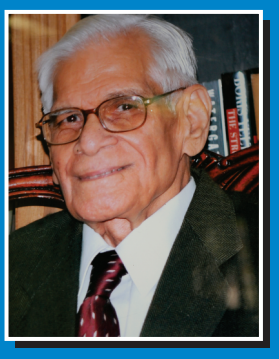
उत्पादनोन्मुखी सर्वेक्षण
Production Oriented Survey

सहयोगः
राज्य कृषि विश्वविध्यालय एवं कृषि विभाग

In collaboration with:
State Agricultural Universities and Departments of Agriculture



Padma Shri Dr SVS Shastri
(1928 - 2019)
"Father of AICRIP"

अखिल भारतीय समन्वित चावल सुधार परियोजना
All India Co-ordinated Rice Improvement Project

2018

भाकृअनुप
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भाकृअनुप - भारतीय चावल अनुसंधान संस्थान
भारतीय कृषि अनुसंधान परिषद

ICAR-Indian Institute of Rice Research
(Indian Council of Agricultural Research)
Rajendranagar, Hyderabad - 500 030

PRODUCTION ORIENTED SURVEY 2018

In collaboration with

AGRICULTURAL UNIVERSITIES

and

STATE DEPARTMENTS OF AGRICULTURE

All India Coordinated Rice Improvement Programme (AICRIP)

ICAR-Indian Institute of Rice Research
Rajendranagar, Hyderabad 500 030, TS, India

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SUMMARY

Production oriented survey is conducted by a team of subject matter experts (from different state agricutltural universities and ICAR Insstitutes) along with officials from state department of agriculture with an objective to collect information on different aspects of rice cultivation from different rice growing states of India. The survey is based on both eye-ball survey and questionnaire based survey. The different aspects that are covered in the survey are prevailing climatic conditions for rice cultivation, varietal profile in a particular region, extent of use of organic manure and inorganic fertilizers, occurrence of different biotic and abiotic problems and their management and various needs of the farmers and problems faced by the farmers. During 2018, the survey was conducted in 15 states of India *viz*., Bihar, Chhattishgarh, Gujarat, Haryana, Himachal Pradesh, Jammu and Kashmir, Karnataka, Madhya Pradesh, Maharashtra, Punjab, Tamil Nadu, Telangana, Uttar Pradesh, Uttarakhand and West Bengal by 17 AICRIP centres. A total of 103 scientific staff and 62 officials and technical staffs from different States Department of Agriculture surveyed 111 Districts in 15 States.

The season (June-September) rainfall over the country as a whole was 91% of its long period average (LPA). Seasonal rainfalls over Northwest India, Central India, South Peninsula and Northeast (NE) India were 98%, 93%, 98% and 76% of respective LPA. Out of the total 36 meteorological subdivisions, 23 subdivisions constituting 68% of the total area of the country received normal season rainfall, 1 subdivision received excess rainfall (1% of the total area), and 12 subdivisions (31% of the total area) received deficient season rainfall. Monthly rainfall over the country as a whole was 95% of LPA in June, 94% of LPA in July, 92% of LPA in August, and 76% of LPA in September. Southwest monsoon current reached south Andaman Sea and Nicobar Islands on 25th May (5 days later than its normal date), but further advance was relatively faster. It set in over Kerala on 29th May, 3 days ahead of its normal date, thereafter progressed rapidly and covered the entire country in one month. The cyclonic storm 'Daye' which made a landfall on south Odisha resulted in heavy rainfall and strong winds in various districts of Odisha and adjoining Andhra Pradesh during third week of September, 2018. Another severe ccyclone 'Titli' made a landfall near Palasa, Andhra Pradesh on October 11 killing at least 85 people and causing heavy damage. Another strong cyclone 'Gaja' made a landfall in southern India on November, 16, 2018 causing huge damage to property and life in Tamil Nadu.

Predominant rice varieties cultivated by the farmers in different states are presented in Table 2. The prevalence of different diseases and insect pests in different rice growing regions of India is presented in Table 3 and Table 4. Rice hybrids occupy a significant area in states like Chhattishgarh, Haryana, Himachal Pradesh, Madhya Pradesh, Maharashtra and Uttar Pradesh and its area is increasing in states like Karnataka, Gujarat, Telangana and West Bengal. The major problems faced by the farmers were shortage of agricultural labours and their high wages and irrigation water. Many farmers from different states also expressed problem of timely availability of seeds of different hybrids, availability of different inputs in time, farm mechanization (on hire basis/custom hiring), market facility and farm loan. The diseases like blast, neck blast, brown spot, sheath blight, sheath rot, false smut and bacterial blight were widespread. There was a severe outbreak of bacterial bight in Nizamabad and Suryapet districts of Telangana. Similarly false smut was very severe in parts of Uttarakhand on PR 126 and in some areas in Mandi in Himachal Pradesh and Siddharthnagar in UP. Sheath

blight has become a major problem in Haryana and Punjab and its intensity was also very high in many fields in some parts of Karnataka and Chhattishgarh. Neck blast was severe in many areas in Himachal Pradesh especially in Mandi, Karnataka and Chhattishgarh. Among the insect pests, stem borer, leaf folder and BPH were widespread throughout India. BPH/WBPH was very widespread in moderate to severe form in most of the districts of Haryana and many parts of Vidharbha region of Maharashtra and Telangana. There was severe attack of rice hispa in some fields in Nizamabad.

Bihar: Production Oriented Survey was conducted in Rohtas district of Bihar during the crop season 2018. In general, the climatic conditions were normal for rice cultivation. However, during early part of the Kharif season, 2018, there was scarcity of rainfall and also due to late supply of irrigation water, the sowing was delayed in majority of the places in the district. The predominant rice varieties cultivated by the farmers were HYVs and like MTU-7029 (Swarna), BPT 5204 (Samba Mahsuri), Rajendra Sweta and Rajendra Mahsuri and hybrids like Arize 6444. Common crop rotations followed by the farmers were rice-wheat, rice-potato, rice- vegetables, rice-pulses and rice-toria. The average rice yield of Swarna in the district was 6500-6800 kg/ha. Optimum time of planting was July-August. In the main fields, farmers applied 100 kg N/ha, 50 kg P_2O_5/ha, 40 kg K_2O/ha and 20 kg $ZnSO_4$/ha. The intensity of common weeds like *Cyperus rotundus* and *Echinochloa colona* in and around rice fields was moderate. Hand weeding was most common among the farmers and some farmers also applied weedicides like butachlor or pretilachlor. Some of the common needs of the farmers in the region were timely supply of canal water, repair of tube wells, regular supply of electricity and improvement in the rice procurement system. Among different biotic constraints, false smut and bacterial blight were recorded in moderate to high intensities in some fields. Other biotic constraints like sheath blight, stem borer and leaf folder were recorded in low to moderate intensities. Some of the common problems faced by the farmers were delayed supply of canal water, non-functional government tube wells and erratic supply of electricity.

Chhattishgarh: Production oriented survey was conducted in 4 rice growing districts of Chhattishgarh when the most of the rice fields were in milk to dough stage. The rice fields surveyed were either under irrigated or rainfed lowland ecosystem. In general, the weather conditions were normal for rice cultivation. Common rice varieties cultivated by the farmers were HYVs like Swarna, MTU1010, MTU1001, Mahamaya, Sonamasuri, Kaveri 371, PKV-HMT, IR64, Indira Sugandhit Dhan, Vijay, Chandrahasni, Bamleswari, IGKVV R1, IGKVVR2, Safri, Durgeswai, Karmamasuri and Indira Barani Dhan and hybrids like Arize 6444, VNR 2245, DRS 775, VNR 2355, US312 and US 382. Some farmers also cultivated local varieties like Bisnubhog, Dubraj, Tulsimajri and Javaphool. Predominant cropping sequences followed by the farmers were rice-gram, rice-wheat, rice-rice or rice-fallow. Average rice yield ranged in between 3500-4200 kg/ha in case of HYVs and about 4600 kg/ha in hybrids like Arize 6444. Planting was done mainly during mid June to mid July. Farmers applied FYM both in nursery and in main fields. In main fields fertilizers were applied @ 220-280 kg urea/ha, 180-250 kg DAP/ha and 130-200 kg MOP/ha. Most of the farmers applied zinc sulphate. The intensity of common weeds like yellow sedge (*Cyperus esculentus*), false daisy (*Eclipta prostrata*), Sawa (*Echinochloa colona*), dayflower (*Commelina benghalensis*) and motha (*Cyperus rotundus*) in and around rice fields was low to medium. Hand weeding was commonly followed by the farmers. Among the diseases, leaf and neck blast, sheath blight and grain discoloration were more in some fields in Raipur and Kabirdham. Among different insect pests, BPH was moderate to severe in all the districts surveyed. Farmers applied different pesticides for managing different biotic stresses. Some of

the common needs of the farmers were proper supply of electricity, proper market price for the produce, improvement in the irrigation facilities, timely availability of quality seeds of HYVs and availability of agricultural implements.

Gujarat: Production Oriented Survey was conducted in rice growing areas of 13 districts of Gujarat State *viz.*, Ahmedabad, Kheda, Anand, Gandhinagar, Mehsana, Dang, Panchmahal, Vadodara, Navsari, Valsad, Surat, Tapi and Narmada. A total of 26 talukas and 58 villages were covered during the survey. The *Kharif* 2018 witnessed more or less timely onset of monsoon (last week of June) with 388 mm rainfall in 22 days at our station Nawagam. There was no rainfall at the maturity of the crop. Varieties like Gurjari, GAR-13, GNR-3, GR-101, Mahisagar, Masuri, Jaya, Moti-gold, Surya moti, Sonam, Nath Pauha, Daftari Om Sriram 125, Krishna Kamod, US-312, US-807, US-834, MC-13 etc. were cultivated in different districts of Gujarat. Prevailing crop rotations were rice-wheat-rice, rice-sugarcane, rice-chickpea, rice-banana, rice-wheat-vegetable, rice-rice, rice-wheat-maize, rice-pearl millet, rice-summer green gram etc. were adopted by the farmers in different districts of Gujarat. Average seed rate in different districts ranged from 25-30 kg/ha and seed treatment practice was not common among the farmers. Farmers applied FYM both in the nursery and in the main fields. In addition, farmers applied urea and DAP in the nursery. In the main fields, the fertilizers were applied @ 80-160 kg N/ha (in three splits through urea or ammonium sulphate) and 20-66 kg P_2O_5/ha (as DAP or SSP). Potash application was almost very rare. Few farmers applied zinc sulfate. Intensity of common weeds like *Echinochloa crusgalli, E. colona, Cynodon dactylon, Parthenium* spp. and *Cyperus rotundus* was low and hand weeding was most common among the farmers. In addition to hand weeding, some farmers also applied herbicides like pendemethalene and bizpyribac sodium. Some of the common needs of the farmers were low cost production technologies, early Maturing and salt tolerant varieties with high yield potential, varieties suitable for direct sowing, insect pests resistant and lodging resistant varieties and good market price. Intensity of most of the biotic stresses was low.

Haryana: Roving surveys in 8 paddy growing districts of Haryana during crop season of 2018. The area under scented and non-scented rice varieties was 61.4 and 38.6%, respectively. The commonly grown rice varieties in scented group were Pusa Basmati 1121, Pusa Basmati 1509, Basmati CSR 30, Pusa Basmati 1401, Pusa Basmati 1637, Pusa Basmati 1728 and Taroari Basmati while the common high yielding non-scented varieties were PR 114, PR 126, Pusa 44 and HKR 47 and the commonly grown hybrids were Sava 127, Arize 6444, Arize 6129, Pioneer RH 27P31 and Swift Gold. Application of sub-optimal doses of weedicides, application of combination formulations of fungicides and insecticides and mixed application of fungicides with insecticides as foliar spray and broadcasting of granular insecticides with urea, random planting, inadequate plant population, raising of nursery in unpuddled fields and rice-wheat sequence were the common practices in all the surveyed districts. None of the rice diseases and insect-pests appeared in devastating form and the farmers were managing these biotic stresses with recommended/other effective pesticides. Among the diseases, sheath blight was widespread in low to moderate form. Other diseases observed were leaf and neck blast (in low to moderate form), bakanae (in low intensity) and false smut (in low intensity). Bacterial leaf blight was recorded only at one location in moderate form in district Yamunanagar in varieties Pusa Basmati 1637 and Pusa Basmati 1, respectively. Among the insect pests, BPH/WBPH was very widespread in moderate to severe form. Stem borer and leaf folder were observed in low intensity. The incidence of other diseases viz., stem rot, brown spot, narrow brown leaf spot and insect-pests namely, grasshopper and gundhi bug was low at the surveyed sites. Farmers used different pesticides and majority of the farmers mixed different pesticides at the time of application. The major constraints identified in

increasing rice production in Haryana were declining water table, water scarcity, inadequate and intermittent power and canal water supply and problematic soil and underground water, low profitability due to high production cost, inadequate technical knowhow, declining soil fertility, sub-optimal plant population, nutrient imbalances and continuous follow up of rice-wheat cropping system in addition to biotic constraints particularly planthoppers (WBPH & BPH) and sheath blight.

Himachal Pradesh: Production oriented survey was conducted in three districts of Himachal Pradesh viz., Kangra, Mandi and Una. District Kangra district remains leading in the area under rice cultivation followed by Mandi district. Commonly cultivated rice varieties under irrigated conditions were Palam Basmati-1, Palam Lal Dhan-1, HPR 2143, HPR 1068, Kasturi, Sharbati, Pusa 1509, Pusa 1121 while under rinfed condition, most common varieties were HPR 1156 and HPR 2656 (Him Palam Dhan-1). Besides these, hybrids like Arize 6129, PAC 807, Hyb 834, Arize Swift Gold, Sri Ram Khushbu, Shahi Dawat, US 312, Raftaar, Hyb 2266 and Nirmal-4. In Mandi distrcit, the most predominant rice hybrid was US-312. Prevailing crop sequences were Rice-wheat, maize-wheat and rice- potato. Among the weeds *Digitaria sanguinalis, Echinochloa colona, E. crusgalli, Cyperus iria, Cyperus rotundus, Ageratum conyzoides* and wild rice were very common under direct sown conditions. The common weeds under transplanted conditions were *E. crusgalli, Monochoria vaginalis, Cyperus iria Commelina benghalensis* and *Bonnaya veronicaefolia*. Bispyribac sodium was the most common weedicide used by the farmers to check weeds. Common fertilizers used include IFFCO 12:32:16 and urea while dose applied ranged between 0-70 kg N, 0-40 kg P_2O_5 and 0-40 kg K_2O. Most of the biotic constraints were recorded in low to moderate intensities. However, severe outbreak of false smut (Intensity $\geq$ 30%) on HYVs and hybrids and neck blast (Intensity $\geq$ 50%) on varieties like Pusa 1121, Pusa 1509, PAC 807 was observed in Batail area of Sarkaghat block of Mandi district. Incidence of black beetles was quite higher in Tikri Duhki area of Panchrukhi block in Kangra district especially during early phase of crop growth. Pesticide application was in general inadequate. Common problems in the area were use of inadequate and imbalance dose of fertilizers and rain during dough to maturity stage and at later stages resulting in high incidence of grain discoloration and sheath rot in some parts of the state.

Jammu and Kashmir-1: Rice is the staple food of majority of the population inhabiting the Kashmir valley and the crop is grown in all the districts of the valley. By and large, farmers of the valley are highly skilled in rice cultivation but most of the farmers need to improve nursery management and learn the technology of raising protected nurseries as the temperatures sometimes dip low in the valley when the seeds are sown. Production oriented survey was conducted in three districts viz., Anantnag, Kulgam and Kupwara when the crop were mainly at maturity stage. The general climatic conditions were normal as far as rice is concerned. The main crop rotation practices followed by the farmers were rice-mustard and rice-oats. Most predominant rice varieties cultivated in this region were HYVs like Jehlum, SKAU 408, SR-4 and SR-3. Some farmers are growing local varieties like Zag and Mushk Budgi for special attributes. However, HYVs are spreading very fast and replacing the local varieties. Optimum time of sowing was end of April to Ist week of May and optimum time of planting was end of May to 1st week of June. Average seed rate was 80-100 kg/ha and the co-operator reported that majority of the farmers contacted (80-100%) adopted seed treatment with either carbendazim (2-3 g/kg) or tricyclazole (0.06%). In the main fields, farmers applied 80-120 kg N/ha, 50-60 kg P_2O_5/ha and 30 kg K_2O/ha. All the farmers contacted applied FYM (5-12 q/ha) in the main field. Random method of transplanting was common among the farmers. The intensity of common weeds like *Echinochloa* spp., *Potamogeton*

spp., *Crotolaria*s pp., *Eichhornia*spp., *Ammannia* spp. and sedges was low. All the farmers in district Kupwara adopted hand weeding and in addition applied herbicides like butachlor (1.5 kg a.i./acre) but the farmers of Anantnag and Kulgam districts applied only herbicide Eros (4 kg/acre) and no hand weeding. Some of the common needs of the farmers were availability of certified seeds of good HYVs, timely supply of inputs, irrigation facilities and advices from experts regarding rice production technology. The intensity of most of the biotic constraints was low and application of pesticides was not common among the farmers.

Jammu and Kashmir-2: Survey was conducted in 13 villages (in 3 blocks) in this district involving 19 farmers when the crops were in heading to milk stage. The fields surveyed were either under irrigated ecosystem or under hilly ecosystem. The weather conditions were in general normal for rice cultivation. About 75% of the farmers contacted told that they are using 10-60% of their land for cultivation of other crops like maize. Common crop rotation practices were rice-vegetables, rice-wheat, rice-oats and rice-fallow. Common rice varieties cultivated by the farmers were Cheena (CH 988), Japonica (CI 1561), Giza 14, Daggu (Local) and K 39 (Local). Higher altitude areas prefer variety Cheena (CH 988) whereas low reaches had the preference of growing varieties like Japonica (CI 1561) and Giza 14. The average productivity in this district was 4000-5500 kg/ha in varieties like CI 1561, Cheena, K-39 and Giza 14 and 2500-3000 kg/ha in local variety Doggu. The major problem was seed mixture which caused yield reduction to the tune of 20-30%. Planting was done mainly done last week of May to 1st week of June. Seed rate ranged from 100-160 kg/ha. None of the farmers treated the seeds. Farmers generally applied farm yard manure in the nursery beds. However, none of them applied any inorganic fertilizers in the nursery. Usage of fertilizers and weedicides was in general less. In the main fields, farmers applied 40-160 kg urea/ha and 40-60 kg DAP/ha. Application of potash was very rare. The intensity of common weeds like *Echinochloa* spp. and *Cyperus* spp. was low to medium. Hand weeding was most common among the farmers and application of weeds was very less. Only few farmers applied butachlor (500 g/kanal). Some of the common needs of the farmers were timely availability of fertilizers and other inputs, improvement in irrigation facilities (a large area has been converted to maize due to scarcity of irrigation water), pure seeds of Japonica varieties and seeds of improved rice varieties. In general, intensity of different diseases and insect pests was low to moderate. High incidence of leaf blast was recorded in some fields of Vaski Vihar. Application of chemical pesticides was almost nil except some farmers who applied Bavistin and tricyclazole for the management of leaf blast.

Karnataka: Production oriented survey was conducted in four districts of Karnataka viz., Chikkamagalur, Hassan, Mandya, and Mysuru during maximum tillering, dough and ripening stage. The prevailing cropping sequences in these districts were rice-rice followed by rice-sugarcane, rice-vegetables, rice-pulses, rice-ragi and rice-fallow. Rice is grown in the state under irrigated, rain-fed and tank-fed conditions. The rainfall was timely and well distributed and was suitable for paddy crop cultivation. The main varieties cultivated during *Kharif*' 2018 are medium duration varieties such as MTU-1001, IR64, Jyothi, Jaya MTU1010, JGL1798, Tunga, Thanu, IET13901, BR2655. Some private varieties like Super Amman, Sri Ram Sona were also grown in noticeable area. Traditional local varieties *viz*., Rajmudi, Ratnachudi, Rajabhogha, Jirige sanna and Gandasala are being grown in some taluks of Hassan and Mysuru districts. In Mysuru and Mandya district the area under hybrids *viz*., VNR 2233, KRH-4, DRH836 and MC 13 have increased current year. In the main fields, fertilizers were applied @ 50-100 kg urea/acre and/or 100 kg 10:26:26/acre, or 20:20:0:13/20:20:0:17 @ 100 kg/acre and 50 kg MOP/acre. Fertilizer usage is as per recommended but slightly more application of nitrogenous fertilizers. Intensity of common

weeds like *Echinochloa crusgalli*, *Echinochloa colona, Cyperus iria, Panicum repens, Cyperus rotundus, Cyperus procerus* and *Monochoria vaginalis* was low to moderate. In addition to hand weeding, many farmers (>90%) applied different weedicides like Londax Power, Top Star, butachlor, Nominee Gold and others. Mechanization in all the districts was adopted mainly for harvesting by using combine harvesters. Farmers are demanding for mechanical transplanters and harvesters cum binder. The farm machineries in the state are being promoted from state agriculture department by providing subsidy. The scheme "Yantra Dhare" started by state government in association with NGO Shri Kshetra Dharmastala Grama Abhiruddi Yojana for providing machineries (drum seeder, transplanter, cono weeder etc) on hire basis to the farmers at hobli level in every district is running successfully. During the vegetative stage the crop was severely affected by leaf folder especially in early tillering and tillering stage. In general, different insect pests were observed in low to moderate form. Among different diseases, blast and neck blast were moderate to severe in some fields in Mysuru and Mandya and sheath blight was high in some fields in Chikmagalore and Mysuru. Zinc deficiency was commonly observed in across all the districts surveyed.

Madhya Pradesh: Six districts *viz*. Rewa, Satna, Sidhi, Shahdol, Katni and Umaria situated in Kymore Plateau and Satpura hills under rice-wheat crop zone in Madhya Pradesh were surveyed for production oriented survey during 2018 K*harif* season. Very poor rainfall ranging from 794 mm to 920 mm was received in the surveyed area. The onset of monsoon was delayed and distribution of rainfall was not good in the region. Predominant rice varieties in the state were HYVs like Dhanteswari, IR 64, Pusa sugandha 5, Poonam, MTU 1010, Poorva, Rupali, Ankur Biranj, Pusa Sugandha 4, IR-36, IR-50, Shahbhagi Dhan, Winner, Champion, Supergold, Sonali and Sonam and hybrids like Goraknath, JRH 4, JRH 5, PAC 801, Arize Tej, Arize 6111, Ganga Kaveri, US382, US312, PHB71 Dhanya, JK401, PAC807, Arize 6201, Shahyadri, Pioneer-27p31, Pioneer 25p35, Raja, Indum1011 and Arize 6444. The average yield among the hybrids ranged from 65 to 75 q/ha compared to improved varieties (25-35 q/ha) under irrigated ecosystem. The predominant cropping system in the state was rice-wheat, rice-gram and rice-pea, rice–lentil and rice-toria. The major source of irrigation is bore-well followed by open well and canal irrigation. Some of the common problems faced by the farmers are timely supply of inputs particularly good quality seeds, fertilizers, equipment and fertilizers. The rice productivity in the state was low (2.55 t/ha) due to dominance of local poor yielding varieties, imbalance use of fertilizer, poor irrigation resources, poor plant protection measures and poor socio-economic status of the farmers. It was observed that weed infestation was very high in rainfed ecosystem and causing heavy economic yield losses as compared to transplanting system. Hand weeding was common among the farmers. Very few progressive farmers are using weedicide like pretilachlor, Web Super, bispyribac sodium, pendimethalin, butachlor and Almix for management of weeds. Organic resources like BGA, Azolla and Mycorrhiza were commonly adopted by the progressive farmers in the region particularly in Rewa, Shahdol and Umaria district. Zinc deficiency was commonly noticed in most of the surveyed districts. In general, pests and diseases incidence was low to moderate.

Maharashtra-1: The Konkan region of Maharashtra is predominate rice growing belt with an average productivity of 33.5q/ha. The regions comprise five districts *viz.* Thane, Palghar, Raigad, Ratnagiri and Sindhudurg. The total area under rice cultivation in *Kharif*-2018 season in the region was 392392 ha. The farmers of this region cannot grow any crop other than rice in *Kharif* because of high rainfall and geographically low land. The Production Oriented Survey for rice was organized at dough and maturity stage of crop during the month of October-November 2018. The onset of monsoon was early by 1week in South Konkan Costal

Zonewhereas, it was in time in North Konkan Costal Zone of theregion. Very high rain fall was received in almost all districts of Konkan region except Palghar and Thane. Rice is grown as a rain fed crop due to heavy rains in the region. The most common cropping pattern adopted by farmers in the region is Rice-Fallow, Rice-Pulses and Rice-Vegetables. Pulses after Kharif rice on residual moisture is a common practice in Palghar, Raigad, Thane and Ratnagiri districts. Average seed rate ranged from 40-50 kg/ha in HYVs and local varieties. However, in case of hybrids, seed rate was 15-20 kg/ha. Some farmers told that they adopted seed treatment with thiram (2.5 g/kg). Farmers are raising their nursery with organic amendments, mostly FYM and many of them also applied one dose of urea (1-1.5 kg/R; 1R==1000 sq. ft). The most common method of weed management in the nursery was by burning the nursery area with organic waste before sowing the seeds, a method known as 'Rab'. Though the balanced use of fertilizers is not practiced in the region, most of the farmers use Urea with limited quantity of complex fertilizers mostly 15:15:15, 18:18:10 and 18:18:18. Few progressive farmers applied FYM and poultry manure depending on availability. Planting was random and average plant population was 30-35 hills/m^2. Farmers use 21 to 30 days old seedlings for transplanting. Intensity of different weeds was low to medium. Hand weeding is common practice in the district. None of the farmers use weedicide in paddy cultivation but *Rabing* is followed for nursery weed management. Some of the common needs of the farmers were mechanization, irrigation facilities, subsidy on inputs and technical guidance during crop growth. Few farmers used power tiller and tractor. Intensity of different biotic constraints was low to medium. Application of pesticides was very less. Major problem faced by the farmers were shortage of labours and their high cost.

Maharashtra-2: Production oriented survey was conducted in 5 rice growing districts of Vidarbha region of Maharashtra when the rice fields were at milk to maturity stage. Most of the rice fields were under irrigated ecosystem. Predominant rice varieties cultivated in the region were HYVs like MTU 1010, Shriram, PKV HMT, BPT 5204, PDKV Kisan, JGL-384, MTU 1001, JGL 1798, DRK, Hira, Sonam , Jai Shriram, RS 555, Balwan, OM 3, Akshay, D-1008, D-30, Sona Raja, Om Shri Ram, Pintoo, Khajana, Jordar, Shri 101, RPN, YSR, IR 64, Sarthi, Akash and RPN Gold and hybrids like Arize 6444, Hybrid 5152, Nitya 333. Common cropping sequences followed by the farmers were rice-rice, rice-wheat, rice-vegetables, rice-fodder, rice-lathyrus, rice-watermelon, rice-gram and rice-green gram. Rice yield during the last season was drastically reduced due to severe infestation of BPH and water stress. Average seed rate in the region ranged from 30-75 kg/ha and majority of the farmers told that they treated the seeds with 3% brine solution followed by treatment with thiram (3 g/kg). Application of organic matter either in the nursery or in the main fields was very less. Fertilizers were applied @ 40-116 kg N/ha, 25-75 kg P_2O_5/ha and 5-64 kg K_2O/ha. Many farmers applied zinc sulphate and sulfur in the field. Different complex fertilizers like 20:20:0:13, DAP, 10:26:26, 18:18:10 and 12:32:13 were used by the farmers. The intensity of common weeds like Sawa (*Echinochloa colona*), Manka (local name), *Cyperus iria*, Shikara (local name), *Selaginella kraussiana*, *Echinochloa glabrescens*, *Cyperus difformis* and Kena (*Commelina benghalensis*) was low to high. Hand weeding was common among the farmers and in addition about 60% of the farmers also applied weedicides like Sathi along with urea, Eraze and pendimethalin. Some of the common needs of the farmers were proper irrigation systems, proper supply of electricity, labour, financial support for tractor and other small equipments and improvement of roads to fields. Among different biotic constraints, neck blast and sheath blight were more in Bhandara while BPH was severe in many fields in Chandrapur, Gadchiroli and Gondia. Farmers applied different pesticides for controlling different biotic stresses.

Punjab: Production oriented survey was conducted in farmers' field in different districts of Punjab during *Kharif* 2018. During *Kharif* 2018 in Punjab, paddy was grown on an area of around 30.5 lakh hectares. Non-Basmati and Basmati varieties occupied around 83 and 17 per cent area, respectively. Among the non-Basmati group, PR 121 was the most popular variety and occupied 32 per cent (8.0 lakh ha) area and PR 126, Pusa 44, PR 124, PR 122 and PR 114 were the other popular varieties. On the other hand, among the Basmati group, Pusa Basmati 1121 was the predominant variety followed by Pusa Basmati 1509. The predominant crop rotation was Rice-Wheat. Transplanting of HYVs was done between June 20 to July 10 and Basmati was transplanted during first week of July to end July at farmer's field. Predominant weeds observed during the survey were *Echnochloa crusgalli*, *Leptochloa chinensis* and others. Most of the farmers used weedicides like pretilachlor, butachlor and some farmers also used bispyribac sodium as a post emergence herbicide for weed control in rice crop. Even, a small fraction of farmers did not use any weedicide but they adopted cultural method of weed control i.e. ponding of water for the first 15 days of crop cycle. In most of the cases, planting density was inadequate i.e. it varied from 18-22 plants/ m^2 as against recommended density of 33 plants/ m^2. Most of the farmers used 10-15 kg/ha of seed rate for nursery sowing. Majority of the farmers had done seed treatments prior to nursery sowing. Mostly farmers transplanted 30-40 days old nursery. Most of the surveyed farmers used over dose of nitrogen but many farmers skipped the application of P_2O_5 and K_2O in paddy crop, owing to higher status of these nutrients in their soils. Application of Zinc sulphate (either 21 or 33%) was practiced by less than 25% of farmers but they used under dose of Zinc. Direct- seeded rice (DSR) was also grown by some farmers in the pockets of Sri Mukatsar Sahib, Ferozepur, Sangroor, Moga and Barnala districts of state. Farmers used both pre- and post-emergence herbicides for weed control in dry direct-seeded rice and used seed @ about 20-25 kg/ha with the drills fitted with inclined plate metering mechanism. Most of the farmers grew Basmati (Pusa Basmati 1121) and short duration rice varieties (PR 126 and PR 121) but some farmers had also sown PR 122 and PR 118. Most of farmers got similar or even higher yield under DSR but a small fraction of farmers also reported yield penalty to the tune of 3 to 4 q/ha over transplanted rice. Among different diseases, sheath blight was widespread throughout Punjab in low to moderate form. Incidence of false smut was low during 2018 almost throughout the state. In general, the incidence of leaf and neck blast, bakanae, brown spot, sheath rot, bacterial blight, stem rot and grain discoloration was low. Low incidence of *Erwinia* disease was recorded from few fields in district Faridkot on varieties Pusa 44 and PR 121. Incidence and population of rice insect-pest in general during *Kharif*' 2018 was below economic threshold levels at most of the locations surveyed in Punjab. In general, most of the farmers had broadcasted Padan 4G (cartap hydrochloride) @ 5 to 7.5 kg per acre or Regent 0.3G (fipronil) @ 5-6 kg per acre for control of leaf folder and stem borers. In later crop growth stage, farmers used tank mixture of insecticides or ready to use insecticides like Combi (Chlor 50% + Cyper 5%) @ 500 ml/acre or acephate @ 330 g + Actara @ 50 g + Contaf @ 330 ml for control of rice insect-pests and diseases. Hopper burn symptoms caused by BPH were observed on PR121 at village Ghulal in district Ludhiana.

Tamil Nadu: Production Oriented Survey was conducted in 12 districts (Dharmapuri, Krishnagiri, Thiruvanamalai, Vellore, Erode, Salem, Tiruppur, Theni, Madurai, Ramanathapuram, Tirunelvelli and Kanyakumari) of Tamil Nadu during *Kharif* 2018. Due to well distribution of southwest and northeast rainfall, timely planting was observed in most of the district surveyed. Canal irrigation was sufficient for two season cultivation. Wherever insufficient rainfall and canal irrigation was there, farmers used medium and long duration varieties as single season crop. Herbicides nominee gold and butachlor were used along with one or two hand weeding for the control of weeds. Weeding through cono weeder was

practiced by the farmers and some farmers adopted SRI method of rice cultivation. Complex fertilizers containing 17:17:17 NPK was applied by the farmers along with urea/DAP as basal fertilizers. Urea and potash were applied as top dressing in some of the rice growing areas. Farmers used the seeds in higher level, beyond 30 kg per acre. Machine planting was minimum. Shortage of labors is the main problem faced by the farmers. In the planting methods random transplanting, line transplanting and direct sowing were adopted by the farmers. In the mechanized cultivation, farmers are using the agricultural implements, power tiller, tractor and machine harvester. Mostly farmers took advice from the pesticide dealers for the usage fertilizers, pesticides and seed. Combined harvester was used by the farmers to harvest the paddy on hourly basis, farmers getting yield an average of 5000-6000kg/ha. Increasing cost of cultivation, water scarcity and labour shortage are the common constraints faced by many farmers. Non lodging, market value and short duration varieties are highly expected by the farmers. Disease incidence (leaf blast and brown spot) was low during 2018 crop seasons of rice. Usage of fungicides was also very less. Among the insect pests, leaf folder and stem borer incidence were observed in many places. Insecticides *viz.,* lambda cyhalothrin, acephate, profenophos, malathion, chlorpyriphos, moncrotophos, cartap hydrochloride, chlorpyriphos + cypermethrin combination product were used by the farmers for the control of BPH, leaf folder, ear head bug, gall midge and stem borer. In several places higher dose of chemicals and combination of different insecticide, fungicides and growth regulators were used without differentiation for the control insect pests and diseases.

Telangana: Production Oriented Survey was conducted in 13 districts of Telangana covering major rice growing areas. Overall, the average rainfall received in Telangana state from June to December, 2018 was recorded as 698.5 mm as against the normal rainfall of 843.8 mm with deviation of -17 per cent with over all status being normal. The actual rice area covered during *kharif* 2018 was 9.62 lakh ha (81.68%) compared to 7.63 lakh ha during *kharif*, 2017. The major varieties grown in the surveyed districts during *kharif*, 2018 were Samba Mahsuri, Telangana Sona (RNR 15048), Jai Sreeram, HMT Sona, Kunaram Sannalu, MTU 1010, Siddi, Bathukamma, JGL 11470, IR 64, Pooja, Chintu, Omkar, Kedar, MTU 1061, MTU 1153, MTU 1001, Tellahamsa *etc*., whereas the private hybrids grown particularly in Nalgonda, Warangal and Karimnagar districts were Arize 6444 gold, Arize Tej, KPH 412, KPH 272, Karishma, Champion, 27P31, 27P25, 27P63 and 27P38. But, the area under hybrids during *kharif* season is very less compared to *Rabi* season. The rice productivity in the surveyed districts during *kharif*, 2017 was in the range of 2250 to 4750 kg/ha. Average seed rate for fine grained varieties ranged from 50-60 kg/ha whereas in case of coarse grain varieties it was 75 kg/ha. About 25-30% of the farmers followed seed treatment with carbendazim. Fertilizers were applied @ 120-220 kg N/ha, 50-125 kg P_2O_5/ha and 25-75 kg K_2O/ha. Majority of the farmers are applying NPK in the form of complex fertilizers *viz.,* 18-46-0, 16-20-0-13, 17-17-17, 19-19-19, 28-28-0, 20-20-13. Some of the farmers applied green manure, poultry manure, FYM or sheep manure depending on availability. Direct seeding with drum seeder under puddled conditions and machine planting are gaining popularity among the progressive farmers in Khammam, Jagtial, Karimnagar, Nizamabad, Suryapet, Nalgonda and Peddapalli, in view of shortage of labour. Intensity of common weeds was low to medium. In addition to hand weeding, farmers are using different pre- and post emergence herbicides for the management of weeds. Some of the common needs of the farmers were bpt 5204 quality rice with high yield and multiple disease and pest resistance, improved version of Telangana Sona and Bathukamma, agricultural implements and increase in the MSP. Among the insect pests, BPH was severe in many fields in Khammam, Nalgonda, Jogulamba Gadwal and Wanaparthy. Moderate intensity of leaf mite was recorded in Nalgonda and Medak while panicle mite was comparatively more in Wanparthy. High incidence of rice

hispa and leaf folder was recorded in some fields of Nizamabad. Among the diseases, bacterial blight was very severe in large areas in Nizamabad and Suryapet. Sheath blight and stem rot was severe in some fields of J. Gadwal. Other diseases were recorded in low to moderate form. Farmers applied different pesticides and in many cases, different pesticides were mixed before application. Average number of pesticide spray ranged from 2-3. However, in some places in Nizamabad and Suryapet, the number of pesticide application went up to 4-5. Besides, declining land and water resources, labour shortage was found to be a major production constraint in all the surveyed districts.

Uttar Pradesh: Production oriented survey of rice growing areas 7 districts of eastern Uttar Pradesh. Major rice varieties cultivated in the region were HYVs like NDR 359, NDR 2064, NDR 2065, Sarjoo-52, NDR 97, Swarna, Swarna-Sub-1, BPT 5204, Sonam, Komal, Moti Gold, Dhanrekha, Damini and hybrids like Arize 6444, Arize 6444 Gold, 27P63, Gorakhnath-509. Major crop sequences followed by the farmers were rice-wheat, rice-sugarcane, rice-pulses and rice-mustard. Average seed rate for HYVs was 30-35 kg/ha and for hybrids about 15 kg/ha. Seed treatment was not common among the farmers and very few only treated the seeds with carbendazim (2 g/kg). Majority of the farmers applied FYM in the nursery and some of them also applied DAP (60-80 kg/ha). In the main fields, farmers applied 100-120 kg N/ha, 50-60 kg P_2O_5/ha and 15-20 kg/ha zinc sulfate. Very few farmers applied potassic fertilizers. Progressive farmers were using FYM, Compost and Green manure (dhaincha, urd bean and moong bean) to improve the soil health resulted in better grain yield. Plant growth regulators/promoters viz. Hizyme, Biozyme and Microzyme are being promoted by private agencies to obtain good harvest. Planting was mostly random. Intensity of common weeds was low to medium. Hand weeding was most common among the farmers and in addition to hand weeding some of the farmers also applied weedicides like butachlor, pretilachlor and Nominee Gold. Use of rotavator and combine harvester was common practice among the farming community. Majority of the farmers are small in holding size and using farm machinery on hired basis in the surveyed districts. Major diseases of rice viz. sheath blight and bacterial leaf blight were observed from low to moderate intensity however false smut was noticed in the late maturing/hybrids rice varieties up to moderate intensity. Infestation of stem borer, leaf folder and gundhi bug was observed from low to moderate intensity in all the surveyed districts. Majority of the farmers were using plant protection measures viz. fungicides and insecticides to manage the menace of diseases and insect pests in rice crop. Newly developed technologies viz. SRI, DSR and laser leveler was also being promoted among farming community through NFSM and BGERI projects. Soil testing program is being promoted by the govt. agencies and providing Soil Health Card to farmers. Zinc and sulphur deficiency was observed in surveyed districts. Shortage of farm labourers coupled with higher labour wages are the major constraint in rice production in the surveyed district.

Uttarakhand: Production oriented survey was conducted in 52 villages of 7 blocks of district Udham Singh Nagar when rice crop was at maturity. The general weather conditions for rice cultivation were normal. Since rice is the major crop in the *Kharif* season, most of the fields (40-50%) were occupied with rice. The predominant varieties cultivated in this district were HYVs like Pant Dhan 4, Pant Dhan 18, Pant Dhan 23, NDR 359, HKR 47, PR 113, PR 121 and PR 126, and basmati varieties like Pusa Basmati 1121, Pusa Basmati 1, Pusa Basmati 1 and Pusa Basmati 1509. Common crop rotation practices were rice-wheat, rice-sugarcane, Sugarcane-toria/lentil-sugarcane and maize-wheat-rice-vegetable. In the main fields farmers used about 120 Kg N/ha, 60 kg P_2O_5/ha and 40 kg K_2O/ha. Farmers in the district invariably applied zinc sulphate @ 25 kg/ha to avoid zinc deficiency/khaira disease. Different

equipments like tractor, power tiller, rotavator and combine harvester were used by the farmers. Shallow wells were the main sources of irrigation. Yield of rice was expected to be 35-40 q/ha in case of bold and medium grain varieties and 20-25q/ha in case of basmati rice. During survey for diseases, high incidence of false smut (40-50%) was noticed at some places in variety PR 126 (not recommended for the state) in Gadarpur and Bazpur blocks. Whereas, low to moderate incidence of diseases like BLB, Sheath blight, brown spot, blast and grain discoloration and insect pests like stem borer, leaf folder, BPH, WBPH, stem borer and Gandhi bug was observed in majority of the fields surveyed during the crop season. Most of the farmers used pesticides like cartap hydrochloride, Reagent (fipronil 5 SC) and chlorantraniliprole to control stem borer. Grain discoloration was also noticed in the fields at some places where crop was attacked by Gandhi bug. Crop was free from weeds at most of the places as most of the farmers used bis-pyribac sodium (Nominee Gold). Major problems faced by the farmers were lack of proper market facility and low MSP.

West Bengal: Production oriented survey was conducted in 6 districts of West Bengal (4 districts from southern parts viz., Howrah, Jhargram, North 24-Parganas and Nadia and 2 districts from northern part viz., Jalpaiguri and Uttar Dinajpur) when the crops were in dough to maturity stage. Commonly cultivated varieties were HYVs like Lalat, MTU 1010, Super Shymoli, Pratiksha, Swarna Sub-1, Sabita Patnai, Geetanjali, Ranidhan, IET 1010, Dinesh, Rajendra Bhagawati, DRR Dhan 42, Ajit and Rajendra Mahsuri. Some farmers also cultivated hybrids like Arize 6444 Gold, PAC 802, PAC 807, Arize 6129 Gold, JKRH-3333, PNPH-9241 and Bio 453. Some farmers are still cultivating few local speciality cultivars like Gobindabhog, Jhingasal, Santoshi, Moti, Kakuria, kalo Noonia, Bhutbhairiki, Barsha and Maliphore because of their higher market price and preparation of flaked rice and puffed rice. Different crop rotation practices followed by the farmers in the district were rice-rice, rice-mustard, rice-lathyrus-rice, rice-vegetables-rice, rice-maize, rice-potato-rice, rice-jute, rice-pulses-oilseeds and rice-rice-vegetables. Planting was mainly done during 1st week of July to 1st week of August. About 40% farmers adopted seed treatment with carbendazim or mancozeb. Majority of the farmers applied organic manure and chemical fertilizers in the nursery. In the main fields, fertilizers were applied @ 40-120 kg N/ha, 15-60 kg P_2O_5/ha and 40-60 kg K_2O/ha. About 50% of the farmers applied FYM or other organic manures in the main fields. Intensity of common weeds like *Echinochloa colona, E. crusgalli, Cyperus rotundus, C. iria, Cynodon dactylon, Marsilia quadrifolia* and water hyacinth was low to moderate. Hand weeding was most common and only some applied weedicides. Some of the common needs of the farmers were timely availability of quality seeds, subsidy on fertilizers, subsidy on purchase of equipments like threshers, power tillers, proper availability of labours and good market. Among different diseases, brown spot was recorded in high intensity in many fields in Jhargram and some fields of Jalpaiguri while blast and sheath blight were recorded in high intensity in some fields of Jhargram. Among different insect pests, leaf folder, stem borer and BPH were recorded in high intensity in some fields of Jhargram. Farmers applied different pesticides for controlling the biotic stresses.

Table 1: Production oriented survey, 2018-2019: Name of the state, districts surveyed, survey period and survey personnel

State/Region	District surveyed	Survey period	Survey Personnel
Bihar	*Rohtas*	Oct 27, 2018	**AICRIP Rice Centre, Botanical Research Unit, Dhangain, Rohtas-802212, Bihar** Dr. Arvind Kumar, Chief Scientist (Pl. Path) & Regional Director
Chhattishgarh	*Raipur, Kabirdham, Bilaspur* and *Mungeli*	Nov 2-3, 27; 2018	**IGKV, Raipur-492 012, Chhattishgarh** Dr. P. K. Tiwari, Pr. Scientist, Plant Pathology Dr. Sanjay Sharma, Pr. Scientist, Entomology Dr. Deepak Gaurha, Plant Breeder Dr. Bhawna Sharma, Plant Breeder Dr. Mangla Parikh, Plant Breeder
Gujarat	*Ahmedabad, Kheda, Anand, Gandhinagar, Mehsana, Dang, Panchmahal, Vadodara, Navsari, Valsad, Surat, Tapi* and *Narmada*	Oct 4-5, 10, 12, 19-22, 24, 26, 30; Nov 13, 16; 2018	**Main Rice Research Station, AAU, Nawagam 387 540** Dr. Rakesh Kumar Gangwar, Asso. Res Sci (Plant Path) Dr. S. S. Thorat, Asst. Res Sci (Ento) Dr. M. B. Parmar, Asso. Res Sci (Plant Breeding) Dr. D. B. Prajapati, Assoc. Res Scientist (Plant Breeding)
Haryana	*Kaithal, Kurukshetra, Karnal, Jind, Yamunanagar, Ambala, Panipat* and *Sonipat*	Aug 3-4 Sept 5-6 Oct 24-25	**CCS HAU, Rice Research Station, Kaul 136 021** Dr. Ram Singh, Pr. Scientist, Pl Path & Regional Director Dr. Mangat Ram, Pr. Scientist, Agronomy Dr. Ashwani Kumar, Asst Prof. (Pl. Pathology) Dr. Maha Singh, Asst Scientist (Entomology) (RRS, Karnal)
Himachal Pradesh	*Kangra, Mandi* and *Una*	July, 10, 20; Aug-4, 7, 10, 23, 29; Sept-15, 25; Oct 4-5, 9-10, 16; 2018	**Rice and Wheat Research Centre, CSKHPKV, Malan 176047** Dr. Sachin Upmanyu, Scientist, Plant Pathology Dr. Ajai Srivastava, Principal Scientist, Entomology Dr. Daisy Basandrai, Principal Scientist, Plant Breeding Dr. B.S. Mankotia, Principal Scientist, Agronomy Dr. D.P. Pandey, Principal Scientist, Plant Breeding
Jammu and Kashmir-1	*Anantnag, Kulgam* and *Kupwara*	Sep 6, 25, 27; 2018	**Mountain Research Centre for Field Crops (MRCFC), SKUAST-K, Khudwani, Jammu & Kashmir-192102** Dr. N. A. Bhat, Sr. Scientist, Plant Pathology Dr. M. A. Manto, Sr. Scientist, Entomology Dr. M. A. Ganai, Scientist, Agronomy
Jammu and Kashmir-2	*Doda*	Sept 8-10; 2018	**SKUAST-J, Chatha Jammu & Kashmir-180009** Dr. Anil Gupta, Prof & Head, Plant Path; I/c AICRIP Dr. Ramesh K. Salgotra, Prof. Pl. Breeding & Genetics Dr. M. K. Pandey, Asst. Professor, Plant Pathology Dr. Bhupesh Kumar, Asst. Professor, Plant Breeding Dr. Satish Kumar, Asst. Prof. (Biotech) Dr. Rohit Sharma, Jr. Scientist (Agronomy) Dr. Manoj K. Sharma, Jr. Scientist (Soil Science)
Karnataka	*Chikkamagalur, Hassan, Mandya* and *Mysuru*	Sept 26 Oct 5, 28-29 Dec 7, 26; 2018	**ZARS, VC Farm, Madya-571405, Karnataka** Dr. B. S. Chetana, Plant Pathologist Dr. M. P. Rajanna, Sr. Plant Breeder Dr. G. Dinesh (Agronomist) Dr. M. S. Kitturmutt (Entomologist) Dr. H. R. Umesh (Soil Scientist) Dr. N. Shivakumar (Hybrid rice Breeder) Dr. C. A. Deepak, Rice Breeder Mr. Subhash (AAO) Mr. Basavaraju, Agricultural Officer Mr. Prasad, Agricultural Officer, Dept of Agriculture Mr. Gowda, Asst. Agricultural Officer

State/Region	District surveyed	Survey period	Survey Personnel
Madhya Pradesh	*Rewa, Satna, Sidhi, Shahdal, Katni and Umaria*	Aug 19, 28; Sept 14, 19, 22, 27; Oct 1, 3, 6, 25, 31; Nov 14, 19, 27; Dec17; 2018	**College of Agriculture, JNKVV, Rewa, MP-486001** Dr. S. K. Pandey **Dean** Dr. S. K. Tripathi Pr Sci., AICRIP I/c & POS Coordinator Dr. M. R. Dhingra (Entomologist) Dr M.A Alam, Entomologist Dr R. K. Tiwari, Sr. Scientist (Agronomy) Dr Radha Singh, Scientist Plant Physiology Dr A K Pandey, Sr.Scientist KVK Rewa Dr. K. P. Tiwari, PC KVK Umaria Dr A. S. Chauhan, Professor COA Rewa Shri Sudhansu Pandey, TA Rewa Dr Saurabh Singh Sr.TA Rewa Dr M. Gufran Usmani Sr.TA Rewa Shri Mahendra Singh PC KVK Sidhi Dr. B.K,. Tiwari SMS KVK Rewa Dr K S Baghel SMS KVK Rewa Shri Rajeev Nigam ASCO Amarpatan Shri A.K. Shukla FEO Rewa Dr P. N Tripathi PC KVK Shahdol Anand jaiswal RAEO Umaria Narendra Tripathi RAEO Amarpatan
Maharashtra-1	*Thane, Palghar, Raigad, Ratnagiri* and *Sindhudurg*	Oct 29-31; Nov 1-3; 2018	**RARS, Karjat 410 201, Raigad (Dr. B.S. Konkan Krishi Vidyapeeth)** Dr. V. N. Jalgaonkar, Entomologist / plant pathologist (additional charge), Co-ordinator Dr. A. S. Dalvi, Agronomist Dr. H. D. Pawar, Jr. Research assistant
Maharashtra-2	*Nagpur, Chandrapur, Bhandara, Gadchiroli* and *Gondia*	Aug 31; Sept 26; Oct 30; Nov 1, 6; 2018	**Agricultural Research Station, Sakoli, Bhandara-441802 (Panjabrao Deshmukh Krishi Vidyapeeth, Akola)** Dr. G. R. Shamkuwar, Sr. Rice Breeder Shri A. D. Banginwar, Jr. Rice Breeder Dr. B. N. Choudhari, Jr. Rice Entomologist
Punjab	*Amritsar, Taran Taran, Gurdaspur, Patiala, Sangrur, Fatehgarh Sahib, Hoshiarpur, Roopnagar, Ajitgarh (SBS Nagar), Ludhiana, Barnala, Jalandhar, Kapurthala, Ferozepur, Faridkot, Muktsar* and *Moga*	Aug-Nov, 2018	**Punjab Agricultural University, Ludhiana-141 004** Dr. G.S. Mangat, Senior Rice Breeder cum Head Dr. Jagjeet Singh Lore, Sr. Plant Pathologist Dr. R. S. Gill Sr. Plant Breeder Dr. P.S. Sarao, Sr. Entomologist Dr. Jyoti Jain, Asstt. Plant Pathologist Dr. Buta Singh, Asstt. Agronomist Dr. Gurpreet Singh Makkar, Asstt. Entomologist Dr. Rupinder Kaur, Rice Breeder Dr. Navjot Sidhu, Asstt. Plant Breeder Dr. Renu Khanna, Asstt. Plant Breeder
Tamil Nadu	*Dharmapuri, Krishnagiri, Thiruvanamalai, Vellore, Erode, Salem, Tiruppur, Theni, Madurai, Ramanathapuram, Tirunelvelli* and *Kanyakumari*	Dec 5-7; 19, 26-28; 2018	**Tamil Nadu Agricultural University, Coimbatore-641 003** Dr. P. Jeyaprakash, Professor (PB&G) Dr. A. Ramanathan, Professor (Plant Pathology) Dr. R. Saraswathi, Professor (PB&G) Dr. R. P. Soundararajan, Assit Prof. (Agrl. Entomology) Dr. K. Amudha, Assistant Professor (PB&G) Dr. G. Senthilkumar, Assistant Professor (Agronomy)

State/Region	District surveyed	Survey period	Survey Personnel
Telangana	*Nirmal, Nizamabad, Kamareddy, Karimnagar, Jagtial, Peddapalli, Nalgonda, Suryapet, Khammam, Medak, Wanaparthy, Jogulamba Gadwal* and *Vikarabad*		**Rice Research Center, ARI, PJTSAU, Rajendranagar, Hyderabad-500 030** Dr. T. Kiran Babu, Scientist (Pl. Path.), ARI, R'Nagar Dr. N.R.G. Varma, Principal Scientist (Ento), Dr. N. Balram, Scientist (Pl. Path.), RARS, Polasa, Jagtial Sri. P. Jalandhar, Scientist (Pl. Path.), RS&RRS, Rudrur Dr. Y. Chandramohan, Sr. Scientist (Pl. Br.), Dr. L. Krishna, Sr. Scientist (Pl. Br.) Dr. P. Spandana, Scientist (Agro) Dr. Ch. Damodhar Raju, Principal Scientist (Pl. Br.) Dr. T. Pradeep, PS (Rice) & Head, RRC, Rajendranagar Dr. R. Jagadeeshwar, Director of Research, PJTSAU Dr. M. Srinivasa Prasad, PS & Head, Plant Pathology, IIRR, Rajendranagar Dr. G. S. Laha, PS (Pl. Path.), IIRR, RNR, Hyd. Dr. S. Naveen Kumar, Sr. Scientist & Co-ordinator, DAATTC, Nizamabad Dr. T. Kiran Babu, Scientist, (Pl. Path.), RARS, Jagtial Dr. A. Srinivas, Coordinator & Head, DAATTC, Medak Dr. N. Praveen, Co-ordinator, DAATTC, Ranga Reddy Dr. M. Shankaraiah, Sr. Scientist (SSAC), Miss. G. Spandana, Scientist (TOT), DAATTC, Medak Dr. M. A. Aarif Khan, Programme Co-ordinator & Head, KVK, Kampasagar Dr. M. Shankar, SMS (Plant Protection), KVK, Kampasagar Smt. Phanisri, Co-ordinator & Head, DAATTC, Nalgonda Mr. G. Narendar, Scientist (Crop Production), DAATTC, Nalgonda Dr. Durga Rani, Professor, IBT, Rajendranagar Dr. I. Arunasri, Co-ordinator & Head, DAATTC, Karimnagar Dr. K. Madan Mohan Reddy, Scientist (TOT), DAATTC, Karimnagar Dr. I. Arunasri, Dr. K. Madan Mohan Reddy, Dr. B. Pushpavathi, Principal Scientist (Pl. Path.), SRTC, R'Nagar Dr. Ramakrishna Babu, Coordinator & Head, DAATTC, Mahabubnagar Dr. J. Hemanth Kumar, PC, KVK, Wyra **State Department of Agriculture** Dr. M. Shankar, Smt. Phanisri, Mr. G. Narendar, Sri. T. Vasu, ADA, Kodad Smt. PSM. Saritha, MAO, Thripuraram Sri. T. Srinivas, MAO, Chilkur Smt. D. Nagaswathi, AEO, Chilkur Smt. V. Shirisha, AEO, Chilkur Sri. B. Chandra Sekhar, AEO, Chilkur Smt. PSM. Saritha, MAO, Thripuraram Sri. Govindu, DAO, Nizamabad Sri. K. Nagesh Reddy, MAO, Varni Sri. A. Arun Kumar, AEO, Varni Sri. A. Parushuram Naik, DAO, Medak Sri, M, Yadagiri, MAO, Narsangi

State/Region	District surveyed	Survey period	Survey Personnel
			Sri. N. Sathish, MAO, Ramayampet Sri. H. Vijrumbhana, AEO, Narsangi. Sri. K. Nagesh Reddy, MAO, Varni Sri. M. Umapathi, MAO, Eligedu, Sri. G. Anil, AEO, Muppirithota Smt. T. Sujatha, DAO, Wanaparthy. Sri. G. Chandramouli, MAO, Pebbair Sri. B. Nandakishore Reddy, AEO, Kothakota mandal Miss. D. Shirisha, AEO, Palem, Kothakota mandal, Sri. M. Shakriya Nayak, ADA, Alampur, Gadwal district Sri. Md. Ayub, MAO, Itikyala mandal, Jogulamba Gadwal district. Smt. G. Sucharita, MAO, Jogulamba Gadwal mandal Sri. G. Krishnavardhan Reddy, AEO, Rekulapally cluster.
Uttar Pradesh	*Faizabad, Ambedkar Nagar, Barabanki, Sultanpur, Basti, St. Kabir Nagar* and *Siddharth Nagar*	Aug 3; Sept 20-21, 24, 26-28, 30; Oct 1, 3-4, 25, 29; 2018	**Crop Research Station, Masodha (NDUAT), Faizabad-224133** Dr. V. Prasad, Jr. Pathologist & Team Leader Dr. S. K. S. Rajpoot,Asstt. Entomologist Dr. S.P. Giri, Asstt. Prof., Plant Breeding Dr. Saurabh Dixit, Rice Breeder Sri D.P. Singh, Asstt. Prof. Plant Pathology Dr. D.K. Verma, Agronomist Sri. Alok Pandey, Technical Assistant Sri A.W. Khan, Jr. Research Assoc. Sri C.B. Singh, Jr. Research Assoc. Dr. V.N. Rai, Officer Incharge Deptt. of Agriculture, Govt. of U.P.
Uttarakhand	*Udham Singh Nagar*	-	**GBPUA&T, Pantnagar-263145** Dr. Vishwanath, Professor, Plant Pathology
West Bengal	*Howrah, Jhargram, North 24-Parganas, Nadia, Jalpaiguri* and *Uttar Dinajpur*	Nov 1-2, 14-15, 20, 29; 2018	**Rice Research Station, Chinsurah, West Bengal-712102** Dr. Chandan Kr Bhunia, Plant Pathologist Dr. Dilip Kumar Patra, Asst. Plant Pathologist Dr. Rajib Das, Asst Botanist Dr. Kinkar Saha, Asst. Entomologist Dr. Chirasree Gangopadhay, Asst. Entomologist Dr. Suparna Gupta, Asst Botanist Dr. Mitali Chatterjee, Asst. Botanist Smt Purnima haldar, Rice Physiologist Dr. P. K. Dey, Asst. Entomologist Mr. Arup Das, DDA (Admin), North 24-Parganas Mr. Narayan Sikdar, Asst DA (PP), North 24-Parganas Mr Sujoy Bhowmik, Asst DA (Information), North 24-Parg

Table 2: Widely prevalent rice varieties cultivated in surveyed districts of India during 2018-19

District	Varieties
Bihar	**HYVs:** MTU-7029 (Swarna), BPT 5204 (Samba Mahsuri), Rajendra Sweta and Rajendra Mahsuri; **Hybrids:** Arize 6444; **Locals:** Sonachur
Chhatishgarh	**HYVs/Improved**: Swarna, MTU1010, MTU1001, Mahamaya, Sonamasuri, Kaveri 371, PKV-HMT, IR64, Indira Sugandhit Dhan, HMT, Vijay, Chandrahasni, Bamleswari, IGKVVR1, IGKVVR2, Safri, Durgeswai, Danteswari, Karmamasuri, Indira Barani Dhan, Rajeswari, Shri Ram and HMT; **Hybrids**: Arize 6444, Silky, VNR 2245, DRS 775, VNR 2355, US312 and US 382; **Locals**: Bisnubhog, Dubraj, Tulsimajri and Javaphool
Gujarat	**HYVs/Improved:** Gurjari, GAR-13, GNR-3, GNR-6, GR-11, GR-7, Moti, Surya Moti, Moti Gold, Rachna, Daftri, Krishna Kamod, Mahisagar, Masuri, Mahi Sagar Punjab S and Nath Poha, Om Sriram 125, IR-28, Sweta, Jaya and Mahsuri; **Hybrids:** Sonam, US-25 P 25, US-312, US-612and US-2111, MH 5629, Kaveri-468, US-312, Gorakhnath and Arize 6444
Haryana	**HYVs:** Pusa 44, PR 113, PR 114, PR 126 and HKR 127, HKR 47; **Hybrids:** Sava 127, RH Pioneer 27P31, VNR 438, VNR 2355, Arize 6129, Arize 6444, Basmati hybrid 408, RH Pioneer 27P31, Swift Gold and DRH 834; **Basmati:** CSR 30, Pusa, Pusa Basmati 1, Pusa Basmati 1509, Pusa Basmati 1401, CSR 30, Taraori Basmati, Pusa Basmati 1121, Pusa Basmati 1728, Pusa Basmati 1637 and Sarbati
Himachal Pradesh	**HYVs/Improved varieties:** PR 121, PR 126, Palam Basmati-1, Palam Lal Dhan-1, Him Palam Dhan-1, HPR 1156, HPR 2143, HPR 1068, Kasturi, Sharbati, Pusa 1509, Pusa 1121; **Hybrids:** Raja, Arize 6129, Arize 6444, PAC 807, Hybrid 834, Hybrid 57, PR 127, Hybrid 1067, 257, 309, Hybrid 25P35, Arize Swift Gold, Sri Ram Khushbu, Shahi Dawat, US 312, Raftaar, Hyb. 2266, Nirmal-4 etc. **Basmati**: Pusa 1121; **Local:** Jhini
J & K-1	**HYVs:** Jhelum, SR-I, SR-2, SR-3, SR-4 and SR-5; **Locals:** K-39, K-332, China-1039 China-1007 and Mushk Budgi
J & K-2	Cheena (CH 988), Japonica (CI 1561), Giza 14 ; Local: Daggu and K 39
Karnataka	**HYVs/Improved:** IR64, Thanu, Tunga, Intan, JGL1798, JGL 1798, KPR-1, MTU1001, MTU 1010, IET13901, BR2655, Super Amman, Jyothi, BPT5204, JGL1798, Jaya, Jyothi, Purichickka, Akshaydaan; **Hybrids:** KRH-2, KRH-4, VNR 2375, VNR2233, DRH836, MC13, Sun Madhu and Arize Bold and GK 5001; **Locals:** Rajamudy and Ratnachoodi
Madhya Pradesh	**HYVs:** Ankur Biranj, Ankur Juari, Ankur Sonali, Ankur, Champion, Dhanteswari, HMT, IR 50, IR 64, IR36, IR-50, Jaya, JR767, Kanak, Kaveri, MTU 1010, MTU 7029, Poonam, Poorva, PS4, PS5, Rupali, Shahbhagi Dhan, Sita, Sonali, Sonam, Supergold, Swarna Sub1, Swrankamal, Winner. **Basmati:** Pusa 1121, Pusa 1509, Pusa Sugandha 4 and Pusa sugandha 5; **Hybrids:** Advanta 801, 807, Arize 6111, Arize 6201, Arize 6444, Arize Tej, Bioseed 777, Dhanya, Ganga Kaveri, Goraknath, Indum1011, JK401, JRH 4, JRH 5, Loknath, Mahyco 117, Menaka, Mulayam 999, NPH101, NPH105, P35-25, PAC801, PAC807, PHB71, Pioneer 25p35, Pioneer 27p291, Pioneer-27p31, PRH10, Raja, Shahyadri, Suruchi, US 10, US312 and US382; **Locals:** Amagaur, Badari, Bako, Balbhog, Balkeshar, Banspore Basanti, Belari, Bhadaili, Bhantaphool, Biranj, Biranjphool, Bohita, Butanagar, Champa, Chhinmauri, Dehula, Dhanlaxmi, Dhaur, Doodhi,

	Dubaraj, Govinda, Gurmatia, Jalkeshar, Kanakjir, Kaniga, Karaga, Karahani, Karanphool, Kerakhambh, Keshar, Khusboo, Koilari, Kosam, Laichi, Lal Dhan, Lal, Lalita, Laloo-14, Ledua, Lochai, Lohandi, Lonagi, Malti, Manisha, Menaka, Methichoor, Nanhi, Newari, Padmasar, Rambhog, Ranikajal, Reshma, Ruthu, Sabnam, Samasar, Samrat, Shabnam Sumo Vardan, Shukla phool, Sonachoor, Sonkharchi, Subeej Sugandha, Swarnkamal, Tinpakhi, Vishnubhog and Yashoda Bhog.
Maharashtra-1	**HYVs**: Ankur, Ankur Rupali, Ankur Sonam, Anupam, Daptari-100, Ekvira, Green Gold, Green Gold Mohini, HMT-Sona, Indrayani, Jai Shriram, Janaki, Jaya, Jyotika, Karjat-2, Karjat- 3, Karjat -5, Karjat -7, Karjat-184, Komal-101, Krushidhan, Laxmi, Mahsuri, Mohini, MTU 1010, MTU-1001, Om Shriram, Om-3, Pooja, Poonam, Rasi, Rasi Poonam, Ratna, Rupali, S-911, Sarthi, Shabari, Shreeram, Shubhangi, Shweta, Sonal, Sonam, Spriha, Suma, Supreme Sona, Suvarna, Suvarna, Suvarna, Swarna, Trupti, Vaishnavi and YSR; **Hybrids**: Ankur-7434, Silky, Arize 6444, KSI 810, Loknath 509, Mahyco-5629, Pusa RH-10, Sahyadri-1, Sahyadri-2; Sahyadri-3 and Silky-277; **Locals**: Bangalya, Bela, Dongara, Ghansal, Kolam, Kolhyachi Shepti, Kothimbira, Mahadi, Somasal, Sorti, Turya, Wada Kolam, Walai, Yelkar and Zinia.
Maharashtra-2	**HYVs:** Akash, Baby Gold, Balwan, BPT 5204, Chintu, D-1008, D-30, Hira, HMT, IR 64, Jai Shriram, JGL 1798, JGL-384, Jordar, Kesar, Khajana, Mohara, MTU 1001, MTU 1010, OM 3, Om Shri Ram, Parbhani Chinor, Pavan Putra, PDKV Kisan, Pintoo, PKV, PKV Ganesh, PKV HMT, Priyanka, Radha, RNR 15048, RPN Gold, RPN, RPN-24, RS 555, Sabri, Sakoli-9, Sampurna 108, Sarthi, Shri 101, Shriram, Siri, Sona Raja, Sonam, Sumo-11, Super Sona, Swarna, Tukaram, Yashoda 1312, YSR; **Hybrids:** Arize 6444, Hybrid 5152, Nitya 333; **Local:** RP
Punjab	**HYVs:** CR 2012, HKR 47, PR 111, PR 114, PR 116, PR 118, PR 121, PR 122, PR 124, PR 126, PR 127, and Pusa 44. **Basmati**: CSR 30, Pusa 1121, Pusa 44, Pusa 1401, Pusa 1509 and Pusa 1728
Tamil Nadu	**HYVs:** ADT 30, ADT 45, ADT 49, ADT36, ADT37, ADT39, Akshaya, Amman BT, Amman, Amoga, Angur , Archana, ASD16, BPT 5204, CO 51, CO52, Dhanuska, Improved white ponni, IR 20, NLR 34449,Paiyur 1, Pavithra, Ponni, RNLR, Sonam, Sowbackya , Swarnamuki, TKM 13, TPS 3, TPS 5, Vasundra and White ponni**.**
Telangana	**HYVs**: Bathukamma, Chintu, HMT Sona, IR 64, Jai Sree Ram, JGL 11470, JGL 24423, Kedar, Kunaram Sannalu, MTU 1001, MTU 1061, MTU 1153, MTU1010, Omkar, Pooja, Samba Mahsuri, Siddi, Telangana Sona and Tellahamsa; **Hybrids:** Arize 6444 gold, Arize Tej, KPH 412, KPH 272, Karishma, Champion, 27P31, 27P25, 27P63 and 27P38
Uttar Pradesh	**HYVs/Improved:** BPT 5204, Dhanrekha, Dhanversa, Gorakhnath 509, Jallahri, Kalanamak, Karishma, KN3, Moti Gold, Nandi Super, Narendra Lalmati, Narendra Lalmati, Narendra Usar Dhan-3, NDR 2064, NDR 2065, NDR 359, NDR-97, PB-1, Pusa Basmati-1, Sambha Mahsuri, Sarjoo 52, NDR 359, Shusk Samarat, Sona Mahsuri, Sonam, Super 115, Swarna Sub 1, Swarna, US 305 Vedaplus and Basmati varieties; **Hybrids:** 27P31, 27P63, Arize 6444 Gold, Arize 6444, Basmati, Bayer 6633, Biostat, Damini, Dhanya 748, Dhanya 8655, Ganga Kaveri, Gorakhnath 509, Gorakhnath 510, Karishma, Kaveri 9090, Kaveri, Khusi 27, KN3, Krishna Kaveri, Moti

	Gold, Nandi 333, NDR 2064, NDR 2065, NDR 359, Pragya Plus, Sampurna, Sawrnarekha, Silky, US-305 and VNR 2233; **Locals:** Kalanamak
Uttarakhand	**HYVs:** Pant Dhan 4, Pant Dhan 18, Pant Dhan 23, NDR 359, HKR 47, PR 113, PR 121 and PR 126; **Basmati:** Pusa Basmati 1121, Pusa Basmati 1 and Pusa Basmati 1509
West Bengal	**HYVs:** Ajit, Annanda, Banga Lakshmi, BB-11, CR-1010, Dhanraj, Dinesh, DRR Dhan 42, FC-1, GB-1, GB-3, Geetanjali, GS-1, IET 1010, IET 4094, IET 4786, IR 64, Khsitish, Lalat, Manjira, MTU 1001, MTU 1010, Niranjan, Param, Pratiksha, Rajendra Bhagawati, Rajendra Mahsuri, Ranidhan, Ranjana, Sabita Patnai, Shatabdi, Super Shymoli, Swarna Sub-1, Swarna, Ujala Plus, Var. 1018; **Hybrids**: Arize 6444, Arize 6444 Gold, PAC 802, Arize 6129 Gold, Bio 453, Gobindobhog, Paijam and Kalo Noonia; **Locals:** Gobindabhog, Bullet, Maharaja, Kalakandi, Jhingasal, Santoshi, Moti, Kakuria, Bhutbhairiki, Barsha and Maliphore; **Locals:** Gobindabhog, Bullet, Maharaja, Kalakandi, Jhingasal, Santoshi, Moti, Kakuria, Bhutbhairiki, Barsha and Maliphore

Table 3: Biotic constraints (diseases) in different states of India during 2018

Sates	Bl	NBl	BS	ShBl	ShR	FS	GD	LS	StR	NBLS	BAK	KSm	Khaira	UDB	BLB	BLS	RTV
Bihar				L-M		M									M-S		
Chhattishgarh	M	M	L-M	M	L-M	L-M	M-S								L-M		
Gujarat	T	L-M			L-M	T-L	T								T		
Haryana	L-M	L		L-M	L	L					T-L		M		L		
Himachal Pradesh	L-M	M	L-M	L	L-M	L-S	L-M	L		L-M							
J and K-1	L	L	L-M	T-L			L-M										
J and K-2	M		L	L-M	T-L		T-L								L		
Karnataka	L-M	L-S	L	M	L	L	M							L	L-M		
Madhya Pradesh	M	L-M	L-M	L-M	L-M	L	T						L-M		T		
Maharashtra-1	T-L			T-L	L	T	L								T-M		
Maharashtra-2	L	L-M	L-M	L-M	L-S	L-M	L								L-M		
Punjab	T-L	L	L-M	L-M	L	L	L		T-L		L				L		
Tamil Nadu	L-M		L-M			M											
Telangana	L-M	L-M		L-M	L-M		L-M								L-S		
Uttar Pradesh			L	L-M	L	L-M									L		
Uttarakhand	L		L	L-M		S	L								L-M		
West Bengal	L-M	L-M	M	L-M	L-M	L									M		

Bl: Blast, **NBl**: Neck Blast, **BS**: Brown spot, **ShBl**: Sheath blight, **ShR**: Sheath rot, **FS**: False smut, **GD**: Glume discoloration, **LS**: Leaf scald, **StR**: Stem rot, **NBLS**: Narrow brown leaf spot, **BAK**: Bakanae, **KSm**: Kernel Smut, **LSm**: Leaf Smut, **CR**: Crown Rot, **BLB**: Bacterial leaf blight, **BLS**: Bacterial leaf streak, **RTD**: Rice tungro disease; L: Low; M: Moderate; S: Severe.

