PRODUCTION ORIENTED SURVEY 2017

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

Correct citation: ICAR-Indian Institute of Rice Research, 2018
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Production Oriented Survey (POS) is conducted every year on different aspects of rice cultivation in different rice growing states of India during the main crop season (June-July to November-December). 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 2017, the survey was conducted in 16 states of India *viz.*, Bihar, Chhattishgarh, Gujarat, Haryana, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Punjab, Tamil Nadu, Telangana, Uttar Pradesh, Uttarakhand and West Bengal by 21 AICRIP centres. The survey was conducted by the scientists of Indian Institute of Rice Research and its cooperating centres located in different states belonging to different State Agricultural Universities along with officials from departments of Agriculture of various states (Table 1). A total of 105 scientific staff and 75 officials and technical staffs from the different States Department of Agriculture surveyed 147 Districts in 16 States.

The rainfall over the country as a whole during the monsoon season (June-September) was 95% of its long period average (LPA). Seasonal rainfall over Northwest India, Central India, south Peninsula and Northeast (NE) India were recorded at 90%, 94%, 100% and 96% of respective LPAs. Out of the total 36 meteorological subdivisions, 25 subdivisions constituting 65% of the total area of the country received normal seasonal rainfall, 5 subdivisions received excess rainfall (18% of the total area), and 6 subdivisions (17% of the total area) received deficient seasonal rainfall. Monthly rainfall over the country realized as a whole was 104% of LPA in June, 102% of LPA in July, 87% of LPA in August, and 88% of LPA in September. Southwest monsoon reached parts of southeast Bay of Bengal, south Andaman Sea and Nicobar Islands on 14th May (6 days ahead of its normal date). It advanced over Kerala on 30th May (2 days ahead of the normal schedule) and covered the entire country by 19th July (4 days later than the normal date) (http://www.imd.gov.in/). The cyclonic storm 'Maarutha' which made a landfall in Myanmar resulted in heavy rainfall in Andaman and Nicober Islands during 3rd week of April. The cyclone 'Mora' also partly affected eastern and north eastern India. Another cyclonic storm called 'Ockhi' resulted in heavy rainfall in parts of Tamil Nadu and Kerala during December 1st week.

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 especially at the time of peak agricultural operations like planting and harvesting and irrigation water. Many farmers from different states also expressed timely availability of seeds of different hybrids in time, availability of different inputs in time, farm mechanization (on hire basis/custom hiring), market facility and farm loan. The diseases like leaf blast, neck blast, brown spot, sheath blight, false smut and bacterial blight were widespread almost throughout India. Severe leaf and neck blast was recorded in many places in Chhattishgarh and parts of eastern Uttar Pradesh. High intensity of sheath blight was recorded in many fields in Chhattishgar,

Punjab, parts of eastern Uttar Pradesh and West Bengal. Unusual high intensity of bacterial blight was recorded in several places in Khammam, Warangal and Nizamabad in Telangana. Among the insect pests, stem borer, leaf folder and BPH were widespread throughout India. Heavy infestation of BPH was recorded in many fields in Chhattishgarh, Haryana, Karnataka, Kerala and Telangana. Moderate to severe incidence of army worm was recorded in Karnataka.

Bihar-1: Survey was conducted in Rohtas district when the crops were at maturity stage. In general, weather conditions were normal in the surveyed areas. Main source of irrigation is through canals from Sone River. Major crop rotations followed by the farmers were rice-wheat, rice-maize, rice-potato and rice-vegetables. Most prevalent rice varieties in the region were HYVs like MTU 7029, BPT 5204, Rajendra Mahsuri and Rajendra Sweta and hybrids like Arize 6444. Some farmers also cultivated local rice varieties like Sonahur because of its aroma. Most of the plantings were done during July. Average seed rate was 40-45 kg/ha and cooperator reported that some of the farmers adopted seed treatment with carbendazim (2 g/kg seeds). In the main fields, fertilizers were applied @ 100 kg N/ha, 50 kg P_2O_5/ha, 40 kg K_2O/ha and 20 kg $ZnSO_4$/ha. Random planting was common method of planting and intensity of common weeds like *Echinochloa colona* and *Cyperus rotundus* was moderate. In addition to hand weeding, farmers applied weedicides like butachlor or pretilachlor for the management of weeds. Some of the common needs of the farmers were regular supply of electricity, timely supply of fertilizers, pesticides and quality seeds of recommended varieties. Different equipments like tractor, power tiller, rotavator and combined harvester were used by the farmers. Canal and shallow tube wells were the main sources of irrigation. Farmers took advice from staffs of university and private dealers regarding use of inputs. Different biotic constraints like sheath blight, false smut and bacterial blight among the diseases and stem borer and brown plant hopper were recorded in low to moderate intensities. Bacterial blight was widely prevalent in the region. For the management of different diseases, farmers applied propiconazole (1 l/ha), carbendazim (1 kg/ha) and combination of streptocycline + copper oxychloride (50 g + 2.5 kg/ha).

Bihar-2: Production oriented survey was conducted in three districts in this part of Bihar during tillering to maturity. General weather conditions were not very favourable for rice cultivation as there were incidences of severe flood in this region in the month of August damaging the rice crop. Predominant rice varieties cultivated by the farmers were HYVs like Rajendra Bhagwati, Rajendra Sweta, Rajendra Mansuri, Sugandha, Swarna, Sub-1, Rajendra Nilam, Kisori, Sugandha, Rajendra Kasturi, Prabhat, Rajendra Subhasini, Dhanlaxmi, Kamini, Satyam and Rajshree and hybrids like Arize 6444, Arice 6201 and PHB 71. Main cropping sequences followed by the farmers were rice-wheat, rice-maize, rice-potato and rice-mustard. The average yield of rice was 3600-5500 kg./ha in different HYVs and 4500-6000 kg/ha in hybrid rice. Most of farmers applied FYM, neem cake, Castor cake, Vermicompost, Urea (80-150 kg/ha), SSP (30-80 kg/ha) and MOP (20-50 kg/ha). Intensity of common weeds like *Ipomoea spp.*, *Cyperus rotundus* and *Cynodonn dactylon* was moderate. Hand weeding is common in practice for removal of weeds and grasses from rice field. Weedicides were used in direct seeded rice and common weedicides were pendimethelene (Stamp and Pendstar), 2,4-D, Nominee Gold and Adora. In transplanted rice weedicides such as butachlor 50 EC, Saathi, Rifit and Adora were used by few farmers. Among the diseases, brown spot and sheath blight were recorded in moderate to severe intensity in some areas. Other diseases like bacterial blight, false smut, grain discoloration and sheath rot were observed in low to moderate intensities. The insect pests like stem borer, leaf folder, BPH,

gundhi bug, army worm and mealy bugs were observed in low to moderate intensities. Farmers applied different pesticides for management of diseases and pests.

Chhattishgarh: Production oriented survey was conducted in 4 districts in this stage viz., Raipur, Mahasamund, Balodabazar and Bilaspur when the crops were tillering to booting or heading stage. Majority of the fields surveyed were under rainfed lowland ecosystem. Common cropping sequences followed by the farmers were rice-wheat, rice-lathyrus, rice-chickpea, rice-rice, rice-fallow and rice-lentil. Predominant rice varieties cultivated in the region were HYVs like Swarna, MTU 1010, MTU 1001, Mahamaya, Sona Mahsuri, Kaveri 371, PKV-HMT, IR 64, Indira Sugandh Dhan, Chandrasani, Bamleswari, IGKVV R1, IGKVV R2, Safri, Durgeswari, Karma Mahsuri, Indira Barani Dhan, Bishnu Bhog, Dubraj, Tulsi Majri and Javaphool and hybrids like Arize 6444, VNR 2245, DRS 775, VNR 2355, US 312 and US 382. Average rice yield in the region was low and the main reasons for low yield were high pest and disease incidence, high infestation of weeds and erratic rainfall. In the main fields, farmers applied 60-125 kg N/ha, 30-60 kg P_2O_5/ha and 20-40 kg K_2O/ha. Some applied FYM in the main fields at the time of land preparation. Method of planting was random transplanting and direct sowing. The intensity of common weeds like *Echinochloa colona, ischaemum rugosum, fimbristylis miliacea* and *Cyperus rotundus* was high in many places and farmers in addition to hand weeding, applied different herbicides to manage the weeds. Seed replacement rate was low among the farmers. Among various biotic constraints, blast, neck blast and sheath blight among diseases and BPH and mites among the insect pests were widespread in moderate to high intensities.

Gujarat: Production oriented survey was conducted in rice growing areas of 12 districts viz., Ahmedabad, Mehsena, Anand, Kheda, Bharuch, Surat, Tapi, Dang, Panchmahal, Vadodara, Navsari and Valsad. A total of 22 talukas and 47 villages were covered under the survey. Overall climatic conditions were favourable for rice cultivation. Onset of monsoon was in last week of June and monsoon was well distributed (37 days) with total rainfall of 838 mm (as per RARS, Nawagam station data). Different cropping practices followed by the farmers were rice-wheat, rice-vegetables, rice-rice, rice-chickpea, rice-Indian bean, rice-pearl millet, rice-sugarcane, rice-vegetables, rice fodder and rice-mustard. Different HYVs cultivated in the state were Gurjari, GAR-13, GNR-3, GR-11, Mahsuri, Jaya, Moti Gold, Surya Moti, Sonam, nath Pauha, Daftari Om Sriram 125 and Krishna Kamod. Some farmers also cultivated hybrids like US 312, Arize 6201, US 807, US 834, MC 13 and Kaveri. Most of the planting operations were done during end of June to 3rd week of July. Average seed rate was 25-35 kg/ha in case of HYVs. Seed treatment was not followed by the farmers. Farmers applied 80-120 kg N/ha (through urea or ammonium sulphate), 20-40 kg P_2O_5/ha (through DAP or SSP) and 20-30 kg $ZnSO_4$/ha. Farmers also applied FYM (4-8 t/ha) and green manures in the fields. The intensity of common weeds like *Echinochloa crusgalli*, *E. colona* and *Cyperus rotundus* was low. Hand weeding (1-2) was the common practice and most the farmers also applied weedicides like pendimethalin, butachlor or Nominee Gold. Some of the common requirements of the farmers were quality seeds of HYVs, proper market price, low input responding varieties, salt tolerant rice varieties and low cost inputs. The average seed replacement rate in the state was 20-25%. The intensity of different biotic stresses like grain discolouration, false smut, blast, leaf folder and stem borer was low and some farmers applied different pesticides for their management.

Haryana: A total of 80 villages (10 in each district) were surveyed in eight districts of Haryana viz., Kaithal, Kurukshetra, Karnal, Jind, Yamunanagar, Ambala, Panipat and Sonepat during August to October. The rainfall was subnormal and unevenly distributed

particularly during the vegetative growth period in all the districts surveyed except Yamunanagar and Ambala. The commonly grown varieties in scented group were Pusa 1121, CSR-30, Pusa 1509 and Pusa Basmati 1 while the common HYVs and hybrids were PR 114, Sawa 127, RH Pioneer 27P31, Shrestha 261, Arize 6444, Arize 6508, BNR, PA 6129, Swift Gold, HYB 359, VNR 2355, PR 126 and Sudha. Besides RH Pioneer 25P35, DRH 834, Swift, Narendra 361, VNR 6508, RH 257, Sava 134, Sawa 137, Super 127, HYB 2222, BS 6444, BNR 2375, Arize 6508, Kaveri Seed 468, PA 6444, Kaveri seed 468 and Sarbati were also grown by some farmers. Application of weedicide, 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 farmers were satisfied with the rice cultivation particularly with traditional Basmati varieties as this fetched good market price. The major constraints identified in increasing rice production in Haryana were declining water table, water scarcity due to subnormal rainfall, inadequate and intermittent power and canal water supply and problematic soil and underground water, low profitability due to high production cost, nutrient deficiencies, inadequate technical knowhow, declining soil fertility, sub-optimal plant population, nutrient imbalances and low factor productivity of external nutrient supplies, and continuous follow up of rice-wheat cropping system in addition to biotic constraints particularly BPH, WBPH and sheath blight. Among the diseases, sheath blight was widespread. Other diseases like leaf and neck blast, false smut, brown spot, bakanae and stem rot were observed in low to moderate intensities. Among the insect pests, BPH was severe in many places in Kaithal, Karnal, Yamunanagar and Ambala. Leaf folder was observed in high intensity in Kaithal. Other insect pests like stem borer, whorl maggot and WBPH were recorded in low intensities. Farmers applied different pesticides either singly or after mixing with other pesticides for the management of different biotic constraints.

Himachal Pradesh: Production oriented survey was conducted in three districts viz., Kangra, Mandi and Una while Kangra district remains leading in the area under rice cultivation followed by Mandi district. The survey was done when the crops were in dough to maturity stage. The rice fields surveyed were under irrigated ecosystem. Climatic conditions were normal in all the surveyed places. Major crop sequence followed by the farmers was rice-wheat. Some farmers also followed maize-wheat and rice- potato crop rotations. The varieties grown under irrigated conditions were Palam Basmati-1, Palam Lal Dhan-1, HPR 2143, HPR 1068, Kasturi, Sharbati, Pusa 1509, Pusa 1121, PR 121, PR 122, PR 126, PR 134, Pusa 44, PR 3590, PR 202 etc. Besides these, hybrids like Arize 6129, Dhanya 111, PAC 807, Hybrid 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). Farmers applied fertilizers like IFFCO-12:32:16, DAP and urea. Few applied $ZnSO_4$ and $FeSO_4$ in the main fields. Many farmers followed a modified system of SRI in addition to random planting. The intensity of common weeds was low. Hand weeding was not common among the farmers and application of weedicides like Nominee Gold, butachlor and pretilachlor was common. Some of the common needs of the farmers were market facility for sale of the produce, good quality seeds of basmati rice varieties and proper supply of inputs. Common implements used by the farmers were tractor, cultivator, power tiller and threshers. Seed replacement rate was quite high and was in the range of 75-100%. Some of the common problems faced by the farmers were widespread incidence of false smut on inbred as well as hybrid varieties ranging between low to moderate and severe outbreak of blast on susceptible varieties like, Pusa 1121, Pusa 1509, PAC 807 etc. in some places, inadequate application of

pesticides (fungicides/ insecticides) by the farmers in the infested areas, inadequate and imbalanced use of chemical fertilizers, secession of rains during flowering onwards resulting in poorly filled grains particularly in normal and late planted crop in some parts of the State.

Jammu and Kashmir-1: Production oriented survey was conducted in four districts viz., Anantnag, Baramullah, Kupwara and Kulgam of Kashmir when the crops were mainly in 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/oilseeds and rice-oats. Most predominant rice varieties cultivated in this region were HYVs like Jhelum, SKAU-408, SR-4 and SR3. 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 1st 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 cooperator reported that majority of the farmers contacted (90-100%) adopted seed treatment with either carbendazim (2-3 g/kg) or mancozeb (3 g/kg). In the main fields, farmers applied 120 kg N/ha, 60 kg P_2O_5/ha and 30 kg K_2O/ha. All the farmers contacted FYM (5-10 kg/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* spp., *Eichhornia* spp., *Ammannia* spp. and sedges was low to moderate. All and farmers adopted hand weeding and in addition applied herbicides like Eros (4 kg/acre) and butachlor (1.5 kg a.i./acre). 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: An extensive production oriented survey was undertaken in *Kharif* '2017 in the twin hilly districts of Jammu and Kashmir viz., Rajouri and Poonch. Both the districts experienced a normal weather with well distributed rains throughout the season except at the fag end of the crop when there was a long dry spell without affecting much the yield parameters of rice. The irrigation source for the crop was mainly connected through irrigation channels derived from river water basins. Land holding in the districts is generally less than one acre which impedes to go for the diversified farming. Maize and Rice are the only cereal crops grown widely in the *Kharif* season, whereas wheat as well as vegetables forms the sequence for crop rotation. Basmati rice is fast picking up especially in Poonch district. Seed replacement rate remains negligible and the farmers still opt for the age old traditional course varieties like K-343, K-448, K-39 and Giza 14 for their taste preferences. In many fields, Seed mixture was observed and there is a need of replacing the seeds with new and certified seeds. There was no radical change in agronomical practices for paddy crop in either of the districts. Potash was still found elusive in maximum areas while many farmers also skipped phosphorus application. Though some farmers applied DAP, application of phosphorus was not very common among the farmers. However, application of urea was common among the farmers. Hand weeding and limited herbicide application was common practice for management of weeds. Diseases like blast, neck blast, brown spot and bacterial blight and insect pests lilke stem borer, leaf folder, rice hispa and gundhi bugs were recorded in varying intensities. However, the intensity of blast was much less compared to previous years. Plant protection measures and seed treatment was not being practiced by the farmers.

Karnataka-1: Survey was conducted in six districts of Karnataka viz., Chamarajanagar, Chikamagalur, Hassan, Mandya, Mysuru and Uttara Kannada during Kharif 2017. The prevailing cropping sequence in the districts covered is Rice-Rice followed by Rice-

sugarcane, Rice-Vegetables, Rice-Pulses, Rice-Ragi and Rice Fallow. The sources of irrigation are Cauvery, Kabini, Hemavathi, Bhadra,Tunga and Nethravathi rivers. The main varieties grown during *Kharif*' 2017 are of medium duration i.e IR64, Jyothi, MTU-1001, MTU1010, JGL1798, Tunga, Thanu, IET13901, BPT5204 and some private varieties like Super Amman and Sri Ramsona. Some farmers also cultivated hybrids like PAC 837, DRH836, KRH-4, GK 5003 and VNR 2233. In Mysuru and Mandya district the area covered by hybrids has increased. The weed infestation was low to medium and the common weeds were *Echinochloa colona*, *E. crusgalli* and *Cyprus* spp. More than 75% farmers in all the districts surveyed are using weedicides for weed management in addition to hand weeding. Many farmers in Mandya district have started organic method of paddy cultivation. In all the districts surveyed, labour shortage was the major problem faced by the farmers due to urbanization. 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, conoweeder etc) on hire basis to the farmers at hobli level in every district is running successfully. Drum seeding method was adopted by many farmers as there was delay in release of water. Among different insect pests, damage by case worm and leaf folder was more during tillering stage. At the tillering and booting stage, BPH and WBPH was more especially in Mandya and Mysuru districts. High incidence of army worm was also reported from some places. The diseases like blast, sheath blight, neck blast, brown spot, and sheath rot were recorded in low to moderate intensities. In Jyothi variety the udbatta disease incidence was ranged from 10-15% in Mysuru district. During 2017, the false smut disease was noticed in hybrids and high yielding varieties.

Karnataka-2: In this region of Karnataka, survey was conducted in ten districts representing Southern (Chickkamagalur, Davanagere and Shivamogga), North Western (Belagavi, Dharwad and Uttarkannada) and North Eastern (Bellary, Koppal, Raichur, and Yadgir) regions of Karnataka where paddy is grown as a major food/commercial crop. The survey was done during tillering to heading stage of the crop. Erratic planting/sowing of paddy was the common scenario in almost all the surveyed area due to late rains in the rainfed area and late release of dam water in the irrigated regions. In many districts of irrigated belts, considerable area (30-40%) was left fallow/sown with other short duration crops due to no release of water or late release of water. The major cropping practice in the irrigated region was rice-rice or rice-rice-green manures or rice-fallow, whereas, in rainfed areas it is predominately rice-fallow system. The main varieties grown in irrigated regions are BPT-5204, RNR-15048, Nellur Sona, GNV-10-89, Gangavathi Sona, JGL1798, MTU-1001, MTU-1010, IR-64, Gangavathi Emergency, *etc*., along with verities released from private firms such as, Ankur Sona, Kauvery Sona, Ankur Sona, Nindranni *etc*. The rainfed areas are predominantly occupied with varieties such as Abhilash, Jaya, Jyothi, JGL1798, Berma and Ankur Sona. The weed infestation was low to medium and the common weeds were *Echinochloa colona*, *E. crusgalli*, *Cyprus* spp., *Marsilia quadrifolia* etc. Zinc deficiency was commonly observed in all the districts and most of the farmers of irrigated regions are aware of zinc application and only few or no farmers are applying zinc. Among biotic constraints, diseases such as brown spot, leaf blast, false smut and sheath rot were the major diseases under rainfed condition, whereas, leaf blast, BLB, neck blast, sheath blight, sheath rot, stem rot and false smut were observed at moderate to high intensity in all irrigated paddy. Among the insects pests in rainfed regions (Dharwad, Uttarkannada,

Belagavi), Armyworm (*Mythimna separata*) damage was noticed in most severe form in many rice fields of Sirsi taluk and leaf folder was also appeared in moderate to severe form, whereas, BPH and WBPH were low to moderate in their infestation. In Irrigated paddy of Tungh Bhadra Project area (Koppal, Raichur, Bellary) insects pests such as BPH, WBPH and leaf folder are more severe during post tillering stage whereas, leaf folder and stem borer are moderate to severe in post flowering stage. Mechanical transplanter is gaining popularity and combined harvesters are being used in larger area. Recently, farmers are shifting towards direct seeded rice cultivation from transplanted rice system.

