71	1251	1053	1352	567	814	1442	500	1152	1770	1100
	5	Sahabhagidhan	1550	738	1522	633	1092	1425	483	878	1677	1111
	6	US-312	1162	1083	1775	633	1031	1550	800	1140	1833	1223
		T3 Mean	**1335**	**971**	**1481**	**561**	**1029**	**1494**	**644**	**1031**	**1671**	**1135**
T4 (Water stress)	1	IR-64	1131	685	1439	533	1100	1108	667	1063	0	966
	2	KRH-4	1571	823	1937	800	1049	1742	1133	1180	0	1279
	3	PA-6129	1242	900	1629	333	0	1300	683	778	0	981
	4	PHB-71	1242	907	1401	1033	792	1650	667	1169	0	1108
	5	Sahabhagidhan	1266	707	1634	367	1076	1292	317	795	0	932
	6	US-312	1353	984	1922	633	1027	1808	733	1002	0	1183
		T4 Mean	**1301**	**834**	**1660**	**617**	**1009**	**1483**	**700**	**998**	**0**	**1075**
		Grand Mean	**1361**	**1050**	**1581**	**733**	**1043**	**1557**	**729**	**1095**	**1263**	**1144**
		LSD (Silicon)				75.0**						
		LSD (Center x Silicon)				159*						
		LSD (Variety)				63.9**						
		LSD (Center x Variety)				180.7**						
		LSD (Silicon x Variety)				ns						
		LSD (Center x Silicon x Variety)				361.4**						
		CV (%)				21.48						

Table 6.1.11 Influence of Silica application grain yield (g/m2)at different locations Kharif 2017

Treat.	S.No.	Varieties	CBT	CTK	IIRR	KRK	MTU	PNT	PTB	TTB	KJT	Grand Mean
T1 (Control)	1	IR-64	620	514	581	233	546	467	248	387	665	473
	2	KRH-4	772	545	878	367	544	717	259	510	776	597
	3	PA-6129	765	524	1081	267	0	683	281	425	625	575
	4	PHB-71	724	504	905	400	436	742	337	412	644	567
	5	Sahabhagidhan	740	495	680	133	559	700	260	418	758	527
	6	US-312	669	488	923	250	522	675	346	428	931	581
		T1 Mean	**715**	**512**	**842**	**275**	**521**	**664**	**288**	**430**	**733**	**553**
T2 (0.6% Silixol)	1	IR-64	626	553	582	267	542	508	305	388	782	506
	2	KRH-4	820	667	797	333	535	942	314	563	940	657
	3	PA-6129	779	535	992	267	0	767	257	473	543	577
	4	PHB-71	738	622	827	533	463	883	266	485	788	623
	5	Sahabhagidhan	754	511	762	267	567	658	260	451	1058	587
	6	US-312	683	567	992	383	534	683	329	440	874	609
		T2 Mean	**733**	**576**	**826**	**342**	**528**	**740**	**288**	**467**	**831**	**592**
T3 (Silixol + water stress)	1	IR-64	465	319	594	150	514	383	285	310	715	415
	2	KRH-4	536	448	823	217	504	667	360	389	913	540
	3	PA-6129	580	479	854	167	0	867	230	367	567	514
	4	PHB-71	555	415	759	233	405	625	308	385	814	500
	5	Sahabhagidhan	571	328	816	167	514	650	318	362	674	489
	6	US-312	500	432	967	200	470	683	320	390	883	538
		T3 Mean	**534**	**403**	**802**	**189**	**481**	**646**	**303**	**367**	**761**	**499**
T4 (Water stress)	1	IR-64	421	207	771	200	486	367	355	297	0	388
	2	KRH-4	519	356	1000	233	462	642	303	381	0	487
	3	PA-6129	515	361	891	133	0	608	265	278	0	382
	4	PHB-71	511	345	747	267	384	667	316	369	0	451
	5	Sahabhagidhan	527	254	883	183	477	517	247	318	0	426
	6	US-312	456	317	994	183	455	700	299	360	0	471
		T4 Mean	**491**	**307**	**881**	**200**	**453**	**583**	**297**	**334**	**0**	**443**
		Grand Mean	**618**	**449**	**838**	**251**	**506**	**658**	**294**	**399**	**581**	**502**
		LSD (Silicon)				29.7**						
		LSD (Center x Silicon)				84.0**						
		LSD (Variety)				NS						
		LSD (Center x Variety)				59.10**						
		LSD (Silicon x Variety)				ns						
		LSD (Center x Silicon x Variety)				138**						
		CV (%)				13.4						

Table 6.1.12 Influence of Silica application 1000 grain weight (g) at different locations Kharif 2017

Treat.	S.No.	Varieties	CBT	CHN	CTK	IIRR	KRK	MTU	PNT	PTB	TTB	KJT	Grand Mean
T1 (Control)	1	IR-64	23.1	25.2	20.3	24.3	26.2	22.5	22.0	26.3	23.0	22.8	23.6
	2	KRH-4	21.1	19.9	17.1	18.1	19.9	22.0	18.4	18.3	19.0	19.8	19.4
	3	PA-6129	23.8	23.0	22.5	22.3	15.1	0.0	24.0	25.0	20.0	23.2	22.1
	4	PHB-71	24.9	24.4	19.8	22.1	23.2	21.3	21.4	18.0	21.3	23.0	21.9
	5	Sahabhagidhan	24.2	23.6	21.8	22.0	19.7	24.6	20.7	17.7	20.7	24.2	21.9
	6	US-312	20.3	20.2	19.5	19.5	21.0	19.1	21.2	17.3	18.0	21.0	19.7
		T1 Mean	**22.9**	**22.7**	**20.2**	**21.4**	**20.9**	**21.9**	**21.3**	**20.4**	**20.3**	**22.3**	**21.4**
T2 (0.6% Silixol)	1	IR-64	20.6	24.9	19.9	24.9	26.0	23.6	23.4	20.3	23.0	28.2	23.0
	2	KRH-4	21.4	19.8	18.0	18.5	21.0	24.0	21.2	19.7	20.0	18.6	20.2
	3	PA-6129	24.6	22.9	21.0	23.2	18.0	0.0	24.1	25.7	20.3	22.5	22.5
	4	PHB-71	24.1	24.9	18.2	22.6	21.3	22.2	23.1	20.0	22.0	26.0	22.4
	5	Sahabhagidhan	23.5	23.5	20.0	22.2	26.4	24.7	20.4	22.3	22.0	22.2	22.7
	6	US-312	18.3	19.9	18.0	20.0	20.2	20.9	22.2	16.7	20.0	19.4	19.6
		T2 Mean	**22.1**	**22.7**	**19.2**	**21.9**	**22.1**	**23.1**	**22.4**	**20.8**	**21.2**	**22.8**	**21.8**
T3 (Silixol + water stress)	1	IR-64	18.8	25.0	20.7	24.1	27.6	19.5	23.4	18.3	22.3	23.4	22.3
	2	KRH-4	16.8	19.8	16.4	18.4	19.1	17.1	18.7	17.3	18.0	17.0	17.9
	3	PA-6129	19.5	22.9	22.7	23.0	19.6	0.0	21.1	26.0	19.0	20.3	21.6
	4	PHB-71	20.6	24.4	21.8	22.2	24.4	18.0	20.2	17.7	19.3	21.4	21.0
	5	Sahabhagidhan	19.9	23.5	20.8	22.0	24.7	20.6	22.4	21.7	20.7	23.2	21.9
	6	US-312	16.0	20.0	19.4	19.8	21.1	15.6	18.4	22.0	19.3	17.5	18.9
		T3 Mean	**18.6**	**22.6**	**20.3**	**21.6**	**22.7**	**18.2**	**20.7**	**20.5**	**19.8**	**20.5**	**20.5**
T4 (Water stress)	1	IR-64	15.8	24.8	20.3	25.1	26.2	18.6	23.2	15.7	20.0	0.0	21.1
	2	KRH-4	13.8	19.9	17.7	17.9	21.7	15.1	15.2	18.3	17.0	0.0	17.4
	3	PA-6129	16.5	23.1	21.3	22.6	24.1	0.0	23.9	25.0	18.0	0.0	19.4
	4	PHB-71	17.6	24.6	19.9	22.4	22.6	17.2	22.1	19.7	19.0	0.0	20.6
	5	Sahabhagidhan	16.9	23.6	20.7	21.8	16.0	18.9	20.8	16.7	19.0	0.0	19.4
	6	US-312	13.0	20.1	17.8	20.9	23.1	13.2	19.9	19.3	18.7	0.0	18.4
		T4 Mean	**15.6**	**22.7**	**19.6**	**21.8**	**22.3**	**16.6**	**20.9**	**19.1**	**18.6**	**0.0**	**19.7**
		Grand Mean	**19.8**	**22.7**	**19.8**	**21.7**	**22.0**	**19.9**	**21.3**	**20.2**	**20.0**	**16.4**	**20.9**
		LSD (Silicon)						0.23*					
		LSD (Center x Silicon)						0.94**					
		LSD (Variety)						ns					
		LSD (Center x Variety)						1.84**					
		LSD (Silicon x Variety)						ns					
		LSD (Center x Silicon x Variety)						3.68**					
		CV (%)						8.51					

Table 6.1.13 Influence of Silica application Harvest Index (%) at different locations Kharif 2017

Treat.	S.No.	Varieties	CBT	CHN	CTK	IIRR	KRK	MTU	PNT	PTB	TTB	KJT	Grand Mean
T1 (Control)	1	IR-64	45.8	30.5	50.8	52.1	34.9	48.5	35.0	35.8	36.3	47.6	41.7
	2	KRH-4	52.0	28.2	43.0	48.3	32.3	49.7	36.9	23.8	35.0	44.4	39.4
	3	PA-6129	51.9	31.5	46.0	55.8	35.4	0.0	47.1	39.4	39.6	45.2	43.5
	4	PHB-71	52.0	27.3	40.2	49.2	47.7	51.3	44.3	33.2	33.8	42.3	42.1
	5	Sahabhagidhan	52.6	38.4	44.7	53.3	30.6	48.8	46.9	34.9	42.9	46.5	43.9
	6	US-312	53.3	28.9	41.0	50.8	41.6	50.0	39.9	34.2	36.8	49.4	42.6
		T1 Mean	**51.3**	**30.8**	**44.3**	**51.6**	**37.1**	**41.4**	**41.7**	**33.5**	**37.4**	**45.9**	**41.5**
T2 (0.6% Silixol)	1	IR-64	51.8	22.6	44.3	52.3	30.2	47.4	39.1	34.0	37.6	47.6	40.7
	2	KRH-4	50.2	23.9	48.8	50.9	29.1	49.1	40.7	34.0	39.5	47.4	41.4
	3	PA-6129	51.6	37.4	48.1	55.0	30.6	0.0	50.6	38.0	40.3	43.0	43.8
	4	PHB-71	52.8	27.3	47.8	52.6	41.1	51.3	46.6	31.9	36.6	45.3	43.3
	5	Sahabhagidhan	51.7	29.1	44.3	55.5	45.2	48.0	50.8	37.5	44.5	49.3	45.6
	6	US-312	54.1	27.1	46.4	52.3	33.4	49.6	42.5	28.6	37.5	48.2	42.0
		T2 Mean	**52.0**	**27.9**	**46.6**	**53.1**	**34.9**	**40.9**	**45.1**	**34.0**	**39.3**	**46.8**	**42.1**
T3 (Silixol + water stress)	1	IR-64	40.4	22.7	36.2	53.9	33.1	45.9	36.8	36.3	30.7	47.2	38.3
	2	KRH-4	39.7	22.1	45.0	51.5	33.3	46.5	38.3	33.2	36.3	46.2	39.2
	3	PA-6129	37.6	44.8	44.5	55.4	41.7	0.0	48.4	34.5	39.3	45.3	43.5
	4	PHB-71	44.4	27.0	39.4	56.2	46.0	49.7	43.3	38.5	33.5	45.9	42.4
	5	Sahabhagidhan	36.8	29.5	44.5	53.4	27.8	47.1	45.6	42.1	41.2	40.1	40.8
	6	US-312	43.0	25.6	39.9	54.5	34.5	45.6	44.2	38.0	34.3	48.1	40.8
		T3 Mean	**40.3**	**28.6**	**41.6**	**54.1**	**36.1**	**39.1**	**42.8**	**37.1**	**35.9**	**45.5**	**40.1**
T4 (Water stress)	1	IR-64	37.2	19.6	30.2	53.5	39.4	44.4	33.3	43.3	28.3	0.0	36.6
	2	KRH-4	33.0	22.7	43.4	51.4	31.5	44.1	36.8	29.6	32.4	0.0	36.1
	3	PA-6129	41.5	36.4	40.1	54.6	41.7	0.0	46.9	35.9	36.0	0.0	37.0
	4	PHB-71	41.2	22.4	38.1	53.3	29.5	48.5	40.3	38.5	32.1	0.0	38.2
	5	Sahabhagidhan	41.6	20.7	35.9	54.1	51.4	44.5	39.8	35.2	40.1	0.0	40.4
	6	US-312	33.7	22.4	32.2	51.7	29.0	45.3	38.8	32.0	35.9	0.0	35.7
		T4 Mean	**38.0**	**24.0**	**36.6**	**53.1**	**37.1**	**37.8**	**39.3**	**35.7**	**34.1**	**0.0**	**37.3**
		Grand Mean	**0.5**	**0.3**	**0.4**	**53.0**	**36.3**	**39.8**	**42.2**	**35.1**	**36.7**	**46.1**	**27.1**
		LSD (Silicon)					1.73*						
		LSD (Center x Silicon)					5.2**						
		LSD (Variety)					ns						
		LSD (Center x Variety)					5.745**						
		LSD (Silicon x Variety)					ns						
		LSD (Center x Silicon x Variety)					8.78*						
		CV (%)					14.67						

6.2 Screening of elite rice cultures for drought tolerance:

Locations: FZB, PTB, RPUR and REWA

Rice is the important food crops of the world for more than half of the world population grown mainly under irrigated conditions in Asia, about 45% of the total rice area is estimated to have no irrigation input. Yield of rainfed lowland rice, which occupies about 25% of the world's rice areas, are drastically reduced by drought due to unpredictable, insufficient and uneven rainfall during the growing period. To reduce yield losses of rice crops in rainfed lowland areas and to increase overall rice production, new rice varieties with greater adaptation to drought are essential. Hence, the development of drought resistant cultivars with a higher yield potential is one of the main objectives of rainfed lowland rice breeding programmes. Identification of suitable rice cultures for rainfed conditions is one of the research areas of plant physiology group under AICRIP group. A trail to study the drought tolerance traits of rice cultures with respect to yield and other attributes under dry spells was proposed at FZB, PTB, RPUR and REWA centres. The treatments consisted of two irrigation regimes. Irrigated as per recommended schedule and the other one totally grown under rainfed situations without any supplementary irrigations. The entries were taken from IVT-E-DS.

Days to 50% flowering and days to maturity was not significantly varied between treatments. The mean days to 50% flowering and days to maturity was reduced under irrigated conditions by 8 and 6 days. The mean days to 50% flowering was highest in IET 26614, IET 26628 and IET 26645 (117 days) and minimum in IET 26619 (89 days) under irrigated conditions with a mean of 99 days, whereas under rainfed conditions days to 50% flowering varied between 77 (Vandana) – 122 (IET 26614) with a mean of 91 days under irrigated and rainfed treatments. The mean days to maturity was reduced under rainfed condition by 6 days. Days to maturity was lowest in IET 26619 (irrigated) and Vandana (rainfed), whereas it was maximum in IET 26637 (irrigated) and IET 26614 (rainfed). Among the tested locations, days to 50% flowering and days to maturity was highest at REWA followed by RPUR and PTB.

Stem weight (g/m^2) was recorded at flowering and significant differences were observed in stem weight between treatments. Stem weight was 128 and 169 g/m2 under irrigated and rainfed treatments. Among the tested varieties, the mean stem weight (g/m2) was highest in IET 26621 (irrigated and rainfed) and lowest in Vandana (irrigated) and IET

26628 (rainfed). The stem weight was increased in some genotypes under rainfed conditions, and the increase was higher in IET 25134 (85% increase) and least in IET 26621 (6% increase).

Leaf area was significantly varied with the irrigation regimes, the mean leaf area was increased by 13% under irrigated condition. The mean leaf area was varied between 32.5 (IET 26613) – 56.6 (IET 26637) cm^2 and 22.3 (IET 26625) – 57.4 (IET 26629) cm^2 with a mean of 43.1 and 35.7 cm^2 at PTB and RPUR locations. Among the locations, greater reduction in leaf area was recorded at REWA followed by PTB and RPR (Fig 1). With the supply of irrigation, >30% increase in leaf area was observed in IET 26629 and IET 26629 (39%), IET 26633 (33%) and Vandana (31%) (Fig 2).

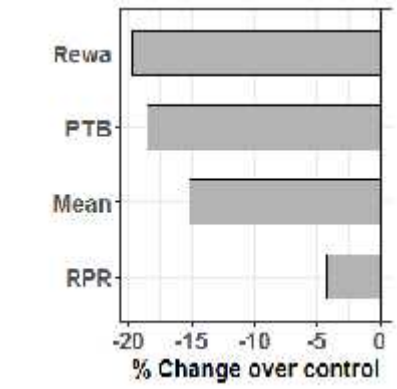


Fig 1A: Percent change in leaf area under rainfed condition. Each value represents mean of all varieties.

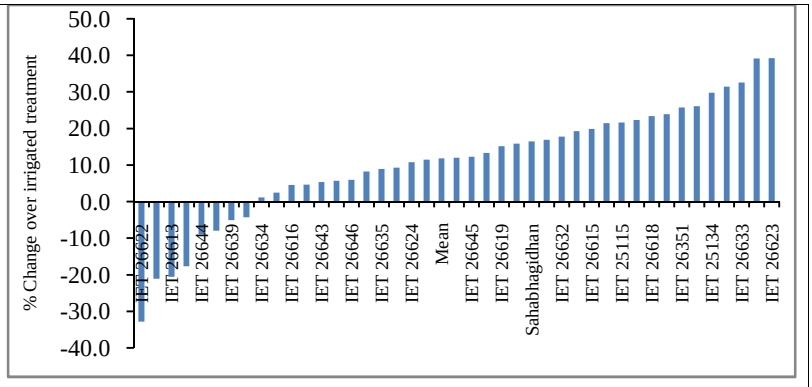


Fig 1B: Percent change in leaf area of all varieties under rainfed condition. Each value represents mean of all locations.

Tiller number per plant was varied significantly with irrigation and locations. The mean tiller number per plant was increased with irrigation (31% increase). Among the tested varieties, IET 26640 showed maximum increase (46% increase) in tiller number per plant under irrigated condition with minimum of 5% (IET 26643). Among the tested locations, mean tiller number per plant was more at RPUR followed by PTB and REWA.

Panicle number/m^2 was significantly reduced under rainfed conditions. Significant differences were observed for genotypes and locations. The mean panicle number/m2 was 461 and 308 under irrigated and rainfed conditions respectively. Panicle number/m2 was reduced under rainfed conditions and the reduction was maximum in IET 26625 (69%) followed by IET 26628 (66%) and IET 26614 (65%), except for few varieties which showed increase in panicle number under rainfed conditions (Fig 2A). The mean panicle number/m2

was highest at RPUR location followed by REWA and PTB, with greater reduction at PTB followed by REWA and RPR (Fig 2B).

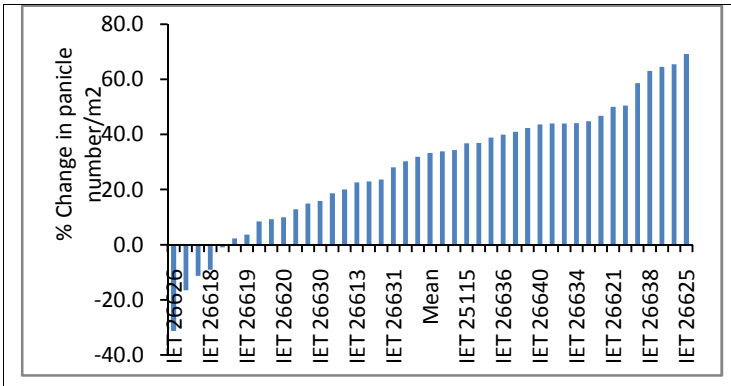


Fig 2A: Percent change in panicle number/m^2 of all varieties under rainfed condition. Each value represents mean of all locations.

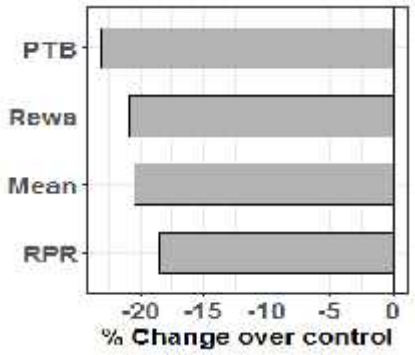


Fig 2B: Percent change in panicle number/m^2 under rainfed condition. Each value represents mean of all varieties

Panicle weight (g/m^2) was recorded at maturity and significant variation was observed in panicle weight (g/m^2) with the irrigation. The mean panicle weight (g/m^2) was reduced (33%) under rainfed condition. Maximum reduction in mean panicle weight (g/m^2) was recorded in IET 26625 (65%), whereas minimum was in IET 26632 (2%). Few varieties showed increase in mean panicle weight under rainfed conditions (Fig 3A). Among all the locations, water limitation had higher effect on reduction of panicle weight at PTB, followed by RPR and REWA (Fig 3B).

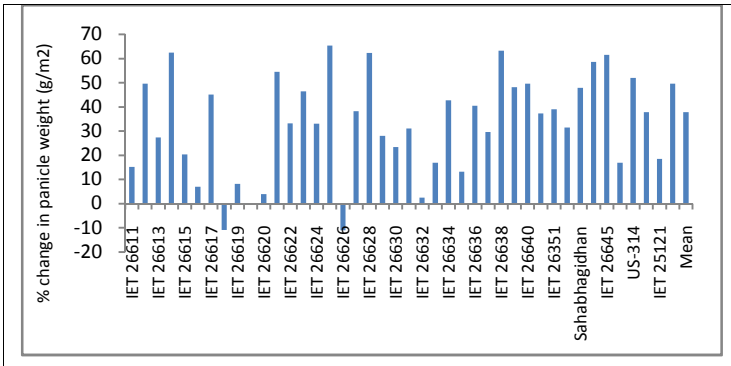


Fig 3A: Percent change in panicle weight/m^2 of all varieties under rainfed condition. Each value represents mean of all locations.

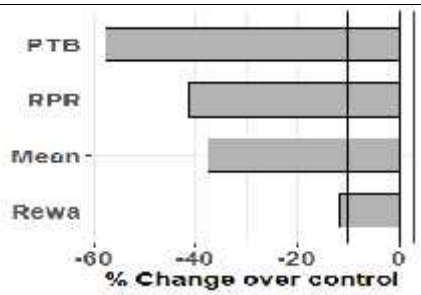


Fig 3B: Percent change in panicle weight/m^2 under rainfed condition. Each value represents mean of all varieties.

Shoot weight was (g/m^2) was significantly increased (49%) with irrigation and the mean shoot weight (g/m2) was varied between 299 (IET 26619) – 717 (IET 26621) and 203 (IET 26619) – 483 (IET 26628) g/m^2 with a mean of 475 and 319 g/m^2 under irrigated and rainfed conditions. The maximum reduction in shoot weight was 60% (IET 25115) with a mean of 31% under rainfed conditions (Fig 4A). The reduction in mean shoot weight was maximum at RPUR followed by PTB and REWA (Fig 4B).

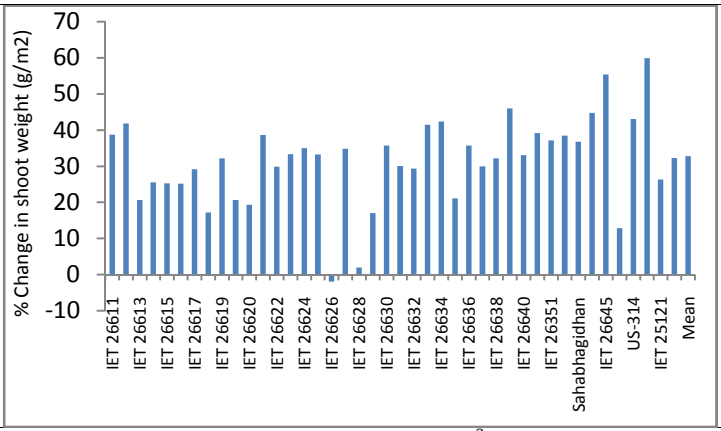


Fig 4A: Percent change in shoot weight g/m^2 of all varieties under rainfed condition. Each value represents mean of all locations.

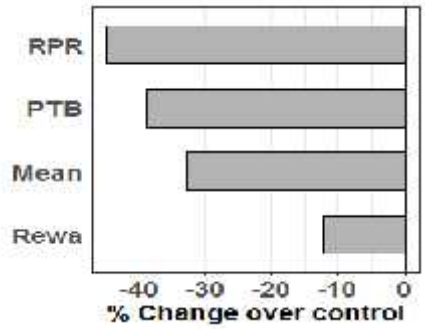


Fig 4B: Percent change in shoot weight g/m^2 under rainfed condition. Each value represents mean of all varieties.

Spikelet number per panicle and spikelet number/m2 were increased under rainfed condition by 22% and 21%. The mean spikelet number per panicle and per square meter was maximum in IET 26612 under rainfed and irrigated conditions. Among the tested locations, mean spikelet number per panicle and per square meter was maximum at REWA followed by RPUR and PTB. Grain number per panicle and grain number per square meter was significantly varied with irrigation. The mean grain number per panicle was reduced under rainfed condition by >40% and the reduction was more in IET 26624 (70%) and least in IET 25121 (2%) (Fig 5A). Among the tested locations, maximum extent of reduction in grain number per panicle was at RPR location followed by PTB and REWA (Fig 5B).

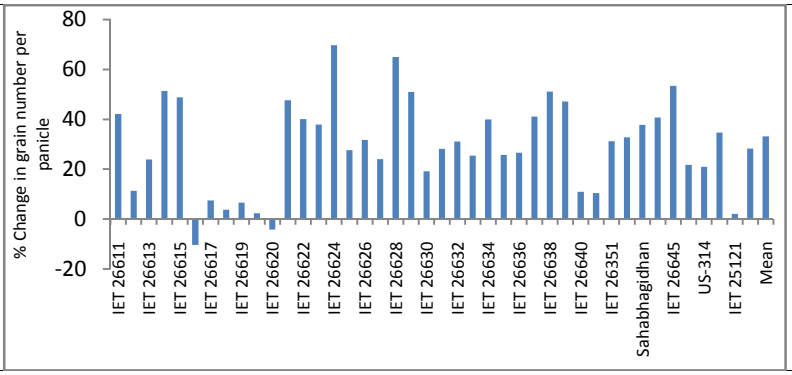


Fig 5A: Percent change in grain number/panicle of all varieties under rainfed condition. Each value represents mean of all locations.

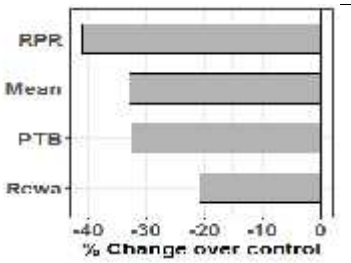


Fig 5B: Percent change in grain number/panicle under rainfed condition. Each value represents mean of all varieties.

The mean grain yield g/m^2 was significantly reduced (46%) under rainfed condition and the reduction was maximum at PTB, followed by RPUR and REWA (Fig 6A). Among the tested varieties, maximum reduction in grain yield was recorded in IET 26644 (54%). Among the tested varieties, reduction in grain yield was less than the average for 19 varieties with a mean of 21%. The mean grain yield was maximum in IET 26617 (554 g/m^2) and IET

26616 (343 g/m^2) under irrigated and rainfed conditions respectively. The mean grain yield/m^2 was maximum at RPUR (409 g/m^2) followed by FZB (326 g/m^2), REWA (310 g/m^2) and PTB (206 g/m^2).

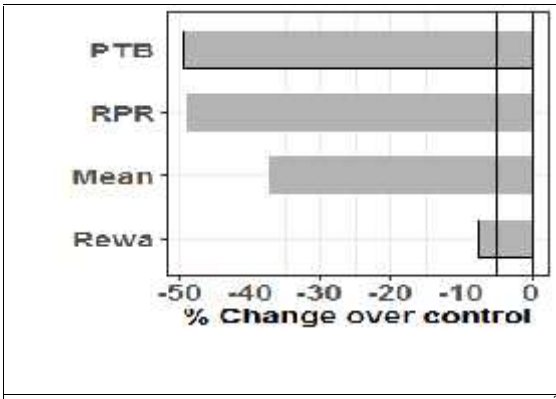


Fig 6A: Percent change in grain grain yield g/m^2 of all varieties under rainfed condition. Each value represents mean of all varieties.

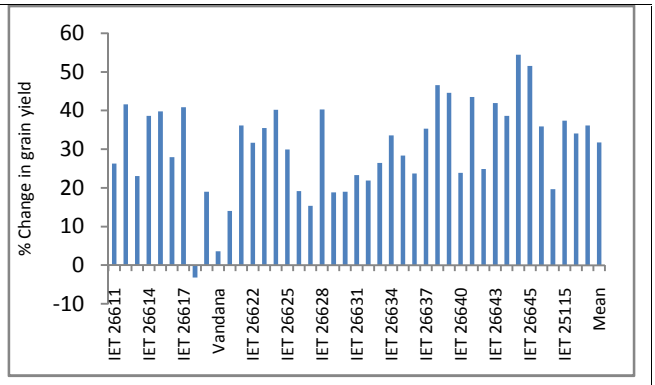


Fig 6B: Percent change in grain yield g/m^2 under rainfed condition. Each value represents mean of all locations.

Test weight (1000 grain weight) is one of the important yield components measured under rainfed and irrigated conditions showed variation with irrigation regimes. The mean 1000 grain weight was reduced by 7% under rainfed condition and the reduction was maximum in IET 26644 (26%) (Fig 7A). Increase in test was recorded in some of the tested varieties and the mean increase was 10%. Among the tested locations, the reduction in mean test weight was more at REWA (11%) followed by PTB (10%) and RPR (7%) (Fig 7B). The mean harvest index under rainfed and irrigated conditions were 34% and among the locations, the mean harvest index was maximum at FZB (43.5%) followed by REWA (33.1%), PTB (32.2%) and RPUR (31.3%).

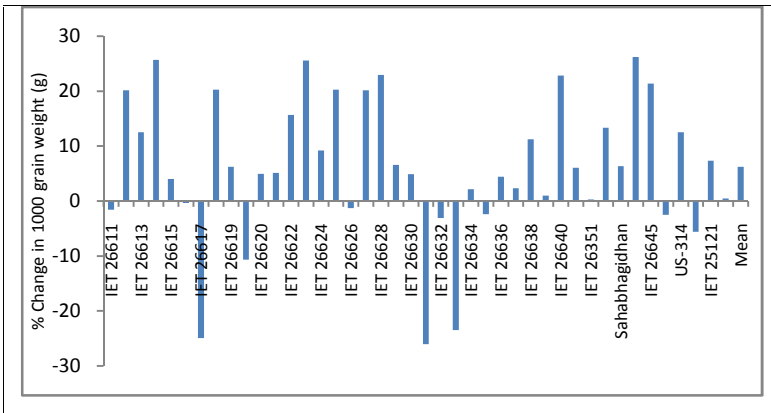


Fig 7A: Percent change in 1000 grain weight (g) under rainfed condition. Each value represents mean of all locations.

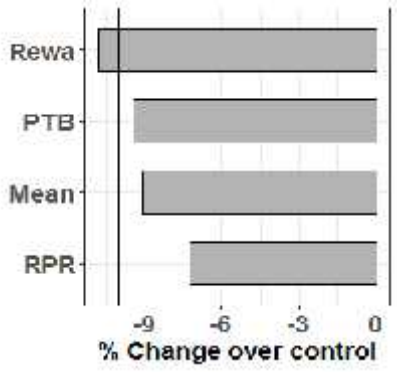


Fig 7B: Percent change in 1000 grain weight (g) of all varieties under rainfed condition. Each value represents mean of all varieties.

Summary and conclusions:

A trail was conducted with 42 varieties and two treatments (rainfed and irrigated) at PTB, RPUR, REWA and FZB locations to study the drought tolerance traits of rice varieties. Grain yield and its components were greatly influenced by the irrigation regimes. Among the tested varieties, reduction in grain yield was less than the average for 19 varieties with a mean of 21%. Among all the tested locations, lowest reduction in mean grain yield was at REWA. The mean grain yield g/m^2 was maximum in IET 26617 and IET 26616 under irrigated and rainfed conditions. The entries with high grain yield under rainfed conditions are suitable for rainfed limited water supply cultivation.

Table 6.2.1 Screening of elite genotypes suitable for rainfed conditions at PTB during Kharif 2017, Influence of irrigation regimes on important yield attributes in different rice genotypes

S.No.	Entries	Days to flowering			Days to maturity			Stem weight (g) flowering		
		irrigated	Rainfed	Mean	irrigated	Rainfed	Mean	irrigated	Rainfed	Mean
1	IET 26611	91	91	91	123	123	123	13.0	11.0	12
2	IET 26612	93	95	94	125	127	126	15.0	9.0	12
3	IET 26613	91	94	92	123	126	124	6.3	6.0	6
4	IET 26614	113	111	112	145	142	144	6.3	9.7	8
5	IET 26615	93	94	93	125	126	125	8.3	6.7	8
6	IET 26616	93	93	93	125	125	125	5.7	9.7	8
7	IET 26617	93	93	93	125	125	125	4.0	8.0	6
8	IET 26618	90	90	90	122	122	122	6.7	6.3	7
9	IET 26619	88	89	89	120	121	121	5.0	5.3	5
10	Vandana	90	90	90	122	122	122	5.7	5.0	5
11	IET 26620	93	91	92	125	123	124	5.7	5.0	5
12	IET 26621	90	91	91	122	123	123	8.0	10.3	9
13	IET 26622	92	91	92	124	123	124	5.0	8.0	7
14	IET 26623	91	93	92	123	124	124	4.3	7.3	6
15	IET 26624	91	92	91	123	124	123	12.3	7.3	10
16	IET 26625	92	92	92	124	124	124	2.7	3.7	3
17	IET 26626	93	92	93	125	124	125	9.3	12.3	11
18	IET 26627	94	100	97	126	135	130	5.3	7.7	7
19	IET 26628	101	99	100	134	130	132	7.0	10.0	9
20	IET 26629	95	92	94	127	124	126	7.7	11.3	10
21	IET 26630	95	93	94	127	125	126	4.0	8.0	6
22	IET 26631	92	92	92	124	124	124	5.7	10.3	8
23	IET 26632	91	96	93	123	128	125	10.0	13.0	12
24	IET 26633	96	94	95	128	126	127	7.7	9.0	8
25	IET 26634	97	97	97	129	129	129	5.7	8.3	7
26	IET 26635	93	93	93	118	125	121	7.7	8.0	8
27	IET 26636	96	94	95	127	126	126	4.7	6.3	6
28	IET 26637	114	111	113	146	143	144	15.7	11.0	13
29	IET 26638	115	113	114	147	144	146	9.7	8.0	9
30	IET 26639	92	90	91	124	122	123	5.0	11.3	8
31	IET 26640	93	90	92	125	122	124	7.0	10.0	9
32	IET 26641	95	93	94	127	125	126	16.7	11.0	14
33	IET 26351	92	90	91	124	122	123	8.3	4.0	6
34	IET 26643	113	110	111	145	132	139	8.7	9.7	9
35	Sahabhagidhan	93	91	92	125	123	124	7.3	7.3	7
36	IET 26644	95	98	96	127	130	128	6.7	5.7	6
37	IET 26645	109	106	108	140	138	139	11.0	9.7	10
38	IET 26646	92	91	92	124	123	124	5.7	7.0	6
39	US-314	94	91	93	126	123	125	8.3	5.3	7
40	IET 25115	93	93	93	125	125	125	9.7	10.3	10
41	IET 25121	93	92	93	125	124	124	8.7	5.0	7
42	IET 25134	93	94	94	125	126	126	14.3	6.0	10
	Mean	**95**	**95**	**95**	**127**	**126**	**127**	**7.9**	**8.2**	**8**
	Grand Mean	**95**			**127**			**8**		
	CD(0.05)	4.6			4.4			3.7		
	CV(%)	4.3			3.1			40.5		
	M and T	ns			ns			ns		
	T and M	ns			ns			ns		

Table 6.2.2 Screening of elite genotypes suitable for rainfed conditions at PTB during Kharif 2017, Influence of irrigation regimes on important yield attributes in different rice genotypes

S.No.	Entries	Tiller number/hill			Leaf area Index at flowering			Panicle number/m2		
		irrigated	Rainfed	Mean	irrigated	Rainfed	Mean	irrigated	Rainfed	Mean
1	IET 26611	11	9	10	51.7	35.1	43.4	307	198	253
2	IET 26612	14	5	10	55.4	47.8	51.6	256	236	246
3	IET 26613	11	7	9	26.8	38.3	32.5	148	159	153
4	IET 26614	13	11	12	61.5	44.0	52.7	242	206	224
5	IET 26615	12	6	9	46.0	33.1	39.5	180	232	206
6	IET 26616	7	10	8	49.5	28.7	39.1	199	243	221
7	IET 26617	10	7	8	41.7	35.7	38.7	243	162	203
8	IET 26618	15	5	10	71.0	41.7	56.3	193	186	190
9	IET 26619	12	7	10	46.0	33.8	39.9	155	133	144
10	Vandana	14	10	12	41.3	31.3	36.3	176	170	173
11	IET 26620	11	9	10	36.0	31.7	33.8	162	123	143
12	IET 26621	10	10	10	52.0	32.4	42.2	202	133	167
13	IET 26622	12	8	10	30.6	40.8	35.7	185	164	174
14	IET 26623	11	7	9	51.1	39.8	45.4	276	226	251
15	IET 26624	17	6	12	39.1	37.2	38.1	169	176	173
16	IET 26625	11	8	9	40.3	35.2	37.8	190	193	191
17	IET 26626	12	13	13	56.9	46.3	51.6	187	309	248
18	IET 26627	12	11	12	33.4	35.1	34.2	148	132	140
19	IET 26628	13	10	11	57.9	51.6	54.8	170	183	177
20	IET 26629	9	12	10	52.2	35.0	43.6	135	108	122
21	IET 26630	11	10	11	36.9	42.1	39.5	311	132	222
22	IET 26631	10	12	11	51.8	37.8	44.8	237	190	213
23	IET 26632	14	10	12	51.2	37.1	44.2	235	242	239
24	IET 26633	12	10	11	57.4	27.0	42.2	199	222	211
25	IET 26634	13	8	11	40.9	40.7	40.8	228	188	208
26	IET 26635	8	7	8	49.2	35.5	42.3	238	176	207
27	IET 26636	11	8	9	45.1	43.1	44.1	214	142	178
28	IET 26637	19	9	14	57.6	55.6	56.6	175	154	165
29	IET 26638	16	10	13	51.9	51.5	51.7	211	155	183
30	IET 26639	13	12	13	41.9	44.2	43.0	296	115	206
31	IET 26640	14	7	10	37.9	32.1	35.0	160	201	181
32	IET 26641	22	12	17	52.8	27.5	40.2	291	206	249
33	IET 26351	14	5	10	41.8	32.2	37.0	298	160	229
34	IET 26643	11	11	11	55.5	40.0	47.7	214	173	194
35	Sahabhagidhan	15	10	13	45.0	34.6	39.8	250	132	191
36	IET 26644	11	9	10	46.4	59.5	52.9	340	168	254
37	IET 26645	12	8	10	40.4	42.5	41.5	334	174	254
38	IET 26646	17	7	12	39.4	32.6	36.0	235	122	178
39	US-314	13	6	9	39.0	33.9	36.4	294	194	244
40	IET 25115	13	9	11	67.0	45.7	56.3	262	155	209
41	IET 25121	10	6	8	40.0	37.2	38.6	267	101	184
42	IET 25134	10	11	11	54.6	28.8	41.7	300	146	223
	Mean	**13**	**9**	**11**	**47.3**	**39.0**	**43.1**	**226**	**174**	**200**
	Grand Mean	**11**			**43.1**			**200.3**		
	CD(0.05)	ns			11.4			62.9		
	CV(%)	35.6			23.4			27.7		
	M and T	ns			16.2			88.9		
	T and M	ns			21.1			135.4		

Table 6.2.3 Screening of elite genotypes suitable for rainfed conditions at PTB during Kharif 2017, Influence of irrigation regimes on important yield attributes in different rice genotypes

S.No.	Entries	Panicle weight (g/m2)			Productive tillers/plant			Shoot weight (g/m2)		
		irrigated	Rainfed	Mean	irrigated	Rainfed	Mean	irrigated	Rainfed	Mean
1	IET 26611	385	152	269	10	9	10	662	366	514
2	IET 26612	663	211	437	13	5	9	619	339	479
3	IET 26613	246	128	187	10	7	9	360	250	305
4	IET 26614	487	267	377	10	7	8	618	466	542
5	IET 26615	297	159	228	11	6	8	442	287	364
6	IET 26616	421	222	322	6	9	8	533	386	460
7	IET 26617	448	145	297	9	5	7	563	275	419
8	IET 26618	225	137	181	13	5	9	451	272	362
9	IET 26619	214	127	170	11	6	9	367	250	309
10	Vandana	145	138	141	13	10	12	356	273	315
11	IET 26620	215	123	169	10	7	8	378	257	317
12	IET 26621	456	130	293	9	8	9	549	257	403
13	IET 26622	287	126	207	12	6	9	391	264	328
14	IET 26623	513	176	345	10	6	8	536	285	411
15	IET 26624	408	153	280	16	5	11	458	274	366
16	IET 26625	217	165	191	10	7	8	392	331	362
17	IET 26626	278	266	272	11	10	11	404	528	466
18	IET 26627	214	119	166	11	8	10	338	256	297
19	IET 26628	274	225	249	12	7	9	251	502	376
20	IET 26629	183	133	158	9	10	10	392	281	336
21	IET 26630	436	140	288	10	9	10	458	260	359
22	IET 26631	321	145	233	9	9	9	603	355	479
23	IET 26632	370	190	280	12	6	9	532	329	430
24	IET 26633	360	195	278	11	10	10	537	335	436
25	IET 26634	282	194	238	12	7	9	451	286	369
26	IET 26635	322	179	250	8	5	7	335	359	347
27	IET 26636	236	130	183	10	6	8	433	261	347
28	IET 26637	267	196	232	17	6	12	615	358	487
29	IET 26638	475	166	321	15	6	10	555	314	435
30	IET 26639	670	146	408	12	9	10	676	276	476
31	IET 26640	212	141	176	12	6	9	411	288	350
32	IET 26641	511	204	358	21	9	15	767	405	586
33	IET 26351	326	136	231	13	4	9	525	284	405
34	IET 26643	433	170	302	10	3	7	685	318	501
35	Sahabhagidhan	470	135	303	10	6	8	516	273	394
36	IET 26644	570	174	372	10	4	7	675	364	519
37	IET 26645	868	181	524	11	5	8	839	290	565
38	IET 26646	343	128	236	16	6	11	459	258	359
39	US-314	630	143	386	11	4	7	637	299	468
40	IET 25115	471	151	311	12	7	9	806	340	573
41	IET 25121	450	133	292	8	4	6	561	274	418
42	IET 25134	588	131	360	10	5	8	411	263	337
	Mean	**388**	**162**	**275**	**11**	**7**	**9**	**514**	**314**	**414**
	Grand Mean	**274.9**			**9.0**			**414**		
	CD(0.05)	83.0			ns			96.6		
	CV(%)	26.7			41.0			20.6		
	M and T	117.4			ns			136.6		
	T and M	130.1			ns			211.3		

Table 6.2.4 Screening of elite genotypes suitable for rainfed conditions at PTB during Kharif 2017, Influence of irrigation regimes on important yield attributes in different rice genotypes

S.No.	Entries	Spikelet number/m2			Spikelet number/panicle			Grain number/m2		
		irrigated	Rainfed	Mean	irrigated	Rainfed	Mean	irrigated	Rainfed	Mean
1	IET 26611	22525	13133	17829	74	61	68	14805	9853	12329
2	IET 26612	34037	16064	25051	134	71	103	22803	13278	18040
3	IET 26613	9849	6783	8316	74	46	60	6429	4622	5526
4	IET 26614	14715	29481	22098	60	142	101	13100	15777	14439
5	IET 26615	12000	9948	10974	64	39	52	9448	7154	8301
6	IET 26616	13369	19787	16578	52	79	66	11367	11680	11523
7	IET 26617	17940	12180	15060	74	58	66	14193	9535	11864
8	IET 26618	13573	9543	11558	61	53	57	11297	6600	8948
9	IET 26619	7335	6084	6710	45	49	47	6123	4772	5447
10	Vandana	9635	9270	9453	59	54	56	7151	6532	6842
11	IET 26620	8818	5074	6946	54	40	47	7952	3924	5938
12	IET 26621	17955	5941	11948	88	45	66	15194	3241	9218
13	IET 26622	13542	6269	9906	74	36	55	10693	4236	7465
14	IET 26623	28197	7638	17918	100	37	68	23289	4498	13894
15	IET 26624	15921	8073	11997	93	44	68	14197	5655	9926
16	IET 26625	13843	11048	12445	71	55	63	11481	8787	10134
17	IET 26626	20196	18028	19112	108	57	83	17952	12988	15470
18	IET 26627	12679	15959	14319	86	136	111	11297	11291	11294
19	IET 26628	13852	18326	16089	79	96	88	11617	12430	12023
20	IET 26629	14565	4477	9521	105	41	73	8649	2061	5355
21	IET 26630	34091	11447	22769	109	86	97	26647	8600	17623
22	IET 26631	18163	8398	13281	70	43	57	14949	5621	10285
23	IET 26632	17512	17567	17540	77	72	74	14331	12436	13383
24	IET 26633	8303	12588	10446	36	56	46	7223	9223	8223
25	IET 26634	13437	9944	11690	59	52	55	9991	7570	8781
26	IET 26635	14036	11192	12614	59	65	62	11565	7198	9381
27	IET 26636	9163	7247	8205	40	50	45	7800	5386	6593
28	IET 26637	21739	17429	19584	127	83	105	20005	9047	14526
29	IET 26638	22999	18328	20664	97	115	106	19919	13782	16850
30	IET 26639	29838	7958	18898	104	53	78	25940	5694	15817
31	IET 26640	13639	16369	15004	82	72	77	11024	12877	11950
32	IET 26641	35016	21165	28090	122	99	110	26004	14545	20275
33	IET 26351	18163	5880	12021	54	36	45	15531	4132	9832
34	IET 26643	17426	11963	14695	82	59	71	14244	11128	12686
35	Sahabhagidhan	23415	6042	14728	95	43	69	20697	8138	14418
36	IET 26644	38347	15937	27142	111	93	102	29703	10832	20268
37	IET 26645	37180	13672	25426	111	77	94	26275	9451	17863
38	IET 26646	17100	3617	10358	72	33	53	12137	2175	7156
39	US-314	39810	11327	25569	136	56	96	33033	22003	27518
40	IET 25115	17879	6931	12405	64	44	54	13780	5372	9576
41	IET 25121	39325	3923	21624	140	37	89	35038	2579	18809
42	IET 25134	25291	5841	15566	84	40	62	20178	4308	12243
	Mean	**19614**	**11285**	**15449**	**83**	**61**	**72**	**15817**	**8296**	**12056**
	Grand Mean	**15449**			**72**			**12056**		
	CD(0.05)	9163.8			30.9			8260.8		
	CV(%)	52.4			37.8			60.6		
	M and T	12959.6			43.7			ns		
	T and M	15176.5			43.8			ns		

Table 6.2.5 Screening of elite genotypes suitable for rainfed conditions at PTB during Kharif 2017, Influence of irrigation regimes on important yield attributes in different rice genotypes

S.No.	Entries	Grain number/panicle			Grain yield (g/m2			1000 grain weight (g)			Harvest Index (%)		
		irrigate	Rainfed	Mean	irrigate	Rainfed	Mean	irrigate	Rainfed	Mean	irrigate	Rainfed	Mean
1	IET 26611	51	46	49	272	132	202	23.3	15.0	19.2	30.1	26.8	28.5
2	IET 26612	90	56	73	440	167	304	30.0	18.3	24.2	41.5	32.6	37.0
3	IET 26613	49	31	40	188	117	153	26.6	18.3	22.5	34.3	31.9	33.1
4	IET 26614	53	67	60	334	201	267	23.3	18.3	20.8	35.0	30.2	32.6
5	IET 26615	51	29	40	219	136	178	17.8	16.7	17.2	33.3	32.1	32.7
6	IET 26616	44	48	46	294	174	234	20.3	28.3	24.3	35.5	30.9	33.2
7	IET 26617	59	43	51	310	127	219	6.6	21.7	14.1	35.8	31.7	33.7
8	IET 26618	51	37	44	175	122	149	16.7	8.3	12.5	28.2	31.0	29.6
9	IET 26619	37	38	38	169	116	142	22.2	13.3	17.8	31.3	31.7	31.5
10	Vandana	43	37	40	135	123	129	18.3	16.7	17.5	33.7	31.1	32.4
11	IET 26620	49	31	40	169	114	141	19.9	13.3	16.6	30.9	30.7	30.8
12	IET 26621	75	27	51	315	118	217	16.6	15.0	15.8	36.0	31.4	33.7
13	IET 26622	61	26	43	213	116	164	25.5	16.7	21.1	34.5	30.6	32.6
14	IET 26623	82	22	52	350	146	248	27.8	11.7	19.7	39.5	33.7	36.6
15	IET 26624	83	29	56	286	132	209	26.9	18.3	22.6	37.1	32.5	34.8
16	IET 26625	54	43	49	171	139	155	17.7	16.7	17.2	29.9	29.8	29.9
17	IET 26626	96	41	69	208	200	204	18.8	23.3	21.1	33.9	27.4	30.7
18	IET 26627	76	100	88	169	111	140	22.3	8.3	15.3	33.3	30.3	31.8
19	IET 26628	67	65	66	205	176	190	17.5	15.0	16.2	29.9	26.7	28.3
20	IET 26629	61	18	40	150	120	135	25.8	21.7	23.7	27.7	30.0	28.8
21	IET 26630	84	65	74	303	124	213	15.5	16.7	16.1	39.8	32.3	36.0
22	IET 26631	60	29	44	234	127	180	15.5	28.3	21.9	28.7	27.1	27.9
23	IET 26632	64	51	57	263	154	209	18.8	21.7	20.3	33.4	32.0	32.7
24	IET 26633	30	41	36	257	157	207	13.8	28.3	21.1	32.7	31.8	32.3
25	IET 26634	44	38	41	210	157	183	21.1	25.0	23.0	31.8	34.9	33.4
26	IET 26635	49	41	45	234	148	191	20.7	23.3	22.0	27.1	29.7	28.4
27	IET 26636	35	37	36	182	118	150	18.9	18.3	18.6	29.7	31.2	30.5
28	IET 26637	117	40	78	201	158	179	18.9	22.3	20.6	24.6	30.7	27.6
29	IET 26638	84	86	85	326	140	233	27.8	23.3	25.6	36.4	30.9	33.7
30	IET 26639	90	38	64	444	118	281	20.0	20.0	20.0	39.4	31.7	35.5
31	IET 26640	67	55	61	168	125	146	30.0	18.3	24.2	29.0	30.3	29.7
32	IET 26641	90	69	80	348	163	256	16.9	20.7	18.8	31.1	28.7	29.9
33	IET 26351	47	25	36	236	122	179	26.4	25.0	25.7	30.6	30.1	30.3
34	IET 26643	68	50	59	301	142	222	29.1	23.3	26.2	31.0	31.0	31.0
35	S.bhagidhan	84	44	64	324	121	223	15.5	11.7	13.6	38.5	30.7	34.6
36	IET 26644	86	65	76	384	145	264	25.5	18.3	21.9	36.3	29.3	32.8
37	IET 26645	78	50	64	564	149	356	22.2	21.7	21.9	40.2	33.8	37.0
38	IET 26646	53	20	36	247	117	182	21.1	21.7	21.4	34.2	31.2	32.7
39	US-314	112	127	119	420	126	273	20.0	12.7	16.3	38.9	29.8	34.3
40	IET 25115	49	34	42	324	131	227	12.2	18.3	15.3	29.7	29.0	29.4
41	IET 25121	124	24	74	312	120	216	24.4	20.0	22.2	35.8	30.5	33.2
42	IET 25134	67	30	49	395	119	257	20.0	18.3	19.2	41.7	31.1	36.4
	Mean	**67**	**45**	**56**	**274**	**137**	**206**	**21.0**	**19.0**	**20.0**	**33.7**	**30.7**	**32.2**
	Grand Mean	**56**			**206**			**20.0**			**32.2**		
	CD(0.05)	32.4			50.2			5.8			3.1		
	CV(%)	51.2			21.6			25.6			8.6		
	M and T	ns			71.0			8.19			4.41		
	T and M	ns			78.8			9.54			5.11		

Table 6.2.6 Screening of elite genotypes suitable for rainfed conditions at Raipur during Kharif 2017, Influence of irrigation regimes on important yield attributes in different rice genotypes

S.No.	Entries	Days to flowering			Days to maturity			Leaf area index			Stem weight (g) at flowering		
		Irrigate	Rainfed	Mean	Irrigate	Rainfed	Mean	Irrigate	Rainfed	Mean	Irrigate	Rainfed	Mean
1	IET 26611	86	72	79	124	119	121	31.3	37.9	35	16	8	12
2	IET 26612	99	91	95	124	123	124	27.9	39.2	34	19	17	18
3	IET 26613	83	78	81	124	107	116	26.4	25.9	26	8	8	8
4	IET 26614	111	119	115	129	149	139	22.6	28.8	26	17	15	16
5	IET 26615	91	89	90	124	119	122	29.6	27.4	29	19	18	19
6	IET 26616	94	85	90	125	119	122	26.2	43.5	35	21	14	17
7	IET 26617	97	85	91	126	120	123	25.1	45.2	35	16	21	19
8	IET 26618	82	71	76	109	107	108	29.6	35.3	32	9	13	11
9	IET 26619	83	72	77	104	106	105	30.0	30.8	30	13	15	14
10	Vandana	85	70	77	124	108	116	35.9	21.5	29	19	11	15
11	IET 26620	79	70	75	124	107	116	37.1	25.8	31	13	7	10
12	IET 26621	69	93	81	125	117	121	30.4	36.1	33	23	5	14
13	IET 26622	83	80	82	124	120	122	27.1	35.7	31	10	10	10
14	IET 26623	83	86	85	124	122	123	46.7	19.6	33	14	12	13
15	IET 26624	104	78	91	124	105	115	31.8	26.0	29	7	8	8
16	IET 26625	86	81	84	114	109	112	28.7	15.8	22	8	5	7
17	IET 26626	86	88	87	119	117	118	40.1	29.0	35	19	6	12
18	IET 26627	91	89	90	124	124	124	46.5	29.4	38	13	5	9
19	IET 26628	117	118	118	115	152	134	26.9	48.1	37	31	15	23
20	IET 26629	86	75	81	124	125	124	73.3	41.4	57	21	14	17
21	IET 26630	90	87	89	124	120	122	41.0	29.4	35	16	10	13
22	IET 26631	88	79	84	124	122	123	43.7	42.6	43	16	12	14
23	IET 26632	92	89	90	124	125	125	37.3	35.6	36	37	24	30
24	IET 26633	95	80	87	124	124	124	31.5	33.0	32	28	24	26
25	IET 26634	95	91	93	124	123	124	32.0	31.4	32	18	13	16
26	IET 26635	86	76	81	124	121	122	26.8	33.8	30	22	8	15
27	IET 26636	87	84	86	124	120	122	32.3	25.4	29	13	11	12
28	IET 26637	104	86	95	131	124	128	29.3	29.1	29	59	14	37
29	IET 26638	101	96	98	131	143	137	29.8	36.7	33	28	13	21
30	IET 26639	86	81	83	119	108	114	34.1	35.7	35	20	8	14
31	IET 26640	82	86	84	119	110	115	41.8	43.0	42	10	10	10
32	IET 26641	94	93	94	124	124	124	35.2	39.4	37	20	15	18
33	IET 26351	86	85	85	119	110	114	58.5	42.4	50	16	11	13
34	IET 26643	82	96	89	124	114	119	38.3	48.7	43	22	33	28
35	S.bhagidhan	91	83	87	124	110	117	49.7	44.6	47	14	9	12
36	IET 26644	99	93	96	131	141	136	40.7	35.4	38	28	13	21
37	IET 26645	107	79	93	131	117	124	46.0	33.3	40	23	23	23
38	IET 26646	82	80	81	114	110	112	37.6	39.8	39	17	6	11
39	US-314	89	81	85	126	121	123	48.2	49.2	49	11	12	11
40	IET 25115	91	78	85	126	117	122	47.8	44.3	46	28	13	20
41	IET 25121	93	84	89	126	122	124	39.1	34.5	37	15	12	14
42	IET 25134	90	85	87	126	117	121	38.2	36.4	37	12	10	11
	Mean	**91**	**85**	**88**	**123**	**119**	**121**	**36.5**	**34.9**	**36**	**19**	**13**	**16**
	Grand Mean	**88**			**121**			**35.7**			**16**		
	CD(0.05)	5			4			2.53			0.92		
	CV(%)	5			3			6.27			5.16		
	M and T	7			6			3.58			1.3		
	T and M	7			6			3.76			1.45		

Table 6.2.7 Screening of elite genotypes suitable for rainfed conditions at Raipur during Kharif 2017, Influence of irrigation regimes on important yield attributes in different rice genotypes

S.No.	Entries	Tiller number/plant at till.			Tiller number/plant at flow.			Panicle number/m2		
		Irrigated	Rainfed	Mean	Irrigated	Rainfed	Mean	Irrigated	Rainfed	Mean
1	IET 26611	15	14	14	13	12	13	367	350	358
2	IET 26612	17	16	16	16	12	14	417	375	396
3	IET 26613	16	15	16	15	13	14	400	375	388
4	IET 26614	18	15	17	17	10	14	442	350	396
5	IET 26615	15	12	14	13	16	15	375	325	350
6	IET 26616	16	13	14	14	12	13	392	375	383
7	IET 26617	20	14	17	20	13	17	500	350	425
8	IET 26618	15	13	14	14	11	13	383	375	379
9	IET 26619	17	10	13	15	9	12	417	250	333
10	Vandana	15	10	13	13	10	12	375	200	288
11	IET 26620	14	12	13	12	10	11	358	375	367
12	IET 26621	14	12	13	11	13	12	342	350	346
13	IET 26622	13	15	14	12	12	12	333	375	354
14	IET 26623	17	14	16	17	11	14	425	375	400
15	IET 26624	13	11	12	11	13	12	325	225	275
16	IET 26625	18	11	14	16	10	13	442	300	371
17	IET 26626	17	12	15	16	11	14	433	325	379
18	IET 26627	12	13	13	10	11	11	300	350	325
19	IET 26628	19	13	16	18	12	15	475	375	425
20	IET 26629	16	11	13	15	13	14	392	275	333
21	IET 26630	18	14	16	16	14	15	442	350	396
22	IET 26631	17	11	14	16	11	13	425	300	363
23	IET 26632	11	12	12	10	11	11	283	325	304
24	IET 26633	12	10	11	11	9	10	292	275	283
25	IET 26634	17	15	16	15	13	14	417	400	408
26	IET 26635	17	10	14	16	8	12	425	275	350
27	IET 26636	10	13	12	9	13	11	258	375	317
28	IET 26637	16	8	12	15	10	13	392	200	296
29	IET 26638	13	13	13	12	14	13	333	350	342
30	IET 26639	11	9	10	10	10	10	283	200	242
31	IET 26640	21	10	16	22	10	16	525	225	375
32	IET 26641	13	12	12	12	10	11	325	250	288
33	IET 26351	18	12	15	17	11	14	450	300	375
34	IET 26643	11	11	11	10	14	12	275	275	275
35	Sahabhagidhan	13	11	12	13	10	11	333	275	304
36	IET 26644	12	9	11	10	13	12	300	250	275
37	IET 26645	18	14	16	18	12	15	458	325	392
38	IET 26646	13	11	12	12	11	12	333	225	279
39	US-314	11	12	12	10	10	10	283	325	304
40	IET 25115	18	13	16	17	10	14	450	325	388
41	IET 25121	21	14	17	21	10	16	517	350	433
42	IET 25134	13	11	12	12	11	12	333	225	279
	Mean	**15**	**12**	**14**	**14**	**11**	**13**	**382**	**311**	**346**
	Grand Mean	**14**			**13**			**346**		
	CD(0.05)	1.57			1.73			22.82		
	CV(%)	10.15			12			5.83		
	M and T	2.23			2.45			32.27		
	T and M	2.5			2.61			34.38		

Table 6.2.8 Screening of elite genotypes suitable for rainfed conditions at Raipur during Kharif 2017, Influence of irrigation regimes on important yield attributes in different rice genotypes