Table 4: Biotic constraints (insect pests) in different states of India during 2018

Sates	SB	LF	BPH	WBPH	GLH	GM	RH	WM	GH	CW	GB	MT/ PM	RT	RB	AW/ SC	Rats	Term	EHB	MB	BB
Bihar	L-M	L																		
Chhattishgarh	M	M	M-S	T	L	L	L	T								M-S				
Gujarat	L	L	L-M	L							L	T			L-M					
Haryana	T-L	M	M-S	M-S				L	T								L			
Himachal Pradesh	L-M	L-M					L-M	L	L-M											M-S*
J and K-1		L							L-M							L				
J and K-2	T	L-M							L-M							T	L-M			
Karnataka	L-M	L-M	L							L						L				
Madhya Pradesh	T-L	L	L-M	L-M	L-M	L				L-M				T	L	T				
Maharashtra-1	L-M	L	L							T					L					
Maharashtra-2	L	L-M	M-S	M		L-M						L		L	L-M					
Punjab	T-L	L-M	L-M	L				T-L	T											
Tamil Nadu	L-M	L	L			L							L					L		
Telangana	L	L-M	L-S			L	L-M					L-M								
Uttar Pradesh	L	T-L	L								T-L				T					
Uttarakhand	L	L	L	L			L				L									
West Bengal	L-M	L	M	L-M				T	L			T-L		L-M						

*** Only in Kangra; Low intensity of cut worm in Anantanag and Kulgam in J & K-1; Low incidence of blue beetle in Ratnagiri and Sindhudurg in Maharashtra; Low incidence of crabs in Maharashtra; SB**: Stem Borer, **LF**: Leaf Folder, **BPH**: Brown Plant Hopper, **WBPH**: White Backed Plant Hopper, **GLH**: Green Leaf Hopper, **GM**: Gall Midge, **RH:** Rice Hispa, **WM:** Whorl Maggot, **GH**: Grass Hopper, **CW**: Case Worm, **GB**: Gundhi Bug, **PM**: Panicle Mite, **MT**: Mite, **RT:** Rice Thrips, **RB**: Rice Bug, **AW**: Army Worm, **SC**: Swarming caterpillar, **Term**: Termites; **EHB**: Ear head bugs; **MB**: Mealy Bug, **WTN**: White Tip Nematode, **BB**: Black beetles: **T**: Traces, **L**: Low, **M**: Moderate, **S**: Severe.

INTRODUCTION

The primary aim of Production oriented survey (POS) is to collect information on various aspects of rice cultivation *viz*., general weather and crop conditions, varieties cultivated in a particular region and yield range, extent of use of organic manure and inorganic fertilizer, different inputs and their availability, different biotic and abiotic problems and there management in different states. The survey assesses the needs and problems of the farmers and determines their degree of knowledge and perceptions of crop management problems. POS gives information about the various constraints faced by the farmers in dealing with the problems. The survey also provides information on various indigenous technical knowledge of the farmers regarding rice cultivation. These surveys can help to identify the gaps in knowledge that need to be addressed by research and extension. The main objectives of the survey are:

- To undertake extensive periodical survey in rice growing areas of the country, and to study the practices and constraints in rice cultivation.

- To suggest suitable remedial measures on the spot to solve the farmers' problems, if any.

- To minimize input costs and suggest methods to avoid any wasteful practices.

Survey team included scientists from co-operating centres of All India Co-ordinated Rice Improvement Programme of the ICAR-Indian Institute of Rice Research and the agricultural and extension officials of respective State Departments of Agriculture. The report contains the names of districts and subunits covered during survey and also the period of survey. Further, it describes the particulars of rice areas, popular varieties under cultivation, and crop production and management technologies adopted in respective regions. In addition, information on different biotic and abiotic production constraints prevalent in different rice growing states during the crop season and usage of plant protection chemicals are also described.

Bihar (Dhangain)

District surveyed: *Rohtas*

Particulars of survey

District	Block	Villages
Rohtas	Bikramganj	Karmaini Khurd and Ghosia Khurd

Widely prevalent rice varieties

District	Varieties
Rohtas	**HYVs:** MTU-7029 (Swarna), BPT 5204 (Samba Mahsuri), Rajendra Sweta and Rajendra Mahsuri; **Hybrids:** Arize 6444; **Locals:** Sonachur

Particulars of rice area

District	Total geographical area (ha)	Total cultivable area (ha)	Total cultivated area (ha)	Total irrigated area (ha)	Area under rice (ha)
Rohtas	390722	235061	329725	311401	170192

Source: DAO Office, Rohtas (Govt. of Bihar)

Weather data of Rohtas district during 2018

Weather parameters	Months						
	June	Jul	Aug	Sep	Oct	Nov	Dec
Rainy days	5	17	18	9	0	0	0
Total rainfall (mm)	84	145	170	154	0	0	0
Max. Temperature	40	35	33	33	35	30	25
Min. Temperature	29	27	26	25	21	15	10

General questions on rice cultivation in district (To be filled by the co-operator in consultation with the Officials from State department of Agriculture)

Parameters	Rohtas
Total area under HYVs in the district	162895 ha
Most prevalent HYVs in the district	MTU 7029
Total area under rice hybrids in the district	7000 ha
Most prevalent rice hybrids in the district	Arize 6464
Total area under basmati in the district	Nil
Most prevalent basmati varieties in the district	Nil
Whether farmers are using any heavy equipments like transplanter/combine harvester	Combined harvester
Mention water saving technologies like SRI/ laser leveling/DSR being used by the farmers	DSR on small scale

Parameters	**Rohtas**
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	1. Cultivation of HYVs should be adopted on large scale 2. Seed treatment practice should be made 3. Preventive measures against diseases should be under taken 4. Crop rotation in the rice cultivation field should be adopted 5. Soil testing must be done
What are the general problems in rice cultivation in the district?	1. Govt. tube well borings were reported out of order 2. There is erratic supply problem of electricity 3. Irrigation water is not supplied in canals, at the time of beginning of the kharif crop season, hence the seedling raising activities are affected.
Please provide any farmers association in the district	1. One FPO "Sasaram Farmers producer company limited", is functional in the district. 2. Several other FPOs ae under process of formation.
Whether availability of agricultural labours is sufficient?	No, there is agricultural labour problem
Whether there is any marketing problem of the produce?	Yes, it is the major problem
Any major irrigation/power generation project in the district	There is only old canal irrigation facility in the district which is functioning well.
Any soil testing program undertaken?	Yes, by IRS, Bikramganj, Rohtas.
Any farmers' training program was organized by the state department of Agriculture/University the state department of Agriculture/University	Training programme at certain intervals are organized by the KVK, Bikramganj, Rohtas (BAU, Sabour). Simultaneously, district department of agriculture also organize some training camps.

Variety wise area coverage (ha) in Rohtas district of Bihar during *Kharif*' 2018

Variety	**Area (ha) covered with this variety in the district**
MTU 7029	97395
BPT 5204	43000
Rajendra Mahsuri	10000
Rajendra Sweta	12500
Arize 6444 (hybrid)	7000
Sonachur (Local)	297

Source: DAO Office, Rohtas (Govt. of Bihar)

District wise details:

Production Oriented Survey was conducted in Rohtas district of Bihar under the Agro-climatic zone IIIB of Bihar during the crop season 2018. Two villages in the Bikramganj block involving

10 farmers were covered for the survey. The rice fields surveyed were under irrigated ecosystem. In general, the climatic conditions were normal for rice cultivation. However, during early part of the Kharif season, 2018, there was scarcity of rainfall and also due to late supply of irrigation water, the sowing was delayed in majority of the places in the district. At few places, where the seedlings were grown on rice community nursery basis, the farmers of the surrounding areas were able to procure seedlings from those nurseries and to transplant it earlier. The predominant rice varieties cultivated by the farmers were HYVs and like MTU-7029 (Swarna), BPT 5204 (Samba Mahsuri), Rajendra Sweta and Rajendra Mahsuri and hybrids like Arize 6444. Few farmers also cultivated local scented rice variety Sonachur. Common crop rotations followed by the farmers were rice-wheat, rice-potato, rice- vegetables, rice-pulses and rice-toria. The average rice yield of Swarna in the district was 6500-6800 kg/ha. Optimum time of planting was July-August. Average seed rate was 40-50 kg/ha and some farmers adopted seed treatment with carbendazim (2 g/kg seeds). In the nursery, farmers applied FYM. However, application of inorganic fertilizers in the nursery beds was not common among the farmers. In the main fields, farmers applied 100 kg N/ha, 50 kg P_2O_5/ha, 40 kg K_2O/ha and 20 kg $ZnSO_4$/ha. In the main fields, farmers applied FYM (~50 q/ha) during land preparation. Some farmers applied available oilcakes during puddling of main fields before transplantation. Random planting was most common among the farmers. The intensity of common weeds like *Cyperus rotundus* and *Echinochloa colona* in and around rice fields was moderate. Hand weeding was most common among the farmers and some farmers also applied weedicides like butachlor or pretilachlor. In some fields occurrence of wild rice rice (*Oryzae sativa* var. *fatua*) was noticed. Some of the common needs of the farmers in the region were timely supply of canal water, repair of tube wells, regular supply of electricity and improvement in the rice procurement system. Farmers used implements like tractor, power tiller, rotavator and combine harvester (either own or on hire basis). Most of the farmers purchased new seeds for sowing except some cases where farmers used previous year's seeds. Main sources of irrigation were canal and shallow tube wells. Electricity and diesel were the main sources of power and most of the farmers reported scarcity of electricity. Private dealers and university personnel were the main advisors to the farmers regarding input use. Among different biotic constraints, false smut and bacterial blight were recorded in moderate to high intensities in some fields. Other biotic constraints like sheath blight, stem borer and leaf folder were recorded in low to moderate intensities. Farmers applied different pesticides like propiconazole 25% EC (1 litre/ha) for false smut, carbendazim 50% WP (1 kg/ha) for sheath blight and combination of streptocycline (50 g) + copper oxychloride (2.5 kg/ha) for bacterial blight of rice. on an average, farners adopted 2 sprayings and farmers usually did not mix different pesticides before application. Some of the common problems faced by the farmers were delayed supply of canal water, non-functional government tube wells and erratic supply of electricity.

Prevalence of diseases and insect pests in Rohtas district of Bihar during 2018-19

District	**Diseases**			**Insect pests**	
	ShBl	**FS**	**BB**	**SB**	**LF**
Rohtas	L-M (10%)	M (20-25%)	M-S (up to 35%)	L-M (10%)	L (5%)

Chhattisgarh (Raipur)

Districts surveyed: *Raipur, Kabirdham, Bilaspur* and *Mungeli*

Particulars of survey

Districts	Blocks	Villages
Raipur	Tilda and Arang	Tarashiv, Khamtrai and Bhothli
Kabirdham	Pandariya and Kawardha	Lalpur Kala and Bharwa (Puran)
Bilaspur	Kota	Bhaisajhar
Mungeli	Mungeli and Pathriya	Chalan and Hathnikala

Widely Prevalent varieties

Districts	Varieties
Raipur	**HYVs/Improved**: Swarna, MTU1010, MTU1001, Mahamaya, Sonamasuri, Kaveri 371, PKV-HMT, IR64, Indira Sugandhit Dhan, HMT, Vijay, Chandrahasni, Bamleswari, IGKVV R1, IGKVVR2, Safri, Durgeswai, Karmamasuri and Indira Barani Dhan; **Hybrids**: Arize 6444, VNR 2245, DRS 775, VNR 2355, US312 and US 382; **Locals**: Bisnubhog, Dubraj, Tulsimajri and Javaphool
Kabirdham	**HYVs/Improved**: Swarna, MTU1010, MTU1001, Mahamaya, IGKVV R1, IGKVVR2, Karmamasuri, Danteswari, Shri Ram and HMT; **Hybrids**: Arize 6444
Bilaspur	**HYVs/Improved**: Swarna, Mahamaya, Sonamasuri, MTU1010, MTU1001, Indira Barani Dhan, IR 64, IGKVV R1 and IGKVVR2; **Hybrids**: Arize 6444 and Silky; **Locals:** Tulsi Manjari and Dubraj
Mungeli	**HYVs/Imprved:** Swarna, Mahamaya and Rajeswari; **Hybrids**: Arize 6444

Particulars of rice areas in the surveyed districts of Chhattisgarh during 2018

District	Total Rainfall (mm)	Total geographical area (000ha.)	Total cultivable area (000ha.)	Total cultivated area (000ha.)	Total irrigated area (000ha.)	Area under paddy (000ha)
Raipur	1166.00	289.20	214.45	230.92	129.52	156.44
Kabirdham	850mm	444.705	290.583	303.665	303.665	83.780
Bilaspur	1085.50	581.849	234.61	234.61	627.35	217.52
Mungeli	1071.00	276.00	123.524	123.524	107.141	107.37

General Question of Rice Cultivation In District (To Be Filled By The Cooperator In With The Officials From State Department of Agriculture

Parameters	Districts			
	Raipur	**Kabirdham**	**Bilaspur**	**Mungeli**
Total Area under HYVs in the district (ha.)				
Most prevalent HYVs in the District	Swarna, MTU1010, MTU1001	Swarna, MTU1010, MTU1001, Maheswari	Swarna, Mahamaya	Swarna, MTU 1010
Total area under rice hybrids in the district (ha.	NA	NA	NA	NA
Most prevalent rice hybrids in the district	Arize 6444	Arize 6444	Arize 6444	Arize 6444
Total area under basmati in the district	Nil	Nil	Nil	Nil
Most prevalent basmati varieties in the district	Nil	Nil	Nil	Nil
Seed replacement Rate				
Whether farmers are using any heavy equipments like transplanted/combine harvester	Paddy Transplanter, Combine harvester	Paddy Transplanter, Combine harvester	Combine harvester	Combine Harvester, Paddy Transplanter
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	SRI, DSR	SRI, DSR	SRI, DSR	SRI, DSR
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	INM, IDM, Not to mix 2-3 pesticides without knowing their compatibility	INM & IDM Not to mix 2-3 pesticides without knowing their compatibility	INM, IDM, Land leveling, fertilizer application based on soil fertility level	INM, IDM, Not to mix 2-3 pesticides without knowing their compatibility
What are the general problems in rice cultivation in the district?	Labor shortage, BPH, stem borer, BLB, blast, neck blast, sheath blight, grain discoloration and Brown spot	Labor shortage, Remuneration price of the produce, BPH, stem borer, sheath blight, blast, grain discoloration	Timely supply of inputs, weeds, BPH, stem borer and neck blast	Labor shortage, BPH, stem borer, BLB, blast, neck blast, sheath blight, grain discoloration and Brown spot
Please provide any farmers association in the district	Agrocrates Society Kisan Sangh, RKVY, Agricon, Green revaluation extension project, National mission for sustainable agriculture	Agrocrates Society Kisan Sangh, RKVY, Agricon, Green revaluation extension project, National mission for sustainable agriculture	Kisan Sangh, Agricon RKVY, Agricon, Green revaluation extension project, National mission for sustainable agriculture	Agrocrates Society Kisan Sangh, Agricon RKVY, Green revaluation extension project, National mission for sustainable agriculture
Whether availability of labors is sufficient?	No	No	Yes	No
Whether there is any marketing problem of the produce?	Not getting expected Samathan value	Not getting expected Samathan value	Not getting expected Samathan value	Not getting expected Samathan value
Any major irrigation/power generation project in the district	Samoda Baraj Gughwa	Kodar prtoject Kaswa Project	Zoke Waller project ,KUta ghat project	Khunta Gath, Bhasa Jhar

Parameters	Districts			
	Raipur	**Kabirdham**	**Bilaspur**	**Mungeli**
Any soil testing program undertaken?	Soil health cards	Soil health cards	Soil health cards	Soil health cards
Any farmers' training program was organized by the state department of Agriculture/ University	Samiti, Raipur	RKVY, Project	RKVY, Project	Bio control Project

Production oriented survey was conducted in 4 rice growing districts of Chhattishgarh when the most of the rice fields were in milk to dough stage. The rice fields surveyed were either under irrigated or rainfed lowland ecosystem. In general, the weather conditions were normal for rice cultivation. Common rice varieties cultivated by the farmers were HYVs like Swarna, MTU1010, MTU1001, Mahamaya, Sonamasuri, Kaveri 371, PKV-HMT, IR64, Indira Sugandhit Dhan, Vijay, Chandrahasni, Bamleswari, IGKVV R1, IGKVVR2, Safri, Durgeswai, Karmamasuri and Indira Barani Dhan and hybrids like Arize 6444, VNR 2245, DRS 775, VNR 2355, US312 and US 382. Some farmers also cultivated local varieties like Bisnubhog, Dubraj, Tulsimajri and Javaphool. Predominant cropping sequences followed by the farmers were rice-gram, rice-wheat, rice-rice or rice-fallow. Average rice yield ranged in between 3500-4200 kg/ha in case of HYVs and about 4600 kg/ha in hybrids like Arize 6444. Planting was done mainly during mid June to mid July. Farmers applied FYM both in nursery and in main fields. In main fields fertilizers were applied @ 220-280 kg urea/ha, 180-250 kg DAP/ha and 130-200 kg MOP/ha. Most of the farmers applied zinc sulphate. The intensity of common weeds like yellow sedge (*Cyperus esculentus*), false daisy (*Eclipta prostrata*), Sawa (*Echinochloa colona*), dayflower (*Commelina benghalensis*) and motha (*Cyperus rotundus*) in and around rice fields was low to medium. Hand weeding was commonly followed by the farmers. Among the diseases, leaf and neck blast, sheath blight and grain discoloration were more in some fields in Raipur and Kabirdham. Among different insect pests, BPH was moderate to severe in all the districts surveyed. Farmers applied different pesticides for managing different biotic stresses. Some of the common needs of the farmers were proper supply of electricity, proper market price for the produce, improvement in the irrigation facilities, timely availability of quality seeds of HYVs and availability of agricultural implements.

District wise observations

Raipur: Production oriented survey was conducted in three villages (in 2 blocks) in this district when most of the fields were in milk to dough stage or mature stage. A total of 14 farmers were interacted during the survey. Majority of the rice fields surveyed were under irrigated ecosystem. However, some fields were under upland and some under rainfed lowland ecosystems. The common rice varieties cultivated by the farmers were HYVs like Swarna, MTU1010, MTU1001, Mahamaya, Sonamasuri, Kaveri 371, PKV-HMT, IR64, Indira Sugandhit Dhan, HMT, Vijay, Chandrahasni, Bamleswari, IGKVV R1, IGKVVR2, Safri, Durgeswai, Karmamasuri and Indira Barani Dhan and hybrids like Arize 6444, VNR 2245, DRS 775, VNR 2355, US312 and US 382. Some farmers also cultivated local varieties like Bisnubhog, Dubraj, Tulsimajri and Javaphool. Different crop rotation practices followed by the farmers were rice-gram, rice-wheat, rice-rice or rice-fallow. Average rice yield in common varieties like Swarna and Mahamaya ranged from 3500-4000 kg/ha. Planting was mainly done during mid June to mid July. None of the farmers contacted adopted any seed treatment. All the farmers contacted applied FYM in the nursery.

However, none of them applied any inorganic fertilizers in the nursery. In the main fields, fertilizers were applied @ 220-280 kg urea/ha, 180-250 kg DAP/ha and 130-200 kg MOP/ha. All the farmers told that they applied zinc sulphate @ 40-65 kg/ha. All the farmers applied FYM in the main field during land preparation. Planting was mainly random. However, some followed line planting and some adopted direct sowing. The intensity of common weeds in and around rice fields was low to medium. The common weeds were yellow sedge (*Cyperus esculentus*), false daisy (*Eclipta prostrata*) and Sawa (*Echinochloa colona*). All the farmers practiced hand weeding for weed management. Only one farmer applied pyrazosulfuron Ethyl (10%) in addition to hand weeding. There were incidences of wild rice in all the places visited.

Some of the common needs of the farmers were proper supply of electricity, proper market price for the produce, improvement in the irrigation facilities, timely availability of quality seeds of HYVs and availability of agricultural implements. Farmers used implements like tractor, harvester, cultivator and seed drill. Majority of the farmers used these implements on hire basis and only few progressive farmers possessed these implements. Farmers used mainly last year's harvested seeds and seed replacement rate was very low. Deep and shallow tube wells were the main sources of irrigation while farmers used mainly diesel for different agricultural operations. Advices from the experts were very less and farmers mainly took their own decisions regarding use of different inputs. Among the different biotic constraints, leaf and neck blast and sheath blight were very severe (up to 50-80%) in some fields in Raipur. Other diseases like brown spot, grain discoloration, false smut, sheath rot and bacterial blight were recorded in low to moderate intensities. Among different insect pests, BPH was severe in many fields. However, intensity of other insect pests was low. Incidence of rat damage was more in some fields. Farmers used different pesticides like imidacloprid (80 ml/acre) for BPH, carbofuran (30 kg/ha), fipronil (25 kg/ha), chlorpyriphos and monocrotophos (1500 ml/ha) for other insects; hexaconazole (1000 ml/ha) and propiconazole (500 ml/ha) for sheath blight and tricyclazole (300 g/ha) for blast were applied by the farmers. Farmers made 2-3 sprayings with hand and knapsack sprayers and almost all the farmers told that they are mixing 2-3 fungicides while application. There were reports of abiotic problems like zinc deficiency. However, all the farmers expressed that they want to continue rice cultivation.

Kabirdham: Two villages in two different blocks involving 14 farmers were surveyed in this district. The rice fields were in milk to maturity stage at the time of survey. All the fields surveyed were under irrigated ecosystem and in general the weather conditions were normal for rice cultivation. Predominant rice varieties cultivated in this district were HYVs like Swarna, MTU1010, MTU1001, Mahamaya, IGKVV R1, IGKVVR2, Karmamasuri, Danteswari, Shri Ram and HMT and hybrids like Arize 6444. The main crop rotation followed by the farmers was rice-gram. Average rice yield in the district were 3400-4300 kg/ha in HYVs like MTU 1010, Swarna and Mahamaya and about 4600 kg/ha in hybrids like Arize 6444. Planting operations lasted from mid June to end of July. Farmers did not follow any seed treatment and all the farmers contacted told that they applied FYM in the nursery. However, none of them applied any chemical fertilizers in the nursery. In the main fields, the farmers applied urea (180-280 kg/ha), DAP (150-230 kg/ha) and MOP (130-180 kg/ha). Majority (78%) of the farmers told that they applied zinc sulphate in the fields. Most of the farmers applied FYM in the field during land preparation. Farmers followed line planting and direct sowing. The intensity of common weeds like yellow sedge (*Cyperus esculentus*), false daisy (*Eclipta prostrata*), Sawa (*Echinochloa*

colona), dayflower (*Commelina benghalensis*) and motha (*Cyperus rotundus*) in and around rice fields was low to medium. All the farmers followed only hand weeding. There were reports of wild rice infestation from many fields in the district. Some of the common needs of the farmers were proper supply of electricity, proper market price for rice, disease and pest resistant rice varieties, quality seeds, irrigation facilities and agricultural implements. Farmers used different implements like tractor, combine harvester, cultivator and seed drill mainly on hire basis. Majority (70%) of the farmers contacted told that they used last year's harvested seeds and in general seed replacement rate was very low. Deep tube wells were the main sources of irrigation. All the farmers told that fertilizers and pesticides were available in time and they were happy with their quality. Farmers used their own experiences in input application though in few cases staffs from state department of agriculture helped them. Among different diseases, intensity of sheath blight and grain discoloration was high (up to 30-40%) in some fields. Other diseases like leaf and neck blast, brown spot, false smut, sheath rot and bacterial blight were recorded in low to moderate intensities. Most of the insect pests were observed in low to moderate intensities throughout the district. Different insecticides like carbaryl (900 g/ha), fipronil (25 kg/ha), carbofuran (30 kg/ha), chlorpyriphos (1500 ml/ha) and imidacloprid (200 ml/ha) against different insect pests and fungicides like mancozeb (800-1000 g/ha), tricyclazome (300 g/ha), hexaconazole (1000 ml/ha) and propiconazole (500 ml/ha) against different diseases were applied by the farmers. Farmers made 2-4 sprayings in a crop season with the help of hand or knapsack sprayer. Most of the farmers told that they are mixing different pesticides during application. Major abiotic problem was zinc deficiency. All the farmers expressed their willingness to continue rice cultivation.

Bilaspur: Seven farmers from Bhaisajhar village (in Kota block) of this district was interacted during production oriented survey. The rice fields were in dough to mature stage or milk stage at the time of survey. Majority of the rice fields surveyed were under rainfed lowland ecosystem. Predominant rice varieties cultivated in the district were HYVs like Swarna, Mahamaya, Sonamasuri, MTU1010, MTU1001, Indira Barani Dhan, IR 64, IGKVV R1 and IGKVVR2 and hybrids like Arize 6444 and Silky. Some farmers cultivated local rice varieties like Tulsi Manjari and Dubraj. Major cropping sequences were rice-gram or rice-fallow. Average rice yield in the district ranged from 3400-4200 kg/ha in varieties like Swarna, MTU 1010, Rajeswari and Mahamaya. Optimum time of planting was end of June to mid July. None of the farmers adopted seed treatment. All the farmers contacted applied FYM in the nursery bed but none of them applied chemical fertilizers in the nursery. In the main fields, farmers applied urea (230-260 kg/ha), DAP (190-230 kg/ha), MOP (150-190 kg/ha) and zinc sulphate (45-80 kg/ha). Most of the farmers (~70%) applied FYM in the main fields. Planting was random. The intensity of common weeds like yellow sedge (*Cyperus esculentus*), false daisy (*Eclipta prostrata*) and Sawa (*Echinochloa colona*) was low. None of the farmers contacted used any herbicides and all of them followed hand weeding for management of weeds. Wild rice infestation was recorded in many fields. Some of the common needs of the farmers were quality seeds of HYVs, irrigation facilities, proper electricity and market price. Commonly used implements were tractor, harvester and cultivator and seed drill. Farmers used these implements mainly on hire basis. About 70% of the farmers told that they used previous year's seed for sowing and seed replacement rate was very low. Deep and shallow tube wells were the main sources of irrigation. All the farmers told that fertilizers and pesticides were available in time and they were happy with their quality. Farmers used their own experiences in input application though in few cases staffs from state

department of agriculture helped them. Most of the diseases like leaf and neck blast, brown spot, sheath blight, grain discoloration, false smut, sheath rot and bacterial blight were recorded in low to moderate intensities. Intensity of most of the insect pests was also low to moderate. However, crop damage by BPH and rat was high in some fields. Different pesticides like carbofuran (30 kg/ha), monocrotophos (1500 ml/ha) and imidacloprid (200 ml/ha) for different insect pests and tricyclazole (300 g/ha) and hexaconazole (1000 ml/ha) for different diseases were applied by the farmers. Farmers made 2-3 sprayings in a crop season with the help of hand or knapsack sprayer. Most of the farmers told that they are mixing different pesticides during application. Major abiotic problem was zinc deficiency. All the farmers expressed their willingness to continue rice cultivation.

Mungeli: Two villages from 2 blocks involving 12 farmers were covered for production oriented survey in this district. About 75% of the fields surveyed were under irrigated condition while about 25% of the fields were under rainfed lowland ecosystem. The rice fields were in milk to dough stage at the time of survey. In general, the weather conditions were normal for rice cultivation. Most predominant rice varieties in the district were HYVs like Swarna, Mahamaya and Rajeswari and hybrids like Arize 6444. Common cropping sequences followed by the farmers were rice-gram, rice-lathyrus and rice-fallow. Average rice yield in the district ranged from 3400-4000 kg/ha in varieties like Swarna, Mahamaya and MTU 1010 and about 4600 kg/ha in Arize 6444. Planting was done mainly during mid June to mid July. None of the farmers adopted seed treatment. All the farmers contacted applied FYM in the nursery bed but none of them applied chemical fertilizers in the nursery. In the main fields, farmers applied urea (200-280 kg/ha), DAP (180-230 kg/ha), MOP (140-200 kg/ha) and zinc sulphate (30-50 kg/ha). Most of the farmers (~70%) applied FYM in the main fields. All the farmers applied FYM in the main fields during land preparation. Planting was mainly random though some farmers followed line planting and direct sowing. The intensity of common weeds like yellow sedge (*Cyperus esculentus*), false daisy (*Eclipta prostrata*), dayflower (*Commelina benghalensis*) and grasses in and around rice fields was low to medium. All the farmers followed only hand weeding. All the farmers followed hand weeding and very few applied weedicides like butachlor in addition to hand weeding. Incidences of wild rice were recorded in some fields. Some of the common needs of the farmers were quality seeds, availability of common implements, proper electricity and market price for the produce and improvement in the irrigation facilities. Commonly used implements were tractor, harvester, seed drill and cultivator. Seed replacement rate was very low. Deep tube wells followed by canal were the sources of irrigation. All the farmers told that fertilizers and pesticides were available in time and they were happy with their quality. Farmers used their own experiences in input application though in few cases staffs from state department of agriculture helped them. Most of the diseases like leaf and neck blast, brown spot, sheath blight, grain discoloration, false smut, sheath rot and bacterial blight were recorded in low to moderate intensities. Intensity of most of the insect pests was also low to moderate. However, BPH was severe in some fields. Different pesticides like monocrotophos (1500 ml/ha), imidacloprid (125 ml/acre), chlorpyriphos (2500 ml/ha) and carbofuran (30 kg/ha) for different insect pests and fungicides like hexaconazole (1000 ml/ha), propiconazole (500 ml/ha), carbendazim (500 gm/ha) and tricyclazole (300 ml/ha) for different diseases were applied by the farmers. Farmers made 3-4 sprayings in a crop season with the help of hand or knapsack sprayer. All the farmers contacted told that they are mixing different pesticides during application. Major

abiotic problem was zinc deficiency. All the farmers expressed their willingness to continue rice cultivation.

Prevalence of diseases and insect pest in Chhattisgarh during *Kharif*' 2018

Districts	Diseases							
	Bl	**NBl**	**BS**	**ShBl**	**GD**	**FS**	**ShR**	**BB**
Raipur	L-S (10-80 %)	L- S (5-80 %)	L-M (15)	M-S (15-50 %)	M-S (15-40 %)	L (10%)	L-M (4-25%)	L-M (5-25%)
Kabirdham	M (15 %)	L-M (5-20 %)	L (6 %)	M-S (15-30%)	M-S (15-40 %)	L-M (2-15 %)	L (5%)	M (15 %)
Bilaspur	L-M (2-15%)	M (15%)	L (15%)	L-M (5-10%)	M (15%)	L-M (4-25%)	L-M (4-25%)	L-M (5-15%)
Mungeli	M (20 %)	M (3%)	L (5 %)	L-M (5-20%)	M (15%)	L-M (4-25%)	L-M (4-25%)	L-M (5-15%)

There was minor incidence of stem rot in some fields in Raipur

Districts	Insect pests								
	SB	**LF**	**BPH**	**WBPH**	**GLH**	**GM**	**RH**	**WM**	**Rats**
Raipur	L- M	L	S	T	L	L	L	T	M-S
Kabirdham	M	M	M	T	L	L	L	T	M
Bilaspur	M	M	S	-	-	-	-	-	M-S
Mungeli	M	M	S	T	L	L	L	T	M

Gujarat (Nawagam)

Districts Surveyed: *Ahmedabad, Kheda, Anand, Gandhinagar, Mehsana, Dang, Panchmahal, Vadodara, Navsari, Valsad, Surat, Tapi* and *Narmada*

Particulars of survey

District	Taluka	Villages
Ahmedabad	Daskroi and Sanand	Badodara, Jetalpur, Pirana, Naj, Meroli, Geratpur, Modasar and Bhawanpur
Kheda	Kheda, Matar, Mahemdabad and Kathlal	Nawagam, Mahij, Umiyapura, Lali, Sankhej, Kumarwada, Bherai, Limbashi, Traj, Mankwa, Kachchai, Jalampura, and Kathana
Anand	Tarapur and Khambhat	Sath, Kali Tadawdi, Rangpur and Valli
Gandhinagar	Dehgam	Zak, Sonarda Rampura and Raipur
Mehsana	Kadi	Thol and Midadraj
Dang	Ahwa and Waghai	Kalibel, Pipri and Bhes Katri
Panchmahal	Godhara	Idea, Pipadiya, Indra Nagri and Kakanpur
Vadodara	Dabhoi and Deshar	Dabhoi, Varasda and Merakuwa
Navsari	Gandevi, Chikhli Navsari and Vansda	Gandeva, Rankuwa, Motivaljar, Pratap Nagar and Sadakpor
Valsad	Khergam, Dharampur and Valsad	Vad, Barumal, Bamti, Makadban, Fanaswada and Bhoma Pardi
Surat	Mandvi and Mangrol	Karanj, Kumarwada and Ratola
Tapi	Vyara	Ambapani and Dolara
Narmada	Dediyapada	Dediyapada and Rakhas Kundi

Widely Prevalent varieties

District	Varieties
Ahmedabad	**HYVs/Improved:** Gurjari, GAR-13, Surya Moti, Moti Gold, Rachna, Mahisagar and Panjab S; **Hybrids:** Sonam
Kheda	**HYVs/Improved:** Gurjari, GAR-13, GR-11, GR-7, Masuri, Punjab S, Surya Moti, Nath Pauha and Moti Gold; **Hybrids:** Sonam
Anand	**HYVs/Improved:** GAR-13, Moti, Krishna Kamod, Gurjari, Daftri, Om Sriram 125, Jaya and Mahsuri
Gandhinagar	**HYVs/Improved:** Gurjari, GR-11, Jaya and GAR – 13
Mehsana	**HYVs/Improved:** GAR-13, GR-11 and Gurjari
Dang	**HYVs/Improved:** IR-28, GNR-6, Mahi Sagar and Mahsuri; **Hybrids:** US-25 P 25, US-312 and US-2111
Panchmahal	**HYVs/Improved:** Gurjari, GAR-13and Jaya
Vadodara	**HYVs/Improved:** GAR-13, GR-11, Gurjari, Surya Moti and Moti Gold
Navsari	**HYVs/Improved:** Gurjari, GNR-3, Jaya, Masuri, Sweta, GR-7 and GAR-13: **Hybrids:** US 312
Valsad	**HYVs/Improved:** Jaya, GR-11, Gurjari, GNR-3 and GAR-13; **Hybrids:** US-312 and US-612
Surat	**HYVs/Improved:** Gurjari, Jaya and Nath Poha; **Hybrids:** US-312, US-25P25

District	Varieties
	and Gorakhnath
Tapi	**HYVs/Improved:** Jaya, Gurjari and GAR-13; **Hybrids:** US-312 and US-25 P 25
Narmada	**Hybrids:** MH 5629, Kaveri-468, US-312 and Arize 6444

Particulars of Rice area in the district:

Name of District	Total geographical area (ha)	Total cultivable area (ha)	Total cultivated area (ha)	Total Irrigated area (ha)	Area under rice (ha)
Ahmedabad	7,98,727	4,75,784	3,95,283	-	1,13,463
Kheda	3,39,271	2,80,665	2,50,460	1,72,007	1,12,876
Anand	2,94,751	2,08,851	1,75,077	1,97,226	1,12,712
Gandhinagar	2,15,838	1,64,954	1,43,565	1,42,577	11,675
Mehsana	77,308	66,469	56,650	52,620	3,010
Dang	1,72,356	57,843	58,284	-	20,400
Panchmahal	5,13,820	2,79,489	2,52,498	37,833	-
Vadodara	4,11,891	3,32,186	2,71,795	1,76,533	33,486
Navsari	2,20,077	1,46,966	59,379	1,11,518	49,386
Valsad	2,94,412	1,52,115	1,02,270	61,751	73,468
Surat	4,32,687	3,15,697	1,30,183	1,93,400	46,240
Tapi	10,72,554	1,60,401	1,15,048	63,496	52,371
Narmada	2,75,536	1,22,253	1,05,600	56,659	10,807

Production Oriented Survey was conducted in rice growing areas of 13 districts of Gujarat State *viz.*, Ahmedabad, Kheda, Anand, Gandhinagar, Mehsana, Dang, Panchmahal, Vadodara, Navsari, Valsad, Surat, Tapi and Narmada. A total of 26 talukas and 58 villages were covered during the survey. The *Kharif* 2018 witnessed more or less timely onset of monsoon (last week of June) with 388 mm rainfall in 22 days at our station Nawagam. There was no rainfall at the maturity of the crop. Varieties like Gurjari, GAR-13, GNR-3, GR-101, Mahisagar, Masuri, Jaya, Moti-gold, Surya moti, Sonam, Nath Pauha, Daftari Om Sriram 125, Krishna Kamod, US-312, US-807, US-834, MC-13 etc. were cultivated in different districts of Gujarat. Prevailing crop rotations were rice-wheat-rice, rice-sugarcane, rice-chickpea, rice-banana, rice-wheat-vegetable, rice-rice, rice-wheat-maize, rice-pearl millet, rice-summer green gram etc. were adopted by the farmers in different districts of Gujarat. Average seed rate in different districts ranged from 25-30 kg/ha and seed treatment practice was not common among the farmers. Farmers applied FYM both in the nursery and in the main fields. In addition, farmers applied urea and DAP in the nursery. In the main fields, the fertilizers were applied @ 80-160 kg N/ha (in three splits through urea or ammonium sulphate) and 20-66 kg P_2O_5/ha (as DAP or SSP). Potash application was almost very rare. Few farmers applied zinc sulfate. Intensity of common weeds like *Echinochloa crusgalli, E. colona, Cynodon dactylon, Parthenium* spp. and *Cyperus rotundus* was low and hand weeding was most common among the farmers. In addition to hand weeding, some farmers also applied herbicides like pendemethalene and bizpyribac sodium. Some of the common needs of the farmers were low cost production technologies, early Maturing and salt tolerant varieties with high yield potential, varieties suitable for direct sowing, insect pests resistant and lodging resistant varieties and good market price. Intensity of most of the biotic stresses was low.

General questions on rice cultivation in district (To be filled by the co-operator in consultation with the Officials from State department of Agriculture)

Parameters	Districts			
	Ahmedabad	**Kheda**	**Anand**	**Gandhinagar**
Total area under HYVs in the district	1,13,463 ha	39,507 ha	1,12,712 ha	11,675 ha
Most prevalent HYVs in the district	Gurjari, GAR-13, Moti	Gurjari	GAR-13	Gurjari
Total area under rice hybrids in the district	-	33,753 ha	46,900 ha	-
Most prevalent rice hybrids in the district	Sonam	MC-13, Nath Poha	Sonam, Daftari Sri Ram 125	-
Total area under basmati in the district	-	-	-	-
Most prevalent basmati varieties in the district	-	-	-	-
Seed replacement rate	25-50%	25-50%	25-60%	20-50%
Whether farmers are using any heavy equipments like transplanter/combine harvester	Yes	Yes	Yes	Yes
Mention water saving technologies like SRI/ laser leveling/DSR being used by the farmers	Laser leveling	Yes	Laser leveling	Laser leveling
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Yes; Plant protection and use of HYVs	Plant protection	IPM	IPM and use of HYVs
What are the general problems in rice cultivation in the district?	-	Labour shortage during transplanting	Scarcity of irrigation water in some areas	-
Please provide any farmers association in the district	-	-	-	Nil
Whether availability of agricultural labours is sufficient?	Yes	No	Yes	No
Whether there is any marketing problem of the produce?	No	Traders got lower price than MSP	No	No
Any major irrigation/power generation project in the district	Fatebadi Narmada Irrigation project	Mahisagar Channel	Dhuvaran	Narmada canal
Any soil testing program undertaken?	Yes; PMMSY	Yes	Yes	PMMSCY
Any farmers' training program was organized by the state department of Agriculture/University	Yes	Yes	Yes	Yes

General questions on rice cultivation in district (To be filled by the co-operator in consultation with the Officials from State department of Agriculture)

Parameters	**Districts**			
	Mehsana	**Dang**	**Panchmahal**	**Vadadora**
Total area under HYVs in the district	3,010 ha	2,430 ha	-	33,486 ha
Most prevalent HYVs in the district	GR-11, GAR-13	IR 28, Jaya, GAR-13	Gurjari, Jaya, IR-28	GAR-13, Gurjari
Total area under rice hybrids in the district	-	17,970 ha	-	-
Most prevalent rice hybrids in the district	-	US-312	-	-
Total area under basmati in the district	-	0	-	0
Most prevalent basmati varieties in the district	-	-	-	-
Seed replacement rate	20-50%	80-100%	20-30%	20-30%
Whether farmers are using any heavy equipments like transplanter/combine harvester	Combine harvester	-	Yes	Yes; Combine harvester
Mention water saving technologies like SRI/ laser leveling/DSR being used by the farmers	SRI demonstration	Yes	Yes; Laser leveling	Yes
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	-	Yes: IDM and use of HYVs	IDM and use of HYVs	IPM and use of HYVs
What are the general problems in rice cultivation in the district?	Irregular rainfall, labour shortage, low market price	-	Shortage of irrigation water	-
Please provide any farmers association in the district	Kisan Sangh-Kadi	-	-	-
Whether availability of agricultural labours is sufficient?	No	Yes	Yes	Yes
Whether there is any marketing problem of the produce?	Yes; Lower market price	No	No	No
Any major irrigation/power generation project in the district	Narmada Irrigation Channel	No	Yes	Vathvana Irrigation
Any soil testing program undertaken?	Collected 50% village soil samples through flagsheip project	No	Yes	-
Any farmers' training program was organized by the state department of Agriculture/University	Yes	Yes	Yes	Yes; Through NFSM

General questions on rice cultivation in district (To be filled by the co-operator in consultation with the Officials from State department of Agriculture)

Parameters	Districts				
	Navsari	**Valsad**	**Surat**	**Tapi**	**Narmada**
Total area under HYVs in the district	27,795 ha	8,758 ha	32,083 ha	52,371 ha	-
Most prevalent HYVs in the district	Gurjari, GNR-3, Jaya, Mahsuri	GUj-3, GR-11, Jaya	Jaya, Gurjari, Mahsuri	GAR-13, NAUR-1, Gurjari	-
Total area under rice hybrids in the district	21,591 ha	64,710 ha	-	44,192 ha	9100 ha
Most prevalent rice hybrids in the district	US-312, Goraknath	Hyb 2233, Goraknath, Sonam	Goraknath, US-312	US-312, Advanta 801	Arize 6444, US-312, Kaveri
Total area under basmati in the district	-	-	-	-	-
Most prevalent basmati varieties in the district	-	-	-	-	-
Seed replacement rate	40-60%	25-100%	20-60%	50-100%	80-100%
Whether farmers are using any heavy equipments like transplanter/combine harvester	Yes	-	Yes	-	-
Mention water saving technologies like SRI/ laser leveling/DSR being used by the farmers	Yes; Laser leveling	-	Yes; Laser leveling	-	-
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	IPM and use of HYVs	Yes; Plant Protection and use of HYVs	IPM and use of HYVs	Plant Protection and Use of HYVs	SRI and land leveling
What are the general problems in rice cultivation in the district?	-	-	-	-	Sloppy land
Please provide any farmers association in the district	-	-	-	-	-
Whether availability of agricultural labours is sufficient?	Yes	Yes	Yes	No	Yes
Whether there is any marketing problem of the produce?	No	No	No	No	No
Any major irrigation/power generation project in the district	No	No	Yes	Yes	No
Any soil testing program undertaken?	Yes	Yes	Yes	Yes	Distributed soil health cards
Any farmers' training program was organized by the state department of Agriculture/University	Yes	Yes	Yes	Yes	Yes

Variety wise area coverage (ha) in different districts of Gujarat during *Kharif*' 2018

Varieties/Hybrids	Districts					
	Kheda	**Ananad**	**Gandhinagar**	**Mehsana**	**Dang**	**Navsari**
GAR-13	33863	36500	85	1802		
GR-11	5644	12500	3570	1208		
Krishna Kamod		3,200				
Jaya		3800	843			11490
Gurjari	39507	6212	6972			10498
Mahsuri		3600				3504
IR-28					1250	1599
Mahi Sagar					130	
MC-13	5644					
Nath Poha	16931					
GR-4						1856
GNR-3						624
Others					205	11,400
Hybrids						
Kaveri hybrid						2198
Goraknath						3020
25p25					600	
US-312					2000	3117
Different hybrids	11288	46900			16420	

Variety wise area coverage (ha) in different districts of Gujarat during *Kharif*' 2018

Varieties/Hybrids	Districts		
	Valsad	**Tapi**	**Narmada**
GAR-13		801	
GR-11	680		
Krishna Kamod			
Guj-3	610		
Guj-4	324		
Dandi	100		
Jaya	2670		
Gurjari	2544	2016	
Mahsuri	1095		
Naur-1		1123	
Others		13604	
Hybrids			
Goraknath		8635	
Advanta 807		10253	
Advanta-801		10652	
US-312	5798	5287	300
Sonam	4150		
Arize 6444			500
Mahyco-5629			700
Kaveri-448			400
Bioseeds-786			650
Pioneer-25p25			5000
Other hybrids			5950

District wise observations

Ahmedabad: Production oriented survey was conducted in 8 villages (in 2 blocks) in this district when the rice crops were in heading to milk stage or in dough to maturity stage. A total of 15 farmers were interacted during the survey. All the fields surveyed were under irrigated ecosystem and in general, the weather conditions were normal for rice cultivation. Though rainfall started in time, but overall rainfall was low during the season. Common rice varieties cultivated by the farmers in the district were Gurjari, GAR-13, Sonam, Surya Moti, Moti Gold, Rachna, Mahisagar and Panjab S. Common crop rotation practices followed by the farmers were rice-summer rice, rice-wheat, rice-vegetables, rice-mustard, rice castor, rice-fodder and others. Average rice yield in the district ranged from 4000-6500 kg/ha in different varieties. Planting was done mainly during July. Average seed rate was 25-35 kg/ha and very few (~ 25%) adopted seed treatment with thiram. All the farmers contacted told that they applied both FYM and inorganic fertilizers like urea (130-200 kg/ha) and DAP (50-100 kg/ha) in the nursery. In the main fields, the fertilizers were applied @ 80-160 kg N/ha (in three splits through urea or ammonium sulphate) and 20-46 kg P_2O_5/ha (as DAP or SSP). Potash application was almost nil. However, majority of the farmers (~70%) applied 20-25 kg/ha zinc sulphate. All the farmers applied FYM (5-15 t/ha) in the main fields at the time of land preparation. Transplanting was mainly random with 18-28 plants/m^2. However, some followed line planting. Intensity of common weeds like *Echinochloa crusgalli, E. colona, Cynodon dactylon* and *Cyperus rotundus* was low to medium. All the farmers contacted followed hand weeding. However, about 50% of the farmers contacted also applied different weedicides like pendimethelin 30 EC (2.5 l/ha) (as pre-emergence) and bispyribac Sodium 10% SC (4 ml/10 litres). Some of the common needs of the farmers were low cost production technologies, early Maturing and salt tolerant varieties with high yield potential, varieties suitable for direct sowing, insect pests resistant and lodging resistant varieties and good market price. Common implements like rotavator, laser leveler, puddler, combined harvester, tractor and threashers were used by the farmers. Average seed replacement rate in the district was 25-50%. In addition to rain water, canal and shallow/ deep tube wells were the sources of irrigation. In addition to their own decisions, farmers took advices from staffs of University, private dealers and state department of agriculture during rice growing. Most of the diseases were recorded in low to negligible form. However, BPH was severe in some fields in Mahij village while high incidence of army worm was recorded in Meerali village on variety Surya Moti. Different pesticides like thiomethoxam (0.25 g/l), imidacloprid (0.5 ml/l), acetamaprid (400 ml/ha) and DDVP 76% (2 ml/l) for hoppers; cartap hydrochloride (20 kg/ha or 2.5 g/l), carbofuram 3G (20 kg/ha), chlorpyriphos + cypermethrin (1 ml/l) and Ferterra (10 kg/ha) for stem borer, leaf folder and army worm, propiconazole (500 ml/ha) for false smut and carbendazim + mancozeb (2 g/l) for blast and other diseases were applied by the farmers. Farmers used mostly knapsack and power sprayers. Number of pesticide application ranged from 2-4.

Kheda and Anand: Thirteen villages (in 4 blocks) in Kheda and four villages (in 2 blocks) in Anand were covered for production oriented survey when the crops were either in booting to heading or dough to maturity stage. A total of 22 farmers were interacted during the survey in these 2 districts. The fields surveyed were under irrigated ecosystem and in general, the weather conditions were normal for rice cultivation. Though rainfall started in time, but overall rainfall was low during the season. Different varieties cultivated by the farmers were Gurjari, GAR-13, GR-11, GR-7, Mashuri, Punjab S, Surya Moti, Nath Pauha, Moti Gold, Krishna Kamod, Daftari, Om Sri Ram 125, Jaya, Moti and Sonam. Different cropping sequences followed by the farmers were Rice–wheat, Rice–tobacco/ vegetable/ pearl millet/ fodder Sorghum–lucerne/ summer rice, rice-

cotton and rice-mustard. Average rice yield in the district ranged from 3.2-6.5 t/ha in different varieties. Main reasons for low yield in certain areas were low plant population and rain during flowering and dough stage. Planting was mostly done during July. Average seed rate was 23-35 kg/ha and very few (~12%) followed seed treatment with thiram (3 g/kg). All the farmers contacted told that they applied both FYM and inorganic fertilizers like urea (90-200 kg/ha) and DAP (30-100 kg/ha) in the nursery. In the main fields, the fertilizers were applied @ 88-150 kg N/ha (in three splits through urea or ammonium sulphate) and 20-56 kg P_2O_5/ha (as DAP or SSP). Potash application was almost nil. However, about 50% of the farmers applied 20 kg/ha zinc sulphate. All the farmers applied FYM (4-15 t/ha) in the main fields at the time of land preparation. Farmers followed both random planting and line planting. The intensity of different weeds like *Echinochloa crusgalli, E. colona,* and *Cyperus rotundus* was low to negligible. Hand weeding (1-2) was common among the farmers and about 50% of the farmers applied herbicides like pendimethelin 30 EC @ 2.5 lit./ ha or bispyrabic sodium 10 SC @ 200 ml /ha. Some of the common needs of the farmers were aromatic rice varieties with good yield, higher market price, HYVs with biotic and abiotic stress resistance and short duration varieties. Different equipments like rotavator, cultivator, laser leveler, puddler, combined harvester, tractor, cultivator, threshers and others were used by the farmers. Average seed replacement rate was 25-60%. In addition to rain water, canal, wells and shallow tube wells were the main sources of irrigation. In addition to their own decisions, farmers took advices from staffs of University, private dealers and state department of agriculture during rice growing. Among the diseases, neck blast was noticed in moderate intensity in some fields of Valli village of Anand on Krishna Kamod. Among insect pests, WBPH was recorded in high intenisity in Mahij village in Kheda district on Punjab S. Different pesticides like carbofuran 3G (25 kg/ha), cartap hydrochloride (20 kg/ha), phorate 10G (20 kg/ha), chlorpyriphos + cypermethrin (2 ml/l), Ferterra (10 kg/ha) and chlorpyriphos (2 ml/ha) for stem borer, leaf folder and army worm; imidacloprid (0.3 ml/l), imidacloprid + acephate (2 ml/l), DDVP, monocrotophos (2 ml/l) and thiomethoxam (1 ml/l) for hoppers; thiomethoxam + lamda cyhalothrin (1 ml/l) and thiomethoxam + chlorantraniliprole (0.5 ml/l) for leaf folder, stem borer and hoppers; carbendazim + mancozeb (2 g/l) for different diseases were applied by the farmers. Farmers used knapsack sprayers and number of sprays ranged from 2-3. About 30% of the farmers contacted told that they mixed different (2-3) pesticides before application.

Gandhinagar and Mehsana: Production oriented survey was conducted in 4 villages (in one block) in Gandhinagar and 2 villages (in one block) in Mehsana when the crops were in heading to dough stage. A total of 8 farmers were interacted during the survey. The rice fields surveyed were under irrigated ecosystem. Though rainfall was timely, but overall rainfall was low during the season. Commonly cultivated rice varieties in the district were Gurjari, GR-11, Jaya and GAR-13. Common crop rotations followed by the farmers were rice-wheat (main), rice-vegetables, rice-mustard, rice-rice, rice-castor, rice-pigeon peas and others. Average rice yields in varieties like Gurjari and GAR-13 ranged from 5000-6500 kg/ha. Planting was done mainly during 1st week of July to 3rd week of July. However, in some cases, plating was done during 1st week of August. Average seed rate was 25-35 kg/ha and seed treatment was not common among the farmers. Only about 15% farmers adopted seed treatment with thiram. All the farmers contacted applied FYM both in the nursery and in the main fields (10-15 t/ha). In the nursery, the farmers also applied urea (135-180 kg/ha) and DAP (30-100 kg/ha). In the main fields, farmers applied 90-140 kg N/ha (in three splits through urea or Ammonium sulfate) and 23-46 kg P_2O_5/ha (in the form of DAP or SSP). None of the farmers contacted applied potash. About 35% farmers applied zinc sulfate (20

kg/ha). Planting was mainly random and few followed line transplating. Intensity of common weeds like *Echinochloa crusgalli*, *Cyperus rotundus* and *Cynodon dactylon* in and around rice fields was low. All the farmers followed hand weeding and in addition majority (75%) of the farmers applied herbicides like pendimethelin (2.5 ml/l) and bispyribac sodium 10% SC (0.4-0.5 ml/l) for management of weeds. Some of the common needs of the farmers were new improved salt tolerant, short duration and high yielding varieties, aromatic high yielding varieties and high market price. Implements like tractor, thresher, harvester, rotavator and disc plough were used by the farmers. Average seed replacement rate was 20-50%. In addition to rain water, canals and tube wells were the main sources of irrigation. In addition to their own decisions, farmers took advices from staffs of University, private dealers and state department of agriculture during rice growing. Most of the biotic constraints were observed in low to very low intensities. Some of the farmers applied pesticides like imidacloprid (0.3-0.5 ml/l) for BPH and WBPH, cartap hydrochloride 50 SP @ 1.5 g/l for other pests, carbendazim (12%) + mancozeb (63%) @ 2 g/l and tricyclazole + hexaconazole (500 g/ha) for different diseases. Farmers used hand or knapsack for applying different pesticides. Number of pesticide application in the crop season ranged from 1-3.

Dang: Three villages in two blocks were covered for production oriented survey in this district when the rice fields were in milk to dough stage. A total of 8 farmers were interacted during the survey. Majority of the rice fields surveyed were under hill ecosystem and some fields were under rainfed lowland ecosystem. Rainfall was timely and well distributed during the season. Commonly cultivated rice varieties in the district were HYVs like IR-28, GNR-6, Mahi Sagar and Mahsuri and hybrids like US-25 P 25, US-312 and US-2111. Few farmers cultivated local rice variety 'Desi Khudsi'. Commonly followed crop sequences were rice-niger, rice-vegetables, rice-sugarcane, rice-pigeon pea, rice-black gram, rice-Indian bean and others. Average rice yield in different hybrids ranged from 3900-4700 kg/ha. The major reasons for low yield in the district were hilly and sloppy land, tribal and rainfed ecology. Planting was done during last week of June to 1st week of July. Average seed rate ranged from 15-25 kg/ha and majority of the farmers used hybrids. None of the farmers contacted followed any seed treatment. All the farmers applied FYM in the nursery and also in the main fields (5-20 t/ha). Farmers also applied urea (80-180 kg/ha) and DAP (30-150 kg/ha) in the nursery. In the main fields, farmers applied 60-110 kg N/ha (in three splits through urea or Ammonium sulfate) and 20-50 kg P_2O_5/ha (in the form of DAP or SSP). None of the farmers contacted applied potash or zinc sulfate. Farmers followed random method of planting. Intensity of different weeds like *Echinochloa crusgalli*, *E. colona* and *Cyperus rotundus* was low to negligible. Hand weeding was the only practice for managment of weeds. Some of the common needs of the farmers were short during HYVs suitable for hilly region, suitable equipments, aromatic rice varieties and higher market price. Equipments like tractor, cultivator, puddler, rotavator and others. All the farmers told that they purchased 100% of their seed requirement. Average seed replacement rate in the district was 50-70%. In addition to rain water, river water and tube wells were the main sources of irrigation. In addition to their own decisions, farmers took advices from staffs of University, private dealers and state department of agriculture during rice growing. Most of the biotic constraints were observed in low to very low intensities. None of the farmers contacted applied any pesticides.

Panchmahal and Vadodara: Production oriented survey was conducted in four villages (in one block) in Panchmahal and 3 villages (in 2 blocks) in Vadodara districts when the crops were in dough to mature stage or milk stage. A total of 12 farmers were interacted during the survey. The

rice fields surveyed were under irrigated ecosystem. Rainfall was timely and well distributed during the season. About 15% of the farmers told that they cultivated castor in 20-50% of their land. Common rice varieties cultivated by the farmers were GAR-13, GR-11, Gurjari, Surya Moti, Jaya and Moti Gold. Commonly followed crop sequences were rice-wheat (main), rice-maize, rice-castor, rice-tobacco, rice-vegetables, rice-cotton and rice-pigeon pea. Average rice yield in different HYVs like Gurjari, GR-11, GAR-13 and Surya Moti ranged between 4200-5600 kg/ha. Some of the major reasons for low yield in the district were low plant population due to random transplanting and scarcity of water. Planting was mainly done during 2nd to 4th week of July. Average seed rate was 25-30 kg/ha and majority of the farmers used certified seeds. Seed treatment was not common among the farmers. All the farmers contacted told that they applied FYM both in the nursery and main fields (4-15 t/ha). Farmers also applied urea (90-200 kg/ha) and DAP (40-100 kg/ha) in the nursery. Few farmers also applied ammonium sulfate in the nursery. In the main fields, farmers applied 85-160 kg N/ha (in three splits through urea or Ammonium sulfate) and 23-46 kg P_2O_5/ha (in the form of DAP or SSP). Very few (10-15%) of the farmers contacted applied potash (20 kg/ha) or zinc sulfate (20 kg/ha). Farmers followed random method of planting. Intensity of different weeds like *Echinochloa crusgalli, E. Colona, Parthenium* spp. and *Cyperus rotundus* was low to negligible. Hand weeding was practiced by all the farmers. In addition to hand weeding, about 15% of the farmers applied hercicides like pendemethalene (2 ml/l) and bispyribac sodium 10% (0.5 ml/l). Some of the common needs of the farmers were fine grain HYVs, short duration rice varieties and higher market price. Equipments like tractor, cultivator, puddler, rotavator and others. All the farmers told that they purchased part of their seed requirement. Average seed replacement rate in the district was 20-30%. In addition to rain water, canal and tube wells were the main sources of irrigation. In addition to their own decisions, farmers took advices from staffs of University, private dealers and state department of agriculture during rice growing. Diseases like grain discoloration, false smut and sheath rot and insect pests like BPH, WBPH, stem borer and leaf folder were observed in low to very low intensities. Different pesticides like phorate 10G (20 kg/ha), chlorpyriphos 50% + cypermethrin 5% (2 ml/l), cartap hydrochloride 4G (20 kg/ha) and carbofuran 3G (20 kg/ha) for leaf folder and stem borer and imidacloprid (0.3 ml/l) for BPH and WBPH were applied by the farmers. Farmers used knapsack sprayer for application of different pesticides.

Navsari and Valsad: Five villages (in 3 blocks) in Navsari and 6 villages (in 3 blocks) in Valsad were covered for production oriented survey when the rice fields were in milk to dough stage. A total of 15 farmers were interacted during the survey. Majority of the fields were under rainfed lowland ecosystem while some were under irrigated and hill ecosystem. Rainfall started in time and was more or less well distributed during the season. Predominant rice varieties cultivated by the farmers were HYVs like Gurjari, GNR-3, Jaya, Masuri, Sweta, GR-11, GR-7 and GAR-13 and hybrids like US 312 and US 612. about 50% of the farmers contacted told that they are using 10-50% of their land for cultivation of other crops like vegetables, sugarcane, yam and finger millet. Common crop sequences followed by the farmers were rice-vegetables, rice-pulses, rice-sunhemp, rice-cowpea and rice-niger. Average rice yield in the district in different varieties and hybrids ranged from 3500-5400 kg/ha. Major reasons for low yield in some areas were uneven climatic conditions and lack of irrigation facilities. Average seed rate was 20-30 kg/ha and none of the farmers followed any seed treatment. All farmers applied FYM in the nursery as well as in the main fields (5-15 t/ha). Farmers also applied DAP (25-100 kg/ha) and urea (45-180 kg/ha). Some farmers also applied ammonium sulfate (50 kg/ha) and 20:20:0:13 (100 kg/ha). In the main fields,

farmers applied 75-150 kg N/ha (in three splits through urea or Ammonium sulfate) and 15-66 kg P_2O_5/ha (in the form of DAP or SSP). None of the farmers interacted applied potash in the fields. Very few (~15%) applied zinc sulfate (20 kg/ha). Few applied green manures like sunnhemp. Planting was mostly random though few followed line planting. Intensity of common weeds like *Echinochloa crusgalli, E. colona, Partehnium* spp. and *Cyperus rotundus* was low. Hand weeding was the only practice for managing the weeds. Some of the common needs of the farmers were fine grain HYVs, short duration varieties, aromatic high yielding rice varieties and higher market price. Implements like tractor, puddler, thresher, cultivator and disc plough were used by the farmers. About 80% of the farmers contacted told that they purchased 100% of their seed requirement while remaining 20% purchased 25-50%. Overall, seed replacement rate in the district was 40-60%. In addition to rain water, canal and shallow tube wells were the main sources of irrigation. In addition to their own decisions, farmers took advices from staffs of University, private dealers and state department of agriculture during rice growing. Different biotic constraints were recorded in low intensities. Farmers applied different pesticides like carbofuran 3G (20 kg/ha) and phorate 10 G (25 kg/ha) for stem borer and leaf folder and imidacloprid 17.8 SL (0.3 ml/l) for BPH and gundhi bugs. Farmers used knapsack sprayers for applying pesticides.

Surat, Tapi and Narmada: Production oriented survey was conducted in 3 villages (in 2 blocks) in Surat, two villages (in 1 block) in Tapi and two villages (in 1 block) in Narmada when the crops were in dough to maturity stage or in milk stage. A total of 11 farmers were interacted during the survey. Most of the fields were in irrigated ecosystem while some were under hill ecosystem. Rainfall started timely and well distributed but overall rainfall was low. About 80% of the farmers contacted told that they used 10-70% of their land for other crops like sugarcane and banana. Common rice varieties cultivated by the farmers were HYVs like Gurjari, GAR-13, Jaya and Nath Poha and hybrids like MH 5629, Kaveri-468, US-312, US-25 P 25 and Arize 6444. Common cropping sequences followed by the farmers were rice-sugarcane, rice-maize, rice-vegetables, rice-rice, rice-niger, rice-sunnhemp, rice-pulses and others. Average rice yield in different rice varieties and hybrids ranged from 3500-5600 kg/ha. Major reasons of low yield in certain areas were uneven climatic conditions and water stress. Planting was mainly done during 1st to 3rd week of July. Average seed rate was 20-30 kg/ha and none of the farmers adopted any seed treatment. All the farmers applied FYM both in the nursery and in the main fields (2.5-20 t/ha). Farmers also applied urea (45-180 kg/ha) and DAP (25-100 kg/ha) in the nursery. Some farmers also applied ammonium sulfate (50-100 kg/ha) and 20:20:0:13 (50-100 kg/ha). In the main fields, farmers applied 80-150 kg N/ha (in three splits through urea or Ammonium sulfate) and 25-53 kg P_2O_5/ha (in the form of DAP or SSP). About 25% of the farmers applied zinc sulfate (20 kg/ha). Planting was mainly random though some farmers adopted line planting. Intensity of common weeds like *Echinochloa crusgalli*, *E. colona*, *Cyperus rotundus* and *Eclipta alba* was low. All the farmers contacted adopted hand weeding and very few (20%) also applied herbicides like bispyribac sodium 10% SC (0.4 ml/l). Some of the common needs of the farmers were fine grain HYVs, short duration varieties, aromatic high yielding rice varieties and higher market price. Implements like tractor, puddler, thresher, cultivator and disc plough were used by the farmers. About 45% of the farmers contacted told that they purchased 100% of their seed requirement while remaining 20% purchased 25-50%. Overall, seed replacement rate in the districts ranged from 20-70%. In addition to rain water, canal, deep tube wells and river/pond water were the main sources of irrigation. In addition to their own decisions, farmers took advices from staffs of University, private dealers and state department of agriculture during rice growing. Different biotic constraints were recorded in

low intensities. Farmers applied different pesticides like cartap hydrochloride 4%G (20 kg/ha) and ranyxypyr 0.4% G (10 kg/ha) for stem borer and leaf folder, chlorpyriphos + cypermethrin (2 ml/l) for gundhi bugs and imidacloprid 17.8 SL (0.3 ml/l) for BPH. Farmers used knapsack sprayers for applying pesticides. Mixing of different pesticides before application was not common among the farmers.