Kerala: Production oriented survey was conducted at Alappuzha (4200 acre) and Kottayam (1220 acre) districts during *Kharif* 2017 from booting stage to maturity stage of the rice crop. The survey covered four taulks in Alappuzha district, *Viz.*, Ambalapuzha, Alappuzha, Kuttanad, and Harippad, while in Kottayam district two taluks namely Kottayam and Vaikom could be surveyed. The predominant cropping sequences were rice-fallow, rice-rice and fallow-rice. The predominant varieties in this district were Uma, Jyothi, Prathyasa, Njavara and Shreyas. The crop performance was good during this year. The average rice yield was 6.75 to 7.5 ton/ha. The ruling variety in the Kuttanad area is Uma (MO 16). All rice area was direct sown except few parts of upper Kuttanad region. Kuttanad farmers are normally using 40-50 HP 'Petti and Para' (locally devised motorized pump) for dewatering of land. They have fitted a 'Petti and Para' for an area of 50-75 acre land. Now it is slowly replaced by introduction of 20 HP vertical turbine pump /submersible pump due to shortage of technician for maintenance of the traditional 'Petti and Para'. The weed population was very high. Weeds like *Monochoria vaginalis, Cyperus difformis, Cyperus iria, Echinochloa crusgalli* and *Sacolepis interrupta* were the major weeds observed during the visit. *Echinochloa* spp. was the major weed found in both Alappuzha and Kottayam districts along with wild rice infestation. Moderate incidences of the biotic constraints like sheath blight, bacterial leaf blight, leaf folder, case worm, rice bug and rats were observed. Lack of sufficient labourers and high labour cost were the main problems faced by the farmers.

Maharashtra: Survey was conducted in five districts viz. Raigad, Ratnagiri, Thane, Sindhudurg and Palghar during *Kharif* season of 2017. Very high rain fall was received in almost all districts of Konkan region except Palghar. Late rainfall at the harvesting time in the month of October-December caused severe losses in the region. Common cropping sequences were rice-fallow, rice-pulses, rice-vegetables, rice-rice and rice-groundnut / sunflower. The predominant varieties in the region were HYVs like Jaya, Swarna, Karjat- 7, Ratna, MTU 1001/ 1010, Trupti, Krushidhan Komal 101, Supreme Sona, Kaveri, Karjar -2, Ankur Sonam, Vaishnvi, YSR, Sarthi, Karjat- 3, Karjat- 5, Laxmi, Shweta and Rasi Poonam and hybrids like Arize 6444, Sahiyadri, Sahiyadri-2, Sahiyadri-3, Sahiyadri-4, KSL 810 and Goraknath. Almost all the farmers in the surveyed districts are preparing nursery by burning FYM and farm waste (Rabing). The majority of farmers adopting seed rate of 40-50 kg/ha in the region. More than 70% of the farmers contacted told that they treated the seeds with thiram (2 g/kg). 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. Some farmers from Thane, Raigad and Sindhudurg districts adopted direct sowing of one day old germinated seed on puddle soil with seed drill or by broadcasting. Weed infestation was in the range of low to high and one to two hand weeding per season is a common practice followed by the farmers. Some of the common needs of the farmers inputs on subsidized rates, irrigation facilities, training on integrated rice cultivation, low cost mechanization in paddy cultivation, finance for developing irrigation facilities and farm sheds, proper price for the produce, threshing yards cum farm shed because of late rainfall and good quality HYVs.

Farmers used implements like tractor and power tiller on hire basis for ploughing their land. Jilha parishad in Thane district has formed farmers "**Farm Machinery and Tool Bank**" in the district from last year. The average seed replacement ratio in the region during *Kharif* '2017 was very high (80%). The diseases like blast, grain discoloration and sheath rot were widely distributed. Intensity of blast was more in some fields in Thane and Sindhudurg while high intensity of sheath blight was recorded in some fields in Ratnagiri. Very high level of grain discoloration was reported from some fields in Ratnagiri and Palghar. Bacterial blight was high in some areas in Raigad and Thane. Among insect pests, high intensity of stem borer was recorded in many areas in Raigad, Thane and Palghar while army worm was high in some fields in Ratnagirir and Sindhudurg. Salt toxicity was noticed in some paddy field of Pen and Uran tahsil of Raigad district whereas Sulphate toxicity was notice in some pocket of Sindhudurg district.

Madhya Pradesh: Seven districts viz. Rewa, Satna, Sidhi, Shahdol, Umaria, Katni and Anuppur situated in Kymore Plateau and Satpura hills under Rice-Wheat crop zone in Madhya Pradesh were surveyed during *Kharif* season. The weather conditions during the season were not favourable and very poor rainfall ranging from 780 to 1050 mm occurred in the surveyed area. The distribution of rainfall was not good in the state. Predominant cropping systems in the state were rice-wheat, rice-gram and rice-pea, rice-lentil and rice-toria. Different rice varieties cultivated by the farmers were HYVs like Shahbhagi,Winner, Champion, Supergold, Menaka , Dhanteswari, Jalkeshar, IR 64, Pusa sugandha 5, Sonali, Sonam, MTU 1010, Poorva, Rupali , Ankur Biranj, Pusa Sugandha 4, IR-36 and IR-50 and hybrids like Sava, Dhanya, JK401, PAC 801, Dhanya 775, Indum1011, Shahyadri, US312, PHB 27P31, PHB 25P35, Raja, PAC801, PAC807, Arize 6201, Arize 6444, Goraknath, JRH 4, JRH 5, Arize Tej, Arize 6111, Ganga Kaveri, JR-75, PRH 10, P221(Tata), Indum1011 and JK2082. The rice productivity in the state was low (2.52 t/ha) due to dominance of local extra early and medium duration poor yielding rice varieties, imbalance use of fertilizer application, poor irrigation facilities, poor plant protection measures and poor socio-economic status of the farmers. Weed infestation was very high in rain fed ecosystem and causing heavy economic yield losses as compared to transplanting system. It was estimated that approximate 20 to 25 % 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 pendimethalin, butachlor, pretilachlor, Web Super, bispyribac sodium and Almix for management of weeds. The specific needs of the farmers were availability of seeds of HYVs in time, paddy thresher, sprayers, duster, cono weeder and rotavator, rice transplanter and adequate power supply for irrigation. Zinc deficiency was commonly noticed in few places. The intensity of different biotic stresses was low to moderate. However, WBPH was severe in Rewa, Satna, Sidhi and Shahdol districts and heavy losses reported.

Punjab: A total of nineteen districts were covered for Production Oriented Survey in the state of Punjab during the *Kharif* season of 2017. The weather conditions were normal throughout the state. The predominant varieties cultivated by the farmers in the state were Pusa 44, PR 126, PR 124, PR 122, PR 114, PR 118 were the other popular varieties, whereas, among the Basmati group, Pusa Basmati 1121 was the predominant variety. The most prevalent crop rotation was Rice-Wheat. Fertilizer use in general was more than the recommended level but some of the farmers followed the recommended dose of fertilizers in Punjab. Among the micronutrients, farmers applied 20-25 kg zinc sulphate/ha. 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. Application of zinc sulphate (either 21 or 33%) is practiced by

more than 70% 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 Predominant weeds observed during the survey were *Echinochloa crusgalli*, *Leptochloa chinensis* and *Ischaemum rugosum.* Most of the farmers used pretilachor, butachlor, pyrazosulfuron ethyl and some farmers also used bispyribac sodium and fenoxaprop ethyl as a post emergence for weed control in rice crop. Among the biotic stresses, diseases like sheath blight, bakanae disease, brown spot, neck blast, false smut, and sheath rot were recorded at low to moderate level of intensity. Moderate to high incidence (25-30%) of the disease was recorded from some fields of districts Barnala, Ferozepur, Fridkot, Fatehgarh Sahib, SBS Nagar and Moga on varieties, Pusa 44, Pusa Basmati 1121, HKR 47, PR114 and PR 118. Among the insect pests, stem borer, leaf folder, WBPH and BPH were observed in low to moderate intensities. Regarding pesticides usage, most of the farmers applied imidacloprid @ 100 ml/acre, buprofezin @ 500 ml/acre+ yebuconazole @ 300 ml/acre.

Tamil Nadu: Ten districts viz., Thiruvanamalai, Dharmapuri, Krishnagiri, Theni, Tirunelvelli, Kanyakumari, Viruthunagar, Dindigul, Madurai and Thoothukudi were surveyed during 2017. Delayed onset of northeast monsoon led to delayed planting in most of the districts surveyed. Commonly grown varieties were Samba Mahsuri, Amman BT, Akshaya, Ponni, Archana, ADT 39, ADT 49, CO(R) 51, TKM 13, Improved White Ponni, ADT 45, White Ponni, ASD 16, Vasundra, Dhanuska, NLR 34449, JGL-1798 and ADT36. Average yield was 4000-5500 kg/ha. Complex fertilizers containing 17:17:17, NPK was applied by the farmers along with DAP as basal fertilizers. Urea and potash along with neem cake 50kg/ha was also applied as top dressing in some of the rice growing areas. Micro-nutrients, $ZnSO_4$ was also applied as basal fertilizer. Seed rate used by the farmers were varied from 30 to 90 kg per hectare and the seeds were purchased by the farmers every year from the local retailers. Seed rate of 10 kg/ha was adopted by farmers wherever the SRI method of cultivation was practiced. The intensity of weeds was low to medium. Herbicides Nominee gold and butachlor were used along with one or two hand weeding for the control of weeds. Cono weeder was practiced by the farmers adopting SRI method of rice cultivation. Farmers are facing insufficient labour for rice cultivation. Random transplanting, limited line transplanting and direct sowing were adopted by the farmers. Machine planting method of cultivation was also observed in few places in the surveyed districts. In the mechanized cultivation farmers are using the agricultural implements viz., power tiller, tractor and machine harvester. In the surveyed districts major sources of irrigation were from canals and deep tube well. Farmers expressed scarcity of irrigation water and electricity. Harvesting is done by combine harvester. Water scarcity and labour shortage are the common constraints faced by many farmers. Among the diseases, blast and brown spot were widespread. Farmers applied different fungicides like tricyclazole, mancozeb and carbendazim for managing the diseases. The incidences of different insect pests were also low to moderate and different insecticides like acephate, profenophos, melathion, chlorpyriphos, moncrotophos and cartap were applied by the farmers.

Telangana: Survey was conducted in 21 major rice growing districts in Telangana covering major rice growing areas of Southern Telangana, parts of Northern Telangana and Central Telangana zones of Telangana state. Two surveys were done during tillering to maximum tillering stage and again during grain filling to maturity stage. Overall, rainfall received in Telangana was normal except in few districts like Nizambad, Jagtial and Peddapalli where deficit rainfall was recorded. Major crop rotation was Rice-rice in all the surveyed districts. The other systems found were green manure-rice-rice, rice- maize, rice-groundnut, rice –

fallow, rice-pulses, rice-rice–vegetables. The major varieties grown were Samba Mahsuri, Telangana Sona (RNR 15048), HMT Sona, Jai Sreeram, Pooja, WGL 32100, WGL 14, MTU 1010, MTU 1001, Tellahamsa, Siddi, Bathukamma, Kunaram Sannalu, Chintu, etc., whereas the private hybrids grown particularly in Nalgonda, Warangal, Karimnagar were Arize 6444 gold, Tej, KPH 412, KPH 272, Karishma, Champion, 27P31, 27P25, 27P63 and 27P38. Productivity ranged from3750-6800 kg/ha. The main reasons for this wide variation was mainly due to deficit rainfall, depletion of ground water in wells/ bore wells, late or non-release of canal water besides high incidence of BPH at later stages of crop growth. Average seed rate was 50 kg/ha in case of fine grain varieties and about 75 kg/ha in case of coarse grain varieties. About 40-48% of the farmers contacted adopted seed treatment with carbendazim. Farmers are applying fertilizers @ 100-180 kg N/ha, 50-120 kg P_2O_5/ha and 20-60 kg K_2O/ha. Many farmers are using different complex fertilizers like 18-46-0, 16-20-0-13, 17-17-17, 19-19-19, 28-28-0, 20-20-13. Weed intensity was low to medium and in addition to hand weeding, most of the farmers are using different weedicides. Some of the common needs of the farmers were multiple pest resistant varieties of BPT 5204 quality, improvement of Telangana Sona for lodging tolerance, Supply of leveling machinery, transplaters, power weeders/ motorized weeders suitable for mechanized planting/ direct seeding through custom hiring centres and increase in the market price of the produce. Among the insect pests, BPH was very widespread in moderate to severe intensity. Other insect pests like stem borer, panicle mite, gall midge, rice hispa, whorl maggot and leaf folder were observed in low to moderate intensities. Among the diseases, high intensity of bacterial blight was recorded in Nizamabad, Kamareddy, Khammam, Kothagudem and Karimnagar while high incidence of neck blast was recorded in Kamareddy and Khammam. Other diseases like sheath blight, sheath rot and grain discolouration were observed in low to moderate intensities. Farmers applied different pesticides and many farmers mixed different pesticides before spraying. Number of pesticide application 5-6 in a season.

Uttar Pradesh-1: Production oriented survey was conducted in Faizabad, Ambedkar Nagar, Barabanki, Sultanpur, Basti, Sant Kabir Nagar and Sidharth Nagar districts of eastern Uttar Pradesh during tillering to maturity stage during *Kharif*' 2017. The fields surveyed were under irrigated ecosystem and in general, the weather conditions were normal for rice cultivation. Major crop rotation practices adopted by the farmers were rice-wheat, rice-mentha, rice-pulses, rice-mustard/potato, rice-pulses and rice-sugarcane. Different rice varieties cultivated by the farmers in the district were HYVs like NDR 97, NDR 2064, NDR 2065, Sarjoo 52, NDR 359,Shusk Samarat, Narendra Lalmati, Jallahri, Narendra Usar Dhan-3, Sambha Mahsuri, Swarna, PB-1, Karishma, Idea and Moti Gold and hybrids like Gorakhnath 509, Arize 6444 Gold, Syngenta 6302, Damini, US 312 PAC 801, PAC 832, Ganga Kaveri and 27P63. Most of the planting activities were done during last week of June to 1st week of July. Average seed rate was 30-35 kg/ha in case of HYVs and about 15 kg/ha in case of hybrids. Seed treatment was not common among the farmers and only few farmers treated seeds with carbendazim or *Trichoderma* formulations. In the main fields, fertilizers were applied @ 80-150 kg N/ha, 40-60 kg P_2O_5/ha, 40-50 kg K_2O/ha and 10-25 kg $ZnSO_4$/ha. However, potash application was done only by few farmers. Progressive farmers were using FYM, Compost and Green manure (Dhaincha, Urd bean, Moong bean) to improve the soil health resulted in better grain yield. Many farmers applied plant growth regulators like Hizyme, Biozyme, Microzyme and Boom flower in the field for better growth and yield. Planting was random. The intensity of weeds like *Echinochloa colona, Eclipta alba, E. crusgalli, Cyperus iria, C. rotundus, Cloeme viscosa, Fimbristylis dichotoma and Paspalum distichum* was low to medium. Hand weeding was the most common practice among the farmers. In addition to hand weeding, farmers also applied herbicides like butachlor,

Nominee Gold, 2,4-D and pretilachlor. Use of Rotavator and combine harvester was common practice among the farming community. Shallow Tubewells/ canals are the main source of irrigation. Zinc and sulphur deficiency was observed in some fields in the surveyed districts. Implements like tractor, rotavator, harrow, combine harvester and cultivator were used by the farmers, mainly on hire basis. Diseases like sheath blight, bacterial blight, false smut, sheath rot and grain discolouration and insect pests like stem borer, leaf folder and gundhi bugs were recorded in low to moderate intensities. Fungicides like carbendazim, propiconazole, Taqat (captan+hexaconazole), hexaconazole and insecticides like Coragen, cartap hydrochloride, Acephate, cabofuron and Folidol were commonly used by the farmers for management of diseases and insect pest. Major problems faced by the farmers were shortage of labours and their high wages. Govt. of U P is providing subsidized solar pumps to minimize the cost of irrigation. Newly developed technologies viz. SRI, DSR and laser leveler was also being promoted among farming community through NFSM and BGERI projects. Soil Health Card Scheme of Govt. of India was also promoted by State Govt. among the farmers of eastern Uttar Pradesh. The main source of farmers finance are own resources, cooperative societies and Kisan credit card.

Uttar Pradesh-2: Production oriented survey was conducted during *Kharif* season at flowering to maturity stage of the crop in 8 of the Districts of Eastern Uttar Pradesh (Varanasi, Chandauli, Sant Ravidas nagar (Badohi), Jaunpur, Ghazipur, Azamgarh, Mau, and Ballia) coming under Varanasi and Azamgarh division. The tentative area of rice crop during this kharif season 2017-18 was nearly 58,97,871 ha area with the total state rice production of 1,54,41,951 mt and have average productivity of 26.18 q/ha. Rainfall was regular and well distributed. Predominant varieties cultivated were HYVs like Sarjoo-52, Pant Dhan 10, NDR-359, BPT-5204, MTU-7029, HUBR 2-1, Pusa Basmati, Komal, Moti, Moti Gold, Pusa 1121, HUR-917 HUR-105 and Swanra Sub-1 and hybrids like PHB-71, Arize 6444 and Ganga Kaveri. The prevailing crop rotations were rice-wheat/mustard, rice-sugarcane, rice-pulses, rice-vegetables. In most of the field surveyed weed infestation was found medium to high. For weed management, two to three hand weeding were common in practice while some of the farmers were using weedicides like butachlor, Eraze, pendimethalin and Nomani Gold. Fertilizers were applied in the form of Urea (as basal and top dressing), DAP, SSP and few applied Murate of Potash. Farmers usually hire or share plant protection equipment from the market at per hour basis or share from each other whenever required in the field. The specific needs of the farmers were irrigation facilities, market facilities, timely availability of good quality seeds and fertilizers. Among the diseases, blast, brown spot, sheath blight, false smut and bacterial blight were observed regularly in the surveyed fields. Brown spot and blast were recorded in higher intensity in many places. Among the insect pests, stem borer, leaf folder and gundhi bugs were recorded in low to moderate forms. In transplanted rice field few fields were noticed having nematode causing root galls. The chemicals like mancozeb (2-2.5 kg/ha), carbendazim (0.5-1.0 kg/ha) or hexaconazole (1 l/ha) were used by farmers for disease control. Some progressive and marginal farmers used chloropyriphos, cartap hydrochloride, imidacloprid, achephate and fipronil for the management of insects and pests.

Uttar Pradesh-3: Production oriented survey was conducted in 5 districts in this part of Uttar Pradesh viz., Baharaich, Barabanki, Gonda, Balrampur and Shrawasti when the crops were in tillering or heading to dough or maturity stage. Majority of the fields surveyed were under rainfed lowland ecosystem. Different cropping sequences followed by the farmers were rice-wheat, rice-mustard/mentha, rice-lentil/mustard, rice-sugarcane/lentil, rice-potato+pea (mixed cropping), rice-vegetables, rice-sugarcane, rice-wheat/mustard and rice-potato-sugarcane.