S.No.	Entries	Panicle weight (g/m2)			Shoot weight (g/m2)			Grain number/m2		
		Irrigated	Rainfed	Mean	Irrigated	Rainfed	Mean	Irrigated	Rainfed	Mean
1	IET 26611	450	537	494	613	271	442	56633	21703	39168
2	IET 26612	1375	548	961	588	197	392	75017	71120	73068
3	IET 26613	925	628	776	288	185	236	72700	49745	61223
4	IET 26614	1488	180	834	450	233	341	100908	8867	54887
5	IET 26615	738	618	678	350	222	286	104475	34983	69729
6	IET 26616	750	880	815	525	322	423	48883	68123	58503
7	IET 26617	1248	568	908	425	268	346	68517	53437	60977
8	IET 26618	188	403	295	313	315	314	32783	41888	37336
9	IET 26619	538	583	560	263	145	204	42375	25072	33723
10	Vandana	200	260	230	425	275	350	14817	12937	13877
11	IET 26620	300	420	360	275	279	277	15875	34502	25188
12	IET 26621	1675	583	1129	813	325	569	119217	55650	87433
13	IET 26622	400	250	325	363	202	282	33267	23378	28323
14	IET 26623	700	370	535	275	176	225	61083	38120	49602
15	IET 26624	613	455	534	313	165	239	184517	25653	105085
16	IET 26625	1248	204	726	313	107	210	76408	36290	56349
17	IET 26626	363	530	446	300	242	271	55058	30007	42533
18	IET 26627	1138	650	894	563	283	423	57708	36627	47168
19	IET 26628	1150	191	670	850	625	737	171042	15880	93461
20	IET 26629	825	542	684	438	395	416	72700	17418	45059
21	IET 26630	350	455	403	350	200	275	62467	42467	52467
22	IET 26631	638	425	531	388	257	322	53242	27607	40424
23	IET 26632	450	652	551	350	212	281	54692	37375	46033
24	IET 26633	363	365	364	613	198	405	33692	17143	25418
25	IET 26634	925	408	666	538	214	376	53817	18800	36308
26	IET 26635	388	445	416	363	163	263	54292	24473	39383
27	IET 26636	863	438	650	575	325	450	38000	34250	36125
28	IET 26637	713	435	574	813	572	692	56392	17662	37027
29	IET 26638	938	188	563	438	275	356	77633	11677	44655
30	IET 26639	613	365	489	363	175	269	54767	14862	34814
31	IET 26640	1063	305	684	475	187	331	70350	30228	50289
32	IET 26641	1313	728	1020	700	335	517	28600	26000	27300
33	IET 26351	1363	721	1042	625	332	479	71850	28988	50419
34	IET 26643	688	540	614	413	220	316	42783	23653	33218
35	Sahabhagidhan	975	513	744	513	264	388	52417	24018	38218
36	IET 26644	863	244	553	713	255	484	45650	12835	29243
37	IET 26645	1200	438	819	788	313	550	116500	24915	70708
38	IET 26646	538	595	566	188	302	245	53983	34200	44092
39	US-314	1275	628	951	563	265	414	46058	29240	37649
40	IET 25115	550	301	425	850	190	520	73333	30013	51673
41	IET 25121	588	692	640	375	388	381	37950	65685	51818
42	IET 25134	812	468	640	438	270	354	57850	31208	44529
	Mean	**804**	**470**	**637**	**480**	**265**	**373**	**64293**	**31160**	**47726**
	Grand Mean	**637**			**373**			**47726**		
	CD(0.05)	1.6			11.7			31103.95		
	CV(%)	0.22			2.77			57.59		
	M and T	2.26			16.54			43987.63		
	T and M	5.15			18.55			45760.36		

Table 6.2.9 Screening of elite genotypes suitable for rainfed conditions at Raipur during Kharif 2017, Influence of irrigation regimes on important yield attributes in different rice genotypes

S.No.	Entries	Grain number/panicle			Grain yield (g/m2)			Spikelet number/m2		
		Irrigated	Rainfed	Mean	Irrigated	Rainfed	Mean	Irrigated	Rainfed	Mean
1	IET 26611	155	62	108	441	284	362	15783	39428	27606
2	IET 26612	180	190	185	649	235	442	17917	85753	51835
3	IET 26613	182	133	157	449	267	358	14658	73752	44205
4	IET 26614	228	25	127	507	146	326	19733	27767	23750
5	IET 26615	278	108	193	774	269	521	20408	45825	33117
6	IET 26616	125	182	153	636	374	505	12942	78753	45848
7	IET 26617	137	153	145	845	359	602	20683	82722	51702
8	IET 26618	86	112	99	324	364	344	15217	51882	33549
9	IET 26619	102	100	101	473	285	379	13617	25678	19648
10	Vandana	39	65	52	240	171	206	7892	17063	12478
11	IET 26620	44	92	68	400	254	327	6333	33372	19853
12	IET 26621	349	159	254	569	291	430	22742	82477	52609
13	IET 26622	100	62	81	538	285	411	9450	24373	16912
14	IET 26623	144	102	123	522	262	392	17550	48633	33092
15	IET 26624	537	114	325	579	231	405	12358	37285	24822
16	IET 26625	173	121	147	421	157	289	19658	39707	29683
17	IET 26626	127	92	110	410	188	299	16175	30553	23364
18	IET 26627	193	105	149	422	211	316	13067	49928	31498
19	IET 26628	360	42	201	489	185	337	27008	56123	41566
20	IET 26629	186	63	125	464	219	341	14217	34018	24118
21	IET 26630	141	121	131	458	415	437	16925	50518	33722
22	IET 26631	125	92	109	538	317	427	14558	18198	16378
23	IET 26632	194	115	154	545	332	439	13075	47672	30373
24	IET 26633	116	62	89	552	376	464	8208	23467	15838
25	IET 26634	130	47	89	563	244	403	17367	20132	18749
26	IET 26635	128	89	108	593	330	462	15825	33283	24554
27	IET 26636	147	91	119	545	344	444	10700	44623	27662
28	IET 26637	144	88	116	531	137	334	12392	26528	19460
29	IET 26638	233	33	133	494	110	302	14000	45032	29516
30	IET 26639	193	74	134	499	209	354	12867	25135	19001
31	IET 26640	134	134	134	496	304	400	18725	34590	26658
32	IET 26641	88	104	96	703	276	489	8883	32165	20524
33	IET 26351	160	97	128	568	344	456	16200	32012	24106
34	IET 26643	155	86	121	644	282	463	8550	37142	22846
35	Sahabhagidhan	157	87	122	703	343	523	12442	37032	24737
36	IET 26644	152	51	102	614	147	380	14125	55328	34727
37	IET 26645	254	77	165	504	211	357	19725	38032	28878
38	IET 26646	162	152	157	604	255	429	12333	46802	29568
39	US-314	163	90	126	498	512	505	9233	39443	24338
40	IET 25115	163	92	128	571	208	390	11517	62403	36960
41	IET 25121	73	188	131	705	395	550	20992	80393	50693
42	IET 25134	174	139	156	705	454	579	15200	34060	24630
	Mean	**169**	**100**	**135**	**542**	**276**	**409**	**14792**	**43550**	**29171**
	Grand Mean	**135**			**409**			**29171**		
	CD(0.05)	86.89			64.33			1340.34		
	CV(%)	57.08			13.9			4.06		
	M and T	122.89			90.97			1895.52		
	T and M	126.61			96.22			2824.31		

Table 6.2.10 Screening of elite genotypes suitable for rainfed conditions at Raipur during Kharif 2017, Influence of irrigation regimes on important yield attributes in different rice genotypes

S.No.	Entries	Spikelet number/panicle			1000 grain weight (g)			Harvest index (%)		
		Irrigated	Rainfed	Mean	Irrigated	Rainfed	Mean	Irrigated	Rainfed	Mean
1	IET 26611	43	113	78	19.1	29.0	24.1	37.5	30.3	33.9
2	IET 26612	43	229	136	23.1	19.0	21.1	33.3	28.6	30.9
3	IET 26613	37	197	117	19.4	19.0	19.2	35.7	30.0	32.8
4	IET 26614	45	79	62	20.3	11.3	15.8	33.9	25.8	29.9
5	IET 26615	54	141	98	24.7	21.3	23.0	38.6	29.2	33.9
6	IET 26616	33	210	122	23.3	20.0	21.7	35.6	27.7	31.6
7	IET 26617	41	236	139	24.9	19.7	22.3	34.7	32.7	33.7
8	IET 26618	40	138	89	17.6	14.0	15.8	36.0	30.4	33.2
9	IET 26619	33	103	68	19.5	24.0	21.7	33.8	31.5	32.6
10	Vandana	21	85	53	17.2	24.3	20.8	35.3	28.2	31.8
11	IET 26620	18	89	53	19.5	25.7	22.6	37.4	29.3	33.4
12	IET 26621	66	236	151	20.1	16.7	18.4	37.1	26.5	31.8
13	IET 26622	28	65	47	20.1	20.3	20.2	38.3	29.8	34.0
14	IET 26623	41	130	86	20.4	18.3	19.4	35.2	27.2	31.2
15	IET 26624	38	166	102	20.7	22.3	21.5	34.7	33.1	33.9
16	IET 26625	44	132	88	22.2	13.7	17.9	30.2	29.6	29.9
17	IET 26626	37	94	66	21.8	19.3	20.6	35.6	21.2	28.4
18	IET 26627	44	143	93	20.0	17.0	18.5	35.1	19.4	27.2
19	IET 26628	57	150	103	21.0	12.3	16.7	37.7	16.6	27.2
20	IET 26629	36	124	80	23.1	21.0	22.1	35.0	19.6	27.3
21	IET 26630	38	144	91	21.0	19.3	20.2	34.7	29.8	32.2
22	IET 26631	34	61	48	21.5	24.0	22.7	33.9	22.1	28.0
23	IET 26632	47	147	97	22.2	22.3	22.3	37.9	26.9	32.4
24	IET 26633	28	85	57	21.8	23.0	22.4	34.4	30.1	32.3
25	IET 26634	42	50	46	22.1	19.0	20.5	35.2	31.4	33.3
26	IET 26635	37	121	79	21.7	18.7	20.2	40.6	29.0	34.8
27	IET 26636	41	119	80	21.1	18.3	19.7	36.2	28.1	32.1
28	IET 26637	32	133	82	21.6	16.0	18.8	32.9	10.1	21.5
29	IET 26638	42	129	85	20.8	18.0	19.4	33.6	17.5	25.6
30	IET 26639	45	126	86	19.8	23.0	21.4	33.0	31.7	32.4
31	IET 26640	36	154	95	20.5	19.0	19.7	32.8	28.9	30.9
32	IET 26641	27	129	78	23.7	20.7	22.2	33.6	21.1	27.3
33	IET 26351	36	107	71	21.7	22.7	22.2	31.5	28.4	30.0
34	IET 26643	31	135	83	22.7	21.0	21.9	32.9	33.6	33.2
35	Sahabhagidhan	37	135	86	22.9	23.0	23.0	39.6	29.6	34.6
36	IET 26644	47	221	134	21.5	14.0	17.8	34.5	22.5	28.5
37	IET 26645	43	117	80	21.4	12.0	16.7	34.6	24.5	29.5
38	IET 26646	37	208	123	21.8	24.0	22.9	43.0	24.2	33.6
39	US-314	33	121	77	21.2	19.3	20.3	35.6	28.9	32.3
40	IET 25115	26	192	109	22.1	21.3	21.7	37.5	32.3	34.9
41	IET 25121	41	230	135	23.3	22.0	22.7	38.0	30.9	34.5
42	IET 25134	46	151	99	23.8	24.0	23.9	34.4	29.9	32.2
	Mean	**39**	**140**	**89**	**21.4**	**19.8**	**20.6**	**35.5**	**27.1**	**31.3**
	Grand Mean	**89**			**20.6**			**31.3**		
	CD(0.05)	2.45			1.66			2.91		
	CV(%)	2.42			7.12			8.21		
	M and T	3.46			2.35			4.11		
	T and M	4.01			2.82			4.07		

Table 6.2.11 Screening of elite genotypes suitable for rainfed conditions at REWA during Kharif 2017, Influence of irrigation regimes on important yield attributes in different rice genotypes

S.No.	Entries	Days to flowering			Days to maturity			Tiller number/hill at flow.		
		Irrigated	Rainfed	Mean	Irrigated	Rainfed	Mean	Irrigated	Rainfed	Mean
1	IET 26611	94	95	95	118	123	121	11	8	10
2	IET 26612	111	113	112	136	137	137	13	10	12
3	IET 26613	100	110	105	126	145	136	12	8	10
4	IET 26614	127	135	131	154	162	158	11	10	11
5	IET 26615	108	109	109	137	135	136	12	9	10
6	IET 26616	108	110	109	136	136	136	12	9	10
7	IET 26617	111	133	122	137	171	154	14	11	12
8	IET 26618	99	100	100	126	156	141	13	10	12
9	IET 26619	95	102	99	121	130	125	10	8	9
10	Vandana	98	92	95	124	121	122	12	10	11
11	IET 26620	98	103	100	124	147	136	13	9	11
12	IET 26621	112	127	120	137	154	146	11	8	9
13	IET 26622	105	120	113	131	143	137	13	8	11
14	IET 26623	111	127	119	135	156	146	13	10	12
15	IET 26624	105	110	108	133	137	135	12	9	11
16	IET 26625	105	113	109	133	137	135	10	7	9
17	IET 26626	108	117	113	132	144	138	11	10	10
18	IET 26627	107	114	111	134	142	138	11	8	10
19	IET 26628	131	109	120	171	165	168	12	10	11
20	IET 26629	105	109	107	132	135	133	10	9	10
21	IET 26630	104	109	106	133	134	133	11	8	9
22	IET 26631	104	108	106	135	134	134	12	10	11
23	IET 26632	111	120	115	140	144	142	13	10	12
24	IET 26633	114	126	120	138	146	142	12	10	11
25	IET 26634	113	126	119	148	149	149	12	8	10
26	IET 26635	110	109	110	135	135	135	12	8	10
27	IET 26636	109	126	118	135	161	148	12	9	11
28	IET 26637	129	128	129	159	154	157	11	9	10
29	IET 26638	129	130	130	158	156	157	14	9	12
30	IET 26639	106	114	110	132	143	138	13	9	11
31	IET 26640	106	105	106	134	131	132	13	9	11
32	IET 26641	119	128	124	152	157	154	12	10	11
33	IET 26351	110	103	107	135	128	132	14	12	13
34	IET 26643	118	114	116	144	141	142	10	8	9
35	Sahabhagidhan	117	113	115	141	138	139	12	10	11
36	IET 26644	109	113	111	139	169	154	12	9	10
37	IET 26645	134	133	133	158	160	159	11	7	9
38	IET 26646	135	107	121	164	133	149	13	10	12
39	US-314	107	116	112	134	143	138	13	9	11
40	IET 25115	108	103	106	132	128	130	13	11	12
41	IET 25121	107	115	111	134	140	137	12	9	11
42	IET 25134	111	122	117	136	144	140	11	8	9
	Mean	**111**	**115**	**113**	**138**	**144**	**141**	**12**	**9**	**11**
	Grand Mean	**113**			**141**				**11**	**11**
	CD(0.05)	3.0			3.5			1.9		
	CV(%)	2.3			2.2			15.5		
	M and T	4.2			4.9			ns		
	T and M	4.2			5.3			ns		

Table 6.2.12 Screening of elite genotypes suitable for rainfed conditions at REWA during Kharif 2017, Influence of irrigation regimes on important yield attributes in different rice genotypes

S.No.	Entries	Stem weight (g/m2) at flowering			Panicle Number/m2			Panicle weight (g/m2) at maturity		
		Irrigated	Rainfed	Mean	Irrigated	Rainfed	Mean	Irrigated	Rainfed	Mean
1	IET 26611	477	407	442	327	257	292	509	449	479
2	IET 26612	454	396	425	373	338	356	638	590	614
3	IET 26613	584	522	553	350	315	333	537	485	511
4	IET 26614	492	439	465	350	350	350	541	499	520
5	IET 26615	457	398	427	327	280	303	463	415	439
6	IET 26616	479	415	447	373	350	362	565	511	538
7	IET 26617	613	561	587	397	385	391	574	532	553
8	IET 26618	450	395	423	373	233	303	359	315	337
9	IET 26619	187	126	156	257	198	228	375	325	350
10	Vandana	527	466	497	373	327	350	514	464	489
11	IET 26620	207	137	172	373	210	292	289	229	259
12	IET 26621	712	653	683	327	385	356	559	511	535
13	IET 26622	327	264	296	397	187	292	407	355	381
14	IET 26623	312	259	286	385	128	257	315	273	294
15	IET 26624	256	197	227	385	140	263	374	326	350
16	IET 26625	213	149	181	268	128	198	294	240	267
17	IET 26626	313	261	287	303	280	292	399	357	378
18	IET 26627	213	159	186	292	292	292	289	245	267
19	IET 26628	311	250	281	373	210	292	273	223	248
20	IET 26629	329	268	298	292	315	303	359	309	334
21	IET 26630	275	205	240	315	233	274	286	226	256
22	IET 26631	364	305	335	385	292	338	445	397	421
23	IET 26632	398	335	367	373	338	356	412	360	386
24	IET 26633	373	320	346	385	338	362	489	447	468
25	IET 26634	208	149	178	350	245	298	324	276	300
26	IET 26635	327	263	295	338	163	251	336	282	309
27	IET 26636	227	174	201	315	257	286	314	272	293
28	IET 26637	321	267	294	327	338	333	350	306	328
29	IET 26638	354	293	324	408	233	321	341	291	316
30	IET 26639	281	220	250	408	385	397	423	373	398
31	IET 26640	470	400	435	420	420	420	517	457	487
32	IET 26641	433	375	404	338	420	379	696	648	672
33	IET 26351	364	301	333	455	455	455	577	525	551
34	IET 26643	418	365	392	268	222	245	317	275	296
35	Sahabhagidhan	376	317	346	362	268	315	321	273	297
36	IET 26644	385	321	353	327	222	274	390	336	363
37	IET 26645	239	187	213	315	303	309	357	315	336
38	IET 26646	332	277	305	385	292	338	308	264	286
39	US-314	322	261	292	385	257	321	370	320	345
40	IET 25115	247	185	216	408	315	362	616	566	591
41	IET 25121	199	149	174	338	222	280	330	290	310
42	IET 25134	191	139	165	315	187	251	301	259	280
	Mean	**358**	**298**	**328**	**353**	**279**	**316**	**416**	**367**	**391**
	Grand Mean		**328**	**328**		**316**	**316**		**391**	**391**
	CD(0.05)	49.0			63.2			42.7		
	CV(%)	13.2			17.7			9.6		
	M and T	ns			89.4			ns		
	T and M	ns			117.3			ns		

Table 6.2.13 Screening of elite genotypes suitable for rainfed conditions at REWA during Kharif 2017, Influence of irrigation regimes on important yield attributes in different rice genotypes

S.No.	Entries	Shoot weight (g/m2)			spikelet number/m2			Spikelet number/panicle		
		Irrigated	Rainfed	Mean	Irrigated	Rainfed	Mean	Irrigated	Rainfed	Mean
1	IET 26611	536	473	504	43552	29155	36353	133	113	123
2	IET 26612	521	469	495	55230	41837	48533	148	124	136
3	IET 26613	650	594	622	50482	37543	44013	144	119	132
4	IET 26614	563	517	540	48148	41137	44643	138	118	128
5	IET 26615	533	480	506	45663	30263	37963	140	108	124
6	IET 26616	559	502	531	56525	42152	49338	151	120	136
7	IET 26617	696	651	673	57248	46655	51952	144	121	133
8	IET 26618	534	486	510	49105	24243	36674	132	104	118
9	IET 26619	268	214	241	31827	20288	26058	124	103	113
10	Vandana	609	554	582	53130	39037	46083	142	120	131
11	IET 26620	284	221	252	40833	20160	30497	109	97	103
12	IET 26621	789	737	763	46573	45967	46270	142	119	131
13	IET 26622	398	342	370	48510	19017	33763	122	102	112
14	IET 26623	379	332	356	46293	12355	29324	120	96	108
15	IET 26624	327	274	301	45092	12927	29009	117	92	105
16	IET 26625	271	214	242	29365	11457	20411	110	90	100
17	IET 26626	370	324	347	41043	28863	34953	135	103	119
18	IET 26627	277	229	253	37438	28373	32906	128	97	113
19	IET 26628	376	322	349	45010	20452	32731	121	98	109
20	IET 26629	393	338	366	40868	35268	38068	140	112	126
21	IET 26630	344	281	312	37765	23298	30532	120	100	110
22	IET 26631	439	387	413	49583	30555	40069	129	105	117
23	IET 26632	472	416	444	49723	36563	43143	133	108	121
24	IET 26633	451	404	428	49782	37053	43418	129	109	119
25	IET 26634	289	236	262	45033	23613	34323	128	96	112
26	IET 26635	405	348	376	43050	15808	29429	128	97	112
27	IET 26636	304	258	281	35443	22867	29155	112	89	101
28	IET 26637	395	347	371	43003	35105	39054	132	104	118
29	IET 26638	431	376	404	50563	23858	37211	123	102	113
30	IET 26639	358	303	331	59162	47262	53212	145	123	134
31	IET 26640	550	486	518	56910	51765	54338	135	123	129
32	IET 26641	520	469	495	49957	52290	51123	148	125	136
33	IET 26351	437	381	409	66885	57738	62312	147	127	137
34	IET 26643	479	433	456	32690	21595	27143	122	98	110
35	Sahabhagidhan	449	396	423	45208	26810	36009	125	100	113
36	IET 26644	456	399	427	38278	21642	29960	117	97	107
37	IET 26645	303	257	280	37100	29598	33349	118	98	108
38	IET 26646	397	349	373	51718	30240	40979	134	103	119
39	US-314	400	346	373	48720	26542	37631	127	104	115
40	IET 25115	314	260	287	60503	37730	49117	148	120	134
41	IET 25121	273	229	251	38150	20557	29353	113	93	103
42	IET 25134	271	225	248	35723	18830	27277	113	101	107
	Mean	**430**	**378**	**404**	**46116**	**30440**	**38278**	**130**	**107**	**118**
	Grand Mean		**404**	**404**		**38278**	**38278**		**118**	**118**
	CD(0.05)	47.8			7888.1			3.7		
	CV(%)	10.5			18.2			2.8		
	M and T	ns			11155.4			5.2		
	T and M	ns			14374.8			5.2		

Table 6.2.14 Screening of elite genotypes suitable for rainfed conditions at REWA during Kharif 2017, Influence of irrigation regimes on important yield attributes in different rice genotypes

S.No.	Entries	Grain number/m2			Grain number/panicle			Grain yield (g/m2)		
		Irrigated	Rainfed	Mean	Irrigated	Rainfed	Mean	Irrigated	Rainfed	Mean
1	IET 26611	24967	13078	19023	77	56	67	376	346	361
2	IET 26612	36960	20907	28933	98	80	89	552	528	540
3	IET 26613	34475	26110	30293	99	87	93	434	408	421
4	IET 26614	37940	27253	32597	108	97	103	493	472	483
5	IET 26615	34137	27895	31016	105	86	95	379	355	367
6	IET 26616	49420	29808	39614	132	102	117	496	469	483
7	IET 26617	51987	37333	44660	131	107	119	507	486	497
8	IET 26618	38395	24792	31593	103	82	92	325	303	314
9	IET 26619	21537	13942	17739	84	70	77	227	202	215
10	Vandana	47425	26518	36972	127	102	115	430	405	417
11	IET 26620	32142	16123	24133	87	64	76	203	173	188
12	IET 26621	44917	32340	38628	137	107	122	484	460	472
13	IET 26622	32947	17500	25223	83	58	71	281	255	268
14	IET 26623	35805	11270	23538	93	75	84	205	184	195
15	IET 26624	39900	7945	23923	103	76	90	209	185	197
16	IET 26625	22855	10850	16853	85	62	74	181	154	168
17	IET 26626	36190	26063	31127	120	100	110	338	317	328
18	IET 26627	32480	26390	29435	111	84	98	196	174	185
19	IET 26628	39083	16543	27813	105	79	92	194	169	182
20	IET 26629	32783	32118	32451	113	94	104	317	292	305
21	IET 26630	29808	17885	23847	94	72	83	210	180	195
22	IET 26631	45897	26250	36073	119	98	109	372	348	360
23	IET 26632	44205	25947	35076	118	93	106	327	301	314
24	IET 26633	53048	42980	48014	138	108	123	410	389	400
25	IET 26634	42408	22540	32474	122	92	107	230	206	218
26	IET 26635	37648	13767	25708	111	83	97	206	179	192
27	IET 26636	30963	18923	24943	98	77	88	214	193	204
28	IET 26637	39620	25083	32352	121	98	110	259	237	248
29	IET 26638	46585	21350	33968	114	91	102	286	261	274
30	IET 26639	51368	35373	43371	125	104	115	324	299	312
31	IET 26640	57400	45430	51415	137	111	124	445	415	430
32	IET 26641	48160	41358	44759	142	114	128	536	512	524
33	IET 26351	60585	49945	55265	133	113	123	519	493	506
34	IET 26643	29657	25877	27767	111	89	100	227	206	217
35	Sahabhagidhan	35992	21385	28688	100	80	90	254	230	242
36	IET 26644	39993	27067	33530	122	97	110	294	267	280
37	IET 26645	33285	21700	27493	106	77	92	204	183	194
38	IET 26646	42992	22388	32690	112	83	98	224	202	213
39	US-314	46457	28093	37275	121	96	108	284	259	272
40	IET 25115	62148	36412	49280	152	112	132	473	448	460
41	IET 25121	34090	23252	28671	101	80	90	202	182	192
42	IET 25134	30508	17138	23823	97	74	85	187	166	176
	Mean	**39742**	**25117**	**32430**	**112**	**88**	**100**	**322**	**297**	**310**
	Grand Mean		**32430**	**32430**		**100**	**100**		**310**	**310**
	CD(0.05)	7494.0			4.9			47.5		
	CV(%)	20.4			4.4			13.6		
	M and T	ns			7.0			ns		
	T and M	ns			7.1			ns		

Table 6.2.15 Screening of elite genotypes suitable for rainfed conditions at REWA during Kharif 2017, Influence of irrigation regimes on important yield attributes in different rice genotypes

S.No.	Entries	1000 grain weight (g)			Harvest Index (%)		
		Irrigated	Rainfed	Grand Mean	Irrigated	Rainfed	Grand Mean
1	IET 26611	20.4	17.8	19.1	30.7	32.1	31.4
2	IET 26612	15.4	13.2	14.3	41.8	44.4	43.1
3	IET 26613	19.5	17.2	18.3	32.3	34.1	33.2
4	IET 26614	18.9	16.8	17.8	38.3	40.6	39.5
5	IET 26615	17.7	16.7	17.2	32.0	34.1	33.0
6	IET 26616	21.9	19.9	20.9	38.0	40.2	39.1
7	IET 26617	17.2	15.6	16.4	33.8	35.1	34.5
8	IET 26618	15.7	13.7	14.7	32.0	33.8	32.9
9	IET 26619	22.1	19.1	20.6	30.9	33.7	32.3
10	Vandana	19.9	17.3	18.6	33.0	34.9	34.0
11	IET 26620	25.3	23.5	24.4	30.7	35.2	32.9
12	IET 26621	14.4	12.8	13.6	30.8	32.1	31.4
13	IET 26622	20.2	18.4	19.3	30.7	33.1	31.9
14	IET 26623	18.7	16.2	17.5	25.6	26.8	26.2
15	IET 26624	23.2	20.6	21.9	25.7	26.9	26.3
16	IET 26625	12.8	10.4	11.6	28.2	30.4	29.3
17	IET 26626	20.1	17.9	19.0	37.8	40.8	39.3
18	IET 26627	18.7	16.4	17.6	29.8	32.9	31.4
19	IET 26628	19.1	17.0	18.1	26.2	28.7	27.5
20	IET 26629	21.7	20.7	21.2	35.1	38.2	36.7
21	IET 26630	16.6	14.6	15.6	28.9	31.8	30.4
22	IET 26631	20.8	19.2	20.0	37.2	39.9	38.6
23	IET 26632	21.5	19.5	20.5	31.2	32.9	32.0
24	IET 26633	19.6	16.6	18.1	37.4	39.6	38.5
25	IET 26634	14.0	11.4	12.7	31.7	35.0	33.3
26	IET 26635	15.7	13.9	14.8	23.4	24.4	23.9
27	IET 26636	17.2	15.6	16.4	30.0	33.2	31.6
28	IET 26637	18.0	16.2	17.1	28.5	30.2	29.3
29	IET 26638	19.5	17.0	18.3	29.5	31.5	30.5
30	IET 26639	21.1	18.5	19.8	35.7	38.4	37.1
31	IET 26640	17.5	15.1	16.3	36.9	39.4	38.1
32	IET 26641	18.5	16.3	17.4	38.8	40.8	39.8
33	IET 26351	18.5	16.2	17.3	44.1	47.5	45.8
34	IET 26643	24.2	22.1	23.2	23.5	24.5	24.0
35	Sahabhagidhan	20.1	19.1	19.6	29.6	32.3	31.0
36	IET 26644	19.2	17.2	18.2	28.6	30.4	29.5
37	IET 26645	19.7	18.1	18.9	24.0	25.3	24.7
38	IET 26646	23.5	21.5	22.5	26.2	27.4	26.8
39	US-314	20.1	17.1	18.6	32.0	34.5	33.2
40	IET 25115	19.0	16.4	17.7	45.3	48.9	47.1
41	IET 25121	21.5	19.7	20.6	29.1	31.2	30.1
42	IET 25134	23.6	22.0	22.8	28.0	30.4	29.2
	Mean	**19.3**	**17.3**	**18.3**	**32.0**	**34.2**	**33.1**
	Grand Mean		**18.3**	**18.3**		**33.1**	**33.1**
	CD(0.05)	1.2			4.8		
	CV(%)	5.6			12.9		
	M and T	ns			ns		
	T and M	ns			ns		

Table 6.2.16 Screening of elite genotypes suitable for rainfed conditions at Faizabad during Kharif 2017

S.No.	Entries	Days to		Stem dry wt. (g/m2)	TDM (g/m2)	Grain Yield (g/m2)	1000 grain wt. (g)	HI %
		Flowering	Maturity					
1	IET 26611	68	95	410	797	308	23.3	38.7
2	IET 26612	70	97	287	797	347	22.4	43.3
3	IET 26613	65	92	377	703	307	21.9	43.6
4	IET 26614	-	-	-	-	-	-	-
5	IET 26615	70	98	402	732	342	22.2	46.7
6	IET 26616	70	96	455	837	353	19.4	42.1
7	IET 26617	81	107	312	758	338	24.3	44.7
8	IET 26618	64	91	322	713	345	17.0	48.4
9	IET 26619	64	93	300	732	335	23.3	45.9
10	Vandana	58	86	393	722	337	23.5	46.7
11	IET 26620	57	86	325	755	345	19.6	45.7
12	IET 26621	64	80	382	687	295	20.1	43.0
13	IET 26622	64	82	368	680	283	18.6	41.6
14	IET 26623	77	102	410	795	335	20.2	42.1
15	IET 26624	69	96	338	690	308	24.4	44.7
16	IET 26625	69	96	302	648	272	15.3	41.9
17	IET 26626	69	96	398	763	325	21.5	42.6
18	IET 26627	69	97	280	853	392	23.2	45.9
19	IET 26628	-	-	-	-	-	-	-
20	IET 26629	69	96	422	815	377	24.5	46.2
21	IET 26630	69	97	472	783	330	16.7	42.2
22	IET 26631	69	95	370	803	377	25.6	46.9
23	IET 26632	72	99	328	777	395	22.4	51.3
24	IET 26633	80	107	417	757	273	22.8	36.3
25	IET 26634	73	100	348	652	282	19.2	43.2
26	IET 26635	69	96	405	800	330	23.3	41.1
27	IET 26636	78	103	368	683	302	20.6	44.3
28	IET 26637	86	114	355	803	323	21.6	39.7
29	IET 26638	67	95	300	710	277	22.2	38.8
30	IET 26639	70	97	398	752	310	18.9	41.2
31	IET 26640	-	-	-	-	-	-	-
32	IET 26641	70	99	338	633	245	16.3	38.7
33	IET 26351	67	93	367	785	367	24.7	46.7
34	IET 26643	71	101	322	642	277	21.4	43.1
35	Sahabhagidhan	66	94	308	773	353	19.3	45.7
36	IET 26644	73	101	415	720	227	15.6	31.5
37	IET 26645	88	116	302	642	278	14.6	43.4
38	IET 26646	67	93	287	780	345	23.6	44.1
39	US-314	70	97	298	798	392	22.4	49.2
40	IET 25115	65	93	308	820	355	19.0	43.3
41	IET 25121	68	97	358	828	375	23.8	45.4
42	IET 25134	69	98	382	762	357	25.1	46.8
	Exp. mean	**69.9**	**96.7**	**357.1**	**748.2**	**325.9**	**21.1**	**43.5**
	CD(0.05)	1.48	7.45	18.05	60.11	44.95	0.55	5.09
	CV	1.31	4.76	3.13	4.97	8.53	1.61	7.24
	res1(t)	**	**	**	**	**	**	**
	res2(r)	**	ns	ns	ns	ns	ns	ns

6.3 Evaluation of rice genotypes for terminal heat stress tolerance suitable for future climate

Locations: IIRR, PNR, PTB, REWA, MTU, TTB and CHN

In the scenario of global climate change, farming community felt hard to attain self sufficiency and to meet the ever increasing demand for food grain production on existing farm lands. Increased atmospheric CO_2 and emission of Non-CO_2 Green House Gases (Non CO_2 GHG's) – methane (CH_4) and nitrous oxide (N_2O) - resulted from an anthropogenic activity of applying excessive nitrogen (N) fertilizer doses to the field crops are the grounds for increasing the global temperature. Furthermore, global climate change is likely to be intensify the current vulnerability of the rice crop to high temperatures, with a projected global average surface temperature increase of 1.4 - 5.8^{o}C by the end of 21st century and the possibility of increased variability about this mean (IPCC, 2013). Rice crop exposure to the spells of high temperature results in grain yield diminish due to spikelet sterility; reduction in source and sink activities; assimilate partitioning mediated through apoplastic and symplastic pathways. (Farrewell *et al.,* 2006). Considering the significance of heat tolerance in rice, a trial was initiated for field level evaluation of elite rice genotypes in 2010 wet season and being continued to date. During 2017 wet season the trial was conducted across the IIRR, PNR, PTB, REWA, MTU, TTB and CHN centres with 34 entries comprising of 32 IVT E-TP entries and 2 checks.

The trial was executed in split-plot RCBD design with 3 replications as temperature regimes as main plot and genotypes and locations as sub-plot treatments. High temperature treatment was imposed in field grown plants by covering with polythene sheet (>92% transmittance) immediately after panicle initiation stage.

At IIRR centre the temperature and humidity (RH) was recorded inside and outside the polythene tunnel. The mean maximum temperature during the crop season (36.7˚C) was (6.3˚C) higher inside the polythene tunnel than ambient mean maximum temperature during the corresponding period. Similarly, the mean minimum temperature recorded inside the tunnel was (2.1˚C) higher than the ambient mean temperature.

At MTU centre the mean maximum temperature recorded inside the tunnel was 4.06 ˚C higher than the ambient temperature during the crop growth period and the mean minimum temperature inside the tunnel was 2.40 ˚C higher than the ambient temperature recorded outside the tunnel during the corresponding period. At TTB centre mean maximum

temperature recorded inside the tunnel was 2.35 ˚C higher than the ambient temperature and the mean minimum temperature recorded as 0.86 ˚C higher than the ambient temperature during the corresponding period. At REWA centre also the temperature inside the polythene tunnel was higher than the ambient temperature recorded during crop growth period. The mean maximum temperature recorded inside the tunnel was 1.53 ˚C higher than the ambient mean maximum temperature and the mean minimum temperature during the corresponding period was 0.97 ˚C higher than the ambient mean minimum temperature.

Elevated temperature had no significant effect on mean days to flowering for all the genotypes. However, significant ($P<0.01$) differences were observed between varieties ($P<0.01$). The interaction between treatment and variety was found to be non-significant. The mean days to flowering showed significant differences among the locations (Table 6.3.1). The interaction between location x treat x variety was also found to be significant ($P<0.01$). The mean days to flowering varied between 60 (IET 24053) to maximum of 95 (175-2 (K)) under elevated temperature. In contrast, it is varied between 61 to maximum of 98 days under ambient conditions.

Similarly, temperature regimes did not alter the days to maturity. The mean maturity days for all the varieties and locations under ambient temperature is 116 days and under high temperature stress the crop took 115 days for maturity. The interaction between treatment and variety was non-significant. The mean maturity days for all locations varied between 101 and 125 days under elevated temperature stress.

Panicle number per sq. meter is an essential yield causative trait. Statistically significant ($P<0.01$) interactions were observed between location x treatment and location x variety, indicating that the entries performed differently at different locations upon the high temperature treatment. However, no significant interaction was noticed in varieties for the trait and treatment x variety. Under elevated temperature stress, the mean no. of panicles m^{-2} for all centres was minimum in IET 24053 (225) followed by IET 26773 (282). Conversely increase in panicle number per sq. meter under high temperature was observed in 175-2 (K) (359) and s-458 (291).

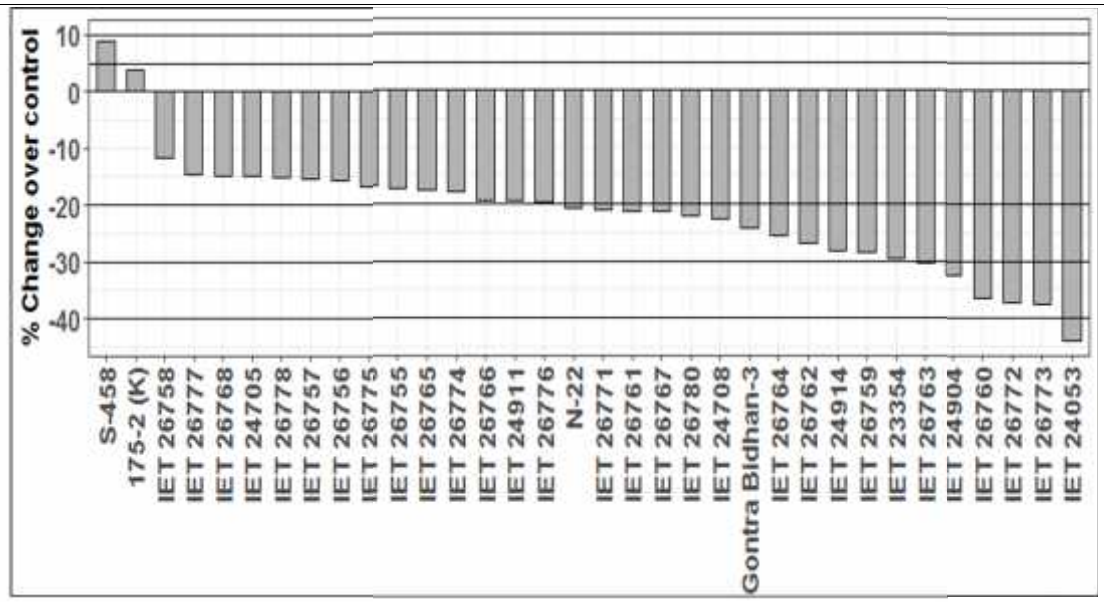


Fig 1: Influence of high temperature stress on mean No. of panicles m^{-2}. Each bar represents the % change in No. of panicles m^{-2} over ambient control.

The mean number of grains per panicle for all entries and centres showed reduction under high temperature stress. The mean No. of filled grains per panicle for all locations varied between 63 (IET 26757) and 109 (IET 26776) under high temperature stress. In order to understand the effect of elevated temperature on individual entries % change in No. of filled grains per panicle over ambient control was calculated. IET 26760 showed the maximum reduction and minimum was observed in IET 26768. As indicated in Fig 2(A), the number of unfilled grains under both elevated and ambient control temperatures is relatively less at REWA, followed by PNR location. Maximum number of unfilled grains was observed at IIRR, TTB and PTB.

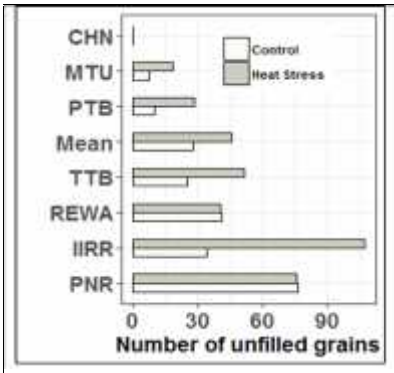


Fig. 2(A): Influence of high temperature stress on number of unfilled grains per panicle in different rice genotypes at different AICRIP centres during Kharif 2017. Each bar represents the mean of all the entries.

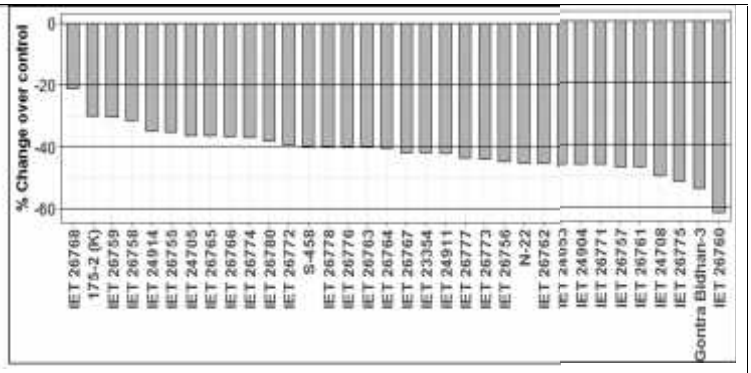


Fig.2 (B): Influence of high temperature stress on number of filled grains in different rice genotypes. Each bar represents the per cent change in filled grain number under elevated temperature with respect to ambient temperature Each bar represents the mean of all the 6 centres.

TDM was recorded at harvest and expressed as g m^{-2} and the data was presented in table (Table 6.3.17). The mean TDM recorded for all varieties and locations was reduced by > 30% under high temperature stress with respect to ambient conditions. However, high temperature stress has significant affect ($P<0.05$) on mean TDM (g m^{-2}). The mean TDM for all entries varied between 880 (IIRR) to 1424 (REWA) under elevated temperature. The interaction between location x treatment and location x variety was statistically significant ($p<0.01$). Percent reduction in mean TDM across the locations was observed in all entries except in IET 26768. Maximum reduction (>50%) in mean TDM was noticed in IET 26761.

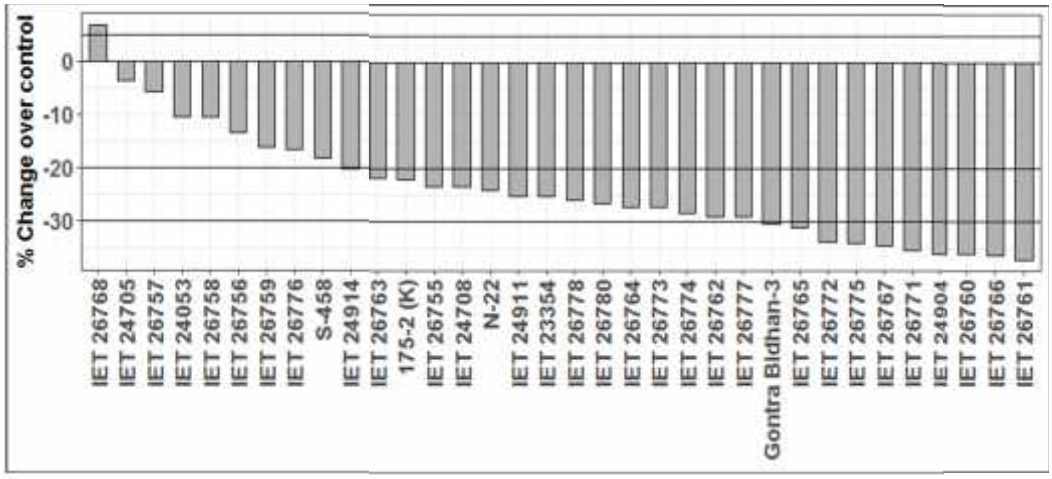


Fig.3: Influence of high temperature on mean total dry matter (g m^{-2}). Each bar represents the per cent change in TDM under elevated temperature with respect to ambient temperature. Each value represents the mean of all the 6 centres.

Grain yield was recorded at harvest and expressed as g m^{-2} and the data was presented in table (Table 6.3.16). The mean grain yield recorded for all varieties and locations was reduced by > 60% under high temperature stress with respect to ambient conditions. The reduction in grain yield was highest in IIRR followed by PTB, PNR and TTB. The minimum reduction in grain yield was observed in REWA as the mean maximum temperature difference between treatment and control was low (1.53 ˚C). A significant reduction was noticed in grain yield among all the varieties across the locations. Maximum reduction (> 60% reduction over the control) in the mean grain yield for all the centres was observed in 20 entries. Particularly, two fold (>2) reduction in mean grain yield over the control conditions across the locations was noticed in IET 26761, IET 24904 and IET 26771. Conversely, the reduction in grain yield under high temperature treatment was very less (< 60% reduction over the control) in 14 entries. Off them very less reduction (1.14 fold reduction; 13.86% reduction over control) was observed in IET 26768. However, the interaction between location x variety and location x treat was observed to be significant.

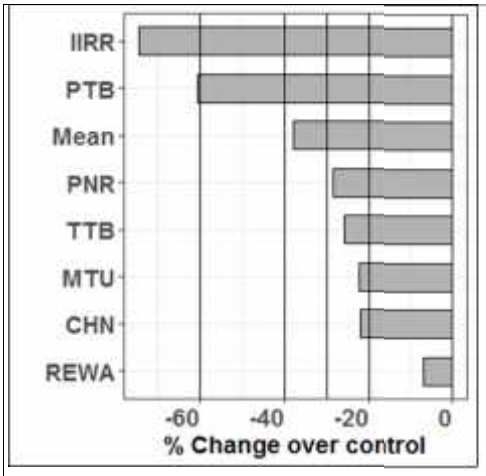


Fig.4A: Influence of high temperature on grain yield. Each value represents the mean of 34 entries.

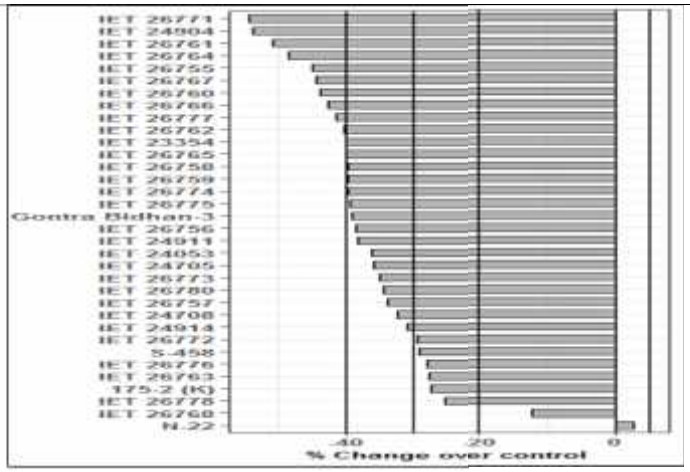


Fig.4B: Influence of high temperature on per cent reduction in grain yield. Each value represent the mean of 6 locations.

The mean test weight (1000 grain weight) recorded for all varieties and locations were reduced by 8.45% under elevated temperature stress over the ambient conditions. The mean 1000 grain weight for all entries varied between a maximum of 20.75 (PTB) and 17.28 (REWA) under elevated temperature condition and under ambient condition, the mean 1000 grain weight of all entries varied between 23.70 (TTB) and 18.49 (REWA). Maximum %

reduction (>15%) in test weight for all entries under elevated temperature over the ambient control was observed in MTU followed by TTB centre, as the mean maximum temperature difference between polythene tunnel and ambient control was 4.06 ˚C and 2.35 ˚C respectively. In order to understand the effect of elevated temperature on individual entries % change in 1000 grain weight over ambient control was calculated. IET 26760 and IET 26761 showed maximum reduction in 1000 grain weight. Conversely, increase in test weight was observed in S-458 followed by IET 26758 and IET 26763.

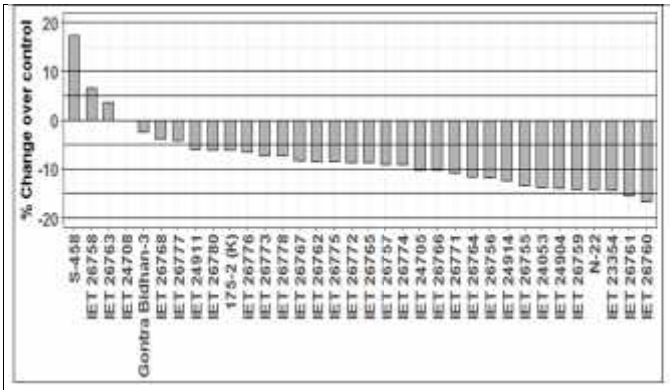


Fig.5(A): Influence of high temperature on 1000 grain weight in rice genotypes. Each value represents the mean of all 6 locations.

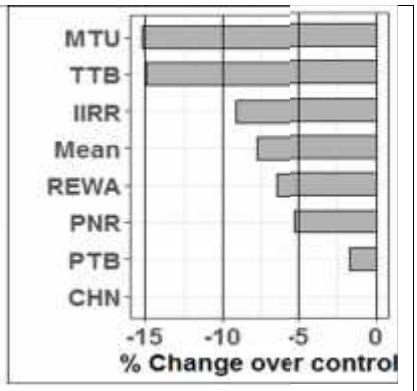


Fig.5B: Influence of high temperature on 1000 grain weight. Each value represent the mean of 32 entries.

The mean harvest index for all the entries and locations was 35.7 under ambient control and reduced to 28.2 under elevated temperature condition. The maximum mean HI of all entries under ambient condition was observer at IIRR, followed by MTU location. Significant differences (P<0.01) were observed between varieties in all locations. The percent change in HI for all entries across the locations was calculated under high temperature condition. Maximum % reduction (>50% over control) in HI under elevated temperature across the locations was observed in IET 24904, followed by IET 26771 and IET 26764. Conversely, minimum % reduction (< 10%) in HI was observed in IET 26778, followed by IET 26763. However, significant interactions were observed in location x variety and location x treatment.

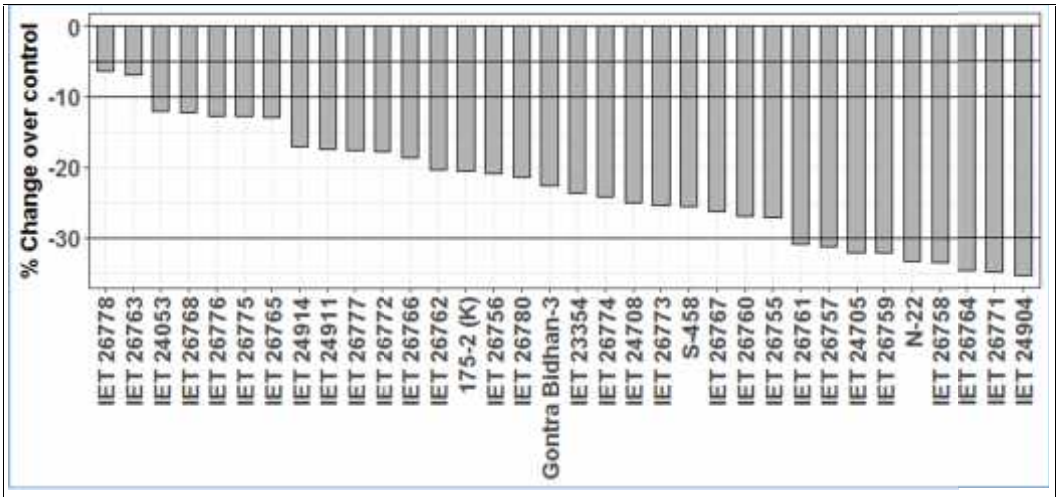


Fig. 6: Influence of high temperature on harvest index of rice genotypes. Each value represent the mean of 6 locations.

Stability analysis was performed to identity rice genotypes with high yield and high stability across tested centres. The results were presented in table 1. Based on YSi values genotypes IET 23354, IET 26765, IET 24914, IET 26768, IET 26772, IET 26774, IET 26775, IET 26776, IET 26777, IET 26778, IET 26780, Gondtra Bidhan-3, IET 24708 performed well across the locations under elevated temperature conditions. However, with the exception of HT-910 all other entries showed highly significant ($p<0.001$) *Stability variance (σ_i^2).*

In order to identify most tolerant rice genotypes to elevated temperatures, yield based indices were computed based on the yield recorded under both elevated and ambient (control) conditions. Multiple correlation analysis was performed to investigate the relation between the heat indices and grain yield(Table 6.3.1 (a)). The correlation coefficients indicate that indices like GMP, HI, HM, MP, K2STI and HTI show highly significant positive association with grain yield. Where as indices like HSI, SHI and TOL show negative association with grain yield. Yield Index (YI) show very strong positive association with grain yield. All the indices which show significant association with grain yield under elevated temperature can be used to identify heat tolerant and susceptible rice genotypes. Significant varietal differences were noticed among the tested entries for all the heat indices (Table 6.3.1 (b)

For indices showing positive associated with yield, genotype showing highest value were assigned a rank of 34 and genotypes showing lowest value were assigned a rank of 1. Similarly, for indices showing negative association with grain yield under elected temperature, the genotype showing lowest value was given highest rank(34) and the genotype showing highest value was assigned a rank of 1. The ranks were allotted to all the indices

which show relationship with yield under elevated temperature. The rank sum and mean rank was calculated for each genotypes and standard error was calculated. The entries with highest mean rank and low standard error could be identified as heat tolerant genotypes. Based on this criteria the genotypes IET 24911, IET 24914, IET 26765, IET 26772 and 175-2 (K) can be identified as heat tolerant and IET 26773, IET 26778, IET 23354 and IET 26763 could be identified as moderately tolerant genotypes for heat stress.

Summary and conclusions:

The crop was exposed to elevated temperature from PI stage to maturity by covering with polythene tunnel. Under elevated temperature regime, the mean grain yield for all entries and locations was reduced by > 60%. The reduction in mean grain yield for all entries were maximum at IIRR location followed by PTB, PNR and TTB, conversely minimum grain yield was noticed at REWA, CHN and MTU. The reduction in grain yield under high temperature was less (< 30% over control) in IET 26768, IET 26778, 175-2(K), IET 26763, IET 26776, S-458 and IET 26772. Furthermore it was observed that, IET 26768 has less (< 20%) reduction in filled grain number per panicle and panicle number per square meter under elevated temperature. Among the better yielding genotypes under heat stress conditions, IET 26778 and IET 26763 maintained good harvest index (<10% reduction) under heat stress.

Table: 6.3.1 (a) *Analysis for simultaneous Selection for higher yield and stability under elevated temperature conditions at different AICRIP locations during Kharif-2017*

S.No.	*Genotype*	*Mean Yield*	*Yield Rank (Y^n)*	*Adjusted Y^h*	*Adjusted Y*	*Stability variance (σ^2)*	*Stability rating (S)*	*YS_i = (Y+S)*
1	IET 26755	282	10	-1	9	21520*	-8	1
2	IET 26756	333	23	1	24	21248**	-8	16+
3	IET 26757	291	12	-1	11	53408**	-8	3
4	IET 26758	251	6	-2	4	18966*	-4	0
5	IET 26759	268	9	-2	7	29467**	-8	-1
6	IET 26760	233	2	-2	0	4967ns	0	0
7	IET 26761	244	4	-2	2	390ns	0	2
8	IET 26762	294	14	-1	13	24124**	-8	5
9	IET 26763	350	26	1	27	36195**	-8	19+
10	IET 23354	**350**	**25**	**1**	**26**	**20454ns**	**-4**	**22+**
11	IET 24911	412	32	3	35	94467**	-8	27+
12	IET 24914	457	33	3	36	106840**	-8	28+
13	IET 24904	314	19	-1	18	30645*	-8	10
14	IET 26764	250	5	-2	3	10126ns	0	3
15	IET 26765	**398**	**30**	**2**	**32**	**49170****	**-8**	**24+**
16	IET 26766	298	15	-1	14	24035**	-8	6
17	IET 26767	293	13	-1	12	35214**	-8	4
18	IET 26768	**463**	**34**	**3**	**37**	**458054****	**-8**	**29+**
19	IET 26771	244	3	-2	1	19642**	-4	-3
20	IET 26772	**369**	**27**	**2**	**29**	**42280****	**-8**	**21+**
21	IET 26773	312	18	-1	17	69710**	-8	9
22	IET 26774	**314**	**20**	**-1**	**19**	**32433****	**-8**	**11+**
23	IET 26775	**327**	**22**	**1**	**23**	**22586****	**-8**	**15+**
24	IET 26776	**304**	**17**	**-1**	**16**	**18729***	**-4**	**12+**
25	IET 26777	**319**	**21**	**1**	**22**	**23845****	**-8**	**14+**
26	IET 26778	**382**	**29**	**2**	**31**	**42520****	**-8**	**23+**
27	IET 26780	**303**	**16**	**-1**	**15**	**14997***	**0**	**15+**
28	IET 24053	259	7	-2	5	59580**	-8	-3
29	IET 24705	288	11	-1	10	29974**	-8	2
30	Gontra Bidhan-3	**402**	**31**	**2**	**33**	**60630****	**-8**	**25+**
31	IET 24708	**338**	**24**	**1**	**25**	**45889****	**-8**	**17+**
32	175-2 (K)	**371**	**28**	**2**	**30**	**53155****	**-8**	**22+**
33	S-458	260	8	-2	6	40623**	-8	-2
34	N-22	144	1	-3	-2	209505**	-8	-10
	Yield Mean	397.0				Signif. codes: * (P<0.05), ** (P<0.01), ns = non-significant		
	YS Mean	9.9						
	LSD (0.05)	76.5				***+selected genotypes for yield and stability***		

Table 6.3.1 (b) Variation in different drought indices computed from grain yield recorded at both ambient (control) and elevated conditions in different rice genotypes in Kh 2017 the mean grain yield for all the centeres was used to compute the heat indices

S.No.	Genotype	HSI	RHI	HTI	GMP	TOL	MP	YI	YSI	HI	SHI	HM	K1STI	K2STI	Rank Mean	SD	SE
1	IET 26755	1.01	1.08	0.24	349	212	365	0.72	0.55	0.4	0.45	334.26	0.44	0.52	11	9.7	0.27
2	IET 26756	0.78	1.21	0.3	385	189	396	0.84	0.61	0.52	0.39	373.75	0.48	0.71	17	5.2	0.35
3	IET 26757	0.69	1.3	0.21	327	136	334	0.74	0.66	0.49	0.34	319.74	0.32	0.55	13	9.1	0.3
4	IET 26758	0.81	1.19	0.19	307	157	316	0.66	0.6	0.4	0.4	297.03	0.31	0.44	8	7.5	0.24
5	IET 26759	0.81	1.19	0.23	338	172	348	0.73	0.6	0.44	0.4	327.05	0.38	0.53	11	6.4	0.27
6	IET 26760	0.89	1.11	0.17	295	172	307	0.62	0.56	0.35	0.44	282.88	0.31	0.38	6	8	0.2
7	IET 26761	1.03	0.97	0.23	337	243	358	0.66	0.49	0.32	0.51	316.5	0.46	0.43	8	11.5	0.23
8	IET 26762	0.82	1.17	0.23	342	178	353	0.74	0.6	0.44	0.4	330.75	0.39	0.54	10	6	0.27
9	IET 26763	0.57	1.42	0.32	399	131	405	0.95	0.72	0.68	0.28	394.23	0.44	0.89	23	8.8	0.4
10	IET 23354	0.81	1.18	0.42	457	236	472	0.99	0.6	0.59	0.4	442.2	0.7	0.97	24	7.5	0.41
11	IET 24911	0.78	1.21	0.52	508	247	523	1.11	0.62	0.69	0.38	493.71	0.84	1.24	30	6.6	0.45
12	IET 24914	0.63	1.36	0.52	508	189	517	1.18	0.69	0.81	0.31	499.84	0.75	1.39	31	6.9	0.46
13	IET 24904	1.09	0.91	0.4	447	353	481	0.85	0.46	0.39	0.54	416.08	0.86	0.72	19	12.9	0.36
14	IET 26764	0.99	1.01	0.23	338	229	357	0.67	0.51	0.35	0.49	319.95	0.44	0.46	8	9	0.23
15	IET 26765	0.81	1.18	0.48	489	251	504	1.06	0.6	0.63	0.4	473.17	0.79	1.11	27	8.7	0.43
16	IET 26766	0.87	1.13	0.29	384	216	399	0.81	0.57	0.46	0.43	369.4	0.51	0.66	14	6.5	0.31
17	IET 26767	0.3	1.09	0.31	393	234	410	0.82	0.56	0.45	0.44	377.04	0.56	0.67	15	7.2	0.32
18	IET 26768	0.05	1.73	0.3	390	51	391	1.02	0.88	0.89	0.12	389.17	0.35	1.04	22	11.6	0.39
19	IET 26771	0.16	0.9	0.28	373	300	402	0.7	0.46	0.32	0.54	346.22	0.61	0.49	10	11.8	0.27
20	IET 26772	0.07	1.39	0.43	464	163	471	1.08	0.7	0.76	0.3	456.72	0.61	1.18	28	8.2	0.44
21	IET 26773	0.06	1.28	0.33	407	177	417	0.91	0.65	0.59	0.35	397.75	0.51	0.84	21	3	0.38
22	IET 26774	0.06	1.19	0.32	402	205	415	0.87	0.6	0.53	0.4	389.84	0.54	0.76	19	3.4	0.36
23	IET 26775	0.05	1.19	0.32	399	202	411	0.86	0.61	0.52	0.39	386.49	0.53	0.75	18	3	0.35
24	IET 26776	0.03	1.41	0.27	365	121	370	0.86	0.72	0.62	0.28	359.74	0.37	0.74	15	8.9	0.33
25	IET 26777	0.04	1.15	0.3	385	209	399	0.82	0.58	0.48	0.42	371.92	0.51	0.67	13	5.4	0.3
26	IET 26778	0.02	1.47	0.35	417	123	421	1	0.75	0.75	0.25	412.35	0.47	1	24	10.6	0.4
27	IET 26780	0.03	1.29	0.31	396	169	405	0.89	0.65	0.58	0.35	386.99	0.48	0.8	18	5	0.36
28	IET 24053	0.03	1.25	0.3	389	177	399	0.87	0.64	0.55	0.36	379.45	0.48	0.75	16	4.1	0.33
29	IET 24705	0.03	1.26	0.26	363	162	372	0.81	0.64	0.52	0.36	353.81	0.41	0.65	12	6.1	0.28
30	Gontra Bidhan-3	0.03	1.2	0.47	486	244	501	1.05	0.61	0.64	0.39	470.92	0.78	1.11	25	7.6	0.42
31	IET 24708	0.02	1.33	0.37	428	169	437	0.98	0.68	0.66	0.32	420.17	0.54	0.96	23	7.4	0.4
32	175-2 (K)	0.02	1.43	0.38	435	139	440	1.03	0.73	0.75	0.27	429.31	0.52	1.07	25	10.6	0.42
33	S-458	0.02	1.39	0.33	407	142	413	0.95	0.71	0.68	0.29	401.17	0.47	0.91	21	9.3	0.38
34	N-22	0	2.02	0.19	312	-8	312	0.88	1.03	0.9	-0.03	312.04	0.19	0.77	14	14.6	0.32
	MEAN	0.42	1.25	0.32	395	185	406	0.87	0.64	0.56	0.36	383.28	0.51	0.78	18	7.9	0.34

Relationship between different Heat Indices and grain yield recorded under elevated conditions (yield stress) in different rice genotypes during Kharif Season. The heat indices were computed from yield recorded under Ambient (Control) and elevated temperature conditions. Pearson's multiple correlation was performed to understand the relationship between the heat indices and grain yield.