Prevalence of diseases and insect pests in Gujarat during *Kharif*-2018

Districts	**Diseases**					
	Bl	**NBl**	**ShR**	**FS**	**GD**	**BB**
Ahmedabad	-		L (5%)	L (5%)	N	L (3%)
Kheda and Anand	T	M (20%)	N-L	T (<2%)	L (5%)	L (2-5%)
Gandhinagar	-		T-L	L (2-3%)	T	-
Mehsana	-		T	T-L	T	-
Dang	T		-	L (3%)	T	-
Panchmahal	-		L-M (6-15%)	L (5%)	L (3-10%)	-
Vadodara	-		L	T-L	T	-
Navsari	-		-	T	T	L (2-5%)
Valsad	-		-	-	-	-
Surat	-		-	-	T	-
Tapi	-		-	-	T	T
Narmada			-	-	-	-

Districts	**Insect pests**						
	BPH	**WBPH**	**LF**	**SB**	**GB**	**Mt**	**AW**
Ahmedabad	M-S (10-35%)	L (1-10%)	L-M (3-20%)	L (2-8%)	-	N	L-S (5-30%)
Kheda and Anand	L-M (2-20%)	L-S (2-30%)	L (3-10%)	L (1-5%)	-	T-L	L (3-10%)
Gandhinagar	L (1-5%)	T	L (2-5%)	L (2-3%)	-	-	-
Mehsana		T	T-L	T	-	-	-
Dang		-	T	T	L (5-10%)	-	-
Panchmahal	L (3-5%)	-	T	L (2-7%)	-	-	-
Vadodara	L (3-5%)	L (10%)	L (2-8%)	L (2-7%)	-	-	-
Navsari	L (1-5%)	T	L (3-5%)	L (1-7%)	L (5%)	-	-
Valsad		-	L (3-5%)	L (1-7%)	L (5%)	-	-
Surat		-	L (2-5%)	L (2-5%)	-	-	-
Tapi		-	L (2-5%)	L (2-5%)	L (2-10%)	T	-
Narmada		-	T	T			

Haryana (Kaul)

Districts surveyed: *Kaithal, Kurukshetra, Karnal, Jind, Yamunanagar, Ambala, Panipat* and *Sonipat*

Details of survey

Districts	**Villages**
Kaithal	Ahun, Rasina, Sirsal, Sherdha, Pai, Meoli, Pubala, Keorak, Cheeka and Bhaghal
Kurukshetra	Mathana, Saraswati Khera, Ajrawar, Jajjanpur, Harnaicha, Gumthala Gadu/Dera Fateh Singh, Talhedi, Chinarhedi, Lukhi and Bhusthala
Karnal	Ganga Taheri, Dachar, Kailram, Amritpur, Dhanoli, Chochra, Salwan, Bahari, Assandh and Dupedi
Jind	Datrath, Paju Kalan, Muana, Singhana, Karkhana, Anchra Khurd, Katwal, Malhar, Tittu Khera and Mulan
Yamunanagar	Kartarpur, Basantpura, Thaska, Rattangarh, Kulchanbudu, Haibatpur, Sangipur, Saran, Thana Chhappar and Saraswati Nagar
Ambala	Jansui Dera, Doha, Thambad, Footi Basi, Tehra Hamidpur, Addo Majra, Durana, Tharwa, Rajpura and Majri
Panipat	Jojan Kalan, Rar Kalan, Seenkh, Shahpur, Kurana, Chhichhrana, Shera, Badoli, Mandi and Paldi
Sonipat	Khubru, Gannaur, Phugthala, Badhoti, Jagsi, Kheri Dhamkan, Gangesar, Gamdi, Khanpur Khurd and Madina

Widely prevalent varieties during *Kharif*' 2018

District	**Rice varieties**
Kaithal	**HYVs:** PR 114, PR 126 and HKR 47; **Hybrids:** Sava 127; **Basmati:** CSR 30, Pusa Basmati 1509, Taraori Basmati and Pusa Basmati 1121
Kurukshetra	**HYVs:** PR 114, Pusa 44, PR 126, PR 113, PR 114 and HKR 127; **Hybrids:** VNR 438 and Sava 127; **Basmati:** Pusa 1121, Pusa 1509, CSR 30 and Pusa Basmati 1
Karnal	**HYVs:** PR 114; **Basmati:** Pusa 1509, Pusa 1121 and CSR 30
Jind	**Hybrids:** RH Pioneer 27P31 and Basmati hybrid 408; **Basmati:** Pusa Basmati 1401, Pusa, Pusa Basmati 1728, Pusa 1509, CSR 30 and Sarbati
Yamunanagar	**Hybrids:** VNR 2355, VNR 438, Arize 6444 and Sava 127; **Basmati:** Pusa Basmati 1637 and Pusa 1121
Ambala	**Hybrids:** Sava 127, Arize 6129, Arize 6444, RH Pioneer 27P31, Swift Gold and DRH 834; **Basmati:** Pusa Basmati 1
Panipat	**Basmati:** Pusa 1121, Pusa 1509, Pusa Basmati 1401 and CSR 30
Sonepat	**Basmati:** Pusa 1121 and Pusa 1509

Particulars of rice areas in the surveyed districts of Haryana during *Kharif*' 2018

District	Total geographical area (ha)	Total cultivable area (ha)	Total cultivated area (ha)	Net irrigated area (ha)	Area under paddy (ha)
Kaithal	2,25,611	1,94,884	1,90,961	1,90,961	1,65,896
Kurukshetra	1,67,167	1,44,436	1,43,348	1,43,348	1,18,000
Karnal	2,46,251	1,99,043	1,99,043	1,99,043	1,74,000
Jind	2,74,024	2,45,930	2,25,688	2,21,000	1,35,000
Yamunanagar	1,72,130	1,27,131	1,19,953	1,08,995	72,000
Ambala	1,53,750	1,35,052	1,18,000	1,06,153	83,000
Panipat	1,30,437	1,02,428	98,176	98,176	74,000
Sonepat	2,13,679	1,78,686	1,66,066	1,63,044	97,000

Weather data for the districts surveyed during *Kharif*' 2018

District	Weather parameter	June 18	July	Aug.	Sept.	Oct. 18
Kaithal	Rainy days	7	12	13	10	Nil
	Total rainfall (mm)	51.3	156.7	80.7	206.3	Nil
Kurukshetra	Rainy days	3	21	18	17	1
	Total rainfall (mm)	99.1	278.8	120.1	188.5	7.9
Karnal	Rainy days	-	-	-	-	-
	Total rainfall (mm)	100.9	268.8	140.1	250.2	-
Jind	Rainy days	6	17	12	13	Nil
	Total rainfall (mm)	69.0	39.7	31.3	71.9	Nil
Yamunanagar	Rainy days	8	20	22	23	15
	Total rainfall (mm)	62.8	368.0	299.0	50.5	34.3
Ambala	Rainy days	17	21	20	14	1
	Total rainfall (mm)	123.0	32.0	292.0	204.0	37.0
Panipat	Rainy days	7	14	8	10	-
	Total rainfall (mm)	16.5	21.4	74.8	153.8	-
Sonepat	Rainy days	5	15	12	14	-
	Total rainfall (mm)	37.2	121.0	99.0	123.0	-

Roving surveys in paddy growing area of Haryana were conducted during August 3-4, September 5-6 and October 7 & 25, 2018 by a team of scientists from Plant Pathology, Agronomy, Plant Breeding and Entomology. A total of 80 villages (10 villages per district) were surveyed in the districts of Kaithal, Kurukshetra, Karnal, Jind, Yamunanagar, Ambala, Panipat and Sonepat. The area under scented and non-scented rice varieties was 61.4 and 38.6%, respectively. Among the non-scented varieties, area under inbreds, hybrids and other local/unrecommended cultivars was 19.8, 15.4 and 3.4%, respectively. The district wise spectrum of rice varieties being cultivated by the farmers is given in the above mentioned Table. The commonly grown rice varieties in scented group were Pusa Basmati 1121, Pusa Basmati 1509, Basmati CSR 30, Pusa Basmati 1401, Pusa Basmati 1637, Pusa Basmati 1728 and Taroari Basmati while the common high yielding non-scented varieties were PR 114, PR 126, Pusa 44 and HKR 47 and the commonly grown hybrids were Sava 127, Arize 6444, Arize 6129, Pioneer RH 27P31 and Swift Gold.

General Question of Rice Cultivation In District (To Be Filled By The Cooperator In With The Officials From State Department of Agriculture

Parameters	**Districts**			
	Kaithal	**Kurukshetra**	**Karnal**	**Jind**
Total Area under HYVs in the district (ha.)	55,000 ha	43,000 ha	-	8800 ha
Most prevalent HYVs in the District	PR 114	PR 114	PR 114	Pusa 44
Total area under rice hybrids in the district (ha)	10,000 ha	45,000 ha	-	11,000 ha
Most prevalent rice hybrids in the district	Sava 127	Sava 127, Swift Gold	-	27p31
Total area under basmati in the district	1,00,000 ha	29,500 ha	~50% area	1,15,200 ha
Most prevalent basmati varieties in the district	CSR 30	Pusa 1121	-	Pusa 1401 Pusa 1121
Seed replacement Rate	-	-	-	-
Whether farmers are using any heavy equipments like transplanted/combine harvester	Yes	Yes	NA	Yes
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	DSR: 1400 ha	Cultivation of short duration HYVs & hybrids	DSR: 450 ha	-
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Yes; Proper spraying technique; IDM and incorporation of crop residues	-do-	Yes; IDM, INM, proper spraying technique	Yes; IDM, INM, proper spraying technique
What are the general problems in rice cultivation in the district?	Water and soil problem and biotic stress	Biotic stresses	Water and soil problem and biotic stress	Water and soil problem and biotic stress
Please provide any farmers association in the district	Progressive Farmers Club	Progressive Farmers Club	-	-
Whether availability of labors is sufficient?	Insufficient	Insufficient	Insufficient	Insufficient
Whether there is any marketing problem of the produce?	No	No	No	No
Any major irrigation/power generation project in the district	No	No	No	No
Any soil testing program undertaken?	Soil Health Card: 24,970	Soil Health Card: 80,000	Soil health card	Soil Health card: 5,23,840
Any farmers' training program was organized by the state department of Agriculture/ University	Kisan melas under ATMA, CRM, New State Plan for Cotton cultivation	Yes; under ATMA and CRM	Yes; under ATMA and CRM	Yes; under ATMA, CRM, New State Plan for Cotton cultivation schemes

General Question of Rice Cultivation In District (To Be Filled By The Cooperator In With The Officials From State Department of Agriculture

Parameters	**Districts**			
	Yamunanagar	**Ambala**	**Panipat**	**Sonepat**
Total Area under HYVs in the district (ha.)	12,000 ha	23,000 ha	11,000 ha	5,000 ha
Most prevalent HYVs in the District	Pusa 44, HKR 127	PR 127, HKR 47, PR 124	PR 114	-
Total area under rice hybrids in the district (ha)	46,000 ha	50,000 ha	-	-
Most prevalent rice hybrids in the district	A 6444	Sava127	-	-
Total area under basmati in the district	14,000 ha	10,000 ha	63,000 ha	92,000 ha
Most prevalent basmati varieties in the district	Pusa Basmati 1	Pusa 1121, CSR 30	Pusa 1121	Pusa 1121, Pusa 1509
Seed replacement Rate	-	-	-	-
Whether farmers are using any heavy equipments like transplanted/combine harvester	yes	Yes	Yes	Yes
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	DSR: 3000 ha Laser leveling: 30,000 ha	DSR: 50 ha	DSR: 100 ha Laser leveling: 1700 ha	DSR: 1200 ha Laser leveling
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Yes	Yes	Yes	Yes
What are the general problems in rice cultivation in the district?	False Smut, BPH/WBPH	Water and soil problem and biotic stress	Problem soil, delayed plant-ing, biotic stresses	Biotic stresses, delayed planting, problem soil
Please provide any farmers association in the district	Yamuna Kisan Club; Saraswati Kisan Club	Progressive Farmers Club	Kisan Club (not functional)	-
Whether availability of labors is sufficient?	No	No	Insufficient	No
Whether there is any marketing problem of the produce?	No	No	No	No
Any major irrigation/power generation project in the district	DBCRTPP Yamunanagar; Bhudkalan & Dadupur Hydal Project	-	No	No
Any soil testing program undertaken?	Soil health card issued	Soil Health card: 88052	Total Soil Health Cards: 1,98,000	Soil Health Cards: 101294; Distributed: 74,000
Any farmers' training program was organized by the state department of Agriculture/ University	Yes; Under ATMA and CRM schemes	Yes; Under ATMA, NFS, CDP-RKVY, CRM schemes	Yes; Under ATMA and CRM schemes	Yes; Under ATMA and CRM schemes

Spectrum of rice varieties being cultivated by farmers during *Kharif* '2018

Variety	Kaithal (80.50 Ac.)	Kurukshetra (506.75 Ac.)	Karnal (38.00 Ac.)	Jind (164.00 Ac.)	Yamunanagar (110.50 Ac.)	Ambala (165.00 Ac.)	Panipat (131.50 Ac.)	Sonepat (275.00 Ac.)	Mean
A Scented Varieties									
Pusa Basmati 1121	1.86	4.14	26.32	25.30	1.35	0.66	72.24	77.10	26.12
Pusa Basmati 1509	11.49	1.97	39.47	4.88	-	-	9.88	17.45	10.64
Basmati CSR-30	36.33	1.28	2.63	2.43	-	-	3.80		5.81
Pusa Basmati 1401	-	-	-	26.22	-	-	7.98	-	4.28
Pusa 1637	-	-	-	-	25.33		-	-	3.17
Pusa 1728	-	-	-	9.75	-	-	-	-	1.22
Taraori Basmati	3.72	0.59	-	-	-	-	-	-	0.54
Pusa Basmati 1	-	1.18	-	-	-	1.21	-	-	0.30
									50.86
B Non-Scented varieties									
PR 114	19.87	44.10	13.15	-	-	-	-	-	9.64
PR 126	12.42	13.61	-	-	-	-	-	-	3.25
Pusa 44	-	20.12	-	-	-	-	-	-	2.52
PR 124	-	0.98	-	-	-	1.81	-	-	0.35
HKR 47	2.48	-	-	-	-	-	-	-	0.31
PR 113	-	2.37	-	-	-	-	-	-	0.30
									16.37
C Hybrids									
Sava 127	6.21	0.59	-	-	3.61	14.54	-	-	3.12
Arize 6444	-	-	-	-	4.52	4.85	-	-	1.17
Arize 6129	-	-	-	-	-	9.09	-	-	1.14
Pioneer RH27P31	-	-	-	4.27	-	4.84	-	-	1.14
Swift Gold	-	0.59	-	-	3.61	4.24	-	-	1.05
VNR 2355	-	-	-	-	7.24	-	-	-	0.91
RHR 555	-	-	-	-	-	4.24	-	-	0.53
RHR 111	-	-	-	-	-	4.24	-	-	0.53
RHR 333	-	-	-	-	3.61	-	-	-	0.45
RHR 444	-	-	-	-	3.61	-	-	-	0.45
Varsha Golden	-	-	-	-	3.61	-	-	-	0.45
VNR 2222	-	0.59	-	-	-	3.03	-	-	0.45
Sava 134	-	0.59	-	-	-	-	-	-	0.07
VNR 901	-	0.59	-	-	-	-	-	-	0.07
									12.75
D Local/Unrecommended Varieties (VNR 438, DRH 834, Tata 8383, Hybrid 8005, Sarbati, Hybrid Basmati- 408, PB 1718, Hybrid 2082)									
	-	2.65	-	3.34	-	10.17	-	-	2.84
Total area under paddy (%)	94.38	95.94	81.57	76.19	61.91	62.92	93.90	95.64	**82.82**
Area under other crops (%)	5.62	4.06	18.43	23.81	38.09	37.08	6.10	4.35	17.98

Area under Scented rice = 61.4% Area under non-scented rice = 38.6% (varieties = 19.8%, hybrids = 15.4%, Others = 3.4%)

Application of sub-optimal doses of weedicides, application of combination formulations of fungicides & insecticides and mixed application of fungicides with insecticides as foliar spray and broadcasting of granular insecticides with urea, random planting, inadequate plant population, raising of nursery in unpuddled fields and rice-wheat sequence were the common

practices in all the surveyed districts. The seed treatment was followed by 85.7, 100, 66.7, 66.7,100, 100, 66.7 and 75 % of the surveyed farmers in Kaithal, Kurukshetra, Karnal, Jind, Yamunanagar, Ambala, Panipat and Sonepat districts, respectively. However, some farmers did not follow the seed treatment properly.

None of the rice diseases and insect-pests appeared in devastating form and the farmers were managing these biotic stresses with recommended/other effective pesticides. Among diseases, sheath blight was observed in low to moderate form at 50, 70, 50, 60, 50, 40, 40 and 20% locations in the districts of Kaithal, Kurukshetra, Karnal, Jind, Yamunanagar, Ambala, Panipat and Sonepat both in scented and non-scented inbreds and hybrids. The disease was recorded in rice varieties PR 114, Pusa 44, Pusa Basmati 1121, Sava 134, Sava 127, Basmati CSR 30, Taraori Basmati, Pusa Basmati 1, Pusa Basmati 1637 and Pusa Basmati 1728. Leaf blast appeared in traces to moderate intensity at 20, 10, 10 and 30% locations in the districts of Kaithal, Kurukshetra, Karnal and Jind in rice varieties Pusa Basmati 1121 and Basmati CSR 30 while Neck blast incidence ranged from 1-6% at 20, 10 and 10% location in district Karnal, Jind and Panipat in Basmati CSR-30 and PUSA Basmati-1121. Bakanae incidence ranged from traces to 6% at 60, 20, 60, 30, 20, 40 and 50% locations in the districts of Kaithal, Kurukshetra, Karnal, Jind, Yamunanagar, Panipat and Sonepat, respectively in Pusa Basmati 1121, Basmati CSR 30 and Pusa Basmati 1509. The maximum bakanae incidence of 6% was observed in village Rasina in Pusa Basmati 1121 in district Kaithal where the farmer uprooted paddy nursery from dry nursery beds leading to root injury. False smut was recorded in low intensity at 20, 10, 30, 10 and 20% sites in district Kaithal, Karnal, Yamunanagar, Ambala and Panipat, respectively in rice varieties PR 126, PR 114, 27P31, Sava 127, 25P35, Swift Gold, Pusa Basmati 1121 and Pusa Basmati 1509, respectively. Bacterial leaf blight was recorded only at one location in moderate form in district Yamunanagar in varieties Pusa Basmati 1637 and Pusa Basmati 1, respectively. Khaira disease (zinc deficiency) was also recorded in low to moderate intensity in Karnal, Yamunanagar and Sonepat districts.

Among insect-pests, stem borer population was in traces to low and its infestation ranged from 0.5 to 2% dead hearts and traces to 4% white earheads formation in Pusa Basmati 1, Pusa Basmati 1121, PR 114, Pusa 44, Sava 127 at 10, 20, 20, 10, 10, 20, 30 and 20% locations in the districts of Kaithal, Kurukshetra, Karnal, Jind, Yamunanagar, Ambala, Panipat and Sonepat, respectively. The population of white backed planthopper (WBPH) /brown planthopper (BPH), a major pest of rice was low to moderate which ranged between 1 to 50 nymphs or adults/hill in PR 114, Pusa Basmati 1121, Basmati CSR 30, Pusa Basmati 1509, PR 126 at 50, 10, 40, 30, 30, 10, 50 and 20% locations in the districts of Kaithal, Kurukshetra, Karnal, Jind, Yamunanagar, Ambala, Panipat and Sonepat, respectively. Leaf folder damage (1.6 to 4.0 % damaged leaves) was recorded at 80, 80, 80, 100, 80, 60, 70 and 60% sites in the districts of Kaithal, Kurukshetra, Karnal, Jind, Yamunanagar, Ambala, Panipat and Sonepat, respectively in PR 114, PR 126, Pusa Basmati 1121, Pusa Basmati 1, Basmati CSR 30, Pusa Basmati 1509, Sava 127, Swift Gold, Pusa Basmati 1401, Pioneer RH 27P31, DRH 834, Pusa Basmati 1637 and Pusa Basmati 1. The damage of whorl maggot was traces to low particularly in late transplanted rice in district Jind, Yamuna Nagar and Ambala in Pusa Basmati 1121, Pusa Basmati 1, Arize 6444 and DRH 834. Termite damage was also low and recorded only at one location of Panipat district. The incidence of other diseases viz., stem rot, brown spot, narrow brown leaf spot and insect-pests namely, grasshopper and gundhi bug was low at the surveyed sites.

The insecticides being used by the farmers were cartap hydrochloride, imidacloprid, fipronil, carbofuran, buperofezin, lambda cyhalothrin, pymetrozin, dinotefuran, chlorentraniliprole, chlorpyriphos + cypermthalin, acephate, flubendiamide, bifenthrin while the commonly used fungicides were propiconazole, validamycin, carbendazim, thiafluzamide, Streptocycline, thiophanate methyl, carbendazim + mancozeb, hexaconazole, hexaconazole + zineb, azoxystrobin + difenoconazole, azoxystrobin + tebuconazole, trifloxystrobin + tebuconazole and fluxapyroxad + epoxiconazole. Pretilachlor was the most commonly used herbicide for weed control in rice, followed by butachlor. However, the farmers used the herbicides at sub-optimal doses. Besides, some farmers also used growth bio-products or bio-fertilizers viz. Rutose (growth substance) and D-vit (a micorryzal biofertilizer). However, they were advised to use the recommended pesticides judiciously with optimum dose at right time following proper method of application. The major constraints identified in increasing rice production in Haryana were declining water table, water scarcity, inadequate and intermittent power and canal water supply and problematic soil and underground water, low profitability due to high production cost, inadequate technical knowhow, declining soil fertility, sub-optimal plant population, nutrient imbalances and continuous follow up of rice-wheat cropping system in addition to biotic constraints particularly planthoppers (WBPH & BPH) and sheath blight.

District wise observations

Kaithal: Production oriented survey was conducted in 10 villages in this district involving 10 farmers. Three surveys were made during the month of August, September and October and the crops were in tillering to booting stage or in heading to dough stage. The rice is grown in irrigated conditions and in general the weather conditions were normal for rice cultivation in all the places except in one place where farmers told that rainfall was sub-normal. Some farmers cultivated fodder sorghum in parts of their land. Commonly grown rice varieties were HYVs like PR 114, PR 126 and HKR 47 and basmati varieties like CSR 30, Pusa Basmati 1509, Taraori Basmati and Pusa Basmati 1121. Among hybrids, Sava 127 was very popular among the farmers. All the farmers followed rice-wheat cropping system. Average yield in HYVs like PR 114 ranged from 7500-9000 kg/ha and in different basmati varieties yield ranged from 4000-5500 kg/ha. Yield in basmati variety CSR-30 ranged from 2500-3600 kg/ha. Planting was done during middle of June to middle of July. Average seed rate for hybrids was 7.5-10 kg/ha while in case of HYVs and basmati varieties, it ranged from 12.5-15 kg/ha. About 90% of the farmers interacted treated the seeds with different chemicals like Bavistrin (1g/kg) + streptocycline (0.1 g/kg) (soaking for 4.5 to 12 hours), Emisan (1g/kg) + streptocycline (0.1 g/kg) (soaking for 24 hours), Emisan + streptomycin + Bavistin and Saaf (2 g/kg). Very few farmers (20%) applied FYM in the nursery. However, all of them applied fertilizers like urea (5-25 kg/kanal; 1 kanal = 500 m^2) and/or DAP (5-8 kg/kanal). Few also applied SSP, insecticide like Super Lethal (chlorpyriphos + cypermethrin) and weedicide like Eraze. In the main fields, fertilizers were applied @ 103.5-218.25 kg N/ha and 28.75 kg P_2O_5/hain case of HYVs and hybrids and 51.75-84.75 kg N/ha and 28.75-40.25 kg P_2O_5/ha in case of basmati varieties. About 60% of the farmers contacted applied zinc sulfate (21% or 33%) @ 12.5-25 kg/ha and very few also applied sulfur (12.5 kg/ha). About 30% farmers applied FYM (2-7 trolley/acre) in the main field. Planting was random and plant population was not maintained strictly.

Intensity of common weeds like *Echinochloa* spp. and *Cyperus* spp. was low. Hand weeding was not very common among the farmers and most of the farmers applied weedicides like pretilachlor

(330-500 ml/acre) and anilophos (500 ml/acre). Some of the farmers expressed the need for rotavator and happy seeder for sowing of wheat in combine harvester harvested fields. Implements like tractor, trolley, harrow, power tiller, combine harvester and reaper were used by the farmers. About 70% of the farmers contacted told that they purchased 100% of their total seed requirement. Deep tube wells were the main sources of irrigation. About 20% farmers expressed shortage of irrigation water and 40% expressed shortage of electricity. In addition to their own decision, farmers took advices from private dealers. Intensity of different diseases like sheath blight, blast, bakanae, false smut and khaira and insect pests like stem borer, leaf folder and hoppers (BPH + WBPH) were low to moderate. Farmers applied different pesticides like chlorpyriphos + cypermethrin (500 ml/acre) for termite; carbofuran (5 kg/acre) for soil borne pests; cartap hydrochloride (7.5-8 kg/acre), Regent Ultra (fipronyl) (4-5 kg/acre, urea mixed) and Ferterra (4 kg/acre) for leaf folder and stem borer; Sheen (100 g/acre) and buprofezin (300-400 ml/acre) for WBPH; lamda cyhalothrin cyhalothrin (200-250 ml/acre) for grasshoppers; fluxapyroxad 62.5% + epoxyconazole 62.5 EC (300 g/acre) and validamycin (450 ml/acre) for sheath blight; propiconazone (Tilt) (170 ml/acre) and thiophenate methyl (500 g/acre) for false smut; carbendazim + mancozeb (mixed with urea) (500 g/acre) for bakanae; Trichoderma viride (1 kg/acre) + *Pseudomonas* spp. (1 kg/acre) in ½ kg jiggery for different soil borne diseases; Chess 50 WG (pymetrozine) (200 g/acre) + Amistar Top (azoxystrobin + difenconazole) (200 ml/acre) + Matador (lamda cyhalothrin cyhalothrin) (250 ml/acre) for leaf folder, stem borer, WBPH, sheath blight and neck blast and Isoprothiolane (250 ml/acre) + validamycin (400 ml/acre) for sheath blight and neck blast. Number of pesticide application ranged from 1-4 and about 60% of the farmers told that they mixed 2-3 pesticides before application.

Kurukshetra: Production oriented survey was conducted in 10 villages in this district when the fields were in tillering to stem elongation stage or in milk to dough stage. Three surveys were made during early August, early September and in October. A total of 10 farmers were interacted during the survey. Rice is grown under irrigated condition and the weather conditions were normal for rice cultivation. Few farmers (20%) cultivated other crops like sorghum in part of their land. Commonly cultivated rice varieties were HYVs like PR 114, Pusa 44, PR 126, PR 113, PR 114 and HKR 127and basmati like Pusa 1121, Pusa 1509, CSR 30 and Pusa Basmati 1. Hybrids like VNR 438 and Sava 127 were common among the farmers. Rice-wheat sequence was followed by all the farmers. Some of them also followed rice-potato-moong and rice-potato-wheat. Average rice yield in the district was 7000-9000 kg/ha in different HYVs and hybrids and 4250-5000 kg/ha in basmati varieties like Pusa 1121 and Pusa 1509. Yield in CSR 30 ranged from 2500-3200 kg/ha. In some fields, yield of Pusa 1121 was severely affected due to water shortage and BPH/WBPH infestation. Planting was done during middle of June to middle of July. Average seed rate for HYVs and hybrids was 10-15 kg/ha and for hybrids 7.5 kg/ha. All the farmers contacted adopted seed treatment with emisan (1 g/kg seeds/1 litre water; soaking for 24 hours), emisan + streptocycline and carbendazim (1 g/kg seeds). About 90% of the farmers contacted told that they did not apply FYM in the nursery. All of them applied fertilizers like DAP (5-10 kg/kanal) and/or urea (5-8 kg/ha). Some farmers applied MOP (1 kg/kanal), weedicide Sofit and insecticide thimet. In the main fields, fertilizers were applied @ 126-155.25 kg N/ha and 28.75-57.5 kg P_2O_5/ha in case of HYVs and hybrids and 77.6-114.75 kg N/ha and 28.5 kg P_2O_5/ha in case of basmati varieties. Application of potash was nil or very negligible. About 60% farmers applied zinc sulfate (21% or 33%) @ 10-25 kg/ha. Few applied chelated zinc (1.25 kg/ha) and sulfur (7.5 kg/ha). About 40% of the farmers applied FYM (2-6 t/acre) and few (~10%) applied

green manure (dhaincha; Sesbania aculeate) and plant biofertilizer (Rutose @ 5 kg/acre) in the main fields. Planting was random and plant population was not maintained strictly.

Intensity of common weeds like *Echinochloa* spp. and *Cyperus* spp. was low. Some farmers adopted hand weeding. However, almost all the farmers applied weeidicides like pretilachlor (600-750 ml/acre) and butachlor (1000 ml/acre). Some of the farmers expressed the need for happy seeder. Different implements like rotavator, reaper, tractor, trolley, harrow, tillers, ridger (bund maker), seed cum fertilizer drill and combine harvester were used by the farmers. About 80% of the farmers told that they purchased 80-100% of their seed requirement. Deep tube wells were the main sources of irrigation followed by shallow tube wells and canal and overall, there was no scarcity of irrigation water and electricity. In addition to their own decision, private dealers and staffs from university advised the farmers. Among the diseases, sheath blight was widespread in low to moderate form. However, other diseases like bakanae and leaf blast were recorded in traces. Insect pests like stem borer, leaf folder and hoppers (BPH + WBPH) were low to moderate. Different pesticides like chlorpyriphos (1 l/acre) and chlorpyriphos + cypermethrin (500 ml/acre) for termites; fipronyl (2.5-7.5 kg/acre), cartap hydrochloride (Padan) (7.5 kg/acre; urea mixed or with irrigation water) and Ferterra (5 kg/acre) for leaf folder and stem borer; thiophenate methyl (500 g/acre; urea mixed) and Saaf (500 g/acre) for bakanae; buprofezin (330 ml/acre) + tricyclazole (120 g/acre) for neck blast and WBPH; Nativo (80 g/acre) + acephate (250 ml/acre), validamycin (450 ml/acre) + buprofezin (330 ml/acre) and Nativo (80 g/acre) + (330 ml/acre) for sheath blight and BPH/WBPH and Matador (lamda cyhalothrin cyhalothrin) (200 ml/acre) + Chess (120 g/acre) + Taspa (propiconazole + difenconazole) (200 g/acre) for grasshoppers, BPH/WBPH and sheath blight were applied by the farmers. Number of pesticide application in the crop season ranged from 1-4 and about 60% of the farmers contacted mixed 2-3 pesticides before application.

Karnal: Survey was conducted three times in the crop season in the district and the rice crops were in maximum tillering to stem elongation stage or dough to milk stage during survey. A total of 10 farmers from 10 villages were contacted during survey. The rice fields were under irrigated ecosystem and in general, the weather conditions were normal for rice cultivation. All the farmers interacted told that they used 100% of their cultivable land for rice cultivation. Major crop rotation followed by the farmers was rice-wheat though few followed rice-gram and rice-mustard crop sequence. Commonly cultivated varieties in the district were HYVs like PR 114 and basmati varieties like Pusa 1509, Pusa 1121 and CSR 30. Yield in basmati varieties like Pusa 1509 and Pusa 1121 ranged from 4000-5000 kg/ha while in case of CSR 30 it ranged from 1500-3000 kg/ha. Main reason of low yield in CSR 30 in some areas was delayed planting due to water shortage. Planting was done during mid June to mid July. Average seed rate was 10-15 kg/ha and about 50% of the farmers contacted told that they adopted seed treatment with Bavistrin (1g/kg) + streptocycline (0.1 g/kg) (soaking for 4.5 to 12 hours) or Emisan (1g/kg) + streptocycline (0.1 g/kg) (soaking for 24 hours) or mancozeb (2 g/kg). None of the farmers contacted applied organic manure in the nursery and all of them applied fertilizers like DAP (8-12 kg/kanal) and/or urea (7-12 kg/kanal). In the main fields, fertilizers were applied @ 77.6-177.75 kg N/ha and 28.75-57.5 kg P_2O_5/hain case of HYVs and hybrids and 62.0-207 kg N/ha and 27.5-57.5 kg P_2O_5/ha in case of basmati varieties. Application of potash was nil or very negligible. About 60% farmers applied zinc sulfate (21% or 33%) @ 10-25 kg/ha. None of the farmers applied FYM or any other organic manure in the main fields. Planting was random and plant population was not maintained strictly.

Intensity of common weeds like *Echinochloa* spp. and *Cyperus* spp. was low. Hand weeding was not very common among the farmers and most of the farmers applied weedicides like pretilachlor (500-700 ml/acre), butachlor (1000 ml/acre), anilophos (500 ml/acre) and Nominee Gold (100 g/acre). Implements like tractor, trolley, harrow, power tiller and combine harvester were used by the farmers. About 80% of the farmers contacted told that they purchased 70-100% of their total seed requirement. Deep tube wells were the main sources of irrigation. In general, there were no problems of electricity (except few places), irrigation water and availability of pesticides and fertilizers. In addition to their own decision, farmers took advices from private dealers and staffs of University. Diseases like sheath blight, leaf and neck blast, false smut, stem rot and bakanae were observed in low intensities. However, among the insect pests, severe intensities of plant hoppers (BPH and WBPH) (up to 35 nymphs and adults/hill on varieties like PB 1509, PR 114, PB 1121, 27P31, Hyb.3333 in Bhamri village) and severe infestation of leaf folder (up to 25% damaged leaves on PB 1121, Bas. CSR 30, PB 1509, 25P35 in Assandh village) were recorded. Farmers applied different pesticides like chlorpyriphos + cypermethrin (500 ml/acre) and bifenthrin (500 ml/acre) for termites; cartap hydrochloride (5-10 kg/acre; urea mixed broadcast or along with irrigation water), Ferterra (4 kg/acre), acephate (400 ml/acre) and Furadan (5 kg/acre) for leaf folder and stem borer; buprofezin (350 ml/acre) for WBPH; Saaf (carbendazim + mancozeb) (500 g/acre; urea mixed) and thiophenate methyl (250 g/acre) for bakanae; Sivic (tricyclazole) (120 g/acre) for neck blast; buprofezin (330 ml/acre) + hexaconazole (450 ml/acre) and validamycin (450 ml/acre) + buprofezin (330 ml/acre) for BPH/WBPH and sheath blight; dinotefuran (100 g/acre) + thiafluzamide (150 ml/acre) for sheath blight and stem borer; buprofezin (330 ml/acre) + propiconazole (200 ml/acre) + validamycin (400 ml/acre) for BPH/WBPH, sheath blight and false smut and buprofezin (330 ml/acre) + Saaf (500 g/acre) for BPH/WBPH and bakanae. Number of pesticide application in a season ranged from 1-5 and about 40% farmers told that they mixed 2-3 pesticides before application. Iron deficiency was recorded in some fields of Dhamoli village and farmers applied $FeSO_4$ along with urea.

Jind: Ten villages involving 10 farmers were covered for production oriented survey in this district when the crops were in maximum tillering to stem elongation stage or milk to dough stage. Three surveys were made during early August, early September and in October. The fields surveyed were under irrigated ecosystem and except in one place (where there was report of subnormal rainfall), weather conditions were normal. About 40% of the farmers told that they cultivated fodders in part of their land. Rice-wheat was the only cropping sequence followed by the farmers. Commonly grown varieties were hybrids like RH Pioneer 27P31 and Basmati hybrid 408 and basmati like Pusa Basmati 1401, Pusa, Pusa Basmati 1728, Pusa 1509, CSR 30 and Sarbati. Planting was done during middle of June to end of July. Average seed rate was 10-17.5 kg/ha and about 90% of the farmers contacted adopted seed treatment with Bavistin (1 g/kg) + streptocycline (0.1 g/kg), Emisan (1 g/kg) and emisan (1 g/kg) + streptocycline (0.1 g/kg). None of the farmers applied organic manure in the nursery. About 90% of the farmers contacted applied fertilizers like DAP (7-12 kg/kanal) and/or urea (7-10 kg/kanal). Few also applied sulphur and weedicide Saathi. In the main fields, fertilizers were applied @ 197.37 kg N/ha and 57.5 kg P_2O_5/ha in case of HYVs and hybrids and 74.25-178.5 kg N/ha and 28.7-57.5 kg P_2O_5/ha in case of basmati varieties. Application of potash was done by few farmers (20%). About 60% farmers applied zinc sulfate (21% or 33%) @ 12.5-25 kg/ha. Some also applied sulfur (12.5 kg/ha). None of the farmers applied FYM. Only one of the

contacted farmers applied mycorrhizal biofertilizer (Diet). Planting was random and plant population was not maintained strictly.

Intensity of common weeds like *Echinochloa* spp. and *Cyperus* spp. was low. None of the farmers contacted adopted hand weeding and all of them applied weeidicides like pretilachlor (400-500 ml/acre) and Nominee Gold. Different implements like tractor, trolley, harrow and tillers were used by the farmers. About 90% of the farmers told that they purchased 100% of their seed requirement. Deep tube wells were the main sources of irrigation followed by canal. About 40% of the farmers contacted expressed scarcity of irrigation water and electricity. In addition to their own decision, private dealers advised the farmers. Diseases like sheath blight, leaf and neck blast and bakanae were recorded in low intensity. However, among the insect pests, plant hoppers (BPH + WBPH) was recorded in high intensity (up tp 20 nymphs and adults/hill on Pusa 1509 and Pusa 1121 in Mulan village. Similarly, leaf folder damage up to 20% was recorded on Pusa 1121, Pusa 1509 and Pusa 1401 in some fields. Farmers applied different pesticides like chlorpyriphos + cypermethrin (500 ml/acre) for termites; cartap hybdrochloride (5-7.5 kg/acre; urea mixed broadcast), Regent (5-7.5 kg/acre; broadcast by making holes in the container), phorate (7.5 kg/acre), Furadan (5 kg/acre) and Ferterra (2.5 kg/acre) for leaf folder and stem borer; buprofezin (400 ml/acre) for WBPH; thiophenate methyl (1000 g/acre; urea mixed broadcast) for bakanae; hexaconazone (400 ml/acre) + Zineb 68% and hexaconazole (500 ml/acre) for sheath blight; carbendazim (200 g/acre) for leaf blast; buprofezin (500 ml/acre) + carbendazim (200 g/acre) for sheath blight, neck blast and WBPH; tricyclazole (120 g/acre) + buprofezin (330 ml/acre) for neck blast and BPH/WBPH and lamda cyhalothrin (300 ml/acre) + buprofezin (400 ml/acre) + validamycin (450 ml/acre) for sheath blight, BPH/WBPH and grasshoppers. Number of pesticide application in a season ranged from 1-3 and about 30% farmers told that they mixed 2-3 pesticides before application.

Yamunanagar: Survey was conducted in 10 villages in this district during maximum tillering to stem elongation stage or milk to dough stage. A total of 10 farmers were contacted during the survey. Rice fields surveyed were under irrigated ecosystem and the weather conditions were normal for rice cultivation. About 60% of the farmers contacted told that they used 8-80% of their land for other crops like sugarcane and sorghum. All the farmers followed rice-wheat cropping system. Commonly grown varieties were hybrids like VNR 2355, VNR 438, Arize 6444 and Sava 127 and basmati varieties like Pusa Basmati 1637 and Pusa 1121. Rice yield in the district ranged from 7000-9000 kg/ha in different hybrids and 5000-6000 kg/ha in Pusa Basmati 1. Planting was done during middle of June to 1st week of July. Average seed rate for hybrids was 7.5-10 kg/ha while for different basmati varieties it was 12.5-15 kg/ha. All the farmers contacted adopted seed treatment with carbendazim (1 g/kg), carbendazim (1 g/kg) + streptocycline (0.1 g/kg), emisan (1 g/kg) + streptocycline (0.1 g/kg), streptocycline (1 g/10 kg), emisan (1 g/kg) or carbendazim + streptocycline + emisan. About 90% of the farmers contacted told that they did not apply FYM in the nursery. However, all of them applied fertilizers like urea (5-10 kg/kanal) and/or DAP (5-10 kg/kanal). Few applied Bavistin (100 g/kanal) in the nursery as sand mix application. In the main fields, fertilizers were applied @ 74.25-178 kg N/ha and 40-57.5 kg P_2O_5/ha in case of hybrids and 34.5-151.87 kg N/ha and 40-97.5 kg P_2O_5/ha in case of basmati varieties. Very few applied potash (75 kg/ha). About 70-80% of the farmers contacted applied zinc sulfate (21% or 33%) @ 12.5-25 kg/ha. Few (20%) also applied sulfur (10-12.5 kg/ha). About 30% of the farmers

contacted applied FYM (4-6 t/ha) in the main fields. Planting was random and plant population was not maintained.

Intensity of common weeds like *Echinochloa* spp. and *Cyperus* spp. was low. Hand weeding was not common among the farmers and all of them applied weedicides butachlor (500-1000 ml/acre) and pretilachlor (500-750 ml/acre). Different implements like tractor, trolley, harrow, tiller, cultivator, rotavator and combine harvester were used by the farmers. All the farmers told that they purchased 90-100% of their seed requirement. Deep tube wells followed by canal were the main sources of irrigation and in general there were no scarcity of irrigation water or electricity. Mainly, farmers took their own decisions and also advices from private dealers. Among diseases, sheath blight, false smut and bakanae were recorded in low to moderate intensity. However, bacterial blight was moderate to severe (in patches) on PB 1637 and PB 1 in Kartarpur village. Among insect pests, stem borer, leaf folder, whorl maggot and grasshoppers were recorded in low intensities. However, plant hoppers (BPH + WBPH) was recorded in moderate to high intensity (15-40 nymphs/hill) on hybrids like Sava 127, Hyb 2222 and 25P35 in Thana Chhappar village. Farmers applied different pesticides like chlorpyriphos (1 l/acre; broadcasted by making holes in the container) for termites; Ferterra (4-5 kg/acre; urea mixed broadcast), cartap hydrochloride (5 kg/acre; urea mixed broadcast) and Regent Ultra (4 kg/acre; urea mixed broadcast) for leaf folder and stem borer; imidacloprid (70 ml/acre), Actara (thiomethoxam) (80 g/acre) and Glamore (imidacloprid 40% + ethiprole 40%) for BPH/WBPH; propiconazole (200 ml/acre) for false smut; thifluzamide (150 g/acre) + imidacloprid (150 ml/acre) + streptocycline (6 g/acre) for bacterial blight, sheath blight and BPH/WBPH; imidacloprid (80 ml/acre) + vakidamycin (500 ml/acre) for sheath blight and WBPH; lamda cyhalothrin (250 ml/acre) + propiconazole (200 ml/acre) + thiomethoxam (80 g/acre) for BPH/WBPH, false smut and sheath blight and buprofezin (300 ml/acre) + lamda cyhalothrin (500 ml/acre) for BPH/WBPH and leaf folder. Number of pesticide application in a season ranged from 1-3 and about 40% farmers told that they mixed 2-3 pesticides before application. Moderate zinc deficiency was noticed in some fields.

Ambala: Production oriented survey was conducted in 10 villages in this district thrice during early August, early September and October. A total of 10 villages were covered for the survey and the rice fields were in either maximum tillering to stem elongation stage or heading to dough stage. The rice fields surveyed were under irrigated ecosystem and in general, the weather conditions were normal for rice cultivation. About 60% of the farmers contacted told that they are using 5-60% of their land for other crops like sugarcane and sorghum. Commonly grown varieties were hybrids like Sava 127, Arize 6129, Arize 6444, RH Pioneer 27P31, Swift Gold and DRH 834 and basmati varieties like Pusa Basmati 1. Hybrids occupy a large area in this district. Main crop rotation practice followed by the farmers was rice-wheat. Few also adopted rice-potato. Average rice yield in the district ranged from 6200-9000 kg in different hybrids like Swift Gold, Arize 6129, 27p22, Hybrid 6029, 25p35, Sava 127, Arize 6444, 27p31 and Hybrid 2222 and about 3000 kg/ha in CSR 30. Planting was done mainly during mid June to mid July. Average seed rate for hybrids was 7.5-10 kg/ha and for HYVs and basmati it was 12.5-15 kg/ha. All the farmers told that they treated the seeds with emisan (1 g/kg) + streptocycline (0.1 g/kg), carbendazim (1 g/kg), Saaf (2 g/kg) or emisan (1 g/kg). About 90% of the farmers contacted told that they did not apply any organic manure in the nursery and all of them applied chemical fertilizers like urea (6-10 kg/kanal) and/or DAP (6-12 kg/kanal). About 10% farmers also applied zinc sulphate and insecticide Coragen. In the

main fields, fertilizers were applied @ 103.75-177.75 kg N/ha and 28.75-57.5 kg P_2O_5/ha. Potash application was almost nil. About 80% of the farmers contacted applied zinc sulfate (21% or 33%) @ 12.5-25 kg/ha. Few (20%) also applied sulfur (10-12.5 kg/ha). None of the farmers contacted applied FYM or any other organic manure in the main fields. Planting was random and plant population was not maintained.

Intensity of common weeds like *Echinochloa* spp. and *Cyperus* spp. was low in most of the fields. Hand weeding was not common among the farmers and all of them applied weedicides like pretilachlor (500-1000 ml/acre) and butachlor (1200 ml/acre). Implements like tractor, trolley, tiller, cultivator, straw chopper, harrow, planker and rotavator were used by the farmers. All the farmers contacted told that they purchased 100% of their seed requirement. Deep tube wells were the main sources of irrigation and in general, there was no scarcity of irrigation water and electricity. In addition to their own decisions, private dealers were the main advisors to the farmers followed by staffs from state department of agriculture. Diseases like sheath blight and false smut were observed in low to moderate intensities. Among the insect pests, plant hoppers (BPH + WBPH) were observed in moderate to high intensities (15-20 nymphs/hill) on PR 114 and Swift Gold in Majri village. Farmers applied different pesticides viz., chlorpyriphos (1 l/acre) and chlorpyriphos + cypermethrin (500 ml/acre) for termites; Ferterra (4-5 kg/acre), cartap hydrochloride (5-7.5 kg/acre; urea mixed broadcast) and dinotefuran (80 g/acre) + acephate (200 ml/acre) for leaf folder and stem borer; Glamore (imidacloprid + ethiprole) (50 ml/acre) for BPH/WBPH; Nativo ((100 g/acre) + Chess (120 g/acre) for sheath blight and BPH/WBPH; Saaf (500 g/acre) for bakanae; Saaf (250 g/acre) + acephate (250 ml/acre) for leaf folder and bakanae and Amistar Top (200 ml/acre) + Chess (150 g/acre) + lamda cyhalothrin (200 ml/acre) for sheath blight, BPH/WBPH, leaf folder and stem borer. Number of pesticide application in a season ranged from 1-4 and about 20% farmers told that they mixed 2-3 pesticides before application.

Panipat: Three surveys were made in this district during early August, early September and October. A total of 10 farmers from 10 villages were contacted during the survey. The rice fields were in tillering to stem elongation stage or milk to maturity stage when surveys were made. All the fields surveyed were under irrigated ecosystem and in general the weather conditions were normal except few places where subnormal rainfall was reported. Few farmers (20%) told that in 10-20% of their land, they cultivated other crops. The district is mainly dominated by the basmati cultivation and predominant varieties cultivated were Pusa 1121, Pusa 1509, Pusa Basmati 1401 and CSR 30. Rice-wheat was the main crop sequence followed by the farmers. However, few also followed rice-pea and rice-mustard. Average rice yield in some commonly grown basmati varieties like Pusa 1509 and Pusa 1121 was 4000-5500 kg/ha. Planting was mainly done during 3rd week of June to end of July. Average seed rate was 12-15 kg/ha and about 80% of the farmers contacted told that they adopted seed treatment with emisan (1 g/kg), emisan (1 g/kg) + streptocycline (0.1 g/kg) (seed soaking for 12 hours), streptomycin + Saaf and carbendazim (1 g/kg) + streptocycline (0.1 g/kg) (soaking for 24 h). None of the farmers contacted applied any organic manure in the nursery and all of them applied chemical fertilizers like urea (5-10 kg/kanal) and/or DAP (5-12 kg/ha). Few farmers also applied gypsum (500 kg/1000 m^2) and weedicide pretilachlor. In the main fields, fertilizers were applied @ 115-229.5 kg N/ha and 28.75-57.5 kg P_2O_5/ha. Potash application was almost nil. About 60% of the farmers contacted applied zinc sulfate (33%) @ 12.5-25 kg/ha or chelated zinc (1.25 kg/ha). About 10% of the farmers contacted also

applied gypsum (10 q/acre) and sulfur (7.5 kg/acre). Planting was random and proper plant population per unit area was not maintained.

Intensity of common weeds like *Echinochloa* spp. and *Cyperus* spp. was low in most of the fields. Hand weeding was not common among the farmers and all of them applied weedicides like pretilachlor (500-800 ml/acre) and Top Star (45 g/acre). Implements like tractor, trolley, tiller, cultivator, harrow and rotavator were used by the farmers. About 70% of the farmers contacted told that they purchased 100% of their seed requirement. Canal followed by deep tube wells were the main sources of irrigation and in general, there was no scarcity of irrigation water and electricity. In addition to their own decisions, private dealers were the main advisors to the farmers. Intensity of diseases like neck blast and bakanae was low. Among the insect pests, plant hoppers (BPH + WBPH) were severe (up to 50 nymphs/ hill) in some fields of Pusa 1121 and Pusa 1509. Farmers applied different pesticides like chlorpyriphos (1 l/acre), bifenthrin (500 ml/acre) and chlorpyrphos + cypermethrin (400 ml/acre; along with irrigation water/by making hole in container) for termites; Furadan (5 kg/acre), cartap hydrochloride (5-7.5 kg/acre; 1-2 times; urea mixed broadcast), Ferterra (4 kg/acre), Glamore (50 ml/acre) + Fame (40 ml/acre) and fipronil (5 kg/acre) for leaf folder and stem borer; buprofezin (330 ml/acre) and thiomethoxam (100 g/acre) for BPH/WBPH; Custodia (azoxystrobin 11% + tebuconazole 18.3% w/w SC) for sheath blight; Glamore (50 ml/acre) + Fame (40 ml/acre) + Folicur (40 ml/acre) for BPH/WBPH, sheath blight, leaf folder and stem borer and buprofezin (330 ml/acre) + Sheathmar (450 ml/acre) for BPH/WBPH and sheath blight. Number of pesticide application in a season ranged from 1-5 and about 20% farmers told that they mixed 2-3 pesticides before application.

Sonepat: Production oriented survey was conducted in 10 villages (involving 10 farmers) in this district when the rice fields were in maximum tillering to stem elongation stage or in milk stage. Three surveys were made during early August, early September and in October. The surveyed rice fields were under irrigated ecosystem and weather conditions were normal. Few farmers (20%) told that they cultivated other crops like sorghum in parts of their cultivable land. The only crop sequence followed by the farmers was rice-wheat. This district is also known for basmati cultivation and the common cultivars were Pusa 1121 and Pusa 1509. Average rice yield in cultivars like Pusa 1121,Pusa 1509 and CSR 30 was 3500-5000 kg/ha. Planting was made during middle of June to 3rd week of July. Average seed rate was 12.5-17.5 kg/ha and about 60% of the farmers followed seed treatment with emisan (1 g/kg) + streptocycline (0.1 g/kg), Bavistin (1 g/kg) + streptocycline (0.1 g/kg) or emisan + Bavistin + streptocycline. About 90% of the farmers contacted told that they did not apply any organic manure in the nursery and all of them applied chemical fertilizers like urea (5-10 kg/kanal) and/or DAP (5-10 kg/kanal). In the main fields, fertilizers were applied @ 74.25-177.75 kg N/ha and 28.75-57.5 kg P_2O_5/ha. Potash application was almost nil. About 50% of the farmers contacted applied zinc sulfate (33% or 21%) @ 10-25 kg/ha. About 10% of the farmers contacted also applied sulfur (7.5 kg/acre). Planting was random and proper plant population per unit area was not maintained. About 20% of the farmers applied FYM (4-5 trolley/acre) and growth regulators like micronutrient mixture (2.5 kg/acre) and White Gold (microbial combination) (500 ml/acre).

Intensity of common weeds like *Echinochloa* spp. and *Cyperus* spp. was low in most of the fields. Hand weeding was not common among the farmers and all of them applied weedicides like pretilachlor (500 ml/acre) and butachlor (1000 ml/acre). Implements like tractor, trolley, tiller,

cultivator, harrow and rotavator were used by the farmers. About 70% of the farmers contacted told that they purchased 100% of their seed requirement. Canal and deep tube wells were the main sources of irrigation and about 60% of the farmers contacted reported scarcity of irrigation water and about 40% of them reported shortage of electricity. In addition to their own decisions, private dealers were the main advisors to the farmers followed by staffs from university. Diseases like sheath blight, bakanae and stem rot were recorded in low to moderate intensities. Among the insect pests, plant hoppers (BPH + WBPH) were severe (15-20 nymphs/hill) in some fields of Pusa 1121 in Khanpur Khurd and Madina villages. Different pesticides were applied viz., chlorpyrphos + cypermethrin (400 ml/acre; along with irrigation water/by making hole in container) and bifenthrin (400 ml/acre) for termites; fipronil (7.5 kg/acre), Ferterra (4 kg/acre; urea mixed broadcast), cartap hydrochloride (7.5 kg/acre; urea mixed broadcast) and phorate (3 kg/acre) for stem borer and leaf folder; Saaf (500 g/acre; urea mixed broadcast) for bakanae; propiconazole (200 ml/acre) for grain discoloration and false smut; buprofezin (330 ml/acre) + validamycin (450 ml/acre) and Taspa (propiconazole + difenconazole) + buprofezin for BPH/WBPH and sheath blight and isoprothiolane (200 ml/acre) + buprofezin (330 ml/acre) for BPH/WBPH and sheath blight. Number of pesticide application in a season ranged from 1-3 and about 20% farmers told that they mixed 2-3 pesticides before application.

Prevalence and severity of rice diseases recorded in different districts of Haryana during *kharif* 2018

District	ShBl	Bl	NBl	Bak	FS	StR	BLB	Khaira
Kaithal (10 %) [C]	40 % L-M[b] Bas. CSR 30, PR 114, PB 1121, PB 1401, PB 1509	20 % L-M Bas. CSR 30	-	60 % Tr. -L (Tr-6.0%)[a] PB-1509, Bas. CSR-30	20 %Tr.- L (Tr-2%tillers) PR 126, PR 114	-	-	20 % L-M PB 1509, PR 126, Basmati CSR 30
Kurukshetra (20 %)	70.0% Tr-M Sava 134, PR 114, Pusa 44, Taraori Basmati	10.0% L-M	-	30 % Tr-L (Tr-1.0%) PB-1121, Bas. CSR 30	-		-	-
Karnal (20 %)	40 % L- M Bas. CSR 30	10 % L Bas. CSR 30	30% L (2-6%) Basmati CSR-30, PB 1121	60 Tr. -L (Tr-0.8%) PB 1121, PB 1509, Bas.CSR 30	10 % L (1-2%tillers) 27P31	10 % L (5-6 %) PB 1121	-	-
Jind (20 %)	40 % L-M PB 1121, PB 1728	20 % Tr. PB 1121	10% L (1-2%) PB 1121	20 % L (0.1%) PB 1509	-	-	-	-
Yamuna-Nagar (40 %)	50 L-M PB 1637, PB 1, Sava 127, PB 1121, Hyb 2222	-	-	20 % Tr. PB 1121	30 % L (2-3%tillers) Sava 127, 25P35	-	10% M-S PB 1637, PB 1	10 % M PB 1
Ambala (60 %)	40 % L-M Sava 127	-	-	-	10 % L (1-2 %tiller) Swift Gold	-	-	-
Panipat (50 %)	-	-	10% L (1%) PB 1121	40 % (Tr.-0.5%) PB 1509	20 % Tr.	-	-	-
Sonepat (50 %)	20 % M PB 1121	-	-	50 % Tr.-L (Tr.-3 %) PB 1121, PB 1509	-	10 % L (6 %) PB 1121	-	20 % M PB 11121

[a]: Disease incidence [b]: % disease severity Severity: Tr: traces; L: low; M: moderate; S: severe Disease incidence: < 10%, 10-25% and > 25% were designated as L, M and S in case of **neck blast, stem rot, bakanae** and **false smut**. Likewise for **sheath blight**, **leaf blast** and **bacterial leaf blight**, disease score of 3, 5 and >5 were treated as L, M and S, respectively: [C]: Disease free locations

Occurrence and severity of rice insect- pests recorded in different districts of Haryana during *Kharif*' 2018

District	SB	Planthoppers (WBPH /BPH)	LF	WM	GH	Termite	Insect free locations
Kaithal	10 % Tr.[b] (0.3-0.4 %WE) PB 1121	50 % Tr.- M[b] (1-12 nymphs/ hill); PB 1509, Bas. CSR 30, PR 114	80 % Tr.-L; (1-10% damaged leaves); PB 1509, PR 114, Bas.CSR 30, PB 1401, PB 1121	-	20 % Tr. Bas. CSR 30, PR 114	-	10 %
Kurukshetra	20 % L (1-2% dead heart)[a] PR 114, Pusa 44	10% M (6-8 nymphs/hill) PR 126, PR 114	80% L (2% damaged leaves) PB-1, PB 1121, Bas. CSR 30, Swift Gold, PR 114, PR 126, VNR 901	-	-	-	Nil
Karnal	20 % Tr.-L (Tr.-4 % WE) PB 1121	40% L-S (1-35 nymphs/ hill); PB 1509, PR 114, PB 1121, 27P31, Hyb.3333	80 % L-S (1-25 % damaged leaves) PB 1121, Bas. CSR 30, PB 1509, 25P35	-	-	-	10 %
Jind	10 % L (1-2 % WE) PB 1718	30 % L- S (2-20 nymphs/hill) PB 1509, PB 1121	100 % Tr.-S (Tr.-20 % damaged leaves) PB 1121, PB 1509, PB 1401	10 % L (1-2% damaged leaves) PB 1121	-	-	10 %
Yamuna Nagar	10 % Tr (0.5-1.0% dead heart) PB 1	30 % M- S (15-40 nymphs/hill) Sava 127, Hyb 2222, 25P35	80 % Tr.-L (Tr.-2 % damaged leaves) PB 1, Sava 127, Pusa Basmati 1637, Swift Gold	10 % L (1-4% damaged leaves) PB 1	20 % Tr.	-	10 %
Ambala	20 % Tr ; (0.5-1.0% dead heart/ WE); Sava 127, Swift Gold, PR 114, PAU 201, PB 1509	10 % M-S (15-20 nymphs/hill) PR 114, Swift Gold	60 % Tr.-L (l-6% damaged leaves) Sava 127, Hybrid 2082, Pioneer RH 27P31, Hybrid 2222, DRH 834	20 % Tr-L (0.5-2% damaged leaves) Arize 6444, DRH 834	-	-	10 %
Panipat	30 % Tr (0.5% WE)	50 % L-S (2-50 nymphs/ hill); PB 1121, PB 1509	70% Tr.-L; (Tr.-10 % damaged leaves) PB 1121, PB 1509	-	-	30 % L 1.5 % infested plants) PB 1121	20 %
Sonepat	20% Tr.-L (1-2 % dead heart/WE) PB 1121	20 % M-S (15-20 nymphs/hill) PB 1121	60 % L (2-6 % damaged leaves) PB 1121, PB 1509	-	-	-	20 %

[a]: Insect-pests population/damage [b]: Severity of insect-pests ; Severity: Tr: Traces, L: Low, M: Moderate, S: severe

For **stem borers**, Traces: <1.0% dead heart/White ear, Low: 1.0-10.0% DH/WE, Moderate: 10.1-20.0% DH/WE, Severe: > 20.0 % DH/WE, **WBPH/ BPH**: Traces: <1.0 nymphs or adults/hill, Low: 1.0-5.0 nymphs or adults/hill, Moderate : 5.1- 15.0 nymphs or adults/hill ; Severe: >15.0 nymphs or adults/hill while for **leaf folder & whorl maggot**: Traces: < 1.0% damaged leaves, Low: 1.1-10.0% damaged leaves , Moderate: 10.1-20.0% damaged leaves; Severe : > 20.0% damaged leaves and for **termites** :Traces: <1.0 % infested plants; Low : 1.0 -5.0 infested plants; Moderate: 5.1-10.0% infested plants; Severe: >10% infested plants

Himachal Pradesh (Malan)

Districts surveyed: *Kangra, Mandi* and *Una*

Districts Surveyed

District	Blocks	Villages
Kangra	Nagrota Bagwan, Kangra, Rait, Baijnath, Bhawarna, Bhedu Mahadev, Dharamshala and Fatehpur	Malan, Chahri, Rait, Shahpur, Bhanala, Bagru, Rehlu haar, Tang, Jadrangal, Mahakaal, Panchrukhi, Biara, Tikri Duhki, Utrala, Harer, Jia, Dadh, Pathiar, Bagora, Bhagotla, Chimbalhaar, Mainjha, Nagri, Gopalpur, Bhawarna, Bhedu Mahadev, Panapar, Dhira, Bari-Khundian, Fatehpur and Badukhar
Mandi	Balh and Sarkaghat (Gopalpur)	Nalsar, Bheora, Kummi, Charaur, Sundernagar, Bhambla and Batail
Una	Una and Haroli	Jankor, Takarla Mod, Nangalkalan, Majra and Basal

Widely Prevalent Varieties

Kangra	**Improved varieties:** Palam Basmati-1, Palam Lal Dhan-1, Him Palam Dhan-1, HPR 1156, HPR 2143, HPR 1068, Kasturi, Sharbati, Pusa 1509, Pusa 1121 **Hybrids:** Raja, Arize 6129, Arize 6444, PAC 807, Hybrid 834, Arize Swift Gold, Sri Ram Khushbu, Shahi Dawat, US 312, Raftaar, Hyb. 2266, Nirmal-4 etc. **Local:** Jhini
Mandi	**Improved varieties:** Pusa 1121, Pusa 1509, Palam Basmati-1, HPR 2143, HPR 1068, HPR 1156 **Hybrids:** US 312, Raja, Sri Ram Khushbu, Arize 6129; **US 312 was the most predominant hybrid.**
Una	**Improved varieties/ hybrids:** PR 121, PR 126, Pusa 1121, Arize 6444, Hybrid 57, PR 127, Hyb. 1067, Hyb. 257, Hyb. 309, Hyb. 25P35

Area under rice crop in districts surveyed during *Kharif* 2018

District	Area Planted (Thousand ha)
Kangra	38.0
Mandi	20.0
Una	2.4
Total Area under rice in HP	**76.5**

Production oriented survey was conducted in three districts of Himachal Pradesh viz., Kangra, Mandi and Una. District Kangra district remains leading in the area under rice cultivation followed by Mandi district. Commonly cultivated rice varieties under irrigated conditions were Palam Basmati-1, Palam Lal Dhan-1, HPR 2143, HPR 1068, Kasturi, Sharbati, Pusa 1509, Pusa

1121 while under rinfed condition, most common varieties were HPR 1156 and HPR 2656 (Him Palam Dhan-1). Besides these, hybrids like Arize 6129, PAC 807, Hyb 834, Arize Swift Gold, Sri Ram Khushbu, Shahi Dawat, US 312, Raftaar, Hyb 2266 and Nirmal-4. In Mandi distrcit, the most predominant rice hybrid was US-312. Prevailing crop sequences were Rice-wheat, maize-wheat and rice- potato. Among the weeds *Digitaria sanguinalis*, *Echinochloa colona, E. crusgalli, Cyperus iria, Cyperus rotundus, Ageratum conyzoides* and wild rice were very common under direct sown conditions. The common weeds under transplanted conditions were *E. crusgalli, Monochoria vaginalis, Cyperus iria Commelina benghalensis* and *Bonnaya veronicaefolia*. Bispyribac sodium was the most common weedicide used by the farmers to check weeds. Common fertilizers used include IFFCO 12:32:16 and urea while dose applied ranged between 0-70 kg N, 0-40 kg P_2O_5 and 0-40 kg K_2O. Most of the biotic constraints were recorded in low to moderate intensities. However, severe outbreak of false smut (Intensity ≥ 30%) on HYVs and hybrids and neck blast (Intensity ≥ 50%) on varieties like Pusa 1121, Pusa 1509, PAC 807 was observed in Batail area of Sarkaghat block of Mandi district. Incidence of black beetles was quite higher in Tikri Duhki area of Panchrukhi block in Kangra district especially during early phase of crop growth. Pesticide application was in general inadequate. Common problems in the area were use of inadequate and imbalance dose of fertilizers and rain during dough to maturity stage and at later stages resulting in high incidence of grain discoloration and sheath rot in some parts of the state.

District-wise observations:

Kangra: Thirty three villages from eight blocks of district Kangra were covered under production oriented survey during *Kharif* 2018 at different crop stages. However, information in respect of rice cultivation was collected from the farmers from Panchrukhi, Bhawarna, Fatehpur and Rait blocks. Rice-wheat, maize-wheat and rice- potato were the prevailing crop rotations. The area under rice cultivation during *Kharif* 2018 in Kangra district was around 37,000 hectares. Three methods of rice cultivation viz., dry seeding, sowing of sprouted seeds in puddled fields and transplanting were practiced in this district. System of rice intensification (SRI) was also observed with slight modifications by random planting. The farmers planted younger seedlings maintaining a proper distance. The varieties grown under irrigated conditions were Palam Basmati-1, Palam Lal Dhan-1, HPR 2143, HPR 1068, Kasturi, Sharbati, Pusa 1509, Pusa 1121. Besides these, hybrids like Arize 6129, PAC 807, Hyb 834, Arize Swift Gold, Sri Ram Khushbu, Shahi Dawat, US 312, Raftaar, Hyb 2266, Nirmal-4 etc. were also grown over larger acreage in potential areas of Kangra. Under rain fed conditions, the most prominent cultivars were HPR 1156 and HPR 2656 (Him Palam Dhan-1). Cultivation of local cultivars like Jhini, Tapta and Ramjawain are still being grown by the farmers though in declining pattern. However, Jhini in Jia Haar of Bhawarna block was noticed in some patches. Seed replacement rate in this district has been found to increase than previous *Kharif* seasons. Among the weeds *Digitaria sanguinalis, Echinochloa colona, E. crusgalli, Cyperus iria, Cyperus rotundus, Ageratum conyzoides* and wild rice were very common under direct sown conditions. The common weeds under transplanted conditions were *E. crusgalli, Monochoria vaginalis, Cyperus iria Commelina benghalensis* and *Bonnaya veronicaefolia*. Two species of alligator weed, *Alternanthera echinata* and *A. sessilis* continued to predominate in this district. Bispyribac sodium was the most common weedicide used by the farmers to check weeds under direct sown and transplanted conditions, respectively. Common fertilizers used include IFFCO 12:32:16 and

urea while dose applied ranged between 0-70 kg N, 0-40 kg P_2O_5 and 0-40 kg K_2O. Diseases such as leaf and neck blast were observed as moderate, false smut, sheath rot and grain discolouration were observed as low to moderate whereas brown spot, sheath blight and narrow brown leaf spot were recorded as low. Though, overall incidence of sheath rot was comparatively less but in certain parts of district Kangra it was considerably higher indicating its importance in this district. Leaf blast severity was quite higher on Pusa 1121 planted in some parts of Rait, Nagrota Bagwan and Bhawarna blocks and was severe on local cultivars in some parts of Bhawarna block. Some farmers used Bavistin 50 WP as foliar application (1 g/l) against blast while seed procured from agricultural stores was already dressed with Bavistin 50 WP (2-2.5 g/ kg seed). Farmers also used chlorpyriphos (2.5 ml/l) against hispa/ leaf folder. The incidence of rice hispa was moderate while incidence of black beetles was quite higher in Tikri Duhki area of Panchrukhi block. Incidence of stem borer, chaffer beetle and leaf folder was low to moderate while other pests like grasshoppers and whorl maggot were observed in many places. Incidence of 'hopper burn' was seen in Badukhar area of Fatehpur block and in Samloti area of Nogrota block after a long spell of time (since 2007). Severe rice hispa damage was noticed from Jia in Bhawarna Block and Basa Bajira from Nurpur Block. Slug caterpillars were also observed from some pockets of Bhawarna Block.