Different rice varieties cultivated by the farmers were HYVs like NDR 359, Pusa Basmati 1, Sarjoo 52, Indrasan and Samba Mahsuri and hybrids like PHB 71 and Arize 6444 Gold. Average yield was 4000-5000 kg/ha in HYVs and hybrids and in case of Pusa Basmati 1, it was 3000-3500 kg/ha. Farmers did not follow seed treatment. However, most of the farmers applied FYM in the nursery and in the main fields. In the main fields, fertilizers were applied @ 80-120 kg urea/ha, 40-80 kg MOP/ha and 40-80 kg DAP/ha. Some applied zinc sulphate (20-25 kg/ha). All the farmers contacted told that they applied FYM in the main fields. Planting was random. The intensity of common weeds like *Cyperus* spp., *Echinochloa* spp. and *Cynodon dactylon* was low to medium. Farmers did not apply any herbicides and hand weeding was the common method of weed management. Implements like tractor, rotavator, cultivator and harrow were used by the farmers. Seed replacement rate was low and most of the farmers contacted told that they used last year's harvested seeds for sowing. Among the biotic constraints, brown spot and sheath blight were observed in higher intensities in some fields. Other diseases like leaf and neck blast, sheath rot, false smut, grain discoloration and insect pests like stem borer and gundhi bugs were observed in low to moderate intensities. Application of pesticides was not very common. In some fields, zinc deficiency symptoms were observed.

Uttarakhand: Production oriented survey was conducted during last week of October, 2017 covering 34 villages (sites) in 7 blocks of the district Udham Singh Nagar, Uttarakhand when the crops were in maturity stage. In general, the climatic conditions with reference to rice 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 (40-45%) were occupied with rice. Entire area under the district is irrigated and farmers followed recommended agronomic practice. The predominant varieties in this district were Pant Dhan 4, Pant Dhan 18, NDR 359, HKR 47, PR 113, PR 121, Pusa Basmati 1121 and Pusa Basmati 1509. However, basmati varieties viz., Pusa Basmati 1121 and Pusa Basmati 1509 were cultivated only in limited areas. The main crop rotation practices were rice-wheat, rice-sugarcane, sugarcane-toria/lentil-sugarcane, maize-wheat-rice-vegetable pea, sugarcane-sugarcane. In seven blocks viz., Khatima, Sitarganj, Rudrapur, Gadarpur, Bazpur, Jaspur and Kashipur of the district, most of the farmers adopted rice-wheat, rice-sugarcane, sugarcane-toria/lentil-sugarcane, maize-wheat-rice-vegetable pea, sugarcane-sugarcane cropping system. Yield of rice was expected to be 35-40q/ha in case of bold and medium grain varieties and that of basmati to be 20-25q/ha. Farmers applied high doses of nitrogenous fertilizers as basal and top dressing to maximize the yield. Farmers in the district unanimously applied zinc sulphate @ 25 kg/ha as basal application to avoid khaira disease. Crop was free from weeds at most of the places as most of the farmers used bis-pyribac sodium (Nominee Gold). The biotic constraints like brown spot, bacterial leaf blight, sheath blight, false smut and grain discoloration among the diseases and leaf folder, stem borer, BPH, WBPH, rice hispa and Gandhi bug were recorded in low intensities. At some places moderate incidence of Gandhi bug was also noticed. Most of the farmers used Cartap hydrochloride and Regent (fipronil) to control stem borer. Grain discoloration was also noticed in the fields at some places where crop was attacked by Gandhi bug.

West Bengal: Production oriented survey was conducted was conducted in four districts in West Bengal viz., Bankura, Purba Medinipur, Coochbehar and South Dinajpur when the crops were in dough to maturity stage. Majority of the fields surveyed were under rainfed lowland ecosystem. Predominant cropping sequences followed by the farmers were rice-mustard, rice-potato, rice-rice, rice-jute, rice-rice-black gram, rice-rice-groundnut, rice-lentil and rice-rice-lathyrus and rice-wheat. Different rice varieties cultivated by the farmers were

HYVs like Swarna, Swarna Sub-1, Ranjana, Nilanjana, Mahsuri, MTU 1075, IET 5656, Gotara Bidhan-1, Annada, Jamuna, Shatabdi, Rajendra Mahsuri, Lalat and Pratiksha. Some farmers also cultivated hybrids like Arize 6444, Suruchi and JKMH-401. Some farmers also cultivated aromatic short grains like Badshabhog and Gobindobhog and local varieties like Kalomani and Yamuna mainly for taste. Average rice yield was 4000-5000 kg/ha. Fertilizers were applied @ 65-70 kg N/ha, 20-35 kg P_2O_5/ha and 20-32 kg K_2O/ha through urea, SSP, MOP, 10:26:26, DAP and Suphala. Application of FYM was common among the farmers from Southern parts of West Bengal like Bankura and Purba Medinipur but not in northern parts of West Bengal like Coochbehar and South Dinajpur. About 50% of the farmers contacted told that they adopted seed treatment with Bavistin or Captan or Diathane M-45. ntensity of common weeds like *Marsilea minuta, Digitaria sanguinalis, Echinochloa colona, Echinochloa crusgalli, Euphorbia hirta, Cyperus rotundus* and *Solanum* spp. was moderate to high. Common method of weed management was hand weeding. Implements like tractor, cultivator, sprayers and power tillers were used by the farmers. Among the diseases, leaf blast was moderate to severe in Purba Medinipur and Coochbehar. Sheath blight was widespread in moderate to severe intensities. Severe incidence of brown spot was observed in Coochbehar. Other diseases and insect pests were observed in low to moderate intensities. Different pesticides were applied by the farmers for management of diseases and insect pests.

Table 1: Production oriented survey, 2017-2018: Name of the state, districts surveyed, survey period and survey personnel

State/Region	District surveyed	Survey period	Survey Personnel
Bihar-1	*Rohtas*	Sept 9, 2017	**Rice Centre, Botanical Research Unit, Dhangain, Rohtas** Dr. Arvind Kumar, Sr. Scientist, Pl. Pathology
Bihar-2	*Samastipur, Muzaffarpur and Begusarai*	-	**Dr. R. P. Central Agricultural Univ, Pusa, Bihar-848125** Dr. (Mrs.) Bimla Rai, University Professor & Head
Chhattishgarh	*Raipur, Mahasamund, Balodabazar and Bilaspur*	-	**IGKV, Raipur-492 012, Chhattishgarh** Dr. P. K. Tiwari, Pr. Scientist, Plant Pathology Dr. Sanjay Sharma, Pr. Scientist, Entomology Dr. Sandeep Bhandarker, Plant Breeder
Gujarat	*Ahmedabad, Mehsena, Anand, Kheda, Bharuch, Surat, Tapi, Dang, Panchmahal, Vadodara, Navsari and Valsad*	Sept 6-7; 19-22, 26; Oct 3, 25; Nov 8, 18; 2017	**Main Rice Research Station, AAU, Nawagam 387 540** Dr. K. S. Prajapati, Res. Scientist (Rice) Dr. Rakesh Kumar Gangwar, Asso. Res Sci (Plant Path) Dr. M. B. Parmar, Asso. Res Sci (Plant Breeding) Dr. S. S. Thorat, Asst. Res Sci (Ento) Prof. D. J. Kacha, Asst. Res Sci (Agron)
Haryana	*Kaithal, Kurukshetra, Karnal, Jind, Yamunanagar, Ambala, Panipat and Sonepat*	Aug 30-31; Sept 26-27; Oct 27, 30; 2017	**CCS HAU, Rice Research Station, Kaul 136 021** Dr. Ram Singh, Pr. Scientist, Pl Path & Regional Director Dr. Lakhi Ram, Consultant Faculty (Entomology)
Himachal Pradesh	*Kangra, Mandi and Una*	Aug 9, 11, 23-24, 30; Sept 5; Oct 7, 12-13; 2017	**Rice and Wheat Research Centre, CSKHPKV, Malan 176047** Dr. Sachin Upmanyu, Scientist, Plant Pathology Dr. Daisy Basandrai, Principal Scientist, Plant Breeding Dr. Ajai Srivastava, Principal Scientist, Entomology Dr. B.S. Mankotia, Principal Scientist, Agronomy Dr. Sandeep Manuja, Principal Scientist, Agronomy Dr. D.P. Pandey, Principal Scientist, Plant Breeding
Jammu and Kashmir-1	*Anantnag, Baramullah, Kupwara and Kulgam*	Sept 8, 12, 25-26, 29-30; 2017	**Mountain Research Centre for Field Crops (MRCFC), SKUAST-K, Khudwani, Kashmir** Dr. N. A. Bhat, Sr. Scientist, Plant Pathology Dr. M. A. Manto, Sr. Scientist, Entomology Dr. M. A. Ganir, Scientist, Agronomy
Jammu and Kashmir-2	*Rajouri* and *Poonch*	Sept 28-30; 2017	**SKUAST-J, Chatha Jammu** Dr. Anil Gupta, Professor, Plant Pathology Dr. Bhupesh Kumar, Asst. Professor, Plant Breeding Dr. M. K. Pandey, Asst. Professor, Plant Pathology Dr. Ajay K. Gupta, Sr. Scientist, Agronomy Dr. Arvind K. Ishar, Sr. Scientist, Entomology Dr. Sanjay Prakash, Extension Education Scientist
Karnataka-1	*Chamarajanagar, Chickamagaluru, Hassan, Mandya, Mysuru* and *Uttar Kannada*	Oct 19, 26; Nov 2, 13-14, 16, 19; Dec 1, 7, 10, 13; 2017	**ZARS, VC Farm, Madya-571405, Karnataka** Dr. B. S. Chetana, Plant Pathologist Dr. M. P. Rajanna, Sr. Plant Breeder Dr. C. Rama Chandra, Agronomist Dr. Uma Shankar, Entomologist Dr. N. G. Hanumaratti, Plant Breeder Dr. C. A. Deepak, Rice Breeder Dr. L. Vijay Kumar Mr. Pampanna Gowda, Technical Assistant Mr. Pramesh, ADA, Narsimharajapura Mr. Subhash, AO, Narsimharajapura

State/Region	District surveyed	Survey period	Survey Personnel
Karnataka-2	*Koppal, Bellary, Raichur, Yadgir, Davanagere, Shivamogga, Chickkamagalur, Uttarkannada, Dharwad and Belagavi*	-	**Agricultural Research Station, Gangavathi, Koppal Dist- 583 227** Dr. Pramesh D., Scientist (Plant Pathology) along with Entomologist, Breeder and Agronomist from the station
Kerala	*Alappuzha* and *Kottayam*	-	**Rice Research Station, Moncompu-688503, Kerala** Dr. M. Surendran, Asst. Prof. (Pl. Pathology) Dr. S. Leena Kumari, Professor (Pl. Breeding) Dr. Reena Mathew, Assoc. Prof (Agronomy) Dr. Shanas Sudheer Asst. Prof. (Entomology)
Madhya Pradesh	*Rewa, Satna, Sidhi, Shahdol, Anuppur, Katni* and *Umaria*		**College of Agriculture, JNKVV, Rewa, MP-486001** Dr. S. K. Pandey, Dean Dr. S. K. Tripathi Principal Scientist, PI AICRIP & 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. S. Chauhan, Professor, COA, Rewa Dr A K Pandey, Sr.Scientist, KVK, Rewa Dr. Mrigerndra Singh, Sr Scientist, KVK Shahdol Dr. K. P. Tiwari, PC, KVK Umaria Shri Mahendra Singh, PC, KVK, Sidhi Dr P. N Tripathi, PC, KVK, Shahdol Dr. B.K. Tiwari, SMS, KVK, Rewa Dr K S Baghel, SMS, KVK, Rewa Shri Rajeev Nigam, ASCO, Amarpatan Shri Sudhansu Pandey, TA, Rewa Dr Saurabh Singh, Sr.TA, Rewa Dr M. Gufran Usmani, Sr.TA, Rewa Dr Jay Singh, KVK, Sidhi Shri A.K. Shukla, FEO, Rewa Shri Mahesh Dahia, Farm Manager, Pondi Farm, Rajendragram Shri G R Indurias, Farm Manager, PondinFarm Rajnish Bajpai, RAEO, Amarpatan Narendra Tripathi, RAEO, Amarpatan B. Saral, RAEO, Naigarhi
Maharashtra	*Raigad, Ratnagiri, Thane, Sindhudurg* and *Palghar*	Sept 8; Oct 23-28; Nov 4; 2017	**RARS, Karjat, Raigad (Dr. B.S. Konkan Krishi Vidyapeeth)** Dr. M. B. Dalvi, Plant Pathologist Dr. R. L. Kunkerkar, Rice Breeder Dr. A. S. Dalvi, Agronomist Prof. V. N. Jalgaonkar, Entomologist
Punjab	*Barnala, Bathinda, Faridkot, Fatehgarh Sahib, Ferozpur, Gurdaspur, Hoshiarpur, Jalandhar, Kapurthala, Ludhiana, Mansa, Moga,*		**Punjab Agricultural University, Ludhiana** Dr. G.S. Mangat, Sr. Rice Breeder Dr. Jagjeet Singh Lore, Sr. Pl Pathologist Dr. R. S. Gill Sr. Plant Breeder Dr. P.S. Sarao, Sr. Entomologist Dr. Jyoti Jain, Asstt. Pl Pathologist Dr. Buta Singh, Asst. Agronomist Dr. Gurpreet Singh Makkar, Asst. Entomologist Dr. Gurpreet Kaur, Asstt. Agronomist

State/Region	District surveyed	Survey period	Survey Personnel
	Muktsar, Nawanshahar, Patiala, Ropar, Sangrur, SBS Nagar and Taran Taran		Dr. Rupinder Kaur, Asstt. Plant Breeder Dr. Navjot Sidhu, Asstt. Plant Breeder Dr. Renu Khanna, Asstt. Plant Breeder
Tamil Nadu	*Thiruvanamalai, Dharmapuri, Krishnagiri, Theni, Tirunelvelli, Kanyakumari, Viruthunagar, Dindigul, Madurai* and *Thoothukudi*	Nov 21, 23; Dec 15-16; 20, 22; 2017	**Tamil Nadu Agricultural University, Coimbatore-641 003** Dr. P. Jeyaprakash, Professor and Head, Dr. K. Rajendran, Professor (Agronomy), Dr. A. Ramanathan, Professor (Plant Pathology), Dr. S. Saraswathi, Professor (PB&G), Dr. V. Ravichandran, Asst Professor (Crop Physiology) Dr. R. P. Soundarajan, Asst. Professor (Agrl. Entomology) Dr. K. Amudha, Assistant Professor (PB&G)
Telangana	*Ranga Reddy, Medchal, Vikarabad, Medak, Sanga Reddy, Siddipet, Nizamabad, Kamareddy, Karimnagar, Peddapally, Jagtial, Warangal (R), Mahabubabad, Janagaon, Mahabubnagar, Wanaparthy, Nagarkurnool, Khammam, Bhadradri Kothagudem, Nalgonda* and *Suryapet*	July 22; Sept 11; Oct 1, 5, 7, 12-13, 23, 25-26, 31; Nov 2-3, 16, 20, 23; Dec 8; 2017; Jan 13, 2018	**Professor Jayashankar Telangana State Agricultural University, Rajendranagar, Hyderabad-500 030** Dr. R. Jagdeeshwar, Principal Scientist (Rice) & Head Dr. N. R. G. Varma, Principal Scientist (Ento) Dr. Praveen, Coordinator &Head, DAATTC,RR Dr. L. Krishna, Senior Scientist (G&PB) Dr. Y. Chandramohan, Senior Scientist (G&PB) Dr. M.Srinivas Prasad, Principal Scientist (Pl. Path), IIRR Dr. G. S. Laha, Principal Scientist (Pl. Path) Dr. D. Krishnaveni, Principal Scientist (Pl. Path) Dr. Naveen Kumar, Coordinator &Head,DAATTC,Nizamabad Dr. J. Hemant Kumar, Prog Coordr & Head, KVK, Wyra Dr. Srinivas,Coordinator & Head, DAATTC, Khammam Dr. R. Uma Reddy, Coordinator & Head, DAATTC,WGL Dr. Sreedhar Siddi, Scientist (G&PB),ARS, Kunaram Dr. B. Srinivas, Scientist (G&PB), RARS, Jagtial Dr. Baalazzi Naik Sri.Vajid Hussain, Dist. Agril. Officer, Nizamabad Sri. Saptagiri,Agril.Extn. Officer, Yedapalli Mandal, Nizamabad Sri.Ajay, Agril.Extn. Officer, Renjal M.Venkataih,Principal Scientist (Ento),RARS,Jagtial T.Kiranbabu, Scientist (Pl.Path) RARS,Jagtial Sri. U. Narsimha Rao ADA, Sattupalli, Khammam, Sri. Y. Srinivasa Rao, Mandal Agril Officer, VemsurMandal Sri. B. Koteswara Rao, NSP Consultant, Khammam Sri. PrasadaRaju, MAO, Dammapeta Smt. Afzal Begam, ADA, Aswaraopeta Sri. Venkateswar Rao, ADA, Khammam Smt. VijayaNirmala, ADA & ATMA i/c, Khammam (R) Sri. Satish, AO, Vemsur Smt. B. Vani, ADA, Kusumanchi V. NageswaraRao, MAO, Khammam (Rl) Mr. Sreenivas, AEO, Pinjaramadugu, Kamepally M. Venkatewarulu, AEO, Khammam (R) V. Venkatesh, AEO, Gollapadu Sri. Mallareddy,Chariman, ATMA Sri. ParasuramNaik, DAO, Medak Smt. Manohara, ADA, Papannapet, Medak Sri.Srinivas, AO (Technical), Medak Mr. I. Prasanth and Sekhar, AEOs

State/Region	District surveyed	Survey period	Survey Personnel
			Mr. Venkanna, Scientist(G&PB) Mr. SrinivasaRao, ADA, Narsamapet Mr. Nagaraju, MAO, Parkala Vasudha, MAO,Khanapur Mr. Ashok, AEO, Narsampet Mr. Shyam Kuamar, AEO, Khanapur Sri. B. Narsimha Rao, DAO, Nalgonda Sri. Jaggu Naik Miss. J. Uma Rani Dr. R. Shanker Smt. L. Lavanya Sri. L. Ranga Reddy Sri. G. Srinivas Sri. G. Harish Kumar Progrssive farmers
Uttar Pradesh-1	*Faizabad, Ambedkarnagar, Barabanki, Sultanpur, Basti, Sant Kabir Nagar* and *Siddhrarth Nagar*	Jlu 13, 19; Aug 30-31; Sept 13, 20-21; Oct 4-7, 11-12, 25-26; Nov 16-17, 28-29; 2017	**Crop Research Station, Masodha (NDUAT), Faizabad** Dr. V. Prasad, Jr. Pathologist & Team Leader Dr. Kumud Singh, Entomologist Dr. S.P. Giri, Asstt. Prof., Plant Breeding Dr. Saurabh Dixit, Jr. Rice Breeder Sri D.P. Singh, Asstt. Prof. Plant Pathology Dr. R.M. Tripathi, STA Dr. D.K. Verma, Agronomist Sri Alok Pandey, Technical Asstt. 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.
Uttar Pradesh-2	*Varanasi, Sant Rabidas Nagar, Chandauli, Jaunpur, Ghazipur, Azamgarh, Mau* and *Ballia*	Oct-Nov, 2017	**Institute of agricultural sciences.BHU, Varanasi, UP** Dr. R.K. Singh, Plant Pathologist, BHU Shri Sumit Kumar Pandey, SRF, BHU Dr. R.S. Meena, Agronomist, BHU Dr. M Raghuraman, Entomologist, BHU Dr. R.P. Singh, SMS Plant Protection, KVK, Azamgarh Dr. Dharmendra Singh, SMS, soil science, KVK, Ghazipur Dr. R. P. Singh SMS, Pl. Protection, KVK, Ghazipur. Dr. N.K. Singh SMS Plant Protection KVK, Varanasi Dr. A.B. Sant Tech Assistant Sant Ravidas Nagar (badohi)
Uttar Pradesh-3	*Baharaich, Barabanki, Gonda, Balrampur and Shrawasti*	Aug 27; Sept 2, 5-10; Oct-6,10,20; Nov 4-5; 12-15; 2017	**Crop Research Station, Ghaghraghat, baharaich-271901, UP** Dr. A. L. Upadhyay, STA, Plant Pathology
Uttarakhand	*Udham Singh Nagar*	-	**GBPUA&T, Pantnagar-263145** Dr. Vishwanath, Professor, Plant Pathology
West Bengal	*Bankura, Purba Medinipur, Coochbehar* and *South Dinajpur*	Nov 1-2, 9; 2017	**Rice Research Station, Chinsurah, West Bengal-712102** Dr. Dilip Kumar Patra, Asst. Pl. Pathologist Dr. Gowtam Kumar Mallick, Rice Breeder, RRS, Bankura Dr. C. K. Bhunia, Pl. Pathologist Dr. P. K. Bandopadhyay, Asst. Plant Pathologist Dr. Kinkar Saha, Asst. Entomologist Dr. Utpal Mandal, ADA, Agril. Information, Balurghat Dr. Anirban Lahari, ADA, Pl. Prot., Mr. Amitabha Ghosh, ADA, Fertlizer Mr. Bhupen, Sirkar, KPS Deputy Director of Agriculture (Admin), Coochbehar