Correlation Matrix

GMP = Geometric Mean Productivity; HI = Heat Index; HM = Hormonic Mean; HSI= Heat Susceptibility Index; HTI= Heat Tolerance Index; K1ST1= Modified stress Tolerance Index1; K2STI = Modified Stress Tolerance Index2; MP=Mean Production; RHI= Relative Heat Index; SHI=Stress Heat Index; TOL=Tolerance; YI=Yield Index; YSI= Yield Stability Index; Yield Stress= Yield under elevated temperature.

Variable	Yield_stress	GMP	HI	HM	HSI	HTI	K1STI	K2STI	MP	RHI	SHI	TOL	YI	YSI
Yield_stress	1.000													
GMP	**0.884**	1.000												
HI	**0.841**	0.496	1.000											
HM	**0.928**	**0.993**	**0.581**	1.000										
HSI	-0.397	-0.164	**-0.538**	-0.222	1.000									
HTI	**0.881**	**0.997**	0.496	**0.990**	-0.127	1.000								
K1STI	**0.566**	**0.880**	0.064	**0.820**	0.134	**0.883**	1.000							
K2STI	**0.996**	**0.887**	**0.830**	**0.930**	-0.356	**0.890**	**0.578**	1.000						
MP	**0.825**	**0.993**	0.401	**0.973**	-0.101	**0.990**	**0.929**	**0.830**	1.000					
RHI	0.466	0.007	**0.867**	0.107	**-0.527**	0.009	-0.413	0.446	-0.097	1.000				
SHI	-0.466	-0.007	**-0.867**	-0.107	**0.527**	-0.009	0.413	-0.446	0.097	**-1.000**	1.000			
TOL	-0.131	0.347	**-0.623**	0.241	0.448	0.346	**0.736**	-0.116	0.453	**-0.905**	**0.905**	1.000		
YI	**1.000**	**0.884**	**0.841**	**0.928**	-0.397	**0.881**	**0.566**	**0.996**	**0.825**	0.466	-0.466	-0.131	1.000	
YSI	0.466	0.007	**0.867**	0.107	**-0.527**	0.009	-0.413	0.446	-0.097	**1.000**	**-1.000**	**-0.905**	0.466	1.000

Table 6.3.1 Influence of Heat Stress Days to flowering different AICRIP centres Kharif 2017

S.No.	Genotypes	Control							Grand Mean	Heat Stress							Grand Mean
		CHN	IIRR	MTU	PNR	PTB	REWA	TTB		CHN	IIRR	MTU	PNR	PTB	REWA	TTB	
1	IET 26755	85.0	91.7	96.0	87.7	84.0	99.3	82.3	89.4	85.0	89.7	93.7	84.7	68.0	100.7	78.0	85.7
2	IET 26756	84.0	90.3	85.0	83.3	84.0	80.7	79.3	83.8	84.0	89.3	95.3	83.0	67.7	82.7	75.0	82.4
3	IET 26757	84.0	90.7	91.3	93.0	88.7	94.7	82.0	89.2	84.0	90.0	92.7	87.3	76.7	96.0	80.0	86.7
4	IET 26758	90.0	98.0	102.0	83.3	81.3	103.7	96.0	93.5	90.0	96.0	98.0	84.0	67.0	104.7	93.0	90.4
5	IET 26759	83.0	91.0	92.3	87.3	77.3	95.3	79.7	86.6	83.0	89.0	91.3	85.0	65.0	98.7	75.0	83.9
6	IET 26760	80.0	92.0	91.3	83.0	82.0	96.0	82.0	86.6	80.0	90.0	91.0	83.3	65.3	98.0	79.0	83.8
7	IET 26761	79.0	90.0	93.0	83.7	72.0	95.7	79.0	84.6	79.0	88.0	91.3	83.3	64.7	97.3	76.0	82.8
8	IET 26762	74.0	91.0	92.0	85.0	93.7	93.7	75.7	86.4	74.0	89.0	88.0	84.7	72.0	95.7	73.0	82.3
9	IET 26763	90.0	94.0	97.3	86.3	86.0	105.3	96.0	93.6	90.0	93.0	97.3	84.0	66.0	107.0	95.0	90.3
10	IET 23354	0.0	95.0	85.3	85.7	73.0	90.3	79.0	72.6	0.0	94.3	83.0	84.3	67.0	92.7	78.0	71.3
11	IET 24911	81.0	94.0	92.3	85.7	92.7	95.7	85.0	89.5	81.0	91.3	92.7	84.3	73.7	99.7	83.0	86.5
12	IET 24914	82.0	95.0	94.3	86.7	82.0	94.7	85.0	88.5	82.0	93.0	93.0	89.0	74.0	97.0	81.0	87.0
13	IET 24904	84.0	98.0	94.0	85.0	83.3	95.0	84.7	89.1	84.0	96.0	88.0	85.7	68.7	96.7	82.0	85.9
14	IET 26764	88.0	96.0	86.0	85.0	72.7	99.0	96.0	89.0	88.0	95.0	87.3	84.7	68.0	101.3	92.0	88.0
15	IET 26765	81.0	91.0	85.3	84.7	91.3	87.3	85.0	86.5	81.0	89.0	82.3	83.3	79.7	91.3	82.0	84.1
16	IET 26766	90.0	99.0	94.7	87.0	82.3	97.7	79.0	90.0	90.0	97.0	97.0	86.7	67.0	100.0	77.0	87.8
17	IET 26767	84.0	91.0	92.3	85.0	96.0	90.7	79.3	88.3	84.0	89.0	89.0	84.0	65.3	92.7	75.0	82.7
18	IET 26768	75.0	89.0	87.7	83.7	76.0	79.0	94.0	83.5	75.0	87.0	91.3	83.0	66.3	81.0	92.0	82.2
19	IET 26771	85.0	93.0	91.0	86.3	78.7	96.0	76.0	86.6	85.0	91.0	92.3	88.0	69.3	101.3	73.0	85.7
20	IET 26772	90.0	105.0	102.0	111.3	74.0	94.7	85.0	94.6	90.0	103.0	98.3	108.7	67.7	97.7	81.0	92.3
21	IET 26773	79.0	92.0	93.3	83.0	73.7	80.0	107.0	86.9	79.0	90.0	89.3	83.3	80.7	82.0	103.0	86.8
22	IET 26774	81.0	92.0	96.0	83.3	74.0	93.3	76.0	85.1	81.0	90.0	93.0	83.7	81.3	95.0	74.0	85.4
23	IET 26775	78.0	95.0	101.3	87.3	75.3	96.0	88.0	88.7	78.0	94.0	98.0	86.0	76.0	97.3	85.0	87.8
24	IET 26776	70.0	89.0	92.0	83.7	76.7	81.7	82.0	82.1	70.0	88.0	87.0	83.0	76.7	83.3	78.0	80.9
25	IET 26777	78.0	92.0	97.0	86.7	77.3	94.7	94.0	88.5	78.0	91.0	94.0	84.3	75.3	65.7	91.0	82.8
26	IET 26778	88.0	98.0	101.0	92.3	71.7	98.0	85.0	90.6	88.0	96.0	96.7	91.0	74.0	99.3	80.0	89.3
27	IET 26780	81.0	96.0	94.7	84.3	79.3	97.3	79.0	87.4	81.0	95.0	92.0	88.7	73.7	100.0	77.0	86.8
28	IET 24053	0.0	88.0	93.3	83.0	80.3	84.0	0.0	61.2	0.0	87.7	89.7	83.0	80.0	86.0	0.0	60.9
29	IET 24705	89.0	95.0	87.0	90.3	91.0	92.0	85.0	89.9	89.0	93.7	85.0	88.7	63.7	95.3	82.0	85.3
30	Gontra Bidhan-3	80.0	96.0	85.3	84.7	82.3	94.3	82.0	86.4	80.0	95.0	83.0	84.3	68.3	96.3	78.0	83.6
31	IET 24708	83.0	92.0	96.0	83.7	82.7	93.7	82.0	87.6	83.0	90.0	95.0	83.0	82.3	95.3	79.0	86.8
32	175-2 (K)	0.0	105.0	105.0	105.7	82.0	87.3	105.3	98.4	0.0	104.0	105.7	91.7	77.3	90.7	102.0	95.2
33	S-458	88.0	104.0	101.0	86.3	92.7	94.7	105.0	96.0	88.0	103.0	102.0	85.0	82.0	98.7	102.0	94.4
34	N-22	107.0	88.0	0.0	0.0	76.3	0.0	95.0	73.3	107.0	86.0	0.0	0.0	76.8	0.0	92.0	90.4
	Mean	**78.5**	**94.0**	**93.6**	**87.1**	**81.4**	**93.1**	**83.7**	**85.8**	**78.5**	**92.4**	**92.2**	**86.0**	**72.0**	**94.5**	**80.7**	**83.8**
	LSD (Treat)				ns			*LSD (Treat x variety)*				ns					
	LSD (Location x Treat)				0.75**			*LSD (location x Treat x variety)*				6.95**					
	LSD (variety)				1.85**			*CV(%) Treat*				3.88					
	LSD(Location x variety)				4.19**												

Table 6.3.2 Influence of Heat Stress Days to maturity different AICRIP centres Kharif 2017

S.No.	Genotypes	Control							Grand Mean	Heat Stress							Grand Mean
		CHN	IIRR	MTU	PNR	PTB	REWA	TTB		CHN	IIRR	MTU	PNR	PTB	REWA	TTB	
1	IET 26755	116.0	117.7	127.3	122.7	117.0	125.7	117.7	120.6	116.0	117.7	124.7	119.7	101.3	130.3	115.0	117.8
2	IET 26756	114.0	117.7	121.7	118.3	117.0	115.7	114.7	117.0	114.0	117.3	121.0	118.0	100.3	118.7	110.0	114.2
3	IET 26757	115.0	117.0	121.7	128.0	121.7	119.3	114.0	119.5	115.0	117.0	119.7	122.3	108.7	122.3	111.0	116.6
4	IET 26758	121.0	127.0	134.3	118.3	114.3	127.7	131.0	124.8	121.0	127.0	131.3	119.0	99.0	129.7	126.0	121.9
5	IET 26759	114.0	124.0	128.3	122.3	110.3	120.7	115.3	119.3	114.0	118.0	126.0	120.0	97.7	125.3	110.0	115.9
6	IET 26760	110.0	118.0	126.0	118.0	115.0	123.3	116.0	118.0	110.0	118.0	125.0	118.3	98.0	125.3	111.0	115.1
7	IET 26761	110.0	121.7	122.7	118.7	127.3	122.0	113.0	119.3	110.0	117.3	122.3	118.3	97.0	124.0	111.0	114.3
8	IET 26762	104.0	118.0	122.0	120.0	127.7	120.0	109.3	117.3	104.0	117.0	123.0	119.7	104.0	122.0	106.0	113.7
9	IET 26763	120.0	122.3	131.3	121.3	119.0	129.7	133.0	125.2	120.0	122.3	132.3	119.0	98.3	131.3	131.0	122.0
10	IET 23354	0.0	123.3	120.0	120.7	105.3	119.3	112.0	116.8	0.0	123.3	124.7	119.3	102.0	122.3	112.0	117.3
11	IET 24911	112.0	123.3	122.7	120.7	126.3	121.7	118.0	120.7	112.0	122.7	123.3	119.3	105.7	124.7	114.0	117.4
12	IET 24914	112.0	123.3	124.7	121.7	115.0	120.7	113.0	118.6	112.0	124.0	121.0	124.0	102.7	123.3	109.0	116.6
13	IET 24904	115.0	125.7	123.7	120.0	116.7	122.3	115.3	119.8	115.0	125.0	125.3	120.7	101.7	128.3	111.0	118.1
14	IET 26764	119.0	124.3	121.3	120.0	105.3	125.7	131.0	121.0	119.0	125.7	121.0	119.7	100.3	128.0	129.0	120.4
15	IET 26765	112.0	121.3	118.0	119.7	125.7	111.0	115.0	117.5	112.0	121.0	116.3	118.3	91.0	113.7	112.0	112.0
16	IET 26766	121.0	127.0	131.3	122.0	115.3	123.7	112.0	121.8	121.0	128.0	129.3	121.7	99.7	127.0	110.0	119.5
17	IET 26767	115.0	117.0	124.3	120.0	129.0	120.3	112.0	119.7	115.0	117.0	121.3	119.0	98.0	122.7	108.0	114.4
18	IET 26768	105.0	117.3	118.3	118.7	108.7	105.3	131.0	114.9	105.0	118.0	116.0	118.0	99.3	109.3	124.0	112.8
19	IET 26771	116.0	122.0	126.7	121.3	111.7	121.3	110.0	118.4	116.0	122.0	123.3	123.0	101.3	124.7	108.0	116.9
20	IET 26772	120.0	131.3	137.0	146.3	106.3	120.0	112.0	124.7	120.0	131.3	134.3	143.7	99.7	122.7	110.0	123.1
21	IET 26773	110.0	117.0	124.7	118.0	105.7	106.7	137.0	117.0	110.0	117.0	123.3	118.3	112.3	113.3	135.0	118.5
22	IET 26774	112.0	122.3	126.7	118.3	105.7	110.3	112.0	115.3	112.0	121.0	127.0	118.7	113.0	113.7	108.0	116.2
23	IET 26775	109.0	123.7	132.0	122.3	107.3	135.3	122.0	121.7	109.0	124.7	132.7	121.0	108.0	136.7	120.0	121.7
24	IET 26776	111.0	117.3	125.7	118.7	109.0	107.7	110.0	114.2	111.0	117.0	124.7	118.0	108.0	111.0	107.0	113.8
25	IET 26777	109.0	122.7	126.0	121.7	110.0	120.3	127.0	119.5	109.0	122.3	124.0	119.3	106.7	123.3	123.0	118.2
26	IET 26778	118.0	125.0	135.3	127.3	103.3	124.0	118.0	121.6	118.0	125.0	141.7	126.0	105.0	125.3	113.0	122.0
27	IET 26780	112.0	125.0	123.0	119.3	112.3	121.7	112.0	117.9	112.0	125.3	123.0	123.7	125.0	125.0	110.0	120.6
28	IET 24053	0.0	116.3	122.3	118.0	113.3	111.0	0.0	116.2	0.0	116.7	120.7	118.0	111.3	144.7	0.0	101.9
29	IET 24705	120.0	118.0	119.0	125.3	124.7	133.3	112.0	121.8	120.0	118.3	120.7	123.7	97.0	135.3	108.0	117.6
30	Gontra Bidhan-3	110.0	124.3	120.7	119.7	115.7	122.0	113.0	117.9	110.0	124.0	121.7	119.3	101.0	124.7	106.0	115.2
31	IET 24708	113.0	122.0	131.3	118.7	115.7	120.3	115.0	119.4	113.0	122.0	132.0	118.0	114.0	123.7	110.0	119.0
32	175-2 (K)	0.0	131.0	136.7	140.7	115.0	112.3	138.7	110.6	0.0	131.3	132.7	126.7	109.3	114.7	136.0	125.1
33	S-458	119.0	130.7	135.7	121.3	125.7	120.0	141.0	127.6	119.0	130.7	134.3	120.0	112.7	122.7	136.0	125.0
34	N-22	137.0	116.3	0.0	0.0	109.0	0.0	131.0	123.3	137.0	116.3	0.0	0.0	107.8	0.0	125.0	123.3
	Mean	**114.5**	**122.1**	**126.1**	**122.1**	**114.9**	**120.0**	**119.2**	**116.4**	**114.5**	**121.8**	**125.4**	**118.6**	**104.1**	**120.3**	**112.2**	**114.7**
	LSD (Treat)						ns			*LSD (Treat x variety)*						ns	
	LSD (Location x Treat)						1.18**			*LSD (location x Treat x variety)*						8.77**	
	LSD (variety)						2.43**			*CV(%) Treat*						3.6	
	LSD(Location x variety)						6.2**										

Table 6.3.3 Influence of Heat Stress LAI at flowering different AICRIP centres Kharif 2017

S.No.	Genotypes	Control						Grand	Heat Stress						Grand
		CHN	IIRR	PNR	PTB	REWA	TTB	Mean	CHN	IIRR	PNR	PTB	REWA	TTB	Mean
1	IET 26755	0	4.08	4.67	0	3.62	0	2.06	0	2.61	5.70	0	2.48	0	1.80
2	IET 26756	0	3.38	4.80	0	3.62	0	1.97	0	2.99	4.68	0	3.57	0	1.87
3	IET 26757	0	3.26	6.52	0	4.20	0	2.33	0	3.63	6.53	0	3.49	0	2.28
4	IET 26758	0	3.90	3.21	0	3.38	0	1.75	0	3.21	3.69	0	3.33	0	1.70
5	IET 26759	0	4.34	4.33	0	4.32	0	2.17	0	3.56	4.87	0	3.24	0	1.95
6	IET 26760	0	2.93	3.41	0	3.81	0	1.69	0	2.36	3.83	0	2.76	0	1.49
7	IET 26761	0	3.79	3.73	0	3.58	0	1.85	0	3.23	3.85	0	2.50	0	1.60
8	IET 26762	0	6.29	6.51	0	3.91	0	2.79	0	3.27	6.66	0	3.86	0	2.30
9	IET 26763	0	3.61	5.56	0	3.13	0	2.05	0	4.83	5.89	0	2.42	0	2.19
10	IET 23354	0	3.76	4.34	0	4.27	0	2.06	0	4.15	3.54	0	3.16	0	1.81
11	IET 24911	0	3.80	6.52	0	4.48	0	2.47	0	4.04	4.64	0	3.44	0	2.02
12	IET 24914	0	4.43	5.91	0	4.90	0	2.54	0	6.12	6.22	0	3.47	0	2.64
13	IET 24904	0	4.02	6.68	0	3.69	0	2.40	0	4.02	6.36	0	2.98	0	2.23
14	IET 26764	0	5.30	5.77	0	3.12	0	2.37	0	3.55	6.35	0	2.76	0	2.11
15	IET 26765	0	3.11	4.97	0	5.00	0	2.18	0	3.94	5.43	0	3.57	0	2.16
16	IET 26766	0	4.50	5.87	0	3.77	0	2.36	0	5.61	6.58	0	2.71	0	2.48
17	IET 26767	0	4.82	4.57	0	4.74	0	2.36	0	4.44	5.32	0	4.40	0	2.36
18	IET 26768	0	2.84	4.67	0	3.16	0	1.78	0	2.51	4.90	0	3.11	0	1.75
19	IET 26771	0	3.28	4.60	0	3.72	0	1.93	0	2.97	5.81	0	3.66	0	2.07
20	IET 26772	0	6.28	6.46	0	4.00	0	2.79	0	4.76	6.52	0	2.96	0	2.37
21	IET 26773	0	3.14	4.33	0	5.25	0	2.12	0	4.23	5.11	0	3.66	0	2.17
22	IET 26774	0	3.29	5.37	0	4.72	0	2.23	0	4.36	6.28	0	3.25	0	2.31
23	IET 26775	0	3.48	5.33	0	4.33	0	2.19	0	3.40	6.57	0	3.19	0	2.19
24	IET 26776	0	2.91	4.94	0	3.83	0	1.95	0	3.33	4.74	0	2.81	0	1.81
25	IET 26777	0	4.09	6.25	0	3.07	0	2.24	0	4.78	6.17	0	2.31	0	2.21
26	IET 26778	0	4.22	3.68	0	4.28	0	2.03	0	3.57	4.91	0	3.23	0	1.95
27	IET 26780	0	3.54	4.09	0	3.24	0	1.81	0	3.26	3.64	0	2.53	0	1.57
28	IET 24053	0	3.52	3.33	0	3.14	0	1.66	0	3.44	3.86	0	2.77	0	1.68
29	IET 24705	0	4.08	4.41	0	5.25	0	2.29	0	4.15	4.94	0	4.16	0	2.21
30	Gontra Bidhan-3	0	3.74	5.19	0	3.47	0	2.07	0	2.94	4.87	0	2.76	0	1.76
31	IET 24708	0	2.81	4.16	0	3.46	0	1.74	0	3.87	4.36	0	2.75	0	1.83
32	175-2 (K)	0	4.43	5.59	0	4.00	0	2.34	0	3.82	5.86	0	3.29	0	2.16
33	S-458	0	5.17	4.72	0	4.83	0	2.45	0	3.01	5.01	0	3.80	0	1.97
34	N-22	0	2.38	0.00	0	0.00	0	0.40	0	4.34	0.00	0	0.00	0	0.72
	Mean	**0**	**3.90**	**4.84**	**0**	**3.86**	**0**	**2.10**	**0**	**3.77**	**5.16**	**0**	**3.07**	**0**	**2.01**
	LSD (Treat)						ns			*LSD (Treat x variety)*					ns
	LSD (Location x Treat)						0.24**			*LSD (location x Treat x variety)*					0.95**
	LSD (variety)						0.26**			*CV(%) Treat*					25.3
	LSD(Location x variety)						0.68**								

Table 6.3.4 Influence of Heat Stress plant height (cm) at flowering different AICRIP centres Kharif 2017

S.No.	Genotypes	Control							Grand Mean	Heat Stress							Grand Mean
		CHN	IIRR	MTU	PNR	PTB	REWA	TTB		CHN	IIRR	MTU	PNR	PTB	REWA	TTB	
1	IET 26755	103.7	91.8	109.7	99.7	81.7	82.3	100.3	95.6	96.3	92.0	103.5	105.7	121.3	80.3	93.7	99.0
2	IET 26756	115.3	104.5	148.7	115.3	70.0	100.0	103.0	108.1	118.3	105.8	133.2	119.3	116.0	98.3	101.0	113.1
3	IET 26757	108.3	100.5	124.8	106.3	73.7	84.0	103.7	100.2	109.3	94.8	105.0	113.0	118.7	80.0	98.0	102.7
4	IET 26758	102.3	84.3	127.2	106.3	81.3	89.7	109.7	100.1	107.3	94.7	109.0	104.0	111.7	89.3	103.0	102.7
5	IET 26759	107.7	94.7	125.5	107.0	82.7	91.0	104.3	101.8	103.3	94.2	116.0	110.7	113.0	84.0	97.7	102.7
6	IET 26760	93.7	95.2	115.5	99.7	87.3	86.0	106.7	97.7	102.7	96.7	104.0	99.0	91.7	81.3	104.0	97.0
7	IET 26761	105.0	97.7	124.0	104.3	79.3	90.0	105.3	100.8	115.0	101.3	123.1	100.7	114.7	84.7	97.0	105.2
8	IET 26762	98.3	99.5	110.0	113.0	81.0	87.3	105.0	99.2	99.7	100.8	109.2	115.0	149.7	81.7	102.3	108.3
9	IET 26763	113.7	81.7	114.0	113.0	104.7	93.0	110.0	104.3	115.0	83.2	113.0	115.0	135.0	93.0	106.7	108.7
10	IET 23354	0.0	82.8	158.5	120.3	90.3	122.3	118.3	115.4	0.0	93.7	157.0	122.7	112.0	119.0	112.7	102.4
11	IET 24911	113.0	92.7	136.5	116.7	90.0	92.0	110.0	107.3	113.3	85.2	133.5	106.7	122.7	90.0	103.3	107.8
12	IET 24914	120.0	90.8	146.1	115.3	92.0	100.0	100.3	109.2	122.0	87.5	146.0	117.3	126.7	97.7	92.3	112.8
13	IET 24904	122.0	91.7	137.2	111.3	98.3	92.0	106.3	108.4	119.0	101.3	128.5	117.0	113.7	85.3	100.0	109.3
14	IET 26764	115.0	78.3	127.0	120.7	97.7	93.0	106.7	105.5	111.0	83.5	116.0	119.7	92.7	89.0	101.3	101.9
15	IET 26765	103.3	96.3	117.0	97.3	114.7	92.0	106.7	103.9	105.3	99.8	113.5	100.3	122.0	90.0	101.7	104.7
16	IET 26766	127.7	98.8	126.0	119.3	83.7	100.0	117.3	110.4	132.7	95.0	125.5	132.3	128.3	94.3	115.7	117.7
17	IET 26767	112.0	97.8	135.5	107.3	84.7	82.7	108.7	104.1	112.0	100.2	129.0	114.0	101.7	78.7	101.3	105.3
18	IET 26768	102.0	100.5	127.0	107.7	79.7	94.0	98.3	101.3	101.3	80.7	120.0	114.7	118.0	91.0	92.7	102.6
19	IET 26771	109.7	91.3	124.5	104.0	92.3	104.0	110.0	105.1	114.3	95.8	120.5	118.3	95.0	101.0	103.0	106.9
20	IET 26772	111.7	80.2	112.5	121.3	79.7	91.3	109.3	100.9	106.3	79.7	112.0	113.3	117.0	85.3	106.0	102.8
21	IET 26773	96.0	90.8	115.0	96.3	86.0	97.7	93.3	96.5	98.0	94.2	113.5	102.7	107.3	91.7	89.3	99.5
22	IET 26774	97.7	95.2	123.0	102.3	90.7	99.7	106.3	102.1	103.0	93.8	116.0	106.0	86.3	85.7	101.7	98.9
23	IET 26775	96.7	82.5	116.5	99.7	93.3	83.3	102.0	96.3	96.3	88.5	114.5	104.0	107.3	79.0	83.7	96.2
24	IET 26776	100.7	79.8	121.5	106.0	106.3	92.0	91.7	99.7	97.7	74.2	119.5	103.3	120.0	87.7	88.3	98.7
25	IET 26777	142.3	104.2	151.5	128.7	103.0	104.3	134.0	124.0	145.0	100.7	139.0	129.3	98.3	100.0	130.3	120.4
26	IET 26778	111.0	92.2	128.0	103.0	85.3	84.0	109.3	101.8	113.7	90.3	123.5	112.3	103.3	77.3	106.3	103.8
27	IET 26780	105.0	92.7	133.5	102.7	94.0	98.0	96.3	103.2	111.3	92.7	129.7	105.3	105.7	92.0	94.7	104.5
28	IET 24053	0.0	115.2	158.5	131.7	86.7	102.7	0.0	99.1	0.0	111.2	143.5	110.0	77.3	96.7	0.0	77.0
29	IET 24705	110.0	90.5	122.5	109.0	85.7	84.0	103.0	100.7	118.0	92.2	122.0	101.7	107.3	80.0	97.3	102.6
30	Gontra Bidhan-3	115.3	91.3	138.0	115.7	86.3	82.0	102.7	104.5	115.3	94.0	124.0	117.7	108.3	78.0	102.0	105.6
31	IET 24708	112.7	99.3	127.0	107.7	96.7	88.3	107.0	105.5	111.7	97.8	119.0	108.0	95.7	80.3	100.3	101.8
32	175-2 (K)	0.0	69.2	115.5	114.7	104.3	106.0	107.7	88.2	0.0	90.8	114.9	112.3	113.3	102.0	98.0	105.2
33	S-458	115.7	138.0	115.5	121.7	93.3	103.0	130.7	116.8	112.3	93.0	112.0	125.3	99.0	97.3	129.7	109.8
34	N-22	154.0	68.8	0.0	0.0	93.0	0.0	129.3	111.3	137.3	91.7	0.0	0.0	94.3	0.0	121.7	111.2
	Mean	**111.0**	**93.0**	**123.9**	**107.2**	**89.7**	**90.9**	**104.5**	**101.5**	**108.3**	**93.3**	**121.5**	**112.0**	**110.0**	**89.1**	**99.3**	**102.7**
	LSD (Treat)					ns					*LSD (Treat x variety)*					ns	
	LSD (Location x Treat)					1.57**					*LSD (location x Treat x variety)*					15.23**	
	LSD (variety)					4.01*					*CV(%) Treat*					7.1	
	LSD(Location x variety)					10.8**											

Table 6.3.5 Influence of Heat Stress leaf weight (g/m2) at flowering different AICRIP centres Kharif 2017

S.No.	Genotypes	Control							Grand Mean	Heat Stress							Grand Mean
		CHN	IIRR	MTU	PNR	PTB	REWA	TTB		CHN	IIRR	MTU	PNR	PTB	REWA	TTB	
1	IET 26755	0	172	160	298	204	203	168	201	0	110	126	272	448	206	106	181
2	IET 26756	0	151	120	177	202	247	161	176	0	130	100	245	737	277	107	228
3	IET 26757	0	141	133	332	400	250	184	240	0	148	120	323	703	210	150	236
4	IET 26758	0	182	86	243	324	297	90	204	0	136	80	218	301	253	95	155
5	IET 26759	0	190	94	187	351	304	135	210	0	151	113	128	451	227	113	169
6	IET 26760	0	138	112	160	448	245	101	201	0	134	98	150	504	194	69	164
7	IET 26761	0	168	126	305	351	233	141	221	0	156	119	145	756	198	104	211
8	IET 26762	0	246	95	215	269	337	151	219	0	137	106	218	589	271	103	203
9	IET 26763	0	177	147	242	374	284	153	230	0	201	133	217	373	235	123	183
10	IET 23354	0	185	165	280	369	350	171	253	0	187	145	210	201	298	147	170
11	IET 24911	0	179	185	252	524	265	139	257	0	170	184	223	352	212	95	177
12	IET 24914	0	202	133	225	326	287	128	217	0	263	108	317	576	236	126	232
13	IET 24904	0	183	125	278	349	259	133	221	0	173	97	267	327	242	126	176
14	IET 26764	0	214	126	215	347	227	126	209	0	135	108	335	183	188	63	145
15	IET 26765	0	140	126	168	674	274	180	260	0	179	95	185	472	225	104	180
16	IET 26766	0	205	112	258	125	266	151	186	0	236	106	193	248	226	134	163
17	IET 26767	0	199	127	173	202	226	106	172	0	188	110	218	257	199	81	151
18	IET 26768	0	131	126	148	225	230	163	171	0	118	103	135	372	219	106	150
19	IET 26771	0	146	84	222	300	236	159	191	0	146	69	223	270	180	167	151
20	IET 26772	0	242	124	265	259	230	139	210	0	190	125	248	225	213	122	161
21	IET 26773	0	139	112	215	303	400	86	209	0	199	110	178	347	311	73	174
22	IET 26774	0	141	114	215	352	279	81	197	0	175	95	230	382	246	87	174
23	IET 26775	0	141	87	352	403	297	129	235	0	149	81	283	314	268	118	173
24	IET 26776	0	139	122	137	403	264	128	199	0	144	90	150	650	212	94	191
25	IET 26777	0	174	142	223	292	237	115	197	0	193	128	322	241	242	91	174
26	IET 26778	0	202	135	163	103	322	89	169	0	169	110	328	401	284	81	196
27	IET 26780	0	172	120	212	55	230	150	156	0	159	103	192	200	220	105	140
28	IET 24053	0	146	120	180	308	244	0	166	0	136	111	135	201	254	0	120
29	IET 24705	0	165	81	173	79	312	148	160	0	179	74	218	451	297	89	187
30	Gontra Bidhan-3	0	153	131	177	127	282	128	166	0	133	111	152	455	240	99	170
31	IET 24708	0	122	140	143	206	347	104	177	0	180	136	212	622	212	79	206
32	175-2 (K)	0	186	118	358	104	352	123	207	0	165	105	257	483	298	103	202
33	S-458	0	217	123	298	106	273	116	189	0	136	111	225	203	245	96	145
34	N-22	0	115	0	0	341	0	107	187	0	194	0	0	289	0	94	193
	Mean	**0**	**171**	**123**	**227**	**288**	**275**	**129**	**171**	**0**	**165**	**109**	**223**	**399**	**238**	**102**	**175**
	LSD (Treat)				ns					*LSD (Treat x variety)*				ns			
	LSD (Location x Treat)				13.9**					*LSD (location x Treat x variety)*				102.63**			
	LSD (variety)				20.85*					*CV(%) Treat*				19.36			
	LSD(Location x variety)				72.6**												

Table 6.3.6 Influence of Heat Stress Stem weight (g/m2) at flowering different AICRIP centres Kharif 2017

S.No.	Genotypes	Control							Grand Mean	Heat Stress							Grand Mean
		CHN	IIRR	MTU	PNR	PTB	REWA	TTB		CHN	IIRR	MTU	PNR	PTB	REWA	TTB	
1	IET 26755	675	453	692	352	1044	401	506	589	625	259	544	385	1250	318	297	525
2	IET 26756	600	536	522	437	674	465	349	512	900	923	435	382	2943	397	281	894
3	IET 26757	950	523	575	735	1182	461	344	681	950	511	521	468	2526	389	263	804
4	IET 26758	750	500	373	455	1147	407	251	555	1200	445	346	278	1473	342	234	617
5	IET 26759	600	604	405	275	1051	461	357	536	1025	510	490	425	1455	373	264	649
6	IET 26760	825	537	487	383	1270	358	342	600	625	504	423	330	1411	317	194	543
7	IET 26761	625	599	545	453	1123	374	422	592	1150	588	518	342	2841	304	215	851
8	IET 26762	650	513	410	412	474	431	278	453	875	443	461	553	1530	399	157	631
9	IET 26763	800	475	636	392	744	357	358	537	950	483	576	323	1626	338	242	648
10	IET 23354	0	603	714	632	964	499	299	618	0	599	627	357	947	388	282	533
11	IET 24911	950	655	803	543	1131	467	249	685	975	660	797	445	1511	379	188	708
12	IET 24914	700	670	577	517	897	496	381	605	950	794	468	438	1873	413	291	747
13	IET 24904	375	739	541	395	1124	426	314	559	575	602	419	357	1348	347	275	560
14	IET 26764	825	676	546	488	925	318	254	576	450	541	468	543	484	290	195	424
15	IET 26765	600	540	544	305	1855	445	431	674	1000	666	413	332	1358	413	310	642
16	IET 26766	750	624	486	482	429	402	412	512	450	855	459	520	1117	377	363	591
17	IET 26767	550	594	552	455	692	388	313	506	700	572	478	372	851	344	192	501
18	IET 26768	1050	511	548	363	515	414	422	546	600	458	445	328	1222	369	254	525
19	IET 26771	550	499	364	355	751	354	480	479	600	576	298	557	897	332	338	514
20	IET 26772	600	693	539	663	539	438	313	541	850	591	543	542	1455	386	207	653
21	IET 26773	575	463	484	357	734	572	210	485	750	571	477	413	959	525	146	549
22	IET 26774	650	503	495	428	1107	493	197	553	950	545	413	518	885	464	188	566
23	IET 26775	575	478	378	427	1211	493	256	545	675	499	351	377	698	399	228	461
24	IET 26776	375	416	528	463	1202	408	265	522	500	465	388	377	1604	379	233	564
25	IET 26777	550	578	616	488	999	353	291	554	625	533	553	440	896	326	195	510
26	IET 26778	775	588	584	337	420	478	322	501	1025	513	477	558	1048	425	195	606
27	IET 26780	1000	671	521	355	209	382	320	494	600	571	446	395	901	364	212	498
28	IET 24053	0	583	521	542	842	319	0	401	0	480	483	368	552	299	0	436
29	IET 24705	700	556	350	415	204	535	263	432	850	465	321	517	1461	484	282	626
30	Gontra Bidhan-3	600	637	566	385	478	403	320	484	400	548	480	317	1745	389	214	585
31	IET 24708	475	508	606	318	483	473	217	440	650	506	591	593	1570	419	149	640
32	175-2 (K)	0	609	513	717	517	585	247	531	0	493	457	597	1853	480	245	687
33	S-458	100	795	531	822	448	463	295	493	500	756	483	517	1408	415	248	618
34	N-22	450	459	0	0	1196	0	297	601	600	534	0	0	869	0	247	563
	Mean	**653**	**570**	**532**	**459**	**841**	**434**	**311**	**529**	**760**	**561**	**474**	**432**	**1365**	**381**	**230**	**587**
	LSD (Treat)					ns				*LSD (Treat x variety)*					ns		
	LSD (Location x Treat)					20.71**				*LSD (location x Treat x variety)*					311.3**		
	LSD (variety)					83.12*				*CV(%) Treat*					16.5		
	LSD(Location x variety)					220.3**											

Table 6.3.7 Influence of Heat Stress panicle weight (g/m2) at flowering different AICRIP centres Kharif 2017

S.No.	Genotypes	Control							Grand Mean	Heat Stress							Grand Mean
		CHN	IIRR	MTU	PNR	PTB	REWA	TTB		CHN	IIRR	MTU	PNR	PTB	REWA	TTB	
1	IET 26755	0	212	0	143	150	430	218	231	0	98	0	187	455	244	182	233
2	IET 26756	0	179	0	220	55	447	178	216	0	151	0	157	1442	219	154	424
3	IET 26757	0	168	0	135	206	403	219	226	0	140	0	112	802	194	198	289
4	IET 26758	0	73	0	123	54	254	158	132	0	144	0	113	452	175	83	194
5	IET 26759	0	167	0	160	151	170	262	182	0	100	0	163	502	203	186	231
6	IET 26760	0	135	0	163	275	282	151	201	0	85	0	110	654	187	86	224
7	IET 26761	0	136	0	233	303	312	191	235	0	108	0	108	627	256	114	243
8	IET 26762	0	148	0	123	75	385	211	188	0	137	0	128	803	192	120	276
9	IET 26763	0	108	0	193	155	264	248	194	0	91	0	155	527	223	201	239
10	IET 23354	0	83	0	133	276	261	263	203	0	83	0	117	377	171	215	193
11	IET 24911	0	110	0	217	77	232	182	163	0	133	0	202	656	206	143	268
12	IET 24914	0	149	0	122	303	349	158	216	0	138	0	120	656	162	111	237
13	IET 24904	0	164	0	190	356	291	212	243	0	141	0	157	549	168	148	232
14	IET 26764	0	101	0	170	524	319	193	261	0	84	0	155	151	188	94	134
15	IET 26765	0	148	0	218	106	111	228	162	0	155	0	177	427	275	191	245
16	IET 26766	0	84	0	137	77	383	281	192	0	128	0	180	376	199	237	224
17	IET 26767	0	138	0	268	104	160	183	171	0	162	0	185	358	234	145	217
18	IET 26768	0	332	0	197	153	244	240	233	0	204	0	188	426	187	157	232
19	IET 26771	0	116	0	125	153	413	222	206	0	116	0	157	451	220	203	229
20	IET 26772	0	76	0	338	117	384	193	222	0	82	0	312	228	158	130	182
21	IET 26773	0	107	0	160	276	314	154	202	0	140	0	253	254	174	80	180
22	IET 26774	0	133	0	212	253	205	125	186	0	92	0	158	206	200	116	154
23	IET 26775	0	116	0	337	146	194	165	192	0	137	0	135	304	173	131	176
24	IET 26776	0	128	0	198	145	232	218	184	0	113	0	155	303	159	92	165
25	IET 26777	0	121	0	185	147	296	146	179	0	106	0	113	175	230	98	145
26	IET 26778	0	120	0	147	105	238	190	160	0	86	0	143	954	169	112	293
27	IET 26780	0	124	0	122	54	205	204	142	0	123	0	125	153	183	113	139
28	IET 24053	0	173	0	172	204	275	0	206	0	110	0	138	155	187	0	148
29	IET 24705	0	144	0	185	155	345	199	206	0	106	0	170	424	171	156	205
30	Gontra Bidhan-3	0	159	0	182	123	287	191	188	0	108	0	213	453	155	157	217
31	IET 24708	0	105	0	125	175	256	122	157	0	123	0	183	477	194	120	219
32	175-2 (K)	0	111	0	457	105	313	169	231	0	150	0	217	428	217	161	234
33	S-458	0	156	0	185	107	287	202	187	0	142	0	150	223	144	172	166
34	N-22	0	121	0	0	275	0	204	120	0	171	0	0	386	0	176	146
	Mean	**0**	**137**	**0**	**185**	**175**	**281**	**190**	**193**	**0**	**123**	**0**	**159**	**464**	**189**	**141**	**154**
	LSD (Treat)					ns				*LSD (Treat x variety)*					ns		
	LSD (Location x Treat)					13.2**				*LSD (location x Treat x variety)*					131.1**		
	LSD (variety)					ns				*CV(%) Treat*					21.7		
	LSD(Location x variety)					93.3**											

Table 6.3.8 Influence of Heat Stress Total dry matter (g/m2) at flowering different AICRIP centres Kharif 2017

S.No.	Genotypes	Control							Grand Mean	Heat Stress							Grand Mean
		CHN	IIRR	MTU	PNR	PTB	REWA	TTB		CHN	IIRR	MTU	PNR	PTB	REWA	TTB	
1	IET 26755	0	836	1065	793	1258	1033	892	980	0	468	837	843	1938	768	584	906
2	IET 26756	0	866	803	833	838	1159	687	865	0	1205	670	783	4607	893	542	1450
3	IET 26757	0	833	884	1202	1726	1114	747	1084	0	799	801	903	3629	792	611	1256
4	IET 26758	0	755	573	822	1366	959	498	829	0	725	532	610	2001	771	412	842
5	IET 26759	0	961	624	622	1398	935	754	882	0	761	754	717	2171	803	563	961
6	IET 26760	0	810	749	707	1793	885	594	923	0	723	650	590	2313	698	349	887
7	IET 26761	0	903	838	992	1599	919	755	1001	0	852	796	595	3801	758	432	1206
8	IET 26762	0	906	631	750	738	1153	640	803	0	716	710	900	2629	863	380	1033
9	IET 26763	0	760	978	827	1145	905	759	896	0	775	886	695	2271	795	566	998
10	IET 23354	0	871	1098	1045	1452	1110	733	1051	0	869	965	683	1370	857	645	898
11	IET 24911	0	944	1235	1012	1559	963	571	1047	0	963	1225	870	2268	798	426	1092
12	IET 24914	0	1021	888	863	1373	1132	667	991	0	1196	721	875	2795	810	528	1154
13	IET 24904	0	1086	832	863	1646	976	659	1010	0	916	645	780	2002	757	549	941
14	IET 26764	0	991	840	873	1616	864	573	960	0	760	719	1033	735	666	352	711
15	IET 26765	0	827	837	692	2372	830	839	1066	0	1000	636	693	2029	913	604	979
16	IET 26766	0	913	748	877	568	1051	844	833	0	1219	706	893	1561	802	733	986
17	IET 26767	0	931	849	897	898	774	602	825	0	921	735	775	1318	778	419	824
18	IET 26768	0	973	843	708	801	889	825	840	0	781	684	652	1818	776	517	871
19	IET 26771	0	761	560	702	1084	1004	860	828	0	838	459	937	1456	732	708	855
20	IET 26772	0	1011	829	1267	826	1051	645	938	0	863	836	1102	1742	758	459	960
21	IET 26773	0	708	745	732	1185	1286	449	851	0	910	734	845	1403	1011	299	867
22	IET 26774	0	777	762	855	1542	976	403	886	0	812	635	907	1329	910	391	830
23	IET 26775	0	735	582	1115	1585	985	549	925	0	785	540	795	1184	840	478	770
24	IET 26776	0	683	812	798	1575	903	611	897	0	722	597	682	2302	751	418	912
25	IET 26777	0	872	948	897	1293	886	551	908	0	832	851	875	1174	798	384	819
26	IET 26778	0	909	899	647	566	1038	601	777	0	767	734	1030	2163	878	388	993
27	IET 26780	0	967	802	688	288	817	674	706	0	853	686	712	1129	766	430	763
28	IET 24053	0	901	801	893	1222	838	0	776	0	726	743	642	818	740	0	734
29	IET 24705	0	865	539	773	395	1192	610	729	0	749	494	905	2102	953	527	955
30	Gontra Bidhan-3	0	949	871	743	656	972	639	805	0	788	738	682	2378	784	470	973
31	IET 24708	0	736	933	587	777	1077	443	759	0	809	909	988	2401	826	348	1047
32	175-2 (K)	0	906	790	1532	650	1250	539	944	0	808	703	1070	2486	995	508	1095
33	S-458	0	1168	817	1305	661	1023	612	931	0	1033	743	892	1834	805	516	970
34	N-22	0	695	0	0	1647	0	608	983	0	899	0	0	1444	0	517	953
	Mean	**0**	**877**	**818**	**876**	**1179**	**998**	**630**	**757**	**0**	**848**	**729**	**817**	**2012**	**813**	**472**	**806**
	LSD (Treat)					ns				*LSD (Treat x variety)*					ns		
	LSD (Location x Treat)					118.5**				*LSD (location x Treat x variety)*					417.5**		
	LSD (variety)					111.7**				*CV(%) Treat*					25.3		
	LSD(Location x variety)					295.1**											

Table 6.3.9 Influence of Heat Stress shoot weight (g/m2) at Maturity different AICRIP centres Kharif 2017

S.No.	Genotypes	Control							Grand Mean	Heat Stress							Grand Mean
		CHN	IIRR	MTU	PNR	PTB	REWA	TTB		CHN	IIRR	MTU	PNR	PTB	REWA	TTB	
1	IET 26755	1000	563	0	845	1462	496	789	859	750	622	0	891	949	408	522	690
2	IET 26756	750	696	0	918	1199	554	678	799	1000	547	0	821	1475	497	543	814
3	IET 26757	1000	566	0	2455	772	546	793	1022	1125	506	0	2147	1533	484	716	1085
4	IET 26758	1000	804	0	1166	876	497	1021	894	1500	559	0	804	1416	440	818	923
5	IET 26759	750	438	0	697	2145	554	983	928	1250	607	0	594	853	473	1041	803
6	IET 26760	1000	625	0	732	2165	447	633	934	750	449	0	684	753	406	811	642
7	IET 26761	750	557	0	744	1566	474	808	817	1250	554	0	680	363	408	748	667
8	IET 26762	750	579	0	805	1575	531	531	795	1000	529	0	653	456	505	712	642
9	IET 26763	1000	433	0	853	1159	446	991	814	1250	417	0	732	508	431	693	672
10	IET 23354	0	540	0	799	1704	584	991	446	0	777	0	637	913	484	624	703
11	IET 24911	1250	568	0	799	2735	557	722	1105	1375	664	0	837	1108	469	603	843
12	IET 24914	1000	571	0	1310	1570	589	778	970	1350	565	0	959	1267	506	667	886
13	IET 24904	750	550	0	1092	1946	515	732	931	1000	545	0	1211	958	436	717	811
14	IET 26764	1000	483	0	1183	1706	418	810	933	750	534	0	969	1432	390	547	770
15	IET 26765	750	563	0	857	2415	545	926	1009	1250	563	0	809	793	513	642	762
16	IET 26766	1000	517	0	1346	1935	491	858	1025	750	615	0	1201	368	466	668	678
17	IET 26767	750	589	0	550	1622	473	619	767	1000	633	0	452	390	434	614	587
18	IET 26768	1250	482	0	767	469	504	503	663	750	584	0	609	982	469	525	653
19	IET 26771	750	524	0	1284	1305	447	753	844	1000	498	0	871	993	427	589	730
20	IET 26772	1000	523	0	1932	1065	527	847	982	1250	606	0	1309	979	484	688	886
21	IET 26773	750	437	0	1157	1125	672	473	769	1000	362	0	780	689	625	494	658
22	IET 26774	1000	575	0	651	1625	593	889	889	1250	464	0	510	958	553	701	739
23	IET 26775	875	552	0	747	1486	582	996	873	1000	394	0	638	506	503	689	622
24	IET 26776	625	487	0	750	1336	493	671	727	750	424	0	590	1378	485	570	700
25	IET 26777	750	577	0	2010	1260	443	879	987	1000	717	0	1069	649	419	695	758
26	IET 26778	1000	508	0	1023	1287	571	619	835	1250	614	0	834	396	521	701	719
27	IET 26780	1250	529	0	696	1007	471	750	784	1000	549	0	592	427	454	574	599
28	IET 24053	0	554	0	1047	3777	419	0	1449	0	482	0	591	1063	392	0	632
29	IET 24705	1000	386	0	1095	537	635	776	738	1250	513	0	866	1673	573	678	926
30	Gontra Bidhan-3	1000	545	0	1188	1947	492	836	1001	750	759	0	917	1749	489	622	881
31	IET 24708	750	462	0	1233	1067	558	746	802	1000	476	0	889	729	519	609	704
32	175-2 (K)	0	536	0	2107	1737	675	868	1264	0	607	0	1508	1293	569	727	784
33	S-458	667	718	0	1781	0	556	927	775	750	841	0	1533	0	510	623	710
34	N-22	750	475	0	0	983	0	772	745	1000	425	0	0	639	0	741	688
	Mean	**901**	**544**	**0**	**1110**	**1487**	**526**	**787**	**892**	**1044**	**559**	**0**	**884**	**929**	**477**	**664**	**626**
	LSD (Treat)					ns				*LSD (Treat x variety)*					170.2**		
	LSD (Location x Treat)					70.1**				*LSD (location x Treat x variety)*					450.3**		
	LSD (variety)					ns				*CV(%) Treat*					24.5		
	LSD(Location x variety)					318.2**											

Table 6.3.10 Influence of Heat Stress Panicle weight (g/m2) at Maturity different AICRIP centres Kharif 2017

S.No.	Genotypes	Control							Grand Mean	Heat Stress							Grand Mean
		CHN	IIRR	MTU	PNR	PTB	REWA	TTB		CHN	IIRR	MTU	PNR	PTB	REWA	TTB	
1	IET 26755	0	890	638	671	500	814	451	566	0	459	517	316	550	583	265	384
2	IET 26756	0	1019	572	826	500	874	414	601	0	441	517	605	655	594	321	448
3	IET 26757	0	1015	451	281	260	813	423	463	0	197	366	198	385	575	387	301
4	IET 26758	0	659	467	650	380	597	393	449	0	123	398	539	635	505	274	354
5	IET 26759	0	623	486	535	840	657	545	527	0	249	370	423	580	625	400	378
6	IET 26760	0	690	550	444	1260	679	238	552	0	188	495	307	275	574	213	293
7	IET 26761	0	854	594	514	1150	744	378	605	0	240	508	345	180	627	232	305
8	IET 26762	0	823	535	497	820	971	323	567	0	345	418	383	240	755	162	329
9	IET 26763	0	797	567	583	440	603	523	502	0	454	484	473	335	508	418	382
10	IET 23354	0	559	671	555	1020	862	454	589	0	288	498	399	365	757	384	384
11	IET 24911	0	941	448	656	920	803	394	595	0	402	338	500	1000	734	253	461
12	IET 24914	0	863	479	872	700	1066	442	632	0	283	427	741	765	874	273	480
13	IET 24904	0	813	628	1065	1250	784	510	721	0	205	543	445	385	631	282	356
14	IET 26764	0	715	482	478	1060	770	423	561	0	144	442	416	300	604	287	313
15	IET 26765	0	902	587	627	1510	668	352	664	0	693	513	427	575	757	330	471
16	IET 26766	0	687	691	470	1210	875	468	629	0	145	591	333	290	655	428	349
17	IET 26767	0	889	601	450	1310	615	387	607	0	474	451	319	80	633	298	322
18	IET 26768	0	827	558	696	450	692	296	503	0	1301	491	529	355	605	182	495
19	IET 26771	0	715	520	653	1400	797	576	666	0	160	465	443	360	541	361	333
20	IET 26772	0	688	619	492	1360	858	603	660	0	216	536	362	595	610	372	384
21	IET 26773	0	688	484	533	1240	1026	370	620	0	339	407	340	447	872	180	369
22	IET 26774	0	796	484	543	960	860	427	581	0	250	396	428	373	843	278	367
23	IET 26775	0	750	438	587	1070	793	469	587	0	410	362	530	312	735	268	374
24	IET 26776	0	792	506	574	580	656	350	494	0	312	454	476	570	575	213	372
25	IET 26777	0	676	509	507	1250	686	459	584	0	290	406	373	443	568	416	357
26	IET 26778	0	611	479	562	1000	743	346	534	0	419	381	480	273	663	312	361
27	IET 26780	0	675	539	728	640	611	426	517	0	331	473	496	165	563	288	331
28	IET 24053	0	696	561	592	490	644	0	597	0	347	451	477	285	534	0	419
29	IET 24705	0	650	616	683	350	915	415	518	0	161	539	838	340	730	345	422
30	Gontra Bidhan-3	0	758	548	948	1250	707	461	667	0	302	473	682	593	548	423	432
31	IET 24708	0	715	517	923	620	713	418	558	0	216	440	641	398	622	253	367
32	175-2 (K)	0	653	498	463	940	876	500	561	0	103	433	382	663	760	403	392
33	S-458	0	880	486	523	0	708	348	649	0	195	432	390	0	545	297	391
34	N-22	0	730	0	0	780	0	457	656	0	263	0	0	601	0	406	432
	Mean	**0**	**766**	**540**	**612**	**894**	**772**	**413**	**560**	**0**	**322**	**442**	**447**	**424**	**627**	**300**	**366**
	LSD (Treat)				12.38*					*LSD (Treat x variety)*				ns			
	LSD (Location x Treat)				45.5**					*LSD (location x Treat x variety)*				237.9**			
	LSD (variety)				63.6**					*CV(%) Treat*				23.5			
	LSD(Location x variety)				168.2**												

Table 6.3.11 Influence of Heat Stress Panicle number (m2) at Maturity different AICRIP centres Kharif 2017

S.No.	Genotypes	Control							Grand Mean	Heat Stress							Grand Mean
		CHN	IIRR	MTU	PNR	PTB	REWA	TTB		CHN	IIRR	MTU	PNR	PTB	REWA	TTB	
1	IET 26755	142	453	264	325	550	292	295	332	183	447	297	263	265	222	241	274
2	IET 26756	167	500	385	507	350	350	300	365	225	380	374	375	310	245	250	308
3	IET 26757	167	407	418	468	450	257	302	353	175	330	418	373	325	187	281	298
4	IET 26758	175	427	352	443	350	280	299	332	175	370	418	365	315	175	235	293
5	IET 26759	192	313	396	367	1000	385	282	419	217	470	363	285	240	280	243	300
6	IET 26760	175	453	418	533	750	292	293	416	158	297	341	360	220	222	254	265
7	IET 26761	175	373	374	385	850	350	274	397	233	273	341	267	525	315	238	313
8	IET 26762	133	453	374	428	750	455	266	409	192	420	363	402	145	385	182	298
9	IET 26763	200	373	385	583	650	233	281	387	208	343	396	375	150	163	246	269
10	IET 23354	0	243	484	315	850	420	281	432	0	287	462	213	245	350	268	304
11	IET 24911	208	283	319	562	500	432	244	364	175	353	330	438	285	327	144	293
12	IET 24914	208	293	396	375	750	443	203	381	183	327	363	267	290	303	186	274
13	IET 24904	217	297	451	417	1100	408	237	447	192	253	451	333	385	303	189	301
14	IET 26764	242	437	418	533	500	373	214	388	150	350	374	380	340	233	191	288
15	IET 26765	142	447	451	482	550	373	255	386	208	417	407	372	300	303	222	318
16	IET 26766	175	277	429	565	450	455	288	377	175	243	407	487	180	385	252	304
17	IET 26767	170	410	418	423	750	408	277	408	233	437	418	327	285	303	248	322
18	IET 26768	167	310	374	475	550	362	277	359	233	440	363	393	230	292	192	306
19	IET 26771	175	323	440	530	850	350	296	423	158	463	451	438	315	245	270	334
20	IET 26772	192	367	440	492	1000	315	303	444	242	247	429	403	190	210	228	278
21	IET 26773	167	350	407	392	1150	432	267	452	158	240	374	285	335	362	217	282
22	IET 26774	158	377	440	452	550	432	305	388	217	287	451	383	242	397	256	319
23	IET 26775	208	367	352	477	650	432	313	400	175	413	341	350	450	362	236	332
24	IET 26776	158	353	429	392	500	397	275	358	125	270	440	338	285	327	226	287
25	IET 26777	133	300	407	448	600	280	277	349	233	263	385	385	375	210	235	298
26	IET 26778	217	300	440	482	300	397	233	338	158	353	440	392	168	292	204	287
27	IET 26780	242	260	440	533	450	245	285	351	200	277	451	375	240	105	268	274
28	IET 24053	0	263	385	493	600	268	0	402	0	217	396	383	190	163	0	225
29	IET 24705	208	293	462	642	300	420	247	367	150	300	462	445	325	280	228	313
30	Gontra Bidhan-3	167	263	473	445	900	350	282	411	167	390	462	273	355	280	253	311
31	IET 24708	250	323	484	533	500	303	240	376	233	330	440	342	292	198	205	291
32	175-2 (K)	0	307	451	435	550	443	230	345	0	273	462	335	505	373	204	359
33	S-458	183	310	418	393	0	327	235	267	158	427	407	293	0	257	202	291
34	N-22	200	380	0	0	827	0	252	415	208	360	0	0	508	0	237	328
	Mean	**168**	**350**	**399**	**455**	**630**	**352**	**262**	**374**	**190**	**340**	**402**	**354**	**297**	**266**	**221**	**290**
	LSD (Treat)					ns				*LSD (Treat x variety)*					ns		
	LSD (Location x Treat)					35.5**				*LSD (location x Treat x variety)*					176.2**		
	LSD (variety)					ns				*CV(%) Treat*					25.7		
	LSD(Location x variety)					124.6**											

Table 6.3.12 Influence of Heat Stress grain number/panicle at Maturity different AICRIP centres Kharif 2017

S.No.	Genotypes	Control							Grand Mean	Heat Stress							Grand Mean
		CHN	IIRR	MTU	PNR	PTB	REWA	TTB		CHN	IIRR	MTU	PNR	PTB	REWA	TTB	
1	IET 26755	0	118	114	157	78	80	139	114	0	46	102	52	121	53	192	94
2	IET 26756	0	91	104	158	49	102	202	117	0	35	85	67	75	71	156	81
3	IET 26757	0	111	110	15	38	100	245	103	0	18	80	10	80	77	114	63
4	IET 26758	0	109	102	233	71	105	67	115	0	10	87	143	107	86	168	100
5	IET 26759	0	68	95	105	31	109	42	75	0	21	83	40	110	94	111	77
6	IET 26760	0	60	101	103	164	111	118	110	0	25	88	69	125	84	58	75
7	IET 26761	0	90	96	156	88	127	89	108	0	21	85	146	24	97	114	81
8	IET 26762	0	89	96	152	52	133	127	108	0	45	75	69	140	102	107	90
9	IET 26763	0	94	93	34	65	94	144	87	0	42	80	9	115	65	141	75
10	IET 23354	0	85	105	136	57	133	183	116	0	21	90	69	91	113	122	84
11	IET 24911	0	113	103	196	62	133	132	123	0	21	83	97	120	109	145	96
12	IET 24914	0	102	110	123	47	141	118	107	0	14	85	106	114	119	133	95
13	IET 24904	0	90	84	13	106	105	181	97	0	9	70	83	100	91	100	76
14	IET 26764	0	123	108	22	72	106	131	94	0	5	85	10	141	79	130	75
15	IET 26765	0	74	101	100	90	125	120	102	0	35	90	69	84	91	98	78
16	IET 26766	0	93	95	40	48	112	119	84	0	17	77	15	100	89	122	70
17	IET 26767	0	90	88	143	54	113	143	105	0	30	67	114	79	84	95	78
18	IET 26768	0	105	108	134	47	109	136	106	0	38	93	102	53	95	135	86
19	IET 26771	0	67	94	73	71	102	158	94	0	4	75	37	68	75	152	69
20	IET 26772	0	85	100	13	48	115	110	78	0	28	72	6	141	82	164	82
21	IET 26773	0	64	98	64	56	145	131	93	0	30	81	56	81	129	68	74
22	IET 26774	0	76	97	100	77	124	160	105	0	26	85	61	125	109	86	82
23	IET 26775	0	91	94	66	135	120	157	110	0	35	75	41	44	105	122	70
24	IET 26776	0	112	98	223	152	131	166	147	0	44	81	163	125	104	133	109
25	IET 26777	0	93	93	35	101	117	127	94	0	31	74	14	64	83	155	70
26	IET 26778	0	75	87	124	93	113	143	106	0	64	72	22	113	90	123	81
27	IET 26780	0	108	82	102	90	110	120	102	0	27	70	72	91	81	146	81
28	IET 24053	0	101	104	69	74	106	0	91	0	28	84	25	140	84	0	72
29	IET 24705	0	84	100	123	46	118	136	101	0	13	83	74	100	96	107	79
30	Gontra Bidhan-3	0	129	91	242	81	116	172	138	0	14	74	65	98	98	174	87
31	IET 24708	0	112	104	185	100	132	228	144	0	15	82	127	80	109	188	100
32	175-2 (K)	0	96	97	43	65	135	157	99	0	21	82	15	78	112	135	74
33	S-458	0	109	91	125	0	121	157	121	0	6	80	110	0	95	135	85
34	N-22	0	79	0	0	93	0	208	127	0	29	0	0	94	0	125	82
	Mean	**0**	**94**	**98**	**109**	**76**	**116**	**144**	**89**	**0**	**25**	**81**	**65**	**98**	**92**	**129**	**82**
	LSD (Treat)					ns				*LSD (Treat x variety)*					ns		
	LSD (Location x Treat)					4.25**				*LSD (location x Treat x variety)*					34.8**		
	LSD (variety)					ns				*CV(%) Treat*					21.5		
	LSD(Location x variety)					24.6**											