Mandi: Farmers from rice bowl of Mandi i.e. Balh block and Sarkaghat (Gopalpur) block were contacted for production oriented survey in this district. Survey was conducted during dough to maturity stage of the rice crop. The farmers contacted were marginal to sub-marginal. The area under rice cultivation during *Kharif* 2018 in Mandi district was around 20,000 hectares. Rice-wheat and maize-wheat were the prevailing crop rotations. The predominant high yielding varieties in the district were Pusa 1121, Pusa 1509, Palam Basmati-1, HPR 2143, HPR 1068, HPR 1156 and Kasturi. However, hybrids grown in Balh valley included US 312, Raja, Arize 6129 of which US 312 was the predominant one as around 90 per cent of hybrid area was under US 312**.** Local germplasm seemed to be replaced by hybrids in this block. Seed replacement rate in this district is quite high especially in Balh valley where maximum area is under hybrids. The farmers in the district mostly use FYM and NPK fertilizer in wheat crop during *rabi* season and apply urea @ 20-60 kg N/ha in 2 splits as top dressing to rice crop. IFFCO 12:32:16 was the most commonly used fertilizer. The most common weeds found in the district were *Cyperus iria, Echinochloa colonum, E. crusgalli Monochoria vaginalis, Paspalum spp., Eragrostis japonica, Alternanthera echinata, A. sessilis, Digitaria sanguinalis, Ageratum conyzoides* and wild rice. Butachlor was used by almost all the farmers. Farmers had adopted a modified system of rice intensification. Among diseases, neck blast, sheath rot, grain discolouration and false smut appeared as low to moderate while leaf blast, sheath blight and brown spot appeared as low. However, severe outbreak of false smut (Intensity ≥ 30%) and neck blast (Intensity ≥ 50%) was observed in Batail area of Sarkaghat block. Stem borer was observed as low to moderate. Very few farmers adopted the control measures for diseases and pests.

Una: Survey was conducted in lower hills of Una distirct comprising of Jankor, Takarla Mod, Basal, Santokhgarh, Majra and Nangalkalan (Tahliwal) areas where the farmers contacted for collecting information in respect of rice cultivation were marginal to sub-marginal. The high yielding varieties grown by the farmers included HPR 2143, HPR 1068, HPR 1156, PR 121, PR 126 and hybrids like Arize 6444, Hyb 57, Hyb 1067, Hyb 257, Hyb 309, Hyb 25P35. The farmers used recommended doses of fertilizers and applied zinc sulhate in some areas. The top

dressing of urea at tillering and heading stages was also done. Some farmers also applied zinc sulphate in the field. The common weeds were *Cyperus iria, Echinochloa colona* and *E. crusgalli*. Farmers used Bispyribac sodium (Nominee Gold) for the control of weeds. Diseases like false smut, narrow brown leaf spot, neck blast and sheath rot were low to moderate while leaf blast, grain discolouration and sheath blight were recorded as low. Brown spot was observed in moderate forms (>20%) on Pusa 1121 at Nangalkalan. Leaf folder damage was also moderate. Pesticides like Tilt 25 EC against false smut and insecticide like chlorpyriphos for leaf folder were used by some farmers.

Prevalence of diseases of rice in Himachal Pradesh during *Kharif* 2018

District	Diseases									
	Bl	**NBl**	**BS**	**GD**	**FS**	**LS**	**NBLS**	**ShBl**	**ShR**	**BLB**
Kangra	M	M	L	L-M	L-M	L	L	L	L-M	-
Mandi	L-M	L-S	L	L-M	L-S	L	L	L	L-M	-
Una	L	L-M	L-M	L	L-M	L	L-M	L	L-M	-

Prevalence of insect-pests of rice in Himachal Pradesh during *Kharif* 2018

District	Insect pests					
	LF	**SB**	**RH**	**GH**	**WM**	**BB***
Kangra	L-M	M	M	L-M	L	M-S
Mandi	M	L-M	-	L-M	-	
Una	L	L	L	L	L	

*BB-black beetles

Jammu and Kashmir-1 (Khudwani)

Districts surveyed: *Anantnag, Kulgam* and *Kupwara*

Particulars of survey

Districts	Blocks	Villages
Anantnag	Anantnag, Achabal an Dooru	Wanpoh, Trehpoo, Arampora-bonpora, Iqbalabad, Khandipheri, Bragam, Koot and Laram
Kulgam	Qaimoh, Kulgam and Devsar	Khudwani, Kenipora, Aagroo, Brazuloo, Kaladrengh, Ashmuji, Mutalhama and Chadder
Kupwara	Langate, Drugmulla, Handwara and Sogam	Langate, Natnusu, Kawara, Kulangam, Wawoora, Lalpora, Sogam, Nehama, and Baderkal

Widely prevalent varieties

Districts	Varieties
Anantnag	**HYVs:** Jhelum, SR-I, SR-2, SR-3, SR-4 and SR-5; **Locals:** K-39, K-332, China-1039 China-1007 and Mushk Budgi
Kulgam	**HYVs:** Jhelum, SR-I, SR-3 and SR-4
Kupwara	**HYVs:** Jhelum SR-I, SR-4 and SR-5; **Local:** K-39

Particulars of rice area

District	Total geographical area (ha)	Total Cultivable area (ha)	Total Cultivated area (ha)	Total irrigated area (ha)	Area under rice (ha)
Anantnag	72,149	48,123	47,861	31,127	25,147
Kulgam	47,642	35,605	27,397	20,046	16,748
Kupwara	65,574	52,406	45,534	22,710	16,570

General questions on rice cultivation in district (To be filled by the co-operator in consultation with the Officials from State department of Agriculture)

Parameters	Anantnag	Kulgam	Kupwara
Total area under HYVs in the district (ha)	17400	12400	8000
Most prevalent HVVs in the district	Jehlum	Jehlum	Jehlum
Total area under rice hybrids in the district (ha)	Nil	Nil	Nil
Most prevalent rice hybrids in the district	Nil	Nil	Nil
Total area under basmati in the district	Nil	Nil	Nil
Most prevalent basmati varieties in the district	Nil	Nil	Nil
Whether farmers are using any heavy equipments like transplanted/combine harvester	No	No	No
Mention water saving technologies like	Nil	Nil	Nil

Parameters	**Anantnag**	**Kulgam**	**Kupwara**
SRI/laser levelling/DSR being used by the farmers			
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Use of HYV, RFD, proper nursery mgt.	Use of HYV, RFD, proper nursery mgt.	Use of HYV, RFD, proper nursery mgt.
What are the general problems in rice cultivation in the district	Untimely availability of inputs	Untimely availability of inputs	Untimely availability of inputs
Please provide any farmers association in the district	M. Budji Growers' Association Sagam	Nil	Nil
Whether availability of labours is sufficient?	Yes	Yes	Yes
Whether there is any marketing problem of the produce?	No	No	No
Any major irrigation/power generation project in the district	Power; No Irrigation Nandi canal	Irrigation canals: Maw, Sonman	Irrigation canals: Mawar, Lalkul
Any soil testing program undertaken?	Yes	Yes	Yes
Any farmers training programme was organized by the state department of Agriculture/University	Yes	Yes	Yes

Variety wise area coverage (ha) in different districts of Jammu and Kashmir-1 during *Kharif*' 2018

Varieties	**Anantnag**	**Kulgam**	**Kupwara**
Jehlum	13700	9700	4500
SR-1	1000	800	1500
SR-2	100	-	-
SR-3	400	700	1700
SR-4	2100	1200	200
SR-5	100	-	100
K-39	1200	500	4200
K-332	400	-	-
China 1039/1007	4200	3400	2200
Mushk Budgi	800	-	-
Local and Others	1147	448	2170

Rice is the staple food of majority of the population inhabiting the Kashmir valley and the crop is grown in all the districts of the valley. By and large, farmers of the valley are highly skilled in rice cultivation but most of the farmers need to improve nursery management and learn the technology of raising protected nurseries as the temperatures sometimes dip low in the valley when the seeds are sown. Production oriented survey was conducted in three districts viz.,

Anantnag, Kulgam and Kupwara when the crop were mainly at maturity stage. The general climatic conditions were normal as far as rice is concerned. The main crop rotation practices followed by the farmers were rice-mustard and rice-oats. Most predominant rice varieties cultivated in this region were HYVs like Jehlum, SKAU 408, SR-4 and SR-3. Some farmers are growing local varieties like Zag and Mushk Budgi for special attributes. However, HYVs are spreading very fast and replacing the local varieties. Optimum time of sowing was end of April to Ist week of May and optimum time of planting was end of May to 1st week of June. Average seed rate was 80-100 kg/ha and the co-operator reported that majority of the farmers contacted (80-100%) adopted seed treatment with either carbendazim (2-3 g/kg) or tricyclazole (0.06%). In the main fields, farmers applied 80-120 kg N/ha, 50-60 kg P_2O_5/ha and 30 kg K_2O/ha. All the farmers contacted applied FYM (5-12 q/ha) in the main field. Random method of transplanting was common among the farmers. The intensity of common weeds like *Echinochloa* spp., *Potamogeton* spp., *Crotolaria*s pp., *Eichhornia*spp., *Ammannia* spp. and sedges was low. All the farmers in district Kupwara adopted hand weeding and in addition applied herbicides like butachlor (1.5 kg a.i./acre) but the farmers of Anantnag and Kulgam districts applied only herbicide Eros (4 kg/acre) and no hand weeding. Some of the common needs of the farmers were availability of certified seeds of good HYVs, timely supply of inputs, irrigation facilities and advices from experts regarding rice production technology. The intensity of most of the biotic constraints was low and application of pesticides was not common among the farmers.

District wise observations

Anantnag: Production oriented survey was conducted in eight villages in this district involving 10 farmers. The rice fields surveyed were under irrigated conditions and the general weather conditions were normal for rice production. The crops were at maturity stage at the time of survey. About 30% farmers told that they used part of their land (10-20%) for raising other crops like pulses and vegetables mainly for domestic consumption. The main crop rotation practice followed by the farmers was rice-mustard followed by rice-oats. Predominant rice varieties cultivated by the farmers were HYVs like Jehlum, SKAU-408, SR -4 and SR -3. Some of the farmers also cultivated local varieties like China -1039, China-1007 and Mushk Budgi. However, a large area is being cultivated with rice HYVs. About 800 ha are covered under local aromatic course rice variety Mushka Budgi in its niche area Sagam and there is a Mushka Budgi Growers' Association in place. Average rice yield in the region was 6300-6900 kg/ha in Jehlum. High yield in this variety was attributed to application of balanced dose of fertilizers, timely irrigation and use of recommended package of practices. Optimum time of sowing was end of April to Ist week of May and optimum time of planting was end of May to 1st week of June. Average seed rate was 80-100 kg/ha and the co-operator reported that majority of the farmers contacted (90%) adopted seed treatment with either carbendazim (2-3 g/kg) or tricyclazole (0.06%). All the farmers contacted told that they apply FYM in the nursery bed and all of them applied urea (400-500 g/25 m^2), DAP (500-600 g/25 m^2) and MOP (100-200 g/25 m^2). In the main fields, farmers applied 80-120 kg N/ha, 45-60 kg P_2O_5/ha and 20-30 kg K_2O/ha. All the farmers contacted applied FYM (5-10 t/ha) in the main field. Random method of transplanting was common among the farmers. The intensity of common weeds like *Echinochloa* spp., *Potamogeton* spp., *Ammannia* spp. *Polygonus* spp. and sedges was low. None of the farmers contacted had adopted hand weeding but had applied herbicides like Eros (6% pretilachlor + 0.15% pyrazosulfuron ethyl) (4 kg/acre) or butachlor (1.5 kg a.i/ha). Some of the common needs of the farmers were

availability of certified seeds of good HYVs, timely supply of inputs, irrigation facilities and advices from experts regarding rice production technology. Tractor and power tillers were used by the farmers. Seed replacement rate was high (50-100%). Canal was the main source of irrigation and farmers received advices from officials of State Department of Agriculture and University. About 70% of the farmers contacted expressed that fertilizers and pesticides were not available in time. Intensity of different biotic constraints was low and none of the farmers contacted applied any pesticides. Some of the farmers applied organic ash in the nursery beds. All the farmers expressed that they want to continue rice cultivation.

Kulgam: Eight villages involving 10 farmers were covered for production oriented survey in this district when the crop was at maturity stage. All the fields surveyed were under irrigated ecosystem and the general climatic conditions were normal for rice cultivation. All the farmers contacted told that they are using 5-20% of their land for cultivation of other crops like vegetables, pulses and maize for domestic consumption. The main crop rotation practices followed by the farmers were rice-oilseeds, rice-oeats and rice-barseem. Predominant rice varieties were HYVs like Jhelum, SR-I, SR-3 and SR-4. It was reported that area under SR-4 increased significantly in this district. The region was mainly dominated by rice variety Jehlum and the average yield was 6300-6900 kg/ha. Primary reasons for higher yield were use of recommended package of practices, proper spacing, timely irrigation, and use of balanced dose of fertilizers. Optimum time of sowing was end of April to Ist week of May and optimum time of planting was end of May to 1st week of June. Average seed rate was 60-80 kg/ha and the co-operator reported that all the farmers contacted adopted seed treatment with carbendazim (2 g/kg). All the farmers contacted told that they apply FYM in the nursery beds and all of them applied urea (500 g/25 m^2), DAP (550-600 g/25 m^2) and MOP (150-200 g/25 m^2). In the main fields, farmers applied 100-120 kg N/ha, 60 kg P_2O_5/ha and 30 kg K_2O/ha. All the farmers contacted applied FYM (8-12 t/ha) in the main field. Random method of transplanting was common among the farmers. The intensity of common weeds like *Echinochloa* spp., *Potamogeton* spp., *Ammannia* spp., and sedges was low. All the farmers applied herbicides like Eros (4 kg/acre) or butachlor (1.5 kg a.i/ha) and did not practice hand weeding. Some of the common needs of the farmers were availability of inputs, quality seeds and assured irrigation. Commonly used equipments in this district were tractor and power tiller. Canal was the main source of irrigation and farmers received advices from officials of State Department of Agriculture and University. Seed replacement rate was high (50-100%). Majority of the farmers expressed that fertilizers and pesticides were not available in time. The intensity of most of the biotic constraints was low to moderate and none of the farmers contacted applied any chemical pesticides. All the farmers told that that they want to continue rice cultivation.

Kupwara: Survey was conducted in 9 villages involving 10 farmers in this district when the crop was in maturity stage. All the fields surveyed were under irrigated ecosystem and the general weather conditions were normal for rice cultivation. About 90% of the farmers contacted told that they are using about 15-25% of their land for cultivation of other crops like vegetables, pulses, maize and fodder, mainly for domestic purposes. Common crop rotations were rice-mustard, rice-oats, rice-wheat and rice-fallow. Predominant rice varieties cultivated by the farmers were HYVs like Jehlum, SKAU-408, SR -3 and local varieties like Zag (local red rice) and other local rice varieties. Both Zag and Mushk Budgi are high value varieties but are having low yields. However, HYVs are spreading very fast in the region and on an average 60-70% area

is covered with HYVs. Average rice yield in the region was 5700-6800 kg/ha in HYVs like Jehlum and SR -3 and 3000-4000 kg/ha in local varieities like Zag Mushk Budgi. Primary reason for higher yield in case of HYVs were use of recommended package of practices, proper spacing, timely irrigation, management of pests and diseases especially blast and use of balanced dose of fertilizers. Optimum time of sowing was end of April to Ist week of May and optimum time of planting was end of May to 1st week of June. Average seed rate was 80-100 kg/ha and the co-operator reported that majority (80%) of the farmers contacted adopted seed treatment with carbendazim (2 g/kg). All the farmers contacted told that they apply FYM in the nursery beds and all of them applied urea (400-700 g/25 m^2), DAP (400-600 g/25 m^2) and MOP (100-200 g/25 m^2). In the main fields, farmers applied 60-100 kg N/ha, 50-60 kg P_2O_5/ha and 30-45 kg K_2O/ha. All the farmers contacted applied FYM (5-12 t/ha) in the main field. Random method of transplanting was common among the farmers. The intensity of common weeds like *Echinochloa* spp., *Potamogeton* spp., *Ammannia* spp., *Crotolaria* spp., *Polygonum* spp. and sedges was low to moderate. In addition to hand weeding, all the farmers applied herbicides like Eros (4 kg/acre) or butachlor (1.5 a. i./acre). Some of the common needs of the farmers were quality and disease free certified seeds, timely availability of inputs especially fertilizers and pesticides, assured irrigation, plant protection equipments and above all technical knowhow. Commonly used equipments in this district were tractor and power tiller. The co-operator reported that the seed replacement rate in this district was 8-10%. Canal was the main source of irrigation and farmers received advices from officials of State Department of Agriculture and University. Majority of the farmers (80%) told that fertilizers and pesticides were not available in time. The intensity of different biotic constraints was low. None of the farmers contacted applied any chemical pesticides. The major constraints faced by the farmers were non availability of seeds, spraying equipments, fertilizers and pesticides and timely supply of inputs. All the farmers told that they want to continue rice cultivation.

Prevalence of diseases and insect pests in Jammu and Kashmir-1 during *Kharif*' 2018

Districts	**Diseases**				
	BI	**NBI**	**ShBl**	**BS**	**GD**
Anantnag	L (1-5%)	L (<3%)	L (1-5%)	L-M (2-10%)	L-M (<2-10%)
Kulgam	L (3-5%)	<2%	T (<1%)	L-M (3-10%)	L (<3%)
Kupwara	L (3-6%)	L (<4%)	T (<2%)	L-M (5-10)	L-M (2-10%)

Districts	**Insect pests**			
	LF	**GH**	**Cut worm**	**Rats**
Anantnag	L (2-5%)	L-M (3-15%)	L (2%)	L (2-3%)
Kulgam	L (1-5%)	L-M (5-15%)	L (2%)	L (1-2%)
Kupwara	L (1-5%)	L-M (5-16%)	-	L (1-2%)

Jammu and Kashmir-2 (Chatha)

District surveyed: *Doda*

Particulars of survey

District	Blocks	Villages
Doda	Bhalla, Sartangal and Bhaderwah	Chinote, Bhalla, Rainda, Vaski, Sartangal, Kotli, Udhrana, Gatha, Chalini, Sarna, Nalthi, Nai Basti and Drodhu

Widely prevalent varieties

District	Varieties
Doda	Cheena (CH 988), Japonica (CI 1561), Giza 14, Daggu (Local) and K 39 (Local)

Particulars of rice area

District	Total geographical are (ha)	Total cultivable area (ha)	Total cultivated area (ha)	Total irrigated area (ha)	Area under rice (ha)
Doda	4,19,000	70,500	58,000	4,640	2400

General questions on rice cultivation in district (To be filled by the co-operator in consultation with the Officials from State department of Agriculture)

Parameters	Doda
Total area under HYVs in the district (ha)	-
Most prevalent HVVs in the district	Japonica (CI 1561) & Goza 14
Total area under rice hybrids in the district (ha)	Nil
Most prevalent rice hybrids in the district	Nil
Total area under basmati in the district	Nil
Most prevalent basmati varieties in the district	Nil
Seed replacement rate	<10%
Whether farmers are using any heavy equipments like transplanted/combine harvester	No
Mention water saving technologies like SRI/laser levelling/DSR being used by the farmers	Nil
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Yes; how to maintain pure lines of native cultivars
What are the general problems in rice cultivation in the district	Seed mixture; incidence of blast and bacterial blight
Please provide any farmers association in the district	KVK-Farmers Club (100 Nos)
Whether availability of labours is sufficient?	Yes
Whether there is any marketing problem of the produce?	No marketing; farmers are mostly using the produce for domestic consumption
Any major irrigation/power generation project in the	No

Parameters	**Doda**
district	
Any soil testing program undertaken?	No
Any farmers training programme was organized by the state department of Agriculture/University	Yes; through KVK, university is organizing

An extensive survey on paddy scenario in Doda district of Jammu region was conducted during *Kharif*' 2018. District Doda lies amidst outer Himalayan ranges of Jammu Division with its geographical area extended up to 8912 sq. Km and is the third largest district of Jammu and Kashmir after Leh and Kargil. The district composes snowclad hilly terrains of eastern part of Jammu Division that stand at $32^0$53` and $34^0$21` north latitude and $75^0$1` and $76^0$47` east longitude with elevation of 1107 m from MSL. The area under rice cultivation holds an undulated topography with scattered distribution of cultivated land and terraces. Farmers usually have small holdings.

Details of survey

Doda: Survey was conducted in 13 villages (in 3 blocks) in this district involving 19 farmers when the crops were in heading to milk stage. The fields surveyed were either under irrigated ecosystem or under hilly ecosystem. The weather conditions were in general normal for rice cultivation. About 75% of the farmers contacted told that they are using 10-60% of their land for cultivation of other crops like maize. Common crop rotation practices were rice-vegetables, rice-wheat, rice-oats and rice-fallow. Common rice varieties cultivated by the farmers were Cheena (CH 988), Japonica (CI 1561), Giza 14, Daggu (Local) and K 39 (Local). Higher altitude areas prefer variety Cheena (CH 988) whereas low reaches had the preference of growing varieties like Japonica (CI 1561) and Giza 14. Farmers generally do not change the varieties due to their aroma and taste preferences. The average productivity in this district was 4000-5500 kg/ha in varieties like CI 1561, Cheena, K-39 and Giza 14 and 2500-3000 kg/ha in local variety Doggu. The major problem was seed mixture which caused yield reduction to the tune of 20-30%. Planting was done mainly done last week of May to 1st week of June. Seed rate ranged from 100-160 kg/ha. None of the farmers treated the seeds. Farmers generally applied farm yard manure in the nursery beds. However, none of them applied any inorganic fertilizers in the nursery.

Usage of fertilizers and weedicides was in general less. In the main fields, farmers applied 40-160 kg urea/ha and 40-60 kg DAP/ha. Application of potash was very rare. About 50% of the farmers told that they applied FYM. In general, FYM is applied at every 2-3 years interval. Planting was random. The intensity of common weeds like *Echinochloa* spp. and *Cyperus* spp. was low to medium. Hand weeding was most common among the farmers and application of weeds was very less. Only few farmers applied butachlor (500 g/kanal). Some of the common needs of the farmers were timely availability of fertilizers and other inputs, improvement in irrigation facilities (a large area has been converted to maize due to scarcity of irrigation water), pure seeds of Japonica varieties and seeds of improved rice varieties. Some of the farmers used large implements like tractor and power tiller, mainly on hire basis. Farmers mainly used last year's seeds for sowing and seed replacement rate was very less (less than 10%). Main source of irrigation was canal and all the farmers told that there was no scarcity of irrigation water. However, many farmers expressed that fertilizers and pesticides were not available in time. In

addition to their own decision, staffs from State department and University advised the farmers regarding input use. In general, intensity of different diseases and insect pests was low to moderate. High incidence of leaf blast was recorded in some fields of Vaski Vihar. Application of chemical pesticides was almost nil except some farmers who applied Bavistin and tricyclazole for the management of leaf blast. There were no reports of any abiotic symptoms. All the farmers want to continue rice cultivation.

Prevalence of diseases and insect pests in Jammu during *Kharif*' 2018

District	**Diseases**					
	Bl	**BS**	**ShBl**	**ShR**	**GD**	**BLB**
Doda	T-S (1-30%)	T-M (1-15%)	L-M (4-15%)	T-L (1-2%)	T-L (1-3%)	L-M (5-20%)

District	**Insect pests**				
	SB	**LF**	**GH**	**Term**	**Rats**
Doda	T	L-M	L-M	L-M	T

Karnataka (Mandya)

Districts surveyed: *Chikkamagalur*, *Hassan*, *Mandya* and *Mysuru*

Particulars of survey

Districts	Taluks	Villages
Chikkamagalur	Koppa, Narasimharajapura, Sringeri and Tarikere	Hariharpura, Jayapura, Bharikere, Lakkavalli and Gadikoppe
Hassan	Holenarsipura and Channarayapatna	Holenarsipura, Jakkahalli, Nirvahanakoppalu, Cholenahalli, Channarayapatna, Gunjevu and Madenuru
Mandya	Srirangapatna, Mandya, Pandavapura, KR Pete, Malavalli, Maddur and Nagamangala	Akkinebhalli, Talagavadi, Nuggehalli, Shettihalli, Chandagalu, Mallanayakanakatte, Matada Daddi, Malavalli, Cheenya and Shivalli
Mysuru	KR Nagara, HD Kote, T. Narsipura, Hunusur and Nanjanagud	Saathigrama, Chandagalu, Mirale, Hunsuru, Benakanahalli, Sadashiva Koppalu, Talakad, Hosaagrahar, Biligere and Hundenahalli

Widely prevalent rice varieties

Districts	Varieties
Chikkamagalur	**HYVs/Improved:** IR64, Intan, MTU1001, IET13901, BR2655, Jyothi, BPT5204, JGL1798 and Jaya
Hassan	**HYVs/Improved:** IR-64, Tanu, BR2655, Tunga, MTU1001, Intan, Jaya, JGL1798, KPR-1, Purichickka and Akshaydaan; **Hybrids:** KRH-2, VNR2233 and GK 5001; **Locals:** Rajamudy and Ratnachoodi
Mandya	**HYVs/Improved:** MTU 1001, IR 64, BR 2655, Thanu, Jaya, MTU 1010, Super Amman and Jyothi; **Hybrids**: KRH-4, VNR 2375, VNR 2233, DRH836 and MC13
Mysuru	**HYVs/Improved:** Jyothi, IR 64, MTU 1001, MTU 1010, Jaya, Thanu, JGL 1798, BR 2655 and BPT5204; **Hybrids**: VNR 2375, VNR 2233,KRH-4, DRH836, Sun Madhu, Arize Bold and MC 13

Particulars of rice area

Districts	Total geographical area (ha)	Total cultivable area (ha)	Total cultivated area (ha)	Total irrigated area (ha)	Area under rice (ha)
Chikkamagalur	722075	313377	313000	25000	28036
Hassan	662602	260105	249246	50000	49038
Mandya	498244	330504	253118	83656	54615
Mysuru	676382	368528	489640	114100	57459

Weather information in different districts of Karnataka during *Kharif*' 2018

Months	Districts			
	Chikkamaglur	**Hassan**	**Mandya**	**Mysuru**
June 2018				
Max. Temp(°C)	30.81	25.48	31.50	27.55
Min. Temp (°C)	18.15	19.38	20.10	20.04
Rainfall (mm)	492.88	294.34	36.30	132.20
Max. Hum (%)	100.00	90.00	89.00	90.00
Min. Hum(%)	54.85	78.55	85.00	75.92
July 2018				
Max. Temp(°C)	29.18	37.02	31.20	30.81
Min. Temp(°C)	17.97	28.70	20.10	20.67
Rainfall (mm)	631.50	311.37	26.40	131.90
Max. Hum (%)	100.00	80.60	91.00	88.93
Min. Hum(%)	53.75	61.99	76.00	54.17
August 2018				
Max. Temp(°C)	29.15	27.38	31.30	29.13
Min. Temp(°C)	17.66	19.35	19.30	20.19
Rainfall (mm)	543.00	269.76	16.00	132.20
Max. Hum (%)	100.00	90.00	94.00	89.54
Min. Hum(%)	55.28	70.21	78.00	57.90
September 2018				
Max. Temp(°C)	33.41	30.93	30.50	32.88
Min.Temp(°C)	15.98	18.11	22.40	19.25
Rainfall (mm)	111.10	127.77	177.80	120.30
Max. Hum (%)	100.00	90.00	93.00	90.00
Min. Hum(%)	38.64	49.92	79.00	41.08
October 2018				
Max. Temp(°C)	33.77	31.98	31.50	32.65
Min. Temp(°C)	14.85	18.63	19.20	19.95
Rainfall (mm)	115.60	107.86	100.10	121.30
Max. Hum (%)	100.00	90.00	94.00	90.00
Min. Hum(%)	34.13	48.67	80.00	38.98
November 2018				
Max. Temp(°C)	33.22	34.40	28.30	36.20
Min. Temp	13.92	8.30	17.30	10.30
Rainfall (mm)	27.30	21.13	0.00	7.00
Max. Hum (%)	100.00	100.00	84.00	100.00
Min. Hum(%)	32.36	14.00	70.00	15.00
December 2018				
Max. Temp(°C)	32.00	34.30	27.40	35.40
Min. Temp	12.82	0.00	16.70	0.00
Rainfall (mm)	9.50	3.57	3.80	2.00
Max. Hum (%)	96.77	100.00	82.00	100.00
Min. Hum(%)	31.35	0.00	68.00	0.00

General questions on rice cultivation in district (To be filled by the co-operator in consultation with the Officials from State department of Agriculture)

Parameters	Districts			
	Chikkamagalur	**Hassan**	**Mandya**	**Mysuru**
Total area under HYVs in the district(Ha)	21215	11730	54342	57459
Most prevalent HYVs in the district	IET13901, IR64, Intan	IR64 and BR 2655	MTU-1001, IR64,BR2655	Jyothi, IR64 MTU-1001
Total area under rice hybrids in the district	No hybrids cultivated	No hybrids cultivated	1500 Ha	3481 Ha
Most prevalent rice hybrids in the district	-	-	VNR2233 VNR2375 KRH- 4 DRH836	VNR2233 VNR 2375 KRH-4
Whether farmers are using any heavy equipments like transplanter/combine harvester	Combine harvester	Combine harvester	Combine harvester	Transplanter Harvester
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	-	-	DSR	DSR
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Timely Plant protection measures to be followed.	Plant protection measures.	Application of Zn, pest and disease control, Crop insurance, SRI Method.	Plant protection measures.
What are the general problems in rice cultivation in the district?	-	Water, electricity, support price, seed quality	Water, electricity, support price, seed quality	Water, electricity, support price, seed quality
Please provide any farmers association in the district	Karnataka Farmers association	Karnataka Farmers association	Karnataka Farmers association	Karnataka Farmers association
Whether availability of agricultural labours is the sufficient?	No	No	No	No
Whether there is any marketing problem of the produce?	Yes	Yes	Yes	Yes
Any major irrigation/power generation project in the district	Bhadra river project	Hemavathi irrigation project	Krishna Raja sagara	Krishna Raja sagara and Kabini
Any soil testing program undertaken?	Soil health card	Soil health card mission by central govt	Soil health card mission by central govt	Soil health card mission by central govt
Any farmers training program was organized by the state department of Agriculture/University	ATMA Training programme by State department of Agriculture	ATMA Training programme by State department of Agriculture	ATMA Training programme by State department of Agriculture	ATMA Training programme by State department of Agriculture

Variety wise area coverage in different district of Karnataka (Ha)

Variety/Hybrid	Districts			
	Chikkamaglur	**Hassan**	**Mandya**	**Mysuru**
IR64	1700	3359	8192	588.7
MTU-1001	1395	-	35500	927.5
MTU-1010	-	-	-	751
BR2655	2635	1505	2731	2974.4
Jyothi	3300	-	1365	20634
Thanu	-	621	2731	-
JGL 1798	2845	2000	-	12110.3
IET 13901	8046	-	-	-
Jaya	700	110	-	-
Jaya cross	-	-	1092	-
Intan	1200	-	-	-
BPT5204	650	-	-	-
Tunga	-	1714	-	-
RNR15048	-	-	-	3186.3
Rajamudy	-	1900	-	-
Hybrids				
VNR2233			1638	3181
KRH-4	-	-	1128	400
VNR2375+			-	20

Production oriented survey was conducted in four districts of Karnataka viz., Chikkamagalur, Hassan, Mandya, and Mysuru of Zone 6 , 7 & 9 during Kharif' 2018. A team of Plant Pathologist, Entomologist, Soil Scientist ,Agronomist and Breeder carried out the survey during maximum tillering, dough and ripening stage. The prevailing cropping sequences in these districts were rice-rice followed by rice-sugarcane, rice-vegetables, rice-pulses, rice-ragi and rice-fallow. Rice is grown in the state under irrigated, rain-fed and tank-fed conditions. The state received average annual rainfall of 1095 mm as against 1155 mm normal rainfall (-5.2% deficit). The south west monsoon entered the state on 30.5.2018 in coastal and south interior Karnataka but covered the entire state by 8.06.2018. The rainfall was timely and well distributed and was suitable for paddy crop cultivation. Onset of South-west monsoon in Mandya, Mysuru, Hassan and Chikkamagalur was timely and normal. The sources of irrigation are Cauvery, Kabini, Hemavathi, Bhadra, Tunga and Nethravathi rivers. During July I week water was released from Krishnaraja sagar and Bhadra reservoir due to timely rainfall in the catchment areas. The main varieties cultivated during *Kharif*' 2018 are medium duration varieties such as MTU-1001, IR64, Jyothi, Jaya MTU1010, JGL1798, Tunga, Thanu, IET13901, BR2655. Some private varieties like Super Amman, Sri Ram Sona were also grown in noticeable area. Traditional local varieties *viz*., Rajmudi, Ratnachudi, Rajabhogha, Jirige sanna and Gandasala are being grown in some taluks of Hassan and Mysuru districts. In Mysuru and Mandya district the area under hybrids *viz*., VNR 2233, KRH-4, DRH836 and MC 13 have increased current year. All the farmers applied inorganic fertilizers in the nursery viz., urea (2 kg/300 m^2), 10:26:26 (6 kg/300 m^2), 17:17:17 (9 kg/300 m^2), 19:19:19 (8 kg/300 m^2) or 20:20:20 (7.5 kg300 m^2). In the main fields, fertilizers were applied @ 50-100 kg urea/acre and/or 100 kg 10:26:26/acre, or

20:20:0:13/20:20:0:17 @ 100 kg/acre and 50 kg MOP/acre. Fertilizer usage is as per recommended but slightly more application of nitrogenous fertilizers. Intensity of common weeds like *Echinochloa crusgalli, Echinochloa colona, Cyperus iria, Panicum repens, Cyperus rotundus, Cyperus procerus* and *Monochoria vaginalis was low to moderate. In addition to hand weeding, many farmers (>90%) applied different weedicides like Londax Power, Top Star, butachlor, Nominee Gold and others.*

In all the districts surveyed, labour is the major problem faced by the farmers due to urbanization and in addition labours are demanding more daily wages. Mechanization in all the districts was adopted mainly for harvesting by using combine harvesters. Farmers are demanding for mechanical transplanters and harvesters cum binder. The farm machineries in the state are being promoted from state agriculture department by providing subsidy. The scheme "Yantra Dhare" started by state government in association with NGO Shri Kshetra Dharmastala Grama Abhiruddi Yojana for providing machineries (drum seeder, transplanter, cono weeder etc) on hire basis to the farmers at hobli level in every district is running successfully. During the vegetative stage the crop was severely affected by leaf folder especially in early tillering and tillering stage. In general, different insect pests were observed in low to moderate form. Among different diseases, blast and neck blast were moderate to severe in some fields in Mysuru and Mandya and sheath blight was high in some fields in Chikmagalore and Mysuru. Farmers applied different pesticides for management of different biotic stresses. In MTU1001 and Super Amman variety seed setting problem ranged from 50-80% was observed in some fields reasoned might be due to cold temperature during pollination. In *Kharif*' 2018 due to excess rainfall, Kabini river had overflowed and destroyed the crop in Nanjangud block of Mysuru district due to submergence for many days. Zinc deficiency was commonly observed in across all the districts surveyed. Rodent damage was noticed in some fields near to city at the booting stage across all the districts.

District wise observations

Chikkamagalur: Chikkamagalur belongs to Zone 7 and 9 (Malnad zone) comprising of seven taluks. The area under paddy in the district is 28036 ha during *Kharif* '2018. Five villages in 4 blocks were covered for production oriented survey when the crops were in maximum tillering to dough stage. A total of 6 farmers were interacted during the survey. All the fields surveyed were under irrigated ecosystem and in general normal for rice cultivation. The district received annual rainfall of 2278 mm as against 1757 mm normal rainfall. Paddy is grown in 5 taluks of the district i.e Mudigere, Narasimharajapura, Koppa, Sringeri and Tarikere. Onset of south-west monsoon was timely and normal rainfall received from June to September. Major varieties cultivated by the farmers were HYVs like IR64, Intan, MTU1001, IET13901, BR2655, Jyothi, BPT5204, JGL1798 and Jaya. In some areas, cultivation of local varieties like Gandasala was noticed. The main cropping sequence followed by the farmers was rice-rice. However, some followed rice-green gram and rice-rice-green gram. Average rice yield in the district ranged from 5000-6250 kg/ha in different HYVs like IET 13901, Jyothi and JGL 1798. Average seed rate was 25 kg/acre and all the farmers contacted told that they adopted seed treatment with carbendazim (2 g/kg). Planting was done during 1st to 3rd week of August. Nursery sowing and transplanting depends on the release of water from Bhadra dam. Application of FYM in the nursery and also in the main fields was not very common. However, many farmers followed green manuring

(Dhaincha) in the main field. Farmers usually grow green manure crop for one month and incorporate to the soil. All the farmers applied inorganic fertilizers in the nursery viz., urea (2 kg/300 m^2), 10:26:26 (6 kg/300 m^2), 17:17:17 (9 kg/300 m^2), 19:19:19 (8 kg/300 m^2) or 20:20:20 (7.5 kg300 m^2). In the main fields, fertilizers were applied @ 50-100 kg urea/acre and/or 100 kg 10:26:26/acre, or 20:20:0:13/20:20:0:17 @ 100 kg/acre and 50 kg MOP/acre. Fertilizer usage is as per recommended but slightly more application of nitrogenous fertilizers. Farmers used micronutrients (Zinc and Boron) compulsorily. Planting was random and intensity of common weeds like *Echinochloa* spp. and *Cyperus difformis* and other was low. Majority of the farmers followed hand weeding and only few also applied weedcides like butachlor 50 EC (1000-1500 ml/acre) and pretilachlor (600 ml/acre). Most of the farmers used last year's harvested seeds for sowing and seed replacement rate was very low (10%). Canal was the main source of irrigation. And electricity and diesel were the main sources of power for different agricultural operations. Farmers took advices from staffs of state department of agriculture and university. Among the diseases, blast, neck blast, sheath rot, bacterial blight and false smut were observed in low to moderate intensities. However, sheath blight was more (up to 50-60% incidence) on verities like Jyothi in Gadikoppe and Bharikere villages. Incidence of different insect pests like leaf folder, stem borer and rats were observed in low to moderate intensities. Different pesticides like chlorpyriphos (2 ml/l), Carbofuron 3G and monocrotophos against insect pests and carbendazim (1 g/l), tricyclazole (0.6 g/l), hexaconazole (2 ml/l) and propiconazole (1 ml/l) for different fungal diseases and bacterinashak (0.2 g/l) + Blitox (0.5 g/l) for bacterial diseases were applied by the farmers.

Hassan: Hassan belongs to Zone 7 comprising of eight taluks. Paddy is cultivated in southern dry zone covering four taluks viz., Holenarsipura, Sakleshpura, channarayapattatna and Hassan. Production oriented survey was conducted in 7 villages (in 2 blocks) involving 7 farmers when the rice fields were in maturity stage. All the fields surveyed were under irrigated ecosystem and in general, the weather conditions were normal for rice cultivation. The district received annual rainfall of 1452 mm as against 1075 mm normal rainfall. Farmers used 90-95% of their cultivable land for rice growing. Commonly grown rice varieties in the district were HYVs like IR-64, Tanu, BR2655, Tunga, MTU1001, Intan, Jaya, JGL1798, KPR-1, Purichickka and Akshaydaan and hybrids like KRH-2, VNR2233 and GK 5001. The traditional local varieties grown were Rajamudy, Ratnachudi and Rajabhoga. These local varieties were grown due to the preference of the local people for its taste. They mainly use, the local varieties for eating purposes. Farmers are demanding geographical indication for Rajamudy variety. Rice-rice and rice-pulses is the prevailing crop rotation practiced. Average rice yield in the district ranged from 5500-6000 kg/ha in case of different HYVs and 3750-4000 kg/ha in case of local varieties like Rajamudy. Planting was very late during last week of August to second week of September. Average seed rate was 60-62.5 kg/ha and all the farmers contacted told that they adopted seed treatment with carbendazim (4 g/kg). All the farmers applied FYM (@ 8-10 t/acre) in the nursery and also applied inorganic fertilizers like urea (2-7.5 kg/300 m^2), 10:26:26 (6 kg/300 m^2), 17:17:17 (9 kg/300 m^2), 19:19:19 (8 kg/300 m^2) or 20:20:20 (2 kg/300 m^2) and also 10:26:26. In the main fields, fertilizers were applied @ 50-100 kg urea/acre and/or 75-100 kg 10:26:26/acre, or 20:20:0:13 @ 100 kg/acre and 50 kg MOP/acre. Most of the farmers contacted grew sunhemp and diancha as a green manure crop. Intensity of common weeds like *Echinochloa* spp, *Cyperus difformis, C. iria, Cyperus procerus* and others was medium. Hand weeding was not common among the farmers and most of the farmers used weedicides like butachlor 50EC (1000 ml/acre),

Londax Power (4 kg/acre), Nominee Gold (80 ml/acre) and Top Star (125 g/ha). About 85% of the farmers told that they purchased new seeds for sowing and seed replacement rate was 90%. Canal was the main source of irrigation. And electricity and diesel were the main sources of power for different agricultural operations. Farmers took advices from staffs of state department of agriculture and university. Diseases like leaf and neck blast, sheath blight, brown spot and sheath rot and insect pests like stem borer, leaf folder and case worm were recorded in low to moderate intensities. Different pesticides like Regent, quinalphos 25EC (2 ml/l), and chlorpyriphos 25 EC (2 ml/l) for different insect pests and tricyclazole (0.06 g/l), propiconazole (1 ml/l) and Nativo (0.4 g/l) for different diseases were applied by the farmers. Number of pesticide application during the crop season ranged from 1-3 and about 70% of the farmers contacted told that they mixed 2-3 pesticides during application.

Mandya: Mandya belongs to Zone 6 (Agricultural zone 6) comprising of seven taluks. Paddy is grown mainly in five taluks viz., Krishna Rajpet, Mandya, Srirangapatna, Maddur, Malavalli, Pandavapura. Production oriented survey was conducted in 10 villages (in 7 blocks) in this district when the rice fields were mainly in maturity stage. A total of 10 farmers were interacted during the survey. All the rice fields surveyed were under irrigated ecosystem and in general, the weather conditions were normal for rice cultivation. The district received annual rainfall of 720 mm as against 749 mm normal rainfall. Overall the rainfall received was normal except in the month of November in *Kharif'* 2018. Predominant rice varieties cultivated in the district were HYVs like MTU 1001, IR 64, BR 2655, Thanu, Jaya, MTU 1010, Super Amman and Jyothi and hybrids like KRH-4, VNR 2375, VNR 2233, DRH836 and MC13. Common crop rotation practices followed by the farmers were rice-rice, rice-sugarcane, rice-vegetables and rice-fallow. Average rice yield in the district was 5500-6750 kg/ha in different HYVs. Planting was done during middle of August to 1st week of September. Average seed rate was 62-65 kg/ha and all the farmers contacted told that they treated their seeds with carbendazim (4 g/kg). All the farmers contacted told that they applied FYM in the nursery and also applied inorganic fertilizers like urea (2 kg/300 m^2), 10:26:26 (6 kg/300 m^2), 17:17:17 (9 kg/300 m^2), 19:19:19 (8 kg/300 m^2) or 20:20:20 (2 kg/300 m^2). In the main fields, fertilizers were applied @ 50-100 kg urea/acre and/or 75-100 kg 10:26:26/acre, or 20:20:0:13 @ 100 kg/acre or 19:19:19 @ 110 kg/acre or 20:20:20 @ 100 kg/acre and 50 kg MOP/acre. However, application of potash was done only by few farmers. About 40% of the farmers contacted told that they applied zinc sulfate (8 kg/acre). Almost all the farmers told that they practiced green manuring with dhaincha or sunnhemp. Planting was random. Intensity of common weeds like *Echinochloa crusgalli*, *Echinochloa colona*, *Cyperus iria, Panicum repens* and *Monochoria vaginalis was medium. In recent years the aquatic wed Alternanthera sessilis is observed in paddy fields*. Hand weeding was not very common among the farmers and farmers applied different weedicides like Londax Power (4 kg/acre), Top Star (125 g/ha) and Nominee Gold (80 ml/acre). Most of the farmers used combine harvester. All the farmers contacted told that they purchased 90-100% of their seed requirement. In the district, 99% of the paddy area was cultivated due to timely release of water from the Krishnarajasagar reservoir. Availability of inputs like equipment, seeds, water, power, fertilizers, pesticides and storage facility was adequate. Farmers took advices from staffs of state department of agriculture and university. Among the diseases, neck blast/collar was recorded in very high intensity (65-70%) on varieties like MC-13 (in Rabi season) and MTU 1001 in Malavalli, Chandagulu and Matada Daddi villages. Similarly, Grain discoloration problem was noticed in MTU 1001 in Mallanayakanakatte village. There was severe problem of seed setting (up to 70 90% chaffy

grains) in Shettihalli and Nugehalli villages. Most of the insect pests were observed in low to moderate intensities. Farmers applied different pesticides like Regent and chlorpyriphos for different insect pests and carbendazim (1 g/l), hexaconazole (2 ml/l), propiconazole (1 ml/l), Nativo (0.4 g/l) and tricyclazole (0.6 g/l) for control of different diseases. The number of pesticide application ranged from 2-3 and about 90% of the farmers contacted told that they aremixing 2-3 pesticides at the time of application. In many fields zinc deficiency was observed due to which growth was affected. The state department of Agriculture is supplying the zinc fertilizer through subsidy, but the farmers are neglecting due to lack of knowledge about problem of zinc deficiency. In unpuddled dry nursery, iron deficiency is noticed during summer season. Farmers faced problems in selling the produce.

Mysuru: Mysuru belongs to Zone (6 and 7) comprising of seven taluks. Ten villages (in 5 blocks) were covered for production oriented survey when the rice fields were in tillering stage. . A total of 10 farmers were interacted during the survey. All the rice fields surveyed were under irrigated ecosystem and in general, the weather conditions were normal for rice cultivation. The district received annual rainfall of 970 mm as against 815 mm normal rainfall. In Kharif 2018, 99% of the paddy area was cultivated. Commonly cultivated rice varieties were HYVs like Jyothi, IR 64, MTU 1001, MTU 1010, Jaya, Thanu, JGL 1798, BR 2655 and BPT5204 and hybrids like VNR 2375, VNR 2233, KRH-4, DRH836, Sun Madhu, Arize Bold and MC 13. In recent years area under hybrid rice are picking up as the department is supplying the seeds under subsidy. Hybrids like VNR 2233 VNR 2375, DRH 836, MC13 has covered a large area in the district. The common crop rotation systems in the district are rice-rice, rice-vegetables and rice-pulses. Average rice yield in the district ranged from 6000-6250 kg/ha in different HYVs, 7000-9500 kg/ha in hybrids like MC-13 and VNR 2233 and about 4000-4500 kg/ha in Rajamudy. Planting was mostly done during 2nd week to end of August. Average seed rate was 60-62.5 kg/ha and about 70% of the farmers contacted told that they treated their seeds with carbendazim (4 g/kg). About 70% of farmers contacted told that they applied FYM in the nursery. However, all of them applied inorganic fertilizers like urea (2-10 kg/300 m^2), DAP (3.25 kg/300 m^2), 10:26:26 (6 kg/300 m^2), 17:17:17 (9 kg/300 m^2), 19:19:19 (8 kg/300 m^2) or 20:20:20 (7.5 kg/300 m^2). In the main fields, fertilizers were applied @ 50-100 kg urea/acre and/or 75-150 kg 10:26:26/acre, or 20:20:0:13 @ 100 kg/acre or 19:19:19 @ 100 kg/acre or and 50 kg MOP/acre. However, application of potash was practiced only by few farmers. About 30% of the farmers applied 8-10 kg zinc sulfate per acre. About 20% farmers applied FYM and 50% farmers applied green manures (dhaincha or sunnhemp) in the main fields. In addition to random planting, some farmers followed line planting and some practiced direct sowing. Intensity of common weeds like *Echinochloa crusgalli*, *Echinochloa colona*, *Cyperus rotundus*, *Cyperus iria*, *Cyperus difformis*, *Cyperus procerus* and *Centella asiatica* was low to medium. About 80% of the farmers told that they followed hand weeding and most of them also applied weedicides like butachlor (1000 ml/acre), Top Star (125 g/ha), Londax Power (4 kg/acre) and Nominee Gold (80 ml/acre) for management of weeds. All the farmers told that they purchased 90-100% of their seed requirement. Canal water from Kabini, Cauvery River and open wells are the main source of irrigation. Farmers took advices from staffs of state department of agriculture and university and also from private dealers. Among different diseases, sheath blight was widespread and in some fields of variety Jyothi and MTU 1001, its intensity up to 60% was recorded in villages like Saathigrama, Biligere and Mirle. Similarly, leaf blast was very high in some fields of Vasundhara in Hunsuru. High intensity of neck blast was also observed on Jyothi in Mirle

village. Bacterial blight of 10-20% severity was noticed in some fields of Talakad hobli of T Narasipura taluk on Jyothi variety. Insects pests like leaf folder and stem borer were low to moderate. Different pesticides like chlorpyriphos (400 g/acre), flubendamide (1 ml/l), Regent, and monocrotophos (1-2 ml/l) for different insect pests and Nativo (40 g/acre), carbendazim (1 g/l), Merger (2 g/l), tricyclazole (0.6 g/l), Saaf (2 g/l), propiconazole (200 ml/acre), hexaconazole (1.5-2 ml/l) and Avatar (1 g/l) for different fungal diseases and Kocide (2 g/l), copper oxychloride + streptocycline and Bacterinashak for bacterial blight of rice were applied by the farmers. The number of pesticide application in a season ranged from 2-3. However, mixing of different pesticides was not common among the farmers.

Prevalence of disease and pests in Southern Karnataka during *Kharif*' 2018

Districts	**Diseases**								
	Bl	**NBl**	**BS**	**ShBl**	**ShR**	**UD**	**FS**	**GD**	**BB**
Chikkamagalur	L (5-10%)	L-M (5-15%)	L	L-S (5-60%)	L (5-10%)	L	L		L-M (10-15%)
Hassan	L (5-10%)	L-M (5-15%)	L	L (5-10%)	L	-	-		-
Mandya	L(5%)	M-S (20-70%)	L	L-M (5-15%)	L	L	L	M-S (25-30%)	-
Mysuru	M-S (25-50%)	L-S (10-30%)	L-M (15-20%)	L-S (5-60%)	L	L	L	L-M (10-15%)	L-M (10-20%)

Districts	**Insect pests**				
	SB	**BPH**	**LF**	**CW**	**Rats**
Chikkamagalur	L-M (5-20%)	L	L-M (10-25%)	L	L (5-10%)
Hassan	L-M (10-15%)	-	L-M (10-15%)	L	
Mandya	L-M (5-15%)	L	L-M	L	L-M (10-25%)
Mysuru	L-M (5-25%)	L	L-M (5-20%)	L-M (10-15%)	L

Madhya Pradesh (Rewa)

Districts surveyed: *Rewa, Satna, Sidhi, Shahdal, Katni and Umaria*

Particulars of survey

Districts	**Blocks**	**Villages**
Rewa	Rewa, Sirmour, Raipur Karchulian, Mauganj and Gangeo	Gerui, Puras Silpara, Govindgarh, Barsaita, Sirmour, Baikunthpur, Maghigama, Barahula, Kosta, Dubari, Jaraha, Dudhawa Dani, Joginhai, Gurh, Rithi, Barsaita, Mahansav, Badaganv, Khuj, Budwa, Itaura, Barahadi, Barehi, Marhi, Janakhai, Saman, Mahsua, Ratahara, Semaria, Amiliki, Raura, Laxmanpur and Kothi
Satna	Ram Nagar, Amarpatan, Maihar, Maghigama and Rampur baghelan	Maghigama, Satna, Lalpur, Nadan, Baretihia, Uchehara, Amadara, Kartaha, Deolond, Ladbad, Deoraj Nagar, Rampur, Baghelan, Nadantola, Jhinna, Kaithaha, Sarai, Kothar, Bela, Kakalpur, Jhinna, Sannehi, Hinauta, Pipari, Nadantola, Bahelia, Deorajnagar, Ram Nagar, Choragadi, Hinauta, Pipari, Gorhai, Karra, Amarpatan, Jhalwar, Pathara, Dhadhia, Jhonta and Virsinghpur
Sidhi	Rampur, Naikin, Churahat and Sidhi	Churahat, Dadhiya, Sonvarsha, Mamadar, Jhalwar, Barkheda, Raiduria, Semaria, Bhitari, Padkhuri, Misirgama, Amaha, Rampur, Naikin, Kandawar, Banajri, Sonvarsha, Gopalpur, Baghawar, Chorgadi, Budgauna, Barahath, Panwar, Badh, Jamudi, Mishirgama, Jhangh, Duara, Bairiha Kapuri and Bharatpur
Shahdol	Gohaparu, Burhar, Sohagpur, Beohari and Jaisingh Nagar	Aswari, Burhar, Khamdand, Beohari, Barakach, Dhangama, Jaisingh Nagar, Kanchanpur, Khannaudhi, Chachai, Khadda, Sarai, Chatawai, Burhar, Dhanpuri, Deoganv, Budwa, Mau, Bansukali, Tihiki, Ghorasa, Khannaudhi, Tetaka, Karki, Singhpur and Gohaparu
Umaria	Karkeli, Manpur and Pali	Dhanwahi, Tali, Barahi, Itama, Khitauli, Karki, Deori, Karondi, Kevlari Karela, Manpur, Khutar, Jarwahi Khurd, Indawar, Jobi, Sarasi, Kareli, Chandia, Pali Manpur, Bharewa, Karkeli, Dhamokhar, Goverdi, Kacharwar, Amaha, Bhauraula, Khutar, Masira, Kanadi and Khurd
Katni	Badwara, Katni and Vijayraghavgarh	Jhukehi, Sabhaganj, Khirahani, Kaudia, Sonwari, Ghunawara, Vilayatkala, Barahi, Mohantola, Hardua, Itama, Padkhuri, Paraswara, Murwara, Rohania, Pakaria and Patharahata

Widely prevalent rice varieties

District	Varieties/ Hybrids
Rewa	**HYVs:** JR767, Dhanteswari, IR 64, Pusa sugandha 5, Poonam, MTU 1010, Poorva, Rupali, Ankur Biranj, Pusa Sugandha 4, IR-36, IR-50, Shahbhagi Dhan, Winner, Champion, Supergold, Sonali and Sonam; **Hybrids:** Goraknath, JRH 4, JRH 5, PAC 801, Arize Tej, Arize 6111, Ganga Kaveri, US382, US312, PHB71 Dhanya, JK401, PAC807, Arize 6201, Shahyadri, Pioneer-27p31, Pioneer 25p35, Raja, Indum1011 and Arize 6444; **Locals:** Jalkeshar, Lochai, Rambhog, Sonachoor, Lonagi, Yashoda Bhog, Sonkharchi, Manisha, Reshma, Khusboo, Shabnam, Lohandi, Dehula, Newari and Menaka (Dominance of Improved varieties 75%)
Satna	**HYVs:** IR36, IR64, Rupali, Sonam, Jaya, Poorva, Ankur Sonali, Champion, Basmati, Roopali, IR 50, MTU 1010 and Pusa 1121; **Hybrids:** Pioneer 27p291, Pioneer 27p31, Arize 6201, Arize 6111, Arize 6444, Loknath, P35-25, Bioseed 777, JRH 4 and JRH 5; **Locals:** Menaka, Lonagi, Bhantaphool, Biranj, Rambhog, Laloo-14, Biranjphool, Dhanlaxmi, Balbhog, Laichi, Lochai, Lal Dhan, Dehula, Newari, Kaniga, Lonhadi, Jalkeshar, Yashoda Bhog, Karahani, Padmasar, Shabnam and Vishnubhog (Improved variety 80%)
Sidhi	**HYVs:** Danteswari, MTU 7029, Poorva, Rupali, Ankur Sonali, Pusa Sugandha 5, Sonali, MTU 1010, Poonam, IR-36, IR-64 and IR 50; **Hybrids:** US312, Pioneer 27p291, Pioneer-27p31, Loknath, Mahyco 117, Arize 6201, Arize 6444, PAC801, NPH 105 and Pusa RH-10; **Locals:** Karahani, Chhinmauri, Balkeshar, Vishnubhog, Sumo Vardan, Badari, Dehula, Tinpakhi, Karaga, Lal, Laichi, Bako, Methichoor, Padmasar, Karanphool, Gurmatia, Ranikajal, Butanagar, Menaka, Reshma, Basanti, Belari, Kanakjir, Ruthu, Lochai Basmati, Bhantaphool, Karaga, Nanhi, Manisha, Shukla phool, (Improved variety 70 %)
Shahdol	**HYVs:** Poorva, Rupali, Ankur, Kanak, Winner, Champion, PS5, PS4, Swarna Sub1, Kaveri, Rupali, Pusa 1121, Sonali, MTU1010 and Poonam; **Hybrids:** Loknath, Pioneer 27-P-31, Suruchi, Arize 6201, Goraknath, JRH4, JRH5, PAC807, US312, US 10, Arize 6201, Menaka, Arize 6444 and PAC801; **Locals:** Lochai, Kerakhambh, Swarnkamal, Rambhog, Chhinmauri, Amagaur, KPH199, Champa, Gurmatia, Lonagi, Lonhadi, Kerakhambh, Reshma, Newari, Lonagi, Biranj, Ledua, Bohita, Sabnam, Reshma, Ranikajal, Butanagar and Lonhadi (Improved variety 70%)
Umaria	**HYVs:** PS5, PS 4, Shahbhagi, Kanak, Swrankamal, IR64, MTU 1010, Champion, Dhanteswari and Sonam; **Hybrids:** Ganga Kaveri, NPH101, NPH105, Advanta 801, 807, Mulayam 999, Pioneer 25P35 and Pioneer 27-P-31; **Locals:** Vishnubhog, Koilari, Kanakjir, Malti, Lalita,, Laichi, Bagari, Koilari, Kosam, Biranj, Doodhi, Samasar, Govinda and Banspore (Improved variety 70 %)
Katni	**HYVs:** HMT, Sonali, Poonam, IR36, IR 50, IR 64, Champion, Kanak, Poorva, Rupali, Ankur Juari, Sita, Pusa 1509 and Pusa 1121; **Hybrids:** PRH10, Goraknath, Arize 6444, Arize Tej, JRH 4 and JRH 5; **Locals:** Lochai, Menaka, Khusboo, Reshma, Samrat, Dhaur, Bhadaili, Menaka, Dubaraj, Keshar, Subeej Sugandha and Padmsar (Improved variety 65 %)

Weather data of Rewa district during *Kharif* 2018

Weather Data	Months					
	June	**July**	**Aug**	**Sep**	**Oct**	**Nov**
Rainy Days (No.)	4	14	20	5	0	0
Total Rain Fall (mm)	116.8	174	404.4	99	0	0
Temperature (°C)						
-Maximum	39.6	33.5	31.3	32.3	34.3	30.4
-Minimum	27.1	25.2	24.3	22.7	17.1	11.8
Relative Humidity						
-Morning	49	78	85	79	62	62
-Evening	32	61	79	66	45	50

Particulars of rice surveyed area during 2018

District	Total geographical area (000ha)	Total cultivated area (000ha)	Net cultivated area (000ha)	Irrigated area(000ha)	Total Rice Area (000 ha)
Rewa	628.7	478.4	371.8	160	120
Satna	742.4	475.9	341.2	110	127
Sidhi	481.5	231.0	168.0	72	69
Shahdol	537.0	187.0	166.0	36	105
Umaria		141.0	103.0	36	45
Katni		296.0	209	155	105

Six districts *viz*. Rewa, Satna, Sidhi, Shahdol, Katni and Umaria situated in Kymore Plateau and Satpura hills under rice-wheat crop zone in Madhya Pradesh were surveyed for production oriented survey during 2018 K*harif* season. Very poor rainfall ranging from 794 mm to 920 mm was received in the surveyed area. The onset of monsoon was delayed and distribution of rainfall was not good in the region. As a result, sowing of direct seeded rice and transplanting was not carried out in time in rainfed and irrigated ecosystem. Due to heavy and continuous rains in the month of July, area under direct seeded rice was reduced and area under crops like soybean, black gram, green gram, sorghum, pigeon pea and sesamum area was also reduced in certain areas in the surveyed districts. Predominant rice varieties in the state were HYVs like Dhanteswari, IR 64, Pusa sugandha 5, Poonam, MTU 1010, Poorva, Rupali, Ankur Biranj, Pusa Sugandha 4, IR-36, IR-50, Shahbhagi Dhan, Winner, Champion, Supergold, Sonali and Sonam and hybrids like Goraknath, JRH 4, JRH 5, PAC 801, Arize Tej, Arize 6111, Ganga Kaveri, US382, US312, PHB71 Dhanya, JK401, PAC807, Arize 6201, Shahyadri, Pioneer-27p31, Pioneer 25p35, Raja, Indum1011 and Arize 6444. It was noted that rice hybrids are being popularized by the private sectors and government agencies in the state and therefore, the farmers are taking keen interest to grow rice hybrids and getting higher grain yield ranging from 65 to 75 q/ha compared to improved varieties (25-35q/ha) under irrigated ecosystem. Rice hybrids occupied a large area in districts like adoption Rewa, Satna and Sidhi (mainly by the progressive farmers) (~65% area) compared to districts like Shahdol, Katni and Umaria which have comparatively less area under hybrid rice ranging from 35 to 40 %.

General Question of Rice Cultivation In District (To Be Filled By The Cooperator In With The Officials From State Department of Agriculture

Parameters	**Districts**		
	Rewa	**Satna**	**Sidhi**
Total Area under HYVs in the district (ha.)	30%	80%	70%
Most prevalent HYVs in the District	MTU 1010, JR 747	MTU 1010, Swarna	IR 64 and others
Total area under rice hybrids in the district (ha)	42,500 ha	45,000 ha	45,000 ha
Most prevalent rice hybrids in the district	Arize 6444	Loknath, Arize 6444, Arize 6201	PHB 71, Arize 6201
Total area under basmati in the district	1500 ha	1800 ha	1800 ha
Most prevalent basmati varieties in the district	PS 4, PS 5	Pusa 1121	PS 4, PS 5, Pusa 1121
Seed replacement Rate	39%	38%	38%
Whether farmers are using any heavy equipments like transplanted/combine harvester	Yes	Yes	No
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	SRI, DSR	SRI/DSR	SRI/DSR
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Yes, Plant Protection	INM, IPM	INM/IPM
What are the general problems in rice cultivation in the district?	Supply of inputs	Supply of inputs	Supply of inputs
Please provide any farmers association in the district	-	-	-
Whether availability of labors is sufficient?	Yes	Yes	No
Whether there is any marketing problem of the produce?	No	No	No
Any major irrigation/power generation project in the district	Bansagar Project	Bansagar Project	Bansagar Project
Any soil testing program undertaken?	Yes	Yes	Yes
Any farmers' training program was organized by the state department of Agriculture/ University	Yes	Yes	Yes

General Question of Rice Cultivation In District (To Be Filled By The Cooperator In With The Officials From State Department of Agriculture

Parameters	**Districts**		
	Shahdol	**Umaria**	**Katni**
Total Area under HYVs in the district (ha.)	70%	65%	65%
Most prevalent HYVs in the District	MTU 1010, Sonam	IR 64, MTU 1010	Sonam, HMT
Total area under rice hybrids in the district (ha)	40,000 ha	15,000 ha	25,000 ha
Most prevalent rice hybrids in the district	Arize 6201, Menaka	Arize 6201, Pioneer 27-P-31	Arize 6201, Pioneer 27-P-31
Total area under basmati in the district	1200 ha	1200 ha	1500 ha
Most prevalent basmati varieties in the district	Pusa 1121, PS 4, PS 5	Pusa 1121	Pusa 1121, PS 4
Seed replacement Rate	20-25%	25%	NA
Whether farmers are using any heavy equipments like transplanted/combine harvester	No	No	No
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	SRI (42000 ha)	SRI (1200 ha)	DSR
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	INM/IPM	INM/IPM	INM/IPM
What are the general problems in rice cultivation in the district?	Irrigation facilities	Irrigation facilities	Irrigation facilities
Please provide any farmers association in the district	-	-	-
Whether availability of labors is sufficient?	No	Yes	Yes
Whether there is any marketing problem of the produce?	Yes	Yes	Yes
Any major irrigation/power generation project in the district	Nil	Nil	Nil
Any soil testing program undertaken?	Yes	Yes	Yes
Any farmers' training program was organized by the state department of Agriculture/ University	Yes	Yes	Yes

The predominant cropping system in the state was rice-wheat, rice-gram and rice-pea, rice–lentil and rice-toria. Crop sequences like rice-fallow, rice-barley and rice-wheat are commonly practiced in Shahdol and Umaria districts where light poor soil, forest area and undulated land are predominant and irrigation facilities are comparatively low. The major source of irrigation is bore-well followed by open well and canal irrigation. The main source of power for agricultural operations was electricity in Rewa, Satna, Sidhi and Katni whereas, diesel was commonly used by farmers in Umaria and districts. Some of the common problems faced by the farmers are

timely supply of inputs particularly good quality seeds, fertilizers (DAP and zinc sulphate) equipment and fertilizers. The rice productivity in the state was low (2.55 t/ha) due to dominance of local poor yielding varieties, imbalance use of fertilizer, poor irrigation resources, poor plant protection measures and poor socio-economic status of the farmers. However, productivity in Rewa and Shahdol division was significantly increased from 2.5 t/ha to 3.8 t/ha due to cultivation of hybrids. The farmers are demanding early high yielding varieties (90 to 100 days duration) and hybrids looking to the rainfall scenario.

It was observed that weed infestation was very high in rainfed ecosystem and causing heavy economic yield losses as compared to transplanting system. It was estimated that approximate 30 to 35 % yield losses occurred due to weed infestation in upland rainfed ecosystem and farmers were facing a lot of problem to combat the losses due to heavy investment in manual weeding and labour crisis. Very few progressive farmers are using weedicide like pretilachlor, Web Super, bispyribac sodium, pendimethalin, butachlor and Almix for management of weeds. Organic resources like BGA, Azolla and Mycorrhiza were commonly adopted by the progressive farmers in the region particularly in Rewa, Shahdol and Umaria district. Zinc deficiency was commonly noticed in most of the surveyed districts. In general, pests and diseases incidence was low to moderate. It is worth mentioning that due to the efforts of MP Govt, the state has declared fourth time successive 'Krishi Karman Award' for optimum Agricultural growth rate (25%) in India. District level Kisan mela has been organized for demonstration of technology and equipment resources.