Table 2: Widely prevalent rice varieties cultivated in surveyed districts of India during 2017-18

District	Varieties
Bihar-1	**HYVs:** MTU 7029, BPT 5204, Rajendra Mahsuri, Rajendra Sweta and Sonahur (Local); **Hybrids:** Arize 6444.
Bihar-2	**HYVs:** BPT 5204, MTU7029, Pan, Vaidehi, Kisori, Abhishek, Rajendra Bhagwati, Rajendra Sweta, Rajendra Mansuri, Rajendra Swati, Rajendra Kasturi, Prabhat, Rajendra Subhasini, Rajendra Nilam, Rajendra Kasturi, Sugandha, Swarna, Swarna Sub-1, Kisori, Sugandha, Dhanlaxmi, Kamini, Satyam, Rajshree, Super Katarni, Sita, Lal Sita Parimal, Kasturi; **Hybrids:** Arize 6444, Arize 6201 and PHB71.
Chhattishgarh	**HYVs/Improved**: Bamleswari, Bishnu Bhog, Chandrasani, Dubraj, Durgeswari, Indira Barani Dhan, Indira Sugandh Dhan, Javaphool, Karma Mahsuri, Kaveri 371, Mahamaya, Maheswari, MTU 1010, MTU 1001, PKV-HMT, IR 64, IGKVV R1, IGKVV R2, Safri, Tulsi Manjari, Samba Mahsuri, Sona Mahsuri, Swarna, Swarna Sub-1, Rewa Jawaphool and Rajeswari **Hybrids:** Arize 6444, DDR H4, VNR 2245, DRS 775, VNR 2355, US 312, US 382 and Silky
Gujrat	**HYVs:** Gurjari, Jaya, Dhan Versa, GR-11, GAR-13, GNR-3, GR-101, Mahisagar, Sonam, Moti, Moti Gold, Surya Moti, Nath Pauha, GNR-3, Mahsuri, MC-13, Gurjari, Daftari Om Sriram, Moti Gold; **Hybrids:** US-312, US 807, Excel-708, Dhanya-748 , 25P35, Arize 6201, Pioneer Hybrids and Kaveri.
Haryana	**HYVs:** PR 113, PR 114, PR 121, PR 126, Narendra 361, HKR 47, Pusa 44, NDR 359 and Sarbati; **Hybrids:** Hyb 834, Hyb Swift, HYB 2222, HYB 359, Sudha, Super 127, BS 6444, RH 257,Sawa 127, Sawa 134, Sawa 137, Shrestha 261, Swift gold, VNR 2355, VNR 6508, RH Pioneer 27P31, RH Pioneer 25P35, BNR, PA 6129, HYB 2266, Arize 6508, Kaveri Seed 468, BNR 2375 and Arize 6444; **Basmati:** Pusa Basmati 1, Pusa Basmati 1121, CSR 30, and Pusa 1509.
Himachal Pradesh	**HYVs/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, PR 121, PR 122, PR 126, PR 134, Pusa 44, PR 3590 and PR 202; **Hybrids:** Raja, Arize 6129, Dhanya 111, PAC 807, Hybrid 834, Arize Swift Gold, Sri Ram Khushbu, Shahi Dawat, US 312, Raftaar, Hyb. 2266, Arize 6444, Hybrid 57, PR 121, PR 127, Hyb. 1067, Hyb. 257 Hyb. 25P35and Nirmal-4; **Local:** Jhini.
Jammu and Kashmir-1	**HYVs:** Jhelum, SKAU-408, SR-4 and SR3; **Local:** China-1039 and China-1007; **Local**: Zag (local red rice), Mushk-Budgi (Local aromatic variety) and other local varieties.
Jammu and Kashmir-2	**HYVs:** K 39, K 343, K 448, K-39, K 343, Giza 14, PC 19 and Basmati local; **Hybrids:** Arize 6444.
Karnataka-1	**HYVs**: IR-64, Jyothi , Intan, IET13901, MTU 1001, MTU 1010, Jaya, Thanu, JGL 1798, BR 2655 Tunga, Rajamudy, Ratnachoodi, KPR-1, Purichickka, Akshaydaan and GK 5001, BPT5204, Super Amman, Abhilash, MGD101, Alursanna and Berma; **Hybrids:** KRH-2, KRH-4, DRH836 and MC 13 VNR2233, VNR 2375, DRH836, MC13and Private hybrids.
Karnataka-2	**HYVs:** BPT-5204, Gangavathi Sona, IR64, GNV-10-89, RNR-15048, Improved BPT-5204, Kauvery Sona, Ankur Sona, Amman Sona, Nellur Sona, JGL1798, MTU1010, MTU1001, Sriram Gold, Gangavathi

	Emergency, Telhamsa, Nindranni , Jaya, Abhilasha, Berma, Jyothi, Siri and Thanu.
Kerala	**HYVs:** Uma, Jyothi, Shreyas, Prathyasa, Chettivirippu, Pokkali, Mundakan and Njavara.
Madhya Pradesh	**HYVs**: Ankur, Ankur Juari, Biranj, Champion, Dubaraj, Dhanteswari, Jaya, ,Jalkeshar, IR-36, IR-50, IR 64, Keshar, MTU 1010, MTU7029, Menaka, Pusa sugandha 4, Poorva, Pusa Sugandha 5, Pusa Sugandha 4, Rupali, Sita, Swarna, Sonali, Sonam Rupali, Supergold, Subeej Sugandha, Shahbhagi,Winner, Swarna Sub-1, Pusa 1121, Poonam, HMT, Pusa 1509 and Pusa 1121; **Hybrids**: Advanta 801, Advanta 807, Arize 6201, Arize 6444, Arize Tej, Arize 6111, Bioseed 777, Dhanya, Dhanya 775, Goraknath, Ganga Kaveri, Indum1011, JK401, JRH 4, JRH 5, JR-75, KPH 199, Loknath, Mahyco 117, Mulayam 999, NPH 101, NPH105, PRH 10, P221(Tata), PHB 27P31, PHB 25P35, PAC801, PAC807, JK2082, Raja, RH-10, Sava, Shahyadri, Suruchi, US-10 and US312; **Locals**: Amagaur, Balbhog, Bako, Badari, Bhadaili, Bharra, Belari, Bhantaphool, Biranjphool, Bhejari, Biranj, Balkeshar, Badshah Phool, Bohita, Butanagar, Champa Chhinmauri, Dhau, Dehula, Dhanlaxmi, Dadbako, Gurmatia, Govinda, Hanskanak, Jiledar, Jalkeshar, Kanak, Karaga, Kalisugandh, Karahani, Kaniga, Keshar, Khusboo, Karanphool, Kanji, Kanakjir, Kerakhambh, Khoonta, Kioilari, Lal, Lonagi, Lonhadi, Lochai, Lal Dhan, Laichi, Lochai, Ledua, Lohandi, Lawangchoor, Mansooria, Menaka, Manisha Poonam, Methichoor, Mahak Rabina, Menaka, Nanhi, Nadawal, Newari, Newari, Padmini, Padmasar, Poonam, Poorva, Reshma, Rambhog, Ranikajal, Samrat, Rashutta, Shabnam, Sonkharchi, Sonachoor, Swarnkamal, Sumo Vardan, Tinpakhi, Shukla phool, Vishnubhog and Yashoda Bhog; **Basmati:** Basmati, Pusa 1460, and Pusa 1121.
Maharashtra	**HYVs:** Jaya, Swarna, Karjar -2, Karjat- 3, Karjat-5, Karjat- 7, Ratna, Trupti, Krushidhan Komal 101, Supreme Sona Kaveri, Ankur Sonam, Vaishnvi, YSR, Sarthi, Karjat- 3, Karjat- 5, Green Gold Mohini, Swarna, Ankur Rupali, Laxmi, Shweta, Rasi, Poonam, Daptari-125, Daptari-100, Shreeram, Mohini, Spriha, Shabari, Masuri, Silky, Laxmi, S-911 Suma, Anupam, Silky-277 and Avani; **Hybrids:** Arize 6444, Sahyadri, Sahyadri 2, Sahyadri-3, Sahyadri-4, KSL -81, Gorakhnath 505 and Gorakhnath 509; **Locals:** Kolam, Wada Kolam, Bangalya, Mhadi, Bela, Walai, Somasal, Dongara, Sorti, Kolhyachi Shepti, Kothimbira / Ghansal, Turya, Yelkar, Shelwa Kothimbira, Kala Karjat, Wapali, Zinia and Patani.
Punjab	**HYVs**: IR 8, PR118, PR 121, PR 122, PR114, PR 116, PR 118, PR 121, PR 122, PR 124, PR 126, PR127, PR 212, Pusa 44, and KKR 47, HKR 127, Peelipusa and DSR Pusa Dogar; **Basmati**: Pusa 1121 and Pusa Basmati 1.
Tamil Nadu	**HYVs:** BPT5204, Amman BT, Akshaya, Ponni, Archana, Amman, Sowbackya and Dhanista, ASD 16, ADT 36, ADT 39, ADT 45, ADT 49, CO(R) 51, CO 51, TKM 13, Improved white ponni, Paiyur 1, Amoga, Vasundra, Dhanuska, White ponni, NLR, TPS-3, CR 1009, Kathisamba, NLR 3449 and JGL-1798.
Telangana	**HYVs:** Samba Mahsuri (BPT 5204), Telangana Sona (RNR 15048), HMT Sona, Jai Sreeram, Pooja, WGL 32100, WGL 14, MTU 1010, MTU 1001, Tellahamsa, Siddi, Bathukamma, Kunaram Sannalu and Chintu; **Hybrids:** Arize 6444 gold, Tej (Bayer crop science Ltd.), KPH 412, KPH 272 (Kaveri

	seeds Pvt., Ltd.,), Karishma, Champion (Nujiveedu Pvt. Ltd.,), 27P31, 27P25, 27P63 and 27P38 (Pioneer Ltd.,).
Uttar Pradesh-1	**HYVs:** NDR 97, NDR 2064, NDR 2065, Sarjoo 52, NDR 359,Shusk Samarat, Narendra Lalmati, Jallahri, Narendra Usar Dhan-3, Sambha Mahsuri, Swarna, Swarna Sub 1, PB-1, Karishma, Idea and Moti Gold, Dhanrekha, Super 115, Komal, Sonam, PB – 1, Kalanamak, NDR 8002, Basmati, 27P63, Jalpriya, Sawrnarekh and Sampurna; **Hybrids:** Gorakhnath 509, Gorakhnath-510, Arize 6444, Arize 6444 Gold, Syngenta 6302, Damini, US 312, PAC 801, PAC 832, Ganga Kaveri, 27 P 31, 27P63, 27P63, NDR 97 and Advanta 837, Super 115, Super 125, Dhanya 748, JK 401, Dhanya 8666, VNR 2205 Pusa 1509, Kaveri, Dhanya, Chandan 21, Dhanuka 778 and Kaveri 9090; **Basmati:** Pusa Basmati-1.
Uttar Pradesh-2	**HYVs:** Sarjoo-52, Pant Dhan 10, NDR-97, NDR-359, BPT-5204, MTU-7029, HUBR 2-1, Pusa Basmati, Komal, Rupali, Moti, Moti Super, Moti Gold, Sonam, Badshah bhog, and HUR12, Pusa 1121, HUR-917, HUR-105 Pant-12, and Swanra Sub-1, Pant Dhan 10, Pant Dhan 12, Jaisurya, Kalanamak, Koma, Pusa Basmati and Pusa 1121; **Hybrids:** PHB-71, Arize 6444, Ganga Kauveri and PRH-10.
Uttar Pradesh-3	**HYVs:** NDR 359, Pusa Basmati 1, Sarjoo 52, Indrasan and Samba Mahsuri; **Improved:** Sukha Pankhi and Ram Kajra**Hybrids:** PHB 71 and Arize 6444 Gold
Uttarakhand	Pant Dhan 4, Pant Dhan 18, NDR 359, HKR 47, PR 113, PR 121, Pusa Basmati 1121 and Pusa Basmati 1509.
West Bengal	**HYVs:** Swarna, Swarna Sub-1,Lalat, MTU 1010, IET 4786, GB-1, Annada, IR 36, Santoshi, GS-1, Super Shyamali, Rajlakshmi, WGL-20471, CR-1001, IET 4786, Sabita, Gitanjali, Barsha, Pratiksha, Rajendra Mahsur; Ranjana, Nilanjana, Mahsuri, MTU 1075, IET 5656, Gotara Bidhan-1, Jamuna, Shatabdi, Pratiksha Khitish, IET 4094, Samba Mahsuri, Lalat, GB-1 and GB-3; **Scented**: Badshahbhog and Gobindobhog; **Hybrids:** Arize 6444,Suruchi and JKMH-401; **Local:** Kalomani, Chini, Lathisail and Yamuna.

Table 3: Biotic constraints (diseases) in different states of India during 2017

Sates	Bl	NBl	BS	ShBl	ShR	FS	GD	LS	StR	NBLS	BAK	KSm	Khaira	UDB	BLB	BLS	RTV
Bihar-1				L-M		M									M		
Bihar-2			M-S	L-M	L-M	L-M	L-M								L-M		
Chhattishgarh	L-S	M-S	L	M-S	L-M		L-M								L-M		
Gujarat	L	L			T-L	T-L	T-L										
Haryana	L-M	T-L	L	L-M		L-M			M		T-L						
Himachal Pradesh	L-M	M	M	L-M	L-M	M-S	L-M	L		L							
J and K-1	L-M	L-M	L-M	L			T-L										
J and K-2	L-M	M	L-M	L-M			L-M								L-M		
Karnataka-1	L-M	L-M	L-M	L-M	L	L-M								L-M	L-M		
Karnataka-2	M	M	M-S	L-M	M	M-S			L-M					M	L-M		
Kerala			M-S	L-M	L	L	M-S								M		
Maharashtra	M	L		L-M	M	L-M	M	M							M		
Madhya Pradesh	L-M		M	T		T	T-L						M		T		
Punjab	L-M		L-M	M-S	L-M	L	L-M				L-M				L-M		
Tamil Nadu	M	L	M	L		L									L		
Telangana	L-M	L-M		L-M	M		L-M								M		
Uttar Pradesh-1			L	L-M	L-M	L	L								L		
Uttar Pradesh-2	M-S		M-S	M-S	L	M-S									M		
Uttar Pradesh-3	L-M	L	M-S	M-S	L	L-M	L			L							
Uttarakhand			L	L		L	L								L		
West Bengal	M		M-S	M-S	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 2017

Sates	SB	LF	BPH	WBPH	GLH	GM	RH	WM	GH	CW	GB	MT/ PM	RT	RB	AW/ SC	Rats	Term	EHB	MB	BB
Bihar-1	L-M		L																	
Bihar-2	L-M	L-M	L-M								L-M				L-M	L-M			L-M	
Chhattishgarh	L-M	M	M-S		L	L	L					M-S				M-S	M			
Gujarat	T-L	T-L		T-L																
Haryana	T	L-M	L-S	L-M				T	L											
Himachal Pradesh	L-M	M					L-M	L	L-M											M
J and K-1		T					L-M		L-M							L				
J and K-2	L-M	L-M					L		L-M		L-M					M				
Karnataka-1	L	M	L-M							M	L-M				M-S					
Karnataka-2	L-M	M	M-S												M-S					
Kerala	L-M	L-M	S										L					L		M
Maharashtra	L-S	L-M	L							L				M	M					
Madhya Pradesh	T	M		L-M	T					T-M				T-M	T	T				
Punjab	L	L-M	M	L-M																
Tamil Nadu	L-M	L-M	L										L							
Telangana	L-M	L	L-S			L	L	L				L-M								
Uttar Pradesh-1	L-M	L									L-M									
Uttar Pradesh-2	L-M	L-M									M						L			
Uttar Pradesh-3	L-M										L					L	L			
Uttarakhand	L	L	L	L			L				L-M									
West Bengal	M	L-M	M																	

Low to Moderate incidence of crabs in HP and Maharashtra; Low to Moderate incidence of blue beetles in Maharashtra; Low incidence of rice skipper in Tamil Nadu; Low incidence of root knot nematode in UP-2; 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 Bugs: **T**: Traces, **L**: Low, **M**: Moderate, **S**: Severe.

INTRODUCTION

Production oriented survey (POS) is aimed to provide 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, biotic and abiotic production constraints prevalent in the states and usage of plant protection chemicals in brief, are also given.

Bihar-1

Districts surveyed: *Rohtas*

Particulars of survey

District	Blocks	Villages
Rohtas	Bikramganj	Karmaini Khurd, Bodadhi, Babhanaur, Chatara, Bithwan and Dawath

Widely prevalent varieties

District	Varieties
Rohtas	MTU 7029, BPT 5204, Rajendra Mahsuri, Rajendra Sweta, Arize 6444 (Hybrid) and Sonahur (Local)

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	3,90,722	2,35,061	3,29,725	3,11,401	1,70,192

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: Rohtas
Total area under HYVs in the district	1,63,792 ha
Most prevalent HYVs in the district	MTU 7029
Total area under rice hybrids in the district	6000 ha
Most prevalent rice hybrids in the district	Arize 6444
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
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Cultivation of HYVs, Seed treatment, preventive measures against pests and diseases, crop rotation and soil testing

Parameters	**District: Rohtas**
What are the general problems in rice cultivation in the district?	Non-functional Govt. tube wells, erratic electricity supply, irrigation water affecting the nursery
Please provide any farmers association in the district	FPO "Sasaram Farmers producer company limited", Rohtas is incorporated. There are seven Kisan clubs (NABARD sponsored) running in the district
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	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 in the district during *Kharif*' 2017

Name of the variety	**Area (ha) covered**
MTU 7029	92092
BPT 5204	51000
Rajendra Mahsuri	12000
Rajendra Sweta	8700
Arize 6444 (Hybrid)	6000
Sonachur (local variety)	400

Production Oriented Survey was conducted under the Agro-climatic zone IIIB of Bihar, in the districts of Rohtas, during the crop season 2017. The crops were at maturity stage at the time of survey. In general, weather conditions were normal in the surveyed areas. The district of Rohtas is the rice bowl of Bihar. Main source of irrigation is through canals from Sone River. In the beginning of the crop season there was scarcity of rainfall and at the same time, canal water was not supplied properly affecting the raising of seedlings. The centre advised some progressive farmers to raise seedlings as a community basis so that other farmers can purchase and use the seedlings. This venture resulted into considerable income generation as well as it helped timely planting of seedlings. Major crop rotations followed by the farmers were rice-wheat, rice-maize, rice-potato and rice-vegetables. Most prevalent rice varieties in the region were HYVs like MTU 7029, BPT 5204, Rajendra Mahsuri and Rajendra Sweta and hybrids like Arize 6444. Some farmers also cultivated local rice varieties like Sonahur because of its aroma. Average rice yield in MTU 7029 was 6.6 t/ha. Most of the plantings were done during July. Average seed rate was 40-45 kg/ha and cooperator reported that some of the farmers adopted seed treatment with

carbendazim (2 g/kg seeds). In the main fields, fertilizers were applied @ 100 kg N/ha, 50 kg P_2O_5/ha, 40 kg K_2O/ha and 20 kg $ZnSO_4$/ha. All the farmers contacted applied FYM (50 q/ha) in the main field at the time of land preparation. Some of the farmers also applied available oil cakes at the time of land preparation. Random planting was common method of planting and intensity of common weeds like *Echinochloa colona* and *Cyperus rotundus* was moderate. In addition to hand weeding, farmers applied weedicides like butachlor or pretilachlor for the management of weeds. There were reports of wild rice, *Oryza sativa* var. *fatua* in some rice fields. Some of the common needs of the farmers were repair of government tube wells, regular supply of electricity, timely supply of fertilizers, pesticides and quality seeds of recommended varieties. Different equipments like tractor, power tiller, rotavator and combined harvester were used by the farmers. The farmers told that they are using last year's seeds for raising the nursery. Canal and shallow tube wells were the main sources of irrigation. Farmers took advice from staffs of university and private dealers regarding use of inputs. Different biotic constraints like sheath blight, false smut and bacterial blight among the diseases and stem borer and brown plant hopper were recorded in low to moderate intensities. Bacterial blight was widely prevalent in the region. For the management of different diseases, farmers applied propiconazole (1 l/ha), carbendazim (1 kg/ha) and combination of streptocycline + copper oxychloride (50 g + 2.5 kg/ha). The number of pesticide application ranged from 1-2.