Table 6.3.13 Influence of Heat Stress spikelet number/panicle at Maturity different AICRIP centres Kharif 2017

S.No.	Genotypes	Control							Grand Mean	Heat Stress							Grand Mean
		CHN	IIRR	MTU	PNR	PTB	REWA	TTB		CHN	IIRR	MTU	PNR	PTB	REWA	TTB	
1	IET 26755	0	168	129	244	87	155	193	163	0	181	137	144	157	119	278	169
2	IET 26756	0	120	122	194	53	164	257	152	0	144	118	116	96	137	227	140
3	IET 26757	0	167	121	179	66	149	306	165	0	136	103	103	110	124	215	132
4	IET 26758	0	137	112	281	77	155	85	141	0	102	112	214	149	123	273	162
5	IET 26759	0	93	107	134	43	147	89	102	0	78	103	96	234	124	171	134
6	IET 26760	0	94	113	192	176	156	144	146	0	95	111	154	160	129	104	126
7	IET 26761	0	140	108	202	106	172	124	142	0	154	107	192	51	149	165	136
8	IET 26762	0	124	107	204	54	170	157	136	0	125	92	157	155	149	120	133
9	IET 26763	0	135	107	127	69	139	160	123	0	128	104	102	133	113	227	134
10	IET 23354	0	113	115	186	59	180	204	143	0	122	109	139	140	155	158	137
11	IET 24911	0	154	114	215	66	183	153	148	0	145	109	194	191	147	212	166
12	IET 24914	0	132	120	227	70	190	179	153	0	150	111	215	148	163	191	163
13	IET 24904	0	122	92	227	111	155	217	154	0	120	87	224	126	120	190	145
14	IET 26764	0	150	119	104	79	144	174	128	0	159	105	108	183	114	179	141
15	IET 26765	0	83	112	134	102	170	135	123	0	122	110	122	107	137	121	120
16	IET 26766	0	120	104	110	55	156	149	116	0	97	99	110	115	128	162	119
17	IET 26767	0	130	98	208	60	150	174	136	0	109	86	158	86	130	147	119
18	IET 26768	0	131	119	184	52	154	150	132	0	146	117	141	74	140	242	143
19	IET 26771	0	92	105	197	78	150	207	138	0	73	96	174	85	121	206	126
20	IET 26772	0	122	109	181	57	165	127	127	0	454	88	147	179	134	254	209
21	IET 26773	0	82	107	131	67	194	146	121	0	106	99	110	173	159	99	125
22	IET 26774	0	94	111	127	125	174	175	134	0	90	103	120	151	138	154	126
23	IET 26775	0	127	104	215	157	158	181	157	0	99	95	110	70	129	161	111
24	IET 26776	0	152	107	266	172	177	203	180	0	144	98	198	134	145	199	153
25	IET 26777	0	154	103	195	131	162	138	147	0	111	96	87	88	141	208	122
26	IET 26778	0	91	97	198	99	150	169	134	0	128	99	76	128	135	168	122
27	IET 26780	0	132	90	153	96	154	138	127	0	124	86	142	102	131	174	127
28	IET 24053	0	114	115	132	84	154	0	120	0	156	102	107	152	135	0	130
29	IET 24705	0	162	110	202	64	168	165	145	0	108	103	109	130	141	135	121
30	Gontra Bidhan-3	0	161	99	263	89	152	197	160	0	172	95	143	130	143	210	149
31	IET 24708	0	170	112	234	119	170	273	180	0	144	105	192	99	153	291	164
32	175-2 (K)	0	154	105	298	69	174	188	165	0	89	98	211	96	154	180	138
33	S-458	0	146	100	106	0	172	190	143	0	106	99	133	0	153	159	130
34	N-22	0	91	0	0	128	0	227	149	0	99	0	0	144	0	156	133
	Mean		**128**	**106**	**186**	**86**	**158**	**170**	**139**		**133**	**99**	**141**	**126**	**133**	**180**	**116**
	LSD (Treat)				ns					*LSD (Treat x variety)*				21.34*			
	LSD (Location x Treat)				15.1**					*LSD (location x Treat x variety)*				74.1**			
	LSD (variety)				19.9**					*CV(%) Treat*				28			
	LSD(Location x variety)				52.5**												

Table 6.3.14 Influence of Heat Stress grain number/m2 different AICRIP centres Kharif 2017

S.No.	Genotypes	Control							Grand Mean	Heat Stress							Grand Mean
		CHN	IIRR	MTU	PNR	PTB	REWA	TTB		CHN	IIRR	MTU	PNR	PTB	REWA	TTB	
1	IET 26755	0	52391	30195	50920	42900	23053	40913	40062	0	21389	30195	13728	32065	11795	46190	25894
2	IET 26756	0	43630	40106	79943	17150	35642	60787	46210	0	15556	31955	25127	23250	17337	40000	25537
3	IET 26757	0	44985	45815	6880	17100	25597	74442	35803	0	3649	33605	3863	26000	14502	32187	18968
4	IET 26758	0	46094	35849	103453	24850	29657	19232	43189	0	1300	36135	52268	33705	14968	38903	29547
5	IET 26759	0	20916	37400	38665	31000	41743	11865	30265	0	5296	29832	11288	26400	26437	26967	21037
6	IET 26760	0	26727	42416	55160	123000	32422	34346	52345	0	4682	30063	24683	27500	18550	14721	20033
7	IET 26761	0	32508	35970	60025	74800	44485	24329	45353	0	5263	29073	39013	12600	30648	26946	23924
8	IET 26762	0	39617	35805	65037	39000	60480	33367	45551	0	15391	27005	27860	20300	39223	19573	24892
9	IET 26763	0	34800	36036	19785	42250	21840	40622	32556	0	19173	31768	3430	17250	10582	34512	19452
10	IET 23354	0	20614	50831	42748	48450	55568	52145	45059	0	6022	41316	14750	22295	39632	32554	26095
11	IET 24911	0	31464	32725	110048	31000	57458	31793	49082	0	9209	27357	42257	34200	35467	21767	28376
12	IET 24914	0	29831	43549	46228	35250	62627	23557	40174	0	4204	30943	28173	33060	35922	24478	26130
13	IET 24904	0	26827	37389	5523	116600	42747	43135	45370	0	1887	31416	27745	38500	27755	18938	24374
14	IET 26764	0	53694	44935	11500	36000	40110	27802	35674	0	637	31823	3963	47940	17990	25152	21251
15	IET 26765	0	33063	45529	48035	49500	46492	30030	42108	0	24268	36102	25693	25200	27510	21643	26736
16	IET 26766	0	25419	40755	22775	21600	50738	34319	32601	0	2549	31317	7417	18000	34183	30520	20664
17	IET 26767	0	37016	36355	60548	40500	46247	39767	43405	0	14239	28127	37273	22515	25363	23604	25187
18	IET 26768	0	31090	40315	63590	25850	39457	38265	39761	0	48974	33781	40067	12190	27487	25259	31293
19	IET 26771	0	21611	41316	38462	60350	35782	47100	40770	0	655	33726	16310	21420	18223	40879	21869
20	IET 26772	0	31049	43912	6577	48000	36237	33110	33147	0	6149	30668	2320	26790	17173	37509	20102
21	IET 26773	0	22060	39732	25142	64400	62673	34913	41487	0	10076	30140	15832	21800	46702	14896	23241
22	IET 26774	0	28622	42108	45015	42350	53538	49285	43486	0	6472	38247	23330	30208	43400	22346	27334
23	IET 26775	0	32263	32890	31597	87750	51532	49100	47522	0	14465	25542	14257	16800	38080	28094	22873
24	IET 26776	0	39251	41954	87157	76000	52080	46296	57123	0	13742	35816	55287	35625	34043	30678	34198
25	IET 26777	0	27995	37598	15842	60600	32690	35075	34967	0	8738	28347	5465	21000	17383	37053	19664
26	IET 26778	0	22431	38280	59613	27900	44870	32841	37656	0	24855	31570	8560	18767	26168	25350	22545
27	IET 26780	0	27651	36036	54325	40500	26892	34227	36605	0	9074	31636	26833	20760	8563	39115	22664
28	IET 24053	0	26551	40062	33880	44400	28618	0	34702	0	9710	33484	9737	26600	13848	0	18676
29	IET 24705	0	24633	46068	78958	13800	49595	33694	41125	0	2192	38511	32742	32500	26798	24138	26147
30	Gontra Bidhan-3	0	33850	42889	107887	72900	40635	48318	57746	0	4680	34023	17657	32200	27405	43632	26599
31	IET 24708	0	36114	49742	98825	50000	40063	56747	55249	0	3110	36212	43218	23125	21350	38847	27644
32	175-2 (K)	0	28980	43879	18625	35750	60002	36502	37290	0	2255	37961	5155	41197	41965	27712	26041
33	S-458	0	33397	37455	49110	0	39632	37047	39328	0	1104	32692	32233	0	24278	27507	23563
34	N-22	0	29907	0	0	72387	42764	52550	51614	0	7621	0	0	47470	0	29645	28245
	Mean	**0**	**32266**	**40179**	**49754**	**48906**	**42764**	**39016**	**42147**	**0**	**9664**	**32436**	**22350**	**26946**	**26083**	**29434**	**24485**
	LSD (Treat)					1052**				*LSD (Treat x variety)*					ns		
	LSD (Location x Treat)					2785**				*LSD (location x Treat x variety)*					18127**		
	LSD (variety)					ns				*CV(%) Treat*					24		
	LSD(Location x variety)					12817**											

Table 6.3.15 Influence of Heat Stress Spikelet number/m2 different AICRIP centres Kharif 2017

S.No.	Genotypes	Control							Grand	Heat Stress							Grand
		CHN	IIRR	MTU	PNR	PTB	REWA	TTB	Mean	CHN	IIRR	MTU	PNR	PTB	REWA	TTB	Mean
1	IET 26755	0	73759	34012	79300	47850	45138	56773	56139	0	80652	40524	38000	41605	26227	67040	49008
2	IET 26756	0	57603	46926	98110	18550	57948	77240	59396	0	52989	44220	43332	29760	33623	57337	43543
3	IET 26757	0	67948	50369	84047	29700	38278	92955	60549	0	39027	43131	38598	35750	23275	60890	40112
4	IET 26758	0	57863	39358	124762	26950	43283	24569	52798	0	37424	46145	78068	46935	21723	63364	48943
5	IET 26759	0	28949	41822	49082	43000	56490	24982	40721	0	35045	37037	27373	56160	34533	40943	38515
6	IET 26760	0	42276	47300	102630	132000	45675	42037	68653	0	27992	37895	55342	35200	28758	26609	35299
7	IET 26761	0	49575	40491	77923	90100	60200	34023	58719	0	42026	36311	51043	26775	46888	39017	40343
8	IET 26762	0	56092	39710	87563	40500	77350	41672	57148	0	52437	33484	63207	22475	57283	22947	41972
9	IET 26763	0	50679	41085	74068	44850	32608	44951	48040	0	44002	41107	38423	19950	18655	55774	36319
10	IET 23354	0	27399	55671	58465	50150	75763	58186	54272	0	35049	49742	29528	34300	54203	41959	40797
11	IET 24911	0	42402	36300	120705	33000	78937	37015	58060	0	47479	35882	85188	54435	47985	31313	50380
12	IET 24914	0	38252	47674	85170	52500	83778	36358	57289	0	46394	40095	57188	42920	49432	35427	45243
13	IET 24904	0	36280	41063	94467	122100	63152	51817	68146	0	29699	38731	74725	48510	36423	37148	44206
14	IET 26764	0	65078	49467	55367	39500	53270	36865	49925	0	55832	39402	40983	62220	26507	34432	43229
15	IET 26765	0	37025	50523	64572	56100	63268	34005	50915	0	49761	44033	45508	32100	41452	26557	39902
16	IET 26766	0	32752	44792	62205	24750	71458	42898	46476	0	23320	40271	53807	20700	49537	40715	38058
17	IET 26767	0	53007	40469	87990	45000	61320	48190	55996	0	46149	35838	51457	24510	39667	36550	39029
18	IET 26768	0	38840	44429	87512	28600	55557	42384	49554	0	63440	42317	55523	17020	40763	45704	44128
19	IET 26771	0	30164	45815	104375	66300	52372	61499	60087	0	34054	43241	76293	26775	29797	55311	44245
20	IET 26772	0	44620	47883	89113	57000	52080	38497	54866	0	37913	37807	59175	34010	28128	57872	42484
21	IET 26773	0	28335	43648	51275	77050	83930	38969	53868	0	25342	37092	31485	46365	57785	21504	36596
22	IET 26774	0	35274	48070	57370	68750	74947	54118	56421	0	25768	46497	45923	36197	54717	40066	41528
23	IET 26775	0	46452	36355	102535	102050	68063	56973	68738	0	40784	32351	38560	28550	46608	38001	37476
24	IET 26776	0	53564	45749	104072	86000	70000	55969	69226	0	38918	43274	66817	38190	47343	45964	46751
25	IET 26777	0	45872	41965	87288	78600	45360	38121	56201	0	31441	36894	33425	30325	29563	50260	35318
26	IET 26778	0	27135	42713	95590	29700	59267	38429	48806	0	43506	43560	29868	21292	39223	34714	35360
27	IET 26780	0	33968	39732	81397	43200	37637	39405	45890	0	33980	38709	53337	22990	13627	46464	34851
28	IET 24053	0	30024	44077	65193	50400	41230	0	46185	0	33337	40458	40830	28880	22132	0	33127
29	IET 24705	0	46813	50347	129780	19200	70548	40651	59557	0	32356	47641	48570	42250	39422	30369	40101
30	Gontra Bidhan-3	0	42169	46827	117108	80100	53118	55448	65795	0	65508	43681	39020	41845	40005	52951	47168
31	IET 24708	0	54700	53625	124820	59500	51742	66933	68553	0	46942	46090	65560	28877	30567	61075	46518
32	175-2 (K)	0	47264	47630	129828	37950	77175	43699	63924	0	24381	45529	70478	48543	58135	36456	47254
33	S-458	0	44350	40909	41610	0	56140	44777	45557	0	45686	40381	38490	0	39375	32440	39274
34	N-22	0	34259	0	0	98027	0	57402	63229	0	35756	0	0	67100	0	36989	46615
	Mean	**0**	**44139**	**44449**	**87130**	**56940**	**59306**	**47206**	**56528**	**0**	**41306**	**40890**	**50458**	**36167**	**37981**	**42550**	**41559**
	LSD (Treat)				750*					*LSD (Treat x variety)*				ns			
	LSD (Location x Treat)				2757**					*LSD (location x Treat x variety)*				21949**			
	LSD (variety)				ns					*CV(%) Treat*				16.15			
	LSD(Location x variety)				15520**												

Table 6.3.16 Influence of Heat Stress Grain yield (g/m2) different AICRIP centres Kharif 2017

S.No.	Genotypes	Control							Grand Mean	Heat Stress							Grand Mean
		CHN	IIRR	MTU	PNR	PTB	REWA	TTB		CHN	IIRR	MTU	PNR	PTB	REWA	TTB	
1	IET 26755	152	735	592	632	376	384	427	471	123	235	443	268	133	339	272	259
2	IET 26756	114	877	384	808	429	427	398	491	114	230	338	558	193	375	305	302
3	IET 26757	208	834	519	212	220	410	410	402	114	42	429	179	338	381	375	265
4	IET 26758	208	555	380	595	308	343	372	395	161	17	268	459	173	330	258	238
5	IET 26759	303	512	295	485	533	487	426	434	227	92	224	406	83	422	382	262
6	IET 26760	133	547	444	382	628	397	218	393	152	77	363	282	98	387	188	221
7	IET 26761	133	714	410	498	808	432	363	480	189	87	348	312	143	372	202	236
8	IET 26762	152	707	368	483	604	586	199	443	85	203	318	347	198	562	135	264
9	IET 26763	379	665	502	567	352	339	487	470	275	335	430	432	223	285	397	339
10	IET 23354	0	500	766	474	757	600	440	590	0	117	485	374	208	585	330	354
11	IET 24911	455	822	862	670	784	571	360	646	322	213	412	413	673	528	234	399
12	IET 24914	502	732	661	819	436	717	413	611	218	93	435	772	473	712	256	423
13	IET 24904	473	689	547	1037	868	493	493	657	249	43	326	561	223	464	265	304
14	IET 26764	322	634	427	402	688	451	372	471	199	7	347	296	163	416	268	242
15	IET 26765	322	791	571	643	1204	557	321	630	265	507	429	350	303	483	315	379
16	IET 26766	313	621	486	374	808	492	456	507	246	50	355	299	218	456	409	291
17	IET 26767	360	776	524	382	832	455	363	528	294	285	451	286	58	399	280	293
18	IET 26768	133	703	434	652	280	448	263	416	114	754	384	482	253	418	153	365
19	IET 26771	493	643	334	557	1000	384	454	552	303	16	242	341	198	322	343	252
20	IET 26772	530	577	593	398	784	475	509	552	511	92	481	357	478	452	354	389
21	IET 26773	265	609	407	445	832	712	264	505	426	247	364	299	95	697	168	328
22	IET 26774	350	707	384	486	616	655	427	518	303	139	295	377	174	643	257	313
23	IET 26775	350	662	304	543	688	599	442	513	208	262	265	437	189	562	248	310
24	IET 26776	360	671	330	500	400	424	326	430	341	210	259	415	333	416	191	309
25	IET 26777	388	541	539	445	796	389	430	504	152	155	471	310	242	338	395	295
26	IET 26778	246	526	576	545	652	505	329	483	227	473	443	386	204	494	292	360
27	IET 26780	464	581	501	637	412	406	421	489	426	182	427	454	105	380	267	320
28	IET 24053	0	632	564	555	316	368	0	487	0	186	469	443	108	348	0	311
29	IET 24705	455	547	305	602	292	570	399	453	303	39	248	384	178	559	322	290
30	Gontra Bidhan-3	426	676	549	960	821	421	507	623	237	83	456	674	405	393	403	379
31	IET 24708	492	582	525	851	420	456	322	521	436	48	430	619	277	428	227	352
32	175-2 (K)	0	531	611	370	508	563	476	510	0	38	501	321	435	543	386	371
33	S-458	398	749	524	492	0	422	320	484	492	42	469	369	0	401	282	343
34	N-22	521	645	0	0	558	0	434	308	398	137	0	0	345	0	384	316
	Mean	**335**	**656**	**491**	**561**	**607**	**483**	**389**	**488**	**262**	**169**	**382**	**402**	**240**	**451**	**289**	**303**
	LSD (Treat)					7.11*				*LSD (Treat x variety)*					ns		
	LSD (Location x Treat)					26.14**				*LSD (location x Treat x variety)*					178**		
	LSD (variety)					47.6**				*CV(%) Treat*					15.85		
	LSD(Location x variety)					126**											

Table 6.3.17 Influence of Heat Stress Total dry matter (g/m2) at maturity different AICRIP centres Kharif 2017

S.No.	Genotypes	Control							Grand Mean	Heat Stress							Grand Mean
		CHN	IIRR	MTU	PNR	PTB	REWA	TTB		CHN	IIRR	MTU	PNR	PTB	REWA	TTB	
1	IET 26755	0	1453	1298	1477	1920	1576	1240	1494	0	1080	1095	1159	1480	1267	787	1145
2	IET 26756	0	1715	880	1726	1570	1737	1092	1453	0	988	748	1379	2115	1440	865	1256
3	IET 26757	0	1581	1230	2667	900	1662	1217	1543	0	703	1364	2326	1905	1331	1103	1455
4	IET 26758	0	1463	734	1761	1150	1446	1414	1328	0	681	754	1301	2035	1257	1092	1187
5	IET 26759	0	1061	781	1182	2340	1570	1528	1410	0	856	994	1000	1415	1385	1441	1182
6	IET 26760	0	1315	970	1114	3310	1430	871	1502	0	637	872	966	1010	1239	1023	958
7	IET 26761	0	1410	1033	1242	2510	1514	1186	1483	0	794	985	992	525	1304	980	930
8	IET 26762	0	1403	752	1288	2190	1889	854	1396	0	874	911	1000	675	1593	873	988
9	IET 26763	0	1230	1224	1420	1480	1381	1513	1375	0	871	1243	1165	825	1228	1112	1074
10	IET 23354	0	1099	1863	1273	2620	1856	1445	1693	0	1065	1628	1011	1260	1607	1008	1263
11	IET 24911	0	1509	1803	1470	3570	1688	1117	1859	0	1067	1594	1250	2090	1486	857	1391
12	IET 24914	0	1434	1421	2129	2330	1989	1219	1754	0	849	1180	1731	2020	1672	940	1399
13	IET 24904	0	1363	1414	2129	3090	1622	1242	1810	0	750	858	1773	1175	1377	999	1155
14	IET 26764	0	1198	1150	1585	2690	1465	1234	1554	0	678	1042	1265	1720	1241	833	1130
15	IET 26765	0	1464	1196	1500	3530	1545	1278	1752	0	1256	928	1159	1350	1567	972	1205
16	IET 26766	0	1204	1153	1720	2960	1692	1326	1676	0	760	990	1500	640	1407	1097	1066
17	IET 26767	0	1479	1222	932	2700	1381	1006	1453	0	1107	1168	739	445	1333	912	951
18	IET 26768	0	1309	1135	1420	810	1489	799	1160	0	1886	1071	1091	1320	1364	707	1240
19	IET 26771	0	1238	843	1841	2590	1534	1329	1562	0	658	663	1212	1335	1220	950	1006
20	IET 26772	0	1212	1302	2330	2300	1669	1450	1710	0	822	1154	1667	715	1370	1060	1131
21	IET 26773	0	1125	900	1602	2220	2155	843	1474	0	702	977	1080	1118	1866	673	1069
22	IET 26774	0	1371	960	1136	2450	1791	1316	1504	0	714	849	886	1317	1702	979	1075
23	IET 26775	0	1302	733	1290	2440	1732	1464	1493	0	804	684	1076	800	1570	957	982
24	IET 26776	0	1279	1022	1250	1810	1463	1021	1307	0	736	755	989	1930	1342	783	1089
25	IET 26777	0	1253	1298	2455	2300	1419	1339	1677	0	1007	1189	1443	1075	1292	1111	1186
26	IET 26778	0	1119	1241	1568	2360	1699	965	1492	0	1033	1176	1220	652	1523	1012	1102
27	IET 26780	0	1205	1115	1333	1520	1369	1176	1286	0	880	990	1045	572	1304	862	942
28	IET 24053	0	1250	1411	1602	730	1361	0	1271	0	828	1245	1034	1330	1251	0	1138
29	IET 24705	0	1036	792	1697	780	1921	1191	1236	0	674	598	1250	1940	1658	1023	1191
30	Gontra Bidhan-3	0	1302	1169	2148	3060	1535	1297	1752	0	1061	1045	1648	1153	1345	1045	1216
31	IET 24708	0	1176	1275	2083	1570	1677	1164	1491	0	693	1260	1534	1082	1414	862	1141
32	175-2 (K)	0	1189	1280	2477	2560	1965	1368	1807	0	710	1218	1830	1852	1698	1130	1406
33	S-458	0	1598	1353	2273	0	1597	1275	1619	0	1036	1406	1902	0	1361	920	1325
34	N-22	0	1205	0	0	1658	0	1228	1364	0	688	0	0	1267	0	1147	1034
	Mean	**0**	**1310**	**1150**	**1670**	**2182**	**1631**	**1212**	**1526**	**0**	**881**	**1050**	**1292**	**1277**	**1425**	**973**	**1149**
	LSD (Treat)				16.9*					*LSD (Treat x variety)*				ns			
	LSD (Location x Treat)				62.5**					*LSD (location x Treat x variety)*				497**			
	LSD (variety)				132**					*CV(%) Treat*				21.1			
	LSD(Location x variety)				351**												

Table 6.3.18 Influence of Heat Stress 1000 grain weight (g) different AICRIP centres Kharif 2017

S.No.	Genotypes	Control							Grand Mean	Heat Stress							Grand Mean
		CHN	IIRR	MTU	PNR	PTB	REWA	TTB		CHN	IIRR	MTU	PNR	PTB	REWA	TTB	
1	IET 26755	12.0	14.0	16.6	15.7	15.0	10.0	23.3	15.2	12.0	11.0	14.7	14.0	15.0	9.6	16.0	13.2
2	IET 26756	14.5	20.2	23.5	25.0	15.0	20.6	19.0	19.7	14.5	14.7	20.2	23.0	15.0	16.6	17.7	17.4
3	IET 26757	23.0	18.8	19.3	9.0	10.0	14.0	19.3	16.2	23.0	11.6	16.6	10.0	10.0	13.7	18.3	14.7
4	IET 26758	11.0	12.1	17.7	22.0	20.0	12.9	21.0	16.7	11.0	12.9	15.3	20.0	35.0	12.5	17.7	17.8
5	IET 26759	18.0	24.5	25.1	23.7	25.0	19.5	18.7	22.1	18.0	17.5	22.5	17.3	20.0	19.3	18.0	18.9
6	IET 26760	20.0	20.5	22.7	22.0	25.0	17.1	23.0	21.5	20.0	16.4	20.9	22.7	10.0	17.1	18.0	17.9
7	IET 26761	19.5	21.9	22.9	18.3	20.0	18.3	22.7	20.5	19.5	17.0	19.7	16.3	15.0	16.2	17.7	17.3
8	IET 26762	15.0	17.8	16.7	15.7	20.0	12.3	20.3	16.8	15.0	13.6	14.3	15.7	20.0	10.7	18.7	15.4
9	IET 26763	19.5	19.1	22.7	13.0	25.0	18.2	24.0	20.2	19.5	17.5	19.8	18.3	30.0	18.1	23.3	20.9
10	IET 23354	0.0	24.2	25.7	23.0	30.0	22.1	27.0	25.3	0.0	19.2	21.1	20.0	25.0	20.9	24.0	21.7
11	IET 24911	24.5	26.2	26.8	23.3	30.0	23.8	26.0	25.8	24.5	22.8	23.4	23.7	30.0	23.3	22.3	24.3
12	IET 24914	23.5	24.6	24.0	23.0	30.0	21.0	25.0	24.4	23.5	21.7	18.9	14.3	30.0	20.3	21.0	21.4
13	IET 24904	23.5	25.6	25.1	23.3	10.0	21.3	23.7	21.8	23.5	22.7	19.9	22.3	10.0	19.5	13.3	18.8
14	IET 26764	10.0	11.8	15.5	17.0	20.0	16.7	23.7	16.4	10.0	11.0	13.6	12.3	25.0	14.3	15.3	14.5
15	IET 26765	22.0	23.9	24.4	23.0	25.0	20.8	26.3	23.6	22.0	20.9	21.0	18.3	25.0	20.2	23.7	21.6
16	IET 26766	24.5	24.5	25.0	18.0	20.0	22.5	28.0	23.2	24.5	19.4	19.4	15.3	20.0	22.0	25.0	20.8
17	IET 26767	20.5	21.0	24.5	23.0	20.0	20.5	25.3	22.1	20.5	20.0	19.6	22.7	20.0	19.0	20.3	20.3
18	IET 26768	22.0	22.6	24.3	23.7	25.0	20.2	29.0	23.8	22.0	22.2	20.3	23.3	30.0	20.0	22.7	22.9
19	IET 26771	29.0	29.7	25.7	21.7	15.0	22.8	27.0	24.4	29.0	23.7	20.4	22.3	20.0	13.9	23.0	21.8
20	IET 26772	19.0	18.6	21.2	15.3	20.0	16.3	29.7	20.0	19.0	15.1	17.3	14.7	25.0	16.0	21.0	18.3
21	IET 26773	25.5	27.6	22.2	21.0	25.0	20.3	25.0	23.8	25.5	24.7	19.2	24.0	18.3	19.9	23.0	22.1
22	IET 26774	22.0	24.8	23.3	22.0	20.0	18.9	23.3	22.0	22.0	21.4	21.6	22.7	13.3	17.8	21.3	20.0
23	IET 26775	19.0	20.6	18.8	20.7	20.0	17.7	18.0	19.2	19.0	18.1	16.6	17.7	18.3	17.6	16.0	17.6
24	IET 26776	15.5	17.1	19.4	26.0	15.0	14.6	20.7	18.3	15.5	15.2	16.9	20.7	20.0	13.2	18.3	17.1
25	IET 26777	19.5	19.3	22.3	14.7	25.0	17.7	25.0	20.5	19.5	17.7	19.5	19.0	21.7	17.0	23.0	19.6
26	IET 26778	22.5	23.4	24.5	13.0	25.0	19.6	21.0	21.3	22.5	20.3	19.8	18.0	20.0	17.0	20.3	19.7
27	IET 26780	21.0	21.1	21.6	22.0	25.0	18.2	25.0	22.0	21.0	20.1	19.1	20.7	23.3	16.3	24.0	20.6
28	IET 24053	0.0	23.9	25.8	24.3	25.0	20.2	0.0	23.8	0.0	19.3	20.7	23.0	20.0	19.7	0.0	20.5
29	IET 24705	23.0	22.2	24.5	25.7	20.0	20.8	23.0	22.7	23.0	17.9	20.3	23.7	15.0	20.0	23.0	20.4
30	Gontra Bidhan-3	17.5	19.9	20.5	22.0	20.0	17.3	20.7	19.7	17.5	17.6	18.3	21.0	25.0	16.9	18.3	19.2
31	IET 24708	15.0	16.1	18.3	18.3	20.0	18.3	19.3	17.9	15.0	15.3	15.0	18.7	23.3	17.6	20.3	17.9
32	175-2 (K)	0.0	18.3	19.2	14.7	20.0	15.5	25.3	16.1	0.0	15.9	16.5	15.3	20.0	14.3	24.0	15.1
33	S-458	18.0	22.4	25.2	18.3	0.0	20.4	28.7	22.2	18.0	61.8	20.4	16.0	0.0	19.9	20.0	26.0
34	N-22	23.0	21.6	0.0	0.0	16.7	0.0	25.0	21.6	23.0	18.3	0.0	0.0	16.3	0.0	16.3	18.5
	Mean	**19.1**	**21.2**	**22.3**	**20.0**	**21.1**	**18.5**	**23.7**	**20.2**	**19.1**	**19.2**	**18.9**	**19.0**	**20.7**	**17.3**	**20.2**	**18.7**
	LSD (Treat)				0.24*					*LSD (Treat x variety)*				ns			
	LSD (Location x Treat)				0.85*					*LSD (location x Treat x variety)*				6.25**			
	LSD (variety)				1.66**					*CV(%) Treat*				15.18			
	LSD(Location x variety)				4.4**												

Table 6.3.19 Influence of Heat Stress Harvest index (%) at different AICRIP centres Kharif 2017

S.No.	Genotypes	Control						Grand Mean	Heat Stress						Grand Mean
		IIRR	MTU	PNR	PTB	REWA	TTB		IIRR	MTU	PNR	PTB	REWA	TTB	
1	IET 26755	50.3	45.7	42.9	20.5	24.4	34.6	36.4	21.6	41.0	23.1	12.3	26.7	34.7	26.6
2	IET 26756	51.1	44.1	46.8	26.4	24.7	36.6	38.3	22.9	45.2	40.6	11.6	26.1	35.2	30.3
3	IET 26757	52.8	42.3	8.0	22.2	24.7	33.7	30.6	5.8	31.7	7.7	18.1	28.7	34.1	21.0
4	IET 26758	37.9	51.8	33.8	26.0	23.8	26.5	33.3	2.9	35.6	33.6	10.9	26.3	23.6	22.1
5	IET 26759	48.5	37.9	41.1	19.9	31.1	27.8	34.4	10.8	22.6	40.7	8.9	30.5	26.5	23.3
6	IET 26760	41.8	46.5	34.4	22.5	27.7	25.1	33.0	12.5	41.6	29.2	11.5	31.3	18.4	24.1
7	IET 26761	50.6	39.7	40.5	34.0	28.4	32.2	37.6	11.1	36.0	31.4	28.2	28.4	20.6	25.9
8	IET 26762	50.8	48.7	37.5	27.7	31.0	23.4	36.5	23.3	35.2	34.7	30.3	35.3	15.6	29.1
9	IET 26763	54.0	41.2	40.0	23.3	24.5	32.3	35.9	38.8	35.0	37.1	30.5	23.4	35.7	33.4
10	IET 23354	45.4	41.6	36.5	30.8	32.4	30.4	36.2	10.7	29.8	37.2	18.5	36.5	32.9	27.6
11	IET 24911	54.5	48.0	45.8	22.3	33.8	32.3	39.5	19.0	42.1	33.7	37.8	35.6	27.3	32.6
12	IET 24914	50.9	46.6	38.6	22.2	36.2	33.9	38.1	10.7	36.9	44.6	27.2	42.7	27.3	31.6
13	IET 24904	50.4	38.7	48.8	30.9	30.5	39.9	39.9	5.8	37.9	31.7	18.9	33.7	26.5	25.7
14	IET 26764	52.9	37.1	25.4	28.8	30.8	30.2	34.2	1.1	33.5	23.5	10.2	33.5	32.2	22.3
15	IET 26765	54.0	47.8	42.7	33.3	36.1	25.1	39.8	40.3	46.3	30.5	27.6	30.9	32.4	34.7
16	IET 26766	51.6	42.2	21.8	29.5	29.1	34.4	34.8	6.6	35.9	20.0	37.2	32.5	37.5	28.3
17	IET 26767	52.7	42.9	41.0	33.9	33.0	36.2	39.9	25.5	38.6	38.8	12.9	30.1	30.7	29.4
18	IET 26768	53.7	38.6	46.0	37.4	30.1	32.9	39.8	57.6	35.8	43.0	20.5	30.8	21.6	34.9
19	IET 26771	51.8	39.8	30.3	43.4	25.2	34.2	37.4	2.4	36.5	28.2	16.6	26.4	36.1	24.4
20	IET 26772	47.6	45.6	17.1	42.4	28.6	35.1	36.1	11.2	35.4	21.6	43.4	33.1	33.3	29.7
21	IET 26773	54.1	45.9	27.8	42.5	33.1	31.4	39.1	35.3	37.7	25.9	14.4	37.4	24.9	29.2
22	IET 26774	51.5	40.7	42.7	27.5	36.6	32.5	38.6	19.2	35.2	41.3	15.5	37.8	26.2	29.2
23	IET 26775	50.8	41.5	42.1	31.7	34.6	30.2	38.5	32.6	38.7	40.7	27.3	35.8	26.0	33.5
24	IET 26776	52.5	32.5	40.3	23.0	29.0	31.9	34.9	28.4	34.3	42.0	21.1	31.0	25.7	30.4
25	IET 26777	43.1	41.6	18.1	38.7	27.6	32.2	33.5	15.6	39.8	21.5	27.0	26.3	35.6	27.6
26	IET 26778	46.9	46.5	35.5	33.6	29.8	34.1	37.7	46.9	37.8	31.6	34.2	32.5	28.9	35.3
27	IET 26780	48.4	45.0	47.8	29.0	29.7	35.9	39.3	20.4	43.5	43.5	17.8	29.2	31.0	30.9
28	IET 24053	50.4	40.1	34.6	7.7	27.1	0.0	32.0	22.4	37.9	42.9	9.5	27.8	0.0	28.1
29	IET 24705	52.7	39.0	35.6	35.2	29.8	33.5	37.6	5.7	41.4	30.9	10.0	33.7	31.5	25.5
30	Gontra Bidhan-3	51.8	47.0	44.7	29.7	27.4	39.1	39.9	7.6	41.4	40.9	27.8	29.1	38.7	30.9
31	IET 24708	49.6	41.4	42.4	28.3	27.4	27.7	36.1	6.9	34.2	39.2	25.7	30.3	26.3	27.1
32	175-2 (K)	44.7	47.9	15.0	22.5	28.7	34.8	32.2	5.3	41.3	17.6	23.4	32.0	34.2	25.6
33	S-458	46.7	38.9	21.7	0.0	26.4	25.1	31.8	4.2	33.4	19.4	0.0	30.7	30.7	23.7
34	N-22	53.5	0.0	0.0	33.0	0.0	35.4	40.6	19.8	0.0	0.0	27.8	0.0	33.7	27.1
	Mean	**50.0**	**42.9**	**35.4**	**29.1**	**29.5**	**32.1**	**35.7**	**18.0**	**37.2**	**32.4**	**21.6**	**30.5**	**29.6**	**28.2**
	LSD (Treat)				ns					*LSD (Treat x variety)*				ns	
	LSD (Location x Treat)				2.17**					*LSD (location x Treat x variety)*				9.9**	
	LSD (variety)				2.86**					*CV (%) Treat*				16.4	
	LSD(Location x variety)				7.0**										

6.4 Physiological characterization of selected rice genotypes for multiple abiotic stress Tolerance

Locations: CBT, IIRR, KJT, KRK, MTU, NRRI, PTB, REWA and TTB

Rice is one of the important food crops of the world, based on its food supplementation and source of income. At least 25% increase in rice production by the next decade has to be achieved despite of the various factors adversely affecting the rice production. Among all the problems associated with rice production, abiotic stress tolerance is a major objective in majority of rice breeding programs around the world. It is been found that, more than 50% reduction in yield is caused by abiotic stresses and at times resulting in total crop failure. Moreover, they also activate similar cell signalling pathways, several proteins, antioxidants and compatible solutes are produced in response to abiotic stress conditions. Tolerance to water shortage (drought) and salt stress (salinity) are the most damaging factors that inhibit yield in rice crop. Keeping the above factors in view a small experiment was initiated under AICRIP Plant Physiology program to screen genetic material available from various states in AVT-I-IME under coordinated efforts of rice improvement for various abiotic stresses such as submergence, salinity, drought (water stress 1% and 2% mannitol) and low temperature. In total 19 genotypes from IET cultures were screened to identify physiological donor for abiotic stresses and also genotypes having multiple abiotic stress tolerance. Under this experiment, only laboratory situations were used to scrren the above genotypes with the following conditions, 1. Anaerobic germination: In this situation the genotypes were imposed to the stress by allowing to germinate in water at a deapth of 15 cm (Submergence stress). 2. Water stress: Seeds were allowed to germinate under 1% and 2% mannitol solutions. 3. Salinity stress: Sodium chloride of concentration 200mM (Water potential -1.26, PF: 4.11) was used for germinating the seeds. 4. Cold stress: Seeds were germinated at 8-10^{O}C in refrigerator. In case of control conditions, seedlings were grown in hoglands solution and following observations were recorded in each of the stresses and control grown situations. Seed germination percentage, Shoot, root length in cms and seedling vigour were recorded and reported as below.

Seed germination: Significant differences were observed in seed germination between treatments, among varieties and the interaction was found to be significant. Seed germination was highest under control (94%), followed by Mannitol induced water stress (90%), salinity stress (73%) and anaerobic stress (68%). Reduction in seed germination was greater under anaerobic stress (27%), followed by salt stress (22%) and manitol induced water stress(5%)

(Figure 1). Among all the genotypes, seed germination was highest in IET 24934 (control), 175-2(K) (1% Mannitol), IET 26132 (2% Mannitol), IET 26126 (Salt stress), Jaya (Anaerobic stress).

Shoot length: Shoot length was reduced significantly with the imposition of all abiotic stresses, except anaerobic stress. The reduction in shoot length was more under salt stress (43%), followed by 1% mannitol (8%) and 2% mannitol (12%) stress (Figure 1). Variation in shoot length was clearly evident with imposition of 1% mannitol (10.7-13.5 cm), 2% mannitol (10.0-13.3 cm), anaerobic (12.4-17.6 cm) and salt stress (6.5-8.7 cm) in comparison with control. Surprisingly, under anaerobic stress, reduction in shoot length was marginal (<1%) in comparison to control. Among all the genotypes, shoot length was greater in IET 24053 under control, anaerobic and 1% Mannitol stress, followed by IET 26110 (2% Mannitol) and IET 24934 (Salt stress).

Root length: Significant differences were observed in root length between treatments and interaction was significant between varieties and treatments. Root growth was affected much by the imposition of salt stress (36% reduction) and least affected with 1% mannitol stress (9% reduction) (Figure 1). Wide variation was observed in seedling vigour under 1% mannitol (9.1c-11.3 cm), 2% mannitol (7.8-9.9 cm), anaerobic (6.5-10.7 cm) and salinity stress (6.0-8.3 cm) in comparison to control. Anaerobic stress and 2% mannitol stress has reduced the root growth by 23% and 17% respectively. Among all the tested genotypes, mean root length was greater in Gontradhan (control and 1% mannitol) and 175-2(K) (Anerobic and salt stress). IET 26089 showed superior root growth among all the genotypes under 2% mannitol stress.

Seedling vigour: Seedling vigour varied significantly between the treatments and varieties. Vigour was greater under control (2073) followed by 1% mannitol (1824), 2% mannitol (1655), anaerobis stress (1228) and salt stress (734). The reduction in vigour of the seedlings was greater with the imposition of salt stress (65%) followed by anaerobic stress (41%) (Figure 1). The reduction in seedling vigour was less in 1% mannitol stress (12%) when compared to other abiotic stresses. Among all the genotypes, seedling vigour was greater in IET 26074 (control and 2% Mannitol), 175-2(K) (Anaerobic and salt stress) and IET 24934 (1% Mannitol stress).

Cold stress experiment was conducted at NRRI and KRK locations. Under cold stress, seed germination, shoot and root growth were reduced significantly in comparison with

control. Among all the genotypes, IR 64 was superior in seed germination, IET 24708 and IET 24053 were superior in shoot growth, Gontradhan and IET 26089 were good in root growth and 175-2(K) was better in seedling vigour.

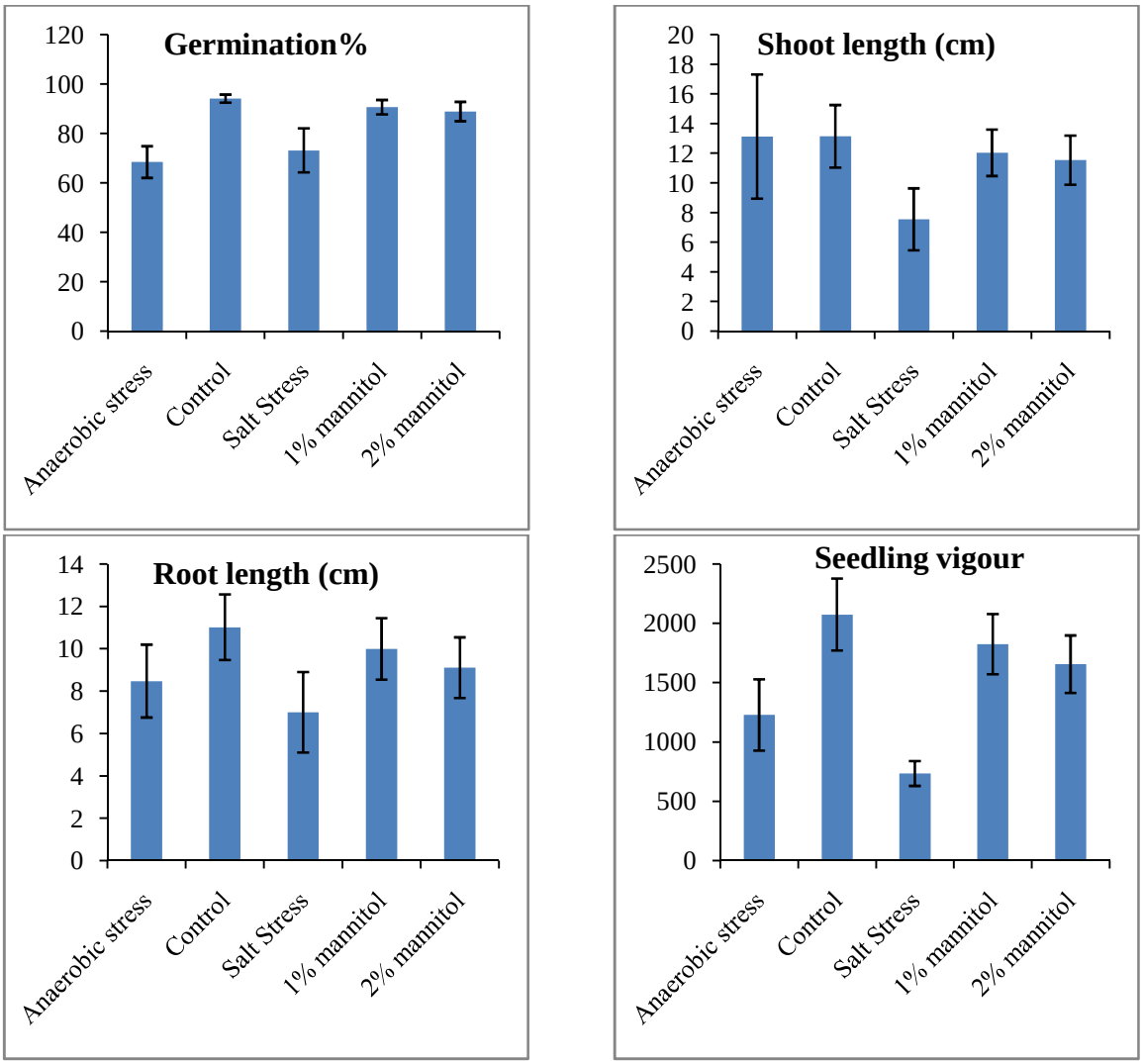


Fig. 1: Mean variation in seedling characters of rice cultures under multiple abiotic stress study.

Summary and Conclusions:

The present study shows that, imposition of different abotic stresses shows detrimental effect on the seedling germination and growth. Under 1% mannitol water stress condition, 175-2(K), IET 24053, Gontradhan abd IET 24934 were superior in the measured traits. With the imposition of 2% mannitol stress, IET 26132, IET 26110, IET 26089, IET 26074 were better performers. Similarly under salt stress, anaerobic stress and cold stress, MAS 317 showed higher seedling vigour. Varieties such as IET 24934, IET 24053, Gontradhan, IET 26074

showed better growth characters under control. Across all the stresses, IET 24934, IET 24053 IET 24053 and 175-2(K) showed superior performance among all the varieties tested.

In the study conducted at 9 locations under AICRIP-Plant Physiology program for multiple abiotic stress tolerance viz., 1%mannitol, 2% mannitol, anaerobic stress, salt stress and cold stress, three cultures (IET 24934, IET 24053, 175-2(K) were identified based on their performance in terms of germination, shoot, root growth and seedling vigour.

Table 6.4.1 Physiological characterization of selected rice Multiple Abiotic Stress Tolerance at Coimbatore Kh 2017

S.No.	Entries	Germination (%)					Shoot Length (cm)				
		Anaerobic	Control	Salinity	Water Stress		Anaerobic	Control	Salinity	Water stress	
					1% Mannitol	2% Mannitol				1% Mannitol	2% Mannitol
1	IET 26096	86	98	92	95	96	6.87	10.00	6.10	8.83	7.33
2	IET 26089	90	100	92	100	96	5.37	9.60	5.70	8.23	7.03
3	IET 26132	80	100	92	97	96	3.93	9.17	5.23	8.03	6.57
4	IET 26074	75	100	88	97	92	7.37	12.30	8.67	11.13	9.83
5	IET 26077	82	100	92	97	96	7.23	12.87	8.93	11.50	10.30
6	IET 24934	72	98	85	95	100	6.47	11.60	7.70	10.23	8.93
7	IET 26126	64	96	92	100	96	2.13	7.47	3.43	6.17	4.83
8	IET 26110	74	98	91	95	95	3.10	8.17	4.40	7.27	5.97
9	IET 26124	78	100	91	97	95	2.13	7.57	3.47	6.23	4.83
10	IET 26094	71	92	84	90	88	1.50	6.03	2.17	4.90	3.57
11	Jaya	90	100	98	97	96	4.83	10.23	6.27	8.87	7.43
12	Akshayadhan	88	100	96	100	100	5.67	11.23	7.03	9.83	8.30
13	IR-64	82	90	96	87	100	3.83	9.27	5.27	7.83	6.43
14	IET 24053	81	96	94	100	100	3.40	8.43	4.60	7.27	5.97
15	IET 24075	81	94	94	91	98	1.87	6.17	2.33	4.97	3.60
16	IET 24708	70	100	82	97	100	8.47	12.30	9.60	12.53	11.27
17	175-2 (K)	79	100	92	100	96	5.63	11.13	7.10	9.63	8.23
18	S-458	82	100	90	97	94	6.27	11.47	7.63	10.40	9.03
19	Gontradhan	94	100	93	100	100	8.07	12.67	8.60	11.63	9.93
	Grand mean	**79.9**	**98.0**	**91.3**	**96.4**	**96.5**	**4.95**	**9.88**	**6.01**	**8.71**	**7.34**
	Variety	***					***				
	Treatment	***					***				
	Variety X Treatment	***					NS				

Table 6.4.2 Physiological characterization of selected rice Multiple Abiotic Stress Tolerance at Coimbatore Kh 2017

S.No.	Entries	Root Length (cm)					Seedling vigour				
		Anaerobic	Control	Salinity	Water stress		Anaerobic	Control	Salinity	Water stress	
					1% Mannitol	2% Mannitol				1% Mannitol	2% Mannitol
1	IET 26096	3.00	6.47	1.27	5.20	2.83	848.3	1613.7	677.7	1333.3	976.0
2	IET 26089	1.97	8.80	2.60	9.40	7.03	660.0	1840.0	763.3	1763.3	1350.3
3	IET 26132	5.87	6.87	6.50	5.60	3.30	784.0	1603.3	1079.7	1322.7	947.3
4	IET 26074	2.17	10.17	2.57	9.60	7.10	715.3	2246.7	988.7	2011.3	1558.0
5	IET 26077	5.63	9.87	6.27	9.07	6.77	1055.0	2273.3	1398.3	1995.0	1638.3
6	IET 24934	5.27	9.77	5.97	8.50	6.20	844.7	2094.0	1162.0	1780.0	1513.3
7	IET 26126	4.87	5.13	5.63	4.50	2.57	448.0	1209.7	834.0	1066.7	710.7
8	IET 26110	2.67	6.47	1.50	5.67	3.37	426.7	1434.3	536.7	1229.0	887.0
9	IET 26124	1.90	6.00	2.67	5.43	3.07	314.7	1356.7	558.0	1132.0	750.7
10	IET 26094	1.67	5.77	2.50	4.93	2.57	224.7	1085.7	392.0	885.0	539.7
11	Jaya	3.57	8.87	1.90	7.87	5.57	756.0	1910.0	800.3	1623.3	1248.0
12	Akshayadhan	4.07	9.60	4.87	8.67	6.27	856.7	2083.3	1142.3	1850.0	1456.7
13	IR-64	4.90	6.40	5.47	5.57	3.27	716.0	1410.0	1030.3	1166.0	970.0
14	IET 24053	2.50	6.00	2.57	5.37	3.07	478.0	1385.7	673.7	1263.3	903.3
15	IET 24075	1.77	7.30	2.37	6.50	4.37	294.0	1265.7	441.7	1043.3	780.7
16	IET 24708	3.13	10.17	3.63	9.83	7.20	812.0	2246.7	1085.0	2170.0	1846.7
17	175-2 (K)	5.87	9.00	6.17	8.33	6.27	908.7	2013.3	1220.3	1796.7	1392.0
18	S-458	5.67	9.40	5.50	8.63	6.20	978.3	2086.7	1182.0	1846.3	1431.7
19	Gontradhan	4.87	10.57	5.67	9.80	7.23	1216.0	2323.3	1327.0	2143.3	1716.7
	Grand mean	**3.75**	**8.03**	**3.98**	**7.29**	**4.96**	**701.9**	**1762.2**	**910.2**	**1548.5**	**1190.4**
	Variety	***					***				
	Treatment	***					***				
	Variety X Treatment	***					***				

Table 6.4.3 Physiological characterization of selected rice Multiple Abiotic Stress Tolerance at IIRR Kh 2017

S.No.	Entries	Germination (%)					Shoot Length (cm)				
		Anaerobic	Control	Salinity	Water stress		Anaerobic	Control	Salinity	Water stress	
					1% Mannitol	2% Mannitol				1% Mannitol	2% Mannitol
1	IET 26096	31.7	83.3	60.0	95.0	98.3	0.30	3.67	3.73	8.90	6.43
2	IET 26089	45.0	88.3	60.0	90.0	96.7	0.47	2.50	0.63	9.60	6.97
3	IET 26132	53.3	100.0	71.7	95.0	96.7	1.07	3.07	1.17	8.57	6.43
4	IET 26074	58.3	100.0	81.7	95.0	100.0	1.27	9.70	3.93	11.50	13.87
5	IET 26077	80.0	95.0	90.0	100.0	96.7	0.17	3.83	1.17	9.53	5.83
6	IET 24934	50.0	98.3	96.7	100.0	98.3	1.00	4.30	2.93	11.17	6.87
7	IET 26126	0.0	95.0	83.3	95.0	98.3	0.00	8.37	1.67	12.13	10.37
8	IET 26110	0.0	95.0	83.3	100.0	96.7	0.00	7.20	0.93	11.10	28.53
9	IET 26124	55.0	100.0	73.3	90.0	88.3	0.27	8.80	1.40	12.33	8.90
10	IET 26094	0.0	86.7	86.7	100.0	100.0	0.00	2.17	1.13	7.47	7.03
11	Jaya	0.0	100.0	81.7	95.0	96.7	0.00	6.73	1.50	11.20	7.67
12	Akshayadhan	0.0	91.7	86.7	100.0	95.0	0.00	5.80	1.23	8.80	7.87
13	IR-64	66.7	100.0	86.7	95.0	98.3	1.03	6.27	4.07	12.10	6.73
14	IET 24053	0.0	95.0	78.3	100.0	98.3	0.00	10.03	4.00	11.40	12.00
15	IET 24075	0.0	100.0	96.7	95.0	98.3	0.00	2.10	1.43	11.60	6.77
16	IET 24708	31.7	98.3	81.7	95.0	100.0	0.57	3.63	3.47	9.57	7.30
17	175-2 (K)	41.7	100.0	93.3	100.0	96.7	0.23	4.23	2.97	10.57	8.50
18	S-458	96.7	95.0	83.3	100.0	96.7	0.20	6.97	1.60	9.90	7.70
19	Gontradhan	0.0	100.0	83.3	100.0	100.0	0.00	1.67	1.90	11.83	4.03
	Grand mean	**55.5**	**95.9**	**82.0**	**96.8**	**97.4**	**0.60**	**5.32**	**2.15**	**10.49**	**8.94**
	Variety	***					***				
	Treatment	***					***				
	Variety X Treatment	***					***				

Table 6.4.4 Physiological characterization of selected rice Multiple Abiotic Stress Tolerance at IIRR Kh 2017

S.No.	Entries	Root Length (cm)					Seedling vigour				
		Anaerobic	Control	Salinity	Water Stress		Anaerobic	Control	Salinity	Water Stress	
					1% Mannitol	2% Mannitol				1% Mannitol	2% Mannitol
1	IET 26096	0.0	9.37	2.07	7.30	8.60	9.50	1084.2	344.2	1539.0	1477.7
2	IET 26089	0.0	10.73	1.47	8.97	8.00	21.00	1169.0	123.3	1671.0	1450.7
3	IET 26132	0.0	12.57	1.97	7.53	9.03	56.83	1563.3	223.7	1529.5	1492.7
4	IET 26074	0.0	12.13	3.63	8.87	8.57	74.33	2183.3	618.8	1934.8	2243.3
5	IET 26077	0.0	11.23	2.30	10.00	6.93	13.33	1431.3	314.3	1953.3	1233.2
6	IET 24934	0.0	12.40	3.90	10.80	6.40	50.00	1645.3	662.0	2196.7	1305.3
7	IET 26126	0.0	18.50	4.00	8.70	9.60	0.00	2552.3	480.3	1979.2	1966.0
8	IET 26110	0.0	13.03	1.73	11.10	8.20	0.00	1922.2	221.0	2220.0	3524.5
9	IET 26124	0.0	5.13	1.77	12.07	7.03	14.67	1393.3	232.0	2196.0	1408.5
10	IET 26094	0.0	10.10	1.70	7.87	6.20	0.00	1060.8	250.0	1533.3	1323.3
11	Jaya	0.0	10.60	2.17	12.13	7.70	0.00	1733.3	300.0	2216.7	1484.5
12	Akshayadhan	0.0	15.47	2.17	6.23	8.30	0.00	1953.8	296.2	1503.3	1534.8
13	IR-64	0.0	9.20	5.10	8.20	7.33	68.83	1546.7	795.2	1928.5	1383.3
14	IET 24053	0.0	12.57	3.93	12.03	13.00	0.00	2147.0	622.0	2343.3	2446.8
15	IET 24075	0.0	10.43	2.03	9.40	6.27	0.00	1253.3	333.3	1995.0	1280.8
16	IET 24708	0.0	8.40	4.50	7.40	8.87	18.17	1180.2	649.3	1611.8	1616.7
17	175-2 (K)	0.0	8.67	3.60	10.47	6.40	9.83	1290.0	614.3	2103.3	1437.3
18	S-458	0.0	9.83	1.87	9.33	4.60	19.33	1596.0	289.2	1923.3	1189.7
19	Gontradhan	0.0	12.13	2.63	13.80	6.70	0.00	1380.0	379.0	2563.3	1073.3
	Grand mean	**0.0**	**11.18**	**2.76**	**9.59**	**7.78**	**32.35**	**1583.4**	**407.8**	**1944.3**	**1624.9**
	Variety	***					***				
	Treatment	***					***				
	Variety X Treatment	***					***				

Table 6.4.5 Physiological characterization of selected rice Multiple Abiotic Stress Tolerance at Karjat Kh 2017

S.No.	Entries	Germination (%)					Shoot Length (cm)				
		Anaerobic	Control	Salinity	Water Stress		Anaerobic	Control	Salinity	Water Stress	
					1% Mannitol	2% Mannitol				1% Mannitol	2% Mannitol
1	IET 26096	88.7	94.0	96.0	97.3	98.3	14.9	9.0	2.57	9.23	10.33
2	IET 26089	89.7	97.0	95.0	97.7	97.3	12.4	10.0	2.10	9.20	8.83
3	IET 26132	87.0	97.0	96.7	95.0	96.3	14.3	8.6	2.00	7.37	8.07
4	IET 26074	95.0	97.3	97.0	97.3	97.3	14.4	10.4	3.20	11.03	9.97
5	IET 26077	86.0	93.3	96.3	96.7	97.0	12.6	7.5	1.37	9.63	9.40
6	IET 24934	89.3	98.3	98.0	97.7	98.0	15.1	10.0	4.30	9.70	8.67
7	IET 26126	90.7	96.7	95.0	97.7	97.7	14.8	8.8	2.57	8.50	8.80
8	IET 26110	88.0	92.3	95.7	98.0	97.3	12.4	10.7	2.20	9.47	9.93
9	IET 26124	82.3	94.3	96.3	96.7	97.3	13.5	11.3	2.07	11.23	10.27
10	IET 26094	82.7	97.7	98.0	98.0	98.0	13.7	7.6	4.20	7.40	8.80
11	Jaya	91.3	96.0	95.3	97.3	97.0	13.6	9.9	4.37	10.57	9.50
12	Akshayadhan	81.3	97.7	98.0	97.3	95.0	13.3	9.3	3.10	8.67	9.47
13	IR-64	82.0	97.7	96.0	97.0	97.7	14.9	10.7	2.33	9.83	11.33
14	IET 24053	89.3	95.3	98.3	94.0	94.3	13.3	12.0	5.07	11.43	10.97
15	IET 24075	90.0	95.7	94.3	98.0	98.0	12.7	9.5	4.17	9.77	9.47
16	IET 24708	87.0	97.3	92.3	97.3	97.7	14.2	7.0	2.27	8.00	8.07
17	175-2 (K)	86.0	97.0	97.3	98.3	96.3	14.4	8.2	3.20	9.00	8.60
18	S-458	87.7	97.3	96.3	95.7	97.3	13.8	8.1	2.73	8.13	9.13
19	Gontradhan	89.7	98.0	97.3	96.7	96.0	12.4	10.3	2.10	8.67	8.27
	Grand mean	**87.6**	**96.3**	**96.3**	**97.0**	**97.1**	**13.7**	**9.4**	**2.94**	**9.31**	**9.36**
	Variety	***					***				
	Treatment	***					***				
	Variety X Treatment	***					***				

Table 6.4.6 Physiological characterization of selected rice Multiple Abiotic Stress Tolerance at Karjat Kh 2017