Rewa: In Rewa district, 34 villages in five blocks were surveyed when the crop was at heading stage. A total of 14 farmers were interacted during the survey. The fields surveyed were under irrigated conditions. The weather condition during the crop growth period was found to be normal but rainfall was moderately poor for rice cultivation. The onset of mansoon was late (27th June) and therefore direct seeding was adversely affected. Again due to continuous rains in the month of July, most of the farmers carried out transplanting operation in the last week of July and even in the month of August. In addition to rice, farmers are growing other crops like soybean and black gram. Predominant rice varieties cultivated by the farmers were HYVs like Dhanteswari, IR 64, Pusa sugandha 5, Poonam, MTU 1010, Poorva, Rupali, Ankur Biranj, Pusa Sugandha 4, IR-36, IR-50, Shahbhagi Dhan, Winner, Champion, Supergold, Sonali and Sonam and hybrids like Goraknath, JRH 4, JRH 5, PAC 801, Arize Tej, Arize 6111, Ganga Kaveri, US382, US312, PHB71 Dhanya, JK401, PAC807, Arize 6201, Shahyadri, Pioneer-27p31, Pioneer 25p35, Raja, Indum1011 and Arize 6444. It was noted that hybrid area was increased to approximately 42,500 ha in the district due to increase the irrigated area under Bansagar Project. The farmers have planted rice hybrids and high yielding improved varieties under irrigated area (53%) and local varieties were grown in traces in rainfed ecosystem. The prominent cropping sequences in the district were rice-wheat, soybean-gram, rice-gram and rice-lentil. The cropping intensity was 149%. Most of the farmers in the district were marginal and sub-marginal and land holding capacity is declining in the district. The averaged yield during the previous seasons ranged between 30-35 q/ha. However, farmers are obtaining higher grain yield ranging from 60 to 65 q/ha in hybrids under irrigated ecosystem. Some of the main reasons for low yield are predominance of local poor yielding varieties, imbalance use of fertilizers, late planting, lack of proper irrigation and upland conditions. Our cooperators reported the farmers are adopting seed treatment before sowing. Almost all the farmers interacted told that they applied FYM in the

nursery and also applied chemical fertilizers (urea @ 100 g/10 sq m nursery) in the nursery. The basal fertilizer application consisted of 20-30 kg/ha SSP and 10-20 kg/ha muriate of potash with zinc sulphate (20 kg/ha) adopted by the progressive farmers followed by top dressing of urea 40-50 kg/ha. However, marginal and sub marginal farmers were applied top dressing of urea only (15-20 kg/ha) during tillering and grain filling stage. Most of the farmers told that they applied FYM in the main fields.

Modified SRI cultivation area was found to be tremendously. The most predominant weeds in the rainfed farming system were *Echinochloa* spp., *Cyprus rotundus* and *Paspalum* spp. The intensity of weeds was less in transplanted rice. Hand weeding was commonly practiced by the farmers. In addition to hand weeding, the progressive farmers applied different weedicides like pendimethalin as pre emergence and bispyribac sodium/ pretilachlor application as post emergence. Bore well, canals and well are the main source of irrigation. The primary source of finance was public sector followed by cooperative societies and self-finance. Kisan Credit Card facilities and short term loan from nationalized bank are playing a significant role for assisting to the farmers for purchasing of inputs and other agricultural resources. Seed replacement rate was 39%. Most of the biotic constraints were recorded in low incidences due to low rainfall. Raipur Karchulian block was severely affected with the incidence of WBPH. Many hybrids were severely affected in Gerui, Puras, Barahi, Telaitola, Belawa and Paikan. Progressive farmers applied pesticides like trizophos, imidacloprid, monocrotophos, chloropyriphos, and carbendazim/tricyclazole for the management of different biotic constraints. Zinc deficiency symptoms which are commonly known as Khaira were commonly recorded in the district and hot spot pockets were identified. With the efforts of KVK and Department of Agriculture soil health card work is in progress and farmers are taking keen interest for soil analysis.

Satna: Production oriented survey was conducted in 39 villages in 5 blocks of of Satna district when the crops were at grain filling stage. A total of 14 farmers were interacted during the survey. This year rainfall was low (805 mm) in the district and severe drought occurred in the month of September. The onset of monsoon was on 27th July and therefore farmers transplanted hybrid and improved varieties in last week of July and August in rainfed and irrigated area. It was observed that due to low rainfall and irregular distribution only irrigated rice was successfully grown whereas rainfed rice area was badly affected and even unsown. Predominant varieties cultivated by the farmers were HYVs like IR36, IR64, Rupali, Sonam, Jaya, Poorva, Ankur Sonali, Champion, Basmati, Roopali, IR 50, MTU 1010 and Pusa 1121 and hybrids like Pioneer 27p291, Pioneer 27p31, Arize 6201, Arize 6111, Arize 6444, Loknath, P35-25, Bioseed 777, JRH 4 and JRH 5. Local varieties were grown in Rama Nagar ,Maihar and Nagod blocks. The major crop rotations were soybean-gram, rice-wheat, rice-gram, rice-lentil and rice-barley. Average rice yield in the district ranged from 3000-3500 kg/ha. Some of the main reasons for low yield are predominance of local poor yielding varieties, imbalance use of fertilizers, late planting, lack of proper irrigation and upland conditions. Our cooperators reported that most of the farmers adopted seed treatment. All the farmers contacted told that they applied FYM in the nursery and also urea (80-100 g/10 sq m). In regard to fertilizer application it was observed that farmers were used low doses of nitrogen in splits (40-70 kg/ha) rather than balanced application of nutrients except progressive farmers. Progressive farmers also applied 30-50 kg P_2O_5/ha and 20-30 kg K_2O/ha. Majority of the farmers applied FYM in the main fields. SRI is also becoming very popular in the district (approx 42,000 ha) and Azolla application was practiced. It was noted

that weed population was high in direct seeded rice as compared to transplanted rice. Hand weeding was commonly practiced by the farmers. However, progressive farmers applied herbicides like butachlor @ 1.5 lit/ha, bispyriback sodium and pretilachlor for effective weed control. Some of the common needs of the farmers were early maturing high yielding rice varieties, timely availability of fertilizers, paddy transplanter, plant protection equipments and proper supply of electricity for assured irrigation. Tank, canal and bore wells are the main source of irrigation. Seed replacement rate is 38% and cropping intensity was 130% in the district. Most of the biotic constraints were recorded in low to moderate intensities. WBPH incidence in the villages like Pipari, Karra, Gorhai, Sagauni, Gauhani, Hatawa, Naranpur, Govindpur, Raikwar, Bela, Kothar and Khutaha was severe and considerable yield losses noted. Application of cypermethrin, imidachloprid, monocrotophos, chloropyriphos and trizophos were practiced by the farmers for controlling the pest. Khaira disease caused by zinc deficiency was commonly noticed in Ramnagar, Amarpatan, Rampur baghelan and Maihar blocks. Some progressive farmers applied zinc sulphate as basal dose. Farmers faced marketing problem of their produce.

Sidhi: Thirty one villages in four blocks were surveyed in this district when the crops were in heading stage. A total of 12 farmers were interacted during the survey. There was poor rainfall (790 mm) in the district therefore the area under rice was reduced. In addition to rice some of the farmers cultivated other crops like sorghum, green gram, black gram, pigeon pes and sesamum in the upland areas. Predominant rice varieties cultivated by the farmers were HYVs like Danteswari, MTU 7029, Poorva, Rupali, Ankur Sonali, Pusa Sugandha 5, Sonali, MTU 1010, Poonam, IR-36, IR-64 and IR 50 and hybrids like US312, Pioneer 27p291, Pioneer-27p31, Loknath, Mahyco 117, Arize 6201, Arize 6444, PAC801, NPH 105 and Pusa RH-10. Local varieties are Predominant in Maghauli block. Progressive farmers grew the hybrids and improved cultivars under irrigated ecosystem. Common crop sequences followed by the farmers were rice-wheat, rice-gram, rice-toria, rice-linseed, rice-lentil and rice-fallow. Many farmers cultivated local varieties in upland areas. The productivity was 30 q/ha due to very low dose of fertilizer application, less irrigation heavy weeds infestation, dominance of local varieties, undulated topography and marginal lands with low nutritional status of soil. Average seed rate for hybrids was 10-20 kg/ha. Almost all the farmers interacted told that they applied FYM in the nursery. All the farmers also applied inorganic fertilizers lilke urea (90-100 g/10 m^2) in the nursery. In the fields where irrigation facilities were available and in case of HYVs/hybrids, fertilizers were applied 50-70 kg N/ha, 30-40 kg P_2O_5/ha and 10-30 kg K_2O/ha. However, in general, the fertilizer application was very less (30 kg /ha) whereas, in Rabi basal dose of fertilizer and line sowing were commonly practiced in the district. Due to light soil and poor irrigation facilities farmers are not applying adequate doses of chemical fertilizers. It was noted that top dressing of urea only was commonly practiced in rice without basal application whereas, in Rabi, farmers adopted line sowing followed by basal application of super phosphate and potash in the district. Very few progressive farmers applied basal fertilizer as single super phosphate followed by muriate of potash and zinc sulphate in low land/ bunded rice fields. Hybrid rice is being adopted by the farmers and SRI method is becoming very popular in the district. SRI was adopted in 35000 ha and hybrid area increased (approx. 45000 ha) in the district. All the farmers told that they applied FYM in the main fields. Weed infestation was observed moderate in direct seeded as compared to transplanted ecosystem. Hand weeding was commonly practiced. Very few progressive farmers were applied post emergence herbicides bispyriac sodium, butachlor and pretilachlor. Electricity supply was improved in the district

compared to past years and farmers developed their own irrigation resources like tube well and open wells for irrigation. The cropping intensity and seed replacement rate was 142% and 38% respectively. Among different biotic constraints, leaf blast, sheath blight and brown spot among diseases and BPH and WBPH among insect pests were observed in low to moderate intensities. Over all pest incidence was noted to be very low due to poor rainfall in the district. Zinc deficiency was commonly noted in Churahat, Sidhi, Maghauli and Rampur Naikin blocks.

Shahdol: Production oriented survey was conducted in 26 villages (in 5 blocks) involving 12 farmers when the crops were in tillering to heading or dough to maturity stage. The onset of monsoon was delayed and therefore nursery preparation was delayed and transplanting was carried out in the last week of July and beginning of August in the rainfed ecosystem. The rainfall was 835 mm and distribution was very poor. In addition to rice, farmers also cultivated other crops like black gram and soybean. Different varieties cultivated by the farmers were HYVs like Poorva, Rupali, Ankur, Kanak, Winner, Champion, PS5, PS4, Swarna Sub1, Kaveri, Rupali, Pusa 1121, Sonali, MTU1010 and Poonam and hybrids like Loknath, Pioneer 27-P-31, Suruchi, Arize 6201, Goraknath, JRH4, JRH5, PAC807, US312, US 10, Arize 6201, Arize 6444 and PAC801. Leaving the fields fallow after rice was common in the area. However, some farmers followed crop sequences like rice-wheat, rice-barley, rice-kodo millet and others. Rice yields in different varieties ranged from 2800-3500 kg/ha. The district is known for rice mono cropping because of dominance of sandy soil, forest area and low irrigation facilities. Major reasons for low yield in the district were poor irrigation facilities, erratic rainfall, poor and imbalance dose of fertilizers and overall poor socioeconomic status of the farmers leading to poor management of rice fields. Average seed rate for hybrids was 8-12 kg/ha. All the farmers contacted told that they applied FYM or poultry manure in the nursery. All of them told that they applied urea (90-120 g/10 m^2) in the nursery. In the fields where irrigation facilities were available and in case of HYVs/hybrids, fertilizers were applied 55-85 kg N/ha, 20-40 kg P_2O_5/ha and 20-40 kg K_2O/ha. However, overall fertilizer application was very poor because of poor irrigation, light soil and existence of forest rice soil. Nitrogenous fertilizers were applied during tillering stage. All the farmers applied FYM in the main fields. Weed infestation was noted to be very low in transplanting ecosystem. Hand weeding was commonly practiced in the district. Herbicide [Londax™ Power (bensulfuron methyl 0.6% + Pretilachlor 6% GR) @ 4 kg/acre] application was adopted by the progressive farmers.

Some of the common requirements of the farmers were equipment, irrigation facilities, proper electricity supply, improved seeds of short duration rice varieties, storage facility, financial support from government organizations and transfer of technology were the main requirements of farmers. Farmers are using their own seeds and seed replacement rate was 20-25%. The bore wells and tank are the main source of irrigation**.** It is very interesting to note that modified SRI cultivation area was tremendously increased in the district (42 000ha) in the district and adopted by the farmers in Beohari, Burhar and Gohaparu blocks. Among the diseases, leaf blast, brown spot, sheath rot were observed in moderate form in some fields. Other diseases and insect pests were observed in low incidences. Plant protection measures adoption was noted to be very poor. Very few farmers were applied imidacloprid, trizophos, chloropyriphos and monocrotophos for the management of different insect pests and mancozeb for management of different diseases.

Umaria: Thirty villages (in 3 blocks) involving 9 farmers were surveyed when the rice fields were in during tillering and panicle initiation and grain filling stage. The onset of monsoon was late and therefore nursery preparation was carried out late and transplanting was delayed. There was very poor rainfall (820 cm) in the district and because of that other crops like black gram, green gram, soybean and sesamum were grown by the farmers in addition to rice. Different rice varieties cultivated by the farmers were HYVs like PS5, PS 4, Shahbhagi, Kanak, Swrankamal, IR64, MTU 1010, Champion, Dhanteswari and Sonam and hybrids like Ganga Kaveri, NPH101, NPH105, Advanta 801, 807, Mulayam 999, Pioneer 25P35 and Pioneer 27P-31. Many farmers cultivated local rice varieties/land races in the upland areas. The major cropping systems were rice-wheat, rice-barley and rice-fallow in the district due to variation in soil types and poor irrigation resources. It was noted that farmers have sown hybrid and improved high yielding varieties in irrigated ecosystem whereas and under rainfed direct seeding and lehi were practiced. The average rice yields in the district ranged from 24-31 q/ha. Some of the major reasons for low yield were poor dosage of fertilizers, late planting and erratic rainfall. Average seed rate for hybrids was 10-14 kg/ha. Most of the farmers told that they applied FYM in the nursery and also in the main fields. In the nursery, farmers applied urea (90-110 g/10 m^2). In case of HYVs and hybrids and where irrigation facilities were available, fertilizers were applied 50-80 kg N/ha, 25-50 kg P_2O_5/ha and 20-50 kg K_2O/ha. However, overall fertilizer consumption was very poor. Nitrogenous fertilizers were applied at tillering stage. Weed infestation was noted to be low to moderate. Normally weeding was not practiced but very few farmers adopted hand weeding for weed management. Few progressive farmers applied weedicides like pretilachlor and butachlor. Some of the common needs of the farmers were availability of equipments, marketing facilities, proper supply of electricity, seeds of improved rice varieties and irrigation facilities. The economic status of the farmers was found to be very poor due to dominance of tribal in the district, poor soil texture and less agricultural input resources. SRI cultivation was also adopted by the farmers and obtaining the grain yield 50-65/ha in Karkeli, Pali and Chandia area. SRI was adopted in 12000ha and hybrid rice area was covered around 6000 ha. The seed replacement rate and cropping intensity was noted to be 25% and132% respectively. Among the diseases, leaf and neck blast and brown spot were recorded in moderate form in some fields and among insect pests, WBPH was moderate in some fields. Other pests and diseases were recorded in low incidences. Khaira was also noted in traces in the surveyed area. Adoption of plant protection measures was noted to be very poor. Few progressive farmers applied pesticides like chlorpyriphos, monocrotophos and imidacloprid.

Katni: Production oriented survey was conducted in 29 villages (in 3 blocks) in this district when the crops were in heading to milk stage. A total of 12 farmers were interacted during the survey. In addition to rice, farmers are growing other crops like soybean and black gram in upland areas. Rainfall started late during end of July and total rainfall received in the district was 910 mm. Different rice varieties cultivated by the farmers were HYVs like HMT, Sonali, Poonam, IR36, IR 50, IR 64, Champion, Kanak, Poorva, Rupali, Ankur Juari, Sita, Pusa 1509 and Pusa 1121 and hybrids like PRH10, Goraknath, Arize 6444, Arize Tej, JRH 4 and JRH 5. The major cropping systems were rice-wheat, rice-gram and rice- pea. Average rice yield in the district ranged from 2500-3500 kg/ha. Major reasons for low yield were inherent less fertile soil, poor fertilizer application, lack of proper irrigation, erratic rainfall and overall poor management of the crop. Average seed rate for hybrids was 7-11 kg/ha. All the farmers contacted told that they applied FYM both in the nursery and in the main fields. In the nursery, farmers applied urea

@ 80-100 g/10 M^2. In case of HYVs and hybrids and where irrigation facilities were available, fertilizers were applied 50-60 kg N/ha, 35-50 kg P_2O_5/ha and 20-40 kg K_2O/ha. Direct seeding was commonly practiced in the district in rainfed and irrigated upland ecosystem. However, progressive farmers have translated rice under irrigated ecosystem. SRI cultivation in the district was found very low (< 1000 ha). It was also noticed that the area under hybrid rice is low less than (30000 ha) as compared to other surveyed area even the farmers having assured irrigation. Weed infestation was noted to be low due to pre emergence application of weedicides like butachlor and pretilachlor. Equipments, irrigation facilities, marketing facilities, improved seeds and transfer of technology were the main requirements of farmers. Among the diseases, leaf and neck blast, sheath blight and brown spot were recorded in moderate form in some fields. Among insect pests, BPH and WBPH were recorded in moderate form in some fields. Other pests and diseases were recorded in low incidences. Khaira disease was recorded in few pockets in the surveyed area. Some progressive farmers applied pesticides like imidacloprid, monocrotophos and chlorpyriphos for the management of different insect pests.

Prevalence of diseases and insect pests in Madhya Pradesh during *Kharif*' 2018

District	Bl	NBl	BS	ShBl	Kh	FS	GD	ShR	BB
Rewa	M (10-16%)		M (10-16%)	T	M	L (3-4%)	T		T
Satna	M (15-16%)		L (9-10%)	T	M	L (3-6%)	T		T
Sidhi	M (10-16%)		L-M (9-13%)	L-M (8-11%)	M	L (3-10%)	T	L (3%)	T
Shahdol	M (16-20%)	L (7-10%)	L-M (8-13%)	L (7%)	M	L (7-9%)	L (7%)	L-M (5-13%)	T
Umaria	M (12-14%)	L-M (8-13%)	M	L (3-10%)	T	T	T	L (8-10%)	T
Katni	L-M (6-16%)	L-M (6-15%)	L-M (3-20%)	L-M (3-14%)	T	L (2-7%)	L (5%)	L-M (4-12%)	T

District	LF	SB	BPH	WBPH	GLH	CW	GM	AW	RB	Rat
Rewa	L (4-5%)	T	L (5%)	M (10-16%)	T	T			T	T
Satna	L (4-6%)	T	L (4-6%)	L (9-10%)	T	T			T	-
Sidhi	L (2-8%)	T	L-M (3-12%)	L-M (8-13%)	L (8-9%)	L (2-5%)		L (4-6%)	L (2-6%)	-
Shahdol	L (7-9%)	L (5-9%)	L (5-8%)	L (3-10%)	L (2-6%)	M	L (2-7%)	L (2-5%)	L (3-5%)	T
Umaria	L-M (5-11%)	L (7%)	L (5-8%)	L-M (3-15%)	L _M (3-11%)	M		L (4%)	T	T
Katni	L (4-5%)	L (7-8%)	L-M (5-12%)	L (2-10%)	L-M (5-11%)	T	L (7%)	T (2%)	T	T

Low incidence (3-6%) of mealy bug in Shahdol, Umaria and Katni; Low incidence of rice hispa in Umaria and Katni; Low incidence of mite in Shahdol

Maharashtra-1 (Karjat)

Districts surveyed: *Thane, Palghar, Raigad, Ratnagiri* and *Sindhudurg*

Particulars of survey

District	Talukas/Blocks	Villages
Thane	Ambernath, Bhiwandi, Kalyan, Murbad and Shahapur	Indgaon, Aamrai, Chimbipada, Mhaskal, Dahiwali, Borivali, Mhasa, Khanivare, Thile, Shendrun, Sapgaon and Savardev
Palghar	Vasai, Palghar, Dahanu, Wada and Vikramgad	Chandip, Mandavi, Dighipada, Loware, Chahadhe, Ranshet (Dongarpada), Ganjad, Savata, Abitghar, Kone, Shirishpada, Sapanekhurd, Wasuri, Sajan and Saharepada (Wasuri)
Raigad	Karjat, Khalapur, Sudhagad pali, Pen and Mangaon	Khandas, Bhaliwadi, Vavarle, Hatnoli, Nanose, Tiware, Zaap, Javali, Shedashi, Varvane, Ghodshetwadi, Lavelwadi and Hodgaon
Ratnagiri	Mandangad, Dapoli, Khed, Chiplun, Sangemeshwar and Ratnagiri	Nargoli, Bhanghar, Navanagar, Bondivali, Veral, Vetalwadi, Kondmala, Pedhe, Mirjole, Tural, Velwan and Karbuda
Sindhudurg	Vaibhavwadi, Kankavali, Kudal, Vengurla and Sawantwadi	Nadhavade, Nadhavade (Sawantwadi), Kokisare, Nadgive, Wargaon, Upvade, Hirlok, Pinguli, Aadeli, Bhatwadi, Vengurla, Talwade, Malgaon and Karivade

Widely prevalent varieties

District	Varieties
Thane	**HYVs**: YSR, Jaya, Ankur Rupali, MTU-1010, Shreeram, Daptari-100, Karjat-7, Karjat-2, Krushidhan Komal-101, Karjat-3, Mohini, Spriha, Poonam, Jyotika, Om Shriram, Vaishnavi and Shabari; **Hybrids**: Arizze 6444, Ankur-7434, Mahyco-5629, Silky-277 and Sahyadri-2; **Locals:** Kolam, Zinia and Mahadi
Palghar	**HYVs:** Jaya, Suvarna, Karjat-3, Rasi Poonam, Karjat-7, MTU- 1010, MTU-1001, Rupali, Komal-101, Silky-277, Suprim sona, Shweta, Jai Shriram, Om-3, Laxmi, Daptari-100, Suma, Mohini, Karjat-184, Indrayani, YSR, Pooja, Ekvira, Anupam, Sonal and Jyotika; **Hybrids:** Sahyadri-3, Pusa RH-10, Mahyco-5629, Silky-277, Arize-6444 and KSI 810; **Locals**: Kolam, Wada Kolam, and Bangalya
Raigad	**HYVs:** Jaya, Suvarna, Ratna, Karjat -3, Karjat -5, Karjat -7, MTU 1010, Krushidhan Komal 101, HMT-Sona, YSR, Trupti, Sonal, Shriram, Pooja, Sonam, Rupali and Shubhangi; **Hybrids:** Sahyadri-2, Sahyadri-3 and Lokhnath 509
Ratnagiri	**HYVs:** Jaya, Suvarna, Karjat-2, Sonam, Pooja, Komal 101, Shriram, Trupti, Sarthi, Green Gold Mohini, Ankur Rupali, Vaishnavi, Karjat- 3, Laxmi, Shweta, Rasi Poonam and YSR; **Hybrids:** Arize 6444, Sahyadri-3, Sahyadri-2 and Loknath 509
Sindhudurg	**HYVs:** Mahsuri, Jaya, Ankur Rupali, Ankur Sonam, Krushidhan Komal 101, Silky, Daptari-100, YSR, Rasi Poonam, Karjat-2, Janaki, Supreme Sona, Green Gold Mohini, Laxmi, Swarna, Karjat-3, Karjat-5 and S- 911; **Hybrids**: Sahyadri-1, Arize-6444, Ankur-7434 and Loknath-509; **Locals:** Bela, Walai, Somasal, Dongara, Sorti, Kolhyachi Shepti, Kothimbira, Ghansal, Turya and Yelkar

Particulars of rice area in different districts of Konkan region of Maharashtra (*Kharif* 2018)

District	Total geographical area (ha.)	Total cultivable area (ha.)	Total cultivated area (ha.)	Net irrigated area (ha.)	Area under rice (ha.)
Thane	933700	210825	183244	2494	57200
Palghar	469699	263707	217338	15727	76500
Raigad	687000	141200	231000	9000	117173
Ratnagiri	816000	388000	275000	5900	72932
Sindhudurg	503950	465307	139300	3630	68587

District wise rainy days and rainfall data *Kharif*'2018

District		June	July	Aug	Sept	Oct	Nov	Dec	Total
Thane	RD	15	23	24	7	1	1	0	71
	RF	605.2	1304.2	417.3	84.1	14.3	0.0	0.0	2425.1
	T_{max} (C)	32.6	28.8	29.2	30.9	35.3	35.4	32.0	-
	T_{min} (C)	26.0	24.6	24.6	23.5	23.6	18.3	16.4	-
	S-hrs	2.7	0.8	1.3	5.4	7.8	8.2	7.8	-
Palghar	RD	12	21	21	4	00	00	00	58
	RF	553.1	1433.1	294.0	34.4	00	00	00	2314.6
	T_{max} (C)	32.5	29.1	29.7	30.9	35.1	35.1	30.8	-
	T_{min} (C)	26.9	25.2	25.4	24.1	22.5	19.1	18.8	-
	S-hrs	3.4	1.1	2.2	6.9	8.1	8.1	7.6	-
Raigad	RD	18	26	30	10	2	1	0	87
	RF	885.7	1605.4	816.7	199.7	21.8	29	0	3558.3
	T_{max} (C)	32.7	28.6	28.8	30.9	35.5	35.6	33.2	-
	T_{min} (C)	25.0	24.1	23.8	23.0	24.7	17.5	13.9	-
	S-hrs	1.9	0.5	0.4	3.8	7.5	8.4	8.0	-
Ratangiri	RD	29	24	28	2	2	0	0	85
	RF	1137.0	1316.0	748.1	156.2	50.2	0.0	0.0	3407.5
	T_{max} (C)	31.6	30.2	29.7	31.7	35.1	35.8	31.2	-
	T_{min} (C)	24.9	24.8	24.4	23.2	23.1	21.0	20.8	-
	S-hrs	2.2	0.6	0.8	6.8	7.8	8.0	7.8	-
Sindhudurg	RD	23	27	30	13	6	4	0	103
	RF	1246.9	1037.5	647.5	189.6	54.6	38.5	0	3214.6
	T_{max} (C)	30.7	29.3	29.1	32.1	34.8	35.2	32.2	-
	T_{min} (C)	22.2	22.5	22.8	21.4	22.2	20.5	20.8	-
	S-hrs	2.8	0.6	1.9	7	7.1	7.7	7.8	-

RD: Rainy Days RF: Total Rain Fall (mm) S-hrs: Sunshine hours

General Question of Rice Cultivation In District (To Be Filled By The Cooperator In With The Officials From State Department of Agriculture

Parameters	Districts		
	Thane	**Palghar**	**Raigad**
Total Area under HYVs in the district (ha.)	54493 ha	7015.45 ha	103684 ha
Most prevalent HYVs in the District	Jaya, YSR, Ankur Rupali, Karjat-7, Karjat-3, Spriha, Om Shreeram, Daptari-100, MTU 1010	Jaya, Suvarna, Karjat-3, Rasi Poonam, Karjat-7, Rupali, Komal-101, Silky-277, Suprim sona, Jai Shriram, Om-3, Daptari-100 and Jyotika	Jaya, Suvarna, Ratna, Karjat -3, Karjat -5, Karjat -7, MTU 1010, Krushidhan Komal 101, HMT-Sona, YSR, Trupti, Sonal and Shriram
Total area under rice hybrids in the district (ha.	1245 ha	4761.55 ha	435
Most prevalent rice hybrids in the district	Arize 6444, Ankur-7434, Loknath-509, Mahyco-5629, Sahyadri-2	Sahyadri-3, Pusa RH-10, Mahyco-5629, Arize 6444	Sahyadri-2, Sahyadri-3, Loknath 509
Total area under basmati in the district	Nil	Nil	Nil
Most prevalent basmati varieties in the district	-	Nil	Nil
Seed replacement Rate	46%	48%	45%
Whether farmers are using any heavy equipments like transplanted/combine harvester	Yes	Nil	Yes
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	No	Nil	No
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	IPM, INM and mechanization in rice cultivation	IPM, INM and mechanization in rice cultivation	IPM, INM and mechanization in rice cultivation
What are the general problems in rice cultivation in the district?	Non-availability and high wages of labour, lack of irrigation facilities	Non-availability and high wages of labour, lack of marketing and irrigation facilities	Non-availability and high wages of labours
Please provide any farmers association in the district	Farmer's group registered under ATMA and 'Agricultural Tools Bank Association'	Farmer's group registered under ATMA	Cooperative Rice Seed Production Society, Vadap, Karjat Shetkari Vikas Sanstha, Mhad
Whether availability of labors is sufficient?	No	No	No
Whether there is any marketing problem of the produce?	Yes	Yes	Yes
Any major irrigation/power generation project in the district	Nil	Bhastra, Surya and Wandri irrigation projects in the district	Pathas, Kal, Rajnala, Hetawane irrigation projects
Any soil testing program undertaken?	Yes; Soil health Improvement Prog	Yes; Soil health Improvement Prog	Yes; Soil health Improvement Prog
Any farmers' training program was organized by the state department of Agriculture/ University	Integrated Rice Improvement Program and demonstrations	Integrated Rice Improvement Program and demonstrations	Integrated Rice Improvement Program and demonstrations

General Question of Rice Cultivation In District (To Be Filled By The Cooperator In With The Officials From State Department of Agriculture

Parameters	Districts	
	Ratnagiri	**Sindhudurg**
Total Area under HYVs in the district (ha.)	64646 ha	52967.40 ha
Most prevalent HYVs in the District	Jaya, Suvarna, Karjat-2, Sonam, Pooja, Komal 101, Shriram, Trupti, Sarthi, Green Gold Mohini, Ankur Rupali, Vaishnavi and Karjat-3	Mahsuri, Jaya, Ankur Rupali, Ankur Sonam, Krushidhan Komal 101, Silky, Daptari-100, YSR, Rasi Poonam, Karjat-2, Swarna, Karjat-3, Karjat-5
Total area under rice hybrids in the district (ha.	2950 ha	874.60 ha
Most prevalent rice hybrids in the district	Sahyadri-3, Sahyadri-4, Arize 6444 and Loknath 509	Sahyadri-1, Arize 6444, Ankur 7434, Loknath-509
Total area under basmati in the district	Nil	Nil
Most prevalent basmati varieties in the district	Nil	Nil
Seed replacement Rate	48%	47%
Whether farmers are using any heavy equipments like transplanted/combine harvester	Nil	No
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	Nil	No
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	INM, IPM of rice, chemical weed control and mechanization	Mechanization in harvesting, threshing, drum seeding and ICM
What are the general problems in rice cultivation in the district?	Shortage of labours, limitation for mechanization due to geographical situation and high labour wages	Labour shortage, limitation on mechanization due to small land holding
Please provide any farmers association in the district	Nil	Shetkari Kharedi Vikri Sangha: 8
Whether availability of labors is sufficient?	No	No
Whether there is any marketing problem of the produce?	Yes	Yes
Any major irrigation/power generation project in the district	Natu Nagar Irrigation Project and Ratnagiri Power Company	Talamba, Aruna Tilari, Sarmala and Mahmmad Wadi irrigation projects
Any soil testing program undertaken?	Yes; Soil health Improvement Program	Yes; Soil health Improvement Program
Any farmers' training program was organized by the state department of Agriculture/ University	Integrated Rice Improvement Program and field demonstrations	Integrated Rice Improvement Program and demonstrations

The Konkan region of Maharashtra is predominate rice growing belt with an average productivity of 33.5q/ha. The regions comprise five districts *viz.* Thane, Palghar, Raigad, Ratnagiri and Sindhudurg. The total area under rice cultivation in *Kharif*-2018 season in the

region was 392392 ha. The farmers of this region cannot grow any crop other than rice in *Kharif* because of high rainfall and geographically low land. The Production Oriented Survey for rice was organized at dough and maturity stage of crop during the month of October-November 2018. The onset of monsoon was early by 1week in South Konkan Costal Zonewhereas, it was in time in North Konkan Costal Zone of theregion. Very high rain fall was received in almost all districts of Konkan region except Palghar and Thane. The maximum rainy days in Raigad and Sindhudurg districts were 87 and 103 days respectively. Whereas, the maximum rain fall was high in Raigad district (3558.3 mm) in 87 rainy days. The total rain fall and its distribution in South Konkan Costal Zone region was much satisfactory. District wise rice varieties grown are presented in the Table above. Rice is grown as a rain fed crop due to heavy rains in the region. The most common cropping pattern adopted by farmers in the region is Rice-Fallow, Rice-Pulses and Rice-Vegetables. Pulses after Kharif rice on residual moisture is a common practice in Palghar, Raigad, Thane and Ratnagiri districts.

Average seed rate ranged from 40-50 kg/ha in HYVs and local varieties. However, in case of hybrids, seed rate was 15-20 kg/ha. Some farmers told that they adopted seed treatment with thiram (2.5 g/kg). Farmers are raising their nursery with organic amendments, mostly FYM and many of them also applied one dose of urea (1-1.5 kg/R; 1R==1000 sq. ft). The most common method of weed management in the nursery was by burning the nursery area with organic waste before sowing the seeds, a method known as 'Rab'. Though the balanced use of fertilizers is not practiced in the region, most of the farmers use Urea with limited quantity of complex fertilizers mostly 15:15:15, 18:18:10 and 18:18:18. Few progressive farmers applied FYM and poultry manure depending on availability. Planting was random and average plant population was 30-35 hills/m^2. Farmers use 21 to 30 days old seedlings for transplanting. This year the monsoon was started in time and farmers completed their transplanting in time. In saline soils of Raigad district farmers do not transplant the rice seedling but uprooted seedlings are uniformly scattered in the puddle fields locally called as *'Awatni'*. Fertilizer dose in the district ranged from 23-114 kg N/ha, 7.5-45 kg P_2O_5/ha and 7.5-45 kg K_2O/ha. Though the balanced use of fertilizers is not practiced in the region, most of the farmers use Urea with limited quantity of complex fertilizers like 15:15:15. Intensity of different weeds like *Echinochloa* spp, *Isphaenae globosa, Ichaemum rugosum, Cyperus* spp., *Coix lacryma., Ludwigia octovalvis., Themeda* spp., *Panicum repens, Celosia* spp., *Alternanthera sessilis* and *Cynodon dactylon* was low to medium. Hand weeding is common practice in the district. None of the farmers use weedicide in paddy cultivation but *Rabing* is followed for nursery weed management. Some of the common needs of the farmers were mechanization, irrigation facilities, subsidy on inputs and technical guidance during crop growth. Few farmers used power tiller and tractor. Intensity of different biotic constraints was low to medium. Application of pesticides was very less. Major problem faced by the farmers were shortage of labours and their high cost.

District wise details

Thane: Production Oriented Survey was conducted in 12 villages in 5 mandals when the crops were in maturity and harvesting stage. A total 12 farmers were contacted for this purpose. Most of the farmers were marginal and sub-marginal. The fields surveyed were under rainfed lowland condition. The onset of monsoon was in time but later long dry spell in the month of September and average rainfall was 2425.1 mm during *Kharif*, 2018. The weather conditions during

flowering and maturity period were moderately abnormal because of long dry spell results in to heavy yield losses. The farmer has sown the seeds in the nursery in the month of June and the transplanting was done in time. Commonly cultivated rice varieties in the district were HYVs like YSR, Jaya, Ankur Rupali, MTU-1010, Shreeram, Daptari-100, Karjat-7, Karjat-2, Krushidhan Komal-101, Karjat-3, Mohini, Spriha, Poonam, Jyotika, Om Shriram, Vaishnavi and Shabari. Some farmers cultivated hybrids like Arizze 6444, Ankur-7434, Mahyco-5629, Silky-277 and Sahyadri-2. It was observed that some farmers in the district are still cultivating local varieties like Kolam, Zinia and Mahadi for their fine quality and taste. The most common cropping patterns adopted by farmers in the region were rice-fallow, rice-pulses and rice-vegetables. Pulses after *Kharif* rice on residual moisture is a common practice in the district. Average rice yield in the district ranged from 2-2.9 t/ha in different HYVs. Planting was mainly done during 1st week of July to 3rd week of July. Seed rate ranged from 50-75 kg/ha in case of HYVs and about 20 kg/ha in case of hybrids. About 50% of the farmers told that they adopted seed treatment with thiram (2.5 g/kg). Farmers are raising their nursery with organic amendments, mostly FYM and many of them also applied one dose of urea (1-2 kg/R; 1R==1000 sq. ft). Few farmers also used phorate for control of crabs. The most common method of weed management in the nursery was by burning the nursery area with organic waste before sowing the seeds, a method known as 'Rab'. Use of fertilizer is quite satisfactory. Though the balanced use of fertilizers is not practiced in the region, most of the farmers use Urea with limited quantity of complex fertilizers like 15:15:15. Fertilizer dose ranged from 61-114 kg N/ha, 7.5-37 kg P_2O_5/ha and 7.5-37 kg K_2O/ha. Few progressive farmers were applying FYM depending upon its availability**.**

Planting was mainly random and average plant population was 30-35 hills/m^2. It was observed that weed infestation was low to moderate in most of the paddy field due to high and continuous rainfall. The predominant weeds in the district were *Isphaenae globosa, Ichaemum rugosum, Coix lacryma, Cyperus* spp*., Panicum repens, Celosia* spp*., Ludwigia octovalvis, Alternanthera sessilis* and *Cynodon dactylon.* All the farmers followed hand weeding and application of weedicides was not common among the farmers. Most of the farmers prepared their land by own plough or hired Power Tiller/Tractor. Only few progressive farmers were having their own power tiller, tractor and harvester. Because of fast urbanization, area under rice farming is decreasing in the district and farmers are facing with acute shortage of farm labour and hence Jilha parishad (District Administration) has formed farmers "**Farm Machinery and Tool Bank**" in the district from last year. Average seed replacement rate was 46%. Main source of irrigation was shallow tube wells. In majority cases, farmers took their own decision regarding input use and in some cases they got advices from staffs of state department of agriculture. Intensity of different diseases was low. However, stem borer incidence was high in some areas. Application of pesticides was negligible. State department of agriculture installed pheromone traps in some fields. The weather conditions during early crop growth period were favourable for rice cultivation. However, dry spell at flowering and maturity caused heavy losses in most of the paddy fields in the district. Some of the major problems faced by the farmers were shortage of labours, low MSP, drought during flowering, high production cost and lack of irrigation facilities and mechanization.

Palghar: Production Oriented Survey was conducted in 15 villages in 5 mandals of this district when the crops were at maturity stage. A total 15 farmers were contacted for this purpose. Most

of the farmers were marginal and sub-marginal. The onset of monsoon was in time and average rainfall was 2314.6 mm during *Kharif* 2018. Most of the fields surveyed were under rainfed lowland condition. The weather conditions during crop growth period were favourable for rice cultivation. However, dry spell at flowering and maturity caused heavy losses in most of the paddy fields. The farmers have sown the seeds in the nursery in the month of June and the transplanting was also in time. Some of the farmers are cultivating horticultural crops in part of their land. Most commonly cultivated rice varieties were HYVs like Jaya, Suvarna, Karjat-3, Rasi Poonam, Karjat-7, MTU- 1010, MTU-1001, Rupali, Komal-101, Silky-277, Suprim sona, Shweta, Jai Shriram, Om-3, Laxmi, Daptari-100, Suma, Mohini, Karjat-184, Indrayani, YSR, Pooja, Ekvira, Anupam, Sonal and Jyotika. Some farmers cultivated hybrids like Sahyadri-3, Pusa RH-10, Mahyco-5629, Silky-277, Arize-6444 and KSI 810. Locally grown varieties are Kolam, Wada Kolam, and Bangalya for their fine quality, taste, special purpose and home consumption. Rice is grown as a rain fed crop due to heavy rains in the region. The most common cropping pattern adopted by farmers in the region is rice-rice, rice-pulses and rice-fallow. Pulses after Kharif rice on residual moisture is a common practice in the district. Average rice yield in the district ranged from 2-3.2 t/ha. Planting was done during July. Average seed rate ranged from 50-90 kg/ha in HYVs and local varieties. However, in case of hybrids, seed rate was 15 kg/ha. About 50% of the farmers told that they adopted seed treatment with thiram (2.5 g/kg). Farmers are raising their nursery with organic amendments, mostly FYM and many of them also applied one dose of urea (1 kg/R; 1R==1000 sq. ft). The most common method of weed management in the nursery was by burning the nursery area with organic waste before sowing the seeds, a method known as 'Rab'. Fertilizer dose in the district ranged from 30.5-107 kg N/ha, 7.5-45 kg P_2O_5/ha and 7.5-45 kg K_2O/ha. Though the balanced use of fertilizers is not practiced in the region, most of the farmers use Urea with limited quantity of complex fertilizers like 15:15:15. Few progressive farmers applied FYM and poultry manure depending on availability. Planting was random and average plant population was 30-35 hills/m^2.

The intensity of common weeds was low to medium and the predominant weeds observed during the survey were *Echinochloa* spp, *Isphaenae globosa*, *Ichaemum rugosum*, *Cyperus* spp., *Coix lacryma., Ludwigia octovalvis., Themeda* spp., *Panicum repens, Celosia* spp., *Alternanthera sessilis* and *Cynodon dactylon.* Hand weeding is common practice in the district. None of the farmers use weedicide in paddy cultivation but *Rabing* is followed for nursery weed management. Some of the common needs of the farmers were mechanization and technical guidance during crop growth. Few farmers used power tiller. Average seed replacement rate was 48%. Shallow tube wells were the main sources of irrigation and about 50% of the farmers expressed shortage of water. Most of the farmers took their own decision regarding use of inputs and in some cases only, they got advices from staffs of state department of agriculture. Intensity of different diseases was low as the climatic conditions were not favourable. Among the insect pests stem borer was observed in most of the field and the intensity was medium. Use of pesticides was very less and very few used phorate (10 kg/ha). There were no toxicity and deficiencies noticed during the survey. Because of fast urbanization in some part of the district, area under rice cultivation is decreasing and farmers are facing acute shortage of farm labours. Some of the common problems faced by the farmers were poor and erratic rainfall, drought during flowering resulting in poor grain filling and rainfall during harvesting. These factors substantially reduced the rice yield (to the tune of 60%).

Raigad: Thirteen villages in 5 tahasils were covered for Production Oriented Survey in this district when the crops were in nursery to maturity stage. Thirteen farmers were contacted for this purpose. The fields surveyed were under rainfed lowland ecosystem. The onset of monsoon was in time and average rainfall was very high (3558.3 mm) as compared to other district of region during *Kharif* 2018. The weather conditions during crop growth period were moderately abnormal. In addition to rice, farmers are also cultivating other crops like vegetables and pulses in part of their land. Commonly cultivated varieties in the district were HYVs like Jaya, Suvarna, Ratna, Karjat -3, Karjat -5, Karjat -7, MTU 1010, Krushidhan Komal 101, HMT-Sona, YSR, Trupti, Sonal, Shriram, Pooja, Sonam, Rupali and Shubhangi. Some farmers are cultivating hybrids like Sahyadri-2, Sahyadri-3 and Lokhnath 509. Rice is grown as a rain fed crop due to heavy rains in the region. The most common cropping pattern adopted by farmers in the region is rice-vegetables, rice-pulses and rice-fallow. Pulses after Kharif rice on residual moisture is a common practice in the district. Average rice yield in the district ranged from 2-2.9 t/ha. There was rainfall at the time of harvesting which resulted in reduction in yield. The farmer has sown the seeds in the nursery in the month of June and because of onset of monsoon rain in time, farmers of the district transplanted their paddy crop up to July end, in most of the places. Average seed rate ranged from 45-80 kg/ha and majority of the farmers told that they used thiram for seed treatment. Farmers are raising their nursery with organic amendments, mostly FYM and many of them also applied one dose of urea (1-1.5 kg/R; 1R==1000 sq. ft). Few farmers used phorate for control of crabs. The most common method of weed management in the nursery was by burning the nursery area with organic waste before sowing the seeds, a method known as 'Rab'. Fertilizer dose in the district ranged from 46-107 kg N/ha, 15-30 kg P_2O_5/ha and 15-30 kg K_2O/ha. Though the balanced use of fertilizers is not practiced in the region, most of the farmers use Urea with limited quantity of complex fertilizers like 15:15:15. About 1/3rd of the farmers contacted applied FYM (2-5 t/ha) depending on availability. Planting was random and average plant population was 30-35 hills/m^2. In saline soils of Raigad district farmers do not transplant the rice seedling but uprooted seedlings are uniformly scattered in the puddle fields locally called as 'Awatni'

The weed infestation was low to medium in most of the paddy field visited during survey. The predominant weeds in the district were *Isphaenae globosa, Coix lacryma, Cyperus sp., Echinochloa* spp*., Celosia* spp*., Ludwigia octovalvis, Alternanthera sessilis, Panicum repens, Hyptis survolens, Digitariya marginiata, Ichaemum rugosum* and *Cynodon dactylon.* Hand weeding is common practice and none of the farmers use weedicides but *Rabbing* is common practice for nursery weed management. Few farmers used implements like tractor and power tiller. Average seed replacement rate in the district was 45%. Some farmers used shallow tube wells for irrigation. About 50% of the farmers expressed about the scarcity of irrigation water. In addition to their own decisions, some farmers got advices from staffs of state department of agriculture. The weather condition during the season was moderately favourable for bacterial leaf blight, sheath rot and false smut diseases development. Leaf blast was very less in most of the tahasil of the district. The bacterial leaf blight was moderate in Uran, Panvel and Karjat blocks, but in few fields only. Among the insect pests stem borer infestation was observed to be moderate range. Application of pesticides was very low and only few farmers applied pesticides like cartap hydrochloride for management of stem borer. No abiotic problems were noticed in the district. Some of the common problems faced by the farmers were lack of irrigation facilities, high labour wages and poor distribution of rainfall.

Ratnagiri: Production Oriented Survey was conducted in 12 villages in 6 mandals of this district when most of the rice fields were in maturity stage. Twelve farmers were contacted for this purpose. Most of the rice fields surveyed were under rainfed ecosystem. The onset of monsoon was in time and average rainfall was 3407.5 mm during *Kharif* 2018. The weather conditions were favourable for rice cultivation. Commonly cultivated varieties in the district were HYVs like Jaya, Suvarna, Karjat-2, Sonam, Pooja, Komal 101, Shriram, Trupti, Sarthi, Green Gold Mohini, Ankur Rupali, Vaishnavi, Karjat- 3, Laxmi, Shweta, Rasi Poonam and YSR and hybrids like Arize 6444, Sahyadri-3, Sahyadri-2 and Loknath 509. Rice is grown as a rain fed crop due to heavy rains in the region. Pulses after Kharif rice on residual moisture is a common practice in the district. Average rice yield in the district ranged from 2.2-2.9 t/ha. There was heavy rainfall at the time of harvesting which resulted in the reduction of yield. The farmer has sown the seeds in nursery in the month of May to June and completed transplanting up to July end at many places. There was no dry spell in the cropping season of *Kharif* 2018. Average seed rate in the district ranged from 40-70 kg/ha in case of HYVs and about 15 kg/ha in case of hybrids. About 25% of the farmers told that they adopted seed treatment with thiram (2.5 g/kg). Farmers are raising their nursery with organic amendments, mostly FYM and many of them also applied one dose of urea (1-1.5 kg/R; 1R==1000 sq. ft). The most common method of weed management in the nursery was by burning the nursery area with organic waste before sowing the seeds, a method known as 'Rab'. Fertilizer dose applied was less than recommended. Fertilizer dose in the district ranged from 23-63.5 kg N/ha, 7.5-17.5 kg P_2O_5/ha and 7.5-17.5 kg K_2O/ha. Though the balanced use of fertilizers is not practiced in the region, most of the farmers use Urea with limited quantity of complex fertilizers like 15:15:15 and 18:18:10. About 45% of the farmers contacted applied FYM depending on availability. Planting was random and average plant population was 30-35 hills/m^2.

It was observed that weed infestation was low to medium in most of the fields. The predominant weeds *viz. Isphaenae globosa*, *Cyperus* spp., *Echinochloa* spp., *Celosia* spp., *Ludwigia octovalvis, Alternanthera sessilis, Ichaemum rugosum, Eragostis major, Themedacialita, Mimosa pudica* and *Cynodon dactylon* were observed in the district. Hand weeding is common practice in the district and none of the farmers use weedicides in paddy field. There was no deficiency or toxicity so far noticed during the survey. Few farmers used implements like power tiller and tractor. Average seed replacement rate was 48%. Majority of the farmers reported that there were no irrigation facilities. Only few used shallow tube wells. In addition to their own decisions, some farmers got advices from staffs of state department of agriculture and private dealers. The weather condition during the season was moderately favourable for leaf blast and sheath rot. The sheath rot with glumes discoloration (Chaffy grains) disease was observed on some fields in Lanja tahasil of the district. However false smut and sheath blight diseases were at very less to medium range. Among the insect pests leaf folder and stem borer were observed in some field but the intensity was very less. Some of the problems faced by the farmers were marketing problem, irrigation facilities and erratic rainfall.

Sindhudurg: Fourteen villages in 5 mandals were covered for production oriented survey in this district when the crops were in maturity stage. Fourteen farmers were contacted for this purpose. The rainfall was satisfactory (3214.6 mm) during *Kharif* 2018. The weather conditions during crop growth period were favourable. The field surveyed were under rainfed lowland condition. In addition to rice, farmers are engaged in cultivation of horticultural crops like cashew.

Different rice varieties cultivated by the farmers were HYVs like Mahsuri, Jaya, Ankur Rupali, Ankur Sonam, Krushidhan Komal 101, Silky, Daptari-100, YSR, Rasi Poonam, Karjat-2, Janaki, Supreme Sona, Green Gold Mohini, Laxmi, Swarna, Karjat-3, Karjat-5 and S- 911. Some of the hybrids that were cultivated in the district were Sahyadri-1, Arize-6444, Ankur-7434 and Loknath-509. The locally grown varieties are Bela, Walai, Somasal, Dongara, Sorti, Kolhyachi Shepti, Kothimbira/Ghansal, Turya and Yelkar. Farmers cultivate these varieties for boiled rice purpose and home consumption. Rice is grown as a rain fed crop due to heavy rains in the region. Common crop rotation practices were rice-pulses and rice-vegetables. Average rice yield in the district ranged from 2-2.8 t/ha. Rainfall during harvesting time resulted in loss of yield. Average seed rate was 40-80 kg/ha in case of HYVs and local varieties and about 20 kg/ha in case of hybrids. About 50% of the farmers told that they treated the seeds with thiram (2.5 g/kg). The farmer has sown the seeds in the month of June and transplanting was completed well in time. Farmers are raising their nursery with organic amendments, mostly FYM and many of them also applied one dose of urea (1-1.3 kg/R; 1R==1000 sq. ft). In parts of the district, weed management in the nursery was done by burning the nursery area with organic waste before sowing the seeds, a method known as 'Rab'. Fertilizer dose applied was less than recommended. Fertilizer dose in the district ranged from 30-92 kg N/ha, 7.5-36 kg P_2O_5/ha and 7.5-36 kg K_2O/ha. Though the balanced use of fertilizers is not practiced in the region, most of the farmers use Urea with limited quantity of complex fertilizers like 15:15:15 and 18:18:18. About 45% of the farmers contacted applied FYM (2.5-5 t/ha) depending on availability. Planting was random and average plant population was 30-35 hills/m^2.

The weed infestation was low to medium. However, in some places its intensity was high and almost all the farmers followed one or two hand weeding. None of the farmers use weedicides in paddy field. It was also observed that infestation of weeds was very high in direct sown rain fed ecosystem than transplanting. The predominant weeds recorded during survey were *Isphaenae globosa, Cyperus* spp., *Echinochloa* spp., *Celosia* spp., *Ludwigia octovalvis, Alternanthera sessilis, Ichaemum rugosum, Eragostis major, Themedacialita, Digitaria sanguinalis, Cynodon dactylon* and *Mimosa pudica*. Some of the common needs of the farmers were low cost mechanization, subsidy on inputs and irrigation facilities. Few farmers used implements like tractor and power tiller. Average seed replacement rate in the district was 47%. Almost all the farmers interacted expressed the scarcity of irrigation water. In addition to their own decisions, few farmers also got advices from staffs of state department of agriculture and private dealers. The weather condition during the season was moderately favourable for blast and it was moderate in some paddy fields of all tahasils in the district. Other diseases like false smut and sheath rot were common in most of the fields but intensity was very less. Among the insect pests leaf folder, case worm and stem borer were observed in some field and the intensity was low. Application of pesticides was very less. Only few applied qunialphos for case worm and blue beetle. Major problem faced by the farmers was high wages of labours. Indegenous technical knowledge used by the farmers was rabbing and use of cow urine for seed treatment.

Incidence of diseases and insect pests in Konkan region of Maharashra during *Kharif*' 2018

District	Diseases					
	Bl	**ShBl**	**GD**	**FS**	**ShR**	**BB**
Thane	T	L (5%)	L (7%)	L (1-7%)	L (3-7%)	M
Palghar	T	-	L (<7%)	T (<1%)	L (3-10%)	T
Raigad	T	T	L (5-10%)	T(<1%)	L (3-10%)	M
Ratnagiri	L (3%)	T	L (3-10%)	T (2%)	L-M (2-15%)	T
Sindhudurg	M	-	L (3-5%)	T (~ 2%)	L (2-5%)	-

District	Insect pests						
	SB	**LF**	**CW**	**BPH**	**AW**	**BB**	**CRB**
Thane	M	L	-	-	-	-	L
Palghar	M	L	-	L	-	-	L
Raigad	M	L (3-5%)	-	L	-	-	L
Ratnagiri	L-M (2-12%)	L (1-10%)	T	-	L (2-3%)	L	L
Sindhudurg	L (3-7%)	L (3-7%)	T	-	-	L	T

Maharashtra-2 (Sakoli)

Districts surveyed: *Nagpur, Chandrapur, Bhandara, Gadchiroli* and *Gondia*

Particulars of Survey

District	Blocks	Villages
Nagpur	Mauda	Babdeo and Yesamba
Chandrapur	Sindewahi and Nagbhid	Palasgaon, Talodi, Nandgaon, Mendh Kirmiti and Nagbhid
Bhandara	Sakoli and Lakhani	Khandala, Salebhata, Rajegaon and Alesur
Gadchiroli	Wadsa	Nayanlad Amgaon, Amgaon and Navin Ladas
Gondia	Sadak Arjuni	Raka

Predominant rice varieties

District	Varieties
Nagpur	**HYVs:** Priyanka, Chintu, Jai Shriram, Pavan Putra, MTU 1010, Shriram, PKV HMT, BPT 5204, PDKV Kisan, JGL-384, MTU 1001, JGL 1798 and Yashoda-1312
Chandrapur	**HYVs:** Parbhani Chinor, Shriram, Tukaram, Sabri, Yashoda 1312, Mohara, Super Sona, Shriram, PKV HMT, PDKV Kisan, Hira, Sonam, Jai Shriram, RS 555, Balwan, OM 3, Akshay and Radha
Bhandara	**HYVs:** Jai Shriram, RPN, Baby Gold, MTU 1001, RNR 15048, Kesar, Sakoli-9, PKV Ganesh, MTU 1010, PKV HMT, PDKV Kisan, D-1008, D-30, Sona Raja, Om Shri Ram, Pintoo, Khajana and Jordar
Gadchiroli	**HYVs:** Sarthi, Jai Shriram, RPN-24, Kesar, HMT, Sumo-11, RPN Gold, MTU 1010, Shriram, PKV HMT, MTU 1001, Akshay, Shri 101, YSR and Sampurna 108
Gondia	**HYVs:** PDKV Kisan, MTU 1001, MTU 1010, Jai Shriram, Siri, Swarna, Shriram, PKV HMT, RPN, IR 64, Sarthi, Akash, RPN Gold and D-1008; **Hybrids:** Arize 6444, Hybrid 5152, Nitya 333; **Local:** RP

Particulars of rice area

District	Total geographical area (ha)	Total Cultivable area (ha)	Total Cultivated area (ha)	Total irrigated area (ha)	Area under rice (ha)
Nagpur	9,86,000	6,38,000	6,38,000	92,000	91,000
Chandrapur	10,92,000	5,31,000	5,31,000	1,23,000	1,80,000
Bhandara	3,42,000	2,02,000	2,02,000	1,13,000	1,77,000
Gadchiroli	14,91,000	2,54,000	2,54,000	53,000	1,83,000
Gondia	5,86,000	2,15,000	2,15,000	1,21,000	1,90,000

Rainfall (mm)/ number of rainy days in Vidharbha region of Maharashtra during 2018

District	June	July	Aug	Sept	Oct
Nagpur	204.8 (12)	356.2 (14)	205.8 (10)	92.2 (4)	0 (0)
Chandrapur	150.9 (9)	367.3 (16)	234.8 (12)	85.2 (5)	0 (0)
Bhandara	175.8 (10)	390.5 (17)	338.9 (13)	68.6 (3)	0 (0)
Gadchiroli	250.0 (11)	473.3 (20)	481.9 (18)	110.6 (07)	- (0)
Gondia	152.7 (9)	531.0 (19)	326.2 (17)	107.0 (6)	0 (0)

Figures in parentheses indicate number of rainy days

Variety wise area coverage in different district of Karnataka (ha)

Variety/Hybrid	Districts				
	Nagpur	Chandrapur	Bhandara	Gadchiroli	Gondia
MTU 1010	4681		7644	7654	20592
Shriram	3989	1482		947	21003
PKV HMT	1505	2174	2094	1530	12000
BPT 5204	1021				
PDKV Kisan	537	830	2050		1076
JGL-384	311				
MTU 1001	324			1037	3888
JGL 1798	126				
DRK	41				
Hira		2612			
Sonam		1507			
Jai Shriram		1813		2584	
RS 555		1193			
Balwan		1187			
OM 3		1011			
Akshay		906		1074	
D-1008			7256		
D-30			4464		
Sona Raja			3178		
Om Shri Ram			2795		
Pintoo			2500		
Khajana			2400		
Jordar			2342		
Shri 101				2630	
RPN				1750	10500
YSR				1021	
IR 64					8784
Sarthi					5000
Akash					4000
RPN Gold					3640

Area shown in the Table is based on seed sale by the State Department. Rest of the area is covered by the farmers' own seeds of different rice varieties

Production oriented survey was conducted in 5 rice growing districts of Vidarbha region of Maharashtra when the rice fields were at milk to maturity stage. Most of the rice fields were

under irrigated ecosystem. Predominant rice varieties cultivated in the region were HYVs like MTU 1010, Shriram, PKV HMT, BPT 5204, PDKV Kisan, JGL-384, MTU 1001, JGL 1798, DRK, Hira, Sonam , Jai Shriram, RS 555, Balwan, OM 3, Akshay, D-1008, D-30, Sona Raja, Om Shri Ram, Pintoo, Khajana, Jordar, Shri 101, RPN, YSR, IR 64, Sarthi, Akash and RPN Gold and hybrids like Arize 6444, Hybrid 5152, Nitya 333. Common cropping sequences followed by the farmers were rice-rice, rice-wheat, rice-vegetables, rice-fodder, rice-lathyrus, rice-watermelon, rice-gram and rice-green gram. Rice yield during the last season was drastically reduced due to severe infestation of BPH and water stress. Average seed rate in the region ranged from 30-75 kg/ha and majority of the farmers told that they treated the seeds with 3% brine solution followed by treatment with thiram (3 g/kg). Application of organic matter either in the nursery or in the main fields was very less. Fertilizers were applied @ 40-116 kg N/ha, 25-75 kg P_2O_5/ha and 5-64 kg K_2O/ha. Many farmers applied zinc sulphate and sulfur in the field. Different complex fertilizers like 20:20:0:13, DAP, 10:26:26, 18:18:10 and 12:32:13 were used by the farmers. The intensity of common weeds like Sawa (*Echinochloa colona*), Manka (local name), *Cyperus iria*, Shikara (local name), *Selaginella kraussiana*, *Echinochloa glabrescens*, *Cyperus difformis* and Kena (*Commelina benghalensis*) was low to high. Hand weeding was common among the farmers and in addition about 60% of the farmers also applied weedicides like Sathi along with urea, Eraze and pendimethalin. Some of the common needs of the farmers were proper irrigation systems, proper supply of electricity, labour, financial support for tractor and other small equipments and improvement of roads to fields. Among different biotic constraints, neck blast and sheath blight were more in Bhandara while BPH was severe in many fields in Chandrapur, Gadchiroli and Gondia. Farmers applied different pesticides for controlling different biotic stresses.

District wise details:

Nagpur: Production oriented survey was conducted in two villages in Mauda block involving 10 farmers when the rice fields were in dough to maturity stage. The rice fields surveyed were under irrigated conditions and in general the weather conditions were normal for rice cultivation. About 50% of the farmers expressed that they used 30-50% of their land for other crops like chilli, cotton and soybean. Predominant rice varieties cultivated in the district were Priyanka, Chintu, Jai Shriram, Pavan Putra, MTU 1010, Shriram, PKV HMT, BPT 5204, PDKV Kisan, JGL-384, MTU 1001, JGL 1798 and Yashoda-1312. Common crop rotation practices followed by the farmers were rice-wheat, rice-chilli, rice-tomato, rice-gram and rice-fodder. Average rice yield in varieties like Priyanka and YSR ranged from 3800-4500 kg/ha. In varieties like Jai Shriram and Chintu, yield was drastically reduced (by 50% or more) due to heavy BPH infestation last year. In some areas yield was reduced due to severe water stress. Average seed rate ranged from 30-50 kg/ha. About 40% of the farmers contacted told that they treated the seeds in 3% brine solution followed by treatment with thiram (3 g/kg). None of the farmers applied any organic manure in the nursery. However, almost all the farmers applied chemical fertilizers like 20:20:0:13 (1-1.25 kg/R; 1R=1000 sq. ft) and/or urea (0.3-1.25 kg/R) and/or DAP (0.6-2 kg/R). Very few also added zinc sulphate (1 kg/R). In the main fields, farmers applied 60-100 kg N/ha, 46-70 kg P_2O_5/ha and 35-64 kg K_2O/ha. About 60% farmers applied zinc sulphate (18-25 kg/ha) and about 40% farmers applied sulfur (14-30 kg/ha). Different fertilizers like 20:20:0:13, urea, DAP, 10:26:26, SSP, MOP and 12:32:13 were used by the farmers. About 30% farmers applied FYM (1-2 trolley/acre) in the main fields at the time of land preparation. The intensity of common weeds

like Sawa (*Echinochloa colona*), Manka (local name), Ghodela (local name), *Cyperus iria*, Shikara (local name), *Selaginella kraussiana*, *Echinochloa glabrescens*, *Cyperus difformis* and Kena (*Commelina benghalensis*) was low to high. Hand weeding was common among the farmers and in addition about 60% of the farmers also applied weedicides like Sathi (150-160 g/ha) along with urea (25 kg/ha) and pendimethalin (1 l/3 acres).

Some of the common needs of the farmers were proper irrigation systems, proper supply of electricity, labour, financial support for tractor and other small equipments and improvement of roads to fields. Farmers used implements like tractor, thresher and harvester mainly on hire basis. Majority of the farmers (70%) told that they purchased fresh seeds (50-100% of their requirement). Different sources like canal, deep and shallow tube wells and rivers were used for irrigation. However, majority of the farmers contacted (80%) reported scarcity of irrigation water. Electricity was the main power source and all the farmers expressed scarcity of electricity. In addition to their own decision, farmers got advices from staffs of state department of agriculture and private dealers. The intensity of different pest and diseases was low this year. Farmers applied different pesticides like imidacloprid (250 ml/ha), thiomethoxam (100 ml/ha), fipronil (700 ml/ha), dinotefuran (250 g/ha), buprofezin (1000 ml/ha) and acephate (1000 g/ha) for BPH and WBPH, Ferterra (10 kg/ha), cartap hydrochloride (10 kg/ha), flubendamide (500 ml/ha) and chlorpyriphos + cypermethrin (416 ml/ha) for stem borer and leaf folder; tebuconazole (625 ml/ha) for blast; zineb + hexaconazole (1000 g/ha), mancozeb (1250 g/ha), carbendazim + mancozeb (1000 g/ha) for sheath blight. Farmers made 1-3 pesticide application and about 80% of the farmers contacted told that they mixed 2-3 pesticides during application.

Chandrapur: Five villages in 2 blocks involving 6 farmers were surveyed when the rice crops were in milk to mature stage. The rice fields surveyed were under irrigated ecosystem. In general, the weather conditions were normal for rice cultivation. Predominant rice varieties in the district were Parbhani Chinor, Shriram, Tukaram, Sabri, Yashoda 1312, Mohara, Super Sona, Shriram, PKV HMT, PDKV Kisan, Hira, Sonam, Jai Shriram, RS 555, Balwan, OM 3, Akshay and Radha. Common cropping sequences were rice-wheat, rice-mustard and rice-gram. Due to severe infestation of BPH and water stress during last year, yield was drastically reduced in many rice varieties like YSR, Shriram, Khajana, Parbhani Chinoor and Super Sona. Planting was done during last week of June to 3rd week of July. Average seed rate in the district was 40-75 kg/ha and about 50% of the farmers contacted told that they treated the seeds with 3% brine solution followed by treatment with thiram. None of the farmers applied organic manure in the nursery. However, all applied chemical fertilizers like DAP (0.5-0.75 kg/R; 1 R = 1000 sq. ft), 20:20:0:13 (1.5-6 kg/R) and 18:18:10. In the main fields, fertilizers were applied @ 40-116 kg N/ha and 60-70 kg P_2O_5/ha. Few farmers applied zince sulphate (20-25 kg/ha) and sulfur (16 kg/ha). Application of FYM in the main fields was not common. Very few applied green manure. The intensity of common weeds like Sawa (*Echinochloa colona*), Reshim Kata (*Alternanthera triandra*), Shikara (local name), *Alternanthera sessilis* and Kena (*Commelina benghalensis*) was low to medium. Planting was random and some also followed direct sowing. Hand weeding was the main method of controlling the weeds and very few applied weedicides like Nominee Gold.

Some of the common needs of the farmers were irrigation facilities, proper supply of labours, proper market price and electricity. Many farmers expressed that rice cultivation is not economical due to high cost of labour. Implements like tractor and threshers were used by the

farmers. About 50% of the farmers told that they purchased 50-100% of their seed requirement. Canal, village water pond and shallow tube wells were used for irrigation and all the farmers contacted expressed scarcity of irrigation water. Electricity was the main power source and all the farmers expressed scarcity of electricity. In addition to their own decision, farmers got advices from staffs of state department of agriculture and private dealers. Among the diseases, bacterial blight was recorded in severe form in some fields of Mendha Kirmiti village. Other diseases were recorded in low to moderate intensities. Among insect pests, BPH and WBPH were observed in severe form in some fields in Talodi village on rice variety Shriram. Farmers applied insecticides like Ferterra (10 kg/ha) and chlorpyriphos (500 ml/ha) for leaf folder and stem borer and imidacloprid (140 ml/ha) for BPH and WBPH. Farmers used mainly hand sprayer and sometimes power sprayer. The number of pesticide application ranged from 1-2. All the farmers expressed that they want to continue rice cultivation.