Prevalence of diseases and insect pests in Bihar-1 during *Kharif'* 2017

Districts	**Diseases**			**Insect pests**	
	ShBl	**FS**	**BLB**	**SB**	**BPH**
Rohtas	L-M (10%)	M (20%)	M (25%)	L-M (12%)	L (5%)

Bihar-2

District Surveyed: *Samastipur, Muzaffarpur* and *Begusarai*

Particulars of survey

District	Villages
Samastipur	Malinagar, Kalyanpur, Saidpur, Pusa, Deopar, Tajpur, Dalsinghsarai, Samastipur town, Mahmada and Dighra
Muzaffarpur	Dardha, Mirapur, Badal, Pilkhi, Rahua, Sakra, Dholi, Kaji- Inda, Markan and Kalichowk
Begusarai	Lakho, Bihat, Baliya, Teghra, Tara-Bariyarpur, Yogidih, Musahari, Chalki and Tetrahi

Widely prevalent varieties

Districts	Varieties
Samastipur	**HYVs:** Rajendra Bhagwati, Rajendra Sweta, Rajendra Mansuri, Sugandha, Swarna, Swarna Sub-1, Rajendra Nilam, Kisori, Sugandha, Rajendra Kasturi, Prabhat, Rajendra Subhasini, Dhanlaxmi, Kamini, Satyam and Rajshree; **Hybrids:** Arize 6444 andArize 6201
Muzaffarpur	**HYVs:** MTU7029, Abhishek, Pan, Rajendra Bhagwati, Rajendra Sweta, Rajendra Swati, Rajendra Subhasini, Rajendra Nilam, BPT 5204, Rajshree, Prabhat, Vaidehi, Rajendra Kasturi, Kisori and Rajendra Sweta; **Hybrids:** Arize 6444, Hybride 6201 and PHB71
Begusarai	**HYVs:** MTU7029, Super Katarni, Sita, Lal Sita Rajendra Mansuri, Parimal and Kasturi

Production oriented survey was conducted in three districts in this part of Bihar during the crop growth period (tillering to maturity). General weather conditions were not very favourable for rice cultivation as there were incidences of severe flood in this region in the month of August damaging the rice crop. Predominant rice varieties cultivated by the farmers were HYVs like Rajendra Bhagwati, Rajendra Sweta, Rajendra Mansuri, Sugandha, Swarna, Sub-1, Rajendra Nilam, Kisori, Sugandha, Rajendra Kasturi, Prabhat, Rajendra Subhasini, Dhanlaxmi, Kamini, Satyam and Rajshree and hybrids like Arize 6444, Arice 6201 and PHB 71. Main cropping sequences followed by the farmers were rice-wheat, rice-maize, rice-potato and rice-mustard. The average yield of rice was 3600-5500 kg./ha in different HYVs and 4500-6000 kg/ha in hybrid rice. Most of farmers applied FYM, neem cake, Castor cake, Vermicompost, Urea (80-150 kg/ha), SSP (30-80 kg/ha) and MOP (20-50 kg/ha). Intensity of common weeds like *Ipomoea spp.*, *Cyperus rotundus* and *Cynodonn dactylon* was moderate. Hand weeding is common in practice for removal of weeds and grasses from rice field. Weedicides were used in direct seeded rice and common weedicides were pendimethelene (Stamp and Pendstar), 2,4-D, Nominee Gold and Adora. In transplanted rice weedicides such as butachlor 50 EC, Saathi, Rifit and Adora were used by few farmers. Among the diseases, brown spot and sheath blight were recorded in moderate to severe intensity in some areas. Other diseases like bacterial blight, false smut, grain discoloration and sheath rot were observed in low to moderate intensities. The insect pests like stem borer, leaf folder, BPH, gundhi bug, army worm and mealy bugs were observed in low to moderate intensities. Farmers applied different pesticides for management of diseases and pests.

District wise observations

Samastipur: Production oriented survey (*Kharif* 2017) was conducted from tillering to maturity stage in ten villages of Samastipur districts. There were reports of flood in most of villages of Samastipur district. Pusa centre also faced the flood situation but Rice pathology trials, 2017

were safe and not damaged. Farmers used 80% of land for rice cultivation. Most of farmers cultivated High Yielding Varieties of rice released from Dr. Rajendra Prasad Central Agricultural University, Pusa and also adopted new technology for rice cultivation. DSR became most popular technology among farmers of Samastipur district. The predominant varieties under rice cultivation were HYVs like Rajendra Bhagwati, Rajendra Sweta, Rajendra Mansuri, Sugandha, Swarna, Sub-1, Rajendra Nilam, Kisori, Sugandha, Rajendra Kasturi, Prabhat, Rajendra Subhasini, Dhanlaxmi, Kamini, Satyam and Rajshree and hybrids like Arize 6444 and Arice 6201. The average yield of rice was 3600-5500 kg./ha in different HYVs and 4500-6000 kg/ha in hybrid rice. The optimum time of sowing was 15-30 June and transplanting was July. Most of farmers applied FYM, neem cake, Castor cake, Vermicompost, Urea (80-150 kg/ha), SSP (30-80 kg/ha) and MOP (20-50 kg/ha). Progressive farmers followed line transplanting of rice. The intensity of weeds was high due to regular rainfall in the district. The common weeds were *Ipomoea spp.*, *Cyperus rotundus* and *Cynodonn dactylon.* Hand weeding is common in practice for removal of weeds and grasses from rice field. Weedicides were used in direct seeded rice and common weedicides were pendimethelene (Stamp and Pendstar), 2,4-D, Nominee Gold and Adora. In transplanted rice weedicides such as butachlor 50 EC, Saathi, Rifit and Adora were used by few farmers. Insect pests like stem borer, leaf folder, gandhi burg, BPH and army worm were common among insects in rice field. Insecticides like furadon 3G(30kg/ha), phorate 10G (10kg/ha), monocrotophos 36 EC (1.5 l/ha) and imidacloprid (1 ml/1) were used for insects pest control in rice field. Among the diseases, brown spot, bacterial blight and sheath blight were recorded in higher intensity while others disease like false smut and grain discoloration observed in low to medium severity. Fungicides like Bavistin (2 gm/l of water), mancozeb (2 gm/l of water), hexaconazole (0.1%) and propiconazole (0.2%) were used for management of said diseases. However, the rate of adoption of plant protection measure against disease/pests/weeds among farmers was limited to 5% only. There were 10-15% losses during harvesting, threshing, cleaning and storage of rice grains. Discoloration of rice grains caused by various micro-organisms reduced the market value of rice grains.

Muzaffarpur: The survey (*Kharif'2017*) was conducted in 10 villages of Muzaffpur district. The general climatic conditions were nor favourable for rice cultivation as there was severe flood situation in several villages of Muzaffarpur district. Musahari block was badly affected by flood water of Budhi Gandak. Farmers used 70% of there land for cultivation of rice crop. More than 50% of rice crop were badly affected by flood water in the month of August. The common crop rotation practices were rice-wheat, rice-maize, rice-potato and rice-mustard. The common varieties grown in the Muzaffarpur district were HYVs like MTU7029, Abhishek, Pan, Rajendra Bhagwati, Rajendra Sweta, Rajendra Swati, Rajendra Subhasini, Rajendra Nilam, BPT 5204, Rajshree, Prabhat, Vaidehi, Rajendra Kasturi, Kisori and Rajendra Sweta and hybrids like Arize 6444, Arize 6201 and PHB71. Most of farmers applied urea and compost in the nursery. Some farmers applied chemical fertilizers like urea (100-150 kg/ha), SSP (30-50 kg/ha) and MOP (15-30 kg/ha). The common weeds were *Cyperus rotundus* and *Cynodon dactylon.* Hand weeding is the most popular method to remove the weeds and grasses from rice field. Only few progressive farmers applied weedicides like butachlor and 2, 4-D. Weedicides were used in direct seeded rice and common weedicides were pendimethelene (Stamp and Pendstar), 2,4-D, Nominee Gold and Adora. In transplanted rice weedicides such as butachlor 50 EC, Saathi, Rifit and Adora were used by few farmers. The common needs of farmers were seeds of HYVs, diesel, power and timely availability of fertilizers. The incidences of biotic constrains like brown spot, sheath blight, bacterial leaf blight, false smut among the diseases and insect pest like BPH, mealy bugs

and stem borer were recorded in low to moderate intensities. SRI method was also adopted by few farmers. Different fungicides like Contaf, carbendazim, Companion, hexaconazole, Blitox-50, propiconazole, mancozeb were used for management of different rice diseases. Some farmers also reported low price of rice grain in market due to discholoration. In spite of severe flood situation in Muzaffarpur district and unpredictable heavy rain fall, the rice grain yield was very good. The rice grain yield in HYVs was 4500-5500 kg/ha and in hybrid rice the grain yield was 5200-6000 kg/ha. The average losses during harvesting, threshing, cleaning and storage were 5-15%.

Begusarai: Production oriented survey was conducted in nine villages of Begusarai district during tillering to maturity stages. Many villages of Begusarai were flooded by river water of Budhi Gandak in the month of August, 2017. The main crop rotation practices were rice-wheat, rice-Mustard and rice-maize. Many progressive farmers left the rice cultivation due to flood or draught or, low price of rice in Begusarai district. Most of the farmers are growing maize in *Kharif* and *Rabi* for animal feed. Many farmers of Begusarai are growing cash crops like chilies, castor and tobacco. The predominant varieties in the district were HYVs like MTU7029, Super Katarni, Sita, Lal Sita Rajendra Mansuri, Parimal and Kasturi. The average yield was 3000-3500 kg/ha in different HYVs and 4500-5500 kg/ha. The normal time of sowing is June and transplanting is July. The average seed rate was 70-80 kg/ha for High Yielding Varieties. Many farmers of Begusarai district applied FYM, vermicompost and chemical fertilizers in rice field. Few farmers also applied neem oil cake and caster cake. Direct seeded rice cultivation also adopted by few farmers due to shortage of laborers. The population of weeds like *Cyperus rotandus* and *Cynodon dactylon* was in medium intensity. The common needs of farmers were high quality high yielding varieties/ hybrid seeds of rice, timely supply of fertilizers and direct subsidies on agricultural equipments like sprayer. Among the diseases brown spot, bacterial leaf blight, sheath rot and sheath blight were common up to 10-50% disease intensity in rice field. Insect pest like stem borer, leaf borer, termites, gandhi bugs and rats were in low to moderate intensities in rice field. Zinc deficiency also recorded in some area. Fungicides like Dithane M-45, Bavistin, Sheathmar, Contaf, Companion, hexaconazole, Blitox-50 and streptocyclin and insecticides like furadon, phorate, monocrotophos and imidacloprid are popular fungicides and insecticides among the farmers of Begusarai. There was 5-10% loss during harvesting, threshing, cleaning and storage of rice-grains.

Prevalence of diseases and insect pests in Bihar-2 during *Kharif'2017*

Districts	**Diseases**					
	BS	**ShBl**	**ShR**	**FS**	**GD**	**BB**
Samastipur	M-S	L-M	-	L-M	L-M	L-M
Muzaffarpur	L-M	L-M	-	L-M	L-M	L-M
Begusarai	M-S	L-S	L-M	-	L-M	L-M

Districts	**Insect pests**						
	SB	**LF**	**BPH**	**GB**	**AW**	**MB**	**Rat**
Samastipur	L-M	L-M	L-M	L	L-M	-	-
Muzaffarpur	L-M	-	L-M	-	-	L-M	-
Begusarai	L-M	L-M	-	L-M	-	-	L-M

Chhattishgarh

Districts surveyed: *Raipur, Mahasamund, Balodabazar* and *Bilaspur*

Particulars of survey

Districts	Blocks	Villages
Raipur	Abhanpur, Palari and Tilda	Bendri, Birahi, Datan, Dhakaw and Tandua
Mahasamund	Mahasamund and Pithora	Singhanpur, Rikha Daddar, Bade Temri, Garhsivni and Chilpawan
Balodabazar	Kasdol	Madwa and Simra
Bilaspur	Marwahi	Lohari, Channa Dongri and Tendu Munda

Widely prevalent varieties

Districts	Varieties
Raipur	**HYVs/Improved**: Swarna, MTU 1010, MTU 1001, Mahamaya, Sona Mahsuri, Kaveri 371, PKV-HMT, IR 64, Indira Sugandh Dhan, Chandrasani, Bamleswari, IGKVV R1, IGKVV R2, Safri, Durgeswari, Karma Mahsuri, Indira Barani Dhan, Bishnu Bhog, Dubraj, Tulsi Majri and Javaphool; **Hybrids:** Arize 6444, VNR 2245, DRS 775, VNR 2355, US 312 and US 382
Mahasamund	**HYVs/Improved**: Swarna, Swarna Sub-1, MTU 1010, MTU 1001, Mahamaya, Maheswari, Samba Mahsuri, IGKVV R1, IGKVV R2, Sona Mahsuri, IR 64, Dubraj, Karma Mahsuri and Rajeswari; **Hybrids:** Arixe 6444, VNR 2245, DRS 775, DDR H4 and Silky
Balodabazar	**HYVs/Improved**: Swarna, Mahamaya, Rewa Durgeswari, Maheswari, PKV HMT 10, Jawaphool, IGKVV R1 and IGKVV R2; **Hybrids:** Arize 6444
Bilaspur	**HYVs/Improved**: Swarna, Mahamaya, Sona Mahsuri, MTU 10101, MTU 1001, Tulsi Manjari, Dubraj, Indira barani Dhan, IR 64, IGKVV R1 and IGKVV R2; **Hybrids:** Arize 6444 and Silky

Particulars of rice area in surveyed districts of Chhattishgar during 2017

Districts	Total Rainfall (mm)	Total geographical area (000ha)	Total cultivable area (000ha)	Total cultivated area (000ha)	Total irrigated area (000ha)	Area under paddy (000ha)
Raipur	1152.90	289.197	230.917	230.919	135.04	161.00
Mahasamund	1434.20	359.39	295.514	295.514	114.068	205.35
Balodabazar	914.61	496.30	318.930	321.130	107.760	239.84
Bilaspur	1164.6	581.9	289.2	289.2	100.2	26.01

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	Mahasamund	Balodabazar	Billaspur
Total Area under HYVs in the district (ha.)	156.00	200.00	203.35	
Most prevalent HYVs in the District	Swarna, MTU 1010, MTU1001	Swarna, MTU 1010, MTU1001, Maheswari	Swarna, Mahamaya	Swarna, MTU 1010
Total area under rice hybrids in the district (ha.)	5.00	39.84	2.00	
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
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, Apply fertilizers according to the fertility level of the soil,	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, 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, neck blast	Labor shortage, BPH, stem borer, BLB, blast, neck blast, sheath blight, grain discoloration, Brown spot
Please provide any farmers association in the district	Agrocrates society Kisan sangh, RKVY, Agricon, Green revaluatin extension project, National mission for sustainable agriculture, Soul health cards	Kisan sangh, Agricon RKVY, Green revaluation extension project, National mission for sustainable agriculture, Soul health cards	Kisan sangh, Agricon RKVY, Agricon, Green revaluation extension project, National mission for sustainable agriculture, Soil health cards	Agrocrates society Kisan sangh, Agricon RKVY, Green revaluation extension project, National mission for sustainable agriculture, Soil health cards
Whether availability of labors is sufficient?	No	No	Yes	
Whether there is any marketing problem of the produce?	Not get expected Samathan value	Not get expected Samathan value	Not get expected Samathan value	Not get expected Samathan value
Any major irrigation/power generation project in the district	Samoda Baraj Gughwa	Kodar project Kaswa Project	Zoke Waller project	Khunta Gath, Bhasa Jhar

Parameters	Districts			
	Raipur	**Mahasamund**	**Balodabazar**	**Billaspur**
Any soil testing program undertaken?	-	-	-	-
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 districts in this stage viz., Raipur, Mahasamund, Balodabazar and Bilaspur when the crops were tillering to booting or heading stage. Majority of the fields surveyed were under rainfed lowland ecosystem. Common cropping sequences followed by the farmers were rice-wheat, rice-lathyrus, rice-chickpea, rice-rice, rice-fallow and rice-lentil. Predominant rice varieties cultivated in the region were HYVs like Swarna, MTU 1010, MTU 1001, Mahamaya, Sona Mahsuri, Kaveri 371, PKV-HMT, IR 64, Indira Sugandh Dhan, Chandrasani, Bamleswari, IGKVV R1, IGKVV R2, Safri, Durgeswari, Karma Mahsuri, Indira Barani Dhan, Bishnu Bhog, Dubraj, Tulsi Majri and Javaphool and hybrids like Arize 6444, VNR 2245, DRS 775, VNR 2355, US 312 and US 382. Average rice yield in the region was low and the main reasons for low yield were high pest and disease incidence, high infestation of weeds and erratic rainfall. In the main fields, farmers applied 60-125 kg N/ha, 30-60 kg P_2O_5/ha and 20-40 kg K_2O/ha. Some applied FYM in the main fields at the time of land preparation. Method of planting was random transplanting and direct sowing. The intensity of common weeds like *Echinochloa colona, ischaemum rugosum, fimbristylis miliacea* and *Cyperus rotundus* was high in many places and farmers in addition to hand weeding, applied different herbicides to manage the weeds. Seed replacement rate was low among the farmers. Among various biotic constraints, blast, neck blast and sheath blight among diseases and BPH and mites among the insect pests were widespread in moderate to high intensities.