S.No.	Entries	Root Length (cm)					Seedling vigour				
		Anaerobic	Control	Salinity	Water Stress		Anaerobic	Control	Salinity	Water Stress	
					1% Mannitol	2% Mannitol				1% Mannitol	2% Mannitol
1	IET 26096	7.97	6.17	1.80	6.93	7.27	2030.7	1425.0	418.7	1574.0	1607.8
2	IET 26089	8.03	5.63	1.57	6.20	7.30	1834.2	1517.0	348.3	1505.0	1551.9
3	IET 26132	8.77	6.70	1.27	5.30	4.67	2004.5	1483.3	315.8	1203.0	1100.9
4	IET 26074	8.53	7.80	2.27	5.97	8.47	2175.5	1770.3	530.3	1654.7	1738.8
5	IET 26077	7.97	7.83	1.53	5.63	6.70	1768.7	1432.3	279.3	1475.3	1433.0
6	IET 24934	7.80	6.43	2.37	5.67	5.77	2042.1	1619.7	653.3	1500.3	1319.9
7	IET 26126	8.00	7.93	1.03	7.57	7.47	2070.4	1614.0	342.1	1570.0	1571.2
8	IET 26110	9.60	8.40	1.20	6.50	7.03	1933.8	1766.3	325.2	1564.7	1558.3
9	IET 26124	8.20	6.97	1.17	4.93	5.90	1791.1	1720.3	311.4	1563.3	1452.4
10	IET 26094	7.90	6.10	2.27	4.77	5.87	1787.3	1342.0	633.9	1191.7	1315.7
11	Jaya	6.73	6.47	2.60	7.03	7.57	1858.9	1567.7	664.0	1713.3	1614.0
12	Akshayadhan	7.73	7.60	1.10	7.67	7.87	1712.7	1653.7	411.7	1589.7	1578.5
13	IR-64	8.37	6.83	2.30	7.53	7.20	1906.5	1716.3	444.7	1685.3	1669.7
14	IET 24053	7.93	9.03	1.33	7.83	7.27	1893.1	2007.3	629.3	1811.7	1592.5
15	IET 24075	8.33	7.10	1.73	7.60	7.03	1892.6	1586.3	556.6	1702.7	1542.4
16	IET 24708	8.40	7.03	2.07	6.83	7.73	1968.5	1362.3	400.1	1444.3	1507.3
17	175-2 (K)	8.53	7.20	3.07	9.27	7.40	1969.0	1491.0	609.9	1796.3	1511.2
18	S-458	7.40	5.43	2.30	6.63	6.67	1856.8	1320.3	484.8	1413.0	1459.6
19	Gontradhan	7.23	7.97	1.60	7.33	7.27	1760.5	1793.3	360.1	1548.7	1510.5
	Grand mean	**8.08**	**7.09**	**1.82**	**6.69**	**6.97**	**1908.3**	**1588.9**	**458.9**	**1553.0**	**1507.1**
	Variety	***					***				
	Treatment	***					***				
	Variety X Treatment	***					***				

Table 6.4.7 Physiological characterization of selected rice Multiple Abiotic Stress Tolerance at Karaikal Kh 2017

.	Entries	Germination (%)					Shoot Length (cm)				
		Anaerobic	Control	Salinity	Water Stress		Anaerobic	Control	Salinity	Water Stress	
					1% Mannitol	2% Mannitol				1% Mannitol	2% Mannitol
1	IET 26096	0	93.1	97.4	99.4	99.6	0	8.57	5.00	10.20	9.03
2	IET 26089	0	99.7	99.3	97.7	99.5	0	10.33	4.67	7.70	7.73
3	IET 26132	0	99.3	98.4	96.5	93.2	0	7.03	2.90	8.57	6.77
4	IET 26074	0	96.2	67.9	97.3	99.4	0	11.53	4.90	12.10	11.30
5	IET 26077	0	97.9	95.7	95.6	99.8	0	7.73	2.93	7.07	7.13
6	IET 24934	0	99.5	98.3	94.4	85.8	0	10.40	3.67	9.47	11.27
7	IET 26126	0	93.3	98.3	97.3	100.0	0	9.83	5.07	8.90	9.40
8	IET 26110	0	95.1	82.5	95.1	98.4	0	8.30	4.83	12.73	7.77
9	IET 26124	0	98.7	98.3	97.0	97.7	0	9.43	3.87	13.80	9.20
10	IET 26094	0	99.1	96.9	97.5	96.6	0	8.00	4.17	5.47	5.37
11	Jaya	0	95.0	99.4	97.4	93.4	0	9.07	4.53	10.03	10.37
12	Akshayadhan	0	99.3	98.6	99.1	95.2	0	9.77	4.20	6.70	9.00
13	IR-64	0	90.3	95.8	97.7	96.5	0	12.10	4.90	9.13	10.00
14	IET 24053	0	97.0	93.5	99.8	96.0	0	9.97	5.67	16.87	11.90
15	IET 24075	0	90.6	99.3	97.9	93.8	0	10.77	4.93	9.70	9.33
16	IET 24708	0	97.5	89.0	98.9	99.4	0	7.17	5.13	6.50	5.23
17	175-2 (K)	0	94.4	98.1	95.2	96.8	0	7.77	4.73	8.10	7.20
18	S-458	0	99.3	94.2	96.3	99.1	0	10.13	1.80	9.10	8.20
19	Gontradhan	0	97.9	98.4	95.7	98.5	0	10.50	2.00	10.70	9.10
	Grand mean	**0**	**96.5**	**94.7**	**97.1**	**96.8**	**0**	**9.39**	**4.21**	**9.62**	**8.70**
	Variety	NS					***				
	Treatment	NS					***				
	Variety X Treatment	*					***				

Table 6.4.8 Physiological characterization of selected rice Multiple Abiotic Stress Tolerance at Karaikal Kh 2017

S.No.	Entries	Root Length (cm)					Seedling vigour				
		Anaerobic	Control	Salinity	Water Stress		Anaerobic	Control	Salinity	Water Stress	
					1% Mannitol	2% Mannitol				1% Mannitol	2% Mannitol
1	IET 26096	0	9.03	7.70	7.30	11.17	0	0	1236.9	1738.8	2011.7
2	IET 26089	0	6.80	7.20	7.43	11.13	0	0	1178.8	1478.4	1876.4
3	IET 26132	0	7.80	6.17	6.13	8.60	0	0	892.5	1418.1	1433.6
4	IET 26074	0	8.37	6.30	7.67	8.87	0	0	733.6	1917.0	2004.4
5	IET 26077	0	9.23	6.47	8.13	9.93	0	0	898.2	1454.0	1703.8
6	IET 24934	0	9.03	5.40	9.80	9.10	0	0	890.9	1819.5	1746.2
7	IET 26126	0	10.40	6.57	12.30	10.67	0	0	1142.5	2062.8	2006.7
8	IET 26110	0	9.37	8.37	10.13	7.40	0	0	1085.7	2179.3	1493.0
9	IET 26124	0	7.53	6.90	8.67	9.83	0	0	1058.7	2182.0	1862.3
10	IET 26094	0	9.10	5.70	6.63	5.10	0	0	957.4	1180.1	1009.5
11	Jaya	0	7.03	7.13	6.80	9.97	0	0	1160.5	1638.2	1898.7
12	Akshayadhan	0	8.20	8.03	12.57	11.97	0	0	1207.6	1910.4	2007.5
13	IR-64	0	10.00	7.70	8.03	8.90	0	0	1207.0	1679.8	1830.0
14	IET 24053	0	9.20	7.57	7.40	11.23	0	0	1235.1	2421.2	2225.3
15	IET 24075	0	6.40	5.60	8.87	6.43	0	0	1045.2	1818.4	1484.4
16	IET 24708	0	7.73	5.87	5.03	8.10	0	0	978.4	1141.3	1325.2
17	175-2 (K)	0	8.07	8.20	5.80	8.53	0	0	1272.2	1318.0	1523.5
18	S-458	0	8.73	4.60	8.73	8.63	0	0	604.6	1715.4	1668.7
19	Gontradhan	0	15.90	6.13	10.03	9.07	0	0	800.2	1982.5	1788.5
	Grand mean	**0**	**8.84**	**6.72**	**8.29**	**9.19**	**0**	**0**	**1030.8**	**1739.8**	**1731.5**
	Variety	***					***				
	Treatment	***					***				
	Variety X Treatment	***					***				

Table 6.4.9 Physiological characterization of selected rice Multiple Abiotic Stress Tolerance at Maruteru Kh 2017

S.No.	Entries	Germination (%)					Shoot Length (cm)				
		Anaerobic	Control	Salinity	Water Stress		Anaerobic	Control	Salinity	Water Stress	
					1% Mannitol	2% Mannitol				1% Mannitol	2% Mannitol
1	IET 26096	0.0	95.3	61.7	83.3	80.3	0.0	9.03	4.07	7.30	6.03
2	IET 26089	0.0	98.3	80.0	88.3	84.3	0.0	8.13	4.37	6.17	8.07
3	IET 26132	0.0	98.0	74.7	91.3	86.7	0.0	8.77	2.70	7.10	6.33
4	IET 26074	0.0	97.3	66.7	84.3	81.7	0.0	8.63	2.43	7.63	6.63
5	IET 26077	0.0	99.7	73.3	92.0	87.3	0.0	10.07	2.23	7.03	6.53
6	IET 24934	0.0	99.0	80.3	86.3	85.0	0.0	10.00	3.43	8.57	8.20
7	IET 26126	0.0	99.3	75.3	89.7	83.7	0.0	10.70	3.60	7.23	7.10
8	IET 26110	0.0	94.3	60.3	87.7	84.3	0.0	9.87	3.87	8.40	7.07
9	IET 26124	0.0	98.7	65.3	85.7	83.0	0.0	11.13	2.83	8.52	8.40
10	IET 26094	0.0	96.0	53.3	84.3	80.7	0.0	11.47	1.97	6.87	5.13
11	Jaya	0.0	98.0	45.3	83.7	79.0	0.0	10.67	3.23	7.57	5.90
12	Akshayadhan	0.0	97.0	54.0	80.0	71.7	0.0	9.93	4.27	7.37	6.27
13	IR-64	0.0	99.0	77.3	82.7	79.7	0.0	10.51	1.03	8.17	7.67
14	IET 24053	0.0	68.3	21.0	55.0	42.0	0.0	11.80	3.60	8.70	5.70
15	IET 24075	0.0	83.7	34.3	74.3	64.0	0.0	10.33	3.37	5.37	6.00
16	IET 24708	0.0	98.0	75.7	84.3	81.0	0.0	11.57	2.57	7.87	8.30
17	175-2 (K)	0.0	99.7	65.3	87.3	85.7	0.0	11.63	4.77	7.77	6.37
18	S-458	0.0	98.3	70.0	85.0	77.7	0.0	11.90	3.40	7.97	5.87
19	Gontradhan	0.0	97.3	81.5	88.0	82.3	0.0	10.17	2.60	8.17	5.47
	Grand mean	**0.0**	**95.5**	**64.0**	**83.9**	**78.9**	**0.0**	**10.33**	**3.18**	**7.57**	**6.69**
	Variety	***					***				
	Treatment	***					***				
	Variety X Treatment	***					***				

Table 6.4.10 Physiological characterization of selected rice Multiple Abiotic Stress Tolerance at Maruteru Kh 2017

S.No.	Entries	Root Length (cm)					Seedling vigour				
		Anaerobic	Control	Salinity	Water Stress		Anaerobic	Control	Salinity	Water Stress	
					1% Mannitol	2% Mannitol				1% Mannitol	2% Mannitol
1	IET 26096	0.0	8.07	2.23	6.83	4.97	0.0	1631.8	388.0	1177.8	883.0
2	IET 26089	0.0	7.27	3.40	6.80	4.63	0.0	1514.3	622.1	1143.5	1070.9
3	IET 26132	0.0	7.30	2.53	7.23	6.77	0.0	1573.8	386.3	1308.8	1133.7
4	IET 26074	0.0	7.13	2.03	4.43	2.80	0.0	1534.4	298.1	1018.8	770.0
5	IET 26077	0.0	9.60	3.33	8.97	7.27	0.0	1960.0	408.9	1471.5	1204.9
6	IET 24934	0.0	9.73	2.73	9.23	5.53	0.0	1954.8	497.0	1535.6	1164.5
7	IET 26126	0.0	10.60	7.07	8.73	7.47	0.0	2115.5	803.3	1432.7	1217.2
8	IET 26110	0.0	8.33	3.90	6.77	4.73	0.0	1715.2	469.1	1330.1	996.3
9	IET 26124	0.0	6.83	3.43	4.67	3.80	0.0	1771.2	408.8	1129.1	1011.1
10	IET 26094	0.0	5.50	1.50	3.60	2.60	0.0	1627.1	185.8	881.5	623.0
11	Jaya	0.0	7.23	2.40	5.20	3.90	0.0	1756.5	256.6	1071.9	774.1
12	Akshayadhan	0.0	4.40	1.83	3.13	2.57	0.0	1392.2	330.4	839.3	635.8
13	IR-64	0.0	8.70	1.47	8.13	6.50	0.0	1900.8	193.5	1346.5	1129.0
14	IET 24053	0.0	7.13	2.23	6.40	3.37	0.0	1293.2	122.1	831.1	383.3
15	IET 24075	0.0	6.23	2.97	4.30	3.30	0.0	1381.6	224.1	718.9	594.1
16	IET 24708	0.0	6.63	2.90	5.73	5.50	0.0	1781.6	414.1	1145.0	1118.0
17	175-2 (K)	0.0	8.67	5.77	7.83	6.50	0.0	2023.2	685.2	1357.6	1101.5
18	S-458	0.0	5.63	2.83	5.20	3.33	0.0	1723.9	435.5	1118.7	715.9
19	Gontradhan	0.0	8.30	4.47	6.53	4.67	0.0	1799.9	576.0	1293.6	833.3
	Grand mean	**0.0**	**7.54**	**3.11**	**6.30**	**4.75**	**0.0**	**1707.9**	**405.5**	**1165.9**	**913.7**
	Variety	***					***				
	Treatment	***					***				
	Variety X Treatment	*					***				

Table 6.4.11 Physiological characterization of selected rice Multiple Abiotic Stress Tolerance at NRRI Kh 2017

S.No.	Entries	Germination (%)					Shoot Length (cm)				
		Anaerobic	Control	Salinity	Water Stress		Anaerobic	Control	Salinity	Water Stress	
					1% Mannitol	2% Mannitol				1% Mannitol	2% Mannitol
1	IET 26096	69.2	100.0	0.0	100.0	100.0	23.4	29.5	20.0	24.0	22.8
2	IET 26089	71.7	100.0	0.0	100.0	100.0	25.2	32.6	21.6	23.4	24.6
3	IET 26132	80.8	100.0	0.0	100.0	100.0	24.3	23.2	19.9	18.9	19.3
4	IET 26074	56.7	100.0	0.0	100.0	100.0	28.7	28.3	22.8	26.2	25.9
5	IET 26077	77.5	100.0	0.0	100.0	100.0	23.6	25.8	19.5	20.7	18.1
6	IET 24934	45.0	100.0	14.2	100.0	100.0	26.3	30.5	23.6	24.3	22.8
7	IET 26126	50.8	100.0	0.0	100.0	100.0	23.9	24.2	17.0	21.5	19.5
8	IET 26110	53.3	100.0	0.0	100.0	100.0	27.4	21.9	18.7	23.5	21.3
9	IET 26124	57.5	100.0	14.2	100.0	100.0	27.2	24.9	19.9	22.0	18.9
10	IET 26094	62.5	100.0	0.0	100.0	100.0	22.8	23.5	17.1	21.7	19.3
11	Jaya	47.5	100.0	0.0	100.0	100.0	28.0	24.8	18.2	20.4	21.2
12	Akshayadhan	30.8	100.0	0.0	100.0	100.0	25.3	31.9	22.3	21.9	25.3
13	IR-64	60.8	100.0	0.0	100.0	100.0	26.6	27.6	20.6	15.7	21.5
14	IET 24053	49.2	100.0	0.0	100.0	100.0	27.5	34.7	20.6	22.1	25.2
15	IET 24075	54.2	100.0	0.0	100.0	100.0	25.7	27.0	18.3	19.8	19.8
16	IET 24708	46.7	100.0	0.0	100.0	100.0	23.8	17.8	14.0	18.8	19.2
17	175-2 (K)	69.2	100.0	0.0	100.0	100.0	21.4	23.4	14.4	19.1	18.9
18	S-458	62.5	100.0	0.0	100.0	100.0	23.6	26.0	17.2	22.4	22.1
19	GONTRADHAN	30.8		0.0	100.0	100.0	21.8	30.4	18.9	22.5	21.8
	Grand mean	**56.7**	**100.0**	**14.2**	**100.0**	**100.0**	**25.1**	**26.7**	**19.2**	**21.5**	**21.4**
	Variety	***					***				
	Treatment	***					***				
	Variety X Treatment	***					***				

Table 6.4.12 Physiological characterization of selected rice Multiple Abiotic Stress Tolerance at NRRI Kh 2017

S.No.	Entries	Root Length (cm)					Seedling vigour				
		Anaerobic	Control	Salinity	Water Stress		Anaerobic	Control	Salinity	Water Stress	
					1% Mannitol					1% Mannitol	2% Mannitol
1	IET 26096	12.2	14.8	12.2	11.7	14.3	2467.2	4645.0	0.0	3575.0	3708.3
2	IET 26089	17.4	13.2	11.5	10.2	13.8	3047.4	4355.0	0.0	3350.0	3846.7
3	IET 26132	13.0	14.5	11.6	14.2	12.5	3014.9	3800.0	0.0	3305.0	3186.7
4	IET 26074	14.0	19.3	15.6	16.9	13.9	2417.8	5095.0	0.0	4305.0	3978.3
5	IET 26077	14.3	15.0	14.6	18.3	12.8	2941.0	3940.0	0.0	3904.2	3086.7
6	IET 24934	15.7	17.5	14.7	15.6	12.0	1894.4	4475.0	560.5	3986.7	3480.0
7	IET 26126	12.3	17.2	11.0	18.0	11.7	1844.5	4180.0	0.0	3948.3	3118.3
8	IET 26110	15.6	15.7	15.3	17.3	14.1	2297.9	3565.0	0.0	4083.3	3533.3
9	IET 26124	14.8	15.2	11.9	13.6	10.5	2415.4	3960.0	462.6	3555.0	2946.7
10	IET 26094	10.7	16.5	15.9	16.9	14.0	2090.9	4120.0	0.0	3860.0	3335.0
11	Jaya	14.6	16.1	12.1	13.3	12.3	2026.7	4605.0	0.0	3370.0	3350.0
12	Akshayadhan	18.5	13.9	10.6	11.1	11.2	1350.0	4585.0	0.0	3298.3	3645.0
13	IR-64	13.9	16.3	10.1	11.7	11.6	2464.0	4710.0	0.0	2735.0	3311.7
14	IET 24053	18.5	19.4	12.6	15.5	11.7	2266.4	5195.0	0.0	3760.0	3691.7
15	IET 24075	13.1	16.1	11.1	14.4	9.3	2102.1	4315.0	0.0	3418.3	2905.0
16	IET 24708	12.2	12.2	10.7	14.5	11.7	1683.3	3840.0	0.0	3332.5	3090.0
17	175-2 (K)	15.1	17.6	13.7	16.4	12.8	2524.9	4245.0	0.0	3545.0	3171.7
18	S-458	19.8	17.6	14.1	13.7	13.0	2716.9	3925.0	0.0	3613.3	3511.7
19	Gontradhan	12.4	21.8	15.6	17.6	14.5	1056.1	4790.0	0.0	4000.0	3631.7
	Grand mean	**14.6**	**16.3**	**12.9**	**14.8**	**12.5**	**2243.3**	**4333.9**	**511.6**	**3628.7**	**3396.2**
	Variety	***					***				
	Treatment	***					***				
	Variety X Treatment	***					***				

Table 6.4.13 Physiological characterization of selected rice Multiple Abiotic Stress Tolerance at Pattambi Kh 2017

S.No.	Entries	Germination (%)					Shoot Length (cm)				
		Anaerobic	Control	Salinity	Water Stress		Anaerobic	Control	Salinity	Water Stress	
					1% Mannitol	2% Mannitol				1% Mannitol	2% Mannitol
1	IET 26096	91.0	97.3	76.0	73.7	86.7	5.43	10.93	6.00	7.80	13.35
2	IET 26089	91.3	76.0	49.3	90.7	92.7	3.57	15.03	6.50	7.27	12.90
3	IET 26132	64.0	82.3	85.7	92.0	98.0	2.53	12.90	11.17	10.80	8.30
4	IET 26074	81.7	90.7	87.3	80.3	97.3	1.77	15.53	8.53	9.27	12.60
5	IET 26077	98.0	96.7	77.7	96.0	95.7	5.63	10.10	6.67	8.37	10.83
6	IET 24934	97.3	96.3	85.3	98.0	92.0	7.57	11.83	9.43	10.97	11.73
7	IET 26126	95.7	94.3	91.3	86.3	82.0	2.30	16.70	11.60	13.43	8.60
8	IET 26110	59.7	83.7	78.3	83.0	97.0	1.47	15.77	7.07	9.87	9.37
9	IET 26124	93.7	90.7	78.0	91.7	97.0	3.43	15.83	7.93	12.07	12.80
10	IET 26094	95.7	96.0	94.7	77.3	77.7	1.80	10.37	4.90	10.83	9.85
11	Jaya	95.0	99.0	14.0	92.0	92.3	1.93	13.47	0.00	8.10	13.40
12	Akshayadhan	67.7	77.3	42.3	96.0	76.0	2.20	7.93	4.50	6.83	9.00
13	IR-64	88.0	94.0	75.7	72.0	91.7	3.53	14.77	7.20	9.70	6.73
14	IET 24053	97.7	98.0	53.3	98.0	98.0	4.23	19.23	6.65	9.17	6.83
15	IET 24075	87.3	85.7	78.0	98.7	92.3	1.53	15.37	4.35	9.60	5.47
16	IET 24708	95.7	96.7	78.0	93.7	62.3	1.80	11.77	8.40	8.50	7.10
17	175-2 (K)	98.0	98.0	84.7	98.7	97.3	6.67	13.20	8.63	8.20	9.07
18	S-458	84.3	91.7	70.0	77.7	82.3	2.13	13.97	10.00	5.57	12.97
19	Gontradhan	92.3	84.0	28.7	62.0	84.0	2.63	14.93	7.55	6.55	7.30
	Grand mean	**88.1**	**91.0**	**69.9**	**87.2**	**89.1**	**3.27**	**13.66**	**7.62**	**9.10**	**9.91**
	Variety	***					***				
	Treatment	***					***				
	Variety X Treatment	***					***				

Table 6.4.14 Physiological characterization of selected rice Multiple Abiotic Stress Tolerance at Pattambi Kh 2017

S.No.	Entries	Root Length (cm)					Seedling vigour				
		Anaerobic	Control	Salinity	Water Stress		Anaerobic	Control	Salinity	Water Stress	
					1% Mannitol	2% Mannitol				1% Mannitol	2% Mannitol
1	IET 26096	5.23	6.43	2.53	5.60	6.75	969.2	1692.7	646.9	988.2	1844.6
2	IET 26089	1.43	8.40	4.13	4.97	6.77	456.4	1774.6	526.5	1103.5	1822.5
3	IET 26132	3.10	5.07	8.70	4.63	4.80	361.3	1480.1	1702.1	1415.3	1279.9
4	IET 26074	1.60	8.23	5.43	6.03	5.13	274.4	2152.0	1219.9	1230.2	1722.2
5	IET 26077	6.73	6.60	5.43	5.90	5.77	1213.1	1610.0	939.2	1369.9	1589.9
6	IET 24934	7.30	7.33	7.80	5.60	5.73	1448.4	1854.9	1468.5	1617.7	1606.8
7	IET 26126	1.30	5.77	8.00	6.33	4.35	344.6	2117.0	1792.4	1705.1	1084.6
8	IET 26110	1.17	8.63	6.57	4.33	6.60	157.0	2044.0	1068.8	1179.7	1558.0
9	IET 26124	5.13	7.43	5.60	9.57	6.30	802.5	2107.0	1057.2	1976.3	1847.9
10	IET 26094	1.30	7.67	5.67	4.53	5.15	297.5	1731.4	1000.3	1184.9	1156.0
11	Jaya	1.17	8.17	0.00	5.33	6.43	294.8	2141.3	0.0	1233.8	1828.3
12	Akshayadhan	3.03	6.43	2.00	7.37	4.90	356.0	1102.1	260.0	1364.9	1056.4
13	IR-64	5.33	5.80	5.70	4.27	4.77	780.7	1395.3	980.4	1003.2	1048.0
14	IET 24053	1.37	8.13	4.80	5.43	3.70	547.7	2678.7	583.5	1430.3	1032.2
15	IET 24075	1.53	6.50	3.70	4.67	4.80	268.4	1870.8	635.2	1406.3	949.2
16	IET 24708	1.57	5.67	8.50	4.90	5.20	322.4	1681.7	1318.2	1254.3	738.0
17	175-2 (K)	9.47	5.40	9.17	5.27	6.33	1584.6	1821.3	1502.1	1326.8	1497.2
18	S-458	1.20	6.33	15.07	4.37	7.13	281.3	1859.1	1755.4	770.8	1655.2
19	Gontradhan	1.47	8.20	10.35	5.40	4.73	379.4	1941.7	518.4	728.5	1010.6
	Grand mean	**3.18**	**6.96**	**6.62**	**5.50**	**5.54**	**586.3**	**1845.0**	**1054.2**	**1278.4**	**1385.7**
	Variety	***					***				
	Treatment	***					***				
	Variety X Treatment	***					***				

Table 6.4.15 Physiological characterization of selected rice Multiple Abiotic Stress Tolerance at REWA Kh 2017

S.No.	Entries	Germination (%)					Shoot Length (cm)				
		Anaerobic	Control	Salinity	Water Stress		Anaerobic	Control	Salinity	Water Stress	
					1% Mannitol	2% Mannitol				1% Mannitol	2% Mannitol
1	IET 26096	0	84.3	74.7	81.3	78.0	0	17.6	15.1	16.5	15.9
2	IET 26089	0	83.7	73.0	80.3	76.3	0	16.8	14.2	15.3	14.7
3	IET 26132	0	84.3	69.7	79.7	75.3	0	17.0	14.5	15.5	15.1
4	IET 26074	0	83.0	74.0	80.0	75.3	0	17.1	14.9	16.0	15.4
5	IET 26077	0	84.7	72.0	80.7	76.3	0	17.0	14.3	16.0	15.4
6	IET 24934	0	84.3	73.7	81.0	75.0	0	16.6	14.4	15.3	14.7
7	IET 26126	0	84.7	75.3	80.7	77.3	0	16.7	14.7	15.7	15.1
8	IET 26110	0	84.0	71.3	80.3	75.0	0	17.5	15.7	16.7	16.2
9	IET 26124	0	84.7	72.7	80.3	75.3	0	18.0	16.0	16.5	16.0
10	IET 26094	0	85.0	72.3	82.0	77.3	0	18.1	16.5	16.4	15.9
11	Jaya	0	84.3	73.0	80.0	75.7	0	17.7	15.3	16.1	15.6
12	Akshayadhan	0	88.0	79.3	84.3	81.0	0	18.6	17.2	18.0	17.5
13	IR-64	0	84.7	70.7	81.0	76.0	0	17.2	14.9	16.2	15.7
14	IET 24053	0	84.0	70.3	79.7	74.3	0	16.8	14.4	15.5	15.0
15	IET 24075	0	83.7	72.7	81.0	77.3	0	17.6	15.8	15.9	15.3
16	IET 24708	0	84.3	73.3	81.3	77.0	0	16.3	13.3	14.1	13.4
17	175-2 (K)	0	84.3	70.3	79.3	74.7	0	16.9	14.3	15.3	14.8
18	S-458	0	85.0	71.7	81.3	75.3	0	17.2	14.8	15.3	14.8
19	Gontradhan	0	85.0	72.0	82.0	76.7	0	17.8	15.8	16.5	15.9
	Grand mean	**0**	**84.5**	**72.7**	**80.9**	**76.3**	**0**	**17.3**	**15.1**	**15.9**	**15.4**
	Variety	***					***				
	Treatment	***					***				
	Variety X Treatment	NS					NS				

Table 6.4.16 Physiological characterization of selected rice Multiple Abiotic Stress Tolerance at REWA Kh 2017

S.No.	Entries	Root Length (cm)					Seedling vigour				
		Anaerobic	Control	Salinity	Water Stress		Anaerobic	Control	Salinity	Water Stress	
					1% Mannitol	2% Mannitol				1% Mannitol	2% Mannitol
1	IET 26096	0	20.5	18.5	18.0	17.5	0	1486.9	1130.0	1339.3	1239.9
2	IET 26089	0	19.7	18.1	17.1	17.1	0	1408.2	1040.1	1226.5	1124.9
3	IET 26132	0	20.0	17.5	17.5	17.1	0	1436.4	1011.7	1237.4	1139.8
4	IET 26074	0	19.8	18.4	17.6	17.1	0	1422.2	1105.2	1277.1	1162.8
5	IET 26077	0	19.5	17.7	17.3	16.6	0	1442.4	1027.2	1288.4	1177.9
6	IET 24934	0	18.8	16.7	16.4	15.6	0	1403.0	1058.7	1236.7	1104.9
7	IET 26126	0	18.9	16.3	16.8	16.2	0	1413.6	1104.4	1267.3	1169.5
8	IET 26110	0	20.5	18.7	18.4	17.8	0	1472.7	1118.0	1341.8	1213.0
9	IET 26124	0	21.3	19.3	18.9	18.5	0	1526.1	1166.3	1328.4	1202.8
10	IET 26094	0	21.1	18.9	18.5	18.3	0	1538.4	1196.0	1348.2	1229.7
11	Jaya	0	20.4	18.9	18.1	17.7	0	1492.4	1119.6	1288.3	1177.5
12	Akshayadhan	0	21.7	20.0	19.8	19.1	0	1634.1	1367.4	1514.8	1418.2
13	IR-64	0	19.7	17.9	17.6	16.8	0	1456.0	1050.9	1312.5	1190.4
14	IET 24053	0	19.2	16.7	17.0	16.5	0	1408.6	1011.0	1236.9	1114.7
15	IET 24075	0	20.7	18.9	18.0	18.2	0	1472.4	1150.4	1285.2	1185.8
16	IET 24708	0	19.0	17.6	16.3	16.3	0	1371.7	973.2	1144.0	1031.6
17	175-2 (K)	0	19.3	17.0	16.8	16.3	0	1422.5	1002.5	1213.9	1102.5
18	S-458	0	19.8	18.4	17.2	17.0	0	1458.6	1058.3	1248.0	1112.1
19	Gontradhan	0	20.8	18.5	18.6	18.2	0	1515.9	1136.7	1349.4	1216.0
	Grand mean	**0**	**20.0**	**18.1**	**17.7**	**17.3**	**0**	**1462.2**	**1096.2**	**1288.6**	**1174.4**
	Variety	***					***				
	Treatment	***					***				
	Variety X Treatment	NS					NS				

Table 6.4.17 Physiological characterization of selected rice Multiple Abiotic Stress Tolerance at Titabar Kh 2017

S.No.	Entries	Germination (%)					Shoot Length (cm)				
		Anaerobic	Control	Salinity	Water Stress		Anaerobic	Control	Salinity	Water Stress	
					1% Mannitol	2% Mannitol				1% Mannitol	2% Mannitol
1	IET 26096	14.3	91.3	0.0	82.0	60.0	29.4	15.5	0.0	16.0	13.5
2	IET 26089	16.7	83.3	0.0	72.7	69.3	27.7	14.3	0.0	14.2	15.7
3	IET 26132	26.7	83.3	0.0	78.0	78.0	29.8	14.5	0.0	15.3	16.2
4	IET 26074	34.7	98.0	0.0	64.0	60.0	29.6	18.7	0.0	12.7	14.3
5	IET 26077	23.3	91.3	0.0	58.0	60.0	33.0	17.3	0.0	16.2	17.2
6	IET 24934	59.3	97.3	0.0	76.0	73.3	36.7	15.5	0.0	18.8	15.0
7	IET 26126	23.3	88.0	0.0	80.7	73.3	30.7	12.7	0.0	12.7	13.3
8	IET 26110	34.7	95.3	0.0	83.3	59.3	34.4	18.8	0.0	16.3	14.0
9	IET 26124	74.0	86.0	0.0	80.7	78.7	32.5	20.0	0.0	17.8	15.3
10	IET 26094	36.0	78.0	0.0	73.3	66.0	29.4	10.8	0.0	15.0	15.3
11	Jaya	79.3	80.0	0.0	63.3	60.7	28.1	16.8	0.0	15.8	14.0
12	Akshayadhan	30.7	96.0	0.0	84.0	76.0	27.4	18.5	0.0	15.8	16.8
13	IR-64	59.3	93.3	0.0	86.0	77.3	28.4	17.5	0.0	16.0	14.0
14	IET 24053	56.7	97.3	0.0	70.7	63.3	39.4	17.0	0.0	18.7	18.2
15	IET 24075	51.3	83.3	0.0	80.7	72.0	31.5	12.8	0.0	18.3	20.0
16	IET 24708	36.7	92.0	0.0	74.7	60.0	31.2	16.2	0.0	14.3	14.5
17	175-2 (K)	75.3	87.3	0.0	85.3	70.0	30.1	16.3	0.0	15.5	18.3
18	S-458	56.0	84.0	0.0	78.0	66.0	32.4	16.0	0.0	19.5	19.2
19	Gontradhan	26.0	81.3	0.0	75.3	62.7	29.3	19.3	0.0	15.2	19.7
	Grand mean	**42.9**	**88.8**	**0.0**	**76.1**	**67.7**	**31.1**	**16.2**	**0.0**	**16.0**	**16.0**
	Variety	***					***				
	Treatment	***					***				
	Variety X Treatment	***					***				

Table 6.4.18 Physiological characterization of selected rice Multiple Abiotic Stress Tolerance at Titabar Kh 2017

S.No.	Entries	Root Length (cm)					Seedling vigour				
		Anaerobic	Control	Salinity	Water Stress		Anaerobic	Control	Salinity	Water Stress	
					1% Mannitol	2% Mannitol				1% Mannitol	2% Mannitol
1	IET 26096	8.5	10.2	0.0	13.7	11.2	415.8	2344.3	0.0	2433.3	1486.0
2	IET 26089	11.4	9.5	0.0	11.5	13.3	660.3	1995.3	0.0	1857.3	2017.0
3	IET 26132	9.7	11.8	0.0	13.3	14.2	1053.5	2194.3	0.0	2233.0	2363.0
4	IET 26074	15.8	12.8	0.0	10.2	12.0	1563.9	3090.0	0.0	1465.3	1580.3
5	IET 26077	12.8	13.8	0.0	13.7	13.3	1061.6	2843.7	0.0	1723.3	1826.3
6	IET 24934	10.4	13.0	0.0	15.3	13.0	2788.7	2763.0	0.0	2592.7	2038.7
7	IET 26126	10.3	9.7	0.0	13.8	12.2	940.9	1965.0	0.0	2136.0	1866.3
8	IET 26110	14.2	13.2	0.0	14.7	13.5	1678.4	3055.7	0.0	2592.0	1632.3
9	IET 26124	13.6	15.0	0.0	16.5	15.8	3416.5	3005.7	0.0	2766.0	2453.3
10	IET 26094	10.7	7.8	0.0	13.8	10.5	1439.3	1456.7	0.0	2110.0	1694.0
11	Jaya	10.0	15.5	0.0	15.0	10.7	3020.8	2591.0	0.0	1956.0	1506.7
12	Akshayadhan	12.8	17.5	0.0	13.7	14.5	1241.7	3456.7	0.0	2475.0	2398.0
13	IR-64	13.1	14.0	0.0	12.8	11.5	2464.2	2941.7	0.0	2479.0	1965.3
14	IET 24053	18.1	15.7	0.0	16.2	13.3	3253.8	3177.7	0.0	2458.3	1990.0
15	IET 24075	11.1	17.3	0.0	13.7	16.0	2185.1	2521.3	0.0	2579.7	2601.0
16	IET 24708	14.6	12.2	0.0	12.5	11.3	1675.5	2607.0	0.0	2001.0	1551.7
17	175-2 (K)	14.7	13.3	0.0	12.8	13.0	3368.1	2599.7	0.0	2435.3	2188.7
18	S-458	14.9	12.8	0.0	15.8	13.3	2645.2	2426.0	0.0	2750.0	2144.3
19	Gontradhan	14.8	14.5	0.0	12.5	13.8	1161.7	2738.3	0.0	2092.7	2093.7
	Grand mean	**12.7**	**13.1**	**0.0**	**13.8**	**13.0**	**1896.6**	**2619.6**	**0.0**	**2270.3**	**1968.2**
	Variety	***					***				
	Treatment	NS					***				
	Variety X Treatment	*					***				

6.5 Evaluation of Radiation and Nitrogen use efficient promising rice genotypes

Locations: CBT, IIRR, KJT, MTU, PNR, PTB, RPUR and TTB

Nitrogen is one of the important factors influencing the rice productivity and the increase in food production during the past four decades is associated with ~7 fold increase in the N fertilizers application. Increased application of N fertilizers may not necessarily increase the grain yield always. The genotypic potential in absorbing and utilization of applied nitrogen plays important role in the grain yield improvement of rice crop. Nitrogen use efficiency is a complex phenomenon which is defined as increase in grain yield produced per unit of applied nitrogen. Increasing nitrogen use efficiency is imperative to future sustainable agriculture. ICAR funded National Innovative climate resilient agriculture (NICRA) project was initiated in 2011 and one of the major objectives of NICRA was to develop nitrogen use efficient rice varieties. Based on the field screening under different nitrogen levels, promising donors for nitrogen use efficiency were identified and crosses were made among the promising genotypes. A trail was conducted with three N treatments (0%, 50% and 100% recommended doses of nitrogen) and recommended P and K fertilizers (45 P2O5, 60 K2O kg/ha applied as basal dose and the N was applied in 3 splits were used and the trail is conducted for 3rd successive year at eight locations.

Nitrogen application did not lead to significant variation in days to 50% flowering. The mean days to 50% flowering was varied between 83 – 103 and 84 – 103 with a mean of 92 and 93 days under control and 50% RDN levels respectively. Under 100% RDN level, days to 50% flowering was ranged between 85 – 102 days with a mean of 93 days. Among the tested varieties, days to 50% flowering was varied significantly ($p<0.01$) and the interaction was found to be significant for location ($p<0.01$) and location x treatment x variety ($p<0.01$). Among the tested varieties, Sampada x Jaya/2 is late flowering variety under and Rasi x Jaya/2 was early flowering under all the three N levels. Similarly, days to maturity was not significantly varied with N levels. The mean days to maturity was 124 (N0, N50) and 125 (N100) days. Varietal differences were significant ($p<0.01$) for days to maturity and significant interaction was observed for varieties with location and treatment.

Significant differences were observed in plant height between treatments ($p<0.01$) and interaction of location x treatment x variety was significant ($p<0.01$). The mean plant height was increased with N application and the increase was more under 100% RDN (11% increase). The mean plant height was varied from 89.9 (Rasi x Jaya/2) to 112.8 (MTU-1010)

under N0 treatment. With the limitation of N, under 50% RDN plant height was reduced and varied from 95.9 (Rasi x Jaya/2, Sampada) – 115.7 (MTU-1010) with a mean of 102.7. Under 100% RDN level, the mean plant height was 107 cm. The varieties such as Sampada x Jaya/2, Sampada x Jaya/3, Varadhan x BPT 5204/6, Varadhan x MTU 1010/2, Varadhan and MTU-1010 showed <10% reduction in plant height. Among all the locations, higher plant height was detected at PTB, where as response of plant height to N application was more at MTU location followed by IIRR and KJT.

Total dry matter (g/m^2) (TDM) was significantly varied between treatments ($p<0.01$) and significant interaction was observed for location x treat x variety ($p<0.01$). TDM was varied between 830 – 1294 g/m^2 with a mean of 1099 g/m^2 under N0 treatment (Fig 1A). TDM was significantly reduced under 50% RDN (7%) and 0% RDN (24%). Among the tested varieties, under 50% RDN, lower reduction in TDM was shown by Varadhan x BPT 5204/6, followed by Varadhan x BPT 5204/10. Total dry matter (g/m^2) was increased significantly by 32% under 100% RDN levels and among the varieties, Sampada and MTU-1010 showed higher TDM with N response of 49% and 40% respectively. Responsiveness to100% RDN was maximum in Varadhan (54% increase). Across all the locations, higher mean TDM was recorded at KJT followed by PNR and PTB (Fig 1B).

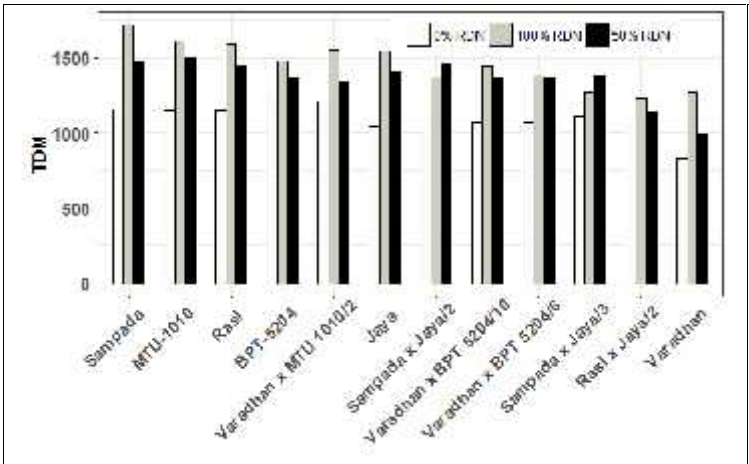


Fig.1A: Influence of Nitrogen levels on total dry matter recorded at maturity. Each value represents the mean of all 7 locations

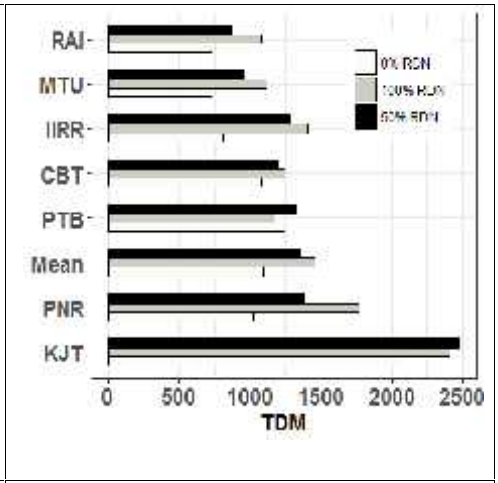


Fig.1B: Influence of nitrogen level on TDM recorded at different locations. Each value represents the mean of all the 12 varieties.

Shoot weight (g/m2) was recorded at maturity and the data was presented under table _. Shoot weight was varied between 599 -905 and 615 – 1051 with a mean of 766 and 878 g/m2 under 0% RDN and 50% RDN treatments respectively. Significant differences were

observed in shoot weight among the tested varieties ($p<0.05$) and significant interaction was observed for location x treatment x variety ($p<0.05$). The mean shoot weight was reduced by 3% and 15% with the limitation of nitrogen under 50% RDN and 0% RDN levels. Among the tested varieties, few varieties such as Sampada x Jaya/2, Sampada x Jaya/3 and Varadhan x BPT 5204/10 showed increase in shoot weight (g/m^2) under 50% RDN levels, where as these same varieties showed reduction in shoot weight under 0% RDN levels, indicating the optimum nitrogen dosage for these varieties as 50% RDN. Among all the tested locations, KJT showed maximum shoot weight, followed by CBT.

Significant differences were observed in panicle number between treatments ($p<0.01$) and the interaction was found to be significant. The mean panicle number was 275, 337 and $369/m^2$ under 0%, 50% and 100% RDN levels. Nitrogen limitation resulted in significant reduction in panicle number/m2 under 50% RDN (9%) and 0% RDN levels (25%). PTB showed highest mean panicle weight among all the locations followed by IIRR and CBT (Fig 2A). Among the genotypes, panicle weight was higher in Varadhan x BPT 5204/6 (0% RDN), Sampada x Jaya/2 (50% and 100% RDN), with a mean reduction in panicle weight of 14% and 18% under 50% and 0% RDN levels (Fig 2B).

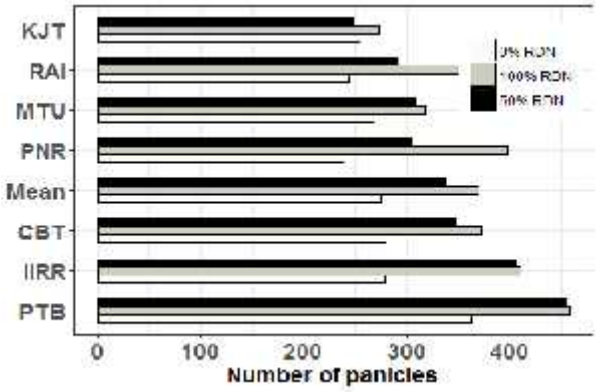


Fig. 2A: Influence of Nitrogen levels on number of panicles m^{-2}. Each bar represents the mean of all the varieties.

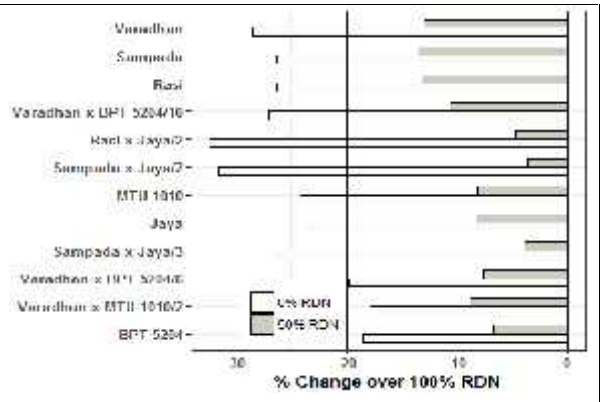


Fig.2B: Influence of Nitrogen levels on number of panicles m^{-2}. Each bar represents the % change in number of panicles over recommended N level (100%RDN).

Panicle weight (g/m^2) was reduced with limitation of nitrogen but the variation between the treatments was not significant. Panicle weight was reduced by 12% and 18% under 50% RDN and 0% RDN levels. Among the tested varieties, Varadhan x BPT 5204/6 showed highest panicle weight (g/m^2) was recorded in Varadhan x BPT 5204/6 under all the treatments. With the limitation of nitrogen, varieties such as Sampada x Jaya/3, Sampada x

Jaya/2, Varadhan x BPT 5204/10 and Sampada were able to maintain lower panicle weight under 50% RDN level (Fig 3A). Significant interaction was observed for location x treatment x variety, indicating that varied behaviour of genotypes at different locations and treatments. Among the locations, highest panicle weight (g/m2) was recorded at CBT location (Fig 3B).

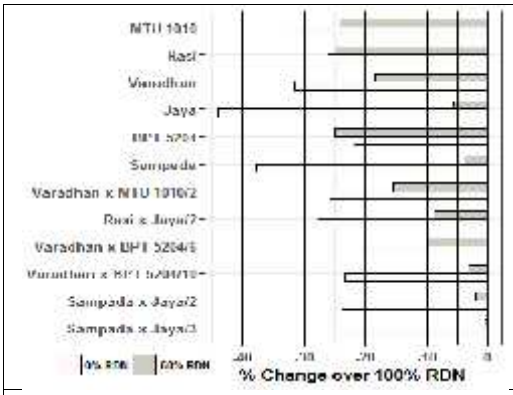


Fig.3A: Influence of Nitrogen levels on panicle weight at maturity. Each bar represent the mean of all the 7 locations. The % change in panicle weight over in 50% RDN over 100% RDN was presented.

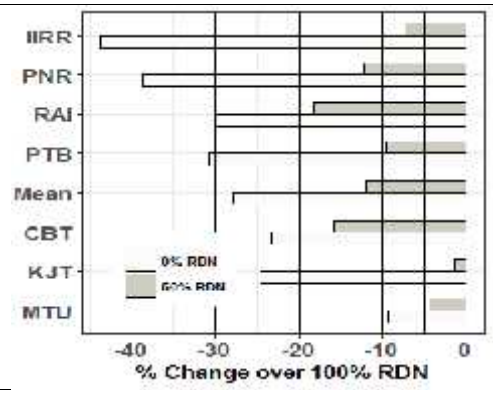


Fig.3B: Influence of Nitrogen on the panicle weight at maturity at different centres. Each bar represents the mean of all the varieties.

Grain number per panicle was significantly reduced ($p<0.01$) under nitrogen limitation. The grain number per panicle was varied between 85 (Rasi x Jaya/2) – 132 (Rasi) with a mean of 113 under 0% RDN levels and among the tested varieties, Rasi showed lower extent of reduction in grain number per panicle under 0% RDN level followed by Varadhan x MTU 1010/2 and BPT-5204 (Fig 4A). Grain number per panicle was reduced by 4% under 50% RDN level and the reduction was less in Sampada and Sampada x Jaya/3, however varieties such as Jaya and Varadhan x MTU 1010/2 showed increase in grain number per panicle under 50% RDN level, which was indicating their genotypic efficiency in nitrogen utilization even under 50% RDN level. The mean grain number per panicle was highest at KJT (0% and 100% RDN) and PTB (50% RDN) locations (Fig 4B). Significant differences were observed in grain number/m^2 and interaction was significant for location x treatment x variety. Data for grain number/m^2 was presented under (Table 6.5.10). Grain number/m^2 was significantly reduced by 17% and 35% under 50% and 0% RDN levels. Among the locations, PTB showed higher grain number/m^2 followed by KJT and PNR locations.

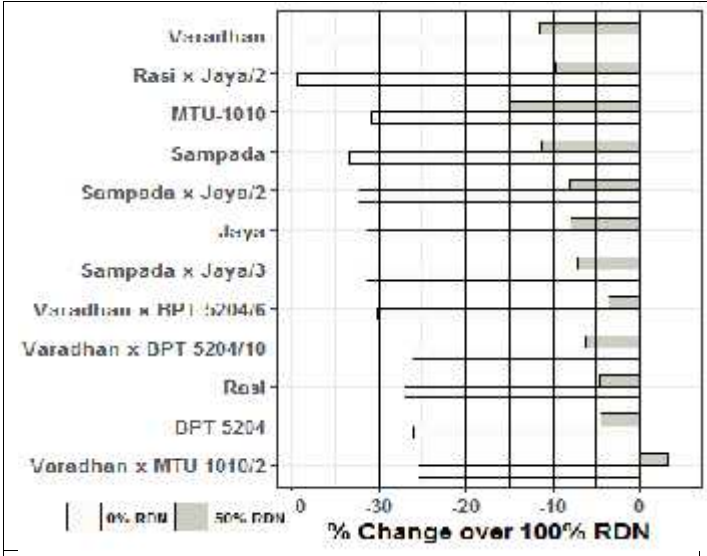


Fig.4A:Influence of N levels on filled grain number per panicle. Each bar represents % change in mean No of filled grains per panicle for all centres over 100% RDN treatment at different centres.

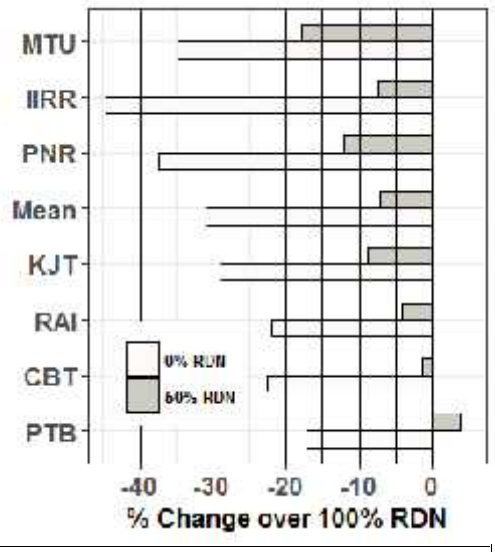


Fig.4B: % change in No. Of filled grains per panicle over 100% RDN treatment at different centres. Each bar represents the mean of all varieties

Nitrogen limitation resulted in significant reduction in spikelet number per panicle and per square meter. The mean spikelet number was 110, 125 and 133 under 0%, 50% and 100% RDN levels. Spikelet number per panicle was reduced by 6% and 17% under 50% and 0% RDN levels. Among the tested varieties, rasi (0% RDN) and sampada x Jaya/2 (100% RDN) showed higher number of spikelets per panicle and per square meter.

Grain yield/m^2 was varied significantly between treatments ($p<0.01$). Reducing the nitrogen by 50% RDN resulted in grain yield reduction by 7% over 100% RDN. The interaction was highly significant for location x treatment, location x variety and location x treatment x variety. The mean grain yield/m^2 for all the varieties was higher at IIRR location followed by CBT (Fig 5A). Lower mean grain yield was observed at KJT and PTB. Reducing the nitrogen fertilization by 50% resulted in maximum reduction in mean grain yield at MTU location followed by PNR. Significant variation was observed among the varieties and maximum reduction in grain yield was observed under 0% RDN level (31% reduction). Among the tested varieties, reduction in grain yield with 50% RDN level was minimum in Varadhan x BPT 5204/6, BPT-5204, Rasi and Varadhan x BPT 5204/10. Surprisingly increase in yield was observed for Varadhan x MTU 1010/2 under 50% RDN levels, which was indicating the better nitrogen utilization and optimum dosage of nitrogen fertilizer for this variety (50% RDN). Under 0% RDN level, highest grain yield (g/m^2) was recorded by BPT-5204, Varadhan x BPT 5204/6 with a mean of 355 g/m^2. With 50% reduction in RDN

fertilizer (50% RDN), varadhan x BPT 5204/6 and varadhan x MTU 1010/2 showed superior grain yield (g/m^2).

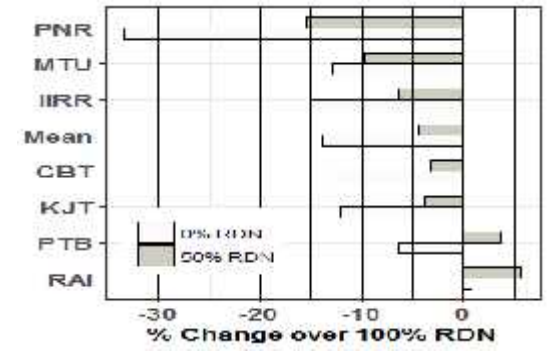


Fig. 5A: Influence of N levels on grain yield. Each bar represent the mean of all varieties and depict the % change in grain yield over 100 RDN.

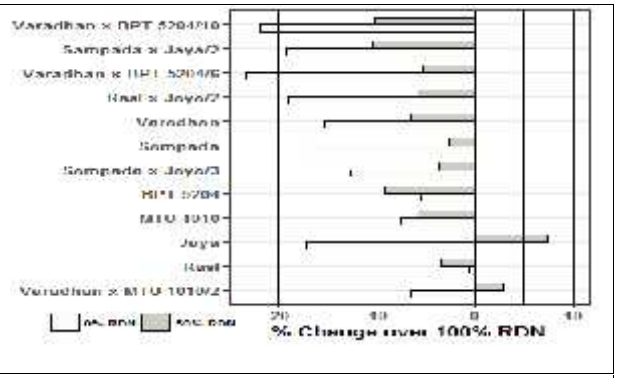


Fig. 5B: Influence of N levels on grain yield. Each bar represent the mean of all locations and depict the % change in grain yield over 100 RDN.

Test weight was not significantly affected with variation in nitrogen levels. The mean test weight for all the varieties was 20.7 g (0% RDN) and 21.6 g (50% and 100% RDN). Test weight was varied between 15.1 (Varadhan x BPT 5204/10) – 26.5 (Sampada x Jaya/3) g and 16.3 (Rasi) – 27.2 (BPT-5204) g with a mean of 21 and 22 g under 0% RDN and 50% RDN levels. Among the tested locations, PTB and CBT showed highest test weight followed by PNR (Fig.6A). Significant differences were observed among varieties ($p<0.01$). Among the tested varieties, highest reduction in test weight was noticed in Varadhan x BPT 5204/10, whereas it was lowest in Rasi (Fig.6B).

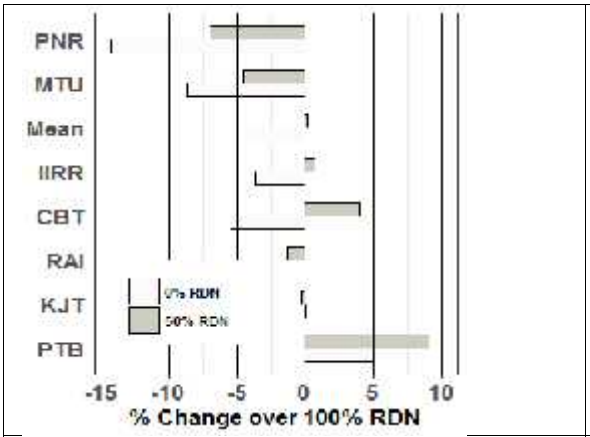


Fig.6A: Influence of nitrogen level on 1000 grain weight. Each bar represent the mean of all the varieties and indicate the % change in 1000 grain weight over 100% RDN

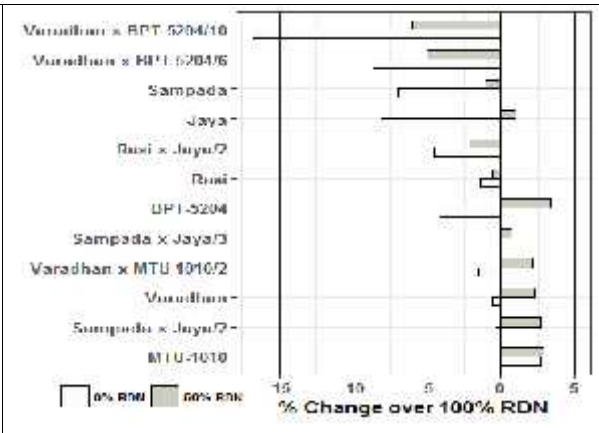


Fig.6B: Influence of nitrogen level on 1000 grain weight. Each bar represent the mean of all locations and indicate the % change in 1000 grain weight over 100% RDN

Nitrogen limitation did not significantly affected the harvest index (%). The mean harvest index for the tested varieties are 33% (0% RDN) and 35% (50% and 100% RDN). The mean harvest index was highest at IIRR location followed by CBT and MTU (Fig.7A). Significant differences were observed among the tested varieties ($p<0.01$). Among the tested varieties, highest harvest index was observed in Varadhan x MTU 1010/2 (0% RDN), Varadhan x BPT 5204/10 (50% RDN), BPT-5204 (100% RDN) (Fig.7B).

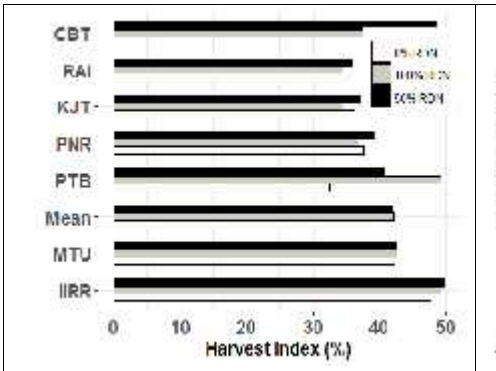


Fig.7A Influence of N levels on HI of rice varieties. Each bar represent the mean of all varieties.

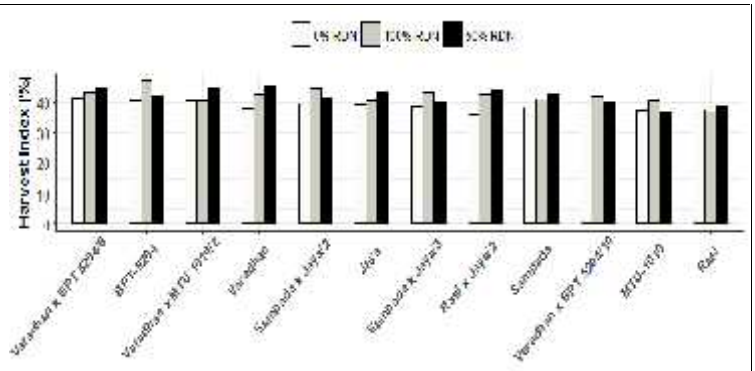


Fig.7B Influence of N levels on HI of rice varieties. Each bar represent the mean of all centers.

The energy required to produce per unit dry matter is radiation use efficiency and it varies based on the photosynthetic photon flux density that is intercepted. It is a one of the better approaches to model the crop dry matter production per unit of intercepted photosynthetically active radiation. Radiation use efficiency and nitrogen utilization are inter twined characters, as the absorption and utilization of photosynthetic photon flux depends on the availability of nitrogen to the crop which collectively influence crop productivity. In the present study radiation use efficiency was estimated using Oryza 2000 model based on the meteorological data and total dry matter accumulation by the individual genotypes at maturity stage. The accumulated PAR throughout the growth period for all the varieties and treatments was estimated. The data shows that the accumulated PAR (APAR) was more under 100% RDN levels and there were no variation in APAR between 0% RDN and 50% RDN levels. Among the locations, highest accumulated PAR was recorded at PNR followed by CBT and IIRR. Radiation use efficiency was estimated at maturity stage and significant differences were observed between treatments. The mean RUE was reduced by 15% under 50% RDN levels. The mean RUE was highest at PTB location followed by TTB and MTU. Among the varieties, mean RUE was highest in Sampada x Jaya/2 (0% RDN) and Sampada x Jaya/3 (50% RDN and 100% RDN).

Summary and conclusions:

The trail was conducted with three nitrogen treatments (0,100 and 50% RDNN) and 12 varieties. Among the tested varieties, varadhan x MTU 1010/2 showed minimum reduction in grain yield/m^2 with N limitation. Among the tested varieties, highest grain yield (g/m^2) was observed in BPT-5204, Varadhan x BPT 5204/6 (0% RDN) and varadhan x BPT 5204/6, varadhan x MTU 1010/2 (50% RDN) and Sampada, Varadhan x BPT 5204/6 (100% RDN). Among the high yielding varieties under three N levels, Varadhan x BPT 5204/6 performed well under all the three N levels.