Bhandara: Production oriented survey was conducted in 4 villages (in 2 blocks) in this district involving 8 farmers when the rice crops were in heading to milk stage or dough to mature stage. All the fields surveyed were under irrigated ecosystem and in general, the weather conditions were normal for rice cultivation. All the farmers contacted told that they used 100% of their land for rice cultivation. Predominant rice varieties in the district were Jai Shriram, RPN, Baby Gold, MTU 1001, RNR 15048, Kesar, Sakoli-9, PKV Ganesh, MTU 1010, PKV HMT, PDKV Kisan, D-1008, D-30, Sona Raja, Om Shri Ram, Pintoo, Khajana and Jordar. Some of the common crop rotation practices followed by the farmers were rice-gram, rice-lathyrus, rice-rice, rice-wheat and rice-vegetables. During last year, yield of most of the rice varieties were drastically reduced (by more than 50%) due to severe infestation of BPH. Planting was mainly done during the month of July. Average seed rate used by the farmers ranged from 25-60 kg/ha and all the farmers contacted told that they treated the seeds with 3% brine solution followed by treatment with thiram or carbendazim. Some of the farmers told that they treated the seeds *Azotobacter* or PSB after treatment with brine solution. About 50% of the farmers contacted told that they applied FYM in the nursery bed. However, all of them applied chemical fertilizers in the nursery viz., urea (1-2 kg/R; 1R= 1000 sq. ft), 20:20:0:13 (2.5 kg/R) and/or 18:18:10 (2 kg/R). In the main fields, fertilizers were applied @ 50-92 kg N/ha, 25-62 kg P_2O_5/ha and 15-50 kg K_2O/ha. However, only 50% of the farmers contacted applied potash. About 50% farmers also applied zinc sulphate (25 kg/ha) and sulphur (16-26 kg/ha).

About 30% of the farmers contacted applied FYM (5-8 t/ha) in the main fields. Planting was random and alley ways. The intensity of common weeds like Sawa (*Echinochloa colona*), *Commelina benghalensis*, *Monochoria vaginalis*, *Alternanthera sessilis*, *Selaginella kraussiana* and Shikara (local name) was low to medium. In addition to hand weeing, majority (75%) of the farmers applied weedicides like pyrazosulfuron ethyl, Sathi, Eraze (850 ml/ha) and Eraze (800 ml/ha) + 2,4-D (1 lit/ha). Some of the common needs of the farmers in the region were regular supply of electricity, labour availability, irrigation facilities and proper market price for the produce. Implements like threshers and tractors were used by the farmers. About 85% of the farmers contacted told that they purchased 30-100% of their seed requirement. Village water pond, deep and shallow tube wells were used for irrigation and all the farmers contacted expressed scarcity of irrigation water. Electricity was the main power source and all the farmers expressed scarcity of electricity. In addition to their own decision, farmers got advices from university staffs. Among diseases, sheath blight was recorded in very severe form in some fields

of Jai Shriram in Khandala village. Similarly, neck blast was severe in some fields of Jai Shriram in Khandala village. Other diseases were recorded in low to moderate form. Among different insect pests, leaf folder damage was high (up to 40%) in some fields of Jai Shriram, MTU 1001 and Kesar in Khandala village. Other insect pests were recorded in low to moderate intensities. Different pesticides like chlorpyriphos + cypermethrin (750-800 ml/ha) and monocrotophos (800-1250 ml/ha) + acephate (800-1500 g/ha) for leaf folder and stem borer; imidacloprid (140 ml/ha) for BPH; phorate 10 G (7.5 kg/ha) and chlorantraniliprole 18.5% SC for stem borer and fall midge; carbendazim (500 g/ha) and hexaconazole (1000 ml/ha) for sheath blight were applied by the farmers. The number of pesticide application in a crop season varied from 2-3 and about 50% of the farmers told that they mixed 2-3 pesticides at the time of application. Some common problems faced by the farmers were labour shortage and wild pigs. Farmers apply powder of naphthalene balls for control of plant hoppers. All the farmers expressed that they want to continue rice cultivation.

Gadchiroli: Three villages in one block involving 6 farmers were interacted during production oriented survey when the rice fields were in dough to maturity stage. The rice fields surveyed were under irrigated condition and in general the weather conditions were normal for rice cultivation. All the farmers told that they used 100% of their land for rice cultivation. Predominant rice varieties in the district were Sarthi, Jai Shriram, RPN-24, Kesar, HMT, Sumo-11, RPN Gold, MTU 1010, Shriram, PKV HMT, MTU 1001, Akshay, Shri 101, YSR and Sampurna 108. Common cropping sequences followed by the farmers were rice-vegetables, rice-green gram, rice-black gram, rice-lathyrus etc. During last season, the yield of different rice varieties like Jai Shriram, RPN, Kesar, Sarthi and others was drastically reduced due to wide spread and heavy incidence of plant hoppers and too some extent bacterial blight. Optimum time of planting was 1st to 3rd week of July. Average seed rate was 50-75 kg/ha and about 65% of the farmers told that they treated the seeds with 3% brine solution and then followed by treatment with thiram. None of the farmers contacted applied any organic matter in the nursery. However, all of them applied chemical fertilizers like DAP + urea, 18:18:10 (1.6 kg/R; 1R=1000 sq. ft) and urea (0.5 kg/R). In the main fields, fertilizers were applied @ 58-115 kg N/ha, 60-75 kg P_2O_5/ha and 5-25 kg K_2O/ha. However, only 50% of the farmers contacted applied potash. Very few applied zinc sulphate (25 kg/ha) and sulphur (48 kg/ha). Different fertilizers used by the farmers were urea, SSP, 20:20:0:13, DAP and 18:18:10.

Application of FYM in the main fields was not common among the farmers. Very few applied green manure in the main fields. Method of planting was random. The intensity of common weeds like Sawa (*Echinochloa colona*), kena (*Commelina benghalensis*), *Alternanthera sessilis*, *Selaginella kraussiana* and Shikara (local name) was low to medium. Hand weeding was the main method of weed management and very few applied weedicides like Eraze (5 lit/15 acres). Some of the common needs of the farmers were regular supply of electricity, sufficient canal water, improvement in irrigation facilities and proper market price. Common implements used by the farmers were tractor and threser (mainly on hire basis). About 80% of the farmers told that they purchased fresh seeds for sowing. Canal and shallow tube wells were the main sources of irrigation and all the farmers expressed that there was severe scarcity of irrigation water. Electricity was the main power source and all the farmers expressed scarcity of electricity. In addition to their own decision, farmers got advices from staffs of state department of agriculture and private dealers. Most of the diseases were recorded in low to moderate intensities except

sheath rot which was recorded in moderate to severe form in some fields in Aamgaon village. Among different insect pests, BPH was severe in some fields of Aamgaon. Farmers applied different pesticides like acephate (500-700 g/ha), chlorpyriphos (500 ml/ha), chlorpyriphos + cypermethrin (1000 ml/ha), alphamethrin and cartap hydrochloride (600 g/ha) for stem borer and leaf folder and acephate (500-700 g/ha) and thiomethoxam (along with dichlorovos) for BPH and other pests. Some farmers applied copper oxychloride for controlling different diseases and mixture of tobacco extract and powder of naphthalene balls for managing stem borer and BPH. Major problem faced by the farmers was shortage of labours.

Gondia: In this district, 6 farmers were interacted from the Raka village when the crops were in milk to dough stage. All the fields surveyed were under irrigated ecosystem and in general, the weather conditions were normal for rice cultivation. About 80% of the farmers told that they used 100% of their land for rice cultivation and one (out of 6 farmers) cultivated other crops like banana as paddy cultivation was not economical. Predominant rice varieties cultivated in the district were HYVs like PDKV Kisan, MTU 1001, MTU 1010, Jai Shriram, Siri, Swarna, Shriram, PKV HMT, RPN, IR 64, Sarthi, Akash, RPN Gold and D-1008 and hybrids like Arize 6444, Hybrid 5152 and Nitya 333. Common cropping sequences followed by the farmers were rice-rice, rice-wheat, rice-lathyrus, rice-watermelon, rice-gram and rice-green gram. The average rice yields in hybrids during previous season like Hyb 5152 and Arize 6444 ranged from 4875-5600 kg/ha. However, yield in many other varieties was drastically reduced during last season due to severe water stress and different biotic constraints. Average seed rate was 50-75 kg/ha in case of HYVs and about 15 kg/ha in case of hybrids. About 65% of the farmers contacted told that they treated the seeds with brine solution followed by treatment with thiram (3 g/kg) or trichoderma. FYM was applied in the nursery by about 65% of the farmers. However, all the farmers applied chemical fertilizers in the nursery like urea (0.5-3 kg/R; 1 R=1000 sq. ft.), 20:20:0:13 (1.25-2.5 kg/R) and mixture of urea+SSP+potash (5 kg + 3 kg + 1 kg/4R). In the main fields, fertilizers were applied @ 74-105 kg N/ha, 30-65 kg P_2O_5/ha and 50 kg K_2O/ha. However, very few applied potash. Some applied zinc sulphate (12-25 kg/ha) and sulphur (15-30 kg/ha). Different fertilizers used by the farmers were urea, SSP, 20:20:0:13 and DAP.

About 35% of the farmers contacted told that they applied FYM (5 trolley/ha) in the main fields. Planting was random. The intensity of common weeds like *Echinochloa colana*, *Selaginella kraussiana* and Shikara (local name), Reshim Kata (*Alternanthera triandra*) and *Alternanthera sessilis* was low to moderate. Hand weeding was the main method of weed management and very few applied weedicides like Saathi (80 g/acre) and 2,4-D (500 ml/acre). Some of the common needs/demands of the farmers were increase in the market price of the produce, proper supply of electricity, improvement in irrigation facilities and subsidy on fertilizers. Common implements used by the farmers were tractor and threser (mainly on hire basis). About 80% of the farmers told that they purchased (70-100%) fresh seeds for sowing. Deep and shallow tube wells were the main sources of irrigation and all the farmers expressed that there was severe scarcity of irrigation water. Electricity was the main power source and all the farmers expressed scarcity of electricity. In addition to their own decision, farmers got advices from staffs of state department of agriculture and private dealers. Intensity of most of the diseases were low to moderate except sheath rot was high on Jai Shriram in Raka village and moderate incidence of false smut on Siri variety in Raka village. Among the insect pests, BPH was very severe on varieties like Jai Shriram, Swarna and D-1008 in Raka village. Farmers applied different pesticides like

chlorpyriphos (1000 ml/ha), lamda cyhalothrin (500 ml/ha) and dichlorovos (600 ml/ha) for leaf folder and stem borer; thiomethoxam (100 g/ha) for BPH; carbendazim + mancozeb (500 g/ha) for sheath blight and sheath rot and streptocycline (25 g/acre) for bacterial blight of rice. Many farmers applied chlorpyriphos and carbendazim together for controlling sheath blight and stem borer. The number of sprays in the season varied from 1-3 and about 65% of the farmers told that they are mixing 2 pesticides at the time of application. All the farmers expressed that they want to continue rice cultivation. However, MSP for rice should be increased.

Prevalence of diseases and insect pests in Vidarbha region of Maharashtra during *Kharif'2018*

District	**Diseases**							
	Bl	**NBl**	**BS**	**ShBl**	**ShR**	**FS**	**GD**	**BB**
Nagpur	T (1-2%)		L (2-4%)	L (1-5%)	L (4-5%)	L (1-7%)	L (2-3%)	
Chandrapur		T (<2%)	L (<10%)	L-M (5-20%)	L (<10%)	L (2-5%)	L-M (2-15%)	L-S (5-50%)
Bhandara	L (2-3%)	S (40%)	M (20%)	L-S (2-80%)		L (5%)	L (1-10%)	
Gadchiroli		L (1-5%)			M-S (30%)	L-M (1-20%)	L (1-10%)	L-M (5-15%)
Gondia	L (1-10%)	L (2-5%)		L-M (2-20%)	L-S (5-40%)	L-M (5-25%)	T (<2%)	

District	**Insect pests**							
	BPH (/hill)	**WBPH (/hill)**	**SB**	**LF (DL%)**	**AW/Cut Worm**	**Mites**	**RB**	**GM**
Nagpur	L (1-4)	L (3-6)	L (1-5%)	L (3%)		L (5-7%)		-
Chandrapur	L-S (2-200/hill)	S (50-100 /hill)	L-M (2-15%)	L (2-5%)	L ($1/m^2$)		L ($1/m^2$)	-
Bhandara	L (2-3/hill)		L (1-7%)	L-S (5-40%)	L ($5-6/m^2$)			M (15-20%)
Gadchiroli	L-S	L	L (1-5%)	L (2-5%)	M (2-5/hill)			
Gondia	M-S (5-200/hill)		L (5-8%)	L (10%)				

There were minor incidence of grass hoppers and moderate incidence of rats in some areas of Gondia

Punjab (Ludhiana)

Districts surveyed: *Amritsar, Taran Taran, Gurdaspur, Patiala, Sangrur, Fatehgarh Sahib, Hoshiarpur, Roopnagar, Ajitgarh (SBS Nagar), Ludhiana, Barnala, Jalandhar, Kapurthala, Ferozepur, Faridkot, Muktsar* and *Moga*

Details of survey

Districts	**Villages**
Amritsar	Balliah, Bhoorshi, Rajputtan, Wadala Khurd and Bhai Ladhu
Taran Taran	Rampur, Kot Mohammad Khan and Kasel
Gurdaspur	Kalanaur, Basantgarh-Kahnuwan, Sahari- Dhariwal, Naharpur, Pandori and Sadda
Patiala	Mardapur, Kheri Gandian, Pratapgarh and Kheri
Sangrur	Samundgarh, Mastwana Sahib, Bhadalwad, Benra, Tibba and Kheri
Fatehgarh Sahib	Amloh -Brongazer, Samaspur, Jalwera Khera, Salana and Adampur
Hoshiarpur	Panjaran, Pandori and Jian
Roopnagar	Fatehgarh Viran, Mahlan, Kajauli, Barsalpur and Kularan
Ajitgarh (SBS Nagar)	Barri
Ludhiana	Mullarpur , Manupur and Ghulal
Barnala	Kattu
Jalandhar	Kadian Liali, Shadipur, Ismailpur and Nacodar
Kapurthala	Mewa Singhwala
Ferozepur	Karmuwala, Rataul Rahi, Rukan Shah Wala and Kakuwala
Faridkot	Galewala, Ahel, Panjgrain Kala, Chahal, Ramwala, Dhilwa Khurd, Samalkha, Aulakh, Kotkapura, Kareerwali
Muktsar	Kote Darmesh, Kirkianwala, Chattiana, Jammuana, Jagat Singh Wala, Goneana, Mansingh Wala, Dharmkot and Alam Wala
Moga	Nidhan Wala, Saffu Wala, Chand Purana, Gill, Man Singh Wala, Ramu Wala Kalan, Khesa Jalal and Budh Singh Wala

Predominant rice varieties

Districts	**Varieties**
Amritsar	**HYVs:** PR 126, PR 121 and PR 114; **Basmati**: Psa 1121 and CSR 30
Taran Taran	**HYVs:** PR 114, Pusa 44 and PR 121; **Basmati**: Pusa 1121 and CSR 30
Gurdaspur	**HYVs:** PR 122 and PR 126; **Basmati**: Pusa 1121 and Pusa 1509
Patiala	**HYVs:** PR 126, PR 124, PR 122 and Pusa 44; **Basmati**: Pusa 1121
Sangrur	**HYVs:** PR 121, PR 126, PR 124, Pusa 44 and PR 114
Fatehgarh Sahib	**HYVs:** PR 121, PR 126, PR 122 and Pusa 44
Hoshiarpur	**HYVs:** PR 121, PR 126 and PR 122; **Basmati**: Pusa 1121
Roopnagar	**HYVs:** PR 124, Pusa 44, PR 126 and PR 121; **Basmati**:Pusa 1121 and Pusa 1401
Ajitgarh (SBS Nagar)	**HYVs:** Pusa 44
Ludhiana	**HYVs:** PR 121, PR 126 and Pusa 44
Barnala	**HYVs:** PR 126 and PR 127

Districts	**Varieties**
Jalandhar	**HYVs:** PR 121, PR 126 and Pusa 44; **Basmati**: Pusa 1121
Kapurthala	**HYVs:** PR 121 and PR 122
Ferozepur	**HYVs:** PR 126, PR 114 and PR 122
Faridkot	**HYVs:** Pusa 44, PR 114, PR 126, PR 118, CR 2012, PR 122 and PR 121; **Basmati**: Pusa 1121 and Pusa 1509
Muktsar	**HYVs:** PR 118, PR 114, PR 121, PR 122 and PR 111; **Basmati**: Pusa 1121, Pusa 1401 and Pusa 1728
Moga	**HYVs:** Pusa 44, PR 121, HKR 47, PR 111, PR 116 and PR 122; **Basmati**: Pusa 1121

Production oriented survey was conducted in farmers' field in different districts of Punjab during *Kharif* 2018. During *Kharif* 2018 in Punjab, paddy was grown on an area of around 30.5 lakh hectares. Non-Basmati and Basmati varieties occupied around 83 and 17 per cent area, respectively. Among the non-Basmati group, PR 121 was the most popular variety and occupied 32 per cent (8.0 lakh ha) area and PR 126, Pusa 44, PR 124, PR 122 and PR 114 were the other popular varieties. On the other hand, among the Basmati group, Pusa Basmati 1121 was the predominant variety followed by Pusa Basmati 1509. The predominant crop rotation was Rice-Wheat. Transplanting of HYVs was done between June 20 to July 10 and Basmati was transplanted during first week of July to end July at farmer's field. Predominant weeds observed during the survey were *Echnochloa crusgalli*, *Leptochloa chinensis* and others. Most of the farmers used weedicides like pretilachlor, butachlor and some farmers also used bispyribac sodium as a post emergence herbicide for weed control in rice crop. Even, a small fraction of farmers did not use any weedicide but they adopted cultural method of weed control i.e. ponding of water for the first 15 days of crop cycle. In most of the cases, planting density was inadequate i.e. it varied from 18-22 plants/ m^2 as against recommended density of 33 plants/ m^2. Most of the farmers used 10-15 kg/ha of seed rate for nursery sowing. Majority of the farmers had done seed treatments prior to nursery sowing. Mostly farmers transplanted 30-40 days old nursery. Most of the surveyed farmers used over dose of nitrogen but many farmers skipped the application of P_2O_5 and K_2O in paddy crop, owing to higher status of these nutrients in their soils. Application of Zinc sulphate (either 21 or 33%) was practiced by less than 25% of farmers but they used under dose of Zinc. Direct- seeded rice (DSR) was also grown by some farmers in the pockets of Sri Mukatsar Sahib, Ferozepur, Sangroor, Moga and Barnala districts of state. Farmers used both pre- and post-emergence herbicides for weed control in dry direct-seeded rice and used seed @ about 20-25 kg/ha with the drills fitted with inclined plate metering mechanism. Most of the farmers grew Basmati (Pusa Basmati 1121) and short duration rice varieties (PR 126 and PR 121) but some farmers had also sown PR 122 and PR 118. Most of farmers got similar or even higher yield under DSR but a small fraction of farmers also reported yield penalty to the tune of 3 to 4 q/ha over transplanted rice.

Among different diseases, sheath blight was widespread throughout Punjab in low to moderate form. Moderate incidence (15-20%) of the disease was recorded from few fields of districts Moga, Sangrur, Ferozepur, Tarn Taran Sahib and Fatehgarh Sahib on varieties PR 122 and Pusa 44. Incidence of false smut was low during 2018 almost throughout the state. In general, the incidence of leaf and neck blast, bakanae, brown spot, sheath rot, bacterial blight, stem rot and grain discoloration was low. Low incidence of *Erwinia* disease was recorded from few fields in

district Faridkot on varieties Pusa 44 and PR 121. Incidence and population of rice insect-pest in general during *Kharif*' 2018 was below economic threshold levels at most of the locations surveyed in Punjab. In general, most of the farmers had broadcasted Padan 4G (cartap hydrochloride) @ 5 to 7.5 kg per acre or Regent 0.3G (fipronil) @ 5-6 kg per acre for control of leaf folder and stem borers. In later crop growth stage, farmers used tank mixture of insecticides or ready to use insecticides like Combi (Chlor 50% + Cyper 5%) @ 500 ml/acre or acephate @ 330 g + Actara @ 50 g + Contaf @ 330 ml for control of rice insect-pests and diseases. Hopper burn symptoms caused by BPH were observed on PR121 at village Ghulal in district Ludhiana.

District wise details

Amritsar, Taran Taran and Gurdaspur: Production oriented survey was conducted in 5 villages in Amritsar, 3 villages in Taran Taran and 6 villages in Gurdaspur whenthe crops were at heading stage. A total of 16 farmers were interacted during the survey. The rice fields surveyed were under irrigated ecosystem and in general, the weather conditions were normal for rice cultivation. All the farmers told that they used 100% land for rice cultivation during Kharif season. Predominant rice varieties cultivated by the farmers were HYVs like PR 126, PR 121, PR 114, Pusa 44 and PR 122 and basmati varieties like Psa 1121, CSR 30 and Pusa 1509. The most predominant cropping sequence was rice-wheat. Few farmers also followed sequences like rice-peas-wheat and rice-potato-wheat. Rice yield in different HYVs like PR 126, PR 114, PR 121, PR 126, Pusa 44 and PR 122 ranged between 7400-8200 kg/ha and in different basmati varieties ranged between 3900-6000 kg/ha. In addition to inherent soil fertility, proper package of practices, timely planting, proper management of inputs and proper plant protection were the reason for high yield. Average seed rate was 10-15 kg/ha and our cooperator reported that most of the farmers followed seed treatment. About 2/3rd of the farmers contacted told that they applied organic manures like FYM or poultry manure in the nursery. All the farmers applied chemical fertilizers in the nursery like urea (30-60 kg/ha). Few farmers also applied zinc sulphate (10-20 kg/ha) in the nursery. In the main fields, fertilizers were applied @ 120-150 kg N/ha and about 25 kg P_2O_5/ha in case of HYVs and about 60-100 kg N/ha and 20 kg P_2O_5/ha in case basmati varieties. Application of P was practiced by very few farmers and K application was almost nil. About 1/4th of the farmers applied zinc sulphate in the main fields.

Planting was mostly random and most cases, plant density was inadequate and varied from 18-22 plants/m^2. Mostly farmers used 30-40 days old seedlings for planting. The intensity of common weeds like *Leptochloa chinensis, Echinochloa crusgalli* and *Echinochloa colona* was low. Hand weeding was not very common among the farmers. Majority of the farmers applied weedicides like Rifit (500-600 ml/acre), butachlor (1000 ml/acre) and Nominee Gold (bispyribac Sodium) (100 ml/acre). Most of the farmers are progressive farmers and they used their own implements. All the farmers told that they purchased 50-100% of their seed requirement. Canal and deep tube wells were the main sources of irrigation and electricity was the main source power. In addition to their own decisions, farmers took advice from university staffs and in some cases from staffs of state department and private dealers regarding use of different inputs. Intensity of most of the diseases and insect pests was low except sheath blight which was widespread in low to moderate intensities in many areas. In general, most of the farmers had broadcasted Padan 4G (cartap hydrochloride) @ 5 to 7.5 kg per acre or Regent 0.3G (fipronil) @ 5-6 kg per acre for control of leaf folder and stem borers. In later crop growth stage, farmers used tank mixture of insecticides

or ready to use insecticides like Combi (chlor 50% + cyper 5%) @ 500 ml/acre or acephate @ 330 g + Actara @ 50 g + Contaf @ 330 ml for control of rice insect-pests and diseases.

Patiala, Sangrur and Fatehgarh Sahib: Production oriented survey was conducted in 4 villages in Patiala, 6 villages in Sangrur and 5 villages in Fatehgarh Sahib involving a total of 17 farmers. The rice fields were at booting to heading stage at the time of survey. All the fields surveyed were under irrigated ecosystem and in general the weather conditions for rice cultivation were normal. All the farmers contacted used 100% of their land for rice cultivation. Predominant rice varieties cultivated b y the farmers in these districts were HYVs like PR 126, PR 124, PR 122, Pusa 44, PR 121 and PR 114 and basmati varieties like Pusa 1121. Main crop rotation followed by the farmers was rice-wheat. Average rice yield in different HYVs in these districts ranged from 6750-8200 kg/ha. Good agricultural practices, good package of practices and quality seeds of HYVs were the main reasons for high yield in these districts. Planting was mainly done during June 20-30. However in some cases especially for basmati varieties, planting was little late. Average seed rate was 10-20 kg/ha and our cooperator told that farmers routinely follow seed treatment. About 60% of the farmers contacted told that they applied organic matter like FYM or poultry manure in the nursery. All of them applied urea (45-70 kg/ha) in the nursery. Some even applied zinc sulphate in the nursery. In the main fields, fertilizers were applied @ 125-150 kg N/ha, 25-50 kg P_2O_5/ha and 20-30 kg K_2O/ha. However very few (~25%) applied potash. About 40% of the farmers contacted applied $ZnSO_4$ (20 kg/ha).

Planting was random. The intensity of common weeds like *Leptochloa chinensis* and *Echinochloa crusgalli* was low to negligible. Hand weeding was not very common among the farmers. Majority of the farmers applied herbicides like butachlor (1200 ml/acre), Nominee Gold (100 ml/acre), Rifit (600 ml/acre), Granite (penoxsulam; Dow AgroSciences) (40 g/acre) and Sunrice (Ethoxysulfuron 15% WDG; Crop Science India) (50 g/acre) for management of different weeds. Majority of the farmers possessed their own equipments including tractor. Some of the farmers used combine harvester on hire basis. Deep tube wells and canal were the main sources of irrigation and all the farmers told that there was no scarcity of irrigation water. Few farmers told that they were not satisfied with the quality of some pesticides and fertilizers. In addition to their own decisions, farmers took advice from university staffs and in some cases from staffs of state department and private dealers regarding use of different inputs. Among the diseases, sheath blight was widespread in low to moderate form. Brown spot and sheath rot were also observed in low to moderate form in some fields. Other diseases were in low in their intensity. BPH population was moderate in some fields. However, the intensity of other pests was less. Routinely farmers applied Padan (5-7.5 kg/acre) or Regent (5-6 kg/ha) during early stage and insecticides like Combi (chlor 50% + cyper 5%) @ 500 ml/acre or acephate @ 330 g + Actara @ 50 g + Contaf @ 330 ml at later stages.

Hoshiarpur, Roopnagar and Ajitgarh: Three villages in Hoshiarpur, 5 villages in Roopnagar and one village in Ajitgarh were covered for production oriented survey when the crops were booting to heading stage. A total of 9 farmers were contacted during this survey. The rice fields surveyed were under irrigated ecosystem and the climatic conditions were favourable for rice cultivation. All the farmers used 100% of their land for rice cultivation. The most popular rice varieties in these districts were HYVs like PR 121, PR 126, PR 122, Pusa 44 and PR 124 and basmati varieties like Pusa 1121, Pusa 1401. Common crop rotation was rice-wheat. Average

rice yield among the HYVs ranged from 7500-8900 kg/ha and among basmati varieties it ranged from 4800-5200 kg/ha. Planting was done between June 20 and July 15. Average seed rate was 10-15 kg/ha and farmers generally treated the seeds before sowing. Application of organic matter in the nursery was not common among the farmers. Few farmers applied poultry manure in the nursery. All the farmers applied urea (50-60 kg/ha) and few also applied zinc sulphate. In the main fields, fertilizers were applied @ 125-160 kg N/ha in case of HYVs and 50-70 kg N/ha in case basmati varieties. Application of P was practiced by very few farmers and K application was almost nil.

Farmers followed random transplaing. The intensity of common weeds like *Leptochloa chinensis, Echinochloa crusgalli* and *Echinochloa colona* was low to negligible. Hand weeding was not very common among the farmers. Majority of the farmers applied weedicides like Rifit (600 ml/acre), butachlor (1200 ml/acre) and Nominee Gold (bispyribac Sodium) (100 ml/acre). Most of the farmers are progressive farmers and they used their own implements. All the farmers told that they purchased 100% of their seed requirement. Canal and deep tube wells were the main sources of irrigation and electricity was the main source power. In addition to their own decisions, farmers took advice from university staffs and in some cases from staffs of state department and private dealers regarding use of different inputs. Intensity of different biotic constraints was low. Routinely farmers applied Padan (5-7.5 kg/acre) or Regent (5-6 kg/ha) during early stage and insecticides like Combi (chlor 50% + cyper 5%) @ 500 ml/acre or acephate @ 330 g + Actara @ 50 g + Contaf @ 330 ml at later stages.

Ludhiana, Barnala, Jalandhar and Kapurthala: Production oriented survey was conducted in 3 villages in Ludhiana, 1 village in Barnala, 4 villages in Jalandhar and 1 village in Kapurthala when the crops were in booting to heading stage. A total of 10 farmers were interacted during the survey. The fields surveyed were under irrigated ecosystem. Most common varieties cultivated by the farmers were HYVs like PR 121, PR 126, Pusa 44, PR 127 and PR 122 and basmati varieties like Pusa 1121. Main crop rotation followed by the farmers was rice-wheat. Few farmers also followed rotations like rice-wheat-moong, rice-potato-wheat and rice-peas-wheat. Average yield among the HYVs in these districts ranged from 7400-8300 kg/ha. Planting was done during June 20-30. Average seed rate was 10-20 kg/ha and farmers generally treated the seeds before sowing. About 1/3rd of the farmers applied organic matter like FYM and poultry manure in the nursery. However, all the farmers applied urea (40-60 kg/ha) in the nursery. In the main fields, farmers applied 120-140 kg N/ha and 30 kg P_2O_5/ha. However, very few farmers applied potash. About 40% farmers applied $ZnSO_4$ (10-20 kg/ha). Farmers mostly followed random planting method and proper plant population was not maintained. Intensity of common weeds like *Leptochloa chinensis*, *Echinochloa crusgalli* and other was low to negligible. Hand weeding was not common among the farmers and most of the farmers applied different weedicides like Rifit (600 ml/acre), butachlor (800-1000 ml/acre) and Nominee Gold (bispyribac Sodium) (100 ml/acre). Most of the farmers are progressive farmers and they used their own implements. All the farmers told that they purchased 100% of their seed requirement. Canal and deep tube wells were the main sources of irrigation and electricity was the main source power. In addition to their own decisions, farmers took advice from university staffs and in some cases from staffs of state department and private dealers regarding use of different inputs. Among different biotic constraints, sheath blight and BPH were widespread in low to moderate intensity. Intensity of other biotic constraints was low. Routinely farmers applied Padan (5-7.5 kg/acre) or

Regent (5-6 kg/ha) during early stage and insecticides like Combi (chlor 50% + cyper 5%) @ 500 ml/acre or acephate @ 330 g + Actara @ 50 g + Contaf @ 330 ml at later stages.

Faridkot and Ferozepur: Production oriented survey was conducted in 10 villages in Faridkot and 4 villages in Ferozepur when the rice crops were in booting to heading stage. A total of 17 farmers were interacted during the survey. The fields were under irrigated ecosystem and in general, climatic conditions were normal for rice cultivation. Commonly cultivated rice varieties were HYVs like Pusa 44, PR 114, PR 126, PR 118, CR 2012, PR 122 and PR 121 and basmati like Pusa 1121 and Pusa 1509. Most predominant crop sequence was rice-wheat. Average rice yield in these districts ranged from 7200-8200 kg/ha in different HYVs and 5100-6200 kg/ha in case of different basmati varieties. Some of the main reasons for higher yields in the area were proper irrigation, inherent soil fertility, quality seeds of HYVs and proper plant stand. Planting was mainly done during June 20-25. However, in some places, planting was continued till 1st week of July. Average seed rate was 10-15 kg/ha and farmers commonly treated the seeds before sowing. About 40% of the farmers contacted applied organic manures (FYM or poultry manure) in the nursery. However, all of them applied urea (50-70 kg/ha). Few farmers (~ 15%) also applied $ZnSO_4$ (21% Zn) in the nursery. In the main fields, fertilizers were applied @ 110-150 kg N/ha, 30 kg P_2O_5/ha and 30 kg K_2O/ha in case of HYVs and @ 70 kg N/ha, 30 kg P_2O_5/ha and 30 kg K_2O/ha in case of basmati varieties. However, potash was applied by very few farmers (~ 15%).

About 25% of the farmers interacted told that they applied FYM or green manure in the main fields. Planting was random and plant population was not maintained. Intensity of common weeds like *Leptochloa chinensis*, *Echinochloa crusgalli* and other was low to negligible. Few farmers (33%) adopted Hand weeding and most of the farmers applied different weedicides like Rifit (600 ml/acre), butachlor (800-1000 ml/acre) and Nominee Gold (bispyribac Sodium) (100 ml/acre). Most of the farmers are progressive farmers and they used their own implements. All the farmers told that they purchased 100% of their seed requirement. Canal and deep tube wells were the main sources of irrigation and electricity was the main source power. In addition to their own decisions, farmers took advice from university staffs and in some cases from staffs of state department and private dealers regarding use of different inputs. Among different biotic constraints, sheath light and BPH were widespread in low to moderate intensity. Other pests and diseases were observed in low intensities. Routine pesticide application [Padan @ 5-7.5 kg/acre or Regent @ 5-6 kg/ha during early stage and Combi (chlor 50% + cyper 5%) @ 500 ml/acre or acephate @ 330 g + Actara @ 50 g + Contaf @ 330 ml at later stages] was followed by the farmers.

Muktsar: Ten villages (involving 13 farmers) were covered during production oriented survey in this district when the crops were in booting stage. The rice fields surveyed were in irrigated ecosystem and in general, the weather conditions were normal for rice cultivation. Most predominant varieties cultivated by the farmers were HYVs like PR 118, PR 114, PR 121, PR 122 and PR 111 and basmati rice varieties like Pusa 1121, Pusa 1401 and Pusa 1728. The most common crop rotation practice among the farmers was rice-wheat. Average seed rate followed by the farmers were 10-20 kg/ha in case of HYVs and about 10-12 kg/ha in case of basmati varieties. Before sowing, farmers generally treated the seeds. Mostly farmers transplanted 30-40 days old nursery. Urea application in the nursery was common among the farmers. Fertilizer

application in the main fields was more or similar like Faridkot and Ferozepur districts. Most of the surveyed farmers used over dose of nitrogen but many farmers skipped the application of P_2O_5 and K_2O in paddy crop, owing to higher status of these nutrients in their soils. Direct-seeded rice (DSR) was also grown by some farmers in the pockets of Mukatsar. Farmers used both pre- and post-emergence herbicides for weed control in dry direct-seeded rice and used seed @ about 20-25 kg/ha with the drills fitted with inclined plate metering mechanism. Among, different diseases, brown spot were observed in low to moderate intensity in some fields. Other diseases and insect pests were recorded in low to moderate intensities. In general, most of the farmers had broadcasted Padan 4G (cartap hydrochloride) @ 5 to 7.5 kg per acre or Regent 0.3G (fipronil) @ 5-6 kg per acre for control of leaf folder and stem borers. In later crop growth stage, farmers used tank mixture of insecticides or ready to use insecticides like Combi (chlor 50% + cyper 5%) @ 500 ml/acre or acephate @ 330 g + Actara @ 50 g + Contaf @ 330 ml for control of rice insect-pests and diseases.

Moga: Eight villages in this district were covered for production oriented survey when the crops were in booting to heading stage. A total of 11 farmers were interacted during the survey. The rice fields surveyed were under irrigated ecosystem and the weather conditions for rice cultivation were in general normal. All the farmers contacted told that they used 100% of their land for rice cultivation. Most predominant rice varieties cultivated by the farmers were HYVs like Pusa 44, PR 121, HKR 47, PR 111, PR 116 and PR 122 and basmati like Pusa 1121. Most common crop sequence was rice-wheat. Average rice yield in Pusa 44 in the district ranged between 8200-89. Planting was mainly done during June 20 to July 5. Average seed rate was 10-15 kg/ha and farmers followed seed treatment before sowing of seeds. Some of the farmers applied FYM in the nursery. In the main fields, fertilizers were applied @ 135-140 kg N/ha and 30 kg P_2O_5/ha. All the farmers followed random planting method. The intensity of common weeds in and around rice fields was low to negligible. All the farmers told that they purchased new seeds for sowing. Deep tube wells were the main source of irrigation. In addition to their own decisions, farmers took advice from university staffs regarding use of different inputs. Among different diseases, sheath blight was widespread in low to moderate intensity. However, other diseases were recorded in low intensity. Among different insect pests, BPH and WBPH were recorded in moderate intensities in some fields. Other insect pests were low in their intensity. Routinely farmers applied Padan (5-7.5 kg/acre) or Regent (5-6 kg/ha) during early stage and insecticides like Combi (chlor 50% + cyper 5%) @ 500 ml/acre or acephate @ 330 g + Actara @ 50 g + Contaf @ 330 ml at later stages.

Prevalence of diseases and insect pests in Punjab during *Kharif* ' 2018

Districts	Diseases									
	Bl	**NBl**	**ShBl**	**BS**	**ShR**	**FS**	**GD**	**Bak**	**StR**	**BB**
Amritsar, Taran Taran and Gurdaspur	T	L (1-3%)	L-M (2-20%)	L (5-10%)	L (5-7%)	L (3-8%)	L (5-7%)	L (1-5%)		
Patiala, Sangrur and Fatehgarh Sahib	T		L-M (5-20%)	L-M (10-12%)	L-M (15-20%)	L (2-7%)	L (1-7%)			
Hoshiarpur, Roopnagar and Ajitgarh	L (4-5%)		L (2-10%)	L-M (5-12%)		L (1-5%)			L (3-5%)	
Ludhiana, Barnala, Jalandhar and Kapurthala			L-M (3-12%)	L (3-7%)		T (1-2%)				
Faridkot and Ferozepur			L-M (2-20%)	L (5-10%)	L (4-7%)	L (6-7%)		L (4-5%)		L (5-7%)
Muktsar	L (2-3%)	L (3-5%)	L (2-7%)	L-M (10-12%)	L (3-5%)	L (3-5%)		L (1-5%)		L (5-10%)
Moga	L (3-5%)		L-M (5-20%)	L (4-5%)		L (2-5%)		L (1-4%)	T	T

There was low (5-7%) incidence of *Erwinia* rot in Faridkot

Districts	Insect pests					
	SB	**LF**	**BPH**	**WBPH**	**WM**	**GH**
Amritsar, Taran Taran and Gurdaspur	T (<2%)	L (2-6%)	L (3-7/hill)			
Patiala, Sangrur and Fatehgarh Sahib	L (1-4)	L-M (3-11%)	L-M (2-11/hill)	L (1-8/hill)	T (<2%)	T (<2%)
Hoshiarpur, Roopnagar and Ajitgarh	T (<2%)	L (2-5%)	L (2-5%)	L (4-5%)		
Ludhiana, Barnala, Jalandhar and Kapurthala	L (1-3%)	L (1-6%)	L (2-6/hill)	L (1-3/hill)		
Faridkot and Ferozepur	L (2-7%)	L-M (2-12%)	L-M (2-14/hill)	L (1-10/hill)	T (1-2%)	
Muktsar	L (1-4%)	L (4-7%)	L (4-10/hill)	L (2-7%)	L (2-3%)	
Moga	L (2-8%)	L (4-7%)	L-M (2-13/hill)	L-M (2-11/hill)	L (2-3%)	

Tamil Nadu (Coimbatore)

Districts surveyed: *Dharmapuri, Krishnagiri, Thiruvanamalai, Vellore, Erode, Salem, Tiruppur, Theni, Madurai, Ramanathapuram, Tirunelvelli* and *Kanyakumari*

Details of survey

Districts	Blocks
Dharmapuri	Old Dharmapuri and Harur
Krishnagiri	Kalvalli, Krishnagiri dam and Kaveripattinam
Thiruvanamalai	Arani, thiruvanamalli, Arathanapatti,
Vellore	Kaveripakkam, Arcot and Nimili
Erode	Kodiverri, Sathiyamangalam and Gobichettipalayam
Salem	Mattur and Salem
Tiruppur	Dharapuram, Amaravathi and Tiruppur
Theni	Periyakulam, Theni and Kambam
Madurai	Othakadai, Osilampattti and Maduai east
Ramanathapuram	Thirupullani, Surankottai and Paramakudi
Tirunelvelli	Kalakadu
Kanyakumari	Agasteeswaram

Widely prevalent rice varieties

Districts	Varieties
Dharmapuri	**HYVs:** Akshaya, Ponni, Archana, Amman, Sowbackya and Dhanista
Krishnagiri	**HYVs:** ADT 39, ADT 49, CO(R) 51, TKM 13, Improved white ponni, BPT 5204, Paiyur 1, Amman, Amoga, Vasundra and Dhanuska
Thiruvanamalai	**HYVs:** BPT5204 and Amman BT
Vellore	**HYVs:** ADT37, CO51, ADT36, Pavithra, Sonam, Angur and NLR 34449
Erode	**HYVs:** ADT45, ADT39IR 20ASD16, NLR 34449, BPT 5204, ADT 45 and Swarnamuki
Salem	**HYVs:** White ponni and BPT 5204
Tiruppur	**HYVs:** CO51 ADT 45, IR 20, ASD 16, ADT 45 and ADT 30
Theni	**HYVs:** CO 51, BPT5204, ADT 45, White ponni and ASD 16
Madurai	**HYVs:** ADT45, Sonam, CO51, Akshaya and RNLR
Ramanathapuram	**HYVs:** ADT 45, CO 51, CO52 and BPT 5204
Tirunelvelli	**HYVs:** ASD 16 and TPS 5
Kanyakumari	**HYVs:** TPS 3, ASD 16 and TPS 5

Particulars of rice area and coverage in different districts of Tamil Nadu

Districts	Total geographical area (ha)	Total cultivable area (ha)	Total cultivated area (ha)	Total irrigated area (ha)	Area under rice (ha)
Dharmapuri	169089	211598	168689	111725	94540
Krishnagiri	407556	244526	184933	83897	23590
Thiruvanamalai	169089	134900	108300	105727	90010
Vellore	592018	183151	18083	1711880	42900
Erode	572264	183151	178083	1711880	86939
Salem	520530	183151	178083	171188	56000
Tiruppur	508726	174161	167174	162277	18402
Theni	2143262	185108	15300	62000	16700
Madurai	361721	89250	88066	45155	11460
Ramanathapuram	408787	174151	168083	141086	13500
Tirunelvelli	682308	191618	168733	100751	79765
Kanyakumari	324330	111400	15200	72200	10200

In the Production Oriented Survey (POS) programme during the year 2018 twelve districts *viz*., Dharmapuri, Krishnagiri, Thiruvanamalai, Vellore, Erode, Salem, Tiruppur, Theni, Madurai, Ramanathapuram, Tirunelvelli and Kanyakumari were surveyed. Due to well distribution of southwest and northeast rainfall, timely planting was observed in most of the district surveyed. Kharif and Rabi season rice cultivation was carried out in many districts. Canal irrigation was sufficient for two season cultivation. Wherever insufficient rainfall and canal irrigation was there, farmers used medium and long duration varieties as single season crop. Varieties chosen by the farmers in each district are mentioned above. Shortage of canal irrigation facilities was faced by farmers in many districts. Generally short duration varieties were chosen by the farmers for cultivation.

Herbicides nominee gold and butachlor were used along with one or two hand weeding for the control of weeds. Weeding through conoweeder was practiced by the farmers and some farmers adopted SRI method of rice cultivation. Complex fertilizers containing 17:17:17 NPK was applied by the farmers along with urea/DAP as basal fertilizers. Urea and potash were applied as top dressing in some of the rice growing areas. Farmers used the seeds in higher level, beyond 30 kg per acre and in many places manual transplanting was very common. Machine planting was minimum and seeds were purchased by the farmers always from the local retailers. Overall in the twelve districts surveyed, SRI method of cultivation was not adopted by farmers in an appreciable level. Shortage of labors is the main problem faced by the farmers. In the planting methods random transplanting, line transplanting and direct sowing were adopted by the farmers. In the mechanized cultivation, farmers are using the agricultural implements, power tiller, tractor and machine harvester. Mostly farmers took advice from the pesticide dealers for the usage fertilizers, pesticides and seed. Combined harvester was used by the farmers to harvest the paddy on hourly basis, farmers getting yield an average of 5000-6000kg/ha. Increasing cost of cultivation, water scarcity and labour shortage are the common constraints faced by many farmers. Non lodging, market value and short duration varieties are highly expected by the farmers.

General questions on rice cultivation in district (To be filled by the co-operator in consultation with the Officials from State department of Agriculture)

Parameters	**Districts**			
	Dharmapuri	**Krishnagiri**	**Thiruvannamalai**	**Vellore**
Total area under HYVs in the district	NA	NA	NA	NA
Most prevalent HYVs in the district	Ponni	NA	NA	ASD 16
Total area under rice hybrids in the district	NA	NA	NA	NA
Most prevalent rice hybrids in the district	NA	NA	NA	NA
Total area under basmati in the district	NIL	NA	NIL	NIL
Most prevalent basmati varieties in the district	NIL	NA	NIL	Nil
Whether farmers are using any heavy equipments like transplanter/combine harvester	Yes	Yes (machine transplanting, combine harvester, Thresher)	Yes	Yes
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	SRI	SRI	-	SRI
Whether survey team gave any advice to the farmers during survey? If yes. Then what are those	Usage of plant protection chemical	Recommendation on pest and disease management	-	Use of pesticides
What are the general problems in rice cultivation in the district?	Water sourcer	RTD and BPH damage	- .	Labour shortage
Please provide any farmers association in the district	-	TamilNadu Vivasayigal Sangam, Krishnagiri	-	No
Whether availability of agricultural labours is sufficient?	No	No	No	No
Whether there is any marketing problem of the produce?	No	Yes	No	No
Any major irrigation/power generation project in the district		KRP dam and Kalavarapalli Dam irrigation project	No	
Any soil testing program undertaken?	Yes.	Yes (soil health card scheme)	Yes	Yes
Any farmers' training program was organized by the state department of Agriculture/University		Yes		

General questions on rice cultivation in district (To be filled by the co-operator in consultation with the Officials from State department of Agriculture)

Parameters	**Districts**			
	Erode	**Salem**	**Trupur**	**Theni**
Total area under HYVs in the district	NA	NA	NA	15700 ha
Most prevalent HYVs in the district	NA	NA	CO 51	NLR
Total area under rice hybrids in the district	NA	NA	NA	NA
Most prevalent rice hybrids in the district	NA	NA	NA	NA
Total area under basmati in the district	NIL	NIL	NIL	NA
Most prevalent basmati varieties in the district	Nil	Nil	Nil	NA
Whether farmers are using any heavy equipments like transplanter/combine harvester	Yes	yes	yes	Yes
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	SRI	SRI	SRI	SRI
Whether survey team gave any advice to the farmers during survey? If yes. Then what are those	Pesticides application	Limited use of pesticides	Limited use of pesticides	
What are the general problems in rice cultivation in the district?	Labour shortage	Insufficient labour	Insufficient labour	Shortage of labor
Please provide any farmers association in the district	No	No	No	-
Whether availability of agricultural labours is sufficient?	No	No	No	No
Whether there is any marketing problem of the produce?	No	No	No	No
Any major irrigation/power generation project in the district				No
Any soil testing program undertaken?	Yes	Yes	Yes	Yes
Any farmers' training program was organized by the state department of Agriculture/University		-		-

General questions on rice cultivation in district (To be filled by the co-operator in consultation with the Officials from State department of Agriculture)

Parameters	**Districts**			
	Madurai	**Ramanathapuram**	**Tirunelvelli**	**Kanyakumari**
Total area under HYVs in the district	NA	NA	940,863 ha	35500ha
Most prevalent HYVs in the district	ADT 45 & NLR	ASD 16	ADT 45,ASD 16	CR 1009. TPS 3, Ponni
Total area under rice hybrids in the district	NA	NA	NA	NA
Most prevalent rice hybrids in the district	NA	NA	NA	NA
Total area under basmati in the district	NIL	NIL	NIL	NIL
Most prevalent basmati varieties in the district	NIL	Nil	NIL	Yes
Whether farmers are using any heavy equipments like transplanter/combine harvester	Yes	yes	Yes	Yes
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	SRI	SRI	SRI	SRI
Whether survey team gave any advice to the farmers during survey? If yes. Then what are those	-	Limited use of pesticides	Usage of plant protection chemicals	.Usage of plant protection chemicals
What are the general problems in rice cultivation in the district?	Availability of labour	Insufficient labour	Insufficient labour	Water source
Please provide any farmers association in the district		No	No	-
Whether availability of agricultural labours is sufficient?	No	No	No	No
Whether there is any marketing problem of the produce?	No	No	No	No
Any major irrigation/power generation project in the district	Periyar vaigai river command area			
Any soil testing program undertaken?	Yes.	Yes	Yes	Yes
Any farmers' training program was organized by the state department of Agriculture/University	yes			-

Climatic conditions in different districts of Tamil Nadu during 2018

Districts/Weather Parameters	Months						
	Jun	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Dharmapuri							
Total rainfall (mm)	59	70	103	147	190	103	37
Temp-Max	33.7	31.9	31.9	31.9	30.7	29.1	28.5
Temp-Min	23.4	22.6	22.4	22.2	21.7	20**.0**	**18.2**
Krishnagiri							
Total rainfall (mm)	45	72	100	122	189	80	30
Temp-Max	33.4	31.6	31.6	31.5	30.4	28.8	28
Temp-Min	23.3	22.5	22.4	22.0	21.5	19.6	17.7
Thiruvannamalai							
Total rainfall (mm)	38.5	131.0	16.5	74.5	127.5	21.0	125.6
Temp-Max	36.0	34.4	35.1	34.7	31.5	28.4	27.5
Temp-Min	27.0	27.1	26.9	26.3	25.1	24**.5**	**23.2**
Vellore							
Total rainfall (mm)	0.1	0.0	5.3	8.0	10.0	275.0	22.5
Temp-Max	36.9	38.5	35.5	34.7	32.5	24.2	28.2
Temp-Min	27.7	27.9	26.3	24.8	23.5	26**.1**	**26.7**
Erode							
Total rainfall (mm)	0.2	0.5	4.3	10.0	12.0	265.0	25.6
Temp-Max	35.9	36.5	37.5	32.7	31.4	26.4	26.2
Temp-Min	26.6	26.7	25.0	22.7	22.5	25**.4**	**25.6**
Salem							
Total rainfall (mm)	0.5	0.0	5.3	13.0	12.0	290.0	58.5
Temp-Max	37.9	36.5	34.5	32.7	30.5	26.2	27.6
Temp-Min	26.7	26.9	27.4	26.8	24.8	25**.5**	**24.7**
Tirupur							
Total rainfall (mm)	0.0	0.0	4.5	7.2	12.2	250.0	30.9
Temp-Max	33.8	36.4	34.6	35.8	32.6	26.3	27.5
Temp-Min	26.6	26.8	25.5	23.6	24.7	25**.3**	**24.7**
Theni							
Total rainfall (mm)	70.0	170.0	203.5	66.5	314.0	181.0	107.9
Temp-Max	29.6	29.2	28.9	33.1	30.9	29.6	26.5
Temp-Min	24.6	23.8	23.7	23.2	22.1	21.8	24.5
Madurai							
Total rainfall (mm)	61.0	169.5	48.0	106.0	90.0	117.5	-
Temp-Max	35.6	34.9	35.2	35.2	32.1	31.1	-
Temp-Min	25.7	24.9	24.8	24.5	2**4.2**	**24.1**	-
Ramanathapuram							
Total rainfall (mm)	0.3	0.4	5.3	7.0	12.0	235.0	52.6
Temp-Max	35.4	36.8	36.7	35.8	31.7	23.8	26.3
Temp-Min	26.6	28.7	24.3	23.6	25.6	24**.6**	**27.3**
Tirunelvelli							
Total rainfall (mm)	0.0	0.5	1.5	1.0	1.0	0.0	100
Temp-Max	34.2	33.7	31.8	35.2	32.4	31.2	28.5
Temp-Min	28.3	27.6	26.8	25.6	24.9	24**.8**	**22.0**
Kanyakumari							
Total rainfall (mm)	1.0	89.0	231.0	0.0	56.5	33.5	300.2
Temp-Max	29.7	29.6	29.0	30.3	27.0	27.3	28.2
Temp-Min	24.6	24.1	24.0	24.2	20.0	19**.6**	**20.5**

Disease incidence (leaf blast and brown spot) was low during 2018 crop seasons of rice. Usage of fungicides was also very less. Fungicides *viz*., tricyclazole, mancozeb, propiconozole and carbendazim were used in few places for controlling the diseases. Farmers always had the practice of mixing 2 to 3 insecticides with fungicides before application. Most of the farmers were not aware about the pesticides they are using and also not able to distinguish the pest and disease incidence in the field. Among the insect pests, leaf folder and stem borer incidence were observed in many places. Insecticides *viz.*, lambda cyhalothrin, acephate, profenophos, malathion, chlorpyriphos, moncrotophos, cartap hydrochloride, chlorpyriphos + cypermethrin combination product were used by the farmers for the control of BPH, leaf folder, ear head bug, gall midge and stem borer. Always it was observed that 2-3 rounds of sprays were given for the control of pests. In several places higher dose of chemicals and combination of different insecticide, fungicides and growth regulators were used without differentiation for the control insect pests and diseases.

District wise observations

Dharmapuri: In Dharmapuri district old Dharmapuri, Harur Blocks were surveyed. In these blocks White Ponni, Vasanthra, Amman and Red Ponni (long duration) were the major rice varieties cultivated. Farmers were growing the crop for seed production and food grain purpose. Seed rate was 30 Kg/acre for cultivation. Complex fertilizer 20:20 and DAP were used as basal fertilizers. Due to water shortage only one crop was raised in these blocks during 2018. Manual and machine harvesting was followed by most of the farmers.

Krishnagiri: In Krishnagiri district Kalvalli, Krishnagiri dam and Kaveripattinam blocks were surveyed. Rice varieties BPT 5204, Amman, Vasunthara, Jalagaraponni were the major rice cultivars grown in this district. Most of the farmers cultivated rice as the 1st and 2nd crop with various varieties in each season. In most of the places variety BPT 5204 was used as 1st crop whereas amman was cultivated as second crop. Canal irrigation facility was available in this district, water sources are from Dam. Basal application of 20:20 complex and top dressing of DAP, 20:20 complex along with potash was followed. Yield of variety BPT 5204 was 40 bags with 75 Kg from one acre. Occurrence of tungro disease and BPH were observed in BPT 5204. Variety jalagaraponni was highly susceptible to pest and disease, especially for BPH. Mostly machine harvesting was carried out, very few farmers followed manual harvesting.

Thiruvannamalai: Arani amd Thiruvanamalli blocks were surveyed. Rice varieties *viz*., ADT 37, ADT 45, CO(R)51 and J-45 were grown by the farmers with an average seed rate of 20-30Kg/acre. Most of the farmers were followed single copping pattern followed by other crops based on availability of water. Basal application of DAP and two split application of urea and potash was used for top dressing. Leaf folder and sheath blight incidence were recorded among the varieties grown except ponni variety. Labor shortage problem was mentioned by most of the farmers thus, mechanization from land preparation, till harvest was followed by hiring the power tiller, tractor for ploughing and machine harvester for harvesting.

Vellore: Kaveripakkam, Arcot and Nimili blocks were surveyed. The varieties predominant in these blocks are ADT37, CO51, ADT36, Pavithra, Sonam, Angur and NLR 34449. Farmers in this district mostly raise 2 season rice crop and few farmers raise three season also. Mostly the

short duration rice varieties like CO 51, ADT 43 were raised. Most of the farmers followed manual transplanting method and few farmers followed direct sown rice crop with the same varieties. In the main field fertilizers, Urea, DAP and MOP were used. Few areas complex fertilizer 17:17:17 was used for basal application. Most of the farmers followed hand weeding one time during vegetative stage of the crop. Pre-emergence herbicides were used to control weed population in the initial stage of the crop. Very few farmers use post emergence herbicides. No major disease was noticed in this district. Among the insect pests, leaffolder and stem borer were recorded at minimum level during the survey period. Farmers used chemicals like monocrotophos, dichlorvos and chlorpyriphos to control insect pest. Most of the farmer use machine harvester for harvest of the crop.

Erode: Kodiverri, Sathiyamangalam and Gobichettipalayam areas are surveyed. Major varieties cultivated are ADT 45, ADT 39 and BPT 5204. Three season rice cultivation was adopted in these areas. Application of neem cake (25Kg/acre), DAP, complex fertilizer were practiced. Weedicide, Pretilachlor was applied along with one hand weeding at 30 DAP. Surplus water for the cultivation was available through canal/tubewell in this year. False smut was the most common disease observed in the field whereas pests incidence was at the minimum level. Machine harverster was employed for harvest.

Salem: Mattur and Salem IWP and White Ponni were the most popular cultivar grown in the region. Crop rotation with either sorghum, turmeric, cotton, green gram or black gram were practiced by the famers. In an average, 1500 kg/ac of grain was harvested in a season. Urea, potash, cow dung manure were applied as nutrient source. Implement used by farmers were hired from private sources/State department. Ear head bug incidence was more prevalent pests observed in the fields apart from minimum incidence of leaffolder and GLH.

Thirupur: Dharapuram, Amaravathi and Tiruppur blocks were surveyed. Rice varieties *viz*., Co 51, IR 20, ADT 45 and ASD 16 were the major varieties cultivated in this district. Basal application of DAP and top dressing of 20:20 complex followed by urea, sulphate and potash were practiced. Hand weeding was followed by farmers to manage the weeds. One spray of Karathane was used to reduce the disease incidence. Organic cultivation of rice was practiced by few farmers by growing CO51 rice variety.

Theni: In this district Periyakulam, Theni and Kambam blocks were surveyed. Rice varieties *viz*., NLR, BPT 5204 and private hybrids were cultivated by the farmers. Few farmers used single cropping pattern whereas crop rotation of rice with sugarcane were also found. NLR rice variety yielded 32 bags of grain weighing 64 kg. Basal application of DAP and 20:20 complex along with potash were applied as nutrient source. Hand weeding and application of pre-emergence herbicide was also followed. Surplus amount of water is available in all the locations during survey period. Neem oil and monocil were applied to mitigate the pests and diseases where leaf folder was major pest observed. Mechanization of harvest by machine harvester was employed due to labour problems prevailing in the localities.

Madurai: Othakadai, Osilampattti and Maduai east blocks were surveyed. Rice varieties *viz*., BPT 5204, ADT 45, Sonam, Co 51 and NLR were the rice varieties/cultivars grown in the surveyed regions of Madurai where BPT 5204 was cultivated in larger proportion. Crop rotation

with different cultivars of rice was followed. Basal application of complex, DAP and top dressing of potash, neem cake and urea were practiced. Farmers also employed application of organic manures (FYM) and green manure (Green gram). Post emergence application of pertilachlor and other pre emergence herbicide were used for weed management. Occurrence of RTV, caseworm was reported in CO51 grown fields. Moreover, sheath blight incidence was also common in the fields.

Ramanathapuram: Three blocks Thirupullani, Surankottai and Paramakudi were surveyed. In this district rice varieties *viz*., CO 51, CO 52, TKM 13, BPT 5204 and ADT 5 were the common varieties raised in these localities and rice as the 2nd crop as well. Irrigated as well as direct sown crop was practiced by most of the farmers. Farmers were depending on the vaigai dam water and deep tube well for irrigation. Fertilizers *viz.,* urea, DAP, potash were applied by the farmers in common and followed by micronutrients (25Kg/ac). Pre emergence and post emergence herbicides were applied to alleviate the weeds. Incidence of pests and diseases were less, however, sparse occurrence of sheath blight was observed in ADT 45 direct seeded fields. One spray of Carbendazim+Mancozeb was applied to contain the disease spread.

Tirunelvelli: In this district Kalakadu block was surveyed. Mostly one rice crop has been raised during the period due to water shortage. Most of the farmers raise rabi season rice crop with ASD 16 and TPS 5. The crop cultivation was during Sep-Oct. Most of the farmers followed transplanting method and few also followed direct sown rice crop with the same varieties. In the main field application fertilizers *viz*., Urea, DAP and MOP were used. Few areas complex fertilizers 17:17:17 were used. Most farmers followed one time hand weeding during tillering stage of the crop. Pre-emergence herbicides were used to control weed population in the initial stage of the crop. Among the diseases sheath blight, sheath rot was noticed. Among insect pests, leaffolder, stem borer and green leafhopper was recorded during the period. Farmers used chemicals like monocrotophos, chlorpyripho and cartap. Most of the farmer use combined harvester to harvest the crop.

Kanyakumari: In Kanyakumari district, villages in Agasteeswaram block was surveyed. TPS 3, ASD 16 and TPS 5 are the popular varieties during the period. Mostly two season rice crop has been grown in transplanted condition. First season sowing was taken during June-July and second crop sown during Sep-Oct. In main field straight fertilizers like Urea, DAP and MOP were used. Few areas complex fertilizers 17:17:17 were used. Most farmers follow hand weeding 2 times during vegetative stage of the crop and very few farmers use pre-emergence herbicides. Farmers aware of SRI method of planting, but they prefer normal method of transplanting. Among the diseases sheath blight, brown spot and grain discolouration were noticed in the varieties TPS 3 and ASD 16. Among the insect pests, stem borer is predominant in this district and causes 15-25 per damage. Farmers mostly use chemicals like monocrotophos, chlorpyriphos, cartap and chlorantraniliprole. Machine harvester is used for harvest of the crop in both the season.

Prevalence of different diseases and insect pests in Tamil Nadu during *Kharif*' 2018

Districts	Diseases						
	Bl	**NBl**	**BS**	**ShBl**	**FS**	**BB**	**RTD**
Dharmapuri	L	-	L	-	-	-	-
Krishnagiri	L	-	-	-	-	-	-
Thiruvanamalai	L	-	-	-	-	-	-
Vellore	-	-	-	-	-	-	-
Erode	L	-	-	-	M-S	-	-
Salem		-	-	-	-	-	-
Tiruppur	M-S	-	M-S	-	M	-	-
Theni	-	-	-	-	-	-	-
Madurai	L	-	L	-	-	-	-
Ramanathapuram							
Tirunelvelli	L	-	L	-	L	-	-
Kanyakumari	L	-	L	-	-	-	-

Districts	Insect pests					
	LF	**SB**	**BPH**	**GM**	**Th**	**EHB**
Dharmapuri	L (10%)	L (5%)	-	-	-	
Krishnagiri	-	L (5%)	L (10%)		-	
Thiruvanamalai	L (10%)	L (10%)	-	-	-	
Vellore	L (5%)	L (5%)	L (5%)			
Erode	L-M (15%)			L-M (15%)		L (5%)
Salem	L (5%)	L (10%)	-	-	-	L (5-10%)
Tiruppur	L (10%)	L (5%)	-	-	-	
Theni	L (10%)	10-15	-	-	-	
Madurai	L (10%)	L-M (15%)	-	-	-	-
Ramanathapuram	-	L (5%)	-	-	L (10%)	
Tirunelvelli	-	L (10%)	-	-	-	
Kanyakumari	-	L-M (15%)	-	-	-	

Telangana (Rajendranagar)

Districts surveyed: *Nirmal, Nizamabad, Kamareddy, Karimnagar, Jagtial, Peddapalli, Nalgonda, Suryapet, Khammam, Medak, Wanaparthy, Jogulamba Gadwal* and *Vikarabad*

Particulars of the survey

District	Mandal	Villages
Nirmal	Mudhole	Basar
Nizamabad	Bodhan and Kotagiri	Kopparga and Pothangal
Medak	Narsangi and Ramyampet	Sankapur and Dhamaracheruvu
Nizamabad	Varni, Bodhan, Rudrur and Mopal	Humnapur, Bhavanipet, Rudrur and Kulaspur
Vikarabad	Parigi	Parigi
Nalgonda	Tripuraram	Duggepalli
Suryapet	Chilkur	Bethavole and Kotta Kondapuram
Peddapalli	Eligedu and Kalva Srirampur	Muppirithota, Laalapally and ARS, Kunaram
Wanaparthy	Kothakota and Pebbair	Palem and Janampally
Jogulamba Gadwal	Itikyala and Jogulamba Gadwal	Thimmapur and Beerolu
Khammam	Mudigonda, Nelakondapally, Chintakani and Wyra	Medipally, Madhapuram, Rajeshwarapuram, Chennaram, Narasimhapuram and Wyra

Telangana is the 29th newly formed state on 2ndJune 2014, in Indian sub-continent. The Production Oriented Survey (POS) of rice growing areas was conducted in 13 districts *viz.*, Nirmal, Nizamabad, Kamareddy, Karimnagar, Jagtial, Peddapalli, Nalgonda, Suryapet, Khammam, Medak, Wanaparthy, Jogulamba Gadwal and Vikarabad covering major rice growing areas of Northern Telangana, Southern Telangana and Central Telangana zones of Telangana state. The total cropped area of the state is 4.6 m. ha with an annual rainfall around 900 to 1100 mm. Seventy five per cent of the rainfall is received from South West monsoon. Rice is the principal food crop cultivated throughout the state providing food for its growing population, fodder to the cattle and employment to the rural masses. Any set back to the rice crop will have a perceptible impact on the state's economy and food security. In Telangana, rice is mostly cultivated under wells (72%), tanks (13%), canals (15%) in an area of around 17 lakh ha annually. Much of the area is covered in *kharif* (>11.0 lakh ha) and the remaining in *rabi* season. Among the rice growing farmers, 70% are small and marginal farmers with land holdings of less than 1 ha.

A. General information

A.1: Seasonal Conditions

The rainfall received from South West monsoon and North East monsoon during the period from June, 2018 to December, 2018 along with district wise rainfall situation is furnished in table 1a and 1b.

General question on Rice cultivation in District during *Kharif*, 2018 (To be filled by the Cooperator in consultation with the officials from State Department of Agriculture)

Parameters	Nirmal	Medak	Nizamabad	Peddpally	Vikarabad
Total area under HYV in the district (ha)	21294	30244	93667	53913	9250
Most preferred HYV in the district	MTU 1010, KNM 118, BPT 5204, Jai Sreeram and Bathukamma	MTU 1010, KNM 118, BPT 5204, Telangana sona and Jai sreeram	BPT 5204, Jai Sreeram, Chintu, Telangana Sona, KNM 118 and Bathukamma	BPT 5204, Telangana sona, MTU 1010, Jai sreeram, Chintu and MTU 1153	Telangana sona and MTU 1010
Total area under rice hybrids in the district (ha)	-	-	-	-	-
Major prevalent rice hybrids in the district	-	-	-	-	-
Total area under basmati in the district	Nil	Nil	Nil	Nil	Nil
Most prevalent basmati varieties in the district	Nil	Nil	Nil	Nil	Nil
Whether farmers are using any heavy equipements like transplanter / combine harvester	Yes, Rotovator, and combine harvester	Yes, Rotovator, machine planter and combine harvester	Yes, Rotovator, machine planter and combine harvester	Yes, Rotovator, Drum seeder, Transplanter and comb. harvester	Yes, Rotovator, machine planter and combine harvester
Mention water technologies like SRI/laser leveling/DSR being used by the farmers	Drum seeder and MSRI	Drum seeder and MSRI	Drum seeder and MSRI	Drum seeder and MSRI	Drum seeder and MSRI
Whether survey team gave any advice to the farmers during the survey? If yes. Then what are those	Yes, regarding varieties, crop production and protection	varieties, water saving technologies and IPM	Yes, varieties, MSRI, fertilizers, IPM	Yes, varieties, MSRI, fertilizers, IPM	Yes, varieties and IPM
What are the general problems in rice cultivation in the district	Hispa, leaf folder, blast and Zinc deficiency	BPH, leaf mite, blast, salinity and Zink deficiency	BB, BPH, hispa, leaf folder and salinity	BPH, leaf folder, grain discoloration	BPH and blast Scarcity of irrigation water
Please provide any farmers association in the district	Rythu Samanvaya Samithi at village, mandal and district level				
Whether availability of labour is sufficient	No	No	No	No	No
Whether there is any marketing problem of the produce	Yes, there is no much difference in coarse and fine grain varieties.	Yes	Yes	Yes	Yes
Any major irrigation power generation project in the district	No	Yes, Singur and Nizam sagar project	SRSP, Nizamsagar, Alisagar lift irrigation project	Yes, Sripada Yellampally project and Kaleshwaram project (Ongoing)	Yes, Kotipally, Jhuntupally, Laknapur, Sarpan Pally minor irrigation projects
Any soil testing programme undertaken	Yes, by department of Agriculture, Govt. of Telangana	Yes, by department of Agriculture, Govt. of Telangana	Yes, by department of Agriculture, Govt. of Telangana	Yes, by department of Agriculture, Govt. of Telangana	Yes, by department of Agriculture, Govt. of Telangana
Any farmers training program was organized by the state department of Agriculture / University	Regular training programmes organized by Dept. of Agriculture, ATMA, KVK and DATTCs of the University.	Regular training programmes organized by Dept. of Agriculture, ATMA, KVK and DATTCs of the University.	Regular training programmes organized by Dept. of Agriculture, ATMA, KVK and DATTCs of the University.	Regular training programmes organized by Dept. of Agriculture, ATMA, KVK and DATTCs of the University.	Regular training programmes organized by Dept. of Agriculture, ATMA, KVK and DATTCs of the University.