District wise observations

Raipur: Production oriented survey was conducted in 5 villages (in 3 blocks) involving 11 farmers. The rice fields were either in tillering to booting stage or in heading stage. All the fields surveyed were under rainfed lowland ecosystem. In some of the surveyed areas there was delayed rainfall. Different cropping sequences followed by the farmers were rice-wheat, rice-chickpea, rice-rice, rice-fallow and rice-lentil. Predominant rice varieties cultivated in the district were HYVs like Swarna, MTU 1010, MTU 1001, Mahamaya, Sona Mahsuri, Kaveri 371, PKV-HMT, IR 64, Indira Sugandh Dhan, Chandrasani, Bamleswari, IGKVV R1, IGKVV R2, Safri, Durgeswari and Indira Barani Dhan and hybrids like Arize 6444, VNR 2245, DRS 775, VNR 2355, US 312 and US 382. Average rice yield in the district was poor and ranged from 1500-4000 kg/ha in different HYVs like PKV HMT, Mahamaya and Swarna and about 3000 kg/ha in Arize 6444 Gold. Main reasons for the low yield in the district were high incidences of pests and diseases, poor weed management and erratic rainfall in certain areas. Planting was done mainly during July. Though some farmers continued planting up to middle of August. Average seed rate was about 60 kg/ha; however, in case of direct sowing it was more (40 kg/acre). Majority of the farmers (>90%) did not follow seed treatment. Application of FYM or other organic manures in the nursery bed was also not common among the farmers. Some of the farmers (~40%) applied inorganic fertilizers like DAP, urea and SSP in the nursery. In the main fields, farmers applied 60-125 kg N/ha, 60 kg P_2O_5/ha and 30-40 kg K_2O/ha. Very few (~ 20%) applied FYM (5-10 t/ha) in the main fields. Many farmers adopted direct sowing and some followed random

transplanting. The intensity of common weeds like *Echinochloa colona, ischaemum rugosum, spilanthes acmella* and wild rice was moderate to high. Hand weeding was common among the farmers and in addition, farmers applied herbicides like Super Mix, Nominee Gold, Adora, Sathi, Whip Super (Fenoxaprop-p-ethyl) and Topstar for management of weeds. Some of the common needs of the farmers were irrigation facilities, and good quality seeds of HYVs. Farmers used equipments like tractor, sprayers and cultivators. Majority of the farmers used their own paddy seeds for sowing and seed replacement rate was low. Canal and deep tube wells were the main sources of irrigation and majority of the farmers told that there was scarcity of water. In addition to their own decisions, farmers took advices from private dealers regarding input use. Intensity of different pests and diseases was high in the district. High intensity of blast and neck blast was observed on varieties like HMT, Swarna and Mahamaya in Bendri village. High intensity (up to 50%) of sheath blight was observed on variety Swarna in Bendri village. Low to moderate incidences of other diseases like brown spot, grain discoloration, false smut, sheath rot and bacterial blight were observed in several fields in the district. Among the insect pests, BPH was recorded in severe intensity (up to 50%) on varieties like HMT and Swarna in villages like Bendri and Birahi. Moderate to high damage by rats was also observed in some fields. The intensity of other pests was in low intensity. However, many farmers did not take any plant protection measures. Few farmers applied pesticides like Tiger (1 ml/l) and M-Star for stem borer and Glamour (250 g/ha) for BPH management. Farmers made 2-3 pesticide application. The major problem faced by the farmers was irrigation facility.

Mahasamund: Four villages in two blocks involving 19 farmers were covered for production oriented survey in this district. The fields surveyed were under rainfed lowland ecosystem. The crops were in tillering to booting stage at the time of survey. In general, the weather conditions were normal for rice cultivation. The main crop rotation practice followed by the farmers was rice-rice followed by rice-lathyrus. Predominant rice varieties cultivated in the district were HYVs like Swarna, Swarna Sub-1, MTU 1010, MTU 1001, Mahamaya, Maheswari, Samba Mahsuri, IGKVV R1, IGKVV R2, Sona Mahsuri, IR 64, Dubraj, Karma Mahsuri and Rajeswari and hybrids like Arixe 6444, VNR 2245, DRS 775, DDR H4 and Silky. Average rice yield in the district was low (2000-2500 kg/ha) in varieties like Swarna, MTU 1010, MTU 1001, Silky and Shridhan. Some of the reasons for low yield were high incidence of pests and diseases and poor weed management. Planting was done mostly during end of June to 1st week of July. Average seed rate was 25-40 kg/acre and only 25% of the farmers adopted seed treatment with fungicides like thiram (2 g/kg) and carbendazim (2 g/kg). All the farmers contacted applied FYM in the nursery and all of them also applied inorganic fertilizers like urea, DAP, MOP and SSP in the nursery. In the main fields, farmers applied 100-150 kg N/ha, 30-60 kg P_2O_5/ha and 30-50 kg K_2O/ha. Almost all the farmers applied FYM (2-10 t/ha) in the main fields. Random method of planting was common among the farmers and about 15% of the farmers adopted direct sowing. Intensity of common weeds like *Echinochloa colona, ischaemum rugosum, fimbristylis miliacea* and *Cyperus rotundus* was high. All the farmers adopted hand weeding and in addition they also applied herbicides like Saathi, Nominee Gold, Adora, pretilachlor, pendimethalin, Fenoxaprop-p-ethyl and others for management of weeds. Incidence of wild rice was reported from some fields. Implements like tractor, plough and sprayers were used by the farmers. Deep tube wells followed by canal were the main sources of irrigation. In addition to their own decisions, farmers took advices from private dealers regarding input use. Intensity of different pests and diseases was high in the district. Among the diseases, blast, neck blast and sheath blight were very wide spread and were recorded in moderate to high intensity. Leaf blast intensity was very high (30-

40%) on variety Rajeswari in Rikha Daddar village. Neck blast incidence up to 35% on Swarna in Singhanpur village, up to 40% on MTU 1010 in Bade Temri village and up to 50% on variety Rajeswari in Rikha Daddar village was recorded. Similarly, sheath blight was very widespread in moderate to high intensity. Sheath blight intensity in the range of 30-40% was recorded on varieties like Swarna and Rajeswari in villages like Garhsivni and Bade Temri. The intensity of other diseases was in low to moderate intensities. Among the insect pests, BPH incidence was moderate to high (up to 40% on variety Rajeswari inRikha Daddar village). There was severe incidence of mite (20-40%) on varieties like Swarna and Rajeswari in villages like Singhanpur, Rikha Daddar and Bade Temri. Some farmers applied pesticides like Ferterra (4 kg/acre), chlorpyriphos (250 ml/ha) and phorate (10 kg/acre) for stem borer; imidacloprid (250 g/ha) and Glamour (250 g/ha) for BPH; tricyclazole (300 g/ha), Nativo (250 g/ha) and tebuconazole (250 g/ha) for blast and neck blast and heaxaconazole (500 ml/ha) for sheath blight. Farmers made 2-3 pesticide application and all the farmers told that they are mixing different pesticides.

Balodabazar: Survey was conducted in two villages in Kasdol block of the district when the crops were heading to dough stage. The fields surveyed were under rainfed lowland ecosystem and in some places the crop suffered water stress. Different cropping sequences followed by the farmers were rice-rice, rice-fallow and rice-lentil. Predominant rice varieties in the district were HYVs like Swarna, Mahamaya, Rewa Durgeswari, Maheswari, PKV HMT 10, Jawaphool, IGKVV R1 and IGKVV R2 and hybrids like Arize 6444. Average rice yield was low (1500-3200 kg/ha) due to high incidences of pests and diseases and water stress. Planting was done mainly during end of June to 1st week of July. Average seed rate was 40-60 kg/ha and none of the farmers contacted adopted seed treatment. Few farmers applied FYM and inorganic fertilizers like urea, DAP and MOP in the nursery. In the main fields, farmers applied 100-125 kg N/ha, 40-50 kg P_2O_5/ha and 20-25 kg K_2O/ha. The intensity of common weeds like *Echinochloa colona, ischaemum rugosum* and wild rice was high in most of the places visited. All the farmers adopted hand weeding and in addition they also applied herbicides like Nominee Gold and Adora. Some of the common needs of the farmers were quality seeds of HYVs and assured irrigation facilities. Implements like tractor, seed drill, cultivator and sprayers were used by the farmers. Farmers mostly used their own harvested paddy as seeds. Canal and deep tube wells were the main sources of irrigation. In addition to their own decisions, farmers took advices from private dealers regarding input use. Among the diseases, neck blast and sheath blight up to 30% incidence was recorded on Swarna in Madwa village. Other diseases were observed in low to moderate intensities. Among the insect pests, BPH and stem borer was widespread. There was high incidence of mite (30%) on Swarna variety in Madwa village. Very few farmers adopted plant protection measures and applied hexaconazole (500 ml/ha) for blast and sheath blight and Ferterra (4 kg/acre) for stem borer management.

Bilaspur: Three villages in Marwahi block were covered for production oriented survey in this district when the crops were in heading stage. A total of 10 farmers were contacted for the survey. Most of the fields surveyed were under upland condition and some were under irrigated ecosystem. Common cropping sequences followed by the farmers were rice-wheat, rice-rice, rice-lathyrus and rice-fallow. Predominant rice varieties cultivated in the district were HYVs like Swarna, Mahamaya, Sona Mahsuri, MTU 10101, MTU 1001, Tulsi Manjari, Dubraj, Indira barani Dhan, IR 64, IGKVV R1 and IGKVV R2 and hybrids like Arize 6444 and Silky. Average yield in the district ranged from 3750-5500 kg/ha in different HYVs. Main reasons for low yield in some of the areas was due to high weed infestation, low and erratic rainfall and high

incidences of pests and diseases. Most of the planting was done in July. Average seed rate was 50-60 kg/ha and none of the farmers contacted adopted seed treatment. Some of the farmers contacted applied FYM and inorganic fertilizers like DAP, MOP and urea in the nursery beds. In the main fields, farmers applied 80-120 kg N/ha, 50-60 kg P_2O_5/ha and 20-40 kg K_2O/ha. About 60% of the farmers contacted applied FYM (5-25 t/ha) in the main fields at the time of land preparation. Farmers followed random transplanting or direct sowing. The intensity of common weeds like *Echinochloa colona* and *ischaemum rugosum* was high in most of the places visited. All the farmers adopted hand weeding and in addition they also applied herbicides like Saathi and Nominee Gold. Implements like tractor, harvester and sprayers were used by the farmers. Majority of the farmers used their own paddy seeds for sowing and seed replacement rate was low. Canal and deep tube wells were the main sources of irrigation. In addition to their own decisions, farmers took advices from private dealers regarding input use. Diseases like blast, neck blast, brown spot, sheath blight, grain discoloration, false smut, sheath rot and bacterial blight were recorded in varying intensities. Moderate to severe intensity of sheath blight (up to 30%) was recorded on variety Swarna in Admar village while leaf blast (up to 30%) was recorded on Lachai variety in Lohari village. BPH was very severe (60-70%) on Swarna in Lohari village. The intensity of other insect pests like stem borer and leaf folder was in low to moderate intensity. Very few farmers adopted plant protection measures and applied pesticides like imidacloprid (250 g/ha) for BPH and stem borer and hexaconazole (500 ml/ha) for sheath blight management.

Prevalence of diseases and insect pest in Chhattisgarh during *Kharif*' 2017

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

Low incidence (4%) of stem rot was noticed in Raipur

Districts	Insect pests								
	SB	**LF**	**BPH**	**GLH**	**GM**	**RH**	**Mite**	**Termite**	**Rat**
Raipur	L- M (5-15%)	L	M-S (10-50%)	L-M (5-10%)	L	L	-		M-S
Mahasamund	M (10-20%)	M	M-S (15-40%)	L	L	L	M-S (20-40%)	S (only in few fields)	M
Balodabazar	M	M	L-M (10-25%)	L	L	L	M-S (30%)		M
Bilaspur	L-M (10-20%)	M	L-S (10-70%)	-	-	-	L-M (5-10%)		M-S

Gujarat

Districts surveyed: *Ahmedabad, Mehsena, Anand, Kheda, Bharuch, Surat, Tapi, Dang, Panchmahal, Vadodara, Navsari* and *Valsad*

Particulars of survey

Districts	Taluka/Blocks	Villages
Ahmedabad	Daskroi and Sanand	Jaitalpur, Pirana, Bareja III, Naaz, Meroli, Nandej and Bhawanpur
Mehsena	Kadi	Thol
Anand	Tarapur	Valli, Kanawada, Khada, Chagda and Dugari
Kheda	Kheda, Kathal, and Mahemdabad	Makwa, Amrapura, Vijaypura, Jeetpura, Kathwada, Goblej and Nawagam
Bharuch	Hansot	Takarma and Pun
Surat	Olpad and Mangrol	Saroli, Bhadol, Kim, Kathwad and Velachha
Tapi	Dolvan and Vyara	Chardhara, Tichakpura and Maipur
Dang	Waghai	Bhes Katri
Panchmahals	Kalol	Derol and Vakrol
Vadodara	Vagodiya, Savli and Deshar	Panchdevla, Asoj, Varasda, Valavav and Vakaneda
Navsari	Navsri, Vansda and Gandevi	Kukeri, Lakhawadi, Jambaliya, Ambheja and Ichchapura
Valsad	Dharampur and Valsad	Kundivinar, Nanidoldungri, Ambatalat and Vankhas

Widely prevalent varieties

Districts	Varieties
Ahmedabad	**HYVs:** Gurjari, GAR-13, GR-101, Mahisagar, Sonma, Surya Moti and Nath Pauha
Mehsena	**HYVs:** Moti Gold, GAR-13 and Surya Moti
Anand	**HYVs:** GAR-13, Sonam, Moti, Gurjari, Daftari Om Sriram and MC-13
Kheda	**HYVs:** Gurjari, GAR-13, GR-11, Mahsuri, Surya Moti, Moti Gold and Sonam
Bharuch	**HYVs:**Gurjari, GNR-3 and GAR-13
Surat	**HYVs:** Gurjari, Jaya, Surya Moti and Nath Pauha
Tapi	**HYVs:** Jaya and Gurjari; **Hybrids**:Excel-708, Dhanya-748 and 25P35
Dang	**HYVs:** Jaya; **Hybrids:** 25P35 and US 312
Panchmahals	**HYVs:** Surya Moti, Moti Gold and Jaya
Vadodara	**HYVs:** GAR-13, Sonam, Dhan Versa, Surya Moti and Moti Gold; **Hybrids:** Pioneer Hybrids
Navsari	**HYVs:** Gurjari, GNR-3, Mahsuri, MC-13 and Nath Pauha; **Hybrids:** US-312 and US 807
Valsad	**HYVs:** Jaya, GNR 3 and Mahi Sagar; **Hybrids:** Arize 6201 and Kaveri

Particulars of rice in different districts of Gujarat

Districts	Total Geographical Area (ha)	Total Cultivable Area (ha)	Total Cultivated Area (ha)	Net Irrigated Area (ha)	Area Under Rice (ha)
Ahmedabad	7,74,800	6,40,000	4,22,420	2,77,000	-
Mehsena	70,619	66,468	58,554	33,304	7,045
Anand	2,94,751	2,11,265	1,62,607	1,96,7000	1,10,752
Kheda	3,94,388	3,04,669	2,40,705	1,39,462	-
Bharuch	5,24,700	3,15,500	2,58,748	1,19,000	-
Surat	4,32,687	3,15,697	1,30,183	1,93,400	46,240
Tapi	3,43,474	1,64,108	1,60,401	63,496	53,483
Dang	1,72,366	57,921	53,080	10,600	-
Panchmahals	5,13,820	2,79,489	2,52,498	37,833	-
Vadodara	7,77,789	5,51,379	4,95,115	1,29,288	-
Navsari	4,39,374	3,68,371	3,15,000	2,05,021	-
Valsad	2,94,412	1,52,115	1,00,344	61,751	70,665

Variety-wise area coverage in different districts of Gujarat during *Kharif'2017*

Varieties	Area covered (ha)/Districts				
	Mehsana	**Anand**	**Surat**	**Tapi**	**Valsad**
HYVs					
GR-11	2773	15500	781		
Gurjari		7500	15330	2034	3931
GAR-13	4272	35000	668	1253	
Jaya		4252	11574	2374	6492
Mahsuri		3500	3730		1270
Krishna Kamud		2500			
Nath Pauha			1310		
Buland				3245	
Sahi Dawat				587	
GR-3					3063
GR-4					2150
Sona					7658
Others			6801	26645	35994
Hybrids		42500			
Gorakhnath			2636		7083
US 312			1000		
Kaveri 508			1640		
MS-13			800		
Pioneer 25P35				8755	
Advanta 807				7545	
Suruchi 5629				1045	3024

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

Parameters	**Mehsana**	**Anand**	**Surat**
Total area under HYVs in the district (ha)	7045 ha	110750 ha	32086 h
Most prevalent HYVs in the district	GR-11, GAR 13	GAR-13	Jaya, Gurjari, GAR-13
Total area under rice hybrids in the district(ha)	-	42500 ha	14157 ha
Most prevalent rice hybrids in the district	-	Sonam, Bayer hybrids	Gorakhnath, US 312, MC-13
Total area under basmati in the district	-	-	-
Most prevalent basmati varieties in the district	-	-	-
Whether farmers are using any heavy equipments like transplanted/combine harvester	Combined harvester	Yes	Transplanter and combine harvester
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	SRI	Laser leveling	Laser leveling
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Judicious use of nitrogenous fertilizers	Judicious use of nitrogenous fertilizers	Use of HYVs
What are the general problems in rice cultivation in the district?	Irregular rainfall & labour scarcity	Canal water is not available in time	-
Please provide any farmers association in the district	Kisan Sangh-Kadi	Yes	-
Whether availability of labours is sufficient?	No	Yes	Yes
Whether there is any marketing problem of the produce?	No	No	Yes
Any major irrigation/power generation project in the district	Yes; Narmada canal	Yes; Dhuvaran	Yes
Any soil testing program undertaken?	No	Yes	Yes
Any farmers' training program was organized by the state department of Agriculture/University	No	Yes	Yes

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

Parameters	**Tapi**	**Valsad**
Total area under HYVs in the district (ha)	5348 ha	19103 ha
Most prevalent HYVs in the district	Jaya, Gurjari, GAR-13	GR-3, GR-11, Jaya
Total area under rice hybrids in the district(ha)	48153 ha	51562 ha
Most prevalent rice hybrids in the district	Gorakhnath, Pioneer 25P35	Goraknath
Total area under basmati in the district	-	-
Most prevalent basmati varieties in the district	-	-
Whether farmers are using any heavy equipments like transplanted/combine harvester	Puddler and combine harvester	No
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	Laser leveling	No
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Seed bed preparation and judicious use of N	Judicious use of N fertilizers
What are the general problems in rice cultivation in the district?	Stem borer infestation	-
Please provide any farmers association in the district	-	-
Whether availability of labours is sufficient?	No	No
Whether there is any marketing problem of the produce?	Not getting proper market price	No marketing agency
Any major irrigation/power generation project in the district	Ukai thermal power project	No
Any soil testing program undertaken?	Yes	Yes
Any farmers' training program was organized by the state department of Agriculture/University	Yes	Yes; Kisan Mahatsav

Production oriented survey was conducted in rice growing areas of 12 districts viz., Ahmedabad, Mehsena, Anand, Kheda, Bharuch, Surat, Tapi, Dang, Panchmahal, Vadodara, Navsari and Valsad. A total of 22 talukas and 47 villages were covered under the survey. Overall climatic conditions were favourable for rice cultivation. Onset of monsoon was in last week of June and monsoon was well distributed (37 days) with total rainfall of 838 mm (as per RARS, Nawagam station data). Different cropping practices followed by the farmers were rice-wheat, rice-vegetables, rice-rice, rice-chickpea, rice-Indian bean, rice-pearl millet, rice-sugarcane, rice-vegetables, rice fodder and rice-mustard. Different HYVs cultivated in the state were Gurjari, GAR-13, GNR-3, GR-11, Mahsuri, Jaya, Moti Gold, Surya Moti, Sonam, nath Pauha, Daftari Om Sriram 125 and Krishna Kamod. Some farmers also cultivated hybrids like US 312, Arize 6201, US 807, US 834, MC 13 and Kaveri. Most of the planting operations were done during end of June to 3rd week of July. Average seed rate was 25-35 kg/ha in case of HYVs. Seed treatment was not followed by the farmers. Farmers applied 80-120 kg N/ha (through urea or ammonium sulphate), 20-40 kg P_2O_5/ha (through DAP or SSP) and 20-30 kg $ZnSO_4$/ha. Farmers also applied FYM (4-8 t/ha) and green manures in the fields. The intensity of common weeds

like *Echinochloa crusgalli*, *E. colona* and *Cyperus rotundus* was low. Hand weeding (1-2) was the common practice and most the farmers also applied weedicides like pendimethalin, butachlor or Nominee Gold. Some of the common requirements of the farmers were quality seeds of HYVs, proper market price, low input responding varieties, salt tolerant rice varieties and low cost inputs. The average seed replacement rate in the state was 20-25%. The intensity of different biotic stresses like grain discolouration, false smut, blast, leaf folder and stem borer was low and some farmers applied different pesticides for their management.