Table 6.5.1 Radiation and Nitrogen Use efficiency days to flowering at different locations Kharif 2017

Treat	S.No.	Genotypes	CBT	IIRR	KJT	MTU	PNR	PTB	RPUR	TTB	Grand Mean
T1 (0 kg N/ha)	1	BPT-5204	101	95	76	95	101	102	93	74	95
	2	Jaya	108	101	85	101	112	85	102	75	99
	3	MTU-1010	91	88	80	88	90	82	82	92	86
	4	Rasi	91	104	85	104	114	82	103	88	98
	5	Rasi x Jaya/2	88	86	79	86	78	83	82	75	83
	6	Sampada	108	100	85	100	114	82	102	71	99
	7	Sampada x Jaya/2	108	106	87	106	112	102	103	71	103
	8	Sampada x Jaya/3	101	95	88	95	99	102	85	87	95
	9	Varadhan	88	85	79	85	78	85	82	92	83
	10	Varadhan x BPT 5204/10	95	106	85	106	114	82	93	92	97
	11	Varadhan x BPT 5204/6	91	91	76	91	89	81	85	75	86
	12	Varadhan x MTU 1010/2	91	85	80	85	89	83	85	93	85
		T1-0 N Mean	**97**	**95**	**82**	**95**	**99**	**87**	**91**	**82**	**92**
T2 (50 Kg N/ha)	1	BPT-5204	101	98	76	98	99	103	93	75	95
	2	Jaya	108	105	87	105	110	80	102	75	100
	3	MTU-1010	91	90	82	90	90	86	82	92	87
	4	Rasi	90	106	85	106	111	92	103	88	99
	5	Rasi x Jaya/2	88	89	79	89	76	83	82	75	84
	6	Sampada	108	102	86	102	110	86	102	71	100
	7	Sampada x Jaya/2	108	106	88	106	110	97	103	71	103
	8	Sampada x Jaya/3	101	95	90	95	97	86	84	91	93
	9	Varadhan	88	90	78	90	76	89	82	93	85
	10	Varadhan x BPT 5204/10	95	107	86	107	111	86	93	92	98
	11	Varadhan x BPT 5204/6	91	86	78	86	87	83	82	75	85
	12	Varadhan x MTU 1010/2	91	101	79	101	87	82	84	93	89
		T2- 50 N Mean	**97**	**98**	**83**	**98**	**97**	**88**	**91**	**83**	**93**
T3 (100 Kg N/ha)	1	BPT-5204	101	96	78	96	99	102	93	82	95
	2	Jaya	108	105	85	105	108	80	102	0	99
	3	MTU-1010	91	95	80	95	89	82	82	0	88
	4	Rasi	93	105	86	105	109	92	103	0	99
	5	Rasi x Jaya/2	88	91	80	91	75	84	84	0	85
	6	Sampada	108	105	85	105	108	90	102	0	100
	7	Sampada x Jaya/2	108	106	88	106	108	95	103	0	102
	8	Sampada x Jaya/3	101	99	87	99	97	95	85	0	95
	9	Varadhan	88	91	78	91	75	87	82	0	85
	10	Varadhan x BPT 5204/10	95	105	85	105	110	90	93	0	98
	11	Varadhan x BPT 5204/6	91	91	76	91	86	84	84	0	86
	12	Varadhan x MTU 1010/2	91	93	81	93	86	83	85	0	87
		T3 - 100 N Mean	**97**	**98**	**82**	**98**	**96**	**89**	**92**	**0**	**93**
		Grand Mean	**97**	**97**	**82**	**97**	**97**	**88**	**91**	**82**	**93**
		LSD (Treat)				ns					
		LSD (Location x Treat)				0.89**					
		LSD (variety)				0.63**					
		LSD (Location x variety)				1.7**					
		LSD (Treat x variety)				ns					
		LSD (location x Treat x variety)				2.89**					
		CV (%) Treat				1.4					
		CV (%) Residual				1.6					

Table 6.5.2 Radiation and Nitrogen Use efficiency days to maturity at different locations Kharif 2017

Treat	S.No.	Genotypes	CBT	IIRR	KJT	MTU	PNR	PTB	RPUR	TTB	Grand Mean
T1 (0 kg N/ha)	1	BPT-5204	132	123	109	123	126	133	134	103	126
	2	Jaya	139	131	117	131	137	116	138	103	130
	3	MTU-1010	122	118	108	118	115	113	132	134	118
	4	Rasi	122	136	115	136	139	113	137	125	128
	5	Rasi x Jaya/2	118	118	110	118	103	114	130	103	116
	6	Sampada	138	137	114	137	139	113	138	103	131
	7	Sampada x Jaya/2	138	136	119	136	137	133	137	103	134
	8	Sampada x Jaya/3	132	136	116	136	124	133	137	122	131
	9	Varadhan	119	122	109	122	103	116	130	124	117
	10	Varadhan x BPT 5204/10	125	135	115	135	139	113	137	124	128
	11	Varadhan x BPT 5204/6	120	119	109	119	114	112	130	103	118
	12	Varadhan x MTU 1010/2	122	118	110	118	114	114	130	126	118
		T1-0 N Mean	**127**	**127**	**113**	**127**	**124**	**118**	**134**	**114**	**124**
T2 (50 Kg N/ha)	1	BPT-5204	130	135	109	135	124	133	134	103	129
	2	Jaya	139	133	119	133	135	110	139	105	130
	3	MTU-1010	121	119	110	119	115	116	132	134	119
	4	Rasi	120	135	115	135	136	122	137	126	129
	5	Rasi x Jaya/2	118	122	110	122	101	113	130	103	117
	6	Sampada	138	134	115	134	135	116	139	103	130
	7	Sampada x Jaya/2	139	135	120	135	135	127	137	103	133
	8	Sampada x Jaya/3	130	122	118	122	122	117	137	124	124
	9	Varadhan	118	119	108	119	101	119	130	124	116
	10	Varadhan x BPT 5204/10	125	135	116	135	136	116	137	128	129
	11	Varadhan x BPT 5204/6	121	119	111	119	112	113	130	105	118
	12	Varadhan x MTU 1010/2	125	128	109	128	112	112	130	114	121
		T2- 50 N Mean	**127**	**128**	**113**	**128**	**122**	**118**	**134**	**0**	**124**
T3 (100 Kg N/ha)	1	BPT-5204	131	138	111	138	124	132	134	0	130
	2	Jaya	138	139	117	139	133	111	139	0	131
	3	MTU-1010	121	123	108	123	114	113	132	0	119
	4	Rasi	123	138	116	138	134	123	137	0	130
	5	Rasi x Jaya/2	118	117	111	117	100	115	130	0	116
	6	Sampada	137	139	114	139	133	120	139	0	132
	7	Sampada x Jaya/2	138	134	120	134	133	126	137	0	132
	8	Sampada x Jaya/3	131	139	115	139	122	121	137	0	129
	9	Varadhan	118	120	108	120	100	118	130	0	116
	10	Varadhan x BPT 5204/10	125	131	115	131	135	121	137	0	128
	11	Varadhan x BPT 5204/6	121	119	109	119	111	114	130	0	118
	12	Varadhan x MTU 1010/2	121	120	111	120	111	114	130	0	118
		T3 - 100 N Mean	**127**	**130**	**113**	**130**	**121**	**119**	**134**	**0**	**125**
		Grand Mean	**127**	**128**	**113**	**128**	**122**	**118**	**134**	**114**	**125**
		LSD (Treat)			ns						
		LSD (Location x Treat)			1.39**						
		LSD (variety)			0.776**						
		LSD (Location x variety)			2.05**						
		LSD (Treat x variety)			1.344**						
		LSD (location x Treat x variety)			3.56**						
		CV (%) Treat			1.71						
		CV (%) Residual			1.35						

Table 6.5.3 Radiation and Nitrogen Use efficiency Plant height (cm) flowering at different locations Kharif 2017

Treat	S.No.	Genotypes	CBT	IIRR	KJT	MTU	PNR	PTB	RPUR	TTB	Grand Mean
T1 (0 kg N/ha)	1	BPT-5204	101.0	96.7	80.7	117.0	107.5	127.3	93.4	115	103.4
	2	Jaya	81.0	72.2	61.3	105.3	99.2	120.0	105.5	111	92.1
	3	MTU-1010	140.3	92.8	107.7	112.0	98.7	114.3	123.6	123	112.8
	4	Rasi	80.3	80.8	67.2	92.0	104.3	115.0	106.8	111	92.4
	5	Rasi x Jaya/2	96.3	64.0	73.5	83.3	96.7	115.7	99.8	98	89.9
	6	Sampada	86.0	77.3	72.9	85.0	99.0	114.7	96.8	89	90.2
	7	Sampada x Jaya/2	85.3	74.5	79.4	98.3	110.0	123.3	108.7	100	97.1
	8	Sampada x Jaya/3	90.0	85.7	82.5	100.0	104.8	124.3	95.7	109	97.6
	9	Varadhan	99.0	68.3	75.2	82.0	98.3	116.3	97.8	105	91.0
	10	Varadhan x BPT 5204/10	78.0	76.0	77.8	115.0	96.7	116.0	90.8	116	92.9
	11	Varadhan x BPT 5204/6	105.3	72.7	84.7	108.3	102.3	114.7	116.5	119	100.6
	12	Varadhan x MTU 1010/2	100.0	83.3	85.3	83.0	101.0	115.0	108.4	114	96.6
		T1-0 N Mean	**95.2**	**78.7**	**79.0**	**98.4**	**101.5**	**118.1**	**103.6**	**109**	**96.4**
T2 (50 Kg N/ha)	1	BPT-5204	115.3	103.5	83.1	127.3	115.7	126.3	111.9	121	111.9
	2	Jaya	93.7	90.5	72.7	145.7	118.5	113.0	106.5	112	105.8
	3	MTU-1010	128.0	99.0	105.2	111.7	110.0	115.0	141.3	118	115.7
	4	Rasi	87.7	89.0	72.8	100.0	107.5	117.7	107.7	108	97.5
	5	Rasi x Jaya/2	105.7	76.2	82.5	98.0	101.0	112.3	95.6	111	95.9
	6	Sampada	90.7	81.2	72.8	108.7	104.9	115.7	97.3	95	95.9
	7	Sampada x Jaya/2	89.0	84.0	77.1	99.3	119.3	124.3	109.5	95	100.4
	8	Sampada x Jaya/3	100.3	91.5	83.2	100.0	109.0	125.0	101.6	121	101.5
	9	Varadhan	106.7	84.5	74.2	105.3	102.7	116.0	100.3	117	98.5
	10	Varadhan x BPT 5204/10	92.0	92.3	78.3	96.0	108.0	115.3	105.6	109	98.2
	11	Varadhan x BPT 5204/6	101.0	80.8	89.6	116.7	109.8	113.7	113.8	121	103.6
	12	Varadhan x MTU 1010/2	101.0	94.3	91.2	124.3	110.3	115.3	114.0	112	107.2
		T2- 50 N Mean	**100.9**	**88.9**	**81.9**	**111.1**	**109.7**	**117.5**	**108.8**	**112**	**102.7**
T3 (100 Kg N/ha)	1	BPT-5204	119.0	109.3	101.9	124.3	129.8	126.3	115.3	0	118.0
	2	Jaya	101.0	84.3	99.9	150.0	116.8	115.0	104.2	0	110.2
	3	MTU-1010	135.0	100.5	110.8	150.0	115.7	112.3	139.4	0	123.4
	4	Rasi	96.0	101.5	81.7	116.7	116.2	118.0	113.8	0	106.3
	5	Rasi x Jaya/2	103.3	86.7	79.9	107.0	105.3	116.3	100.9	0	99.9
	6	Sampada	101.7	87.7	79.7	113.7	121.0	118.0	96.9	0	102.7
	7	Sampada x Jaya/2	98.3	83.3	78.3	96.3	121.8	122.7	114.5	0	102.2
	8	Sampada x Jaya/3	102.3	96.7	91.0	105.3	111.3	122.7	107.7	0	105.3
	9	Varadhan	109.0	82.2	84.1	97.0	105.0	115.7	99.3	0	98.9
	10	Varadhan x BPT 5204/10	88.3	94.5	91.5	111.7	111.2	117.7	106.8	0	103.1
	11	Varadhan x BPT 5204/6	112.7	81.5	96.6	122.3	117.5	115.3	113.0	0	108.4
	12	Varadhan x MTU 1010/2	102.3	89.0	93.3	109.0	123.0	114.3	115.3	0	106.6
		T3 - 100 N Mean	**105.8**	**91.4**	**90.7**	**116.9**	**116.2**	**117.9**	**110.6**	**0**	**107.1**
		Grand Mean	**100.6**	**86.3**	**83.9**	**108.8**	**109.2**	**117.8**	**107.7**	**110**	**102.0**
		LSD (Treat)				1.2**					
		LSD (Location x Treat)				3.2**					
		LSD (variety)				1.79**					
		LSD (Location x variety)				4.7**					
		LSD (Treat x variety)				3.08**					
		LSD (location x Treat x variety)				8.15**					
		CV (%) Treat				4.9					
		CV (%) Residual				3.79					

Table 6.5.4 Radiation and Nitrogen Use efficiency total dry matter (g/m2) maturity at different locations Kharif 2017

Treat	S.No.	Genotypes	CBT	IIRR	KJT	MTU	PNR	PTB	RPUR	TTB	Grand Mean
T1 (0 kg N/ha)	1	BPT-5204	1275	771	2925	943	1050	1063	1031	0	1294
	2	Jaya	917	628	2350	935	1075	1344	57	0	1044
	3	MTU-1010	1194	983	1995	872	1100	1407	505	0	1151
	4	Rasi	988	915	2424	731	1100	1179	705	0	1149
	5	Rasi x Jaya/2	977	833	2051	485	708	1589	593	0	1034
	6	Sampada	1305	732	1922	927	1100	1242	881	0	1158
	7	Sampada x Jaya/2	1084	862	1879	725	1348	1061	573	0	1076
	8	Sampada x Jaya/3	1127	732	2275	377	1160	1117	949	0	1105
	9	Varadhan	887	891	1258	319	625	790	1037	0	830
	10	Varadhan x BPT 5204/10	1182	703	2192	696	1177	1038	507	0	1071
	11	Varadhan x BPT 5204/6	1072	748	1480	799	908	1433	1089	0	1076
	12	Varadhan x MTU 1010/2	989	884	2074	1020	916	1644	913	0	1206
		T1-0 N Mean	**1083**	**807**	**2069**	**736**	**1022**	**1242**	**737**	**0**	**1099**
T2 (50 Kg N/ha)	1	BPT-5204	1387	1160	2562	1242	1500	1299	409	0	1366
	2	Jaya	1029	1295	2602	922	1592	1290	1186	0	1416
	3	MTU-1010	1306	1238	2863	1123	1342	1427	1249	0	1507
	4	Rasi	1100	1067	3015	1058	1458	1446	1021	0	1452
	5	Rasi x Jaya/2	1089	1552	1948	512	913	1125	792	0	1133
	6	Sampada	1417	1297	2642	1112	1650	1467	782	0	1481
	7	Sampada x Jaya/2	1196	1372	2692	1198	1583	1204	1015	0	1466
	8	Sampada x Jaya/3	1239	835	2651	790	1725	1333	1126	0	1385
	9	Varadhan	999	1432	1538	510	842	1008	611	0	991
	10	Varadhan x BPT 5204/10	1294	1047	2607	914	1575	1439	677	0	1365
	11	Varadhan x BPT 5204/6	1184	1485	2195	952	1133	1421	1166	0	1362
	12	Varadhan x MTU 1010/2	1101	1671	2432	1157	1283	1351	411	0	1344
		T2- 50 N Mean	**1195**	**1288**	**2479**	**958**	**1383**	**1317**	**871**	**0**	**1356**
T3 (100 Kg N/ha)	1	BPT-5204	1044	1148	2820	1279	2077	1064	894	0	1475
	2	Jaya	1458	1247	2315	1318	1962	1151	1339	0	1541
	3	MTU-1010	1073	1371	3030	1237	1882	1411	1289	0	1613
	4	Rasi	1332	1092	2860	1049	2182	1111	1533	0	1594
	5	Rasi x Jaya/2	1151	1725	2124	681	1115	1053	740	0	1227
	6	Sampada	1439	1422	3096	1246	2050	1215	1578	0	1721
	7	Sampada x Jaya/2	1341	1455	2241	1070	1712	1159	632	0	1373
	8	Sampada x Jaya/3	1248	1404	1792	944	1700	1085	753	0	1275
	9	Varadhan	1134	1555	2188	550	1125	1150	1223	0	1275
	10	Varadhan x BPT 5204/10	1234	959	2200	1738	1817	1108	1019	0	1439
	11	Varadhan x BPT 5204/6	1150	1814	1831	1219	1750	1262	672	0	1385
	12	Varadhan x MTU 1010/2	1284	1641	2406	1075	1872	1290	1295	0	1552
		T3 - 100 N Mean	**1241**	**1403**	**2409**	**1117**	**1770**	**1171**	**1081**	**0**	**1456**
		Grand Mean	**1173**	**1166**	**2319**	**937**	**1392**	**1244**	**896**	**0**	**1304**
		LSD (Treat)			42.9**						
		LSD (Location x Treat)			113.5**						
		LSD (variety)			51.7**						
		LSD (Location x variety)			136.8**						
		LSD (Treat x variety)			89.6**						
		LSD (location x Treat x variety)			237.1**						
		CV (%) Treat			13.33						
		CV (%) Residual			8.89						

Table 6.5.5 Radiation and Nitrogen Use efficiency shoot weight (g/m2) maturity at different locations Kharif 2017

Treat	S.No.	Genotypes	CBT	IIRR	KJT	MTU	PNR	PTB	RPUR	TTB	Grand Mean
T1 (0 kg N/ha)	1	BPT-5204	1104	324	2288	0	628	595	491	768	905
	2	Jaya	837	263	1958	0	662	772	35	676	755
	3	MTU-1010	1248	468	1414	0	763	925	259	770	846
	4	Rasi	1050	383	1774	0	721	665	253	663	807
	5	Rasi x Jaya/2	1018	359	1452	0	424	1100	169	500	754
	6	Sampada	1191	315	1385	0	696	657	286	339	755
	7	Sampada x Jaya/2	1094	362	1166	0	903	538	204	509	711
	8	Sampada x Jaya/3	1137	335	1841	0	681	692	256	667	824
	9	Varadhan	1085	370	935	0	357	431	417	775	599
	10	Varadhan x BPT 5204/10	1145	316	1727	0	790	513	188	734	780
	11	Varadhan x BPT 5204/6	1136	326	1042	0	507	726	328	691	678
	12	Varadhan x MTU 1010/2	1131	401	1356	0	582	922	271	764	777
		T1-0 N Mean	**1098**	**352**	**1528**	**0**	**643**	**711**	**263**	**655**	**766**
T2 (50 Kg N/ha)	1	BPT-5204	1363	462	2140	0	899	674	173	1075	952
	2	Jaya	1005	529	1921	0	863	560	442	680	887
	3	MTU-1010	1282	627	2144	0	875	770	608	960	1051
	4	Rasi	1076	443	2197	0	977	772	444	1062	985
	5	Rasi x Jaya/2	1065	643	1395	0	606	435	288	747	739
	6	Sampada	1393	486	1760	0	1029	695	264	837	938
	7	Sampada x Jaya/2	1172	543	1881	0	1023	534	319	1061	912
	8	Sampada x Jaya/3	1215	382	1968	0	944	735	295	626	923
	9	Varadhan	975	597	914	0	512	445	247	709	615
	10	Varadhan x BPT 5204/10	1270	503	1857	0	1055	737	249	806	945
	11	Varadhan x BPT 5204/6	1160	580	1429	0	661	612	334	812	796
	12	Varadhan x MTU 1010/2	1077	661	1664	0	711	516	134	659	794
		T2- 50 N Mean	**1171**	**538**	**1772**	**0**	**846**	**624**	**316**	**840**	**878**
T3 (100 Kg N/ha)	1	BPT-5204	1020	560	2121	0	1389	337	381	817	968
	2	Jaya	1434	503	1751	0	1185	349	507	828	955
	3	MTU-1010	1049	665	2106	0	1353	632	708	0	1086
	4	Rasi	1308	467	2050	0	1575	352	605	0	1060
	5	Rasi x Jaya/2	1127	737	1464	0	713	346	253	0	774
	6	Sampada	1415	551	2136	0	1252	399	510	0	1044
	7	Sampada x Jaya/2	1317	575	1381	0	1075	410	253	0	835
	8	Sampada x Jaya/3	1224	619	1219	0	1029	363	268	0	787
	9	Varadhan	1110	659	1582	0	709	470	403	0	822
	10	Varadhan x BPT 5204/10	1210	434	1738	0	1313	350	318	0	894
	11	Varadhan x BPT 5204/6	1126	688	1215	0	1077	451	213	0	795
	12	Varadhan x MTU 1010/2	1260	672	1536	0	1242	397	410	0	920
		T3 - 100 N Mean	**1217**	**594**	**1692**	**0**	**1159**	**405**	**402**	**0**	**912**
		Grand Mean	**1162**	**495**	**1664**	**0**	**883**	**580**	**327**	**751**	**730**
		LSD (Treat)				ns					
		LSD (Location x Treat)				95.7**					
		LSD (variety)				40.77*					
		LSD (Location x variety)				101.7**					
		LSD (Treat x variety)				ns					
		LSD (location x Treat x variety)				186.33*					
		CV (%) Treat				20.12					
		CV (%) Residual				12.01					

Table 6.5.6 Radiation and Nitrogen Use efficiency panicle weight (g/m2) maturity at different locations Kharif 2017

Treat	S.No.	Genotypes	CBT	IIRR	KJT	MTU	PNR	PTB	RPUR	TTB	Grand Mean
T1 (0 kg N/ha)	1	BPT-5204	2536	447	637	457	425	468	541	427	787
	2	Jaya	1245	365	392	366	420	572	23	602	483
	3	MTU-1010	1886	515	580	342	343	482	246	763	628
	4	Rasi	2621	532	651	417	387	514	453	597	796
	5	Rasi x Jaya/2	1974	474	599	180	291	489	425	413	633
	6	Sampada	1460	417	537	354	413	585	595	295	623
	7	Sampada x Jaya/2	2643	500	713	471	454	523	369	272	810
	8	Sampada x Jaya/3	2157	397	434	307	481	424	692	575	699
	9	Varadhan	2009	521	323	141	274	360	621	654	607
	10	Varadhan x BPT 5204/10	3016	387	465	364	393	525	319	627	781
	11	Varadhan x BPT 5204/6	3372	422	438	495	367	707	761	325	937
	12	Varadhan x MTU 1010/2	2144	483	718	395	379	721	642	658	783
		T1-0 N Mean	**2255**	**455**	**541**	**357**	**386**	**531**	**474**	**517**	**714**
T2 (50 Kg N/ha)	1	BPT-5204	2201	698	422	487	614	625	237	483	755
	2	Jaya	1652	766	681	388	748	729	744	539	815
	3	MTU-1010	1437	611	719	360	478	658	640	824	701
	4	Rasi	2078	624	818	413	490	674	577	615	811
	5	Rasi x Jaya/2	2336	909	553	195	407	690	504	397	799
	6	Sampada	2728	811	882	407	636	772	518	259	965
	7	Sampada x Jaya/2	3208	829	811	483	602	670	696	283	1043
	8	Sampada x Jaya/3	2835	453	683	318	690	598	831	653	916
	9	Varadhan	2166	836	624	152	349	563	365	775	722
	10	Varadhan x BPT 5204/10	3564	544	749	371	539	702	429	711	985
	11	Varadhan x BPT 5204/6	3095	904	765	521	487	809	832	476	1059
	12	Varadhan x MTU 1010/2	2349	1010	768	428	580	834	277	705	892
		T2- 50 N Mean	**2471**	**750**	**706**	**377**	**552**	**694**	**554**	**560**	**872**
T3 (100 Kg N/ha)	1	BPT-5204	3265	588	699	555	707	727	513	0	1008
	2	Jaya	1904	744	564	395	800	802	832	0	863
	3	MTU-1010	2573	707	925	362	545	778	581	0	924
	4	Rasi	3366	625	810	436	619	759	929	0	1078
	5	Rasi x Jaya/2	2657	988	659	220	420	706	487	0	877
	6	Sampada	2075	871	960	411	821	816	1068	0	1003
	7	Sampada x Jaya/2	3420	880	861	512	653	748	379	0	1065
	8	Sampada x Jaya/3	2876	784	573	317	690	722	486	0	921
	9	Varadhan	2598	895	606	164	434	680	820	0	885
	10	Varadhan x BPT 5204/10	3765	526	462	402	521	759	700	0	1019
	11	Varadhan x BPT 5204/6	4027	1126	615	527	684	812	459	0	1179
	12	Varadhan x MTU 1010/2	2690	969	870	432	650	892	885	0	1055
		T3 - 100 N Mean	**2935**	**808**	**717**	**394**	**629**	**767**	**678**	**0**	**990**
		Grand Mean	**2554**	**671**	**655**	**376**	**522**	**664**	**569**	**539**	**859**
		LSD (Treat)					ns				
		LSD (Location x Treat)					49.1**				
		LSD (variety)					ns				
		LSD (Location x variety)					107.7**				
		LSD (Treat x variety)					ns				
		LSD (location x Treat x variety)					186.5**				
		CV (%) Treat					8.9				
		CV (%) Residual					10.3				

Table 6.5.7 Radiation and Nitrogen Use efficiency panicle number/m2 maturity at different locations Kharif 2017

Treat	S.No.	Genotypes	CBT	IIRR	KJT	MTU	PNR	PTB	RPUR	TTB	Grand Mean
T1 (0 kg N/ha)	1	BPT-5204	254	213	230	306	195	323	203	128	246
	2	Jaya	179	233	321	294	249	403	280	213	280
	3	MTU-1010	254	267	263	284	195	371	140	283	254
	4	Rasi	253	390	256	265	274	361	240	201	291
	5	Rasi x Jaya/2	329	327	269	245	190	312	200	150	267
	6	Sampada	154	297	274	275	273	401	320	264	285
	7	Sampada x Jaya/2	329	293	230	246	291	341	200	127	276
	8	Sampada x Jaya/3	304	230	233	266	156	239	200	144	233
	9	Varadhan	354	310	203	219	297	168	340	215	270
	10	Varadhan x BPT 5204/10	317	290	269	272	271	349	200	191	281
	11	Varadhan x BPT 5204/6	301	237	254	240	274	513	360	157	311
	12	Varadhan x MTU 1010/2	329	253	248	303	194	558	240	250	304
		T1-0 N Mean	**280**	**278**	**254**	**268**	**238**	**362**	**244**	**151**	**275**
T2 (50 Kg N/ha)	1	BPT-5204	322	273	241	336	244	437	120	196	282
	2	Jaya	247	367	269	349	350	363	420	139	338
	3	MTU-1010	322	363	211	292	247	436	280	161	307
	4	Rasi	321	370	269	308	327	448	360	157	343
	5	Rasi x Jaya/2	397	540	283	277	373	432	340	146	377
	6	Sampada	222	440	278	254	334	528	280	130	334
	7	Sampada x Jaya/2	397	457	245	343	339	518	420	136	388
	8	Sampada x Jaya/3	372	283	230	340	199	427	280	147	305
	9	Varadhan	422	487	233	219	331	349	260	204	329
	10	Varadhan x BPT 5204/10	385	417	248	316	326	437	280	175	344
	11	Varadhan x BPT 5204/6	369	410	218	310	329	535	340	202	359
	12	Varadhan x MTU 1010/2	397	443	264	355	246	533	120	207	337
		T2- 50 N Mean	**348**	**404**	**249**	**308**	**304**	**454**	**292**	**167**	**337**
T3 (100 Kg N/ha)	1	BPT-5204	250	253	237	373	306	437	260	0	302
	2	Jaya	346	403	297	363	449	378	340	0	368
	3	MTU-1010	343	357	236	275	309	462	360	0	335
	4	Rasi	399	380	339	273	435	461	480	0	395
	5	Rasi x Jaya/2	448	560	218	356	395	453	340	0	396
	6	Sampada	277	413	318	265	381	508	540	0	386
	7	Sampada x Jaya/2	395	433	330	351	530	542	240	0	403
	8	Sampada x Jaya/3	420	377	278	309	280	394	160	0	317
	9	Varadhan	348	540	203	273	366	335	580	0	378
	10	Varadhan x BPT 5204/10	423	320	259	295	676	464	260	0	385
	11	Varadhan x BPT 5204/6	410	483	339	351	384	551	200	0	388
	12	Varadhan x MTU 1010/2	419	410	216	330	267	506	440	0	370
		T3 - 100 N Mean	**373**	**411**	**273**	**318**	**398**	**458**	**350**	**0**	**369**
		Grand Mean	**334**	**364**	**259**	**298**	**313**	**424**	**295**	**178**	**327**
		LSD (Treat)				8.8**					
		LSD (Location x Treat)				23.43**					
		LSD (variety)				ns					
		LSD (Location x variety)				47.6**					
		LSD (Treat x variety)				ns					
		LSD (location x Treat x variety)				82.5**					
		CV (%) Treat				11					
		CV (%) Residual				11.506					

Table 6.5.8 Radiation and Nitrogen Use efficiency grain number/panicle at different locations Kharif 2017

Treat	S.No.	Genotypes	CBT	IIRR	KJT	MTU	PNR	PTB	RPUR	TTB	Grand Mean
T1 (0 kg N/ha)	1	BPT-5204	122	71	133	114	114	135	170	151	123
	2	Jaya	120	81	169	96	108	159	27	177	108
	3	MTU-1010	166	75	177	84	134	144	110	162	127
	4	Rasi	151	81	198	106	111	82	195	148	132
	5	Rasi x Jaya/2	102	59	138	66	77	104	50	132	85
	6	Sampada	155	78	163	96	82	150	125	40	121
	7	Sampada x Jaya/2	164	92	165	90	107	123	120	102	123
	8	Sampada x Jaya/3	132	56	161	72	116	124	117	169	111
	9	Varadhan	130	69	123	58	83	67	125	195	94
	10	Varadhan x BPT 5204/10	121	80	140	82	89	56	168	253	105
	11	Varadhan x BPT 5204/6	128	70	139	88	106	71	110	95	102
	12	Varadhan x MTU 1010/2	126	74	137	106	139	107	195	202	126
		T1-0 N Mean	**135**	**74**	**154**	**88**	**106**	**110**	**126**	**152**	**113**
T2 (50 Kg N/ha)	1	BPT-5204	137	90	162	117	122	128	70	156	118
	2	Jaya	135	105	168	100	156	158	162	226	141
	3	MTU-1010	181	64	181	85	144	121	130	297	130
	4	Rasi	166	100	171	104	122	94	140	137	128
	5	Rasi x Jaya/2	117	68	162	63	98	98	85	122	99
	6	Sampada	170	90	168	101	161	163	140	90	142
	7	Sampada x Jaya/2	179	93	170	102	138	145	130	105	137
	8	Sampada x Jaya/3	147	53	181	74	137	107	160	192	123
	9	Varadhan	145	70	141	58	96	97	115	275	103
	10	Varadhan x BPT 5204/10	136	76	163	88	141	89	151	266	121
	11	Varadhan x BPT 5204/6	143	83	148	90	134	115	166	135	126
	12	Varadhan x MTU 1010/2	141	83	200	109	157	146	135	235	139
		T2- 50 N Mean	**150**	**81**	**168**	**91**	**134**	**122**	**132**	**186**	**125**
T3 (100 Kg N/ha)	1	BPT-5204	142	78	178	123	144	115	130	0	130
	2	Jaya	140	95	186	107	160	155	74	0	131
	3	MTU-1010	186	76	155	92	191	107	155	0	138
	4	Rasi	171	95	181	111	146	85	140	0	133
	5	Rasi x Jaya/2	122	72	162	72	115	99	93	0	105
	6	Sampada	175	110	180	108	169	160	120	0	146
	7	Sampada x Jaya/2	184	104	210	109	211	158	90	0	152
	8	Sampada x Jaya/3	152	67	180	82	170	124	115	0	127
	9	Varadhan	150	69	168	66	106	89	125	0	110
	10	Varadhan x BPT 5204/10	141	99	191	118	176	65	152	0	134
	11	Varadhan x BPT 5204/6	148	85	158	104	146	106	180	0	133
	12	Varadhan x MTU 1010/2	146	92	149	119	166	147	125	0	135
		T3 - 100 N Mean	**155**	**87**	**175**	**101**	**158**	**118**	**125**	**0**	**131**
		Grand Mean	**146**	**81**	**165**	**93**	**133**	**117**	**128**	**169**	**123**
		LSD (Treat)			4.6**						
		LSD (Location x Treat)			1.3**						
		LSD (variety)			6.3**						
		LSD (Location x variety)			16.7**						
		LSD (Treat x variety)			ns						
		LSD (location x Treat x variety)			28.98**						
		CV (%) Treat			11.1						
		CV (%) Residual			15.3						

Table 6.5.9 Radiation and Nitrogen Use efficiency spikelet number/panicle at different locations Kharif 2017

Treat	S.No.	Genotypes	CBT	IIRR	KJT	MTU	PNR	PTB	RPUR	TTB	Grand Mean
T1 (0 kg N/ha)	1	BPT-5204	136	99	0	106	150	140	210	178	120
	2	Jaya	135	118	0	100	205	166	52	208	111
	3	MTU-1010	183	88	0	85	185	149	116	189	115
	4	Rasi	166	122	0	117	161	88	255	179	130
	5	Rasi x Jaya/2	116	66	0	69	96	109	71	158	75
	6	Sampada	170	120	0	108	138	156	175	71	124
	7	Sampada x Jaya/2	177	134	0	100	160	133	170	122	125
	8	Sampada x Jaya/3	147	82	0	79	156	133	165	190	109
	9	Varadhan	147	80	0	88	102	74	145	229	91
	10	Varadhan x BPT 5204/10	134	106	0	93	113	62	204	287	102
	11	Varadhan x BPT 5204/6	141	88	0	92	160	88	163	132	105
	12	Varadhan x MTU 1010/2	142	90	0	106	145	117	227	223	118
		T1-0 N Mean	**149**	**99**	**0**	**95**	**148**	**118**	**163**	**180**	**110**
T2 (50 Kg N/ha)	1	BPT-5204	162	114	0	120	155	134	134	186	117
	2	Jaya	159	148	0	105	253	165	255	257	155
	3	MTU-1010	206	74	0	88	192	126	155	338	120
	4	Rasi	189	262	0	118	168	104	225	163	152
	5	Rasi x Jaya/2	147	74	0	72	107	90	121	152	87
	6	Sampada	196	139	0	112	192	173	252	122	152
	7	Sampada x Jaya/2	204	139	0	107	191	149	185	124	139
	8	Sampada x Jaya/3	171	73	0	79	188	112	217	212	120
	9	Varadhan	172	81	0	92	113	107	130	308	99
	10	Varadhan x BPT 5204/10	160	95	0	94	173	94	206	303	118
	11	Varadhan x BPT 5204/6	166	106	0	98	167	122	161	151	117
	12	Varadhan x MTU 1010/2	165	102	0	108	177	154	180	251	127
		T2- 50 N Mean	**175**	**117**	**0**	**99**	**173**	**128**	**185**	**214**	**125**
T3 (100 Kg N/ha)	1	BPT-5204	177	100	0	133	186	122	167	0	126
	2	Jaya	175	150	0	123	326	163	130	0	153
	3	MTU-1010	220	89	0	105	204	114	191	0	132
	4	Rasi	203	133	0	120	194	92	233	0	139
	5	Rasi x Jaya/2	157	79	0	80	131	105	136	0	98
	6	Sampada	212	173	0	122	205	201	160	0	153
	7	Sampada x Jaya/2	215	161	0	120	309	164	185	0	165
	8	Sampada x Jaya/3	186	91	0	90	213	133	161	0	125
	9	Varadhan	187	80	0	89	120	98	155	0	104
	10	Varadhan x BPT 5204/10	177	128	0	126	225	75	219	0	136
	11	Varadhan x BPT 5204/6	184	106	0	112	183	114	220	0	131
	12	Varadhan x MTU 1010/2	182	105	0	134	192	152	153	0	131
		T3 - 100 N Mean	**190**	**116**	**0**	**113**	**207**	**128**	**176**	**0**	**133**
		Grand Mean	**171**	**111**	**0**	**102**	**176**	**124**	**175**	**197**	**123**
		LSD (Treat)				4.4**					
		LSD (Location x Treat)				11.8**					
		LSD (variety)				8.8**					
		LSD (Location x variety)				23.4**					
		LSD (Treat x variety)				15.3**					
		LSD (location x Treat x variety)				40.5**					
		CV (%) Treat				14.7					
		CV (%) Residual				15.6					

Table 6.5.10 Radiation and Nitrogen Use efficiency grain number/m2 at different locations Kharif 2017

Treat	S.No.	Genotypes	CBT	IIRR	KJT	MTU	PNR	PTB	RPUR	TTB	Grand Mean
T1 (0 kg N/ha)	1	BPT-5204	14199	15051	30327	45979	22343	41788	34667	19308	29193
	2	Jaya	8033	19022	54115	40140	26993	64263	7517	36967	31441
	3	MTU-1010	27916	20152	46582	19518	26188	53916	15467	42725	29963
	4	Rasi	25699	31200	51497	41172	30493	29808	38533	26333	35486
	5	Rasi x Jaya/2	17716	19056	37606	22569	14690	32958	10067	19572	22095
	6	Sampada	13365	22787	44839	43842	22282	60083	40067	10303	35323
	7	Sampada x Jaya/2	47524	26599	37663	38615	30992	41964	24133	12797	35356
	8	Sampada x Jaya/3	34699	13030	37665	21421	18187	32037	23437	23738	25782
	9	Varadhan	50141	21215	24975	16900	24721	11180	42567	40969	27386
	10	Varadhan x BPT 5204/10	46649	22783	37869	31789	24081	20055	33667	48435	30985
	11	Varadhan x BPT 5204/6	42791	16152	35413	34216	28990	36313	39667	15220	33363
	12	Varadhan x MTU 1010/2	29191	18798	33639	44568	26832	59433	38533	50383	35857
		T1-0 N Mean	**29827**	**20487**	**39349**	**33394**	**24733**	**40317**	**29027**	**28896**	**31019**
T2 (50 Kg N/ha)	1	BPT-5204	14534	24327	39456	50643	29705	56103	8467	23563	31891
	2	Jaya	8368	38395	46113	42821	54520	54896	67633	30869	44678
	3	MTU-1010	28251	23013	38651	19507	35571	50880	36467	47614	33191
	4	Rasi	26034	37015	46496	42823	39765	43298	50467	21496	40843
	5	Rasi x Jaya/2	18051	36556	45857	23151	36728	42390	28967	17756	33100
	6	Sampada	13700	39810	46690	46841	53822	86589	39267	11478	46674
	7	Sampada x Jaya/2	47859	42140	41162	41436	46712	75322	54667	14071	49900
	8	Sampada x Jaya/3	35034	14923	41959	21335	27195	45067	44867	27618	32911
	9	Varadhan	50476	33042	32799	17902	31685	33961	29967	51569	32833
	10	Varadhan x BPT 5204/10	46984	30932	40648	33847	45943	38779	42347	46124	39926
	11	Varadhan x BPT 5204/6	43126	33625	32451	37185	44241	61217	56507	27081	44050
	12	Varadhan x MTU 1010/2	29526	36763	53072	45132	38538	78099	16267	48030	42485
		T2- 50 N Mean	**30162**	**32545**	**42113**	**35218**	**40369**	**55550**	**39657**	**30606**	**39373**
T3 (100 Kg N/ha)	1	BPT-5204	30714	19806	42569	53106	43959	50290	33867	0	39187
	2	Jaya	23755	38350	55046	43843	71813	56983	25227	0	45002
	3	MTU-1010	48872	27067	36926	21837	59182	48426	55867	0	42597
	4	Rasi	44289	36128	62785	47175	63636	40465	67267	0	51678
	5	Rasi x Jaya/2	35647	39915	35447	23334	45327	45198	31687	0	36651
	6	Sampada	30489	43935	57440	51305	64320	81518	64867	0	56268
	7	Sampada x Jaya/2	72047	44787	69814	44277	111546	86150	21667	0	64327
	8	Sampada x Jaya/3	58005	25246	50324	20185	47727	49425	18467	0	38483
	9	Varadhan	70089	36755	34047	18203	38796	29622	72567	0	42868
	10	Varadhan x BPT 5204/10	68830	31447	48998	38238	118724	30183	39587	0	53715
	11	Varadhan x BPT 5204/6	60614	41193	53510	39172	56229	57915	36067	0	49243
	12	Varadhan x MTU 1010/2	45305	37266	31771	52399	44150	74253	55067	0	48602
		T3 - 100 N Mean	**49055**	**35158**	**48223**	**37756**	**63784**	**54202**	**43517**	**0**	**47385**
		Grand Mean	**36348**	**29397**	**43228**	**35456**	**42962**	**50023**	**37400**	**29751**	**39259**
		LSD (Treat)				1362**					
		LSD (Location x Treat)				36.3**					
		LSD (variety)				2356*					
		LSD (Location x variety)				8206**					
		LSD (Treat x variety)				ns					
		LSD (location x Treat x variety)				5372**					
		CV (%) Treat				14.99					
		CV (%) Residual				17.15					

Table 6.5.11 Radiation and Nitrogen Use efficiency spikelet number/m2 at different locations Kharif 2017

Treat	S.No.	Genotypes	CBT	IIRR	KJT	MTU	PNR	PTB	RPUR	TTB	Grand Mean
T1 (0 kg N/ha)	1	BPT-5204	18530	20581	0	46904	29370	43369	42800	22792	33592
	2	Jaya	10239	27566	0	41567	50996	67175	14627	43566	35361
	3	MTU-1010	32247	23520	0	20162	36143	55945	16307	50784	30721
	4	Rasi	30030	47425	0	42740	44214	32007	61267	32871	42947
	5	Rasi x Jaya/2	22047	21528	0	22651	18325	33805	14267	23327	22104
	6	Sampada	17405	35396	0	43487	37716	62787	56067	18314	42143
	7	Sampada x Jaya/2	51855	38163	0	38838	46485	45324	34133	15305	42466
	8	Sampada x Jaya/3	39030	19109	0	22603	24336	34163	33067	26582	28718
	9	Varadhan	54472	24795	0	17467	30356	12352	49367	48068	31468
	10	Varadhan x BPT 5204/10	50980	30272	0	32661	30491	22134	40867	54909	34568
	11	Varadhan x BPT 5204/6	47122	20599	0	35087	43985	45450	58747	20621	41832
	12	Varadhan x MTU 1010/2	33522	22726	0	44474	28122	61270	54547	55777	40777
		T1-0 N Mean	**33957**	**27640**	**0**	**34053**	**35045**	**42982**	**39672**	**34410**	**35558**
T2 (50 Kg N/ha)	1	BPT-5204	18689	30771	0	52267	37660	58879	16147	28090	35735
	2	Jaya	10398	54162	0	46643	88673	57140	107166	35164	60697
	3	MTU-1010	32406	26838	0	24516	47414	52901	43467	54247	37924
	4	Rasi	30189	95681	0	49700	54800	47888	81067	25589	59887
	5	Rasi x Jaya/2	22206	40021	0	21321	39921	39125	41207	22156	33967
	6	Sampada	17564	60949	0	47688	64192	91741	70627	15393	58794
	7	Sampada x Jaya/2	52014	63331	0	37992	64698	77228	77767	16720	62172
	8	Sampada x Jaya/3	39189	20673	0	24933	37316	47059	60827	30753	38333
	9	Varadhan	54631	38112	0	23370	37307	37313	33867	58179	37433
	10	Varadhan x BPT 5204/10	51139	38803	0	30460	56245	41114	57747	52419	45918
	11	Varadhan x BPT 5204/6	47281	43898	0	35191	54886	64970	54507	30110	50122
	12	Varadhan x MTU 1010/2	33681	44932	0	41456	43625	82747	21667	51260	44685
		T2- 50 N Mean	**34116**	**46514**	**0**	**36295**	**52228**	**58175**	**50808**	**35007**	**46356**
T3 (100 Kg N/ha)	1	BPT-5204	34770	25324	0	54683	56915	53486	43487	0	44777
	2	Jaya	27811	60646	0	49443	146322	60308	44267	0	64800
	3	MTU-1010	52928	31540	0	31434	62989	51635	68827	0	49892
	4	Rasi	48345	50400	0	47909	84221	43807	111840	0	64420
	5	Rasi x Jaya/2	39703	44242	0	21327	51657	47930	46307	0	41861
	6	Sampada	34545	68926	0	53449	78176	85318	86467	0	67813
	7	Sampada x Jaya/2	76103	69710	0	49527	163618	89799	44467	0	82204
	8	Sampada x Jaya/3	62061	33927	0	26050	59676	53017	25827	0	43426
	9	Varadhan	74145	43030	0	27147	43798	32690	89967	0	51796
	10	Varadhan x BPT 5204/10	72886	40650	0	51327	152078	34711	57007	0	68110
	11	Varadhan x BPT 5204/6	64670	51130	0	47171	70193	62578	44067	0	56635
	12	Varadhan x MTU 1010/2	49361	42592	0	54283	51079	76394	67387	0	56849
		T3 - 100 N Mean	**53111**	**46843**	**0**	**42812**	**85060**	**57639**	**57825**	**0**	**57215**
		Grand Mean	**40394**	**40332**	**0**	**37720**	**57444**	**52932**	**49232**	**34708**	**46343**
		LSD (Treat)		3476*							
		LSD (Location x Treat)		4369**							
		LSD (variety)		1651**							
		LSD (Location x variety)		12144**							
		LSD (Treat x variety)		ns							
		LSD (location x Treat x variety)		15136							
		CV (%) Treat		24.8							
		CV (%) Residual		17.9							

Table 6.5.12 Radiation and Nitrogen Use efficiency grain yield (g/m2) at different locations Kharif 2017

Treat	S.No.	Genotypes	CBT	IIRR	KJT	MTU	PNR	PTB	RPUR	TTB	Grand Mean
T1 (0 kg N/ha)	1	BPT-5204	499	360	228	476	422	283	554	332	403
	2	Jaya	379	290	373	359	413	345	392	465	364
	3	MTU-1010	524	455	315	331	337	291	270	590	360
	4	Rasi	452	434	243	350	379	310	215	462	340
	5	Rasi x Jaya/2	348	418	227	142	285	296	262	319	282
	6	Sampada	519	345	273	383	404	353	370	225	378
	7	Sampada x Jaya/2	489	417	259	286	446	316	385	217	371
	8	Sampada x Jaya/3	413	342	303	164	479	257	351	469	330
	9	Varadhan	488	463	181	127	268	217	287	512	290
	10	Varadhan x BPT 5204/10	522	315	241	334	387	317	399	601	359
	11	Varadhan x BPT 5204/6	415	371	327	406	402	427	416	253	395
	12	Varadhan x MTU 1010/2	390	429	266	435	371	436	384	517	387
		T1-0 N Mean	**453**	**386**	**270**	**316**	**383**	**321**	**357**	**413**	**355**
T2 (50 Kg N/ha)	1	BPT-5204	623	623	268	610	601	308	612	378	521
	2	Jaya	503	641	369	332	729	404	443	427	489
	3	MTU-1010	648	549	278	362	467	397	404	660	444
	4	Rasi	576	531	243	453	481	407	423	502	445
	5	Rasi x Jaya/2	472	817	368	196	307	417	375	313	422
	6	Sampada	643	658	281	460	621	466	399	206	504
	7	Sampada x Jaya/2	613	687	429	508	560	338	391	222	504
	8	Sampada x Jaya/3	537	393	363	332	781	361	355	547	446
	9	Varadhan	612	730	254	180	329	340	508	605	422
	10	Varadhan x BPT 5204/10	646	451	503	379	521	424	277	607	457
	11	Varadhan x BPT 5204/6	539	800	488	468	472	488	558	372	545
	12	Varadhan x MTU 1010/2	514	874	305	500	572	470	515	558	536
		T2- 50 N Mean	**577**	**646**	**346**	**398**	**537**	**402**	**438**	**450**	**478**
T3 (100 Kg N/ha)	1	BPT-5204	631	530	403	654	688	352	554	0	545
	2	Jaya	511	608	408	606	777	325	481	0	531
	3	MTU-1010	656	641	463	466	528	470	431	0	522
	4	Rasi	584	522	372	441	606	351	391	0	467
	5	Rasi x Jaya/2	480	892	487	272	402	360	372	0	466
	6	Sampada	651	716	368	587	798	451	403	0	568
	7	Sampada x Jaya/2	621	728	326	526	636	377	623	0	548
	8	Sampada x Jaya/3	545	686	308	366	671	403	387	0	481
	9	Varadhan	620	800	391	201	416	411	501	0	477
	10	Varadhan x BPT 5204/10	654	435	417	586	503	358	454	0	487
	11	Varadhan x BPT 5204/6	547	957	303	567	673	327	580	0	565
	12	Varadhan x MTU 1010/2	522	855	308	552	629	462	305	0	519
		T3 - 100 N Mean	**585**	**698**	**380**	**485**	**611**	**387**	**457**	**0**	**515**
		Grand Mean	**538**	**577**	**332**	**400**	**510**	**370**	**417**	**432**	**449**
		LSD (Treat)	585	11.41**							
		LSD (Location x Treat)		30.20**							
		LSD (variety)		NS							
		LSD (Location x variety)		60.20**							
		LSD (Treat x variety)		NS							
		LSD (location x Treat x variety)		104.62**							
		CV (%) Treat		10.9							
		CV (%) Residual		11.01							

Table 6.5.13 Radiation and Nitrogen Use efficiency 1000 grain weight (g) at different locations Kharif 2017

Treat	S.No.	Genotypes	CBT	IIRR	KJT	MTU	PNR	PTB	RPUR	TTB	Grand Mean
T1 (0 kg N/ha)	1	BPT-5204	28.9	23.9	24.1	22.9	24.2	27.7	25.0	22.7	25.3
	2	Jaya	17.9	15.2	16.7	16.8	17.1	21.1	16.0	16.7	17.3
	3	MTU-1010	25.6	22.5	25.1	23.7	23.2	30.0	23.0	16.3	24.7
	4	Rasi	17.1	13.9	14.6	15.0	14.1	24.4	14.0	27.3	16.1
	5	Rasi x Jaya/2	23.6	21.9	21.6	20.2	21.1	24.3	20.0	21.7	21.8
	6	Sampada	18.4	15.1	14.8	17.4	16.2	21.1	15.0	19.3	16.9
	7	Sampada x Jaya/2	17.3	15.7	15.2	17.9	18.1	21.1	16.0	21.3	17.3
	8	Sampada x Jaya/3	25.1	26.0	27.0	25.4	26.1	28.9	27.0	26.0	26.5
	9	Varadhan	16.4	21.8	25.6	20.6	21.5	22.2	21.0	16.3	21.3
	10	Varadhan x BPT 5204/10	19.9	13.9	15.4	13.9	14.1	13.3	15.0	15.7	15.1
	11	Varadhan x BPT 5204/6	25.8	23.0	23.7	21.5	22.1	21.1	23.0	19.3	22.9
	12	Varadhan x MTU 1010/2	24.8	22.9	24.6	19.5	23.2	27.0	23.0	14.0	23.6
		T1-0 N Mean	**21.7**	**19.6**	**20.7**	**19.6**	**20.1**	**23.5**	**19.8**	**19.7**	**20.7**
T2 (50 Kg N/ha)	1	BPT-5204	30.1	25.6	24.1	28.5	27.5	28.9	26.0	20.7	27.2
	2	Jaya	24.6	16.7	16.4	17.0	17.6	24.4	16.0	18.7	19.0
	3	MTU-1010	25.9	23.9	25.0	23.8	24.3	27.8	23.0	18.3	24.8
	4	Rasi	17.9	14.4	14.2	16.0	16.4	21.1	14.0	29.0	16.3
	5	Rasi x Jaya/2	23.4	22.4	22.9	20.0	22.4	25.5	20.0	21.7	22.4
	6	Sampada	20.2	16.5	15.3	16.8	18.3	23.3	15.0	20.3	17.9
	7	Sampada x Jaya/2	19.5	16.3	14.5	18.0	18.6	22.2	16.0	20.7	17.8
	8	Sampada x Jaya/3	26.4	26.4	26.3	26.0	29.6	27.8	25.0	25.7	26.8
	9	Varadhan	22.3	22.1	22.4	20.8	22.6	23.3	20.0	16.0	21.9
	10	Varadhan x BPT 5204/10	25.4	14.6	16.2	14.4	14.6	18.9	15.0	16.3	17.0
	11	Varadhan x BPT 5204/6	25.7	23.7	25.1	21.4	24.5	22.2	24.0	19.7	23.8
	12	Varadhan x MTU 1010/2	25.7	23.7	24.9	22.8	25.4	27.7	21.0	16.7	24.5
		T2- 50 N Mean	**23.9**	**20.5**	**20.6**	**20.4**	**21.8**	**24.4**	**19.6**	**20.3**	**21.6**
T3 (100 Kg N/ha)	1	BPT-5204	29.2	26.8	23.6	28.2	28.5	22.2	26.0	0	26.4
	2	Jaya	18.1	15.9	16.6	17.6	18.6	28.9	16.0	0	18.8
	3	MTU-1010	26.1	23.6	23.8	23.6	25.4	23.3	23.0	0	24.1
	4	Rasi	18.3	14.4	14.6	16.7	23.3	13.3	14.0	0	16.4
	5	Rasi x Jaya/2	24.2	22.3	23.1	20.3	23.4	27.7	19.0	0	22.9
	6	Sampada	19.1	16.3	15.8	18.1	19.3	22.2	16.0	0	18.1
	7	Sampada x Jaya/2	19.4	16.3	15.5	18.4	19.4	17.7	15.0	0	17.4
	8	Sampada x Jaya/3	25.6	27.1	26.8	26.9	31.4	21.1	27.0	0	26.6
	9	Varadhan	17.0	21.8	22.9	20.6	23.5	23.3	21.0	0	21.4
	10	Varadhan x BPT 5204/10	26.6	13.9	16.3	21.4	16.8	16.6	15.0	0	18.1
	11	Varadhan x BPT 5204/6	26.3	23.3	24.5	23.9	25.5	28.9	23.0	0	25.0
	12	Varadhan x MTU 1010/2	26.1	23.0	24.6	21.2	26.3	23.3	23.0	0	23.9
		T3 - 100 N Mean	**23.0**	**20.4**	**20.7**	**21.4**	**23.4**	**22.4**	**19.8**	**0**	**21.6**
		Grand Mean	**22.9**	**20.2**	**20.7**	**20.5**	**21.8**	**23.4**	**19.8**	**20**	**21.3**
		LSD (Treat)	NS								
		LSD (Location x Treat)	0.766**								
		LSD (variety)	0.79**								
		LSD (Location x variety)	2.09**								
		LSD (Treat x variety)	NS								
		LSD (location x Treat x variety)	2.65**								
		CV (%) Treat	7.98								
		CV (%) Residual	5.88								

Table 6.5.14 Radiation and Nitrogen Use efficiency harvest index (@) at different locations Kharif 2017

Treat	S.No.	Genotypes	CBT	IIRR	KJT	MTU	PNR	PTB	RPUR	TTB	Grand Mean
T1 (0 kg N/ha)	1	BPT-5204	0.39	46.4	33.2	50.5	40.7	35.1	39.4	27.8	35.1
	2	Jaya	0.41	45.8	44.5	38.4	38.4	31.0	34.3	36.4	33.3
	3	MTU-1010	0.44	46.1	36.1	38.1	30.7	26.8	40.8	38.6	31.3
	4	Rasi	0.40	47.4	36.4	48.0	34.8	31.8	25.2	36.7	32.0
	5	Rasi x Jaya/2	0.36	50.3	35.8	27.4	40.3	22.6	40.1	35.0	31.0
	6	Sampada	0.40	47.2	34.9	41.5	36.9	34.9	34.1	35.6	32.8
	7	Sampada x Jaya/2	0.43	48.2	34.3	38.9	33.0	36.9	43.7	30.3	33.6
	8	Sampada x Jaya/3	0.37	46.4	39.2	44.3	41.8	28.5	35.2	37.9	33.7
	9	Varadhan	0.42	51.7	27.8	41.3	42.8	33.9	25.3	35.8	31.9
	10	Varadhan x BPT 5204/10	0.44	45.1	29.8	45.3	32.9	38.1	41.7	44.2	33.3
	11	Varadhan x BPT 5204/6	0.39	49.6	39.4	50.8	39.5	37.6	34.2	25.4	35.9
	12	Varadhan x MTU 1010/2	0.39	48.4	43.1	42.7	40.6	32.7	38.5	36.4	35.2
		T1-0 N Mean	**0.40**	**47.7**	**36.2**	**42.3**	**37.7**	**32.5**	**36.0**	**35.0**	**33.3**
T2 (50 Kg N/ha)	1	BPT-5204	0.45	53.7	36.9	49.1	40.2	31.5	36.5	24.2	35.5
	2	Jaya	0.49	49.5	38.5	46.9	45.9	42.5	31.2	28.8	36.4
	3	MTU-1010	0.50	44.4	27.8	35.3	34.9	34.3	28.4	35.2	29.4
	4	Rasi	0.53	49.8	23.2	42.9	33.0	35.9	34.4	37.0	31.4
	5	Rasi x Jaya/2	0.43	52.4	42.0	38.3	41.8	48.9	39.4	26.1	37.6
	6	Sampada	0.45	50.8	38.9	40.8	37.7	42.8	43.2	15.7	36.4
	7	Sampada x Jaya/2	0.51	50.1	38.8	42.6	37.1	38.7	32.6	24.6	34.3
	8	Sampada x Jaya/3	0.43	47.4	44.2	42.1	40.7	36.3	27.8	40.0	34.1
	9	Varadhan	0.61	51.1	41.7	37.3	39.1	45.9	41.5	38.3	36.7
	10	Varadhan x BPT 5204/10	0.50	43.0	37.9	43.3	33.1	37.6	35.1	39.9	32.9
	11	Varadhan x BPT 5204/6	0.45	53.9	36.7	47.3	41.8	44.9	42.4	33.2	38.2
	12	Varadhan x MTU 1010/2	0.47	52.2	40.4	43.2	44.5	48.3	37.1	36.1	38.0
		T2- 50 N Mean	**0.49**	**49.8**	**37.2**	**42.4**	**39.1**	**40.6**	**35.8**	**31.6**	**35.1**
T3 (100 Kg N/ha)	1	BPT-5204	0.60	46.1	39.4	51.4	37.6	51.2	43.3	0	38.5
	2	Jaya	0.35	48.9	33.3	46.1	42.3	48.3	30.0	0	35.6
	3	MTU-1010	0.61	46.8	36.0	37.6	30.6	42.9	29.6	0	32.0
	4	Rasi	0.44	48.0	28.6	35.4	29.3	52.1	21.5	0	30.7
	5	Rasi x Jaya/2	0.42	51.6	38.8	41.5	37.6	46.7	40.3	0	36.7
	6	Sampada	0.45	50.4	30.7	43.9	41.2	53.1	21.9	0	34.5
	7	Sampada x Jaya/2	0.47	50.1	30.6	49.2	39.6	48.7	45.9	0	37.8
	8	Sampada x Jaya/3	0.44	48.8	40.8	38.9	39.5	52.4	38.4	0	37.0
	9	Varadhan	0.55	51.4	34.8	36.7	38.5	46.7	36.5	0	35.0
	10	Varadhan x BPT 5204/10	0.53	45.4	42.5	33.6	29.0	50.2	38.7	0	34.3
	11	Varadhan x BPT 5204/6	0.48	52.8	30.8	46.6	38.7	43.7	44.0	0	36.7
	12	Varadhan x MTU 1010/2	0.41	52.1	26.2	51.3	37.6	55.9	21.7	0	35.0
		T3 - 100 N Mean	**0.48**	**49.4**	**34.4**	**42.7**	**36.8**	**49.3**	**34.3**	**0**	**35.3**
		Grand Mean	**0.46**	**49.0**	**35.9**	**42.5**	**37.9**	**40.8**	**35.4**	**33**	**34.6**
		LSD (Treat)	NS								
		LSD (Location x Treat)	2.57**								
		LSD (variety)	2.02**								
		LSD (Location x variety)	5.36**								
		LSD (Treat x variety)	NS								
		LSD (location x Treat x variety)	8.91**								
		CV (%) Treat	12.61								
		CV (%) Residual	12.19								

Table 6.5.15 Variation in RUE_m of rice genotypes across eight locations Kharif 2017

Treat	S.No.	Genotypes	CBT	IIRR	KJT	MTU	PNR	PTB	RPR	TTB
			RUE_m	RUE_m	RUE_m	RUE_m	RUE_m	RUE_m	RUE_m	RUE_m
T1 (0 kg N/ha)	1	BPT-5204	0.34	0.43	0.17	0.38	0.41	1.37	0.34	0.54
	2	Jaya	0.32	0.51	0.12	0.48	0.36	1.51	0.33	0.50
	3	MTU-1010	0.37	0.43	0.14	0.46	0.31	1.70	0.31	0.49
	4	Rasi	0.35	0.52	0.12	0.89	0.34	2.03	0.43	0.57
	5	Rasi x Jaya/2	0.37	0.37	0.12	0.29	0.40	2.42	0.34	0.70
	6	Sampada	0.36	0.39	0.12	0.63	0.48	2.20	0.47	1.01
	7	Sampada x Jaya/2	0.40	0.37	0.20	0.96	0.55	2.22	0.38	0.93
	8	Sampada x Jaya/3	0.31	0.48	0.08	0.33	0.38	2.03	0.29	0.57
	9	Varadhan	0.31	0.49	0.14	0.36	0.39	1.19	0.22	0.51
	10	Varadhan x BPT 5204/10	0.44	0.57	0.11	0.35	0.39	1.34	0.45	0.53
	11	Varadhan x BPT 5204/6	0.30	0.35	0.12	0.34	0.34	1.74	0.60	0.65
	12	Varadhan x MTU 1010/2	0.37	0.39	0.11	0.46	0.39	1.99	0.56	0.51
		T1-0 N Mean	**0.35**	**0.44**	**0.13**	**0.49**	**0.40**	**1.78**	**0.39**	**0.63**
T2 (50 Kg N/ha)	1	BPT-5204	0.31	0.23	0.11	0.32	0.32	0.82	0.19	0.41
	2	Jaya	0.29	0.34	0.10	0.36	0.27	0.91	0.24	0.40
	3	MTU-1010	0.34	0.26	0.10	0.28	0.27	1.10	0.42	0.40
	4	Rasi	0.31	0.44	0.10	0.39	0.22	0.86	0.43	0.54
	5	Rasi x Jaya/2	0.34	0.20	0.10	0.28	0.29	1.39	0.27	0.53
	6	Sampada	0.32	0.21	0.13	0.60	0.38	1.06	0.33	0.49
	7	Sampada x Jaya/2	0.36	0.23	0.16	0.59	0.40	1.00	0.42	0.72
	8	Sampada x Jaya/3	0.28	0.31	0.10	0.27	0.26	2.36	0.26	0.53
	9	Varadhan	0.29	0.28	0.10	0.30	0.25	0.85	0.36	0.46
	10	Varadhan x BPT 5204/10	0.39	0.28	0.10	0.36	0.27	0.82	0.32	0.48
	11	Varadhan x BPT 5204/6	0.28	0.27	0.09	0.27	0.28	0.65	0.27	0.58
	12	Varadhan x MTU 1010/2	0.33	0.33	0.09	0.31	0.29	0.58	0.28	0.47
		T2- 50 N Mean	**0.32**	**0.28**	**0.11**	**0.36**	**0.29**	**1.03**	**0.32**	**0.50**
T3 (100 Kg N/ha)	1	BPT-5204	0.32	0.18	0.14	0.25	0.21	1.02	0.22	0
	2	Jaya	0.30	0.38	0.12	0.19	0.23	2.12	0.22	0
	3	MTU-1010	0.30	0.26	0.12	0.31	0.24	2.28	0.20	0
	4	Rasi	0.31	0.26	0.15	0.36	0.23	1.66	0.29	0
	5	Rasi x Jaya/2	0.28	0.20	0.10	0.28	0.19	0.79	0.28	0
	6	Sampada	0.31	0.19	0.12	0.44	0.30	0.83	0.33	0
	7	Sampada x Jaya/2	0.31	0.21	0.11	0.55	0.30	1.93	0.32	0
	8	Sampada x Jaya/3	0.37	0.32	0.09	0.26	0.19	2.80	0.23	0
	9	Varadhan	0.28	0.26	0.08	0.27	0.20	2.07	0.37	0
	10	Varadhan x BPT 5204/10	0.28	0.29	0.11	0.26	0.21	1.79	0.38	0
	11	Varadhan x BPT 5204/6	0.34	0.24	0.08	0.25	0.19	1.79	0.26	0
	12	Varadhan x MTU 1010/2	0.27	0.34	0.09	0.32	0.19	1.69	0.47	0
		T3 -100 N Mean	**0.31**	**0.26**	**0.11**	**0.31**	**0.22**	**1.79**	**0.30**	**0**
		Expt. Mean	**0.33**	**0.33**	**0.12**	**0.39**	**0.30**	**1.48**	**0.34**	**0.56**
		CD(0.05)	0.01	0.05	0.01	0.03	0.02	0.45	0.02	0.11
		CV(%)	3.04	17.04	8.02	8.60	8.73	32.62	6.70	17.44
		M and T	0.02	ns	0.01	0.05	0.04	0.78	0.04	0.16
		T and M	0.02	ns	0.01	0.05	0.04	0.97	0.04	0.16

Table 6.5.16 Variation in APAR_m of rice genotypes across eight locations Kharif 2017

Treat	S.No.	Genotypes	CBT	IIRR	KJT	MTU	PNR	PTB	RPR	TTB
			APAR_m	APAR_m	APAR_m	APAR_m	APAR_m	APAR_m	APAR_m	APAR_m
T1 (0 kg N/ha)	1	BPT-5204	360	322	248	300	367	312	321	256
	2	Jaya	373	354	260	331	427	313	337	256
	3	MTU-1010	405	357	269	332	422	368	337	301
	4	Rasi	392	360	261	333	391	368	337	289
	5	Rasi x Jaya/2	365	325	249	297	367	316	321	256
	6	Sampada	354	321	249	299	341	316	321	256
	7	Sampada x Jaya/2	358	320	248	306	341	322	321	256
	8	Sampada x Jaya/3	391	354	248	308	396	368	330	284
	9	Varadhan	405	357	258	334	427	314	340	287
	10	Varadhan x BPT 5204/10	406	354	264	325	422	324	340	287
	11	Varadhan x BPT 5204/6	364	334	246	299	369	316	326	256
	12	Varadhan x MTU 1010/2	364	354	260	332	427	313	337	291
		T1-0 N Mean	**378**	**343**	**255**	**316**	**391**	**328**	**331**	**273**
T2 (50 Kg N/ha)	1	BPT-5204	361	325	251	300	363	314	321	256
	2	Jaya	372	356	261	332	420	323	337	258
	3	MTU-1010	406	362	272	331	418	353	337	301
	4	Rasi	387	360	266	306	386	325	337	291
	5	Rasi x Jaya/2	372	326	248	321	363	311	321	256
	6	Sampada	353	323	249	307	335	315	321	256
	7	Sampada x Jaya/2	355	323	246	301	335	330	321	256
	8	Sampada x Jaya/3	387	360	248	331	391	368	330	287
	9	Varadhan	405	362	260	330	418	324	341	287
	10	Varadhan x BPT 5204/10	406	362	269	328	418	308	341	294
	11	Varadhan x BPT 5204/6	363	330	249	301	369	323	326	258
	12	Varadhan x MTU 1010/2	360	354	260	332	420	337	337	291
		T2- 50 N Mean	**377**	**345**	**257**	**318**	**386**	**327**	**331**	**274**
T3 (100 Kg N/ha)	1	BPT-5204	363	333	248	300	360	318	321	0
	2	Jaya	372	366	260	325	418	334	337	0
	3	MTU-1010	404	374	272	329	413	348	337	0
	4	Rasi	389	370	260	340	386	335	337	0
	5	Rasi x Jaya/2	363	328	251	302	360	316	321	0
	6	Sampada	354	332	251	296	332	320	321	0
	7	Sampada x Jaya/2	353	329	246	301	332	326	321	0
	8	Sampada x Jaya/3	389	366	251	336	391	367	330	0
	9	Varadhan	403	372	258	339	413	333	341	0
	10	Varadhan x BPT 5204/10	404	366	264	338	413	309	341	0
	11	Varadhan x BPT 5204/6	363	328	246	308	367	314	326	0
	12	Varadhan x MTU 1010/2	366	366	261	336	416	339	337	0
		T3 -100 N Mean	**377**	**353**	**256**	**321**	**383**	**330**	**331**	**0**
		Expt. Mean	**377**	**347**	**256**	**318**	**387**	**328**	**331**	**274**
		CD(0.05)	4.67	2.79	ns	2.19	ns	9.25	0.51	0.52
		CV(%)	1.32	0.86	0	0.74	0	3.02	0.17	0.16
		M and T	ns	4.83	ns	3.79	ns	16	ns	0.74
		T and M	ns	4.87	ns	3.8	ns	15.6	ns	0.72

6.6 Screening of rice varieties for tolerance to low light stress

Locations: NRRI, IIRR, PNR, MTU, TTB, KJT and RPR

The high yield potential of improved rice plant types is mostly expressed with adequate solar radiation during the dry season. Grain yield is comparatively low during the wet season due to cloudy days with inadequate light intensity. It is reported that grain yield correlates positively with solar radiation, especially during later stages of crop growth. It is estimated that, a cumulative solar radiation of 200 hrs bright sunshine during the 30 day before harvest could be optimum for grain yield. Vamadevan and Murthy reported that, a traditional rice growing areas in India were exposed to less than 450 hrs of bright sunshine from July to September. The west coast and major parts of eastern and north eastern India receive less than 300 hrs of sunshine during this period. Keeping the above points in view, and low productivity levels of rice in eastern and north eastern India a trail was constituted in the 51st ARGM to screen elite germplasm from AICRIP trails for low light stress tolerance and identify donors to improve the breeding programs in low light stress tolerance environments. It is also established that, poor grain yield during wet season is attributed to low incidental light, which reduces grain number per panicle in short duration rice varieties, increases spikelet sterility in medium duration varieties, and decreases panicle number in long duration varieties. Low light stress at anthesis leads to high spikelet sterility and low harvest index because of poor grain filling in rice attributed to unbalanced source-sink relationship. The trail was conducted at seven locations with material from AVT II from eastern and north eastern India and screened for tolerance to low light stress with Swarnaprabha as check. The trail was conducted in split plot RCBD design with three replications, with light regimes as main plot treatment and genotypes as sub plot treatment. Low light treatments were imposed immediately after transplanting by enclosing the plots in shade net (50% transmittance), the shade net was supported by metal rods/ bamboo poles.