General question on Rice cultivation in District during *Kharif*, 2018 (To be filled by the Cooperator in consultation with the officials from State Department of Agriculture)

Parameters	Wanaparthy	Jogulamba Gadwal	Nalgonda	Suryapet	Khammam
Total area under HYV in the district (ha)	28736	15184	56558	63019	52965
Most preferred HYV in the district	Telangana Sone, BPT 5204, Omkar and Keshav	Telangana Sone, BPt 5204, Omkar, Keshav,	BPT 5204, Jai Sreeram, Chintu, Telangana Sona, KNM 118 and Bathukamma	BPT 5204, Telangana sona, MTU 1010, Kunaram Sannalu, Pooja, Chintu,	BPT 5204, MTU 1061, Pooja, Siddi, Kunaram Sannalu, MTU 1010 and Telangana Sona,
Total area under rice hybrids (ha)	-	-	-	-	-
Major rice hybrids	-	-	-	-	-
Total area under basmati	Nil	Nil	Nil	Nil	Nil
Most prevalent basmati varieties in the district	Nil	Nil	Nil	Nil	Nil
Whether farmers are using any heavy equipment's like transplanter / combine harvester	Yes, Rotovator, and combine harvester	Yes, Rotovator, and combine harvester	Yes, Rotovator, machine planter and combine harvester	Yes, Rotovator, machine planter and combine harvester	Yes, Rotovator, machine planter and combine harvester
Mention water technologies like SRI/laser leveling/DSR being used by the farmers	No	No	Drum seeder and MSRI	Drum seeder and MSRI	Direct sowing and drum seeder
Whether survey team gave any advice to the farmers during the survey? If yes. Then what are those	Yes, regarding the improved package and practices of rice	Yes, regarding varieties, water saving technologies and pest and disease management	Yes, varieties, MSRI, fertilizers, management of pests and diseases.	Yes, varieties, MSRI, fertilizers, management of pests and diseases.	Yes, varieties and management of pests and diseases
What are the general problems in rice cultivation in the district	BPH, panicle mite, sheath rot and grain discoloration, salinity. Labour shortage	BPH, panicle mite, stem rot and grain discoloration, salinity and labour shortage	Timely availability of canal water, BPH, leaf mite and blast	Timely availability of canal water, BLB and BPH	Late receipt of canal water, BPH, blast and sheath rot. Indiscriminate use of Bios
Please provide any farmers association in the district	Rythu Samanvaya Samithi at village, mandal and district level	Rythu Samanvaya Samithi at village, mandal and district level	Rythu Samanvaya Samithi at village, mandal and district level	Rythu Samanvaya Samithi at village, mandal and district level	Rythu Samanvaya Samithi at village, mandal and district level
Whether availability of labour is sufficient	No	No	No	No	No
Whether there is any marketing problem of the produce	Yes,	Yes	Yes	Yes	Yes
Any major irrigation power generation project in the district	Mahatma Gandhi Kalwakurthy Lift Irrigation Scheme (MGKLIS)	Priyadarshini Jurala Project and Gattu lift irrigation project	Nagarjuna Sagar irrigation (left canal)	Nagarjuna Sagar irrigation (left canal)	Nagarjuna Sagar irrigation (left canal) and Sitarama lift irrigation project
Any soil testing programme undertaken	Yes, by department of Agriculture, Govt. of Telangana	Yes, by department of Agriculture, Govt. of Telangana	Yes, by department of Agriculture, Govt. of Telangana	Yes, by department of Agriculture, Govt. of Telangana	Yes, by department of Agriculture, Govt. of Telangana
Any farmers training program was organized by the state department of Agriculture / University	Regular training programmes organized by Dept. of Agriculture, ATMA, KVK and DATTCs of the University.	Regular training programmes organized by Dept. of Agriculture, ATMA, KVK and DATTCs of the University.	Regular training programmes organized by Dept. of Agriculture, ATMA, KVK and DATTCs of the University.	Regular training programmes organized by Dept. of Agriculture, ATMA, KVK and DATTCs of the University.	Regular training programmes organized by Dept. of Agriculture, ATMA, KVK and DATTCs of the University.

Table 1a. Month wise Rainfall received in Telangana State from 01-06-2018 to 28.12.2018

Month	Normal	Rainfall during 2018	Rainfall during 2017	% deviation to normal	Status
June, 2018	129.9	148.9	189.7	15	Normal
July, 2018	242.7	170.1	146.3	-30	Deficit
August, 2018	218.7	259.0	192.4	18	Normal
September, 2018	128.0	83.1	118.8	-35	Deficit
S W Monsoon	**719.3**	**661.1**	**647.2**	**-8**	**Normal**
October, 2018	96.5	16.4	126.9	-83	Scanty
November, 2018	24.1	1.3	2.6	-95	Scanty
December, 2018	3.9	19.7	0.1	418	Excess
N E Monsoon	**124.5**	**37.4**	**129.6**	**-70**	**Scanty**
Cumulative Total (01-06-2018 to 28-12-2018)	**843.8**	**698.5**	**776.8**	**-17**	**Normal**

South West Monsoon (01.06.2018 – 30.9.2018)

During the South-west monsoon period, a total of 661.1 mm rainfall received in Telangana as against normal rainfall of 719.3 mm showing deviation -8.09 % with over all status being normal.

North-East Monsoon (01.10.2018 to 28.12.2018)

Normally, the Telangana state receives only 14% rainfall during North East monsoon. North East normal rainfall is 129.5 mm. As against normal rainfall of 126.1 mm and only 37.40 mm has been received till 31.12.2018 with per cent of deviation over normal is -70%.

Table 1b. District wise average rainfall for the period from 1.6.2018 to 27.12.2018

S. No.	District	Normal annual rainfall	Cumulative total from 01.06.18 to 27.12.18 (in mm)						Status
			During the period			Corr. Period of		% Dev. of current actual over previous	
			Normal	Actual	% Dev.	Actual	% Dev.		
1.	Adilabad	1,199.0	1130.4	1291.0	14	909.8	-20	42	Normal
2.	Komarambheem	1,195.5	1132.3	1171.2	3	717.2	-37	63	Normal
3.	Mancherial	1,145.3	1089.2	1018.8	-6	739.6	-32	38	Normal
4.	Nirmal	1,127.6	1072.2	878.8	-18	815.5	-24	8	Normal
5.	Nizambad	1,039.0	982.3	845.7	-14	714.4	-27	18	Normal
6.	Jagtial	1,034.6	964.0	980.8	2	647.2	-33	52	Normal
7.	Peddapalli	1,055.4	996.0	1145.5	15	696.0	-30	65	Normal
8.	Jayashanker	1,180.1	1111.6	1155.2	4	950.9	-14	21	Normal
9.	Bhadradri	1,132.6	1019.8	1101.1	8	970.6	-5	13	Normal
10.	Mahabubabad	1,007.7	920.9	792.3	-14	873.4	-5	-9	Normal
11.	Warangal (R)	1,037.4	959.0	716.5	-25	904.9	-6	-21	Deficit
12.	Warangal (U)	889.5	821.8	718.2	-13	840.7	2	-15	Normal
13.	Karimnagar	898.3	832.3	778.2	-7	732.2	-12	6	Normal
14.	Rajanna	915.3	849.6	657.2	-23	628.8	-26	5	Deficit
15.	Kamareddy	1,029.0	974.3	734.2	-25	880.2	-10	-17	Deficit
16.	Sangareddy	895.4	830.3	450.9	-46	820.6	-1	-45	Deficit

S. No.	District	Normal annual rainfall	Cumulative total from 01.06.18 to 27.12.18 (in mm)						Status
			During the period			Corr. Period of		% Dev. of current actual over previous	
			Normal	Actual	% Dev.	Actual	% Dev.		
17.	Medak	916.9	859.4	511.0	-41	664.4	-23	-23	Deficit
18.	Siddipet	787.3	723.5	486.7	-33	733.7	1	-34	Deficit
19	Jangoan	867.6	794.8	575.9	-28	716.4	-10	-20	Deficit
20.	Yadadri	741.0	692.6	384.8	-44	704.3	2	-45	Deficit
21.	Medchal	770.6	708.2	499.0	-30	1050.1	48	-52	Deficit
22.	Rangareddy	694.6	639.4	432.2	-32	806.9	26	-46	Deficit
23.	Vikarabad	814.3	755.2	476.9	-37	691.7	-8	-31	Deficit
24.	Mahabubnagar	599.4	564.3	448.9	-20	786.9	39	-43	Deficit
25.	J. Gadwal	533.0	500.1	328.9	-34	694.1	39	-53	Deficit
26.	Wanaparthy	579.6	544.0	364.3	-33	637.6	17	-43	Deficit
27.	Nagarkurnool	642.3	602.6	365.7	-39	533.6	-11	-31	Deficit
28.	Nalgonda	704.2	653.4	376.2	-42	648.1	-1	-42	Deficit
29.	Suryapet	836.8	780.0	575.6	-26	687.5	-12	-16	Deficit
30.	Khammam	1,036.0	940.8	919.8	-2	857.1	-9	7	Normal
Telangana Average		905.3	843.8	698.5	**-17**	**776.8**	**-8**	**-10**	Normal

Source: Directorate of Economics & Statistics, Govt. of Telangana, Hyderabad
Date is provisional & Limits for deviation from Normal
Excess=(+20% & above), Normal=(+19% to -19%), Deficit= (-20% to -59%), Scanty==(-60% to -99%), No rain=(-100%)

Overall, the average rainfall received in Telangana state from June to December, 2018 was recorded as 698.5 mm as against the normal rainfall of 843.8 mm with deviation of -17 per cent with over all status being normal. Among the districts, Adilabad District received the highest rainfall of 1291 mm while Jogulamba Gadwal District received lowest rainfall of 328.9 mm. The district wise rainfall, status and deviation of rainfall during the period from 01.06.2018 to 27.12.2018 are presented in Table 3.

Table 2: Status and deviation of rainfall during the period from 01.06.2018 to 27.12.2018

S. No.	Districts	No. of districts	Status & deviation
1	-- Nil --	0	Excess (20% & above)
2	Adilabad, Kumarambheem, Mancherial, Nirmal, Nizamabad, Jagtial, Peddapalli, Jayashankar, Bhadradri Kothagudem, Mahabubabad, Warangal (U), Karimnagar and Khammam	12	Normal (+ 19% to -19%)
3	Warangal (R), Rajanna Sirisilla, Kamareddy, Sangareddy, Medak, Siddipet, Jangaon, Yadadri, Medchal, Rangareddy, Vikarabad, Mahabubnagar, Jogulamba Gadwal, Wanaparty, Nagakurnool, Suryapet and Nalgonda	18	Deficit (-20% to -59%)

A.2. Crop coverage

In Telangana state, as against normal area of 9.48 lakh ha, the actual rice area covered during *kharif* 2018 was 9.62 lakh ha (81.68%) compared to 7.63 lakh ha during *kharif*, 2017 (Table 3). The paddy area in Telangana state is expected to increase 2 fold within 3-4 years once the ongoing irrigation projects are completed.

Table 3: District wise normal and actual rice area (ha) covered during *Kharif*' 2018

S. No.	District	Normal area (ha)	Actual area (ha)	% of coverage over normal area
STZ				
1.	Rangareddy	14669	10768	73.4
2.	Medchal	3064	3414	111.4
3.	Vikarabad	11893	9250	77.8
4.	Mahabubnagar	33089	28526	86.2
5.	Nagarkunrnool	10216	14585	142.8
6.	Wanaparthy	26673	28736	107.7
7.	Jogulamba Gadwal	15268	15184	99.4
8.	Nalgonda	63002	56558	89.8
9.	Suryapet	70909	63019	88.9
10.	Yadadri	34066	36723	107.8
		2,82,849	**2,66,763**	**94.3**
CTZ				
11.	Medak	38068	30244	79.4
12.	Sangareddy	16975	16879	99.4
13.	Siddipet	31497	29988	95.2
14.	Waranagal (R)	33337	32459	97.4
15.	Wanrangal (U)	12803	13910	108.6
16.	Jayashankar	59348	57258	96.5
17.	Janagoam	21698	21912	101.0
18.	Mahabubabad	31878	33184	104.1
19.	Khammam	60547	52965	87.5
20.	Kothagudem	43405	40107	92.4
		3,49,556	**3,28,906**	**94.1**
NTZ				
21.	Nizamabad	82489	93667	113.6
22.	Kamareddy	40272	48599	120.7
23.	Karimnagar	36347	44946	123.7
24.	Jagtial	41118	58568	142.4
25.	Peddapalli	43107	53913	125.1
26.	Siricilla	22202	21077	94.9
27.	Adilabad	1019	147	14.4
28.	Mancherial	25029	33075	132.1
29.	Nirmal	16102	21294	132.2
30.	Asifabad	9942	4121	41.5
		3,17,627	**3,68,733**	**116.1**

Source: www.tg.agrisinet.com, Directorate of Agriculture, Telangana state and concerned districts ADAs and MAOs.

A.3. Crop stage at the time of survey

The survey was conducted in the selected districts when the crop was between maximum tillering and booting to maturity stage.

A.4. Crop rotation practiced

Rice-rice was the predominant cropping system in all the surveyed districts varying from 50-60%. The other systems found were green manure-rice-rice, rice- maize, rice-groundnut, rice-fallow, rice-pulses, rice-sesame and rice-rice-vegetables depending on the water availability and other factors.

A.5. Varietal profile and reasons for cultivation of local varieties

During the POS visit, an approximate data on variety wise rice area were collected from Dept. of Agriculture and farmers and presented in Table 4a and 4b. The major varieties grown in the surveyed districts during *kharif*, 2018 were Samba Mahsuri (BPT 5204), Telangana Sona (RNR 15048), Jai Sreeram, HMT Sona, Kunaram Sannalu, MTU 1010, Siddi, Bathukamma, JGL 11470, IR 64, Pooja, Chintu, Omkar, Kedar, MTU 1061, MTU 1153, MTU 1001, Tellahamsa *etc*., whereas the private hybrids grown particularly in Nalgonda, Warangal and Karimnagar districts were Arize 6444 gold, Tej (Bayer crop science Ltd.), KPH 412, KPH 272 (Kaveri seeds Pvt., Ltd.,), Karishma, Champion (Nujiveedu Pvt. Ltd.,), 27P31, 27P25, 27P63, 27P38 (Pioneer Ltd.,). But, the area under hybrids during *kharif* season is very less compared to *Rabi* season. The pre-release rice culture JGL 24423 was also cultivated in some areas of Jagtial, Mancherial and Nizamabad. Among the fine grain popular varieties, the area under BPT 5204 was ranging from 8.0 – 63.0% as compared to previous *kharif*, 2017 (13.98-48%) in all the surveyed districts. It was observed that, few farmers shifted from BPT 5204 to MTU 1010 and KNM 118 due to severe incidence of BPH during *kharif*, 2017. A shift from fine (BPT 5204 – 19.73%) to coarse varieties (MTU 1010 – 29.76% and KNM 118 – 19.75%) was also observed in Medak district.

Telangana Sona, a short duration (125 days) fine grain variety has replaced the BPT 5204 and occupying considerable area in Telangana ranging from 1.5 to 59.84% in the district survyed. Among the surveyed districts maximum area under Telangana Sona was covered in Jogulamba Gadwal (59.84%) followed by Vikarabad (58.43%), Wanaparthy (49.42%) and Karimnagar (20%). Majority of the farmers preferred the Telangana Sona because of its short duration, super fine grain and blast resistance and suitability to late planted situations and relatively requires less water. In Wanaparthy and Jogulamba Gadwal districts, the farmers were growing the paddy varieties *i.e*. Omkar, Kedar and Sowbhagya (Research paddy – 10 kg pack fine grain type) during *kharif*, 2018. Upon close observation, it was found that all these varieties are akin to RNR 15048 (grain type and plant stature).The team also compared the grain type of RNR 15048, Kedar and Omakar and shown to farmers. During the visit, it was observed that, some of the private firms are selling released varieties of PJTSAU (RNR 15048) in the name of research paddy, which needs to be curbed through development of efficient seed monitoring mechanisms.

Among the coarse grain varieties, farmers were aware of Kunaram Sannalu (KNM 118) and Bathukamma (JGL 18047) in all the surveyed districts. The per cent coverage under KNM-118 was ranged from 1.54 to 21.47% whereas Bathukamma ranged from 0.50-5.62%. The two varieties are mainly preferred by the farmers owing to their higher yields and non-shattering nature, which are replacing MTU 1010 in the surveyed districts. Similarly, a new pre-release

culture JGL 24423 (0.27 – 12.0%) is becoming very popular in Northern Telangana Zone of Telangana state. This culture was preferred by the farmers due to its high yielding, short duration, BPH tolerance and non-shattering nature.

Table 4a: District wise, variety wise rice area (ha) covered during *Kharif*, 2018

Variety	**NRML**	**NZB**	**KMR**	**KRMN**	**JGL**	**PDP**	**NLG**
Samba Mahsuri	3969 (18.64)	45588 (48.67)	22978 (47.28)	12585 (28.0)	4685 (8.0)	33965 (63.0)	25451 (45.0)
Telangana Sona	319 (1.50)	6126 (6.54)	4116 (8.47)	8989 (20.0)	5857 (10.0)	3235 (6.0)	5656 (10.0)
Jai Sree Ram	2721 (12.78)	14303 (15.27)	10570 (21.75)	4495 (10.0)	12299 (21.0)	1078 (2.0)	-
HMT Sona	547 (2.57)	9226 (9.85)	4252 (8.75)	2247 (5.0)	7614 (13.0)	539 (1.0)	679 (1.2)
Pooja	238 (1.12)	4908 (5.24)	1205 (2.48)	-	-	-	8540 (15.1)
Chintu	166 (0.78)	4552 (4.86)	1808 (3.72)	2023 (4.5)	4685 (8.0)	-	1046 (1.85)
Omkar	-	-	-	-	-	-	
Kedar	-	-	-	-	-	-	
MTU1010	6122 (28.75)	1480 (1.58)	1322 (2.72)	4944 (11.0)	2928 (5.0)	4313 (8.0)	5288 (9.35)
MTU 1001	-	-	-	-	586 (1.0)	-	
Kunaram Sannalu	4572 (21.47)	1442 (1.54)	714 (1.47)	5394 (12.0)	8200 (14.0)	5391 (10.0)	4807 (8.5)
Bathukamma	909 (4.27)	3250 (3.47)	972 (2.0)	899 (2.0)	1757 (3.0)	539 (1.0)	1697 (3.0)
Siddi	-	-	-	-	-	-	537 (0.95)
Tellahamsa	-	-	-	-	-	-	848 (1.5)
MTU 1153	-	-	-	1798 (4.0)	586 (1.0)	2965 (5.5)	-
MTU 1061	-	-	-	-	-	-	-
JGL 24423	-	253 (0.27)	486 (1.0)	351 (0.78)	7028 (12)	809 (1.5)	-
IR 64	398 (1.87)	665 (0.71)	-	-	586 (1.0)	647 (1.2)	-
JGL 11470	-	-	-	-	586 (1.0)	-	-
Others	1331 (6.25)	1873 (2.05)	175 (0.38)	1223 (2.47)	879 (1.51)	431 (0.80)	629 (1.14)
Total	**21294**	**93667**	**48424**	**44946**	**58276**	**53913**	**55179**

Table 4b: District wise, variety wise rice area (ha) covered during *Kharif*, 2018

Variety	SURP	KMM	MDK	WNP	J.GAD	VKBD
Samba Mahsuri	27035 (42.9)	28601 (54.0)	5967 (19.73)	6592 (22.94)	2695 (17.75)	487 (5.27)
Telangana Sona	6094 (9.67)	2383 (4.5)	2084 (6.89)	14115 (49.12)	9086 (59.84)	5405 (58.43)
Jai Sree Ram	391 (0.62)	-	2834 (9.37)	1026 (3.57)	238 (1.57)	-
HMT Sona	964 (1.53)	530 (1.0)	-	256 (0.89)	135 (0.89)	-
Pooja	9907 (15.72)	5826 (11.0)	-	-	-	-
Chintu	1134 (1.8)	794 (1.5)	859 (2.84)	-	-	-
Omkar	-	-	-	2739 (9.53)	1099 (7.24)	289 (3.12)
Kedar	-	-	-	853 (2.97)	386 (2.54)	-
MTU1010	4065 (6.45)	2648 (5.0)	9001 (29.76)	1003 (3.49)	530 (3.49)	1163 (12.57)
MTU 1001	-	-	-	-	-	142 (1.54)
Kunaram Sannalu	7512 (11.92)	1324 (2.5)	5973 (19.75)	540 (1.88)	285 (1.88)	885 (9.57)
Bathukamma	2313 (3.67)	265 (0.5)	1700 (5.62)	-	-	446 (4.82)
Siddi	-	1589 (3.0)	-	-	-	-
Tellahamsa	2187 (3.47)	-	-	330 (1.15)	84 (0.55)	51 (0.55)
MTU 1153	-	265 (0.5)	-	-	-	-
MTU 1061	-	7415 (14.0)	-	-	-	-
JGL 24423	-	265 (0.50)	-	-	-	-
Others	1418	1059 (1.99)	1827 (6.04)	1282 (4.46)	645 (4.24)	382 (4.12)
Total	**63019**	**52965**	**30244**	**28736**	**15184**	**9250**

Source: Concerned district DAOs, ADAs, MAOs, AMC, Farmers interaction and Scientists from Research Stations, DAATTCs and KVKs.

Approximate figures arrived based on the seed production and sale and farmers interaction during POS visit and Dept. of Agriculture, Govt. of Telangana.

A.6. Minikit visit

The POS team visited the PJTSAU rice minikits (JGL 24423, JGLH1, WGL 962, KNM 733, KNM 1638, RNR 15435, RNR 11718, KPS 2874) at Kulaspur village of Mopal mandal, Nizamabad district. The minikit trials were conducted by DAATTC, Nizamabad. The minikit cultures sown on 13th and 21st June, 2018 were planted on 21st July, 2018. The incidence of leaf

mite and whorl maggot was observed in WGL 962 and KNM 1638. The crop was at booting to panicle emergence stage. The POS team visited the PJTSAU rice minikits (KNM 733 and KNM 1638) at Rajeshwarapuram village of Nelakondapally mandal which were at harvesting stage. The farmer has grown the minikit under organic farming. He has sprayed the Jeevaamrutham @ 3 times during the *kharif*, 2018. The severe incidence of blast, brown spot and grain discoloration was observed in KNM 733, whereas the incidence was very less in KNM 1638.

A.7. Farmer's scientist's interaction programme

The POS team also participated in "farmer and scientist's interaction programme" on rice cultivation organized by DAATTC, Nizamabad (Rudrur (v&m) on 11.09.2018) and DAATTC, Karimnagar (Muppirithota (v), Eligedu (m) on 08.10.2018). A total of 100 farmers from Rudrur, Varni and Kotagiri mandals participated in the programme at Nizmabad.

A.8. Rice yields recorded during previous year (*Kharif*, 2017)

The rice productivity in the surveyed districts during *kharif*, 2017 was in the range of 2250 to 4750 kg/ha. Severe incidence of BPH across the district caused substantial yield losses during *Kharif*, 2017 at later stages of crop growth resulted in poor yields. Among the varieties, BPT 5204 was severely affected across the districts surveyed incurring huge losses. The variation in the yield was also due to deficit rainfall, depletion of ground water in wells/ bore wells and late or non- release of canal water. Majority of the farmers in all the surveyed districts have taken up on an average 5-6 sprays during the crop growth period during *Kharif*' 2017. In few districts like Nizamabad, Karimnagar, Khammam and Nalgonda, they have sprayed 6-8 sprays for the management of BPH. As per the feedback from the Input dealers that, they have given all the recommended molecules, however, none of the chemicals were found effective for control of BPH in paddy during *Kharif*' 2017. The farmers opined that, they never experienced such a massive insect attack of BPH in the past 30 years.

B. Nursery Management

B.1. Seed rate and source

Majority of the farmers using optimum seed rate *i.e*. 50-60 kg/ha for fine grain varieties whereas 75 kg/ha for coarse grain varieties. The majority of the farmers were purchased the seed from TSSDC, DCMS or private input dealers every year / season. During the POS, it was observed that, the farmers are using the 10 kg research paddy seed purchased from private companies.

B.2. Seed treatment

Majority of the farmers are sowing the paddy nurseries without any seed treatment in the surveyed districts, however, small portion of farmers are adopting wet seed treatment to an extent of 25 - 30 % by using carbendazim @ 1.0 g per kg of seed per liter of water by soaking for 24 hours. It was observed that, 80 – 90% of the farmers in the surveyed villages are aware of the importance of seed treatment for the management of diseases in paddy.

B.3. Organic manures and inorganic fertilizers applied

In raising of the rice nurseries majority of the farmers applied inorganic fertilizers @ 2-10 kg of N, 1-6 kg P and 2.0-3.0 kg K_2O in the farm of DAP/ complex fertilizers. Few farmers used FYM or sheep manure @ 600-850 kg per 3-4 cents of nursery area.

C. Main Field Management

C.1. Fertilizer application

Information on application of fertilizers in the surveyed districts varied to a greater extent. Majority of the farmers are applying NPK in the form of complex fertilizers *viz.*, 18-46-0, 16-20-0-13, 17-17-17, 19-19-19, 28-28-0, 20-20-13. Among the complex fertilizers, DAP is the most commonly used as basal fertilizer across the districts surveyed, except in Wanaparthy and Jogulamba Gadwal. Majority of the farmers are applying DAP or other complex fertilizers (50-150 kg/acre) as basal and top dressing of nitrogen in the form of Urea (150-200 kg/acre) and potash in the form of MOP (25-50 kg/acre) in 2-3 split doses coinciding with initiation of tillers, maximum tillering, booting and just before panicle initiation depending on duration of the varieties cultivated (Table 5). In addition, the farmers are also applying zinc sulphate in the form of chelated zinc sulphate formulation (35%) and 25% as foliar application at the time of tillering stage (15-30 DAT).

Table 5: District wise usage of major nutrients during *Kharif*' 2018 for rice cultivation

Nutrient (kg/ha)	Nirmal	Nizamabad/ Kamareddy	Karimnagar/ Peddapalli/ Jagtial	Medak	Nalgonda/ Suryapet	Khammam	Wanaparthy / Jogulamba Gadwal	Vikarabad
N	150-160	200-220	100-180	130-160	180-210	157-170	160-200	120-150
P_2O_5	50-105	80-120	60-80	50-105	60-115	100-120	100-125	50-75
K_2O	25-60	25-75	30-40	25-40	37.5-50	37.5-50	40-60	25-40

Source: Concerned district DAOs, ADAs, MAOs and AEOs; Scientists from Research Stations, DAATTCs and KVKs.

C.2: Manures and organic amendments

Majority of the farmers (35-45%) were growing the green manure crops *viz*., *Crotalaria* and Sunhemp preceding to rice in Peddapalli, Nizamabad, Khammam, Nalgonda and Suryapet, while in other districts usage was less than 10%. Majority of the farmers opined that, the timely availability of green manure seed is the major issue being faced by them. Usage of poultry manure in Nizamabad, Kamareddy, Khammam, Karimnagar was in the range of 5-18% and application of FYM or Sheep manure was minimum (5-22%). Across the districts surveyed, sulphide injury, salinity or alkalinity was found to be the major problem in Nalgonda, Suryapet, Wanaparthy, Jogulamba Gadwal, Peddapalli and Medak districts and its intensity is increasing several folds due to mono-cropping of rice, improper drainage system and excess usage of inorganic fertilizers.

C.3: Method of planting

Majority of the farmers adopted random or zig-zag method of planting. Direct seeding with drum seeder under puddled conditions and machine planting are gaining popularity among the progressive farmers in Khammam, Jagtial, Karimnagar, Nizamabad, Suryapet, Nalgonda and Peddapalli, in view of shortage of labour. Machine planting is becoming popular among the farming community due to labour shortage. During the POS visit, majority of the farmers were showing the interest on machine planting. In few districts, the price of machine and manual planting were equal (Rs. 3000 – 3500). In view of untimely rains and labour shortage for transplanting during peak season, the machine planting is the only option to finish the transplantings within short time. In this connection, the PJTSAU in collaboration with Dept. of

Agriculture, Govt. of Telangana has conducted the demonstration to farmers at RRC, Rajendranagar, RARS, Jagtial, Palem and Warangal on machine planting of paddy involving 6-8 machine transplanters manufactures, public representatives and farmers. The main aim of this programme was to encourage the farmers towards the machine transplanting as well as to establish the custom hiring centers for giving the employment to rural youth in the villages.

C.4: Planting density

A plant population of 19-24 hills/m^2 is generally maintained in majority of the fields irrespective of the variety and planting time.

C.5: Intensity of weeds

Weed intensity was in the range of low to medium in all the major rice growing areas and predominant weedflora includes *Echinocloa colanum, E. crusgalli, Cyandon dactylon, Cyprus rotundus, Leersia hexandra, Panicum ripens, Euphorbia spp. and Parthenium spp*.

C.6: Method of weed control /any weedy rice

Due to non-availability of labour, the farmers in the surveyed districts are using various pre- and post-emergence herbicide molecules depending upon the availability in the districts. The most commonly used herbicides used in nursery and main field are listed below:

Pre / Post Emergence	**Herbicides used by the farmers**
Pre-emergence	Benthiocarb@ 75 ml or Pretilachlor+safener@ 40 ml or Butachlor @ 50 ml or Pyrazosulfuron ethyl @ 5 g in 10 liters of water for five cents nursery
	Butachlor @ 1.25 litres /acre (or) Anilophos @ 500 ml/acre (or) Pretilachlor @ 600 ml /acre (or) Oxadiargyl @ 35 grams (mixed with 500 ml of water) within 3 to 5 days of transplanting.
Post-Emergence	Pyrazosulfuran ethyl @ 80-100 g/ acre at 8-12 DAT or Bensulfuron methyl + Pretilachlor @ 4 kg /acre at 3-5 DAT. 2,4- D SS@ 400 g / acre at 20-25 DAT to control broad leaved weeds or Bispyribac sodium @ 100 ml/acre at 20 DAT to control both grassy and broad leaved weeds.

Majority of the farmers were taking up manual weeding at 25-35 DAT in all the surveyed districts. Under problematic soils the farmers are taking up inter-cultivation to create aeration at root zone around 30-45 DAT along with application of Urea + Sprint. This practice is helping in enhancing the nutrition of the plants. Irrespective of the districts surveyed, the problem of weedy rice was not observed.

C.7: Needs of the farmers

- Development of high yielding multiple resistant varieties having BPT 5204 quality and duration.
- Improvement of Telangana Sona for lodging tolerance and Bathukamma for grain test weight.
- Studies on source of origin and authencity of private variety Ganga Kaveri (fine and coarse grain) which has become popular in Nizamabad district for the past few years needs to be carried out.

- Development of multiple insect pests and disease resistant hybrids and varieties, particularly for BPH/ YSB / blast /sheath rot / grain discoloration.
- Supply of leveling machinery, transplanters, power weeders suitable for mechanized planting / direct seeding through custom hiring centers.
- Enhancing of minimum support price (Rs. 2700/- per quintal) in view of the increased cost of cultivation.

D: Inputs

In the surveyed districts, majority of the small holder farmers are hiring the tractor drawn implements *viz*., cultivators, rotavators, disc plough, MB plough, leveler for their field preparation. The timely availability of tractor for rice field preparation has been increased drastically due to implementation of Govt. subsidy scheme on tractor and tractor drawn implements. A minimum of 2 tractors were available in a small village for field preparation. The progressive farmers as well as few marginal farmers are having their own tractor drawn implements for undertaking rice cultivation. Majority of the farmers (90-95%) were going for purchase of new seed from local dealers, Dept. of Agril. cooperative societies and Research stations. Only few farmers (5-10%) were using their own seed for rice cultivation. Majority of the farmers were asking for new varieties. As far as the source of irrigation water is concerned, in all the surveyed districts the rice crop is grown under wells/ bore wells (65%) and remaining are through canal water and tanks (35%). Electric motors were being used by all the farmers (98%) in the surveyed districts. During the survey farmers have expressed that there was no scarcity of power in the villages due to the intervention of Govt. of Telangana in providing 24 hours continuous power supply. Majority of the farmers have expressed their satisfaction that sufficient quantities of fertilizers and pesticides were made available timely through local input dealers, co-op societies and other agencies under the supervision of MAOs at mandal / ADAs at divisional level.

The farmers were receiving advices with regard to fertilizer and pesticide recommendations through concerned Mandal Agricultural Officers, Scientists of DAATTCs, KVKs and University Scientists, Kisan call centre and input dealers. However, the progressive farmers are managing the crop based on self experience by timely application of fertilizers / pesticides or following the recommendations of university vyavasaya panchangam / Annadata and other publications. Now a days, farmers are uploading the photographs of pest or disease infected field / plants to the scientist / MAOs through Whatsapp for suitable control measures. In order to forecast the incidence of pests and diseases in rice, Principal Scientist (Rice), PJTSAU, Rice Research Centre, Rajendranagar, has given alert messages (twice in a month) to farmers, Dept. of Agriculture, DAATTCs, KVKs, NGOs and wide publicity was given through print and electronic media.

E. Biotic constraints

E.1: Insect pests & Diseases

The pest scenario in rice cultivation has been assessed in the 13 surveyed districts during *kharif*, 2018 in response to adoption of new varieties, cultivation practices and pest control methods being followed. The district wise insect pest scenario has been presented in Table 6. Among the major insect pests of rice, BPH was severe in Khammam (3-35%), Nalgonda (3-30%), followed

by Jogulamba Gadwal (5-30%) and Wanaparthy (3-28%). The BPH incidence was less severe across the districts during *kharif*, 2018 as compared to *kharif*, 2017. In Telangana state, BPH was the most ravaging insect pest in previous *kharif*. Overall, the cultivation of long duration and susceptible varieties like BPT 5204, Jaisreeram, Supper Aman, Ankur Sona, Pooja, Aman Sona, *etc*., and high response to nitrogenous fertilizers due to frequent rains and use of resurgence causing chemicals like chlorpyriphos 50 EC, Profenophos, other synthetic pyrethroids and Bios, stagnated water in the field resulted in high BPH incidence. Keeping the importance and constraint posed by the BPH during *Kharif*, 2017, the PJTSAU as well as Dept. of Agriculture, Govt. of Telangana has created awareness among the farming community on management practices of BPH through training programmes, diagnostic field visits and alert messages. Owing to creation of awareness and wider publicity on BPH management, few farmers (20-25%) provided the alleyways across the districts surveyed. Even now, lot of rice areas was found without provision of alley ways. It was observed that, majority of the farmers have taken up timely sprayings for control of BPH across the districts surveyed.

Among the insecticides, Pymetrozine and Bios were mostly widely used for control of BPH. It was also observed that, majority of the farmers in the surveyed villages are using the Bio's (**Locker or Royal BPH**) for control of BPH in Paddy. Usage of Bio's was high in Khammam, Suryapet and Peddapalli districts as compared to other surveyed districts. As informed by the farmers, they are purchasing the Bio's from Guntur district of Andhra Pradesh incurring of Rs. 400-450 per acre. The farmers from Khammam, Badradri Kothagudem, Mahabubabad, Warangal, Nalgonda, Suryapet are going to Guntur district of Andhra Pradesh for purchase of bio's. As per the farmer's feedback, the bio's are effectively controlling the BPH as compared to that of Pymetrozine / Dinotefuron. The cost of the bios was very less compared to the insecticides and there is no chemical formula. Spraying of several bio-formulations with high expectations on good plant growth, profuse tillering and effective BPH control due to knock down effect was a common practice in the surveyed districts.

Table 6: District wise insect pest damage recorded during *Kharif*, 2018

S. No.	District	BPH	YSB	Leaf mite	Panicle mite	Gall midge	Rice hispa	Leaf folder
1.	Nirmal	3-10	5-10	-	3-5	3-5	5-12	5-12
2.	Nizamabad	5-10	5-12	-	3-10	2-5	5-35	5-40
3.	Kamareddy	5-15	3-8	-	5-10	3-5	2-10	10-20
4.	Karimnagar	3-8	3-8	-	3-10	2-5	3-15	3-15
5.	Jagtial	5-15	3-8	-	3-8	5-10	3-5	5-20
6.	Peddapalli	3-10	5-9	-	3-8	5-15	3-10	3-10
7.	Nalgonda	3-30	3-9	5-20	3-5	-	5-8	5-8
8.	Suryapet	3-15	5-8	5-10	2-6	-	3-8	2-5
9.	Khammam	5-35	3-7		5-8	2-5	2-5	3-8
10.	Medak	5-15	5-10	5-25	5-10	2-5	6-20	5-10
11.	Wanaparthy	3-28	3-8	-	5-25	2-5	2-5	5-9
12.	Jogulamba Gadwal	5-30	3-9	-	5-15	3-5	2-5	1-5
13.	Vikarabad	3-15	2-8	-	3-5	2-5	3-12	3-8

Source: Concerned district ADAs, MAOs, AEOs and Farmers Interaction

Incidence of rice yellow stem borer ranged from 2-10% across the districts with maximum incidence reported from Nizamabad (5-12%), Medak and Nirmal (5-10%). Stem borer incidence was less in all the districts surveyed. Overall, The gall midge incidence was minimal except in late planted situations of Jagtial, Peddpally, Karimnagar and Nizamabad districts.

Among the minor insect pests, the incidence of leaf folder was severe in Nizamabad (5-40%) district at reproductive stage followed by Jagtial (5-20%) and Kamareddy (10-20%) districts. The incidence of rice hispa was severe in early stage of crop growth at Nizamabad (5-35%) followed by Medak (6-20%) and later, the pest incidence was reduced. The majority of the farmers were sprayed the Profenophos @ 2 ml per litre for control of rice hispa during early stage of crop growth (25 – 40 DAT). The panicle mite incidence ranged from 3-25% across the districts and was severe in Wanaparthy (5-25%) and Jogulamba Gadwal (5-15%) districts.

Severe incidence of leaf mite was observed in Nalgonda (5-20%) and Medak (5-25%) districts at maximum tillering stage to booting stage. Initially, the farmers and dept. officials suspected it as rice tungro disease in Medak district. On close observation, the reddening of leaves was due to severe incidence leaf mite. On enquiry at both the districts, farmers told that, there was no rainfall since 10-15 days, coupled with high temperatures (30-35°C). The prolonged dry spell coupled with favourable temperatures accentuated leaf mite populations. The leaf mite symptoms were severe in rice variety, Super Aman at Medak district.

Perusal of the data on the incidence of various diseases (Table 7) revealed that the incidence of BLB was severe in 2 districts, mainly Nizamabad (5-65%) and Suryapet (5-55%). Heavy rains coupled with heavy winds, high humidity and more usage of nitrogenous fertilizers pre-disposed the crop to BLB infection. Overall, the incidence of diseases in paddy during *kharif*, 2018 in different districts of Telangana revealed that, Bacterial Leaf Blight (BLB) was the major disease causing substantial yield losses in paddy. Leaf blast incidence was moderate to severe in Nizamabad (5-20%), followed Peddapalli (10-15%), Kamareddy (5-15%) and Khammam (5-15%), whereas 3-10% leaf blast incidence was observed in other districts. The neck blast incidence ranged from 3-20% and incidence was more in Peddapalli (5-20%), followed by Suryapet (10-15%) and Nizamabad (5-15%). Sheath Blight incidence was moderate to severe in Jogulamba Gadwal (10-50%) and the incidence was moderate in other districts. Sheath rot incidence was also moderate in many districts with highest incidence reported from Jogulamba Gadwal (3-20%). Similarly, grain discoloration was also moderate to severe across the districts with higher incidence in Wanaparthy and in Jogulamba Gadwal district (5-25%). However, the incidence of stem rot was relatively low in all the surveyed districts except Jogulamba Gadwal district, wherein severe incidence of stem rot (10-50%) was recorded during *Kharif*' 2018 (Table 7 & 8).

In Nizamabad district, the BLB incidence was severe in Kotagiri, Varni, Bodhan and Rudrur mandals, whereas the incidence was less in Dichpally and Mopal mandals. In Nizamabad, the BLB infection started during second fortnight of August, 2018 in BPT 5204 (Table 9). The BLB incidence was severe in early planted crop, which is at panicle emergence stage as compared to late planted crop. The crop at maximum tillering stage has escaped from BLB as compared to the crop at panicle emergence stage. The farmers have already sprayed (3-4 times) antibiotics (Plantamycin or Speedomycin or Krosin - AG) or Kasugamycin + Copper oxy chloride (Konica)

and Bios for control of BLB at booting stage. It was observed that, BLB has spread to the adjacent fields through irrigation water. In most of the surveyed villages, further spread of BLB infection ceased.

Table 7: District wise per cent disease incidence recorded during *Kharif*' 2018

S.No.	District	BLB	Leaf blast	Neck blast	Sheath blight	Sheath rot	Grain discoloration
1.	Nirmal	1-5	5-10	3-5	3-5	5-8	3-8
2.	Nizamabad	5-65	5-20	5-15	3-10	3-8	3-9
3.	Kamareddy	5-10	5-15	5-8	10-15	5-10	3-20
4.	Karimnagar	1-5	5-10	5-10	3-8	3-12	3-18
5.	Jagtiyal	5-15	3-5	7-12	5-8	5-12	5-20
6.	Peddapalli	-	10-15	5-20	5-15	5-8	3-10
7.	Nalgonda	5-10	3-8	7-10	3-5	3-10	5-12
8.	Suryapet	5-55	5-10	10-15	5-15	5-15	3-20
9.	Khammam	-	5-15	3-18	5-8	3-15	5-10
10.	Medak	-	8-10	5-8	3-10	3-15	3-10
11.	Wanaparthy	-	5-8	7-9	10-12	5-15	5-25
12.	J. Gadwal	-	5-10	5-8	10-50	3-20	5-25
13.	Vikarabad	-	8-10	5-12	5-7	5-8	3-10

Source: Concerned district ADAs, MAOs, Scientists from Research Stations, DAATTCs, KVKs and farmers interaction.

Table 8: District wise major pests and diseases recorded during *Kharif*' 2018

S. No.	District	Major pests	Major disease
1.	Nirmal	Hispa and Leaf folder	Blast
2.	Nizamabad	Hispa and Leaf folder	BLB
3.	Kamareddy	BPH and Leaf folder	Grain discoloration
4.	Karimnagar	Hispa and Leaf folder	Sheath rot and grain discoloration
5.	Jagtial	BPH and Leaf folder	Grain discoloration
6.	Peddapalli	Hispa and Leaf folder	Blast
7.	Nalgonda	BPH and leaf mite	BLB
8.	Suryapet	BPH	BLB
9.	Khammam	BPH	Blast and sheath rot
10.	Medak	BPH and Leaf mite	Blast
11.	Wanaparthy	BPH and Panicle mite	Sheath rot and grain discoloration
12.	Jogulamba Gadwal	BPH and Panicle mite	Stem rot and sheath blight
13.	Vikarabad	BPH	Blast

Source: Concerned district ADAs, MAOs, Scientists from Research Stations, DAATTCs, KVKs and farmers interaction during the POS visits.

The BLB incidence ranged from 5-65% in the surveyed villages, irrespective of varieties (BPT 5204, Jai sreeram and Ganga Kaveri). However, among all the varieties examined, BPT 5204 has succumbed to severe BLB infection with disease score ranging from 5-7 on 0-9 scale. The

variation in occurrence of BLB in different villages of Nizamabad district was due to influence of weather conditions, varietal pattern, and spread of bacterial inoculum through irrigation water and usage pattern of nitrogenous fertilizers.

Reasons for high incidence of BLB in Nizamabad district during *Kharif*, 2018.

- Continuous cultivation of BLB susceptible variety (BPT 5204) during *kharif* season in Nizamabad district.
- The BLB infection initiated coinciding with rains received from 9th to 23rd August, 2018 in different villages. High humidity (81-100%), intermittent rains prevailed during this period coupled with top dressing of high doses of Urea @ 60-70 kg/acre aggravated the spread of the BLB in the rice fields.
- Despite, severe BLB incidence in previous *kharif*, it was observed that majority of the farmers neither cultivating BLB resistant varieties *i.e*. Improved Sambha Mahsuri (RP Bio 226) nor taking up prophylactic measures. Some of the farmers expressed that they have cultivated improved sambha masuri during 2016 and 2017 and found it to be resistant to BLB. However, the farmers opined that, marketing and grain discoloration are the major problems faced by them with this variety.
- Therefore, it was suggested that the farmers growing BPT 5204 and other BLB susceptible varieties need to be vigilant and take up suitable remedial measures or shift to BLB resistant varieties like RP BIO 226 (Improved Samba Masuri) in endemic areas.

In Suryapet district, the BLB incidence was observed from 10th September onwards in small patches at Bethavole village of Chilkur mandal. However, the BLB incidence was not observed in adjacent villages. The farmers and input dealers initially diagnosed the BLB as leaf mite damage and sprayed the miticides at initial stages of the BLB infection. It was observed that, the majority of farmers are spraying the bactericides along with insecticides, fungicides and bios. The farmers have taken up the 3 sprays within 15 days (1st: Azoxystrobin + Plantamycin + Pymetrozine; 2nd: Plantamycin and 3rd: Streptomycin sulphate - Krosin – AG).

Stem Rot: The stem rot incidence was observed in Jogulamba Gadwal and Medak districts. In Beerolu village of Jogulamba Gadwal mandal and district, the severe incidence of stem rot (50-60%) and sheath blight (7-9 rating on 0-9 scale) was observed in BPT 5204 variety. The mycelium and sclerotia was also observed on infected plants. The plants in entire field were dried in patches. The field was located in downstream of a small tank, and was a saline patch wherein the stem rot incidence was severe. Ill drained conditions also prevailed in those patches, which further aggravated the problem. The same field was being infected every year causing yield losses. Further, sheath blight was also observed in adjacent field. On close observation it was noticed that the infection might have been initiated from Typha plants, which are located in the tank and surrounded by paddy field, which played critical role in initiation and spread of the disease. In Medak district, 5-10% stem rot incidence was observed.

Table 9: BLB incidence in different mandals and villages of Nizamabad, Kamareddy and Suryapet districts during *Kharif*, 2018

S. No.	Mandal	Name of village	Variety	BLB incidence (%)
Nizamabad district				
1.	Kotagiri	Pothangal	BPT 5204	10-15%
2.	Bodhan	Bhavanipet	BPT 5204	10-35%
3.	Bodhan	Akasipet	BPT 5204	Nil
4.	Bodhan	Minarpally X road	BPT 5204	Nil
5.	Kotagiri	Ethonda	BPT 5204	8-10%
6.	Kotagiri	Sudlamthanda	BPT 5204	25-30%
7.	Rudrur	Akbar Nagar	BPT 5204	10-20%
8.	Rudur	Rudrur	BPT 5204	10-15%
9.	Varni	Humnapur	BPT 5204	10-40%
6.	Varni	Old Varni	BPT 5204	15-20%
7.	Varni	Srinagar	BPT 5204	15-20%
8.	Varni	Vakeel farm	BPT 5204	10-12%
9.	Varni	Chandur	BPT 5204	5%
10.	Varni	Afandi Thanda	BPT 5204	50%
11.	Varni	Anthapur	BPT 5204	60-70%
12.	Varni	Pottigutta	BPT 5204	40-60%
13.	Varni	Sevalal Thanda	BPT 5204	50%
14.	Varni	Depo Thanda	BPT 5204	50-60%
15.	Varni	Rajipet	BPT 5204	50
16.	Varni	Syedapur	BPT 5204	65
17.	Varni	Shankora	BPT 5204	15
18.	Varni	Mosra	BPT 5204	Nil
19.	Varni	Shankora	BPT 5204	50-60%
20.	Nizamabad	Lingi Thanda	Jai Sreeram	Nil
21.	Nizamabad	Malkapoor Thanda	HMT Sona	Nil
22.	Nizamabad	Mallaram	BPT 5204	Nil
23.	Nizamabad	Thadem	Jai sreeram	Nil
24.	Nizamabad	Thana Kurd	MTU 1010	Nil
25.	Mopal	Kanjar	MTU 1010	Nil
26.	Mopal	Kulaspur	JGL 24423	Nil
Kamareddy district				
27.	Gandhari	Madhuranagar Thanda	BPT 5204	15%
28.	Gandhari	Gouraram	BPT 5204	10%
29.	Gandhrari	Chinna Pothangal	BPT 5204	10%
Suryapet district				
30.	Chilkur	Bethavole	BPT 5204	55-60%
31.	Chilkur	Kotta Kondapur	BPT 5204	5-10%

Source: Field visit and farmers interaction during the POS visit, survey data received from Scientist (Plant Pathology), RS&RRS, Rudrur and Nizamabad district ADAs, MAOs and AEOs.

E.2: Usage of plant Protection Chemicals

The data on usage of plant protection chemicals in rice was found to be maximum (accounting for 95%) in Warangal followed by Karimnagar (93%), Nalgonda (92%), Nizamabad (92%) and Ranga Reddy (50-54%). Majority of the farmers in the surveyed districts are depending on the input dealers for recommendation of plant protection chemicals. On interaction with input dealers and farmers, it was evident that pesticides sales reduced drastically in Khammam and Suryapet districts due to more usage of bio's and unknown chemicals purchased from Guntur district of Andhra Pradesh for control of pests and diseases in paddy. Most commonly used insecticides and fungicides against various insect pests and diseases based on the stage of the crop was presented in Table 10.

E.3: Pesticide application equipment

Hand sprayer was most commonly used in all the surveyed districts up to maximum tillering where as Taiwan sprayer or power sprayer was used during the flowering stage of the crop. Tractor mounted sprayers were used for spraying of pesticides in paddy. The farmers are maintaining the power or Taiwan sprayers and also procured on hire basis during the crop season @ Rs 30 – 40 per tank. Majority of the farmers are spraying the 80-100 liter of spray fluid per acre. It was observed that, majority of the farmers are not spraying the pesticides keeping in mind of wind direction. Further, the farmers are spraying the insecticides over the crop. Due to this, control of BPH has become difficult to the farmers. A few farmers are now using battery operated sprayers also in the surveyed districts.

E.4: Total No. of pesticides sprayed in the crop season

Majority of the farmers in all the surveyed districts have taken up on an average 2-3 sprays during the crop growth period. The sprayings have gone even up to 4-5 for the management of BLB and BPH in Nizamabad and Suryapet. During *Kharif*, 2018, the farmers have sprayed (3-4 times) antibiotics (plantamycin or crocin or speedomycin) for control of BLB in Nizamabad and Suryapet districts. Predominantly, pymetrozine was used for control of BPH.

Table 10: List of insecticides and fungicides used by the farmers in surveyed districts

S. No.	Stage of the Crop	Insect pests/diseases	Chemicals used
	INSECT PESTS		
1.	Nursery	Gall midge, stem borer, whorl maggot and hispa	Carbofuran 3 G, Fipronil 5 SC, Chlorpyriphos 50% EC, Quinalphos 25%EC, Profenophos and Acephate
2.	Vegetative Stage	Hispa, whorl maggot and leaf folder	Phorate 10G, Carbofuran 3G, Cartap Hydrochloride 4G, Cartap hydrochloride 50 SP, Chlorantraniliprole 0.4%G, Chlorphyriphos 50%EC, Acephate, Profenophos, Chlorantraniliprole 18.5 SC
3.	Reproductive Phase	Leaf folder, YSB	Chlorphyriphos 50%EC, Cartap Hydrochloride 4G,Cartap hydrochloride 50SP, Chlorantraniliprole 0.4%G, Chlorantraniliprole 18.5SC, Quinolphos 25SC, Flubendiamide 20WDG, Flubendiamide 39.35 SC, Acephate 75 SP and Acephate 95SG, Chlorantraniliprole 9.6% + Lambda cyhalothrin 4.6% (Ampligo).
4.	Maximum tillering	BPH	Acephate 75 SP and 95SG, Fipronil 0.3%G,

S. No.	Stage of the Crop	Insect pests/diseases	Chemicals used
	to flowering stage		Phenthoate, Ethofenprox, Buprofezin, Dinotefuran (Token, Osheen), Imidacloprid + Ethiprole 80WG, Pymetrozine (Chess), Triflumezopyrim 10% SC (Pexalon), Lamda cyhalothrin,
5.	Max. Tillering to Flowering Stage	Leaf mite / panicle mite	Dicofol, Propargite, Omite, Diafenthiuron and Propargite
	DISEASES		
6.	Nursery	Leaf blast / seed borne diseases	Seed treatment with Carbendazim @ 3g / kg of seed
7.	Vegetative/ Reproductive Phase	Leaf blast/ Neck Blast and stem rot	Propineb 70%WP, Carbendazim 50%WP, Tricyclazole 75%WP, Isoprothiolane 40%EC, Kasugamycin 3%L, Kresoxim methyl 44.3%SC, Azoxystrobin + Tebuconazole (Custodia), Carbendazim + Mancozeb (Saaf / Sprint)
8.	Max.Tillering to Flowering Stage	Sheath Blight BLB	Hexaconazole 5%EC, Propiconozole 25%EC, Validamycin 3%L, Tebuconazole + Trifloxystrobin (Nativo). Copper oxy chloride + Plantmycin or Pauschamycin or Crocin or Agrimycin; Copper oxy chloride + Kasugamycin.
9.	Maximum Tillering to Flowering Stage	Stem rot	Validamycin 3%L, Propiconazole 25%EC, Hexaconazole 5%EC, Iprobenphos 48%EC, Carbendazim 25% + Mancozeb 50% WS (Sprint), Tebuconazole 25.9%EC
10.	Flowering / Milky/ maturity	Sheath rot and Grain discoloration	Propiconozole 25%EC, Carbendazim 12% + Mancozeb 63% WP (Saaf),

Source: Interaction with farmers during POS visits, ADAs and MAOs

E.5: Mixing of different pesticides and spraying of Bio's for the management of pests and diseases:

During *kharif,* 2018, it was observed that, the majority of the farmers in surveyed districts were mixing at least one insecticide and fungicide compulsorily while others are using cock-tail mixtures of various molecules in different proportions. The majority of the farmers were mixing the one or two insecticides + one fungicide / antibiotics and bio's or any other nutrient formulations. Further, it was also observed that, majority of the farmers in the surveyed villages are using the Bio's (**Locker or Royal BPH**) for control of BPH in Paddy. Usage of Bio's was high in Khammam, Suryapet and Peddapalli districts as compared to other surveyed districts. As per the farmer's feedback, the bio's are effectively controlling the BPH as compared to that of Pymetrozine / Dinotefuron. The cost of the bios was very less compared to the insecticides and there is no chemical formula in those bio's.

The following are the common mixtures being used by the farmers in the surveyed districts.

1. Propineb+ Acephate
2. Acephate+ Buprofezin + Carbendazim / Tricyclazole/Saaf
3. Chloropyriphos + Sand + Saff / Sprint
4. Dinotefuran/ Pymetrozine+ Dichlorvos

5. Copper oxy chloride + Plantamycin / Paushamycin + Kasugamycin
6. Chlorantraniliprole + Carbendazim + Mancozeb
7. Lamdacyhalothrin+ Carbendazim / Tricyclazole/Saaf
8. Dinotefuran/ Pymetrozine+ Carbendazim / Tricyclazole/Saaf
9. Chlorpyriphos+Cypermethrin
10. Cartaphydrochloride 50SP + Propiconazole
11. Chlorantraniliprole + Tricyclazole
12. Acephate+Nuvan+ Carbendazim / Tricyclazole/Saaf
13. Phorate 10G +Urea
14. Copper Oxy Chloride + Kasugamycin

F. Indigenous technical knowledge ITK/Farmers practices

In Nizamabad, the BLB infection started during second fortnight of August, 2018 in BPT 5204. Due to severe incidence of BLB, one of the farmer (Sri. K. Yella Rao, Bhavanipeta village of Bodhan mandal) has pruned the infected leaves up to 10 to 15 cm in Jaisreeram variety and the infection was ceased to older leaves. BLB was not observed on the young leaves.

G. Bumper paddy harvest during *Kharif*, 2018 in Telangana state:

The rice productivity in the surveyed districts during *kharif*, 2018 was in the range of 4500 - 6300 kg/ha (Table. 11). The state of Telangana has created a record in paddy production in *kharif*, 2018 season. The paddy production has reached 61 lakh metric tonnes, as against the 42.81 lakh metric tons during 2014 *(Source: Dept. of Agriculture, Govt. of Telangana)*.

The reasons for highest production are as follows:

- Varietal replacement with high yielding, short duration fine and coarse grain varieties like Telangana Sona, Kunaram Sannalu and Bathukamma.
- Congenial weather conditions, timely rainfall, water supply from irrigation projects, good management practices like timely sowing, optimum spacing, water management, efficient nitrogen utilization by neem-coated urea *etc*., helped the state achieve record paddy production.
- Low to medium incidence of pests and diseases except in Nizamabad, Khammam and Suryapet districts.

Table 11: District wise provisional yields (kg/ha) recorded during *kharif*, 2018

S. No.	District	Provisional Yields (kg/ha)*
1	Medak	5500 – 6000
2	Nizamabad	5900 – 6250
3	Peddapalli	5800 – 6300
4	Vikarabad	5400 – 5800
5	Wanaparthy	5800 – 6200
6	Jogulamba Gadwal	4500 – 5200
7.	Nalgonda	5600 – 6000
8.	Suryapet	5700 – 6000
9.	Khammam	5500 – 6200

***Provisional yields calculated based on sampled farmers**

Although, higher yields were recorded during *kharif*, 2018, the farmers were getting only half of the price of consumers' pay. The intermediary margins were on high side. Thus, the

farmers were under the impression that the Minimum support price (MSP) fixed by the GOI was not based on the actual costs of cultivation/production and also urge the Govt. to fix the price taking into consideration the lively-hood income per family/month. It was observed that, there isn't much difference between minimum support price or even market price for fine and coarse grain varieties. So, the farmers prefer to grow the short duration and high yielding coarse grain varieties rather than fine grain varieties. The farmers said that owner of a rice farm is getting on an average a net profit of Rs 6000 - 8000/acre. This amount is insufficient to meet the family needs of not only a small farmer, but also a farmer having 10 acres of land. Almost all the farmers were of the opinion that the present minimum support price provided by the Government is not sufficient and it must be increased to 2000 - 2200 rupees/quintal.

Changes observed among the farming community compared to the previous years:

- The farmers are showing interest on cultivation of short duration, high yielding, multiple disease and pest resistant and fine grain varieties.
- 10-15 per cent of the farmers in the surveyed districts during *kharif*, 2018 were shifted from BPT 5204 to MTU 1010, KNM 118 and other private varieties due to severe incidence of BPH during *kharif*, 2017.
- Due to severe menace of BPH in previous year, few farmers adopted the practice of alleyways.

The points emerged during the POS, *Kharif*, 2018, which needs immediate attention:

- BLB, BPH and Blast are the common problems in Telangana state causing substantial yield losses in paddy every year. Majority of farmers are asking for development of BLB and BPH tolerant fine grain varieties.
- Farmers expressed that, a private variety Ganga Kaveri (fine and coarse grain) whose source is unknown has become popular in Nizamabad district for the past few years. Farmers are getting 45-50 bags during *kharif* with this variety and 55–60 bags during *rabi* with coarse grain variety.
- Phyto-toxicity was observed due to copper oxychloride spraying in paddy for the control of BLB.
- Farmers have also sought information on compatibility of insecticides and fungicides.
- Farmers are spraying several chemicals and bios 5-7 times and still unable to check the BLB and BPH incidence, incurring huge amounts for plant protection (Rs. 1000-1200/application/acre).
- Despite of the severe BPH incidence in previous *kharif*, it was observed that majority of the farmers are not making provision for alley ways.
- Most of the farmers sprayed the Lambda cyahalotrhin (Kabaddi) at 40 days after transplanting which is a resurgence causing chemical for BPH.
- Although varieties (BPT 5204 and Pooja) are susceptible to BPH, the farmers are growing the same long duration fine grain varieties (BPT 5204 and Pooja) during *kharif* season.
- 50-60% of farmers in the surveyed district are growing the green manure crops (*Dhanicha*) before the commencement of *kharif* season.
- Majority of the farmers did not apply FYM or Zinc. Zinc application during *rabi* season is a regular practice in this area.

H. Problems faced by the farmers (Other than biotic & abiotic)

Besides, declining land and water resources, labour shortage was found to be a major production constraint in all the surveyed districts. The area under paddy cultivation in Telangana state is expected to increase up to 20 lakh ha due to ongoing irrigation projects. Once more area brought in to cultivation of paddy due to ongoing irrigation projects, the farmer would not get adequate number of farm workers for paddy cultivation. Rural youth are moving to towns leaving their older parents to attend farming. The social problems need to be addressed, through technology development in the form of simple tools and machinery for increasing efficiency and reducing drudgery. Drum seeder with different spacing's, fertilizer applicator, machine planting, power weeders, drones for spraying of pesticides, reapers, threshers, combine harvesters and bagging machines are essentially needed for the rice on subsidized rates.

I. Cost of Cultivation

The cost incurred for cultivation of paddy / acre was computed by using sampled farmers around 20 in the surveyed districts and details are furnished in the Table 12. More expenditure was incurred on a long duration and susceptible variety like BPT 5204 and less on medium / short duration resistant variety like Telangana Sona.

Table 12: Details of cost of cultivation of paddy in the surveyed different districts (Rupees per acre)

Details of work / expenditure	Nirmal	Medak	Nizamabad	Peddpally	Vikarabad	Wanaparthy & Gadwal	Nalgonda & Suryapet	Khammam
Seed cost (25-30 kg)	900	800	900	850	800	800	900	900
Land preparation for nursery and main field, bunds trimming including tractor and labour charges	4500	4500	5500	5000	5000	5000	5000	4500
Nursery pulling, distribution and transplanting	2000	2000	2200	3000	2500	2500	2200	2600
Fertilizers	3800	2600	3800	3000	3000	3000	3000	3200
FYM/ manures	1500	1000	1500	1200	1500	1500	1100	1500
Granular application and spraying of pesticides	3500	2200	3500	2800	2800	2800	2000	1800
Weedicides	750	750	750	750	750	750	750	750
Hand Weeding	2200	1800	2200	1800	1800	1800	2200	2000
Manual harvesting, threshing	5000	5500	5000	5500	5200	5200	5200	5500
Machine harvesting and transportation	2500	2500	2500	2700	2500	2500	2700	2700
Others – miscellaneous	1200	1000	1200	1000	1000	1200	1000	1200
Total (Manual harvesting) (Sl. No. 1 to 10, 11 and 13)	**25350**	**26550**	**26550**	**24900**	**24350**	**24550**	**23350**	**23950**
Total (machine harvesting) (Sl. No. 1 to 10, 12 and 13)	**22850**	**24050**	**24050**	**22100**	**21650**	**21850**	**20850**	**21150**

Uttar Pradesh (Faizabad)

Districts surveyed: *Faizabad, Ambedkar Nagar, Barabanki, Sultanpur, Basti, St. Kabir Nagar* and *Siddharth Nagar*

Particulars of survey

Districts	Block/Taluka	Villages
Faizabad	Masodha, Pura, Maya, Bikapur, Sohawal and Tarun	Fatte Kamesin, Sarai Rashi, Panch Roopwa, Jogia, Mohitpur, Purebajaj, Piperi, Palia Lohami and Amraha
Ambedkar Nagar	Akberpur, Ramnagar, Tanda, Katehari and Jalalpur	Pure Bunram, Anava, Ausanpur, Budganna, Mahmoodpur, Kagri, Bahajwa, Golpur, Aushanpur and Bijupur
Barabanki	Ramsanehi Ghat, Pure Dalai and Sirauli	Ujiddinpur, Sukhipur and Mohdipur
Sultanpur	Dhanpatganj, Baldirai and Kurebhar	Dubeypur, Kanavapur, Sarai Bharti and Bishuhia
Basti	Harriya, Vikramjot and Kaptanganj	Bardeha, Bangaria, Bhadohi, Bhirla, Pachwas, Khardahi, Bahdela, Sankarpur and Malham
St. Kabir Nagar	Khalilabad, Haiser and Pauli	Bairari, Shamichora, Kataimeerganj, Kamaila (Sirsi), Kanela, Vishrapur and Ranipur
Siddharath Nagar	Jogiya Uadaipur, Mithwal and Lotan	Tilanli, Saha, Karhari Shukul, Karhari, Asnar, Varwa, Persawna, Devra and Tingaura

Widely prevalent rice varieties

Districts	Varieties
Faizabad	**HYVs/Improved:** NDR 359, ShuskSamarat, Narendra Lalmati, NDR 97, NDR 2064, NDR 2065, Sarjoo 52, Jallahri, Narendra Usar Dhan-3, SambhaMahsuri, Swarna, PB - 1, Karishma and Moti Gold; **Hybrids:** Gorakhnath 509, Damini, Arize 6444 Gold, US 305, Kaveri 9090 and VNR 2233
Ambedkar Nagar	**HYVs/Improved:** NDR-97, Shusk Samarat, Sarjoo 52, NDR 359, Sambha Mahsuri, Swarna, Narendra Lalmati, Dhanrekha, Super 115, Swarna Sub – 1 and Basmati varieties; **Hybrids:** 27P31, 27P63, Damini, Kaveri 9090, Sawrnarekha, NDR 2064, NDR 2065, Moti Gold, Dhanya 748, US 305, Arize 6444 Gold and Gorakhnath 509
Barabanki	**HYVs/Improved:** NDR-97, Sambha Mahsuri, Swarna, Shusk Samrat, Sarjoo 52, NDR 359, Basmati, Narendra Lalmati, NDR 2064 and NDR 2065 **Hybrids:** US-305, 27 P 31, Arize 6444 Gold, 27P63, Kaveri and Dhanya 8655
Sultanpur	**HYVs/Improved:** NDR 359, Shusk Samarat, Narendra Lalmati, Narendra

Districts	Varieties
	Usar Dhan-3, Sonam, Sambha Mahsuri, Swarna Sub1, PB-1, NDR 97, NDR 2064, NDR 2065, Sarjoo 52, Moti Gold, Nandi Super, Vedaplus and Dhanversa; **Hybrids:** Damini, Gorakhnath 509, Arize 6444 Gold, Ganga Kaveri, 27P31, 27P63, Biostat and Nandi 333
Basti	**HYVs/Improved:** BPT 5204, Gorakhnath 509, NDR 359, Kalanamak, Moti Gold, NDR 2064, NDR 2065,NDR 97 and Swarna; **Hybrids:** Arize 6444 Gold, US 305, Arize6444, Basmati, 27P63, Damini, Dhanya 8655, Bayer 6633 and KN3
Sant Kabir Nagar	**HYVs/Improved:** Sambha Mahsuri, Swarna, Swarna Sub 1, NDR 97, NDR 359 and Moti Gold; **Hybrids:** Gorakhnath-510, Gorakhnath-509, US -305, Arize 6444 Gold, 27P31, 27P63, Damini, Dhanya 8655, Sampurna, VNR 2233, KN3, Karishma, Bayer 6633 and Khusi 27; **Locals:** Kalanamak
Sidharath Nagar	**HYVs/Improved:** NDR 97, Sambha Mahsuri, Swarna, Swarna Sub 1, Pusa Basmati-1, US 305, KN3, Moti Gold and Sona Mahsuri; **Hybrids:** 27P63, Arize 6444 Gold, Dhanya 8655, NDR 359, Gorakhnath -510, Gorakhnath-509, Silki, Damini, Krishna Kaveri, Bayer 6633 and Pragya Plus; **Locals:** Kalanamak

Area under rice cultivation of surveyed districts during *Kharif*2018

Districts	Area (ha) under rice cultivation			
	Scented/ Basmati	Hybrid	Other	Total
Faizabad	1800	36002	65322	10312
Ambedkar Nagar	1151	77003	41584	119738
Barabanki	2051	49112	132685	183848
Sultanpur	1400	46002	49696	97098
Basti	2750	38000	65853	106603
St. Kabir Nagar	2631	29050	61505	93186
Sidharath Nagar	2603	65005	107942	175550

Rainfall distribution in surveyed districts during *Kharif*2018

Districts	Rainfall (mm)							
	June		July		August		September	
	Normal	Actual	Normal	Actual	Normal	Actual	Normal	Actual
Faizabad	106.50	18.45	306.10	275.50	282.00	300.80	196.70	131.60
Ambedkar Nagar	106.50	59.10	295.89	362.60	282.00	339.00	196.70	204.00
Barabanki	98.40	41.50	299.70	473.00	281.60	527.90	203.60	185.40
Sultanpur	87.30	0.00	307.10	370.50	289.50	294.70	202.80	161.60
Basti	126.78	56.25	279.44	175.14	368.00	187.40	141.20	34.70
St. Kabir Nagar	183.02	32.67	349.76	273.67	312.76	322.33	199.07	108.00
Sidharath Nagar	163.00	69.96	380.10	246.42	325.30	211.34	231.30	54.40

Production oriented survey of rice growing areas was conducted in the Faizabad, Ambedkar Nagar, Barabanki, Sultanpur, Basti, SantKabir Nagar and Sidharth Nagardistricts of eastern Uttar Pradesh from tillering to maturity stage during *Kharif*' 2018. Major rice varieties cultivated in

the region were HYVs like NDR 359, NDR 2064, NDR 2065, Sarjoo-52, NDR 97, Swarna, Swarna-Sub-1, BPT 5204, Sonam, Komal, Moti Gold, Dhanrekha, Damini and hybrids like Arize 6444, Arize 6444 Gold, 27P63 and Gorakhnath-509. Major crop sequences followed by the farmers were rice-wheat, rice-sugarcane, rice-pulses and rice-mustard. Average seed rate for HYVs was 30-35 kg/ha and for hybrids about 15 kg/ha. Seed treatment was not common among the farmers and very few only treated the seeds with carbendazim (2 g/kg). Majority of the farmers applied FYM in the nursery and some of them also applied DAP (60-80 kg/ha). In the main fields, farmers applied 100-120 kg N/ha, 50-60 kg P_2O_5/ha and 15-20 kg/ha zinc sulfate. Very few farmers applied potassic fertilizers. Progressive farmers were using FYM, Compost and Green manure (dhaincha, urd bean and moong bean) to improve the soil health resulted in better grain yield. Plant growth regulators/promoters viz. Hizyme, Biozyme and Microzyme are being promoted by private agencies to obtain good harvest. Planting was mostly random. Intensity of common weeds like *Echinochloa crusgalli, E. colona, Eclipta alba, Cyperus iria, C. rotundus, Cloeme viscosa, Fimbristylis dichotoma* and *Paspalum distichum* was low to medium. Hand weeding was most common among the farmers and in addition to hand weeding some of the farmers also applied weedicides like butachlor, pretilachlor and Nominee Gold. Use of rotavator and combine harvester was common practice among the farming community. Majority of the farmers are small in holding size and using farm machinery on hired basis in the surveyed districts. Govt. agencies are providing subsidized seeds, agro-chemicals, plant protection inputs and farm machineries including solar pumps to the farmers. Shallow Tube wells/canals are the main source of irrigation. Major diseases of rice viz. sheath blight and bacterial leaf blight were observed from low to moderate intensity however false smut was noticed in the late maturing/hybrids rice varieties up to moderate intensity. Infestation of stem borer, leaf folder and gundhi bug was observed from low to moderate intensity in all the surveyed districts. Majority of the farmers were using plant protection measures viz. fungicides and insecticides to manage the menace of diseases and insect pests in rice crop. Newly developed technologies viz. SRI, DSR and laser leveler was also being promoted among farming community through NFSM and BGERI projects. Soil testing program is being promoted by the govt. agencies and providing Soil Health Card to farmers. The main source of farmers finance are own resources, cooperative societies and Kisan credit card. Zinc and sulphur deficiency was observed in surveyed districts. Shortage of farm labourers coupled with higher labour wages are the major constraint in rice production in the surveyed district. Kisan Mela, Kisan Gosthis and training programmes were regularly organized by Agricultural universities and Department of Agriculture, Govt. of U.P. to promote new varieties/technologies to minimize the cost of cultivation for enhancing the productivity of rice growing areas.