District wise observations

Ahmedabad and Mehsana: Production oriented survey was conducted in 7 villages (in 2 blocks) in Ahmedabad and one village in Mehsana when the crops were booting to dough stage. Twelve farmers in Ahmedabad and 5 farmers in Mehsana were contacted for survey. The fields were under irrigated ecosystem and in general, the weather conditions were normal for rice cultivation. Rainfall was timely and well distributed. The prominent cropping sequences in the district were rice-wheat, rice-vegetables, rice-rice, rice fodder and rice-mustard. Different rice varieties cultivated by the farmers were HYVs like Gurjari, Moti Gold, GAR-13, GR-101, Mahisagar, Sonma, Surya Moti and Nath Pauha. Average rice yield in the region ranged from 4200-5400 kg/ha in different HYVs. Planting was mainly done during 1st to 3rd week of July. Average seed rate used by the farmers was 25-35 kg/ha. However, majority of the farmers did not adopt seed treatment. Very few treated seeds with thiram. Majority farmers used new certified seeds. Almost all the farmers applied FYM in the nursery and also inorganic fertilizers like DAP (35-37 kg/ha) and urea (40 kg/ha). In the main fields, fertilizers were applied @ 100-120 kg N/ha (through urea or ammonium sulphate), 35-45 kg P_2O_5/ha (through DAP or SSP), 20 kg K_2O/ha and 22-25 kg $ZnSO_4$/ha. Some applied FYM or green manures. Random method of planting with 18-32 plants/m^2 was common among the farmers. The intensity of common weeds like *Echinochloa crusgalli*, *E. colona* and *Cyperus rotundus* was low. Hand weeding (1-2) was the common practice and most the farmers also applied weedicides like pendimethalin (1 kg a.i/ha), butachlor (1.5 kg a.i./ha) or Nominee Gold (200 g/ha). Some of the common needs of the farmers were low cost production technologies, mechanization in rice cultivation, quality seeds of HYVs and proper market price. Equipments like puddler, tractor, thresher, rotavator and harvesters were used by farmers. Average seed replacement was 20-30% and many farmers told that they purchase seeds in every 2-3 years. Canal and shallow tube wells were the main sources of irrigation. In addition to own decisions and advices from staffs from state department and university, private dealers also advised them regarding use of different pesticides and fertilizers. Intensity of different diseases like grain discolouration, sheath rot and false smut and insect pests like leaf folder and stem borer were recorded in some fields in low intensities. Some farmers applied different pesticides like phorate 10G or cartap hydrochloride 4G or carbofuran 3G @ 15-20 kg/ha and cypermethrin 25 EC @ 1 ml/l. The major problems faced by the farmers were shortage of labours and uncertainty of irrigation water and rain.

Anand: Five villages in Tarapur taluk in this district were surveyed for production oriented survey when the crops were in milk to milk stage. A total of 10 farmers were contacted during the survey. The fields were under irrigated ecosystem and in general, the weather conditions were normal for rice cultivation. Rainfall was timely and well distributed during the season. Common crop rotation practices followed by the farmers were rice-rice, rice-wheat, rice-

vegetables, rice-gram, rice-pearl millet, rice-lucerne, rice-vegetables and rice tobacco. Different varieties cultivated by the farmers were GAR-13, Sonam, Moti, Gurjari, Daftari Om Sriram and MC-13. Average rice yield in the district ranged from 4200-5400 kg/ha in different HYVs. Majority of the farmers completed the transplanting during 2nd to 4th week of July. Many farmers used certified seeds for sowing and the average seed rate was 25-35 kg/ha and none of the farmers contacted adopted seed treatment. The farmers did not apply any organic manure in the nursery. However, all of them told that they applied DAP (37 kg/ha) and urea (40 kg/ha) in the nursery. In the main fields, fertilizers were applied @ 100-120 kg N/ha (through urea or ammonium sulphate), 20-40 kg P_2O_5/ha (through DAP or SSP) and 22-25 kg $ZnSO_4$/ha. Some applied FYM or green manures. Random method of planting was common among the farmers, though some told that they followed line planting. The intensity of common weeds like *Echinochloa crusgalli*, *E. colona* and *Cyperus rotundus* was low to medium. Hand weeding (1-2) was the common practice and most the farmers also applied weedicides like pendimethalin (1 kg a.i/ha), butachlor (1.5 kg a.i./ha) or Nominee Gold (200 g/ha). Implements like tractor, cultivator, rotavator, puddler and harvester were commonly used by the farmers. Some of the common needs of the farmers were low cost production technologies, mechanization in rice cultivation, quality seeds of HYVs and proper market price. The average seed replacement rate in the district was 18-30%. Canal and shallow tube wells were the main sources of irrigation while diesel and electricity were the main power sources for different agricultural operations. In addition to own decisions and advices from staffs from state department and university, private dealers also advised them regarding use of different pesticides and fertilizers. The incidence of different biotic stresses was low. Some of the farmers applied different pesticides like carbendazim (12%) + mancozeb (63%) @ 2 g/l, metalaxyl (8%) + mancozeb (64%) @ 1.5 g/l, hexaconazole (4%) + zineb (68%) @ 2 ml/l, mancozeb 75% (2 g/l) and propiconazole (1 ml/l) for false smut and grain discolouration, imidacloprid for WBPH, flubendamide, carbofuran 3G (18 kg/ha) and cartap hydrochloride 4G (20 kg/ha) for stem borer and leaf folder. Farmers made 1-2 pesticides applications and some farmers (40%) told that they are mixing 2-3 pesticides at the time of spraying.

Kheda: Production oriented survey was conducted in 3 villages (in 3 taluks) in this district involving 10 farmers when the crops were in heading to milk stage. The fields were under irrigated ecosystem and in general, the weather conditions were normal for rice cultivation. Rainfall was timely and well distributed during the season. Common cropping sequences in the district were rice-wheat, rice-vegetables, rice-pigeon pea, rice-rice, rice-fodder and rice-pearl millet. Different rice varieties cultivated by the farmers were Gurjari, GAR-13, GR-11, Mahsuri, Surya Moti, Moti Gold and Sonam. Average rice yield in the district was 4200-5300 kg/ha. Planting was done during last week of June to 3rd week of July. Many farmers purchased certified seeds for sowing and the average seed rate was 25-35 kg/ha and none of the farmers contacted adopted seed treatment. The farmers did not apply any organic manure in the nursery. However, all of them told that they applied DAP (37 kg/ha) and urea (40 kg/ha) in the nursery. In the main fields, fertilizers were applied @ 100-120 kg N/ha (through urea or ammonium sulphate), 20-40 kg P_2O_5/ha (through DAP or SSP) and 20 kg $ZnSO_4$/ha. Some of the farmers applied FYM and green manure in the fields. One of the farmers contacted applied plant growth regulator. The intensity of common weeds like *Echinochloa crusgalli*, *E. colona* and *Cyperus rotundus* was low. In addition to hand weeding (1-2 hand weeding), most of the farmers applied herbicides like pendimethalin (1 kg a.i/ha) and butachlor. Some of the common needs of the

farmers were quality seeds of HYVs, proper market price, varieties suitable in low input conditions and mechanization in rice cultivation. Implements like puddler, cultivator, tractor and harvesters were commonly used by the farmers. The average seed replacement rate in the district was 20-25% and some farmers told that they replace the seeds in every 2-3 years. Canal and shallow tube wells were the main sources of irrigation while electricity was the main power sources for different agricultural operations. In addition to own decisions and advices from staffs from state department and university, private dealers also advised them regarding use of different pesticides and fertilizers. The intensity of different biotic stresses was low and some farmers applied pesticides like phorate 10G (15 kg/ha) or cartap hydrochloride 4G (20 kg/ha) or carbofuran 3G (18 kg/ha) or cartap hydrochloride 50 SP (1.5 g/l) for management of different insect pests. Low plant population and rain during flowering and dough stage were the primary reasons for low yield in some areas.

Surat and Bharuch: Production oriented survey was conducted in 5 villges (in 2 taluks) in Surat and 2 villages (in 1 taluk) in Bharuch district. The crops were in heading to milk stage at the time of survey. Seven farmers in Surat and 2 farmers in Bharuch were contacted during survey. The fields were under irrigated ecosystem and in general, the weather conditions were normal for rice cultivation. Rainfall was timely and well distributed during the season. Farmers followed different cropping sequences like rice-wheat, rice-sugarcane, rice-pulses and rice vegetables. Different rice varieties cultivated by the farmers were Gurjari, Jaya, Surya Moti, Nath Pauha GNR-3 and GAR-13. Average rice yield in the region was 4250-5000 kg/ha. Farmers completed most of the planting operations during 1st to 2nd week of July. For summer rice, farmers are growing Jaya by broadcasting. Average seed rate followed by the farmers was 20-25 kg/ha and none of the farmers contacted adopted seed treatment. Application of organic manure in the nursery was not common. However, all the farmers contacted applied DAP (37 kg/ha) and urea (40 kg/ha) in the nursery. In the main fields, fertilizers were applied @ 100-120 kg N/ha (through urea or ammonium sulphate), 20-40 kg P_2O_5/ha (through DAP or SSP) and 20-30 kg $ZnSO_4$/ha. Some of the farmers applied FYM (4-5 t/ha) and green manure in the fields. The intensity of common weeds like *Echinochloa crusgalli*, *E. colona* and *Cyperus rotundus* was low. In addition to hand weeding (1-2 hand weeding), most of the farmers applied herbicides like pendimethalin (1 kg a.i/ha). Common needs of the farmers were quality seeds of HYVs, salt tolerant rice varieties, proper market price and varieties which can response to low inputs. Commonly used implements by the farmers were puddler, cultivator, tractor and rotavator. The average seed replacement rate was 20-25% and some farmers told that they purchase new seeds inevery 2-3 years. Canal was the main source of irrigation. In addition to own decisions and advices from staffs from state department and university, private dealers also advised them regarding use of different pesticides and fertilizers. The intensity of different biotic stresses was low and some farmers applied pesticides like cartap hydrochloride 4G (20 kg/ha) or cartap hydrochloride 50 SP (1.5 g/l) as prophylactive measures for management of different insect pests. The major problem faced by the farmers was water shortage.

Tapi and Dang: Survey was conducted in 3 villages in Tapi and one village in Dang when the crops were in heading to milk stage. Altogether 6 farmers were contacted during survey. The fields in Tapi were under irrigated ecosystem while in Dang, the fields were in hill ecosystem. The weather conditions were normal for rice cultivation. Rainfall was timely and well distributed during the season. Different crop rotations followed by the farmers were rice-sugarcane, rice-

vegetables, rice-rice, rice pearl millet, rice-chickpea, rice-niger and rice-pigeon pea. Different rice varieties cultivated by the farmers in the region were HYVs like Gurjari, Jaya, Surya Moti and Nath Pauha and hybrids like Excel-708, Dhanya-748 and 25P35. Average rice yield in the region was 4600-5450 kg/ha. Planting was done during 1st to 2nd week of July. Many farmers used hybrids in this region. Average seed rate for HYVs was 25-35 kg/ha and none of the farmers contacted adopted seed treatment. Application of organic manure in the nursery was not common. However, all the farmers contacted applied DAP (37 kg/ha) and urea (40 kg/ha) in the nursery. In the main fields, fertilizers were applied @ 100-120 kg N/ha (through urea or ammonium sulphate), 20-40 kg P_2O_5/ha (through DAP or SSP) and 20-30 kg $ZnSO_4$/ha. Some of the farmers applied FYM and green manure in the fields. The intensity of common weeds like *Echinochloa crusgalli*, *E. colona* and *Cyperus rotundus* was low. In addition to hand weeding (1-2 hand weeding), most of the farmers applied herbicides like pendimethalin (1 kg a.i/ha) or butachlor (1 kg a.i./ha). The common needs of the farmers were high yielding varieties and proper market price. Implements like harrow, tractor, puddler and cultivator were used by the farmers. The average seed replacement rate in the region was 20-25%. The main sources of irrigation were canal and shallow tube well. In addition to own decisions and advices from staffs from state department and university, private dealers also advised them regarding use of different pesticides and fertilizers. The intensity of biotic stresses was low. Some farmers applied pesticides like phorate 10G (20 kg/ha) or cartap hydrochloride 4 G (20 kg/ha) for different insect pests and mancozeb (2 g/l) for different diseases.

Panchmahal and Vadodara: Two villages in Panchmahal and five villages in Vadodara were covered for production oriented survey during milk stage of the crop. Three farmers in Panchmahal and 10 farmers in Vododara were contacted during survey. The fields were under irrigated ecosystem and in general, the weather conditions were normal for rice cultivation. Rainfall was timely and well distributed during the season. Different crop rotations followed by the farmers were rice-chickpea, rice-maize, rice-pigeon pea, rice-bajra, rice-vegetables, rice-wheat, rice-pulses and rice-rice. Different rice varieties cultivated by the farmers were GAR-13, Sonam, Dhan Versa, Surya Moti, Jaya and Moti Gold. Some farmers also cultivated Pioneer Hybrids. Average rice yield in the region was 4100-5200 kg/ha. Planting was done during 1st to 2nd week of July. Many farmers used certified seeds and average seed rate was 25-35 kg/ha. None of the farmers contacted adopted seed treatment. Application of organic manure in the nursery was not common. However, all the farmers contacted applied DAP (37 kg/ha) and urea (40 kg/ha) in the nursery. In the main fields, fertilizers were applied @ 100-120 kg N/ha (through urea or ammonium sulphate), 20-40 kg P_2O_5/ha (through DAP or SSP) and 20-30 kg $ZnSO_4$/ha. Some of the farmers applied FYM (4-6 t/ha) and green manure in the fields. The intensity of common weeds like *Echinochloa crusgalli*, *E. colona* and *Cyperus rotundus* was low to medium. In addition to hand weeding (1-2 hand weeding), most of the farmers applied herbicides like pendimethalin (1 kg a.i/ha). The needs of the farmers in the region were proper market price, seeds of HYVs and varieties which can response to low inputs. Implements like cultivators, tractor, rotavator, thresher and puddler were commonly used by the farmers. The average seed replacement rate in the region was 20-25% and many farmers told that they replace the seeds in every 2-4 years. Shallow tube wells and canal were the main sources of irrigation and electricity was the main power source. In addition to own decisions and advices from staffs from state department and university, private dealers also advised them regarding use of different pesticides and fertilizers. The intensity of different pests and diseases was low. Some of the

farmers applied pesticides like carbofuran 3G (20 kg/ha), cartap hydrochloride 4G (20 kg/ha), phorate 10G (20 kg/ha) and quinalphos 25 EC (1.5 ml/l) for different insect pests and mancozeb (2 g/l) for false smut control.

Navsari: Five villages in 3 taluks in this district involving 12 farmers were surveyed when the crops were in heading to milk stage. The fields were under irrigated ecosystem and in general, the weather conditions were normal for rice cultivation. Rainfall was timely and well distributed during the season. Different cropping practices followed by the farmers were rice-wheat, rice-chickpea, rice-vegetables, rice-sugarcane, rice-pigeon pea, rice-niger, rice-turmeric, rice-sunnhemp, rice-beans and rice-pearl millet. Different rice varieties cultivated by the farmers were HYVs like Gurjari, GNR-3, Mahsuri, MC-13 and Nath Pauha and hybrids like US-312 and US 807. Average rice yield in this district ranged from 3800-5500 kg/ha. Planting was done during 1st to 2nd week of July. Some of the farmers are also cultivating organic rice. The average seed rate was 25-35 kg/ha and none of the farmers contacted adopted seed treatment. Application of organic manure in the nursery was not common. However, all the farmers contacted applied DAP (37 kg/ha) and urea (40 kg/ha) in the nursery. In the main fields, fertilizers were applied @ 100-120 kg N/ha (through urea or ammonium sulphate), 30-40 kg P_2O_5/ha (through DAP or SSP) and 20-30 kg $ZnSO_4$/ha. Some of the farmers applied FYM (4-6 t/ha) and green manure (sunnhemp) in the fields. The intensity of common weeds like *Echinochloa crusgalli*, *E. colona*, *Cyperus rotundus* and wild rice was low to medium. In addition to hand weeding (1-2 hand weeding), most of the farmers applied herbicides like pendimethalin (1 kg a.i/ha) or Nominee Gold (200 g/ha). Some of the common requirements of the farmers in the district were quality seeds of HYVs, proper market price and varieties which respond to low input application. Implements like tractor, puddler, cultivator, rotavator and plough were commonly used by the farmers. Average seed replacement rate was 19-50% in the region and many told that they replace the seeds in every 2-3 years. Canal and shallow tube wells were the main sources of irrigation and electricity was the main power source for different agricultural operations. In addition to own decisions and advices from staffs from state department and university, private dealers also advised them regarding use of different pesticides and fertilizers. The intensity of different biotic stresses like grain discolouration, leaf folder and stem borer was low and some of the farmers applied pesticides like carbofuran 3G (20 kg/ha), cartap hydrochloride 4G (20 kg/ha), quinalphos 25 EC (2-3 ml/l), Acephate 75 SP (2 g/l) and triazophos 40 EC (2 ml/l) for different insect pests and mancozeb 75 WP (2 g/l), carbendazim + mancozev and propiconazole (1 ml/l) for different diseases.

Valsad: Production oriented survey was conducted in 4 villages (in 2 taluks) in this district when the crops were in heading stage. Seven farmers were contacted during the survey. The fields were under irrigated ecosystem and in general, the weather conditions were normal for rice cultivation. Rainfall was timely and well distributed during the season. The cropping systems followed by the farmers were rice-chickpea, rice-vegetables, rice-pigeonpea, rice-Indian bean, rice-sunnhemp and rice-rice. In addition to different HYVs, farmers also cultivated different hybrids like Arize 6201 and Kaveri. Average rice yield in the district was 4750-5650 kg/ha. Farmers completed transplanting operations during end of June to 2nd week of July. Average seed rate was 25-35 kg/ha in case of HYVs. None of the farmers contacted adopted seed treatment. Application of organic manure in the nursery was not common. However, all the farmers contacted applied DAP (37 kg/ha) and urea (40 kg/ha) in the nursery. In the main fields,

fertilizers were applied @ 80-120 kg N/ha (through urea or ammonium sulphate), 30-40 kg P_2O_5/ha (through DAP or SSP) and 20-30 kg $ZnSO_4$/ha. Some of the farmers applied FYM (4-8 t/ha) and green manure (sunnhemp) in the fields. The intensity of common weeds like *Echinochloa crusgalli*, *E. colona, Cyperus rotundus* and wild rice was low. In addition to hand weeding (1-2 hand weeding), most of the farmers applied herbicides like pendimethalin (1 kg a.i/ha) or Nominee Gold (200 g/ha). Common requirements of the farmers in the region were quality seeds of HYVs, proper market price, low cost inputs and varieties which respond to low input application. Implements like tractor, puddler, cultivator and sprayers were used by the farmers. The average seed replacement rate in the district was 19-50%. Canal and shallow tube wells were the main sources of irrigation and electricity was the main power source for different agricultural operations. In addition to own decisions and advices from staffs from state department and university, private dealers also advised them regarding use of different pesticides and fertilizers. The intensity of different biotic stresses was low. Some of the farmers contacted applied pesticides like cartap hydrochloride 4G (20-22 kg/ha) and phorate 10G (20 kg/ha) for managing different insect pests. The major problem faced by the farmers was irrigation water during summer season.