Low light stress did not resulted in significant variation in days to flowering in tested genotypes. There was no variation in mean days to 50% flowering under control and low light stress conditions, however varietal variation was significant ($p<0.01$). Among the tested locations, days to 50% flowering was more at KJT, followed by MTU and PNR (Fig. 1A). The mean days to 50% flowering was varied from 91 – 116 days under control condition and 84 – 111 days under low light stress condition. Interaction was significant for location x

treatment ($p<0.01$) and location x variety ($p<0.01$), which was indicating the varied response of tested varieties by location and treatment (Figure 1B).

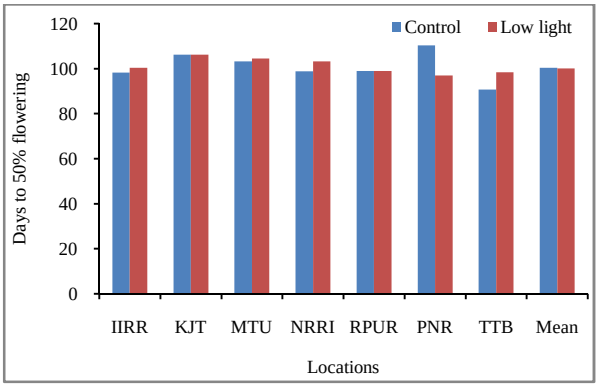


Fig. 1A: Effect of low light stress on days to flowering. Each value represents mean of all varieties

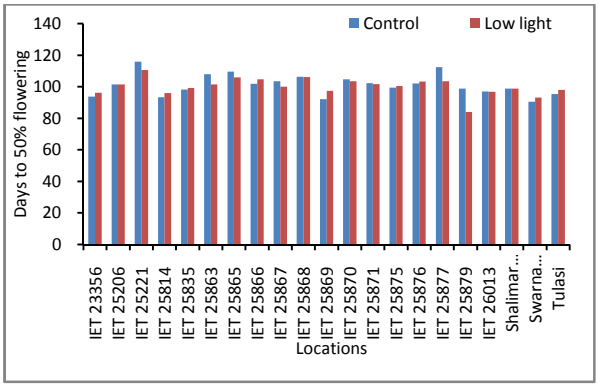


Fig. 1B: Effect of low light stress on days to flowering. Each value represents mean of all locations

Days to maturity was varied in similar manner to the flowering period. There was no significant variation in days to maturity between treatments and among the varieties (Fig. 2A and 2B). However, significant varietal variation was observed with respect to location and treatment ($p<0.01$). Days to maturity was varied between 94 – 153 and 107 – 147 with a mean of 123 and 124 days under control and low light stress respectively. Among the locations, maximum mean days to maturity were recorded at NRRI followed by KJT and PNR (Fig. 2A).

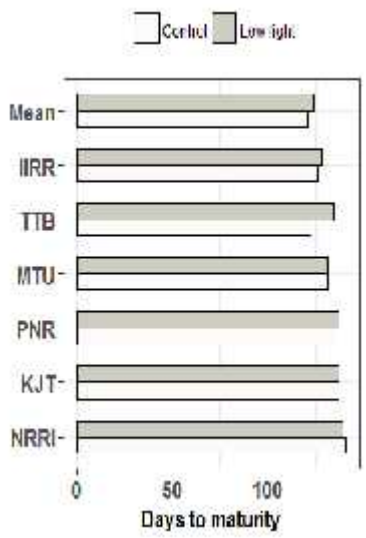


Fig. 2A: Effect of low light stress on days to maturity. Each value represents mean of all varieties

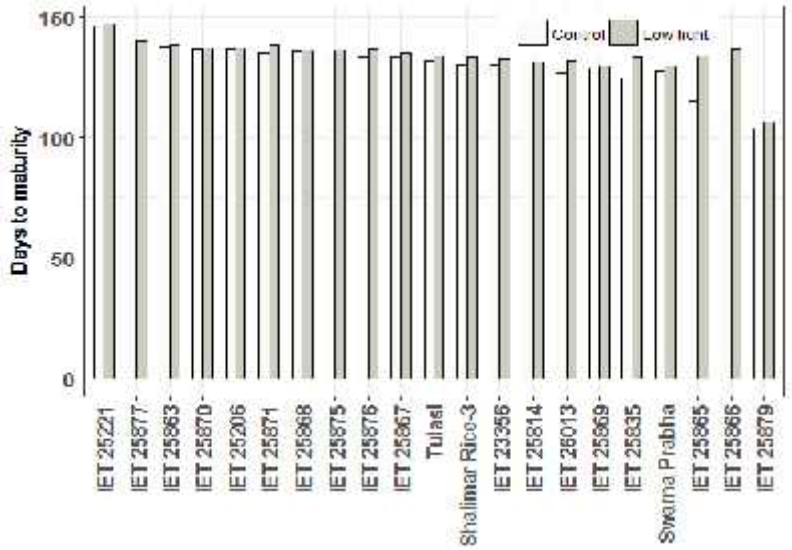


Fig. 2B: Effect of low light stress on days to maturity. Each value represents mean of all locations

There was no significant variation in plant height with the limitation in light radiation but among tested varieties and locations significant variation was detected. Mean plant height

was varied from 91 – 128.8 and 89.7 – 126.9 under control and low light stress conditions respectively. Among the tested varieties, highest mean plant height was recorded in IET 25877 and among the locations, greater plant height was observed at PNR location followed by MTU and TTB (Fig. 3A). When compared to check Swarnaprabha, three varieties (IET 25877, Shalimar Rice-3 and IET 25867) were found be superior in terms of plant height under low light stress conditions (Fig. 3B). The light intensity was significantly reduced inside the shade net and the reduction was more at PNR location followed by RPR and TTB.

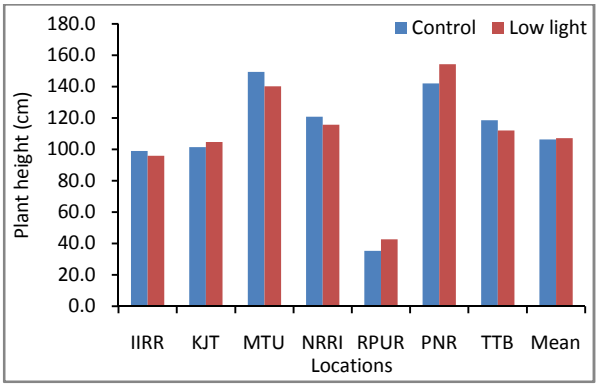


Fig. 3A: Effect of low light stress on Plant height. Each value represents mean of all varieties

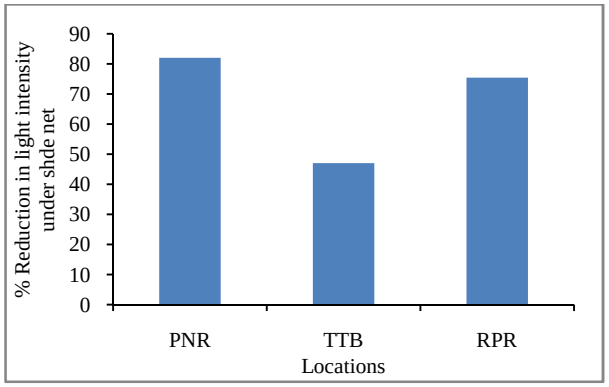


Fig. 3B: Percent reduction in light intensity under shade net. Each value represents mean of all varieties

Leaf weight at flowering was reduced under low light stress. The mean leaf weight was varied between 253 – 398 g/m^2 and 243 – 345 g/m^2 with a mean of 319 and 291 g/m^2 under control and low light stress conditions respectively. Highest leaf weight was observed in IET 26013 and IET 25875 under control and low light conditions. Among the tested locations, leaf weight was maximum at KJT (882 g/m^2) followed by PNR (393 g/m^2) and MTU (251 g/m^2). Interaction was found to be significant for location x treatment ($p<0.01$) and location x variety ($p<0.01$), which was indicating the diverse performance of tested varieties under different locations.

Stem weight (g/m^2) at flowering stage was reduced by 30% under low light stress condition (Fig. 4A). The mean stem weight at flowering was highest at PNR location under control and low light stress conditions. Highest reduction in stem weight (g/m^2) was observed at TTB (46%) followed by PNR (40%) and IIRR (31%) locations. Mean stem weight (g/m^2) was varied between 508 – 850 and 382 – 658 with a mean of 710 and 498 g/m^2 under control and low light stress conditions respectively. Significant interaction was observed in stem weight for location x treatment ($p<0.01$) and location x variety ($p<0.01$). Reduction in mean stem weight was maximum in IET 25879 (49.9%), followed by IET 25871 (48.1%) and IET

25870 (46.2%). Among the tested varieties, IET 25877 and IET 25863 showed higher mean stem weight (g/m^2) under control and light stress conditions respectively.

Significant differences were observed in panicle weight between treatments ($p<0.05$) and the interaction was found to be significant for location x treatment and location x variety ($p<0.01$). Panicle weight was varied from 169 – 331 and 116 – 285 with a mean of 268 and 116 g/m^2 under control and low light stress conditions respectively. Among the tested varieties, IET 25877 and IET 25814 showed higher panicle weight (g/m^2) under control and low light stress levels. With the limitation in light radiation, panicle weight was reduced significantly (23%) and the reduction was more at RPR location followed by TTB and IIRR (Fig. 4B). Low light stress resulted in greater extent of reduction in panicle weight in Tulasi (54%) followed by Swarnaprabha (48%).

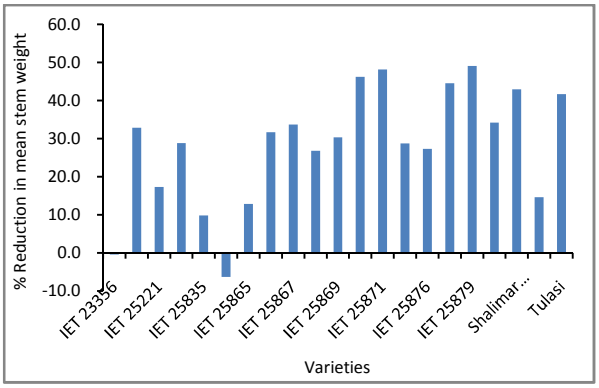


Fig. 4A: Effect of low light stress on reduction in stem weight (g/m^2). Each value represents mean of all locations.

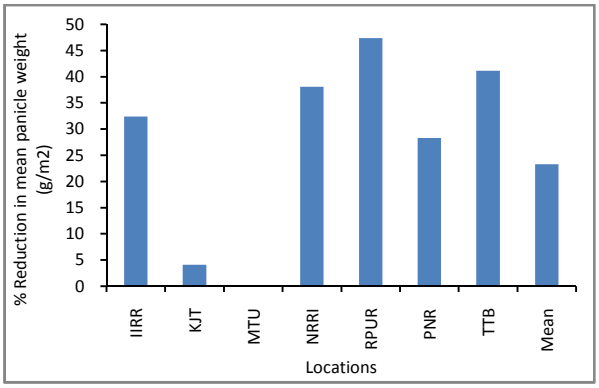


Fig. 4B: Effect of low light stress on reduction in panicle weight (g/m^2). Each value represents mean of all varieties.

Significant differences was observed in total dry matter at flowering (g/m^2) (TDM) between treatments ($p<0.05$) and the interaction was found to be significant for location x treatment ($p<0.01$) and location x variety ($p<0.01$). Mean TDM at flowering was varied between 951 – 1397 and 911 – 1354 with a mean of 1207 and 1042 under control and low light stress conditions respectively. Imposition of low light stress resulted in significant reduction in TDM at flowering (14%) and the reduction was more at RPUR location followed by TTB and PNR. Among the tested varieties, IET 25877 and IET 25875 showed greater TDM under control and low light conditions respectively. Similar trend was observed for TDM at maturity, TDM at maturity was significantly reduced under low light stress and the reduction was more at RPUR and TTB (42%) locations followed by PNR and NRRI. Among tested varieties, IET 25868 and IET 25875 showed greater TDM at maturity under control and low light stress conditions (Fig. 5A).

Shoot weight was recorded at maturity stage and the data was presented under tables. The mean shoot weight was reduced by 32% under low light stress and the reduction was more at TTB (32%) followed by RPUR (44%) and PNR (38%) locations. Significant interaction was observed in stem weight (g/m^2) and among the tested varieties, IET 25877 and IET 25875 showed better shoot weight under control and low light stress conditions. With the imposition of low light stress, genotypes such as IET 25814 and IET 25863 were able to maintain better shoot weight.

Panicle number/m^2 was reduced under low light stress (33% reduction) and the mean panicle weight was varied from 263 – 487 and 179 – 273 with a mean of 335 and 223/m^2 under control and low light conditions. Among the tested varieties, IET 23356 (12% reduction) and IET 25870 (13% reduction) were able to maintain good number of panicles under low light stress. Low light stress resulted in lowest panicle number/m^2 at RPUR followed by KJT and PNR (Fig. 5B).

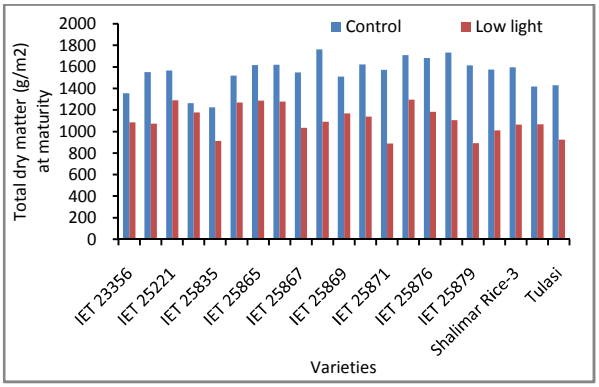


Fig. 5A: Effect of low light stress on total dry matter at flowering (g/m^2). Each value represents mean of all locations.

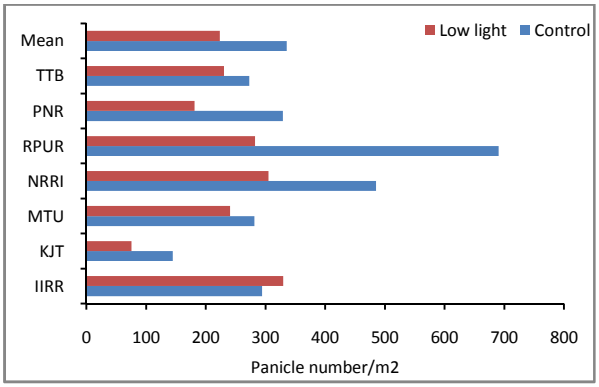


Fig. 5B: Effect of low light stress on reduction in panicle weight (g/m^2). Each value represents mean of all varieties.

Grain number per panicle was recorded at maturity stage and significant differences were observed in grain number per panicle between treatments ($p<0.05$) and the interaction was found to be significant. Grain number per panicle was varied from 58 - 120 and 32 - 118 with a mean of 91 and 69 under control and low light stress conditions respectively. Effect of low light stress resulted in reduction in grain number per panicle to greater extent at IIRR (45%) location followed by PNR (42%) and MTU (39%) locations. Genotypic response to low light stress was not uniform with respect to grain number per panicle (Figure 6A). Among the varieties, higher grain number per panicle was detected in IET 23356 and IET 25877 under control and low light stress respectively. Spikelet number per panicle, grain

number/m^2 and spikelet number/m^2 was recorded at maturity and significant variation was observed between treatments and the interaction was significant. Spikelet number and grain number per panicle and per square meter were varied in the similar manner as grain number per panicle.

Solar radiation limitation resulted in significant reduction ($p<0.01$) in grain yield and the interaction was found to be significant for location x treatment ($p<0.01$) and location x variety ($p<0.01$). Grain yield/m^2 was varied from 317 – 552 g/m^2 and 191 – 355 g/m^2 with a mean of 432 and 256 g/m^2 under control and low light stress condition respectively (Figure 6B). Low light stress resulted in >40% reduction in grain yield/m2 at IIRR, NRRI, RPUR and TTB locations with a mean of 41%. Among the tested varieties, highest grain yield/m^2 was shown by Swarnaprabha followed by IET 25865 under low light stress conditions.

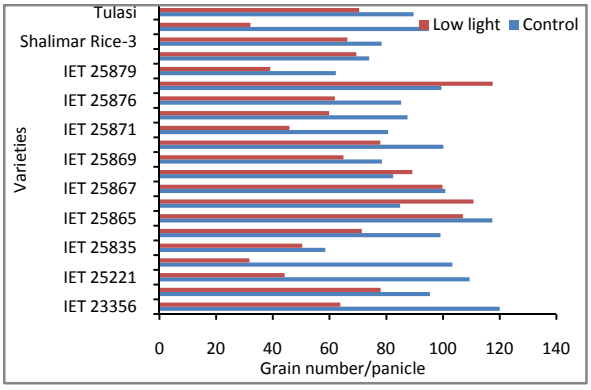


Fig. 6A: Effect of low light stress on grain number/ panicle. Each value represents mean of all locations.

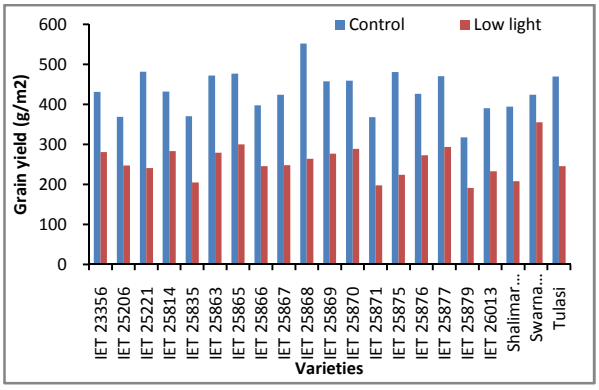


Fig. 6B: Effect of low light stress on grain yield/m^2. Each value represents mean of all varieties.

Test weight (1000 grain weight (g)) was reduced under low light stress (8% reduction) and significant differences were observed in test weight among the tested varieties ($p<0.05$). Test weight was reduced to maximum under low light stress at RPUR and TTB locations followed by MTU and IIRR. Among the tested genotypes, highest test weight was recorded in Tulasi under control and low light stress conditions (Fig. 7A). Variation in 1000 grain weight was not uniform across locations and treatments, few genotypes showed increase in test weight under low light stress conditions (Fig. 7A) and among the locations, increase in test weight was reported at PNR.

Reduced solar radiation intensity showed diminishing effect on harvest index, but the differences are statistically not significant. However, significant interaction was observed for location x treatment ($p<0.01$) and location x varieties ($p<0.01$), indicating the changes in

harvest index were different across locations. Mean harvest index was reduced by 9% under light limitation condition and the reduction was higher at NRRI and IIRR locations (26% reduction). Low light induced changes in harvest index among the tested varieties were given under Figure 7B.

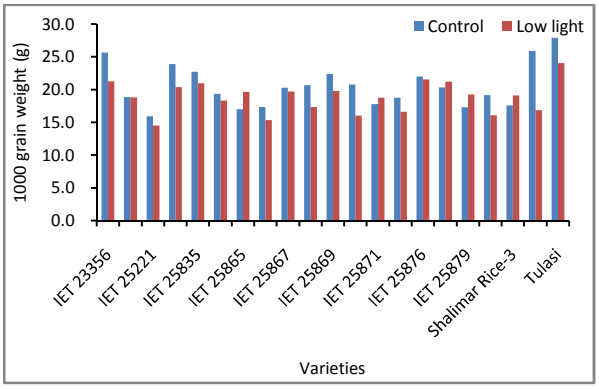


Fig. 7A: Effect of low light stress on 1000 grain weight. Each value represents mean of all locations.

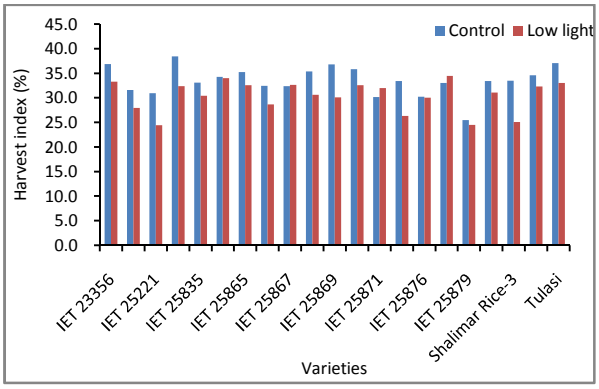


Fig. 7B: Effect of low light stress on Harvest index (%). Each value represents mean of all locations.

Summary and conclusions:

The present study was formulated during 51st ARGM of AICRIP to understand low light tolerance and to identify rice genotypes with low light tolerance. The trail was conducted at seven locations with 21 varieties, including Swarnaprabha as check variety. Results indicated low light stress resulted in significant loss in yield and its components. Under low light stress higher grain yield was shown by check swarnaprabha, followed by IET 25865. Among the tested varieties, IET 25206, IET 25814, IET 23356 showed lesser reduction in grain yield (33%, 34%, 35% reduction) under low light stress conditions. Inspire of the better grain yield (g/m2), varieties such as IET 23356 and IET 25835 showed lower extent of reduction in stem weight and shoot weight at maturity under low light stress conditions. IET 25876 under low light stress maintained better grain yield (36% reduction), panicle weight at flowering (11% reduction), TDM (10% reduction) at flowering and harvest index (1% reduction).

Table 6.6.1 Influence of low-light stress on days to flowering in different rice varieties during Kharif 2017

S.No.	Entries	Control							Grand Mean	Treated (Low light)							Grand Mean
		IIRR	KJT	MTU	NRRI	RPUR	PNR	TTB		IIRR	KJT	MTU	NRRI	RPUR	PNR	TTB	
1	IET 23356	91	103	105	94	94	86	84	94	93	103	99	98	92	100	90	96
2	IET 25206	102	103	100	106	102	105	96	101	104	103	101	109	99	97	104	101
3	IET 25221	103	113	116	115	105	139	120	116	103	113	115	119	99	103	130	111
4	IET 25814	88	104	97	90	94	89	88	93	91	104	101	94	94	89	97	96
5	IET 25835	87	104	101	96	94	114	89	98	90	104	101	100	99	102	99	99
6	IET 25863	102	113	103	107	100	140	89	108	105	113	104	114	99	91	97	101
7	IET 25865	102	113	111	110	101	139	92	110	104	113	112	109	106	102	99	106
8	IET 25866	102	113	99	95	99	108	90	102	104	113	102	99	104	108	97	105
9	IET 25867	88	113	104	107	105	115	96	103	90	113	104	109	102	87	104	100
10	IET 25868	102	103	115	103	105	124	89	106	104	103	116	107	105	105	104	106
11	IET 25869	88	101	99	96	94	86	85	92	90	101	101	106	94	108	90	97
12	IET 25870	102	104	115	103	103	116	89	105	104	104	103	111	105	110	94	103
13	IET 25871	101	113	100	102	103	100	97	102	105	113	103	109	99	86	104	102
14	IET 25875	102	101	101	94	97	107	89	100	104	101	101	99	99	100	97	100
15	IET 25876	102	104	104	94	104	111	87	102	104	104	111	98	105	102	94	103
16	IET 25877	120	111	116	110	105	136	87	113	122	111	112	114	105	77	94	103
17	IET 25879	102	106	0	105	94	106	86	99	104	106	0	109	99	102	93	84
18	IET 26013	88	106	96	85	89	108	94	97	90	106	101	89	89	94	101	97
19	Shalimar Rice-3	101	101	100	94	97	108	86	99	103	101	101	98	92	102	94	99
20	Swarna Prabha	88	101	90	85	92	86	86	91	90	101	97	89	94	86	91	93
21	Tulasi	101	101	93	85	99	94	85	95	103	101	106	89	99	86	93	98
	Mean	**98**	**106**	**103**	**99**	**99**	**110**	**91**	**100**	**100**	**106**	**105**	**103**	**99**	**97**	**98**	**100**
	LSD (Treat)											*NS*					
	LSD (Location x Treat)											*0.135***					
	LSD (variety)											*0.332***					
	LSD(Location x variety)											*0.44***					
	LSD (Treat x variety)											*NS*					
	LSD (location x Treat x variety)											*NS*					
	CV(%)											*3.1*					

Table 6.6.2 Influence of low-light stress on days to maturity in different rice varieties during Kharif 2017

S.No.	Entries	Control							Grand Mean	Treated (Low light)							Grand Mean
		IIRR	KJT	MTU	NRRI	RPUR	PNR	TTB		IIRR	KJT	MTU	NRRI	RPUR	PNR	TTB	
1	IET 23356	119	144	135	125	133	130	120	130	101	144	136	130	135	151	130	133
2	IET 25206	131	142	130	134	150	0	130	137	133	142	136	141	140	128	146	138
3	IET 25221	132	141	151	144	155	0	153	146	132	141	150	150	149	0	165	147
4	IET 25814	116	137	136	122	138	128	124	130	119	137	136	122	133	127	135	131
5	IET 25835	116	139	136	125	138	0	94	125	118	139	136	127	138	0	135	133
6	IET 25863	130	142	133	135	150	152	119	138	134	142	130	146	140	152	133	138
7	IET 25865	132	144	141	138	150	0	126	116	133	144	142	140	147	0	135	140
8	IET 25866	129	143	136	124	138	0	122	111	133	143	138	131	138	0	133	137
9	IET 25867	116	142	138	135	138	137	130	133	118	142	136	137	140	137	138	135
10	IET 25868	132	132	143	131	150	124	135	136	133	132	143	139	142	124	143	136
11	IET 25869	117	131	136	124	133	133	122	129	118	131	136	140	133	133	129	130
12	IET 25870	131	130	147	131	145	150	118	137	133	130	136	139	145	150	130	137
13	IET 25871	129	144	136	130	138	0	129	135	134	144	136	137	138	0	139	138
14	IET 25875	130	132	134	123	138	151	123	135	133	132	134	131	138	151	130	136
15	IET 25876	130	142	136	121	138	0	120	133	133	142	138	130	142	0	129	137
16	IET 25877	140	141	143	139	150	0	121	139	151	141	140	142	142	0	128	140
17	IET 25879	129	135	0	133	138	0	119	104	133	135	0	136	138	0	127	107
18	IET 26013	116	132	136	114	133	0	118	127	118	132	142	120	133	0	135	132
19	Shalimar Rice-3	130	131	136	121	138	0	117	130	132	131	140	126	138	0	126	133
20	Swarna Prabha	117	132	138	113	133	129	119	128	118	132	142	117	133	129	125	130
21	Tulasi	129	135	140	113	138	131	118	132	132	135	140	116	138	131	128	134
	Mean	**126**	**138**	**132**	**127**	**141**	**137**	**123**	**121**	**128**	**138**	**132**	**133**	**139**	**138**	**134**	**124**
	LSD (Treat)								*NS*								
	LSD (Location x Treat)								*0.806***								
	LSD (variety)								*NS*								
	LSD(Location x variety)								*2.61***								
	LSD (Treat x variety)								*NS*								
	LSD (location x Treat x variety)								*NS*								
	CV(%)								*1.43*								

Table 6.6.3 Influence of low-light stress on plant height (cm) at flowering in different rice varieties during Kharif 2017

S.No.	Entries	Control							Grand Mean	Treated (Low light)							Grand Mean
		IIRR	KJT	MTU	NRRI	RPUR	PNR	TTB		IIRR	KJT	MTU	NRRI	RPUR	PNR	TTB	
1	IET 23356	89.5	120.0	159.7	111	38.9	143.3	115.3	111.1	103.2	105.0	132.3	115	42.1	172.7	118.3	112.3
2	IET 25206	101.0	113.3	134.3	129	31.7	169.0	124.7	112.3	101.2	108.3	129.7	114	42.8	135.3	111.0	104.7
3	IET 25221	98.7	95.3	139.7	132	31.1	129.3	110.3	100.7	78.3	101.2	122.3	123	40.0	178.7	92.3	102.1
4	IET 25814	97.8	94.3	119.3	98	37.2	102.3	95.0	91.0	77.7	81.7	104.7	96	40.4	166.7	100.7	95.3
5	IET 25835	92.5	96.0	119.3	84	38.9	121.0	100.0	94.6	83.5	94.0	96.7	84	43.9	139.3	81.0	89.7
6	IET 25863	81.8	76.0	140.7	106	40.3	121.7	107.0	94.6	81.5	95.8	130.0	102	40.3	148.7	106.3	100.4
7	IET 25865	97.0	97.7	142.7	136	38.7	143.0	120.3	106.6	77.8	105.5	137.3	111	39.1	166.7	112.3	106.5
8	IET 25866	102.3	100.0	154.0	135	38.1	148.7	117.0	110.0	99.3	106.7	149.0	122	43.8	165.0	109.3	112.2
9	IET 25867	96.3	100.7	145.7	107	35.7	138.7	114.7	105.3	87.5	109.8	186.0	105	39.5	163.0	125.0	118.5
10	IET 25868	107.0	85.3	146.0	133	35.9	140.7	106.7	103.6	103.5	88.2	133.3	108	46.0	124.3	107.7	100.5
11	IET 25869	94.3	100.7	159.0	112	38.7	142.0	127.7	110.4	90.0	116.8	136.3	119	44.8	137.3	114.3	106.6
12	IET 25870	101.2	87.0	124.0	108	31.1	123.3	113.7	96.7	103.0	96.7	115.0	115	45.4	153.7	121.7	105.9
13	IET 25871	113.7	104.3	151.7	115	37.2	126.3	123.0	109.4	102.7	99.0	119.7	111	44.2	147.3	122.3	105.9
14	IET 25875	100.5	103.7	172.3	116	35.5	157.3	129.7	116.5	105.0	107.2	166.3	119	40.9	154.0	118.3	115.3
15	IET 25876	93.0	100.3	161.0	113	32.4	151.7	123.3	110.3	88.7	108.3	115.0	134	42.5	156.3	114.0	104.1
16	IET 25877	123.0	121.0	202.7	157	29.9	152.3	144.0	128.8	138.2	126.8	170.0	146	41.6	160.0	124.7	126.9
17	IET 25879	96.0	108.0	0.0	130	37.8	149.0	126.0	103.4	101.3	108.2	0.0	111	46.2	183.0	125.7	112.9
18	IET 26013	93.5	105.0	138.7	118	37.1	167.0	117.0	109.7	94.0	107.2	140.0	112	46.1	161.3	100.0	108.1
19	Shalimar Rice-3	99.7	105.0	174.0	140	32.6	172.7	134.3	119.7	105.3	108.2	195.0	121	42.0	142.7	132.0	120.9
20	Swarna Prabha	95.5	112.7	161.3	133	31.6	144.7	122.0	111.3	98.0	126.2	200.0	143	44.1	126.0	109.7	117.3
21	Tulasi	104.5	101.7	142.3	126	31.9	137.7	116.3	105.7	95.3	98.0	124.3	118	39.8	157.3	106.7	103.6
	Mean	**99.0**	**101.3**	**149.4**	**120.8**	**35.3**	**142.0**	**118.5**	**106.4**	**96.0**	**104.7**	**140.2**	**115.6**	**42.6**	**154.3**	**112.1**	**107.2**
	LSD (Treat)									*NS*							
	LSD (Location x Treat)									*2.08***							
	LSD (variety)									*2.09**							
	LSD(Location x variety)									*6.74***							
	LSD (Treat x variety)									*NS*							
	LSD (location x Treat x variety)									*NS*							
	CV(%)									*4.22*							

Table 6.6.4 Influence of low-light stress on leaf weight (g/m2) at flowering in different rice varieties during Kharif 2017

S.No.	Entries	Control							Grand Mean	Treated (Low light)							Grand Mean
		IIRR	KJT	MTU	NRRI	RPUR	PNR	TTB		IIRR	KJT	MTU	NRRI	RPUR	PNR	TTB	
1	IET 23356	131	917	252	144	37	317	100	292	175	916	169	122	42	227	123	275
2	IET 25206	263	725	261	315	37	538	79	317	160	911	263	268	42	175	89	273
3	IET 25221	144	735	261	361	37	433	121	289	117	927	196	308	40	428	69	296
4	IET 25814	160	648	356	175	35	253	64	253	112	790	105	139	43	293	116	243
5	IET 25835	136	885	260	139	37	483	61	310	145	904	132	165	45	453	67	291
6	IET 25863	142	861	459	258	33	592	93	363	111	835	173	246	42	218	97	246
7	IET 25865	158	957	262	183	29	455	75	323	103	843	196	151	40	515	141	306
8	IET 25866	169	1003	266	310	35	548	82	350	168	946	234	229	42	563	84	340
9	IET 25867	233	851	189	290	31	372	85	294	168	871	240	132	39	267	89	279
10	IET 25868	111	854	374	404	33	482	97	325	181	810	368	209	42	262	93	293
11	IET 25869	200	795	170	251	35	448	90	290	161	728	197	171	42	265	126	253
12	IET 25870	314	461	330	293	31	540	79	293	176	966	142	220	40	367	86	296
13	IET 25871	142	1074	290	299	37	293	107	324	162	806	202	213	40	317	76	271
14	IET 25875	197	836	429	248	33	508	74	346	179	832	414	271	40	533	70	345
15	IET 25876	210	827	202	215	34	475	88	306	232	973	145	180	43	367	106	311
16	IET 25877	303	669	253	456	30	407	87	291	286	883	213	235	41	286	73	297
17	IET 25879	250	952	0	263	32	550	100	377	212	1012	0	228	40	282	92	327
18	IET 26013	121	1277	283	297	34	575	97	398	102	1003	211	183	42	215	103	279
19	Shalimar Rice-3	188	931	187	309	28	402	96	305	156	999	213	254	40	282	73	294
20	Swarna Prabha	152	846	203	227	31	561	119	319	86	927	249	222	42	231	101	273
21	Tulasi	172	906	313	280	26	532	82	339	137	1143	373	248	39	175	71	323
	Mean	**186**	**858**	**280**	**272**	**33**	**465**	**89**	**316**	**158**	**906**	**222**	**209**	**41**	**320**	**93**	**288**
	LSD (Treat)								*NS*								
	LSD (Location x Treat)								*28.5***								
	LSD (variety)								*NS*								
	LSD(Location x variety)								*91.03***								
	LSD (Treat x variety)								*NS*								
	LSD (location x Treat x variety)								*NS*								
	CV(%)								*20.2*								

Table 6.6.5 Influence of low-light stress on stem weight (g/m2) at flowering in different rice varieties during Kharif 2017

S.No.	Entries	Control							Grand Mean	Treated (Low light)							Grand Mean
		IIRR	KJT	MTU	NRRI	RPUR	PNR	TTB		IIRR	KJT	MTU	NRRI	RPUR	PNR	TTB	
1	IET 23356	263	845	315	132	120	1475	400	570	709	828	303	113	137	1062	394	572
2	IET 25206	738	772	639	293	108	1925	442	771	399	862	588	242	130	805	319	517
3	IET 25221	200	747	596	429	106	1518	501	611	259	661	611	352	118	1162	222	506
4	IET 25814	608	828	1783	278	101	983	598	817	233	651	1310	119	109	817	369	581
5	IET 25835	446	788	524	160	107	818	366	508	455	615	510	73	117	867	187	459
6	IET 25863	206	786	793	275	104	1353	469	618	203	625	712	205	114	2010	282	658
7	IET 25865	231	691	778	230	100	1498	567	644	253	590	743	191	120	1225	438	562
8	IET 25866	743	755	773	282	119	2058	617	844	363	589	749	193	133	1365	261	577
9	IET 25867	728	594	747	173	120	1770	541	750	467	593	734	84	138	787	268	498
10	IET 25868	203	578	783	538	97	1725	645	672	469	614	821	164	121	667	258	492
11	IET 25869	636	797	395	172	125	1667	618	706	378	779	415	128	158	825	398	492
12	IET 25870	573	822	527	153	110	2067	505	767	307	539	513	121	124	755	237	412
13	IET 25871	620	729	727	278	121	2118	540	809	305	463	773	176	133	672	174	420
14	IET 25875	728	570	853	483	130	1868	490	773	377	234	826	213	142	1365	363	551
15	IET 25876	722	576	905	212	116	1770	686	796	857	355	915	109	129	863	351	578
16	IET 25877	490	885	994	761	130	2208	395	850	242	514	932	355	142	655	234	471
17	IET 25879	845	615	0	246	119	1570	607	751	430	316	0	179	129	762	276	382
18	IET 26013	489	660	462	303	106	1722	528	661	231	490	438	257	132	1067	252	435
19	Shalimar Rice-3	642	582	334	411	124	2190	539	735	408	361	361	314	132	1018	238	420
20	Swarna Prabha	543	831	319	459	129	823	555	534	240	300	331	257	153	1430	280	456
21	Tulasi	662	740	661	357	120	1763	409	726	234	455	680	316	122	862	187	423
	Mean	**539**	**723**	**695**	**315**	**115**	**1662**	**525**	**704**	**372**	**544**	**663**	**198**	**130**	**1002**	**285**	**495**
	LSD (Treat)								*ns*								
	LSD (Location x Treat)								*27.9***								
	LSD (variety)								*ns*								
	LSD(Location x variety)								*90.4***								
	LSD (Treat x variety)								*ns*								
	LSD (location x Treat x variety)								*ns*								
	CV(%)								*10.1*								

Table 6.6.6 Influence of low-light stress on panicle weight (g/m2) at flowering in different rice varieties during Kharif 2017

S.No.	Entries	Control							Grand Mean	Treated (Low light)							Grand Mean
		IIRR	KJT	MTU	NRRI	RPUR	PNR	TTB		IIRR	KJT	MTU	NRRI	RPUR	PNR	TTB	
1	IET 23356	51	606	0	133	142	303	128	246	78	678	0	82	103	215	87	232
2	IET 25206	148	560	0	237	210	163	144	245	85	647	0	153	198	68	55	210
3	IET 25221	74	618	0	219	369	128	120	262	95	720	0	158	213	223	47	260
4	IET 25814	133	608	0	137	412	128	109	278	58	679	0	65	96	500	93	285
5	IET 25835	90	810	0	176	360	147	105	302	76	797	0	37	84	192	52	240
6	IET 25863	60	314	0	270	171	197	101	169	61	405	0	97	100	100	74	148
7	IET 25865	45	524	0	315	489	318	121	299	91	586	0	183	137	85	111	202
8	IET 25866	157	532	0	142	169	467	118	289	59	567	0	91	168	342	63	240
9	IET 25867	148	608	0	166	350	123	112	268	63	603	0	56	132	175	62	207
10	IET 25868	38	688	0	388	137	318	114	259	97	603	0	146	184	150	63	219
11	IET 25869	82	882	0	143	329	212	105	322	83	782	0	104	198	132	98	258
12	IET 25870	90	685	0	82	272	467	113	325	54	687	0	42	117	198	65	224
13	IET 25871	114	728	0	142	182	143	95	253	54	713	0	178	151	182	52	230
14	IET 25875	130	346	0	153	290	385	118	254	50	399	0	105	164	542	48	241
15	IET 25876	74	404	0	272	148	285	121	207	130	456	0	53	207	57	71	184
16	IET 25877	113	527	0	255	472	448	96	331	48	488	0	264	144	350	53	217
17	IET 25879	101	515	0	291	106	198	107	206	69	354	0	290	189	177	59	170
18	IET 26013	100	340	0	116	301	415	114	254	39	253	0	86	119	92	78	116
19	Shalimar Rice-3	115	554	0	150	206	428	118	284	50	423	0	119	101	148	54	155
20	Swarna Prabha	126	480	0	166	222	538	110	295	58	413	0	127	63	168	62	153
21	Tulasi	139	669	0	184	407	132	94	288	41	252	0	126	158	165	48	133
	Mean	**101**	**571**	**0**	**197**	**274**	**283**	**113**	**268**	**68**	**548**	**0**	**122**	**144**	**203**	**66**	**206**
	LSD (Treat)								*5.33**								
	LSD (Location x Treat)								*17.4***								
	LSD (variety)								*ns*								
	LSD(Location x variety)								*57.8***								
	LSD (Treat x variety)								*ns*								
	LSD (location x Treat x variety)								*ns*								
	CV(%)								*19.6*								

Table 6.6.7 Influence of low-light stress on total dry matter (g/m2) flowering in different rice varieties during Kharif 2017

S.No.	Entries	Control							Grand Mean	Treated (Low light)							Grand Mean
		IIRR	KJT	MTU	NRRI	RPUR	PNR	TTB		IIRR	KJT	MTU	NRRI	RPUR	PNR	TTB	
1	IET 23356	445	1813	626	533	492	2095	627	1016	962	2602	492	377	173	1503	604	1056
2	IET 25206	1148	1806	955	1132	695	2627	664	1316	644	2498	917	838	239	1048	463	968
3	IET 25221	418	1646	905	1207	738	2080	742	1088	471	2117	576	970	202	1813	338	920
4	IET 25814	901	1918	907	685	760	1364	771	1104	402	2670	963	389	96	1610	578	1053
5	IET 25835	671	1751	830	619	474	1448	533	951	676	2951	645	360	303	1512	306	1065
6	IET 25863	408	1536	1232	1015	356	2142	663	1056	375	2762	851	709	171	2328	452	1157
7	IET 25865	434	1526	1066	899	901	2272	762	1160	447	2064	997	655	168	1825	690	1032
8	IET 25866	1069	1631	1062	950	437	3073	817	1348	590	2746	994	662	256	2270	407	1211
9	IET 25867	1109	1767	1031	779	690	2265	739	1267	698	3247	965	333	208	1228	419	1128
10	IET 25868	351	1615	1213	1700	449	2526	855	1168	746	2102	1083	641	249	1078	415	946
11	IET 25869	917	1759	583	731	609	2327	814	1168	621	2629	540	511	331	1222	622	994
12	IET 25870	977	1666	1009	660	898	3073	697	1387	536	2678	691	492	482	1320	388	1016
13	IET 25871	876	1637	876	869	598	2555	742	1214	522	2688	829	695	584	1171	302	1016
14	IET 25875	1055	1811	1315	1143	475	2762	682	1350	606	3095	1215	714	286	2441	482	1354
15	IET 25876	1005	1559	1277	871	640	2530	895	1318	1219	2671	1102	458	299	1287	528	1184
16	IET 25877	906	1658	1296	1882	880	3063	577	1397	576	2615	1200	1041	219	1291	360	1043
17	IET 25879	1196	1839	0	994	593	2318	814	1127	711	2936	0	896	174	1220	427	911
18	IET 26013	710	1698	620	803	588	2712	738	1178	372	2803	654	635	165	1373	433	967
19	Shalimar Rice-3	945	1959	539	1094	842	3020	753	1343	613	2679	556	873	160	1448	365	970
20	Swarna Prabha	821	1975	532	1041	534	1923	784	1095	383	2379	517	766	203	1829	444	959
21	Tulasi	973	1753	1008	1035	1066	2427	585	1302	412	2462	1004	830	267	1202	306	942
	Mean	**826**	**1730**	**899**	**983**	**653**	**2410**	**727**	**1207**	**599**	**2638**	**800**	**659**	**249**	**1525**	**444**	**1042**
	LSD (Treat)								*5.33**								
	LSD (Location x Treat)								*17.4***								
	LSD (variety)								*ns*								
	LSD(Location x variety)								*57.8***								
	LSD (Treat x variety)								*ns*								
	LSD (location x Treat x variety)								*ns*								
	CV(%)								*19.6*								

Table 6.6.8 Influence of low-light stress on shoot weight (g/m2) at maturity in different rice varieties during Kharif 2017

S.No.	Entries	Control							Grand Mean	Treated (Low light)							Grand Mean
		IIRR	KJT	MTU	NRRI	RPUR	PNR	TTB		IIRR	KJT	MTU	NRRI	RPUR	PNR	TTB	
1	IET 23356	603	2345	0.0	383	472.8	1739	644	1161	535	1574	0.0	241	110	1447	570	847
2	IET 25206	578	2697	0.0	969	305.9	2736	779	1419	653	1833	0.0	749	211	1055	553	861
3	IET 25221	881	2655	0.0	1061	107.8	1836	941	1284	939	1057	0.0	849	45	1869	446	871
4	IET 25814	346	2750	0.0	479	469.0	1214	878	1131	458	1056	0.0	381	221	1548	442	745
5	IET 25835	466	1752	0.0	860	367.0	1600	577	952	454	1838	0.0	404	275	1588	319	895
6	IET 25863	576	3115	0.0	1388	244.2	1931	652	1304	421	1079	0.0	642	102	2318	396	863
7	IET 25865	759	3414	0.0	1254	341.0	2330	686	1506	571	1025	0.0	648	57	1857	543	811
8	IET 25866	441	1919	0.0	1160	313.3	3207	854	1347	537	1863	0.0	1116	241	2356	549	1109
9	IET 25867	783	2556	0.0	776	409.2	2203	976	1386	556	1858	0.0	500	101	1266	478	852
10	IET 25868	777	2170	0.0	1058	225.8	2358	952	1297	599	1805	0.0	832	54	1175	429	812
11	IET 25869	524	1687	0.0	918	241.5	1884	923	1052	502	1876	0.0	669	292	1257	663	918
12	IET 25870	721	2476	0.0	1347	307.0	2893	711	1422	554	1796	0.0	689	417	1397	352	903
13	IET 25871	727	1759	0.0	1696	356.9	2640	910	1279	466	1643	0.0	757	117	1075	247	710
14	IET 25875	803	1821	0.0	1502	121.8	2636	717	1220	477	1937	0.0	779	250	2460	543	1133
15	IET 25876	626	2011	0.0	1011	155.1	2590	960	1268	502	1596	0.0	932	260	1268	703	866
16	IET 25877	1041	2565	0.0	1510	345.5	3232	568	1550	882	1891	0.0	957	318	1225	260	915
17	IET 25879	525	1458	0.0	836	296.8	2369	897	1109	631	1637	0.0	720	176	1178	416	808
18	IET 26013	677	1870	0.0	802	722.7	2871	788	1386	437	1785	0.0	706	354	1413	346	867
19	Shalimar Rice-3	680	1428	0.0	1498	229.1	3231	744	1262	686	1600	0.0	1195	235	1347	362	846
20	Swarna Prabha	515	2688	0.0	1302	619.8	1653	861	1267	461	1415	0.0	818	247	781	456	672
21	Tulasi	584	1764	0.0	1498	412.6	2203	554	1103	417	1755	0.0	1358	265	1082	264	757
	Mean	**649**	**2233**	**0.0**	**1110**	**336.4**	**2350**	**789**	**1272**	**559**	**1615**	**0.0**	**759**	**207**	**1474**	**445**	**860**
	LSD (Treat)								*ns*								
	LSD (Location x Treat)								*61.9***								
	LSD (variety)								*ns*								
	LSD(Location x variety)								*200.3***								
	LSD (Treat x variety)								*ns*								
	LSD (location x Treat x variety)								*ns*								
	CV(%)								*15.12*								

Table 6.6.9 Influence of low-light stress on panicle weight (g/m2) at maturity in different rice varieties during Kharif 2017

S.No.	Entries	Control							Grand Mean	Treated (Low light)							Grand Mean
		IIRR	KJT	MTU	NRRI	RPUR	PNR	TTB		IIRR	KJT	MTU	NRRI	RPUR	PNR	TTB	
1	IET 23356	796	739	572	528	1055	785	407	726	450	445	403	198	349	243	316	368
2	IET 25206	680	573	705	745	1247	374	461	673	412	470	305	423	629	119	275	368
3	IET 25221	1010	312	627	1050	1194	160	505	635	560	299	262	541	413	146	203	314
4	IET 25814	505	543	407	546	1468	544	539	668	385	293	223	174	421	64	397	297
5	IET 25835	833	444	418	647	1194	289	407	598	452	222	275	200	623	59	262	316
6	IET 25863	528	659	506	1008	922	537	592	624	297	285	213	461	401	316	341	309
7	IET 25865	711	537	682	768	1650	387	566	755	392	296	318	356	357	249	452	344
8	IET 25866	516	485	748	958	899	383	535	594	366	284	328	583	680	83	390	355
9	IET 25867	700	501	572	808	1367	573	534	708	305	250	212	172	421	392	310	315
10	IET 25868	863	387	918	906	838	223	575	634	423	266	408	681	480	302	242	353
11	IET 25869	855	270	396	674	1294	196	447	576	477	237	232	524	812	48	362	362
12	IET 25870	632	293	648	607	1434	284	467	626	520	243	319	342	975	210	285	425
13	IET 25871	663	408	483	766	1194	232	493	579	205	378	309	549	889	263	271	386
14	IET 25875	723	441	748	935	987	689	547	689	294	247	391	350	719	94	234	330
15	IET 25876	608	366	484	604	1036	320	542	559	373	283	317	329	748	53	327	350
16	IET 25877	845	453	814	1004	1731	739	403	831	606	230	334	641	763	249	275	409
17	IET 25879	600	477	0	739	1009	525	503	519	422	277	0	412	556	222	272	292
18	IET 26013	990	535	328	585	1571	247	511	697	429	241	208	422	651	214	358	350
19	Shalimar Rice-3	672	349	407	700	1292	258	611	598	292	265	332	652	532	383	235	340
20	Swarna Prabha	743	345	254	785	1315	716	496	605	527	265	195	727	523	397	271	363
21	Tulasi	546	903	439	808	1911	464	427	782	347	343	217	796	718	134	237	333
	Mean	**715**	**477**	**531**	**770**	**1266**	**425**	**503**	**651**	**406**	**291**	**276**	**454**	**603**	**202**	**301**	**347**
	LSD (Treat)																
	LSD (Location x Treat)																
	LSD (variety)																
	LSD(Location x variety)																
	LSD (Treat x variety)																
	LSD (location x Treat x variety)																
	CV(%)																

Table 6.6.10 Influence of low-light stress on panicle number/m2 at maturity in different rice varieties during Kharif 2017

S.No.	Entries	Control							Grand Mean	Treated (Low light)							Grand Mean
		IIRR	KJT	MTU	NRRI	RPUR	PNR	TTB		IIRR	KJT	MTU	NRRI	RPUR	PNR	TTB	
1	IET 23356	280	185	309	303	300	266	242	264	313	105	288	147	243	243	200	232
2	IET 25206	253	118	289	543	743	311	225	323	367	97	249	250	256	148	250	228
3	IET 25221	480	117	279	463	317	267	320	297	423	69	265	423	64	208	218	208
4	IET 25814	223	162	254	283	369	368	290	278	510	71	202	196	343	107	238	245
5	IET 25835	357	118	257	476	666	361	298	343	377	70	222	273	164	197	242	212
6	IET 25863	280	124	358	709	603	413	297	346	333	74	311	280	343	226	255	257
7	IET 25865	283	193	292	596	584	323	319	332	330	78	271	226	192	155	313	223
8	IET 25866	203	111	350	363	1068	425	215	395	280	92	302	286	477	208	188	258
9	IET 25867	277	112	318	493	324	267	280	263	250	68	232	123	233	140	195	186
10	IET 25868	357	118	374	456	424	343	382	333	250	79	328	403	287	151	260	226
11	IET 25869	340	121	213	410	504	245	235	276	423	67	200	366	245	160	232	221
12	IET 25870	280	113	239	363	712	189	255	298	317	73	213	193	523	175	255	259
13	IET 25871	317	125	245	576	1580	232	282	463	223	79	201	290	252	139	253	191
14	IET 25875	330	111	363	603	923	530	265	421	253	70	309	246	81	157	240	185
15	IET 25876	253	122	382	390	934	267	308	378	293	72	282	273	534	175	280	273
16	IET 25877	250	152	409	356	456	345	290	317	243	78	340	256	338	166	259	237
17	IET 25879	200	233	0	443	664	350	208	276	350	67	0	286	293	222	141	179
18	IET 26013	387	223	194	446	958	247	223	372	317	63	184	286	273	153	212	200
19	Shalimar Rice-3	297	191	254	559	1415	515	247	487	343	68	170	523	210	255	179	204
20	Swarna Prabha	290	145	189	726	564	380	213	297	410	64	186	516	302	234	205	233
21	Tulasi	240	146	341	636	392	273	332	287	320	78	305	563	286	192	223	234
	Mean	**294**	**145**	**281**	**485**	**690**	**329**	**273**	**335**	**330**	**75**	**241**	**305**	**283**	**181**	**230**	**223**
	LSD (Treat)								*ns*								
	LSD (Location x Treat)								*14.6***								
	LSD (variety)								*ns*								
	LSD(Location x variety)								*47.6***								
	LSD (Treat x variety)								*ns*								
	LSD (location x Treat x variety)								*ns*								
	CV(%)								*11.3*								

Table 6.6.11 Influence of low-light stress on grain number/panicle at maturity in different rice varieties during Kharif 2017