General questions on rice cultivation in district (To be filled by the co-operator in consultation with the Officials from State department of Agriculture)

Parameters	**Faizabad**	**Ambedkar nagar**	**Barabanki**	**Sultanpur**
Total area under HYVs in the district (ha)	65322 ha	41584 ha	132685 ha	49696 ha
Most prevalent HVVs in the district	NDR 359, NDR 97, NDR 2064, NDR 2065	NDR 359, NDR 97, NDR 2064, NDR 2065, Swarna	NDR 359, Samba Mahsuri, Swarna, NDR 2064	NDR 359, NDR 2064, Samba Mahsuri, Swarna, NDR 97
Total area under rice hybrids in the district (ha)	36002 ha	77003 ha	49112 ha	46002 ha
Most prevalent rice hybrids in the district	A 6444 Gold, 27p63,G'nath 505,VNR2233	A 6444 Gold, 27p63,G'nath 505,VNR2233	A 6444, 27p63, Dhanya 8655	A 6444 Gold, 27p63, Goraknath 505
Total area under basmati in the district	1800 ha	1151 ha	2051 ha	1400 ha
Most prevalent basmati varieties in the district	Pusa Basmati 1, Rajendra Basmati	PB-1, Narendra Lalmati	PB-1, Narendra Lalmati	PB-1, Narendra Lalmati
Seed replacement rate	70%	60%	70%	70%
Whether farmers are using any heavy equipments like transplanted/combine harvester	Yes; Combine harvester, rotavator	Yes; Combine harvester, rotavator	Yes; Combine harvester, rotavator	Yes; Combine harvester, rotavator
Mention water saving technologies like SRI/laser levelling/DSR being used by the farmers	SRI by progressive farmers	Few farmers	SRI and DSR by some farmers	SRI and DSR by some farmers
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Pl. Prot. Measures, Use of balanced fertilizers	Pl. Prot. Measures and proper spacing	Proper use of pl. protection measures	Proper use of pl. protection measures
What are the general problems in rice cultivation in the district	Shortage of quality seeds, shortage and high cost of labours	Shortage and high cost of labours	Shortage of labours and their high wages	Shortage of labors
Please provide any farmers association in the district	Krishak club	Krishak club	Kisan Club	Kisan Club
Whether availability of labours is sufficient?	No	No	No	No
Whether there is any marketing problem of the produce?	No	No	No	No
Any major irrigation/power generation project in the district	Sharda Sahayak Canal	NTPC	Canal Irrigation	Sharda Sahayak Canal
Any soil testing program undertaken?	Soil health card to farmers	Yes	Yes	Yes
Any farmers training programme was organized by the state department of Agriculture/University	Kisan mela/gosthi by Dept of Ag and University	Training/Krishak Gosthi by Dept of Ag and University KVKs	Trainings by Dept of Ag and University KVKs	Trainings by Dept of Ag and University KVKs

General questions on rice cultivation in district (To be filled by the co-operator in consultation with the Officials from State department of Agriculture)

Parameters	Basti	Sant Kabir Nagar	Siddhartnagar
Total area under HYVs in the district (ha)	65853 ha	61505 ha	107942 ha
Most prevalent HVVs in the district	NDR 2064, NDR 359, NDR 97, BPT 5204, Swarna	NDR 2064, NDR 2065, NDR 359, NDR 97, BPT 5204, Swarna	NDR 359, NDR 2064, Samba Mahsuri, Swarna
Total area under rice hybrids in the district (ha)	3800 ha	29050 ha	65005 ha
Most prevalent rice hybrids in the district	Goraknath 509, A 6444 Gold, 27p63	Goraknath 509, A 6444 Gold, 27p63, Damini	Goraknath 509, A 64444 Gold, 27p63, Damini
Total area under basmati in the district	2750 ha	2631 ha	2603 ha
Most prevalent basmati varieties in the district	PB-1, Kalanamak, KN 3	PB-1, KN-3	PB-1, KN 3
Seed replacement rate	70%	60%	70%
Whether farmers are using any heavy equipments like transplanted/combine harvester	Combine harvester, Rotavator	Combine harvester	Combine harvester
Mention water saving technologies like SRI/laser levelling/DSR being used by the farmers	SRI and DSR by some farmers	SRI by some farmers	SRI and DSR by some farmers
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Plant protection measures	Plant Protection measures	Use of quality seeds and plant Protection measures
What are the general problems in rice cultivation in the district	Quality seeds and higher wages of labours	High labour wages	Water logging problems in some areas
Please provide any farmers association in the district	-	Kisan Club	-
Whether availability of labours is sufficient?	Yes	No	Yes
Whether there is any marketing problem of the produce?	No	No	No
Any major irrigation/power generation project in the district	Canal irrigation available	-	Canal irrigation
Any soil testing program undertaken?	Yes	Yes	Yes
Any farmers training programme was organized by the state department of Agriculture/University	Trainings by Dept of Ag and University KVKs	Trainings by Dept of Ag and University KVKs	Trainings by Dept of Ag and University KVKs

District wise details

Faizabad: Production oriented survey was conducted in 9 villages (in 6 blocks) in this district when the crops were in heading to booting stage. A total of 10 farmers were interacted during the survey. All the fields surveyed were under irrigated ecosystem and in general the weather conditions were normal for rice cultivation. Total area of under rice cultivation was 103124 hectare (36002 ha under hybrid rice, 1800 ha under scented and 65322 ha under HYVs and others). Predominant rice varieties cultivated by the farmers were HYVs like NDR 359, ShuskSamarat, Narendra Lalmati, NDR 97, NDR 2064, NDR 2065, Sarjoo 52, Jallahri, Narendra Usar Dhan-3, SambhaMahsuri, Swarna, PB - 1, Karishma and Moti Gold and hybrids like Gorakhnath 509, Damini, Arize 6444 Gold, US 305, Kaveri 9090 and VNR 2233. Common crop sequences followed by the farmers were rice-wheat, rice-sugarcane, rice-pulses and rice-

mustard. Average rice yield in the district was 3500-5800 kg in different HYVs and 5000-6200 kg/ha in different hybrids. Planting was done mainly during middle of June to 2nd week of July. Average seed rate used by the farmers was 30-35 kg/ha in case of HYVs and about 15 kg/ha in case of hybrids. Very few farmers (20%) adopted seed treatment with carbendazim (2 g/kg seeds). About 80% farmers applied FYM in the nursery and about 50% of them applied DAP (70-80 kg/ha) in the nursery. In the main fields, farmers applied 100-120 kg N/ha, 50-60 kg P_2O_5/ha and 15-20 kg/ha zinc sulfate. Very few farmers applied potassic fertilizers. About 50% farmers applied FYM in the main fields and some farmers were using moong bean and dhaincha (*Sesbaina* spp.) as green manure. Few farmers applied plant growth promoting chemicals like 'Microzyme' (10 kg/ha). Planting was mainly random. The intensity of common weeds like *Echinochloa crusgalli, E. colona, Dactyloctenium aegyptium, Digiteria sanguinalis, Cyperus rotundus, Paspalum distichum and Fimbristylis dichotoma* was low. Hand weeding was most common among the farmers. In addition some farmers applied herbicides like Nominee Gold, pretilachlor, butachlor and 2,4-D. Seed replacement rate in the district was more than 65%. The main sources of irrigation were tubewell/pumping sets and canal. SRI technology was adopted by the few progressive farmers only. Biotic stresses such as diseases (sheath blight, brown spot, bacterial blight and false smut) and insects (stem borer, leaf folder and Gundhi bug) were observed in low to moderate intensity. Different pesticides like Coragen, Cartap hydrochloride, acephate, cabofuron and folidol against different insect pests and carbendazim, propiconazole, Indofil M 45, copper oxychloride + streptocycline and hexaconazole against different diseases were applied by the farmers. Farmers were facing shortage of farm laborers and their high wages and marketing problems. Zinc and sulpher deficiency was also noticed in certain places.

Ambedkar Nagar: Ten villages in 5 blocks were covered for production oriented survey in this district when the rice fields were in heading to booting stage. A total of 10 farmers were interacted during the survey. The fields surveyed were under irrigated ecosystem and in general, the weather conditions were normal for rice cultivation. Some farmers also cultivated other crops like vegetables, pigeon pea and sugarcane in 20-30% of their land. Popular rice varieties cultivated by the farmers in the district were HYVs like NDR-97, Shusk Samarat, Sarjoo 52, NDR 359, Sambha Mahsuri, Swarna, Narendra Lalmati, Dhanrekha, Super 115, Swarna Sub – 1 and Basmati varieties and hybrids like 27P31, 27P63, Damini, Kaveri 9090, Sawrnarekha, NDR 2064, NDR 2065, Moti Gold, Dhanya 748, US 305, Arize 6444 Gold and Gorakhnath 509. The prevailing cropping systems in the district were rice-wheat, rice-sugarcane, rice-mustard and rice-pulses. Average rice yield in the district ranged from 3600-5800 kg/ha in different HYVs and 5700-6200 kg/ha in case of hybrids. Planting was done mainly during middle to end of June. Average seed rate for HYVs was 30-35 kg/ha while for hybrids it was about 15 kg/ha. None of the farmers contacted adopted seed treatment. Almost all the farmers applied FYM in the nursery and about 70% of them also applied DAP (70-90 kg/ha) in the nursery. In the main fields, farmers applied 100-120 kg N/ha, 50 kg P_2O_5/ha and 15-20 kg/ha zinc sulfate. Very few farmers applied potassic fertilizers. About 30% farmers applied plant growth promoting chemicals like Zyme (10 kg/ha). Very few farmers applied FYM in the main fields. Planting was random and plant population was not maintained. SRI technique was adopted by some progressive farmers for rice cultivation. Intensity of common weeds like *Echinochloa crusgalli, E. colona, Cyperus rotundus, Cyperus iria, Cyperus difformis* and *Fimbristylis dichotoma* was low to medium. All the farmers followed hand weeding and many farmers also applied weedicides like butachlor, 2,4-D and Nominee gold. Use of rotavator for field preparation and combine machinefor

harvesting is popular among farming community. The main sources of irrigation are tube well followed by canal. In addition to their own decision, farmers also took advices from staffs of state department of Agriculture and University. Biotic stresses such as diseases (sheath blight, BB and false smut) and insects (leaf folder, stem borer, hoppers and Gundhi bug) were observed in low intensity. Different pesticides like carbendazim @ 500 g/ha, propiconazole @ 500 ml/ha and hexaconazole @ 1 l/ha for different diseases and carbofuran, cartap hydrochloride, Coragen and folidal for different insect pests were applied by the farmers. Zinc sulphate was used to meet out the zinc deficiency.

Barabanki: Production oriented survey was conducted in 3 villages (in 3 blocks) involving 5 farmers when the rice fields were in heading to milk stage. All the rice fields surveyed were under irrigated ecosystem and in general, the weather conditions were normal for rice cultivation. In addition to rice, some farmers cultivated other crops like potato, vegetables and sugarcane. Most common rice varieties cultivated by the farmers were HYVs like NDR-97, Sambha Mahsuri, Swarna, Shusk Samrat, Sarjoo 52, NDR 359, Basmati, Narendra Lalmati, NDR 2064 and NDR 2065 and hybrids like US-305, 27 P 31, Arize 6444 Gold, 27P63, Kaveri and Dhanya 8655. Different cropping systems followed by the farmers were rice-wheat, rice-mentha, rice-mustard/potato and rice-sugarcane. Average rice yield in the district ranged from 4500-5700 kg/ha in different HYVs and 5300-5900 kg/ha in different hybrids. Planting was mainly done during 3rd to 4th week of June. Average seed rate was 30-35 kg/ha in case of HYVs and about 15 kg/ha in case of hybrids. None of the farmers contacted adopted seed treatment. All the farmers applied FYM in the nursery and 60% of them also applied DAP (60-75 kg/ha) in the nursery. In the main fields, farmers applied 100-120 kg N/ha, 40-50 kg P_2O_5/ha and 10-20 kg/ha zinc sulfate. Application of potassic fertilizers was not very common. About 30% farmers applied FYM in the main fields. Very few also applied green manure. Planting was random and plant population was not maintained. Micronutrient mixtures were used to meet out micro nutrient deficiency. Intensity of weeds like *Cyprus iria, C. rotundus, Digiteria sanguinalis, Echinochloa crusgalli, E. colona, Paspalum distichum and Fimbristylis dichotoma* was low. All the farmers practiced hand weeding. In addition to hand weeding, few also applied herbicides like Nominee Gold (200 ml/ha) and butachlor (2500 ml/ha). Implements like tractor, rotavator and combine harvester were used by the farmers. Farmers mostly used last year's seed for sowing and seed replacement rate was low. Major source of irrigation were tube well and canal. In addition to their own decision, farmers also took advices from staffs of state department of Agriculture and University. Diseases like sheath blight, bacterial blight and false smut were the major diseases of rice and they were observed in low to moderate intensity. Infestation of stem borer, leaf folder and hoppers were observed in low intensity. Fungicides like carbendazim, hexaconazole and propiconazole were used to control the disease while insecticides like folidal, cartap hydrochloride, chlorpyriphos and Coragen were used to manage insect pest damage.

Sultanpur: Production oriented survey was conducted in 4 villages (in 3 blocks) in this district when the crops were in heading stage. A total of 5 farmers were interacted during the survey. All the fields surveyed were under irrigated ecosystem and in general, the weather conditions were normal for rice cultivation. In addition to rice, some of the farmers also cultivated other crops like black gram, green gram, pigeon pea and vegetables in 20-30% of their land. Common rice varieties cultivated by the farmers HYVs like NDR 359, Shusk Samarat, Narendra Lalmati, Narendra Usar Dhan-3, Sonam, Sambha Mahsuri, Swarna Sub1, PB-1, NDR 97, NDR 2064,

NDR 2065, Sarjoo 52, Moti Gold, Nandi Super, Vedaplus and Dhanversa and hybrids like Damini, Gorakhnath 509, Arize 6444 Gold, Ganga Kaveri, 27P31, 27P63, Biostat and Nandi 333. Predominant cropping systems followed by the farmers were rice-wheat, rice-pulses and rice-sugarcane. Planting was mainly done during 3rd to 4th week of June. Average seed rate was 30-35 kg/ha in case of HYVs and about 15 kg/ha in case of hybrids. None of the farmers contacted adopted seed treatment. All the farmers applied FYM in the nursery and about 20% of them also applied DAP (70 kg/ha) in the nursery. In the main fields, farmers applied 100-120 kg N/ha, 50 kg P_2O_5/ha and 10-20 kg/ha zinc sulfate. Application of potassic fertilizers was not very common. About 20% farmers applied FYM in the main fields and plant growth promoter like Zyme (10 kg/ha). Planting was random and plant population was not maintained. Intensity of common weeds in and around rice fields like *Echinochloa crusgalli, E. colona, Cyperus rotundus, C. iria, Paspalum distichum* and *Fimbristylis dichotoma* were common weeds of rice was low. All the farmers followed practiced hand weeding and in addition, some farmers also applied herbicides like Nominee Gold (200 ml/ha), pretilachlor, Top Star and butachlor (2500 ml/ha). Implements like tractor, rotavator and combine harvester were commonly used by the farmers. Harvesting by combine harvester was common practice in the district. Tube well and canals were the major source of irrigation of rice crop. In addition to their own decision, farmers also took advices from staffs of state department of Agriculture and University. Biotic stresses viz. sheath blight, bacterial blight, false smut, stem borer, leaf folder and gundhi bug were observed in low intensity. Zinc deficiency was also observed in surveyed aerasof the district. Farmers were advised to use Zinc Sulphate to control the zinc defficency. Fungicides viz. carbendazim, Indofil M-45, propiconazole, streptocycline + copper oxychloride and hexaconazole were used to control different fungal/bacterial diseases while chlorpyriphos, folidol, cartap hydrochloride and monocrotophos were used for the management of rice insect pests.

Basti: Nine villages (in 3 blocks) were covered for production oriented survey in this district when the rice crops were in heading to booting stage. A total of 10 farmers were contacted during the survey. All the fields surveyed were under irrigated ecosystem and in general, the weather conditions were normal for rice cultivation. In addition to rice, some of the farmers cultivated other crops like pigeon pea, black gram, green gram and vegetables in 20-30% of their land. Commonly grown rice varieties in the district were HYVs like BPT 5204, Gorakhnath 509, NDR 359, Kalanamak, Moti Gold, NDR 2064, NDR 2065, NDR 97 and Swarna and hybrids like Arize 6444 Gold, US 305, Arize6444, Basmati, 27P63, Damini, Dhanya 8655, Bayer 6633 and KN3. Major crop rotation practices adopted by the farmers were rice-wheat, rice-sugarcane, rice-mustard, rice-vegetables, rice-potato and Rice-pulses. Average rice yield in the district ranged from 3700-6000 kg in different HYVs like NDR 359, NDR 97, Swarna, NDR 2064, NDR 118, Samba Mahsuri and NDR 2065 and 5500-6200 kg/ha in different hybrids. Few farmers cultivated local variety Kalanamak where yield was about 2300-2400 kg/ha. Planting was done mainly during middle to last week of June. Average seed rate was 30-35 kg/ha in case of HYVs and about 15 kg/ha in case of hybrids. About 90% of the farmers contacted told that they did not follow seed treatment and 10% told that they treated the seeds with carbendazim (2 g/kg). About 90% farmers applied FYM in the nursery and 40% farmers told that they also applied DAP(60-80 kg/ha). In the main fields, farmers applied 100-120 kg N/ha, 50 kg P_2O_5/ha and 15-20 kg/ha zinc sulfate. None of the farmers contacted applied potash. About 20% applied FYM and 30% applied growth promoters like Zym (10 kg/ha). Planting was random. Intensity of common

weeds like *Echinochloa crusgalli, E. colona, Cyprus* spp. *and Fimbristylis dichotoma* was low to medium. All the farmers followed hand weeding and some of them also applied weedicides like butachlor (2500 ml/ha) and Nominee Gold (200 ml/ha). Majority of the rice growing farmers used Rotavator and Combine harvester in rice cultivation. Major source of irrigation were tube well/pumping sets and canal. In addition to their own decision, farmers also took advices from staffs of state department of Agriculture and University. Predominant diseases of rice (sheath blight, bacterial leaf blight and false smut) were observed in low to moderate intensity while major insect pests of rice (stem borer, hopper and gundhi bug) were observed in low intensity. Different pesticides like cartap hybdrochloride, chlorpyriphos and Folidol against different insect pests and different fungicides like carbendazim, hexaconazole, propiconazole and mancozeb against different fungal diseases were applied by the farmers. Few farmers applied copper oxychloride (500 g) and streptocycline (15 g) per acre for controlling bacterial blight. Zinc deficiency was recorded in many places and zinc sulphate was used to overcome zinc deficiency. Major problems faced by the farmers were non-availability of quality seeds and shortage of labours.

Sant Kabir Nagar: Production oriented survey was conducted in 7 villages (in 3 blocks) in this district involving 10 farmers. Most of the rice fields were booting to heading stage. All the fields surveyed were under irrigated ecosystem and in general, the weather conditions were normal for rice cultivation. Some of the farmers also cultivated other crops like pigeon pea, black gram, green gram, vegetables, sugarcane and pulses in 20-30% of their land. Commonly cultivated rice varieties in the district were HYVs like Sambha Mahsuri, Swarna, Swarna Sub 1, NDR 97, NDR 359 and Moti Gold and hybrids like Gorakhnath-510, Gorakhnath-509, US -305, Arize 6444 Gold, 27P31, 27P63, Damini, Dhanya 8655, Sampurna, VNR 2233, KN3, Karishma, Bayer 6633 and Khusi 27. Few farmers also cultivated local variety Kalanamak Rice-wheat, rice-vegetable, rice-pulses and rice-sugarcane were major cropping systems followed by the farmers. Average rice yield in the district was 4000-5500 kg/ha in different HYVs and 5000-6100 kg/ha. The yield was around 2100 kg/ha in case of local variety 'Kalanamak'. Planting was done during end of June. Seed rate for HYVs was 30-35 kg/ha and for hybrids it was about 15 kg/ha. Very farmers (10%) followed seed treatment with carbendazim (2 g/kg). About 90% of the farmers contacted applied FYM in the nursery. In the nursery, about 30% farmers also applied DAP (70 kg/ha). In the main fields, farmers applied 100-120 kg N/ha, 40-50 kg P_2O_5/ha and 10-20 kg/ha zinc sulfate. Very few applied potash. About 60% of the farmers contacted applied FYM in the main fields and 20% applied growth regulators like Zym (10 kg/ha) or Microzyme (10 kg/ha). Planting was random and the intensity of common weeds was low to medium. Common weeds encountered in and around rice fields were *Echinochloa crusgalli, E. colona*, *Cyperus rotundus*, *C. iria*, *Cleome viscosa* and *Fimbristylis dichotoma.* All the farmers contacted followed hand weeding and some farmers in addition also applied weedicides like butachlor (2500 ml/ha), pretilachlor and Nominee Gold (200 ml/ha). Implements like tractor, rotavator and combine harvesters were used by the farmers. Harvesting was done by combine harvester followed by hand weeding. Shallow tube wells were major source of irrigation. In addition to their own decision, farmers also took advices from staffs of state department of Agriculture and University. The diseases sheath blight, bacterial leaf blight and false Smut and insect pests like Stem borer, hopper and gundhi bug were observed from low intensity. Different pesticides like cartap hydrochloride, Folidol (20 kg/ha) and chlorpyriphos for different insect pests and fungicides like carbendazim, propiconazole, Taqat and hexaconazole for different diseases were applied by the

farmers. Few also applied copper oxychloride (500 g) + streptocycline (15 g) per hectare for control of bacterial blight. Zinc deficiency was noticed in this district. Mixing of different pesticides was not common among the farmers. Major problems faced by the farmers were non-availability of quality seeds and shortage of labours.

Siddharath Nagar: Production oriented survey was conducted in 9 villages (in 3 blocks) in this district when the rice fields were in heading to dough stage. A total of 10 farmers were contacted during the survey. All the rice fields surveyed were under irrigated ecosystem and in general, the weather conditions were normal for rice cultivation. However, flood at vegetative stage adversely affected crop establishment in Jogiaveer, Bansi and Methwal block of the district.Some of the farmers also cultivated other crops like green and black gram, pigeon pea, pulses and vegetables in 20-30% of their land. Commonly cultivated rice varieties were HYVs like NDR 97, Sambha Mahsuri, Swarna, Swarna Sub 1, Pusa Basmati-1, US 305, KN3, Moti Gold and Sona Mahsuri and hybrids like 27P63, Arize 6444 Gold, Dhanya 8655, NDR 359, Gorakhnath -510, Gorakhnath-509, Silki, Damini, Krishna Kaveri, Bayer 6633 and Pragya Plus. Few also cultivated local variety 'Kalanamak'. The most common crop rotation practices adopted by the farmers of the district were rice-wheat, rice-sugarcane, rice-mustard and rice-pulses. Average rice yield in the district was 3000-5500 kg/ha in different HYVs and 5000-5900 kg/ha in different hybrids. Planting was done during middle to end of June. Seed rate for HYVs was 30 kg/ha and for hybrids it was about 15 kg/ha. None of the farmers followed seed treatment. About 90% of the farmers contacted applied FYM in the nursery. In the nursery, about 70% farmers also applied DAP (60-80 kg/ha). In the main fields, farmers applied 100-120 kg N/ha, 40-50 kg P_2O_5/ha and 10-20 kg/ha zinc sulfate. Very few applied potash. About 20% of the farmers applied FYM, 40% green manure and 20% plant growth promoters in the main fields. Planting was random. Intensity of common weeds like *Echinochloa crusgalli, E. colona, Cyperus rotundus, C. iria* and *Fimbristylis dichotoma* was low. All the farmers contacted followed hand weeding and some of the farmers also applied weedicides like Nominee Gold (200 ml/ha), butachlor (2500 ml/ha) and pretilachlor (3000 ml/ha) for the management of weeds. Implements like tractor and combine harvesters were used by most of the farmers. Shallow tube wells and canal were the main sources of irrigation. Diesel was the main source of power for different agricultural operations. In addition to their own decision, farmers also took advices from staffs of state department of Agriculture and University. Biotic stresses such as diseases (sheath blight and BB) and insects (stem borer, leaf folder and gundhi bug) were observed from low to moderate intensity. However, false smut was recorded from moderate to severe in some hybrids. Fungicides like carbendazim, propiconazole and hexaconazole for diseases and insecticides like carbofuran, cartap hydrochloride and Folidal for different insect pests were used by the farmers. Mixing of different pesticides at the time of application was not common among the farmers. Zinc deficiency was noticed in most of the places. Major problem faced by the farmers was shortage of labours.

Prevalence of diseases and Insects in Uttar Pradesh-1 during *Kharif*' 2018

Districts	Diseases				
	BS	**ShBl**	**FS**	**ShR**	**BLB**
Faizabad	L (5%)	L-M (5-12%)	L-M		L-M (10-15%)
Ambedkar Nagar	L (5%)	L (8-10%)	L-M		L (5%)
Barabanki		L (5-10%)	L		L-M
Sultanpur	L (5%)	L (5%)	T (<2%)		T-L
Basti		L (8-10%)	L-M (2-12%)	L (8-10%)	L (1-5%)
St. Kabir Nagar		L-M (10-15%)	T (<2%)		L (5%)
Siddharth Nagar		L (5-10%)	M-S		L

Districts	Insect pests				
	LF	**SB**	**AW**	**Hoppers**	**GB**
Faizabad	L (2-5%)	T (<2%)		T-L	T-L
Ambedkar Nagar	T-L	T (<2%)		L	L
Barabanki	L	L		L	L
Sultanpur	T	L		T	T
Basti	T	L		L	L
St. Kabir Nagar	T	L		L	L
Siddharth Nagar	T	L	T (< 2%)	L (2-10%)	L-M

Uttarakhand (Pant Nagar)

Districts surveyed: *Udham Singh Nagar*

Particulars of survey

District	**Blocks**
Udham Singh Nagar	Jaspur, Kashipur, Bazpur, Gadarpur, Rudrapur, Sitarganj and Khatima

Widely prevalent rice varieties

District	**Blocks**
Udham Singh Nagar	**HYVs:** Pant Dhan 4, Pant Dhan 18, Pant Dhan 23, NDR 359, HKR 47, PR 113, PR 121 and PR 126; **Basmati:** Pusa Basmati 1121, Pusa Basmati 1 and Pusa Basmati 1509

Particulars of rice area

District	**Area (ha)**	**Production (tonnes)**	**Productivity (q/ha)**
Udham Singh Nagar	1052112	3709124	35.25

General questions on rice cultivation in district (to be filled by the co-operator in consultation with the officials from state department of Agriculture)

Parameters	**District**
	Udham Singh Nagar
Total area under HYVs in the district	40-50%
Most prevalent HYVs in the district	Pant Dhan 4, Pant Dhan 18, Pant Dhan 23, NDR 359, HKR 47, PR 113, PR 121 and PR 126
Total area under rice hybrids in the district	NA
Most prevalent rice hybrids in the district	NA
Total area under basmati in the district	2%
Most prevalent basmati varieties in the district	Pusa Basmati 1121, Pusa Basmati 2511, Pusa Basmati 1, Pusa Basmati 1509
Whether farmers are using any heavy equipments like transplanter /combine harvester	Yes
Mention water saving technologies like SRI/laser levelling/DSR being used by the farmers	Yes (DSR on small scale)
Whether survey team gave any advice to the farmers during survey? If yes, then what are those?	Avoid summer rice. Judicious use of pesticides.
What are the general problems in rice cultivation in the district?	Non-availability of rice grain sale counters.
Please provide any farmers association in the district	Not known
Whether availability of agricultural labours is sufficient?	No
Whether there is any marketing problem of the	Farmers are not getting MSP.

Parameters	**District**
	Udham Singh Nagar
produce?	
Any major irrigation/power generation project in the district	No
Any soil testing program undertaken	Yes
Any farmers training program was organized by the state department of agriculture/university	Yes

Weather conditions during *Kharif* 2018 in the district

Weather parameters	**Months**						
	May	**June**	**July**	**Aug**	**Sep**	**Oct**	**Nov**
Rainy Days (No.)	3	8	15	20	11	1	1
Total Rain Fall (mm)	22.80	172.80	649.10	616.40	224.60	2.60	4.20
Temperature (°C)							
-Maximum	36.90	37.00	32.30	32.00	31.60	30.80	27.30
-Minimum	22.30	25.90	26.00	25.30	23.70	15.30	11.70
Relative Humidity							
-Morning	69.10	80.20	87.90	92.40	91.20	87.00	92.60
-Evening	41.60	59.20	76.40	79.60	74.40	57.00	57.30

Details of Survey

Production oriented survey was conducted in 52 villages of 7 blocks of district Udham Singh Nagar when rice crop was at maturity. The general weather conditions for rice cultivation were normal. Most of the farmers were marginal or sub-marginal. Since rice is the major crop in the *Kharif* season, most of the fields (40-50%) were occupied with rice. Due to favourable weather conditions, there was nice crop stand, in almost all the areas surveyed. In some pockets, particularly in some villages of Khatima block due to sudden outbreak of rain, there was crop lodging. The predominant varieties cultivated in this district were HYVs like Pant Dhan 4, Pant Dhan 18, Pant Dhan 23, NDR 359, HKR 47, PR 113, PR 121 and PR 126, and basmati varieties like Pusa Basmati 1121, Pusa Basmati 1, Pusa Basmati 1 and Pusa Basmati 1509. In seven blocks of U.S. Nagar viz., Jaspur, Kashipur, Bazpur, Gadarpur, Rudrapur, Sitarganj and Khatima the farmers adopted rice-wheat, rice-sugarcane, Sugarcane-toria/lentil-sugarcane and maize-wheat-rice-vegetable pea cropping systems. Entire area in the district is irrigated and farmers followed recommended agronomic package of practices. In the main fields farmers used about 120 Kg N/ha, 60 kg P_2O_5/ha and 40 kg K_2O/ha. Farmers in the district invariably applied zinc sulphate @ 25 kg/ha to avoid zinc deficiency/khaira disease. Different equipments like tractor, power tiller, rotavator and combine harvester were used by the farmers. Shallow wells were the main sources of irrigation.

High yielding varieties under bold and medium grain categories viz; Pant Dhan 4, Pant Dhan 18, Pant Dhan 23, HKR 47, PR 113, PR 126 and PR 121were predominantly cultivated in the district. However, in basmati categories Pusa Basmati 1121, Pusa Basmati 1, Pusa Basmati 1 and Pusa Basmati 1509 varieties were cultivated only in limited areas. Yield of rice was expected to be 35-40 q/ha in case of bold and medium grain varieties and 20-25q/ha in case of basmati rice. During survey for diseases, high incidence of false smut (40-50%) was noticed at some places in variety PR 126 (not recommended for the state) in Gadarpur and Bazpur blocks. Whereas, low to moderate incidence of diseases like BLB, Sheath blight, brown spot, blast and grain discoloration and insect pests like stem borer, leaf folder, BPH, WBPH, stem borer and Gandhi bug was observed in majority of the fields surveyed during the crop season. Most of the farmers used pesticides like cartap hydrochloride, Reagent (fipronil 5 SC) and chlorantraniliprole to control stem borer. Grain discoloration was also noticed in the fields at some places where crop was attacked by Gandhi bug. Crop was free from weeds at most of the places as most of the farmers used bis-pyribac sodium (Nominee Gold). Major problems faced by the farmers were lack of proper market facility and low MSP.

Prevalence of diseases and insect pests in U S Nagar of Uttarakhand during 2018-19

Diseases						**Insect Pests**					
Bl	**BS**	**ShBl**	**FS**	**GD**	**BLB**	**SB**	**LF**	**BPH**	**WBPH**	**GB**	**RH**
L	L	L-M	S*	L	L-M	L	L	L	L	L	L

***** Severe on rice variety PR 126

West Bengal (Chinsurah)

Districts surveyed: *Howrah, Jhargram, North 24-Parganas, Nadia, Jalpaiguri* and *Uttar Dinajpur*

Particulars of survey

District	Blocks	Villages
Howrah	Uluberia II and Uluberia I,	Nayachak, Barbangalpur, Bauria, Moynapur, Jowargari, Prasadpur and Hatgacha
Jhargram	Jamboni and Jhargram	Mahismura, Tengia, Ramchandrapur, Kalimahuli, Behergram, Chotopindra and Hildi
North 24-Parganas	Habra II	Beraberi and Chandigacha
Nadia	Chakdah and Ranaghat II	Sarmostipur, Kugachhi, Ghoramara, Srirampur, Radhanagar and Gopinagar West
Jalpaiguri	Rajganj	Panikauri, Gachhbari and Baniapara
Uttar Dinajpur	Itahar	Sripur, Sripur Pirtala, Purusothampur, Kamalpur, Kapasia, Bonkur, Ghera and Hasua

Widely prevalent rice varieties

District	Varieties
Howrah	**HYVs:** Lalat, MTU 1010, Super Shymoli, Pratiksha, Swarna Sub-1, Sabita Patnai, Geetanjali, Ranidhan, IET 1010, Dinesh, Rajendra Bhagawati, DRR Dhan 42, Ajit and Rajendra Mahsuri; **Hybrids**: Arize 6444 Gold, PAC 802, Arize 6129 Gold and Bio 453; **Locals:** Gobindabhog, Jhingasal, Santoshi, Moti, Kakuria, Bhutbhairiki, Barsha and Maliphore
Jhargram	**HYVs:** Swarna, Lalat, MTU 1010, Ujala Plus, GS-1, FC-1, GB-1, Annanda, Var. 1018, MTU 1001, Param and Dhanraj; **Hybrids**: Arize 6444; **Locals:** Bullet, Maharaja and Kalakandi
North 24-Parganas	**HYVs:** GS-1, DRR Dhan 42, Swarna, Lalat, Annanda, Prtiksha, GB-1, GB-3, IET 4786, Shatabdi and Swarna Sub-1
Nadia	**HYVs:** Pratiksha, Swarna, Swarna Sub-1, Lalat, IR 64, IET 4094, Shatabdi, Khsitish and MTU-1010
Jalpaiguri	**HYVs:** Swarna Sub-1, Banga Lakshmi, CR-1010, Pratiksha and Ranjana; **Locals:** Gobindobhog, Paijam and Kalo Noonia
Uttar Dinajpur	**HYVs:** Swarna, BB-11, Manjira, MTU-1010, IET 4094, IR 64 and Niranjan; **Hybrids:** Arize 6444 Gold, JKRH-3333, PNPH-9241 and PAC 837

Particulars of rice areas in the surveyed districts of Chhattisgarh during 2018

District	Total geographical area (000 ha)	Total cultivable area (000 ha)	Total cultivated area (000 ha)	Total irrigated area (000 ha)	Area under rice (000 ha)
Howrah	148450	80870	68130	59197	100067 (Total)
Jhargram	302439	168450	168450	61224 (36.3%)	-
N 24-Pganas	388520	261040	-	200560	273600
Nadia	389920.35	272135		239478	205500
Jalpaiguri	334993	239021	140741	72129	135889
U. Dinajpur	313079	269356	242182	151631	200000

General Question of Rice Cultivation In District (To Be Filled By The Cooperator In With The Officials From State Department of Agriculture

Parameters	**Districts**		
	Howrah	**Jhargram**	**24-Paraganas (N)**
Total Area under HYVs in the district (ha.)	64411 ha	140680 ha	142904 ha
Most prevalent HYVs in the District	NC-492	MTU 7029 (Swarna)	Pratiksha, MTU 7029, GB-1, GB-3
Total area under rice hybrids in the district (ha.	150 ha	2015 ha	600 ha
Most prevalent rice hybrids in the district	Arize 6444 Gold	Arize 6444 Gold	PAC 802
Total area under basmati in the district	5 ha	-	-
Most prevalent basmati varieties in the district	Pusa Basmati 1	-	-
Seed replacement Rate	25%	-	-
Whether farmers are using any heavy equipments like transplanted/combine harvester	Yes	Yes	Yes
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	Yes; SRI	Yes	SRI and DSR (very less)
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	-	-	Yes; Seed treatment and line sowing
What are the general problems in rice cultivation in the district?	HYVs as per the ecosystem	Lack of irrigation facilities and suitable equipments	Excessive use of under ground water
Please provide any farmers association in the district	Yes; Swaminathan Farmers' Club	-	Bappur Krishak Sangha, Sohoisetipur Krishsi Uddyug Produce Company Ltd
Whether availability of labors is sufficient?	Yes	-	No
Whether there is any marketing problem of the produce?	No	Yes	Yes
Any major irrigation/power generation project in the district	Nil	Kangshabti Canal	No
Any soil testing program undertaken?	-	SHC	SHC
Any farmers' training program was organized by the state department of Agriculture/ University	-	Yes	Yes

General Question of Rice Cultivation In District (To Be Filled By The Cooperator In With The Officials From State Department of Agriculture

Parameters	Districts		
	Nadia	**Jalpaiguri**	**Uttar Dinajpur**
Total Area under HYVs in the district (ha.)	205000 ha	101916 ha	189000 ha (approx.)
Most prevalent HYVs in the District	MTU 7029, Pratiksha, Lalat, IET 4786, MTU 1010	Swarna Sub-1	MTU 7029
Total area under rice hybrids in the district (ha.	-	1000 ha	11,000 ha
Most prevalent rice hybrids in the district	-	Arize 6444 Gold	Arize 6444 Gold
Total area under basmati in the district	-	-	-
Most prevalent basmati varieties in the district	-	Kalanoonia, Gobindabhog	-
Seed replacement Rate	80%	-	-
Whether farmers are using any heavy equipments like transplanted/combine harvester	Yes	Transplanter	Limited scale
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	SRI and DSR in limited areas	SRI in limited areas	SRI in limited areas
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	-	-	Yes; regarding Sudha method of rice cultivation
What are the general problems in rice cultivation in the district?	High labour cost, diminishing yield, unstable market price, water scarcity during boro and plant hoppers	Irregular rainfall	Uneven rainfall and lack of mechanization
Please provide any farmers association in the district	Two FPC and FPO have been formed	Farmers' club: 50 Nos FPO: 10 Nos	Bangalbari Modern Agril, FPO, Bishnupur FPO, Chainagar FPO, Naoda Hantabad FPO
Whether availability of labors is sufficient?	No	No	No
Whether there is any marketing problem of the produce?	Yes	No	No
Any major irrigation/power generation project in the district	Nil	Teesta Barrage Fulbari Hydroelectric Point	Nil
Any soil testing program undertaken?	Yes	Yes	Yes
Any farmers' training program was organized by the state department of Agriculture/ University	Yes; in large numbers	Yes	Yes

Variety wise area coverage in different district of West Bengal (ha) during 2018

Variety/ Hybrid	Districts				
	Howrah	**Jhargram**	**Nadia**	**Jalpaiguri**	**N. Dinajpur**
HYVs					
R. Bhagawati	5000				
DRR dhan42	14000				
Ajit	250				
Swarna		56272	40000		
MTU-1010		28136	10000		
Lalat		28136	10000		
GB-1		14068			
Annada		12053			
IET 4094			10000		
IET 4786			60000		
Pratiksha			40000		
IR 64			5000		
Swarna Sub-1				40766	
Ranjana				20383	
Paijam				19024	
CR-1010				13588	
Kalonoonia				13588	
Hybrids					
A-6444-Gold	1010	2015			7800
PAC 802	270				
Bio-453	250				
JKRH-3333					1300
PNPH-9241					600
PAC-837					1300

Production oriented survey was conducted in 6 districts of West Bengal (4 districts from southern parts viz., Howrah, Jhargram, North 24-Parganas and Nadia and 2 districts from northern part viz., Jalpaiguri and Uttar Dinajpur) when the crops were in dough to maturity stage. Commonly cultivated varieties were HYVs like Lalat, MTU 1010, Super Shymoli, Pratiksha, Swarna Sub-1, Sabita Patnai, Geetanjali, Ranidhan, IET 1010, Dinesh, Rajendra Bhagawati, DRR Dhan 42, Ajit and Rajendra Mahsuri. Some farmers also cultivated hybrids like Arize 6444 Gold, PAC 802, PAC 807, Arize 6129 Gold, JKRH-3333, PNPH-9241 and Bio 453. Some farmers are still cultivating few local speciality cultivars like Gobindabhog, Jhingasal, Santoshi, Moti, Kakuria, kalo Noonia, Bhutbhairiki, Barsha and Maliphore because of their higher market price and preparation of flaked rice and puffed rice. Different crop rotation practices followed by the farmers in the district were rice-rice, rice-mustard, rice-lathyrus-rice, rice-vegetables-rice, rice-maize, rice-potato-rice, rice-jute, rice-pulses-oilseeds and rice-rice-vegetables. Planting was mainly done during 1st week of July to 1st week of August. About 40% farmers adopted seed treatment with carbendazim or mancozeb. Majority of the farmers applied organic manure and chemical fertilizers in the nursery. In the main fields, fertilizers were applied @ 40-120 kg N/ha, 15-60 kg P_2O_5/ha and 40-60 kg K_2O/ha. About 50% of the farmers applied FYM or other organic

manures in the main fields. Intensity of common weeds like *Echinochloa colona, E. crusgalli, Cyperus rotundus, C. iria, Cynodon dactylon, Marsilia quadrifolia* and water hyacinth was low to moderate. Hand weeding was most common and only some applied weedicides. Some of the common needs of the farmers were timely availability of quality seeds, subsidy on fertilizers, subsidy on purchase of equipments like threshers, power tillers, proper availability of labours and good market. Among different diseases, brown spot was recorded in high intensity in many fields in Jhargram and some fields of Jalpaiguri while blast and sheath blight were recorded in high intensity in some fields of Jhargram. Among different insect pests, leaf folder, stem borer and BPH were recorded in high intensity in some fields of Jhargram. Farmers applied different pesticides for controlling the biotic stresses.

District wise observations

Howrah: Production oriented survey was conducted in 7 villages in two blocks in this district involving 12 farmers. The fields surveyed were under irrigated and rainfed ecosystem and the crops were in maturity stage at the time of survey. In general, farmers used their entire cultivable land for rice growing during Kharif season of 2018. Widely cultivated varieties were HYVs like Lalat, MTU 1010, Super Shymoli, Pratiksha, Swarna Sub-1, Sabita Patnai, Geetanjali, Ranidhan, IET 1010, Dinesh, Rajendra Bhagawati, DRR Dhan 42, Ajit and Rajendra Mahsuri. Some farmers also cultivated hybrids like Arize 6444 Gold, PAC 802, Arize 6129 Gold and Bio 453. Some farmers are still cultivating few local speciality cultivars like Gobindabhog, Jhingasal, Santoshi, Moti, Kakuria, Bhutbhairiki, Barsha and Maliphore because of their higher market price and preparation of flaked rice and puffed rice. Common crop rotation practices followed by the farmers in the district were rice-rice, rice-mustard, rice-lathyrus-rice, rice-vegetables-rice and rice-rice-vegetables. Last year, a new variety 'Ranidhan was cultivated in many places. Average rice yield in the district ranged from 4000-6000 kg/ha in different HYVs like Lalat, Swarna Sub-1, Pratiksha, IET 4786 (minikit), Ranidhan, Moti, IR 64, Geetanjali and others and 2400-3500 kg/ha in different local varieties. Optimum time of planting was 2nd week of July to end of July.

Farmers used an average seed rate of 40-60 kg/ha and about 66% of the farmers contacted treated the seeds with Bavistin (1-2 g/kg seeds) or mancozeb (2 g/kg seeds). All the farmers contacted told that they applied different organic manure like FYM, cowdung manure, green manure or neem cake in the nursery. Most of them also applied fertilizers like urea, SSP and DAP in the nursery. Few applied Furadan, 6 days before uprooting the seedlings. In the main fields, fertilizers were applied @ 40-82 kg N/ha, 12-36 kg P_2O_5/ha and 15-54 kg K_2O/ha. Few also applied zinc sulfate (Mahazinc). About 40% farmers applied FYM or cowdung manure in the main fields while about 25 farmers applied neem cake and very few also applied vermicompost. Planting was manual but they maintained line planting. Intensity of weeds was low to medium and the common weeds were *Echinochloa crusgalli, E. colona, Cyperus rotundus, Cynodon dactylon* and water hyacinth. Hand weeding (one at 21 DAT and another at 45 DAT) was common among the farmers and only few (25%) also applied weedicide like Saathi. Some of the common needs of the farmers were timely availability of quality seeds, subsidy on fertilizers, subsidy on purchase of equipments like threshers, power tillers etc. Farmers used equipments like tractor, power tiller and threshers (on hire basis). About 40% farmers contacted told that they purchased 40-50% of their seed requirement. Shallow tube wells followed by canal were the main sources of irrigation. In addition to their own decisions, farmers got advices from staffs of

state department of agriculture and also private dealers. Most of the biotic stresses were recorded in low to moderate intensities. Application of pesticides was not very widespread and only few farmers applied pesticides like Ferterra (2.5 kg/acre) and Furadan for leaf folder and stem borer; confidor (3 ml/10 litre) and Neemazol 1% (1 ml/l) for BPH and propiconazole (Tilt) (1 ml/l) for sheath blight. Number of pesticide application ranged from 1-3 per crop season and none of the farmers mixed different pesticides before application. Major problems faced by the farmers were labour shortage and shortage of irrigation water during the later part of the season.

Jhargram: Seven villages (in two blocks) were covered for production oriented survey and a total of 18 farmers were interacted during the survey. The fields surveyed were under upland conditions and in general, the weather conditions were normal for rice cultivation. The crops were in dough to maturity stage at the time of survey. Majority of the farmers (90%) of the farmers used 100% of their cultivable land for rice cultivation. Popular rice varieties cultivated by the farmers were HYVs like Swarna, Lalat, MTU 1010, Ujala Plus, GS-1, FC-1, GB-1, Annanda, Var. 1018, MTU 1001, Param and Dhanraj. Few farmers also cultivated hybrids like Arize 6444. Few farmers also cultivated local varieties like Bullet, Maharaja and Kalakandi. Common crop rotation practices followed by the farmers were rice-rice, rice- vegetables, rice-mustard, rice-sesame, rice-mustard-vegetables and rice-wheat. Average rice yield in the district ranged from 3500-6000 kg/ha in different HYVs. Planting was done mainly during mid June to mid July. Average seed rate was 50-75 kg/ha and majority of the farmers (95%) did not adopt seed treatment. Few (~15%) applied organic manure in the nursery. However, majority applied chemical fertilizers like urea and DAP in the nursery. In the main fields, fertilizers were applied @ 34-80 kg N/ha, 40-87 kg P_2O_5/ha and 20-54 kg K_2O/ha. About 25% of the farmers contacted applied FYM (1-8 t/ha) in the field depending on the availabitlity. Planting was random and intensity of common weeds was low to medium. All the farmers followed hand weeding and only few applied weedicides like Saathi. Some of the common needs of the farmers in the district were timely availability of quality seeds, irrigation facilities, good market and timely availability of fertilizers and pesticides. Some of the farmers expressed the need of soil testing and farmer's meet. Commonly used implements were tractor, rotavator, threshers and power tillers (mainly on hire basis). Average seed replacement rate was low (10-25%). Deep tube wells were the main source of irrigation. In addition to their own decisions, farmers got advices from staffs of state department of agriculture and also private dealers. Most of the biotic constraints were observed in high intensities. High intensity of blast was observed in varieties like Swarna and Dhanraj in Tengia village. Brown spot was very wide spread in severe intensities. High intensity (50-80%) was recorded on varieties like Lalat, Swarna and Dhanraj in many fields in Tengia, Behergram, Mahismura and Chot Pindra villages. Similarly, high incidence of stem borer (30-55%) was recorded in varieties like Swarna, Lalat and other varieties in Tengia, Behergram and Mahismura villages. Farmers applied different pesticides like Feradox (17 lg/ha), Hamla (1 ml/l), thimet (5 kg/acre), Ferterra (8 kg/ha) and Ostad (cypermethrin) for stem borer and leaf folder; confidor and Lancer Gold for BPH and WBPH and mancozeb (2.5 g/l), Bavistin (1 g/l) and Tilt (1 ml/l) for different diseases. Few also applied neem oil (1 ml/l). Mixing of different pesticides was not common among the farmers. Major problem faced by the farmers was lack of good quality seeds.

North 24-Parganas: Survey was conducted in two villages in Habra II block involving 15 farmers when the crops were in maturity stage. The fields surveyed were in irrigated and rainfed lowland conditions. About 25% of the farmers told that they used 20-25% of their land for

cultivation of other crops like vegetables and pulses (mainly for domestic consumption). Commonly cultivated rice varieties were GS-1, DRR Dhan 42, Swarna, Lalat, Annanda, Prtiksha, GB-1, GB-3, IET 4786, Shatabdi and Swarna Sub-1. Some of the commonly followed crop sequences were rice-rice, rice-vegetables, rice-mustard-rice and rice-oats-rice. Average rice yield in the district during Kharif season ranged from 4700-5400 kg/ha in different HYVs and 5000-6400 kg/ha in varieties like Shatabdi, Gosai and Gontra (minikit) and GS-1 duirng Rabi season. Planting was mainly done during end of June to last week of July. A seed rate of 25-45 kg/ha was used by the farmers and about 2/3rd of the farmers contacted told that they followed seed treatment with Bavistin (1 g/kg) or mancozeb (1 g/kg). About 50% of the farmers applied organic manure like FYM, cowdung manure and neem cake in the nursery. About 60% of the farmers contacted applied fertilizers like urea, DAP, SSP and 10:26:26. One farmer also applied Abatar (Vitamin) in the nursery. In the main fields, fertilizers were applied @ 90-120 kg N/ha, 30-60 kg P_2O_5/ha and 40-60 kg K_2O/ha. Almost all the farmers applied FYM (1.2-7.5 t/ha) in the main fields. Planting was mainly random. However, some farmers tried rice transplanter. Intensity of common weeds like *Echinochloa colona, E. crusgalli, Cyperus rotundus, C. iria, Cynodon dactylon, Marsilia quadrifolia* and water hyacinth was low to moderate. However, in few places their intensity was more. All the farmers followed hand weeding and in addition about 2/3rd of the farmers contacted also applied different weedicides like Cobra (750-1200 ml/acre), Machete (1.5-2 kg/acre) and Saathi. Some of the common needs of the farmers in the district were timely availability of quality seeds, equipments like power tiller, proper supply of electricity, subsidy on fertilizers and proper availability of labours. Implements like power tillers, sprayers, transplanter, tractor and threshers were used by the farmers (mainly on hire basis). About 2/3rd of the farmers contacted told that they purchased 100% of their seed requirement. Deep tube wells followed by shallow tube wells were the main sources of irrigation. Majority of the farmers expressed scarcity of electricity. In addition to their own decisions, private dealers were the main advisors followed by staffs of state department of agriculture. Intensity of most of the biotic stresses was low to moderate. Farmers applied different pesticide slike Ferterra, carbofuran (6-8 kg/acre), Ostad and chlorpyriphos (2.5 m/l) for stem borer and leaf folder; confidor (4 ml/10 l) and Hamla (1600 ml/acre) for BPH and WBPH and hexaconazole (750 ml/ha) and propiconazole (1 ml/l) for different diseases. Number of pesticide application ranged from 2-4 and none of the farmers mixed pesticides before application. Farmers expressed that high price of fertilizers and pesticide was a major problem.

Nadia: Production oriented survey was conducted in six villages (in 2 blocks) when the crops were in maturity stage. A total of 15 farmers were interacted during the survey. The fields surveyed were in irrigated or upland or rainfed lowland conditions. In about 2/3rd places there were incidences of excess water or flood during the crop season. About 2/3rd of the farmers contacted told that they used a part of their land for cultivation of other crops during *Kharif* viz., vegetables, flowers and fruits like banana. Commonly grown varieties were Pratiksha, Swarna, Swarna Sub-1, Lalat, IR 64, IET 4094, Shatabdi, Khsitish and MTU-1010. Farmers followed crop rotations like rice-mustard, rice-jute, rice-gram-mustard, rice-pulses-oilseeds, rice-vegetables, rice-vegetables-rice, rice-vegetables-vegetables and rice-jute-spices. Average rice yield ranged from 4200-6000 kg/ha in different HYVs. In some places, rice yield was drastically reduced due to flooding conditions, low fertilizer dose and pest and disease incidence. Planting was mainly done during 1st week of July to 1st week of August. A seed rate of 40-65 kg/ha was used by the farmers. About 20% of the farmers told that they adopted seed treatment with

Bavistin (2 g/kg). About 60% of the farmers contacted told that they applied FYM in the nursery and about 1/3rd of them applied chemical fertilizers like 10:26:26. In the main fields, farmers applied either 90 kg urea/ha, 220-230 kg SSP/ha and 60 kg MOP/ha or 80 kg N/ha, 40 kg P_2O_5/ha and 40 kg K_2O/ha. About 60% of the farmers applied FYM/cowdung manure (2-9 t/ha) in the main fields. Few also applied vermicompost and green manure like dhaincha. Planting was done in line as far as possible. Intensity of common weeds like *Echinochloa* spp., *Cyperus rotundus, Cynodon dactylon, Marsilia quadrifolia* and water hyacinth was low to medium. All the farmers contacted followed hand weeding and majority of them (~90%) also applied different weedicides like pretilachlor (1.5-2 ml/l), butachlor and Saathi. Some of the common needs of the farmers were timely availability of quality seeds, availability of equipments like tractor, thresher, combine harvesters, subsidy on fertilizers and micronutrient fertilizers. Commonly used implements were threshers, tractor, sprayers and power tillers. About 70% of the farmers contacted told that they purchased 100% of their seed requirement and rests purchased 50-80% new seeds. Shallow tube wells followed by deep wells were the main sources of irrigation. In addition to their own decisions, private dealers were the main advisors followed by staffs of state department of agriculture. Intensity of different diseases and insect pests was low to moderate and farmers applied different pesticides like fipronil (2 ml/l), Lancer Gold (2 ml/l), chlorpyriphos (2.5 ml/l) and Tarzan (triazophos) (2 ml/l) for leaf folder and stem borer; imidacloprid (2 ml/5 l) for hoppers; dimethoate (2 ml/l) for rice bugs and hexaconazole (2.5 ml/l), Bavistin (1 g/l), Tilt (1 ml/l) and Avatar (2 ml/l) for different diseases. Number of pesticide application in a season ranged from 1-2 and none of the farmers mixed pesticides before application. Major problems faced by the farmers were high price of fertilizers, scarcity of irrigation facilities and flood.

Jalpaiguri: Three villages in one block in this district were covered for survey when the crops were in dough stage. Fifteen farmers were contacted during the process of survey. Some of the fields were under irrigated conditions while others were in upland conditions. All the farmers told that they used 100% of their land for rice cultivation during *Kharif* season. Commonly grown varieties were HYVs like Swarna Sub-1, Banga Lakshmi, CR-1010, Pratiksha and Ranjana. Some of the farmers are still cultivating local varieties like Gobindobhog, Paijam and Kalo Noonia for their taste and high market price. Average rice yield in the district ranged from 2500-4000 kg/ha in different HYVs and 1600-2500 kg in different local scented rice varieties. Optimum time of planting was 2nd week of July to end of July. On an average, a seed rate of 30-42 kg/ha was used by the farmers and about 60% of them told that they adopted seed treatment with carbendazim (2 g/kg). Most of them (>90%) applied FYM/cowdung manure in the nursery and about 60% of them applied fertilizers like urea and DAP. In the main fields, fertilizers were applied @ 76.8-96.8 kg N/ha, 25.5-42.6 kg P_2O_5/ha and 25.5-38.8 kg K_2O/ha. Very few applied FYM or mustard cake in the field. One farmer applied Biozyme growth promoter (5 kg/acre). Planting was random. Intensity of common weeds was low to moderate. All the farmers adopted hand weeding and application of weedicides was not common. Major needs of the farmers were availability of labours and irrigation facilities. Heavy equipments like tractor were used by the farmers (mainly on hire basis). Average seed replacement rate was 10-25%. Canal was the main source of irrigation and majority of the farmers expressed the scarcity of irrigation water. Farmers took their decision and in some cases, they took advices from private dealers. Most of the diseases and insect pests were recorded in low to moderate intensities except brown spot which was recorded in high intensity in some fields of Swarna Sub-1 in Gacchbari village. None

of the farmers contacted applied any pesticides. Main problems faced by the farmers were irregular rainfall and lack of irrigation facilities.

Uttar Dinajpur: Production oriented survey was conducted in 8 villages of Itahar block in this district when the crops were in maturity stage. Fifteen farmers were contacted during the survey. The fields surveyed were under irrigated conditions and in general, the weather conditions were normal for rice cultivation. All the farmers contacted told that they used 100% of their land for rice cultivation during *Kharif* season. Commonly grown varieties were HYVs like Swarna, BB-11, Manjira, MTU-1010, IET 4094, IR 64 and Niranjan. Some farmers also cultivated hybrids like Arize 6444 Gold, JKRH-3333, PNPH-9241 and PAC 837. Common crop sequences followed by the farmers were rice-mustard-rice, rice-maize, rice-wheat-rice, rice-wheat-jute, rice-mustard-maize and rice-potato-rice. During last year, new rice variety, BB-11 was introduced and cultivated in many areas. Average rice yield in the district ranged from 3500-6000 kg/ha in different HYVs and hybrids. Last year, yield of BB-11 in some areas was drastically reduced due to flood. Planting was mainly done during 1st week of July to 1st week of August. A seed rate of 30-50 kg/ha was used by the farmers and none of the farmers contacted adopted seed treatment. About 40% of the farmers applied FYM in the nursery and few applied vermicompost. About 1/3rd applied fertilizers like urea and SSP or urea and 10:26:26 in the nursery. In the main fields, fertilizers were applied @ 68-98 kg N/ha, 30-46 kg P_2O_5/ha and 31-48 kg K_2O/ha. Very few (~15%) applied FYM (7-15 q/ha) in the fields. Planting was random and in general, the intensity of weeds was low except few fields. All the farmers followed hand weeding and about 50% of the farmers contacted applied weedicides like pyrazosulfuran Ethyl 10% (185 g/ha). Major problem faced by the farmers was shortage of labours. Most of the farmers used tractor (on hire basis). Seed replacement rate was in the range of 25-50%. Shallow tube wells followed by deep tube wells were the main sources of irrigation and about 40% of the farmers contacted expressed shortage of irrigation water. In addition to their own decisions, staffs of state department of agriculture were the main advisors followed by private dealers. Intensity of different biotic stresses was low and only few farmers applied different pesticides like Ferterra and cyper+chlorpyriphos.

Incidence of diseases and insect pests in West Bengal during *Kharif*' 2018

Districts	**Diseases**						
	Bl	**NBl**	**BS**	**ShBl**	**FS**	**ShR**	**BB**
Howrah	L-M (3-15%)		L (2-10%)	L (5%)	L (1-5%)		
Jhargram	M-S (10-45%)	L-M (1-20%)	S (30-80%)	L-S (5-30%)	T (<2%)	M (15-20%)	M (20-25%)
24-Pgns (N)	L-M (5-15%)		L (2-10%)	L (5-10%)	L (2-5%)		
Nadia	L-M (2-20%)	L-M (2-20%)	L-M (5-20%)	L-M (2-15%)	L-M (5-15%)	L (2-8%)	
Jalpaiguri			L-S (2-48%)	L-M (2-15%)	L (1-5%)	L-M (3-11%)	
U. D'pur			L (3-4%)	L (2-5%)		L (8-10%)	

Low incidence of stem rot in some fields in Nadia on varieties like Swarna and Pratiksha

Districts	**Insect pests**							
	SB	**LF**	**BPH**	**WBPH**	**WM**	**RB**	**GH**	**Mt**
Howrah	L-M (2-15%)	L (3%)	L (2-5%)		T (<2%)	T (<2%)	L (5%)	T (<2%)
Jhargram	L-S (5-55%)	L-S (5-40%)	L-S (10-40%)	M				
24-Pgns (N)	M (10-25%)	L (3-4%)	L-M (5-25%)	L (5-7%)				L (5%)
Nadia	L-M (10-15%)	L (5-10%)				L-M (5-15%)		
Jalpaiguri	L (1-3%)	T (<2%)				L (2-4%)		
U. D'pur	L (1-8%)							

Low to moderate incidence of GLH (5-15 insects/hill) in some fields in Nadia

Abbreviations:

Bl- Blast, NBl- Neck Blast, BS- Brown spot, ShBl- Sheath blight, ShR- Sheath rot, FS- False smut, LS- Leaf scald, StR- Stem rot, GD- Glume discoloration, NBLS- Narrow brown leaf spot, BaK- Bakanae, KSm- Kernel smut, UDB- Udbatta, KH- Khaira, BB- Bacterial leaf blight, BLS- Bacterial leaf streak, RTV- Rice tungro disease

BPH-Brown Plant Hopper, WBPH- White Backed Plant Hopper, GLH- Green Leaf Hopper, LF- Leaf Folder, SB- Stem Borer, GM- Gall Midge, RH- Rice Hispa, WM- Whorl Maggot, GH- Grass Hopper, CW- Case Worm, GB- Gundhi Bug, PM- Panicle Mite, MT- Mite, RB- Rice Bug, AW- Army Worm, WTN- White Tip Nematode, TERM- Termite, RT- Rice Thrips, HCP- Horned Caterpillar, MB- Mealy Bug, LH- Leaf Hopper, WG- White Grub, STB-Stink bugs

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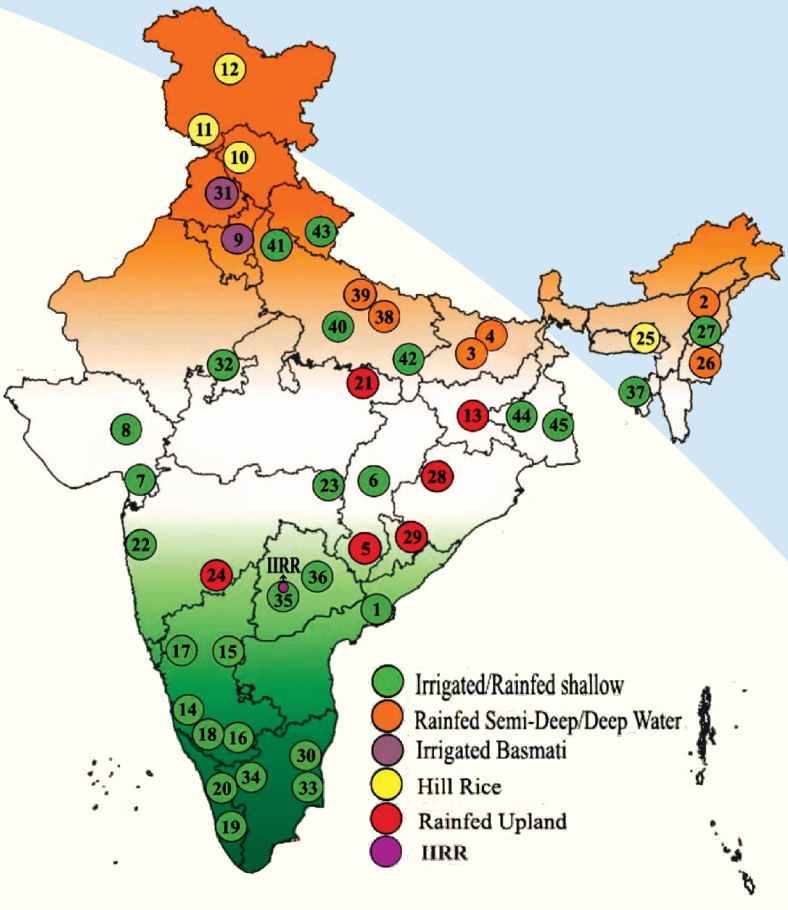
Jaya Rice Variety
Developed by *Padma Shri Dr SVS Shastri*
which is still popular with Farmers.



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