S.No.	Entries	Control							Grand Mean	Treated (Low light)							Grand Mean
		IIRR	KJT	MTU	NRRI	RPUR	PNR	TTB		IIRR	KJT	MTU	NRRI	RPUR	PNR	TTB	
1	IET 23356	99	0.0	121	68	161	177	161	120	53	0.0	55	46	122	31	122	64
2	IET 25206	105	0.0	102	112	183	0	183	95	54	0.0	64	92	165	20	165	78
3	IET 25221	75	0.0	122	107	230	0	230	109	58	0.0	54	64	76	0	76	44
4	IET 25814	90	0.0	75	111	180	94	180	103	27	0.0	45	53	58	2	58	32
5	IET 25835	69	0.0	66	76	108	0	108	58	35	0.0	27	63	120	0	120	50
6	IET 25863	87	0.0	99	115	176	57	176	99	44	0.0	41	94	137	70	137	71
7	IET 25865	121	0.0	87	145	248	0	248	117	61	0.0	70	108	227	57	227	107
8	IET 25866	112	0.0	108	153	145	0	145	85	57	0.0	83	131	262	0	262	111
9	IET 25867	108	0.0	99	156	167	65	167	101	61	0.0	83	103	201	53	201	100
10	IET 25868	103	0.0	120	166	126	20	126	82	82	0.0	88	93	183	0	183	89
11	IET 25869	110	0.0	102	115	123	12	123	78	53	0.0	34	92	150	2	150	65
12	IET 25870	99	0.0	104	134	165	67	165	100	81	0.0	71	98	158	0	158	78
13	IET 25871	77	0.0	113	109	147	0	147	81	40	0.0	44	82	78	35	78	46
14	IET 25875	94	0.0	105	139	159	7	159	87	56	0.0	56	106	120	7	120	60
15	IET 25876	73	0.0	89	89	175	0	175	85	42	0.0	54	44	137	2	137	62
16	IET 25877	136	0.0	124	186	169	0	169	100	98	0.0	81	156	242	43	242	118
17	IET 25879	104	0.0	0	111	134	0	134	62	43	0.0	0	62	94	3	94	39
18	IET 26013	90	0.0	69	45	142	0	142	74	51	0.0	46	36	160	0	160	69
19	Shalimar Rice-3	110	0.0	62	130	149	0	149	78	30	0.0	54	63	137	39	137	66
20	Swarna Prabha	81	0.0	39	46	151	147	151	95	40	0.0	37	37	37	42	37	32
21	Tulasi	69	0.0	104	75	154	56	154	90	35	0.0	67	35	158	4	158	70
	Mean	**96**	**0.0**	**91**	**114**	**162**	**33**	**162**	**91**	**52**	**0.0**	**55**	**79**	**144**	**20**	**144**	**69**
	LSD (Treat)								2.5*								
	LSD (Location x Treat)								8.1**								
	LSD (variety)								10.7**								
	LSD(Location x variety)								26.2**								
	LSD (Treat x variety)								15.1**								
	LSD (location x Treat x variety)								ns								
	CV(%)								21.9								

Table 6.6.12 Influence of low-light stress on spikelet number/panicle at maturity in different rice varieties during Kharif 2017

S.No.	Entries	Control							Grand Mean	Treated (Low light)							Grand Mean
		IIRR	KJT	MTU	NRRI	RPUR	PNR	TTB		IIRR	KJT	MTU	NRRI	RPUR	PNR	TTB	
1	IET 23356	115	0	128	106	173	251	173	140	104	0	58	55	147	186	147	107
2	IET 25206	124	0	125	165	199	241	199	148	77	0	65	141	189	118	189	106
3	IET 25221	122	0	131	133	257	196	257	161	72	0	77	89	101	148	101	83
4	IET 25814	116	0	95	125	194	184	194	131	74	0	75	74	128	124	128	88
5	IET 25835	97	0	84	117	133	128	133	96	86	0	47	96	133	106	133	84
6	IET 25863	145	0	125	138	199	143	199	135	62	0	62	114	158	165	158	101
7	IET 25865	152	0	129	230	267	153	267	161	73	0	95	151	283	170	283	151
8	IET 25866	141	0	132	202	163	192	163	132	107	0	115	176	287	121	287	153
9	IET 25867	137	0	117	200	181	160	181	129	72	0	94	133	225	142	225	126
10	IET 25868	129	0	169	218	138	153	138	121	88	0	116	119	209	134	209	126
11	IET 25869	143	0	97	148	140	146	140	111	95	0	43	104	172	91	172	96
12	IET 25870	116	0	117	169	180	188	180	130	91	0	100	110	176	99	176	107
13	IET 25871	126	0	113	143	162	220	162	131	84	0	63	135	103	161	103	86
14	IET 25875	167	0	125	181	174	284	174	154	104	0	70	123	138	123	138	95
15	IET 25876	106	0	168	119	195	161	195	137	56	0	65	59	154	97	154	88
16	IET 25877	183	0	179	215	183	178	183	151	126	0	115	209	278	152	278	158
17	IET 25879	155	0	0	154	156	175	156	107	96	0	0	103	106	214	106	87
18	IET 26013	141	0	65	84	167	163	167	117	116	0	59	46	174	163	174	114
19	Shalimar Rice-3	148	0	85	189	163	203	163	127	68	0	70	79	162	144	162	101
20	Swarna Prabha	140	0	56	72	163	187	163	118	97	0	46	59	105	179	105	89
21	Tulasi	85	0	135	129	172	140	172	118	62	0	57	52	172	154	172	103
	Mean	**133**	**0**	**113**	**154**	**179**	**183**	**179**	**131**	**86**	**0**	**71**	**106**	**171**	**142**	**171**	**107**
	LSD (Treat)								*3.1**								
	LSD (Location x Treat)								*9.7***								
	LSD (variety)								*12.9***								
	LSD(Location x variety)								*31.4***								
	LSD (Treat x variety)								*18.2***								
	LSD (location x Treat x variety)								*ns*								
	CV(%)								*17.1*								

Table 6.6.13 Influence of low-light stress on grain number/m2 in different rice varieties during Kharif 2017

S.No.	Entries	Control							Grand Mean	Treated (Low light)							Grand Mean
		IIRR	KJT	MTU	NRRI	RPUR	PNR	TTB		IIRR	KJT	MTU	NRRI	RPUR	PNR	TTB	
1	IET 23356	27739	**0**	43371	20561	38708	47023	38708	32591	16381	**0**	13681	6712	24900	7533	24900	14566
2	IET 25206	27242	**0**	46616	61038	41625	0	41625	39277	19372	**0**	21768	22874	41002	2967	41002	21018
3	IET 25221	36156	**0**	34104	49683	74775	0	74775	54953	24024	**0**	16350	27173	16940	0	16940	18563
4	IET 25814	20159	**0**	27386	31466	52240	34592	52240	31103	13837	**0**	29271	10419	13880	213	13880	11847
5	IET 25835	24324	**0**	30590	36216	31617	0	31617	23629	13191	**0**	12781	17085	28108	0	28108	20650
6	IET 25863	24315	**0**	44943	82021	51960	23560	51960	32790	14686	**0**	16187	26291	35300	15797	35300	19545
7	IET 25865	32731	**0**	34537	86651	78807	0	78807	56221	19734	**0**	16862	24567	72800	8854	72800	31842
8	IET 25866	22702	**0**	42358	55413	31177	0	31177	31854	15727	**0**	25893	37631	49708	0	49708	35259
9	IET 25867	29861	**0**	39389	76944	45367	17333	45367	29553	15600	**0**	22266	12511	38700	7420	38700	20448
10	IET 25868	36656	**0**	54447	75845	48043	6867	48043	32343	19553	**0**	33614	37420	47043	0	47043	36813
11	IET 25869	37360	**0**	52247	47089	29443	2940	29443	25239	22838	**0**	18832	33781	34717	321	34717	18571
12	IET 25870	27769	**0**	45088	48732	41583	12663	41583	28114	25468	**0**	25706	18896	40248	0	40248	32918
13	IET 25871	24497	**0**	37265	62967	40850	0	40850	35866	8740	**0**	17974	23827	19693	4853	19693	11826
14	IET 25875	31341	**0**	45583	83539	42353	3710	42353	27557	14208	**0**	22903	26097	28587	1101	28587	15897
15	IET 25876	18394	**0**	41986	34559	53350	0	53350	41770	12448	**0**	15994	12069	38467	351	38467	17621
16	IET 25877	33882	**0**	53227	66407	48567	0	48567	46061	24642	**0**	28722	39924	62468	7124	62468	30904
17	IET 25879	20543	**0**	0	49171	28137	0	28137	25605	15103	**0**	0	17698	13287	667	13287	10586
18	IET 26013	34526	**0**	15661	20069	31880	0	31880	28487	15673	**0**	26737	10156	33580	0	33580	27392
19	Shalimar Rice-3	31581	**0**	25133	72992	35980	0	35980	32169	9473	**0**	23323	33082	24578	9945	24578	15316
20	Swarna Prabha	23550	**0**	12219	33769	32613	55811	32613	26135	16457	**0**	12293	19231	7527	9814	7527	8936
21	Tulasi	16711	**0**	41451	47946	51210	15288	51210	29312	11436	**0**	13553	19746	35467	768	35467	16115
	Mean	**27716**	**0**	**38380**	**54432**	**44299**	**21979**	**44299**	**27222**	**16600**	**0**	**20736**	**22723**	**33667**	**5329**	**33667**	**17897**
	LSD (Treat)								*1274***								
	LSD (Location x Treat)								*3120***								
	LSD (variety)								*4128***								
	LSD(Location x variety)								*10112***								
	LSD (Treat x variety)								*4436**								
	LSD (location x Treat x variety)								*ns*								
	CV(%)								*27.3*								

Table 6.6.14 Influence of low-light stress on spikelet number/m2 in different rice varieties during Kharif 2017

S.No.	Entries	Control							Grand Mean	Treated (Low light)							Grand Mean
		IIRR	KJT	MTU	NRRI	RPUR	PNR	TTB		IIRR	KJT	MTU	NRRI	RPUR	PNR	TTB	
1	IET 23356	32212	0	54040	32214	41625	66695	41625	47239	32192	0	24893	8053	30133	45265	30133	32523
2	IET 25206	31879	0	44536	89292	45058	74881	45058	48282	27415	0	31988	35378	46905	17455	46905	34134
3	IET 25221	58316	0	45946	61488	83980	52392	83980	64923	29993	0	42481	37899	22330	30707	22330	29568
4	IET 25814	25964	0	34595	35259	56213	67709	56213	48139	37829	0	29303	14600	30642	13247	30642	28332
5	IET 25835	34511	0	38863	55932	39097	46354	39097	39584	31896	0	21879	26353	31183	20827	31183	27394
6	IET 25863	40739	0	57041	97815	58926	59160	58926	54958	20771	0	24651	32034	41010	37255	41010	32939
7	IET 25865	41439	0	45231	137262	84791	49331	84791	61117	23777	0	40601	33833	91200	26318	91200	54619
8	IET 25866	28571	0	59177	73254	35344	81430	35344	47973	29668	0	48273	50325	54310	24963	54310	42305
9	IET 25867	38004	0	46343	98495	49513	42658	49513	45206	18477	0	30921	16315	43383	19881	43383	31209
10	IET 25868	46056	0	62447	99459	52750	52402	52750	53281	20987	0	51237	47909	53897	20474	53897	40098
11	IET 25869	48493	0	60857	60777	33243	35800	33243	42327	39841	0	23870	38041	39813	14558	39813	31579
12	IET 25870	32253	0	64945	61460	45377	35494	45377	44689	28870	0	38610	21254	44917	17338	44917	34930
13	IET 25871	40013	0	37018	82468	45253	51013	45253	43710	18759	0	25124	39243	25913	22244	25913	23591
14	IET 25875	55003	0	43126	109180	46173	150405	46173	68176	26261	0	28599	30364	32920	19257	32920	27991
15	IET 25876	26604	0	40009	46251	59300	42825	59300	45608	16473	0	19272	16268	43433	16941	43433	27911
16	IET 25877	45026	0	60760	76651	52767	61476	52767	54559	31386	0	50237	53325	71710	25172	71710	50043
17	IET 25879	30960	0	0	68082	32663	60929	32663	39304	33981	0	0	29426	15043	47612	15043	27920
18	IET 26013	54434	0	21931	37306	37200	40173	37200	38188	36075	0	16027	13143	36632	24859	36632	30045
19	Shalimar Rice-3	42247	0	41008	106007	39748	104583	39748	53467	22870	0	32384	41385	28994	36624	28994	29973
20	Swarna Prabha	40765	0	16647	52406	35135	70879	35135	39712	39335	0	15290	30087	21597	41881	21597	27940
21	Tulasi	20640	0	52072	82237	57252	38235	57252	45090	20193	0	23971	29249	38733	29524	38733	30231
	Mean	**38768**	**0**	**44123**	**74443**	**49115**	**61182**	**49115**	**48461**	**27955**	**0**	**30980**	**30690**	**40224**	**26305**	**40224**	**33137**
	LSD (Treat)								*1111**								
	LSD (Location x Treat)								*3582***								
	LSD (variety)								*4739**								
	LSD(Location x variety)								*11609***								
	LSD (Treat x variety)								*NS*								
	LSD (location x Treat x variety)								*NS*								
	CV(%)								*22.3*								

Table 6.6.15 Influence of low-light stress on grain yield (g/m2) in different rice varieties during Kharif 2017

S.No.	Entries	Control							Grand Mean	Treated (Low light)							Grand Mean
		IIRR	KJT	MTU	NRRI	RPUR	PNR	TTB		IIRR	KJT	MTU	NRRI	RPUR	PNR	TTB	
1	IET 23356	708	455	344	421	349	384	349	432	348	400	241	77	287	123	287	281
2	IET 25206	603	422	389	585	400	0	400	369	352	371	297	270	215	34	215	247
3	IET 25221	787	793	408	598	452	0	452	482	475	360	320	370	146	0	146	241
4	IET 25814	428	516	427	377	502	214	502	432	247	353	325	93	339	95	339	283
5	IET 25835	693	567	248	395	358	0	358	370	310	351	195	110	186	0	186	205
6	IET 25863	427	588	482	652	523	286	523	472	246	369	384	270	280	116	280	279
7	IET 25865	613	511	719	591	510	0	510	477	331	363	292	269	374	67	374	300
8	IET 25866	449	586	402	612	474	0	474	397	271	336	297	422	286	0	286	246
9	IET 25867	578	498	393	643	454	167	454	424	270	355	319	86	241	63	241	248
10	IET 25868	756	619	735	627	497	207	497	552	382	350	486	411	183	0	183	264
11	IET 25869	716	502	289	509	375	489	375	458	368	349	298	382	292	62	292	277
12	IET 25870	570	558	595	472	395	242	395	459	470	332	453	217	240	0	240	289
13	IET 25871	524	555	304	606	413	0	413	368	138	337	222	329	182	122	182	197
14	IET 25875	562	486	512	647	485	353	485	480	215	344	375	216	153	102	153	224
15	IET 25876	521	576	468	467	496	0	496	426	319	355	327	221	292	54	292	273
16	IET 25877	712	753	712	630	323	0	323	471	500	362	432	399	185	96	185	293
17	IET 25879	510	517	0	610	439	0	439	317	314	359	0	307	187	100	187	191
18	IET 26013	785	513	179	466	432	0	432	390	311	369	130	286	295	0	295	233
19	Shalimar Rice-3	568	572	212	617	507	0	507	394	211	354	176	449	141	226	141	208
20	Swarna Prabha	601	502	220	571	425	372	425	424	378	364	248	369	188	766	188	355
21	Tulasi	479	746	548	613	362	321	362	470	279	339	363	394	146	200	146	245
	Mean	**600**	**563**	**409**	**558**	**437**	**145**	**437**	**432**	**321**	**356**	**294**	**283**	**230**	**106**	**230**	**256**
	LSD (Treat)								*154.4***								
	LSD (Location x Treat)								*37.9***								
	LSD (variety)								*NS*								
	LSD(Location x variety)								*123***								
	LSD (Treat x variety)								*NS*								
	LSD (location x Treat x variety)								*NS*								
	CV(%)								*23.3*								

Table 6.6.16 Influence of low-light stress on total dry matter (g/m2) at maturity in different rice varieties during Kharif 2017

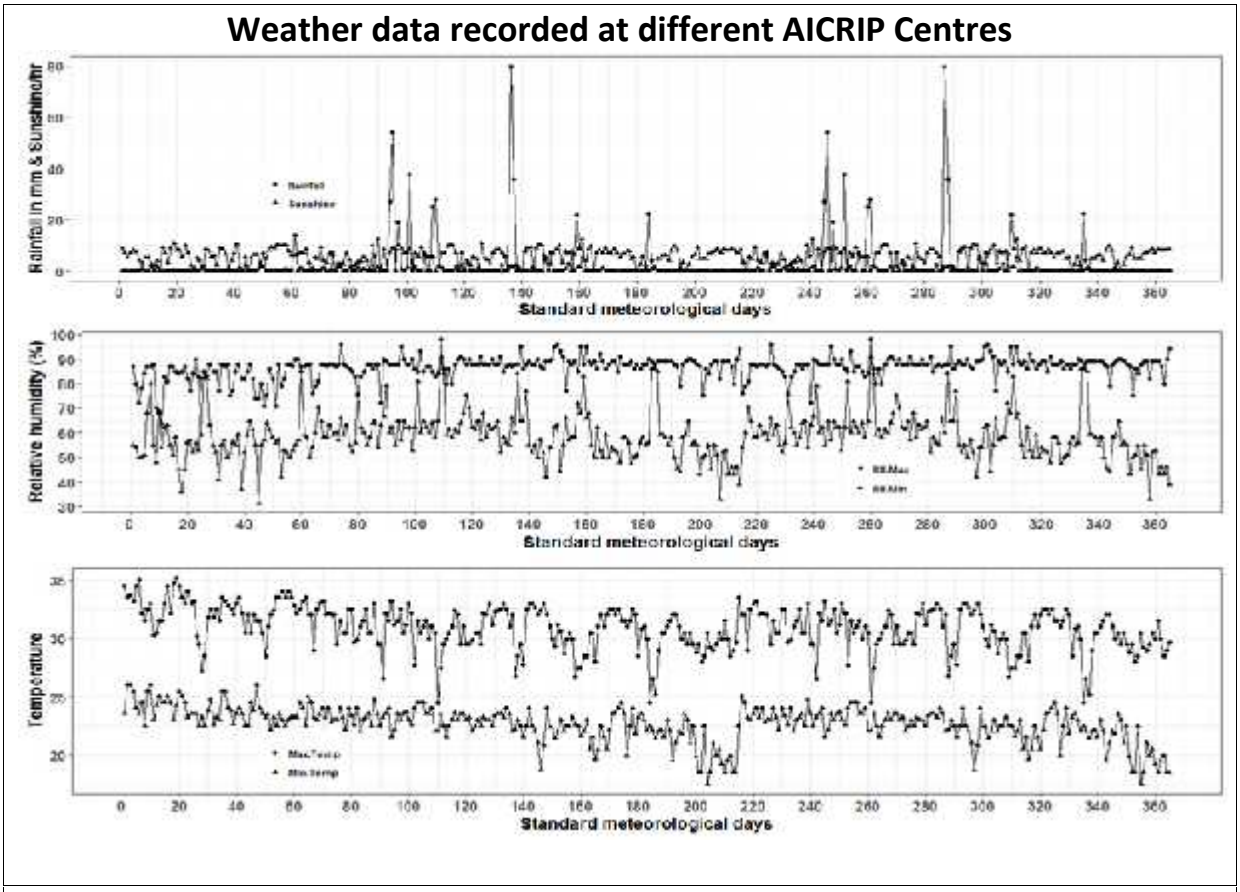
S.No.	Entries	Control							Grand Mean	Treated (Low light)							Grand Mean
		IIRR	KJT	MTU	NRRI	RPUR	PNR	TTB		IIRR	KJT	MTU	NRRI	RPUR	PNR	TTB	
1	IET 23356	1399	1600	902	911	1051	2123	1051	1354	985	1680	498	439	884	1570	884	1084
2	IET 25206	1259	1751	1089	1714	1240	2736	1240	1553	1065	1785	842	1171	827	1089	827	1073
3	IET 25221	1891	1825	954	2111	1446	1836	1446	1566	1499	1786	1408	1390	589	1869	589	1290
4	IET 25814	852	1537	931	1025	1417	1428	1417	1263	843	1885	960	555	867	1642	867	1177
5	IET 25835	1299	1796	683	1507	983	1600	983	1224	906	1442	550	604	497	1588	497	913
6	IET 25863	1104	2065	1233	2396	1243	2216	1243	1517	718	1961	877	1102	815	2435	815	1270
7	IET 25865	1470	1973	1424	2022	1252	2330	1252	1617	963	1938	799	1005	1044	1925	1044	1285
8	IET 25866	957	1779	990	2117	1389	3207	1389	1618	903	1742	801	1699	929	2356	929	1277
9	IET 25867	1483	1654	770	1584	1511	2370	1511	1550	861	1803	726	672	742	1329	742	1034
10	IET 25868	1640	1743	1569	1964	1527	2565	1527	1762	1021	2030	993	1513	664	1175	664	1091
11	IET 25869	1379	1898	675	1593	1370	2373	1370	1511	979	1820	880	1193	1005	1319	1005	1168
12	IET 25870	1353	1659	1238	1954	1178	3135	1178	1624	1074	1857	1031	1031	737	1397	737	1139
13	IET 25871	1390	1926	675	2462	1403	2640	1403	1573	671	1823	594	1305	519	1198	519	887
14	IET 25875	1525	1918	1289	2437	1263	2989	1263	1708	771	1909	988	1129	777	2562	777	1297
15	IET 25876	1235	1901	1360	1615	1502	2590	1502	1682	875	1949	924	1261	1013	1322	1013	1183
16	IET 25877	1885	2048	1295	2514	972	3232	972	1734	1488	1841	912	1599	535	1321	535	1105
17	IET 25879	1125	1779	0	1575	1400	2369	1400	1615	1053	1637	0	1133	687	1278	687	891
18	IET 26013	1667	1916	400	1387	1299	2871	1299	1575	867	1787	583	1128	705	1413	705	1010
19	Shalimar Rice-3	1352	1860	430	2198	1354	3231	1354	1597	978	1853	792	1847	597	1572	597	1065
20	Swarna Prabha	1258	1843	673	2087	1357	2025	1357	1419	987	1687	726	1544	727	1547	727	1067
21	Tulasi	1130	1756	1200	2306	981	2524	981	1429	764	1638	858	2154	501	1282	501	924
	Mean	**1364**	**1820**	**942**	**1880**	**1292**	**2495**	**1292**	**1534**	**965**	**1802**	**837**	**1213**	**746**	**1580**	**746**	**1106**
	LSD (Treat)								16.2*								
	LSD (Location x Treat)								52.3**								
	LSD (variety)								69.2*								
	LSD(Location x variety)								169.41**								
	LSD (Treat x variety)								NS								
	LSD (location x Treat x variety)								NS								
	CV(%)								8.59								

Table 6.6.17 Influence of low-light stress on 1000 grain weight (g) in different rice varieties during Kharif 2017

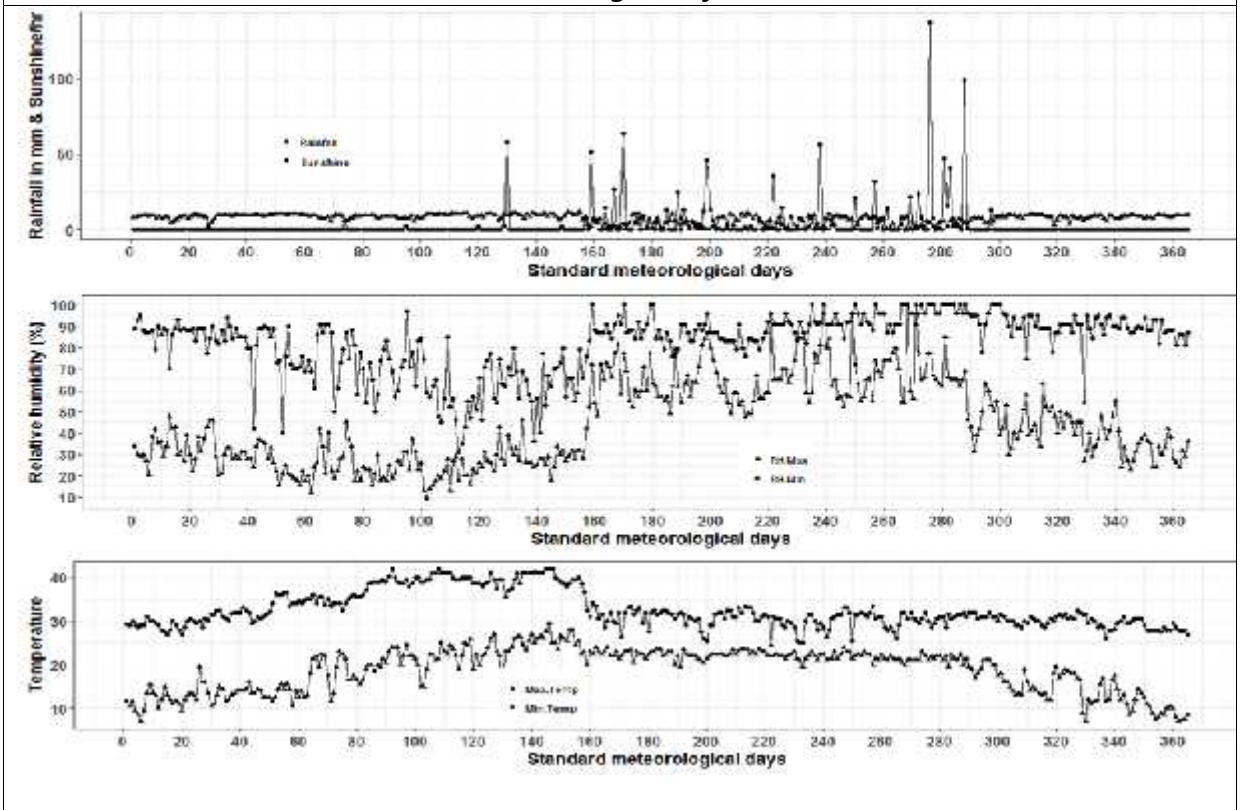
S.No.	Entries	Control							Grand Mean	Treated (Low light)							Grand Mean
		IIRR	KJT	MTU	NRRI	RPUR	PNR	TTB		IIRR	KJT	MTU	NRRI	RPUR	PNR	TTB	
1	IET 23356	25.5	23.1	24.9	22.6	27.0	26.3	27.0	25.6	21.1	23.2	21.8	20.2	24.3	12.8	24.3	21.2
2	IET 25206	22.0	20.8	23.0	21.1	23.7	0.0	23.7	18.9	18.2	20.9	20.1	21.5	19.0	15.7	19.0	18.8
3	IET 25221	21.7	12.2	21.0	20.9	20.3	0.0	20.3	15.9	19.7	12.2	21.9	20.1	16.7	0.0	16.7	14.5
4	IET 25814	21.2	20.2	22.1	17.4	28.3	23.4	28.3	23.9	17.7	20.2	20.1	17.7	21.3	21.6	21.3	20.4
5	IET 25835	28.5	26.1	24.9	25.0	28.3	0.0	28.3	22.7	23.4	26.1	24.2	19.9	26.0	0.0	26.0	20.9
6	IET 25863	17.6	15.2	18.5	17.0	23.3	18.0	23.3	19.3	18.1	15.2	18.3	16.8	19.3	19.6	19.3	18.3
7	IET 25865	18.7	15.2	21.4	19.3	23.3	0.0	23.3	17.0	17.0	15.2	18.8	16.7	21.7	23.6	21.7	19.7
8	IET 25866	19.8	18.5	22.6	17.1	21.7	0.0	21.7	17.4	17.3	18.5	19.7	18.1	18.3	0.0	18.3	15.4
9	IET 25867	19.4	19.2	23.2	15.9	21.3	17.2	21.3	20.3	17.5	19.2	16.1	16.7	20.7	24.0	20.7	19.7
10	IET 25868	20.7	18.5	22.0	20.1	22.7	17.4	22.7	20.7	19.9	18.5	22.3	18.4	21.7	0.0	21.7	17.3
11	IET 25869	19.4	20.2	20.7	19.9	26.0	21.9	26.0	22.4	16.1	20.2	18.9	18.6	24.3	14.8	24.3	19.8
12	IET 25870	20.5	18.4	22.3	21.0	23.3	16.6	23.3	20.7	18.5	18.4	20.0	17.8	19.7	0.0	19.7	16.0
13	IET 25871	21.5	19.6	23.1	23.5	21.3	0.0	21.3	17.8	16.1	19.6	21.7	22.0	18.3	18.6	18.3	18.8
14	IET 25875	18.0	16.0	23.0	18.8	19.7	16.2	19.7	18.7	15.2	16.0	15.9	18.2	19.3	13.9	19.3	16.6
15	IET 25876	28.4	18.2	36.0	28.1	24.7	0.0	24.7	22.0	25.6	18.2	27.6	27.2	20.7	16.5	20.7	21.5
16	IET 25877	21.0	19.6	23.5	22.1	29.0	0.0	29.0	20.3	20.1	19.6	25.4	18.7	22.0	18.2	22.0	21.2
17	IET 25879	24.9	21.6	0.0	25.8	28.7	0.0	28.7	17.3	21.0	21.6	0.0	22.7	24.7	23.6	24.7	19.2
18	IET 26013	22.8	19.4	24.5	19.7	24.0	0.3	24.0	19.2	19.8	19.4	19.9	19.2	18.7	0.0	18.7	16.1
19	Shalimar Rice-3	18.0	14.8	18.8	17.7	27.0	0.0	27.0	17.6	23.2	14.8	16.8	16.9	23.0	13.8	23.0	19.1
20	Swarna Prabha	25.5	21.5	29.1	23.9	25.0	29.2	25.0	25.9	23.0	21.5	15.3	23.5	13.0	15.4	13.0	16.9
21	Tulasi	28.7	29.4	25.0	28.3	25.7	33.0	25.7	27.9	24.5	29.4	26.4	27.8	21.7	20.8	21.7	24.1
	Mean	**22.1**	**19.4**	**22.4**	21.2	**24.5**	**10.5**	**24.5**	**20.5**	**19.7**	**19.4**	**19.6**	19.9	**20.7**	**13.0**	**20.7**	**18.8**
	LSD (Treat)								*NS*								
	LSD (Location x Treat)								*0.411***								
	LSD (variety)								*0.415**								
	LSD(Location x variety)								*1.4***								
	LSD (Treat x variety)								*NS*								
	LSD (location x Treat x variety)								*NS*								
	CV(%)								*4.66*								

Table 6.6.18 Influence of low-light stress on harvest index (%) in different rice varieties during Kharif 2017

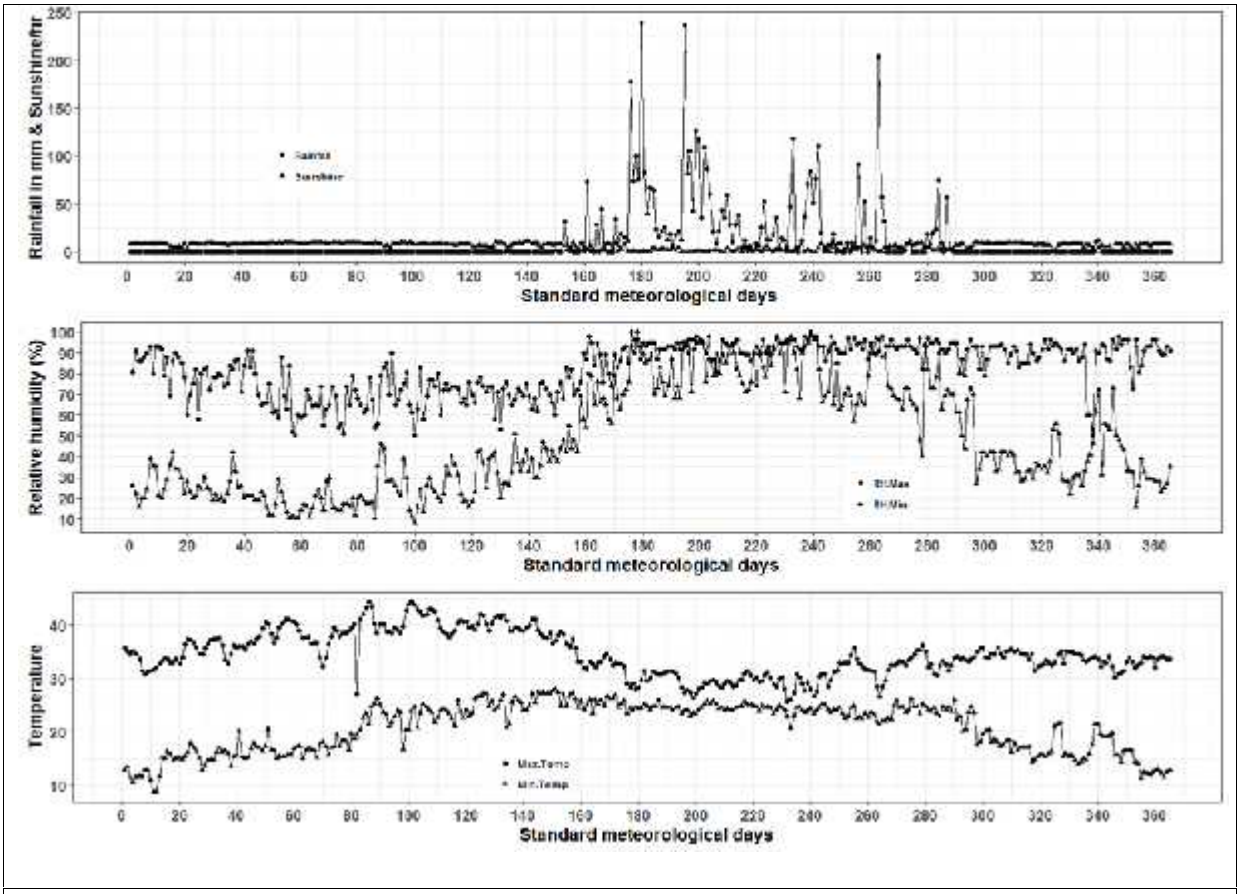
S.No.	Entries	Control							Grand Mean	Treated (Low light)							Grand Mean
		IIRR	KJT	MTU	NRRI	RPUR	PNR	TTB		IIRR	KJT	MTU	NRRI	RPUR	PNR	TTB	
1	IET 23356	50.4	37.0	39.9	46.2	33.2	27.4	33.2	36.9	35.0	39.8	48.5	17.6	32.5	11.4	32.5	33.3
2	IET 25206	46.6	35.2	43.3	34.1	32.3	0.0	32.3	31.6	33.0	40.6	35.3	23.1	26.0	6.7	26.0	27.9
3	IET 25221	41.0	38.4	43.7	28.3	31.2	0.0	31.2	30.9	31.5	42.9	22.8	26.6	24.7	0.0	24.7	24.4
4	IET 25814	50.2	40.8	46.0	36.8	35.5	22.6	35.5	38.4	29.1	40.8	34.1	16.7	39.0	12.1	39.0	32.4
5	IET 25835	53.3	36.1	36.2	26.2	36.4	0.0	36.4	33.1	34.0	41.6	31.8	18.2	37.5	0.0	37.5	30.4
6	IET 25863	38.6	33.3	40.8	27.2	42.1	8.9	42.1	34.3	34.3	41.8	39.0	24.5	34.3	20.0	34.3	34.0
7	IET 25865	41.9	37.4	50.6	29.2	40.7	0.0	40.7	35.2	34.7	43.6	36.7	26.7	35.8	8.8	35.8	32.6
8	IET 25866	46.8	39.7	39.8	28.9	34.1	0.0	34.1	32.4	30.1	43.2	37.0	24.9	30.8	0.0	30.8	28.7
9	IET 25867	38.9	37.1	51.2	40.6	30.0	7.0	30.0	32.4	30.5	44.2	44.2	12.8	32.5	11.9	32.5	32.6
10	IET 25868	45.9	38.9	50.9	31.9	32.5	11.6	32.5	35.4	37.2	45.2	46.2	27.1	27.5	0.0	27.5	30.6
11	IET 25869	52.3	44.1	42.9	32.0	27.4	26.8	27.4	36.8	36.7	42.8	34.2	32.1	29.4	8.3	29.4	30.1
12	IET 25870	42.6	43.9	48.1	24.1	33.5	13.3	33.5	35.8	43.6	42.2	44.1	21.1	32.8	0.0	32.8	32.6
13	IET 25871	37.7	39.3	45.0	24.6	29.4	0.0	29.4	30.1	20.5	43.1	37.5	25.2	35.2	20.3	35.2	32.0
14	IET 25875	36.3	39.3	38.9	26.6	38.3	9.0	38.3	33.4	27.9	43.5	38.1	19.1	19.8	9.0	19.8	26.3
15	IET 25876	42.1	38.9	34.5	28.9	33.0	0.0	33.0	30.2	36.1	44.3	35.4	17.5	28.9	6.7	28.9	30.0
16	IET 25877	37.8	39.8	53.7	25.0	33.3	0.0	33.3	33.0	31.9	45.6	47.4	25.0	34.6	12.5	34.6	34.4
17	IET 25879	45.5	44.5	0.0	38.7	31.3	0.0	31.3	25.4	29.8	45.6	0.0	27.1	27.2	17.1	27.2	24.5
18	IET 26013	47.1	41.2	45.5	33.6	33.3	0.0	33.3	33.4	35.8	45.9	21.0	25.4	41.8	0.0	41.8	31.1
19	Shalimar Rice-3	42.0	41.8	42.2	28.1	37.4	0.0	37.4	33.5	22.0	44.6	22.4	24.3	23.5	14.4	23.5	25.1
20	Swarna Prabha	47.6	41.1	32.7	27.3	31.3	23.4	31.3	34.6	38.0	44.6	34.5	23.9	25.9	24.9	25.9	32.3
21	Tulasi	42.3	39.8	46.5	26.6	36.9	20.2	36.9	37.1	36.0	43.4	42.5	18.3	29.1	18.0	29.1	33.0
	Mean	**44.1**	**39.4**	**41.5**	**30.7**	**34.0**	**8.1**	**34.0**	**33.5**	**32.7**	**43.3**	**34.9**	**22.7**	**30.9**	**9.6**	**30.9**	**30.4**
	LSD (Treat)								*NS*								
	LSD (Location x Treat)								*1.3***								
	LSD (variety)								*NS*								
	LSD(Location x variety)								*4.22***								
	LSD (Treat x variety)								*NS*								
	LSD (location x Treat x variety)								*NS*								



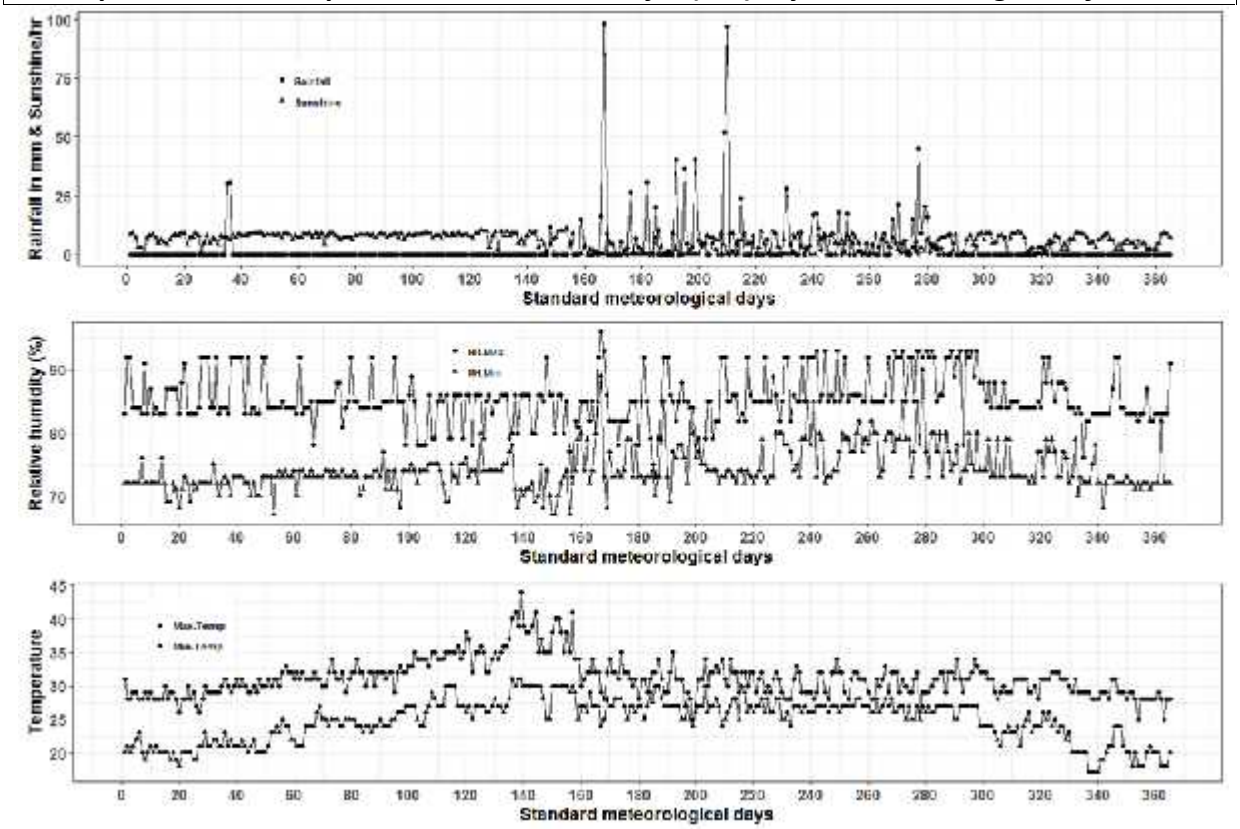
Important weather parameters recoded during crop growth period at Coimbatore (CBT) center during Kharif-2017



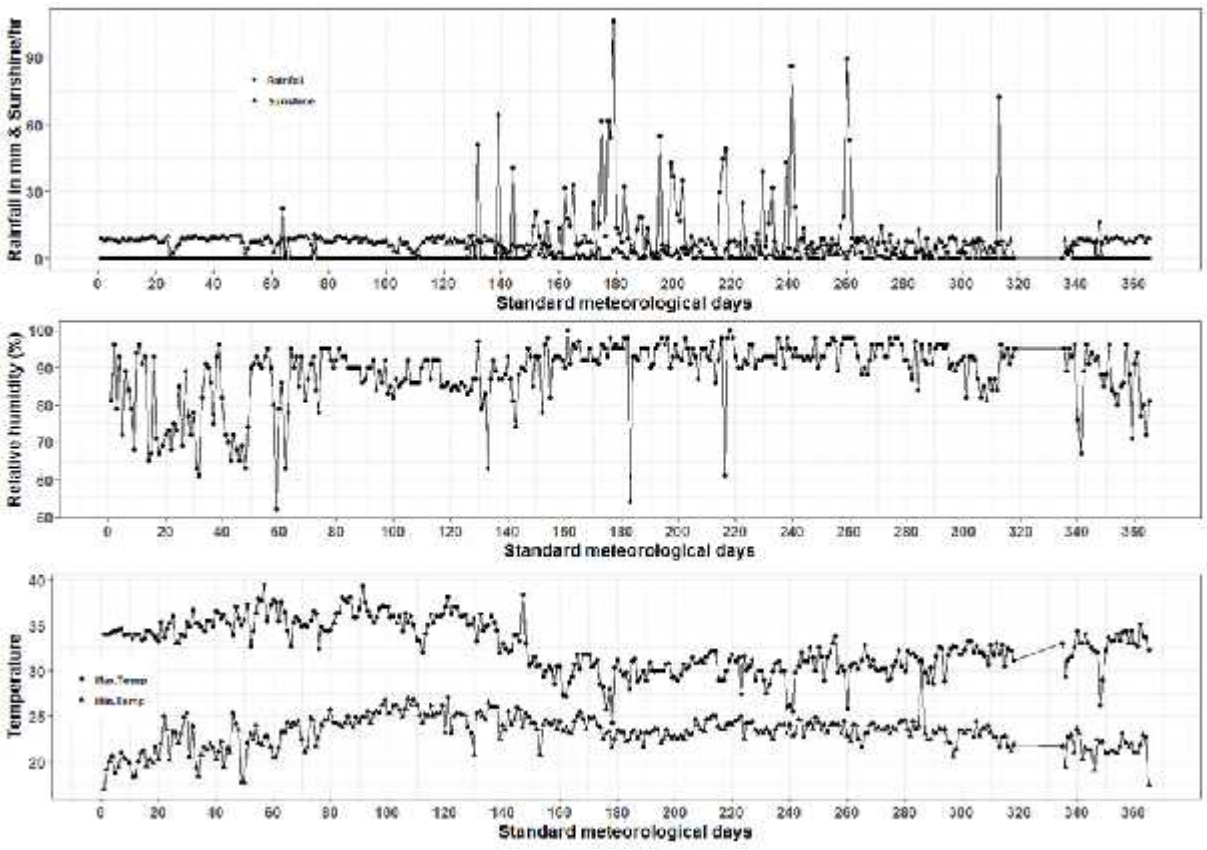
Important weather parameters recoded IIRR Hyderabad during Kharif-2017



Important weather parameters recoded Karjat (KJT) Hyderabad during Kharif-2017

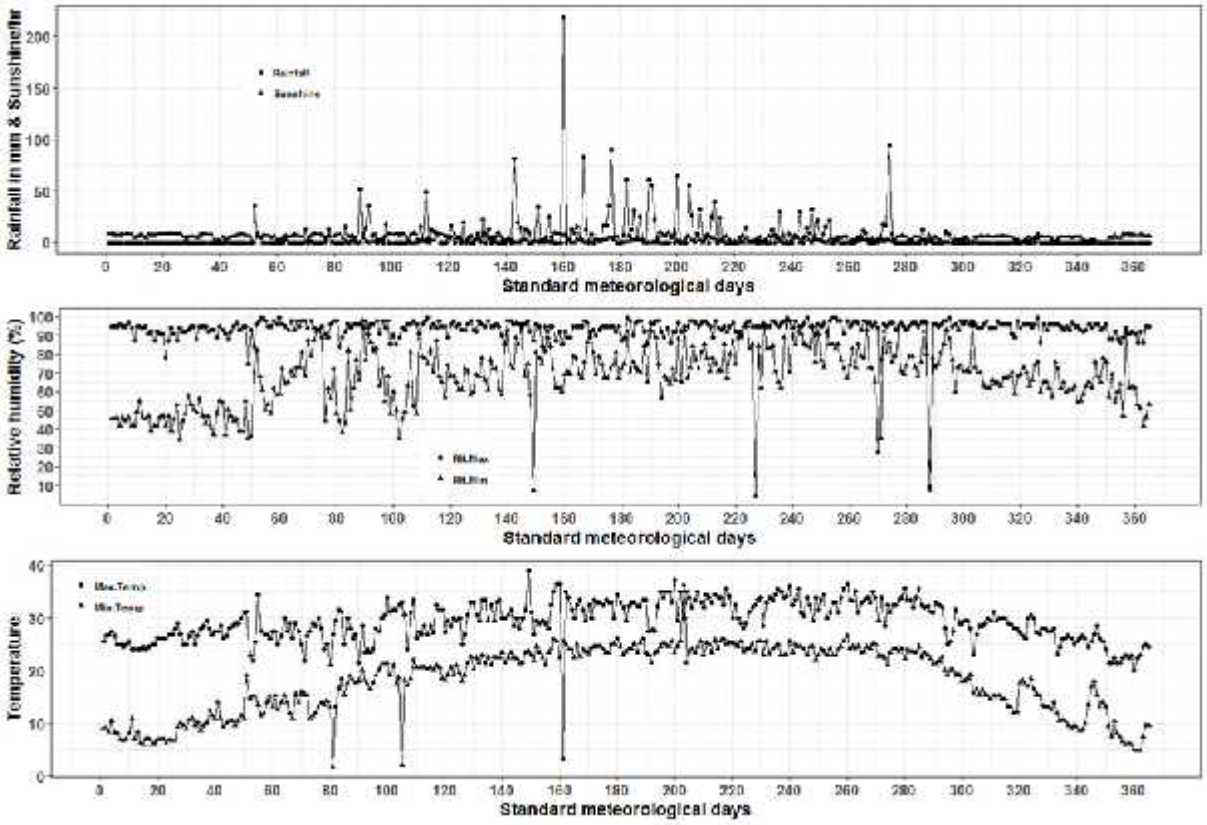


Important weather parameters recoded Maruteru (MTU) during Kharif-2017

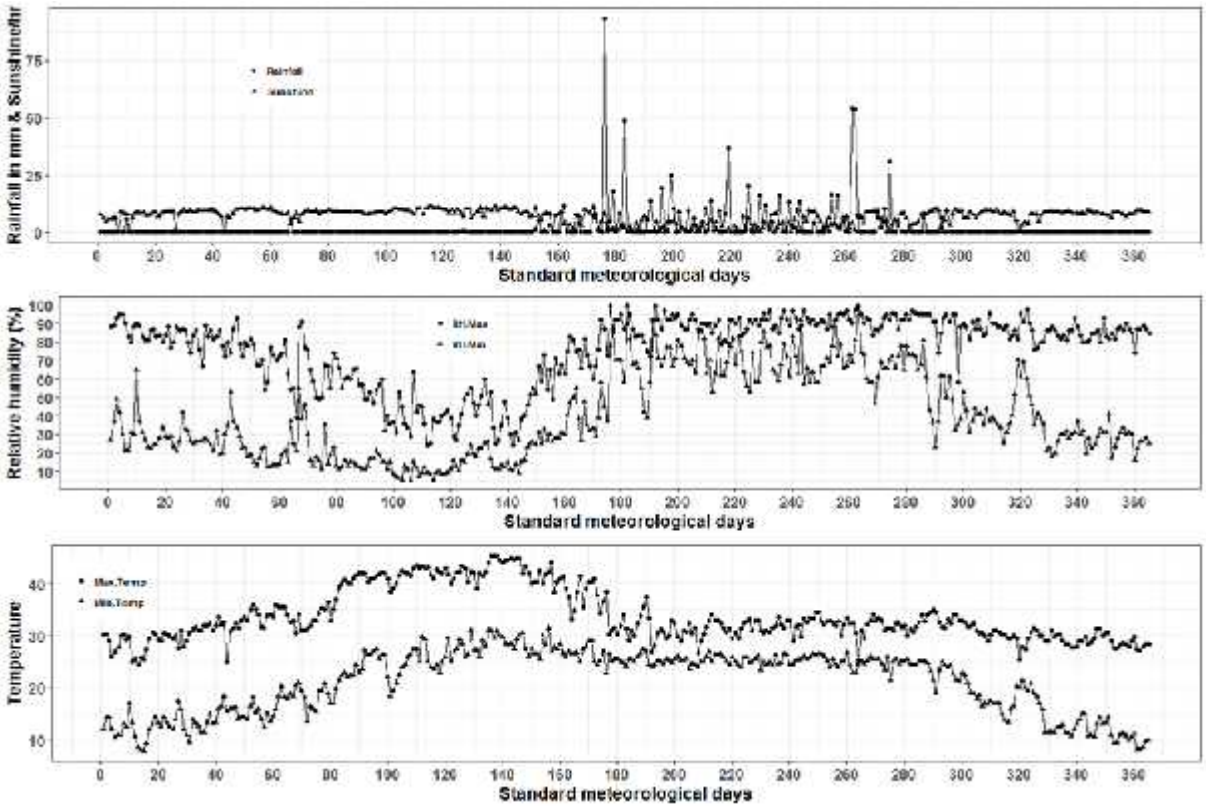


Important weather parameters recoded Pattambi (PTB) during Kharif-2017

Important weather parameters recoded Karaikal (KRK) during Kharif-2017



Important weather parameters recoded Titabar (TTB) during Kharif-2017



Important weather parameters recoded Raipur (RPR) during Kharif-2017

APPENDIX-II

Rice cultures of Physiology

	RNUE		**HT**			**HT**			**RFU**			**MAS**			**LLS**	
S.No.	Entries	S.No.	Entries		S.No.	Entries	IVT-E-TP	19	IET 26628	IVT-E-DS	S.No.	Entries		S.No.	Entries	
1	Varadhan x BPT 5204/6	1	IET 26755	IVT-E-TP	27	IET 26780	IVT-E-TP	20	IET 26629	IVT-E-DS	1	IET 26096	AVT-1-IME	1	IET 23356	YPT-E
2	Varadhan x BPT 5204/10	2	IET 26756	IVT-E-TP	28	IET 24053	IVT-E-TP	21	IET 26630	IVT-E-DS	2	IET 26089	AVT-1-IME	2	IET 25206	IVT-RSL
3	Sampada x Jaya/2	3	IET 26757	IVT-E-TP	29	IET 24705	IVT-E-TP	22	IET 26631	IVT-E-DS	3	IET 26132	AVT-1-IME	3	IET 25221	IVT-RSL
4	Sampada x Jaya/3	4	IET 26758	IVT-E-TP	30	Gontra Bidhan-3	IVT-E-TP	23	IET 26632	IVT-E-DS	4	IET 26074	AVT-1-IME	4	IET 25814	IVT-E(H)
5	Varadhan x MTU 1010/2	5	IET 26759	IVT-E-TP	31	IET 24708	IVT-E-TP	24	IET 26633	IVT-E-DS	5	IET 26077	AVT-1-IME	5	IET 25835	IVT-M(H)
6	Rasi x Jaya/2	6	IET 26760	IVT-E-TP	32	175-2 (K)	IVT-E-TP	25	IET 26634	IVT-E-DS	6	IET 24934	AVT-1-IME	6	IET 25863	IVT-RSL
7	Varadhan	7	IET 26761	IVT-E-TP	33	S-458	IVT-E-TP	26	IET 26635	IVT-E-DS	7	IET 26126	AVT-1-IME	7	IET 25865	IVT-RSL
8	BPT-5204	8	IET 26762	IVT-E-TP	34	N-22	IVT-E-TP	27	IET 26636	IVT-E-DS	8	IET 26110	AVT-1-IME	8	IET 25866	IVT-RSL
9	Sampada	9	IET 26763	IVT-E-TP		**RFU**		28	IET 26637	IVT-E-DS	9	IET 26124	AVT-1-IME	9	IET 25867	IVT-RSL
10	Jaya	10	IET 23354	IVT-E-TP	1	IET 26611	IVT-E-DS	29	IET 26638	IVT-E-DS	10	IET 26094	AVT-1-IME	10	IET 25868	IVT-RSL
11	MTU-1010	11	IET 24911	IVT-E-TP	2	IET 26612	IVT-E-DS	30	IET 26639	IVT-E-DS	11	Jaya	AVT-1-IME	11	IET 25869	IVT-RSL
12	Rasi	12	IET 24914	IVT-E-TP	3	IET 26613	IVT-E-DS	31	IET 26640	IVT-E-DS	12	Akshayadhan	AVT-1-IME	12	IET 25870	IVT-RSL
		13	IET 24904	IVT-E-TP	4	IET 26614	IVT-E-DS	32	IET 26641	IVT-E-DS	13	IR-64	AVT-1-IME	13	IET 25871	IVT-RSL
	SILICON	14	IET 26764	IVT-E-TP	5	IET 26615	IVT-E-DS	33	IET 26351	IVT-E-DS	14	IET 24053	AVT-1-IME	14	IET 25875	IVT-RSL
1	IR-64	15	IET 26765	IVT-E-TP	6	IET 26616	IVT-E-DS	34	IET 26643	IVT-E-DS	15	IET 24075	AVT-1-IME	15	IET 25876	IVT-RSL
2	KRH-4	16	IET 26766	IVT-E-TP	7	IET 26617	IVT-E-DS	35	Sahabhagidhan	IVT-E-DS	16	IET 24708	AVT-1-IME	16	IET 25877	IVT-RSL
3	PA-6129	17	IET 26767	IVT-E-TP	8	IET 26618	IVT-E-DS	36	IET 26644	IVT-E-DS	17	175-2 (K)	AVT-1-IME	17	IET 25879	IVT-RSL
4	PHB-71	18	IET 26768	IVT-E-TP	9	IET 26619	IVT-E-DS	37	IET 26645	IVT-E-DS	18	S-458	AVT-1-IME	18	IET 26013	IVT-IM
5	Sahabhagidhan	19	IET 26771	IVT-E-TP	10	Vandana	IVT-E-DS	38	IET 26646	IVT-E-DS	19	GONTRADHAN	AVT-1-IME	19	Shalimar Rice-3	IVT-E(H)
6	US-312	20	IET 26772	IVT-E-TP	11	IET 26620	IVT-E-DS	39	US-314	IVT-E-DS				20	Swarna Prabha	
		21	IET 26773	IVT-E-TP	12	IET 26621	IVT-E-DS	40	IET 25115	IVT-E-DS				21	Tulasi	
		22	IET 26774	IVT-E-TP	13	IET 26622	IVT-E-DS	41	IET 25121	IVT-E-DS						
		23	IET 26775	IVT-E-TP	14	IET 26623	IVT-E-DS	42	IET 25134	IVT-E-DS						
		24	IET 26776	IVT-E-TP	15	IET 26624	IVT-E-DS									
		25	IET 26777	IVT-E-TP	16	IET 26625	IVT-E-DS									
		26	IET 26778	IVT-E-TP	17	IET 26626	IVT-E-DS									
					18	IET 26627	IVT-E-DS									

LIST OF PLANT PHYSIOLOGY COOPERATORS 2017

	Head of the Station/ Organization & Cooperator(s)	E.mail	Ph.No.
1	**Dr. N Veronica**	veronica13agrico@gmail.com	8985059378
	Scientist Plant Physiology, Division of Crop Physiology		
	Andhra Pradesh Rice Research Institute &		
	Regional Agricultural Research Station		
	MARUTERU-534122		
	West Godavari Dist., Andhra Pradesh		
2	**Dr.P.C.Dey,**	**pcdey2004@yahoo.com**	(O) 03771-248453
	Principal Scientist		(R) 0376-2340610
	Regional Agricultural Station, (AAU),		Fax 03762310008
	TITABAR-785630, Assam.		09435685851 (M)
3	**Dr. S. C. Shankhdhar**	shankhdhar.sc@rediffmail.com	(O) 05944-233350
	Junior Research Officer (JRO),		(M) 9412864897
	Dept.of Plant Physiology,		
	College of Basic Sciences & Humanities,		Fax 05944 233473
	G.B. Pant University of Agri. & Technology,		
	PANTNAGAR-263 145, Uttarakhand		
4	**Dr.(Mrs) Padmini Swain**	pswaincrri@gmail.com	(M) 9438134575
	Principal Scientist (Plant Physiology),		(O) 0671-2367768
	Division of Biochemistry,		(R) 0671-2367692
	Plant Physiology & Environmental Science,		Fax 0671-2367663
	National Rice Research Institute,		
	CUTTACK-753 006, Orissa		
5	**Dr.(Mrs) Radha Singh,**	radhasingh18@gmail.com	(M) 9981799073
	Scientist, Plant Physiology		
	AICRIP-RICE		
	JNKVV, College of Agriculture,		
	REWA-486 001, M.P.		
6	**Dr. P.S. Abida**	abidaps@gmail.com	(O) 0466-2212228
	Asso. Professor	**beenaajitkumar@rediffmail.com**	Fax 0466-2212228
	RARS, KAU, **PATTAMBI-679306**		9745884964
	Kerala		9037998940
7	**Dr. R.M. Tripathi**	manitripathi77@gmail.com	9415918413
	Scientist		8115865676
	Crop Research Station,		
	N.D. University of Agri. & Technology,		
	Masodha, P.O. Dabha Semar,		
	FAIZABAD-224 133, Uttar Pradesh		
8	**Dr.V.Ravichandran, P.hD**	**ravilux@rediffmail.com**	(O) 0422-2474967
	Associate Professor (Crop Physiology)		(R) 09894435675
	Department of Rice		08754953150 New
	Tamil Nadu Agriculture University		
	COIMBATORE-641003, Tamil Nadu		
	Head of the Station/ Organization & Cooperator(s)	**E.mail**	**Ph.No.**
9	**Dr.S.Nadaradjan**	**nadaradjans@gmail.com**	(O) 09944015690
	Associate Professor (Crop Physiology)		(R) 04368-261372
	Pandit Jawaharlal Nehru College of Agril &		Fax 091-4368-261260
	Research Institute		
	KARAIKAL-609603		
	U.T. of Pondicherry		

10	**Mrs. Minakshi H. Keluskar**	keluskar_minakshi@rediffmail.com	9420305805
	Rice Physiologist		
	Regional Agriculture Research Center		
	Karjat Dist-Raigal (M.S) 410201		
11	**Smt Purnima Halder**	purnimahalderkundu@gmail.com	9831104906
	Rice Physiologist		
	Rice Research Station		
	Chinsurah R.S.,Dist Hooghly,		
	West Bengal - 712102		
12	**Dr. V.B. Kuruwanshi/Dr. Arti Guhey**	vb_kuruwanshi@rediffmail.com	
	Scientist, Plant Physiology,	arti_guhey1@rediffmail.com	9685515871
	Department of Plant Physiology		
	College of Agriculture, IGKV, Raipur		
	Chhattisgarh		
13	**Dr. S.R. Voleti**	**srvoleti@drricar.org**	9866192506
	PS & Head, Plant Physiology	**voletisr58@rediffmail.com**	
	Indian Institute of Rice Research		
	Rajendranagar, Hyderabad-500 030		
	Telangana		
14	**Dr. D. Subramanyam**	**subbu_desiraj@msn.com**	9000246931
	PS, Plant Physiology		
	Indian Institute of Rice Research		
	Rajendranagar, Hyderabad-500 030		
	Telangana		
15	**Dr. P. Raghuveer Rao**	**prrao@drricar.org**	9848952679
	Principal Scientist, Plant Physiology	**acripphysiology@gmail.com**	
	Indian Institute of Rice Research	**prrao2005@yahoo.co.in**	
	Rajendranagar, Hyderabad-500 030		
	Telangana		
16	**Dr. D. Sanjeeva Rao**	**sraodurbha@gmail,com**	9440366592
	Scientist, Plant Physiology and Bio-chemistry		
	Indian Institute of Rice Research		
	Rajendranagar, Hyderabad-500 030		
	Telangana		

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