Prevalence of diseases and insect pests in Gujarat during *Kharif'2017*

Districts	**Diseases**					**Insect pests**		
	Bl	**NBl**	**ShR**	**FS**	**GD**	**LF**	**SB**	**WBPH**
Ahmedabad			T-L	T	T-L	T-L	T-L	
Mehsena			T-L	T-L	T-L	T-L	T	
Anand		L (3-4%)	T-L	L-M (2-8%)	T-L	L-M (2-8%)	L-M (2-10%)	L (5-7%)
Kheda			L (4-7%)	T-L	L	L	T-L	
Bharuch						T	T	
Surat					T-L	L-M (2-8%)	T-L	
Tapi					T-L	T	T-L	
Dang	T				T	T	T	
Panchmahals				T-L	L-M (3-10%)	T-L	T-L	
Vadodara				T-L	L-M (3-10%)	T-L	T	
Navsari					L-M (2-8%)	T-L	T-L	
Valsad					L	T-L	T-L	

Haryana

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

Particulars of survey

Districts	Villages
Kaithal	Pobala, Kheri Raiwali, Dhand, Pharal, Mohna, Pabnawa, Barot, Keorak, Pundri and Sirsal
Kurukshetra	Harnaicha, Nivarsi, Thol, Luhar Majra, Beholi, Sanghour, Buhavi, Ujmatpur, Bharan andTikri
Karnal	Gagsina, Chochra, Khandakheri, Munak, Labhkari, Buddanpur, Majra Rodan, Kachhwa, Kaimala and Assandh Dera Phula Singh
Jind	Budha Kheda, Aftabgarh, Hoshiarpura, Rod, Muana, Haat, Silakhedi, Datrath, Dharamgarh and Safidon
Yamunanagar	Gumthala, Chahadwala, Shahkameshpur, Uncha Chandana, Gadi Sikanderan, Alipura, Jathlana, Kail, Chamraudi and Sikendera
Ambala	Mohdi, Shahpur, Mahmoodpur, Ahmadpur, Panjlasha, Ambali, Adhoi, Siwan Majra, Thumbad and Goli
Panipat	Babail, Muhali, Chhichhrana, Neoltha, Ahar, Kalkha, Atolahpur, Dariyapur, Atawala and Kiwana
Sonepat	Ram Nagar, Ghasauli, Ghumad, Shamri, Shahpur, Bajana Khurd, Chhoti Gadi, Khubdu, Bad Malik and Ganaur

Widely prevalent varieties

District	Rice varieties grown in order of preference
Kaithal	**HYVs:** PR 114; **Hybrids:** Sawa 127, Shrestha 261, Swift gold, VNR 6508 and Sawa 134; **Basmati:** Pusa Basmati 1, CSR 30, Pusa 1121 and Pusa 1509
Kurukshetra	**HYVs:** PR 114, Narendra 361; **Hybrids:** Hyb 834, Hyb Swift, HYB 2222, BS 6444, Sawa 127 and RH 257, Pioneer 25P35; **Basmati:** CSR 30, Pusa 1121, Pusa Basmati 1 and Pusa 1509
Karnal	**HYVs:** PR 114, PR 121 and PR 126; **Hybrids:** Sawa 127; **Basmati:** Pusa Basmati 1121, Pusa 1509 and CSR 30
Jind	**HYVs:** PR 114; **Hybrids:** RH Pioneer 27P31, Sawa 127 and RH Pioneer 25P35; **Basmati:** Pusa 1121, CSR 30, Pusa Basmati 1 and Pusa 1509
Yamunanagar	**HYVs:** PR 126, HKR 47 and Sarbati; **Hybrids:** Sawa 127, HYB 359, VNR 2355, VNR 6508, RH 257, Pioneer 25P35, Sudha, Swift Gold, Super 127, VNR 6508 and Sawa 137; **Basmati:** Pusa Basmati 1
Ambala	**HYVs:** PR 113, HKR 47, PR 121, Pusa 44, NDR 359 and Sarbati; **Hybrids:** Sawa 127, Swift Gold, BNR, PA 6129, Pioneer 27P31, HYB 2266, Pioneer 25P35, BS 6444, RH 257, Arize 6508, Hyb 834, Kaveri Seed 468, BNR 2375, Arize 6444 and Pusa Basmati 1509; **Basmati:** Pusa Basmati 1121
Panipat	**Basmati:** Pusa 1121, CSR 30 and Pusa 1509
Sonepat	**Basmati:** Pusa 1121, Pusa 1509 and CSR 30

Particulars of rice areas in the surveyed districts of Haryana during *Kharif*' 2017

District	Total geographical area (ha)	Total cultivable area (ha)	Total cultivated area (ha)	Net irrigated area (ha)	Area under paddy (ha)
Kaithal	2,26,207	1,98,434	1,94,940	1,90,141	1,62,242
Kurukshetra	1,68,253	1,50,370	1,50,370	1,50,370	1,15,600
Karnal	2,45,546	2,16,178	2,08,198	2,06,108	1,60,000
Jind	2,74,024	2,44,622	2,37,106	2,32,560	1,35,000
Yamunanagar	1,60,248.1	1,27,463.8	1,20,513.7	1,08,995.3	75,400
Ambala	1,53,730	1,35,800	1,18,000	1,06,153	83,000
Panipat	1,30,400	1,02,000	96,000	96,000	75,000
Sonepat	2,13,679	1,78,686	1,66,056	1,63,037	94,500

Weather data for the districts surveyed during *kharif* 2017

District	Weather parameter	June	July	Aug	Sept	Oct
Kaithal	Rainy days	8	8	11	6	1
	Total rainfall (mm)	320	131	410	365	1
Kurukshetra	Rainy days	10	12	13	7	Nil
	Total rainfall (mm)	193.01	81	131.4	217	Nil
Karnal	Rainy days	12	15	13	7	Nil
	Total rainfall (mm)	167.33	99.16	88.51	171.89	Nil
Jind	Rainy days	10	12	11	2	Nil
	Total rainfall (mm)	148	42	80	18	Nil
Yamunanagar	Rainy days	8	13	12	4	Nil
	Total rainfall (mm)	188.83	126.50	247.67	181.33	Nil
Ambala	Rainy days	7	8	15	6	Nil
	Total rainfall (mm)	128	89	376.3	128	Nil
Panipat	Rainy days	10	8	9	5	Nil
	Total rainfall (mm)	96	60	78.25	95.25	Nil
Sonepat	Rainy days	7	7	10	6	Nil
	Total rainfall (mm)	130.5	100.25	45.5	127	Nil

Roving surveys in paddy growing areas of Haryana were conducted during August to October 27 & 30, 2017. A total of 80 villages (10 in each district) were surveyed in eight districts of Haryana viz., Kaithal, Kurukshetra, Karnal, Jind, Yamunanagar, Ambala, Panipat and Sonepat. The rainfall was subnormal and unevenly distributed particularly during the vegetative growth period in all the districts surveyed except Yamunanagar and Ambala. The commonly grown varieties in scented group were Pusa 1121, CSR-30, Pusa 1509 and Pusa Basmati 1 while the common HYVs and hybrids were PR 114, Sawa 127, RH Pioneer 27P31, Shrestha 261, Arize 6444, Arize 6508, BNR, PA 6129, Swift Gold, HYB 359, VNR 2355, PR 126 and Sudha. Besides RH Pioneer 25P35, DRH 834, Swift, Narendra 361, VNR 6508, RH 257, Sava 134, Sawa 137, Super 127, HYB 2222, BS 6444, BNR 2375, Arize 6508, Kaveri Seed 468, PA 6444, Kaveri seed 468 and Sarbati were also grown by some farmers. Application of weedicide, 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 90, 80, 90, 90, 70, 80, 90 and 40% farmers in Kaithal, Kurukshetra, Karnal, Jind, Yamunanagar, Ambala, Panipat and Sonepat districts, respectively. However, some farmers did not follow the seed treatment properly. The market price was Rs. 1590/q for high yielding varieties including hybrids, Rs. 2700-3500 for semi dwarf Basmati varieties like Pusa Basmati-1, Pusa Basmati-1509 and Pusa Basmati-1121 while tall Basmati (CSR 30, Tarawari Basmati) fetched Rs. 3400-4100/q. The farmers were satisfied with the rice cultivation particularly with traditional Basmati varieties as this fetched good market price. The major constraints identified in increasing rice production in Haryana were declining water table, water scarcity due to subnormal rainfall, inadequate and intermittent power and canal water supply and problematic soil and underground water, low profitability due to high production cost, nutrient deficiencies, inadequate technical knowhow, declining soil fertility, sub-optimal plant population, nutrient imbalances and low factor productivity of external nutrient supplies, and continuous follow up of rice-wheat cropping system in addition to biotic constraints particularly BPH, WBPH and sheath blight.

Sheath blight was observed in low to severe form at 40-70 locations in the districts of Kaithal, Kurukshetra, Karnal, Jind, Yamunanagar, Ambala, Panipat and Sonepat both in scented and non-scented inbreeds and hybrids. The disease was widespread in PR 114, Pusa Basmati 1121, Sawa 127, Basmati CSR 30, Pusa Basmati-1, Pusa Basmati 1509, VNR 6508 and Arize 6444. Leaf and neck blast appeared in low to severe intensity. The neck blast incidence ranged between traces to 10% in varieties like Pusa-1121, CSR 30 and Pusa-1 at 10-30% in Kaithal, Kurukshetra, Karnal, Jind, Yamunanagar, Panipat and Sonepat, respectively. The maximum neck blast incidence (10%) was recorded in Pusa Basmati-1 in district Yamunanagar. Bakanae incidence ranged from traces to 12% at 10-60% locations in Kaithal, Kurukshetra, Karnal, Jind, Yamunanagar, Ambala, Panipat and Sonepat, respectively in varieties like Pusa-1121, CSR 30, Pusa 1509 and Pusa Basmati-1. The maximum bakanae incidence of 12% was observed in Pusa Basmati 1121 in district Ambala. False smut was recorded in low to moderate intensity at 10-30% sites in Kaithal, Kurukshetra, Karnal, Yamunanagar and Ambala districts in varieties like PR 114, Swift, PR 121, Sawa 134, Arize 6444, Sawa 127 and PB-1. The maximum incidence of 8-20% tillers infected was observed in Sawa 127 and Swift in district Ambala. However, Bacterial leaf blight was not recorded at surveyed locations. Stem rot incidence was found in traces to moderate intensity at 10% locations in Kurukshetra, Ambala and Sonepat, respectively. The disease incidence ranged between 8-10% in PB 1121 in district Sonepat and 20-25% in RH Pioneer 27P31 in district Ambala. Brown spot was recorded in low intensity in district Panipat only in PB 1121.

Stem borer damage was observed in traces at 10-60% locations in Kaithal, Kurukshetra, Karnal, Jind, Yamunanagar, Ambala, Panipat and Sonepat both in scented and non-scented inbreeds and hybrids. The damage was widespread in PR 114, Pusa Basmati 1121, Sawa 127, Basmati CSR 30, Pusa Basmati 1509, VNR 6508 and PR 113. BPH population appeared in low to severe intensity. BPH population ranged between traces to 250 nymphs and adults/hill in Pusa Basmati-1121, Basmati CSR 30, PB 1509, PR 114, Sawa 127, PB-1, Swift, PB 121, Arize 6444 and RH Pioneer 27P31 at 40-90% locations in Kaithal, Kurukshetra, Karnal, Jind, Yamunanagar, Ambala, Panipat and Sonepat. WBPH population ranged from traces to 50% in Pusa -1121, CSR 30, Pusa

1509, PR 114, Sawa 127, PB-1, Swift gold, PB 121, Arize 6444 and RH Pioneer 25P35 at 10-70% locations in Kaithal, Kurukshetra, Karnal, Jind, Yamunanagar, Ambala, Panipat and Sonepat. Leaf folder damage ranged from traces to 25% at 20-70 % locations in Kaithal, Kurukshetra, Karnal, Yamunanagar, Ambala, Panipat and Sonepat in varieties like PR 114, PR 126, VNR 6508, Pusa-1121, CSR 30, Pusa 1509, Sawa 127, Swift gold, Arize 6444 and Pusa Basmati-1. Whorl maggot incidence was observed in traces.

Area covered under different varieties (%) in major rice growing districts of Haryana during *kharif* 2017

Variety	Kaithal (76.25 ac.)	Kurukshetra (78.75ac.)	Karnal (79.5ac.)	Jind (111.5ac.)	Yamunanagar (94.5 ac.)	Ambala (139.5 ac.)	Panipat (99 ac.)	Sonepat (66.5 ac.)	Mean
PB 1121	18.49	6.2	35.67	64.74	-	12.76	53.1	76.09	**38.15**
Bas. CSR 30	23.29	14.23	7.65	4.11	-	-	42.78	9.13	**16.87**
PR 114	12.33	45.25	11.06	6.38	-	-	4.12	-	**15.83**
Sawa 127	13.01	2.55	4.46	4.56	23.4	17.09	-	-	**10.85**
VNR 2375	-	-	-	-	-	9.69	-	-	**9.69**
Shrestha 261	9.59	-	-	-	-	-	-	-	**9.59**
RH Pioneer 27P31	-	-	-	10.74	-	8.16	-	-	**9.45**
PB-1	8.22	5.84	-	3.75	14.91	-	-	-	**8.18**
PA 6129	-	-	-	-	-	8.16	-	-	**8.16**
Hyb 2266	-	-	-	-	-	7.65	-	-	**7.65**
PB 1509	2.74	4.38	13.37	2.97	-	1.09	-	14.78	**6.56**
Swift Gold	4.11	-	-	-	4.07	10.2	-	-	**6.13**
SVNR 2355	-	-	-	-	5.42	-	-	-	**5.42**
Hyb 359	-	-	-	-	5.42	-	-	-	**5.42**
Arize 6444	-	-	-	-	5.42	-	-	-	**5.42**
Hybrid Sudha	-	-	-	-	5.08	-	-	-	**5.08**
PR 126	-	-	3.18	-	6.78	-	-	-	**4.98**
Swift	-	4.38	-	-	-	-	-	-	**4.38**
Narendra 361	-	4.38	-	-	-	-	-	-	**4.38**
RH 257	-	-	-	-	-	4.08	-	-	**4.08**
RH Pioneer 25P35		1.11	-	2.75	5.42	6.63	-	-	**3.98**
Hybrid 834	-	5.84	-	-	-	2.05	-	-	**3.95**
PR 121	-	-	3.82	-	-	-	-	-	**3.82**
Sawa 134	4.11	-	-	-	2.71	-	-	-	**3.81**
BS 6444	-	2.92	-	-	-	4.59	-	-	**3.76**
VNR 6508	4.11	-	-	-	2.72	-	-	-	**3.42**
Hybrid 2222	-	2.92	-	-	-	-	-	-	**2.92**
Super 127	-	-	-	-	2.72	-	-	-	**2.72**
Sarbati	-	-	-	-	5.08	0.26	-	-	**2.67**
Arize 6508	-	-	-	-	-	2.55	-	-	**2.55**
Kaveri seed 468	-	-	-	-	-	2.04	-	-	**2.04**
PR 113	-	-	-	-	-	2.04	-	-	**2.04**
PA 6444	-	-	-	-	-	1.03	-	-	**1.03**
Super 127	-	-	-	-	2.72	-	-	-	**2.72**
Sarbati	-	-	-	-	5.08	0.26	-	-	**2.67**
Arize 6508	-	-	-	-	-	2.55	-	-	**2.55**
Area under paddy (%)	**95.74**	**86.98**	**98.74**	**98.43**	**78.04**	**70.25**	**98**	**86.47**	**89.08**
Area under sorghum, sugarcane, cotton, guar and vegetables (%)	**4.26**	**13.02**	**1.26**	**1.57**	**21.96**	**29.75**	**2**	**13.53**	**10.92**

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

Parameters	Kaithal	Kurukshetra	Karnal	Jind
Total area under HYVs in the district (ha)	91, 600 ha	43, 500 ha	14, 000 ha	10, 000 ha
Most prevalent HYVs in the district	PR114	PR114	PR114	PR114
Total area under rice hybrids in the district(ha)	23, 400 ha	49, 600 ha	50, 000 ha	15, 000 ha
Most prevalent rice hybrids in the district	Sawa127	Sawa127, 25P35	Sawa127	27P31, 25P35, Sawa127
Total area under basmati in the district	47, 242 ha	22, 500 ha	96, 000 ha	1, 10, 000 ha
Most prevalent basmati varieties in the district	Bas, CSR30	Bas, CSR30	PB 1, PB 1121, Bas, CSR30, PB1509	PB 1, PB 1121, Bas, CSR30
Whether farmers are using any heavy equipments like transplanted/combine harvester	Yes, combine harvester	Yes, combine harvester	Yes, combine harvester	Yes, combine harvester
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	Laser levelers, DSR 449.6 ha	DSR 26 ha	DSR 266.2 ha	DSR 9000 ha
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Yes, Use of water saving techniques, IDM	Yes, IPM, Incorporation of paddy residue	Yes, Incorporation of paddy residue	Yes, management of paddy residue
What are the general problems in rice cultivation in the district?	Problematic soil, Poor quality of underground water	Biotic stresses	-	Problematic soil, Poor quality of underground water
Please provide any farmers association in the district	Pragatisheel kisan club	Kisan club at district level	Kisan club at block and district level	Kisan club
Whether availability of labours is sufficient?	Not sufficient	Not sufficient	Not sufficient	Not sufficient
Whether there is any marketing problem of the produce?	-	-	-	-
Any major irrigation/power generation project in the district	-	-	-	-
Any soil testing program undertaken?	Soil health cards issued-29, 919	Soil samples collected-7, 358	Soil health cards issued-95, 418	Soil health cards issued-24, 000
Any farmers' training program was organized by the state department of Agriculture/University	RKVY, ATMA, NMOOP	ATMA, CDP, NFSM, RKVY,NMOOP	ATMA, NMOOP	RKVY

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

Parameters	Yamunanagar	Ambala	Panipat	Sonepat
Total area under HYVs in the district (ha)	8, 000 ha	20, 000 ha	11, 250 ha	9, 500 ha
Most prevalent HYVs in the district	PR114, HKR 47	PR114	PR 114, HKR 127	-
Total area under rice hybrids in the district(ha)	42, 400 ha	50, 000 ha	-	-
Most prevalent rice hybrids in the district	Sawa127, Sawa134, Arize 6129	Sawa127, 27P31, Arize 6129, Swift gold	-	-
Total area under basmati in the district	25, 0000 ha	13, 000 ha	63, 750 ha	85, 000 ha
Most prevalent basmati varieties in the district	PB 1, PB 1121, PB 1509	Bas, CSR30	-	PB 1121
Whether farmers are using any heavy equipments like transplanted/combine harvester	Yes, combine harvester	Yes, combine harvester	Yes, combine harvester	Yes, combine harvester
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	DSR 594.2 ha	DSR 273 ha	DSR 97 ha	DSR 368 ha
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Yes, as given in KKR	Yes, IDM, INM	Paddy straw management	IDM, INM
What are the general problems in rice cultivation in the district?	-	Problematic soil	-	-
Please provide any farmers association in the district	kisan club	Kisan club	Kisan club	kisan club
Whether availability of labours is sufficient?	Not sufficient	Not sufficient	Not sufficient	Not sufficient
Whether there is any marketing problem of the produce?	-	-	-	-
Any major irrigation/power generation project in the district	-	-	-	-
Any soil testing program undertaken?	Soil health cards issued-12, 779	Soil health cards issued-11, 636	Soil samples collected-19, 867	Soil health cards issued-93, 994
Any farmers' training program was organized by the state department of Agriculture/University	ATMA, RKVY	ATMA, CDP, RKVY, NMOOP	ATMA, CDP, RKVY	ATMA, RKVY

District wise observations

Kaithal: Production oriented survey was conducted in 10 villages. Three visits were made during August, September and October' 2017 when the crops were either in booting to heading stage or dough to maturity stage. All the fields surveyed were under irrigated ecosystem and in general, the climatic conditions were favourable for rice cultivation. About 30% farmers contacted told that they used 6-20 % of their land for other crops like fodder sorghum or sugarcane. The main crop rotation practice followed by the farmers was rice-wheat. Different varieties cultivated by the farmers were HYVs like PR 114; hybrids like Sawa 127, Shrestha 261, Swift gold, VNR 6508 and Sawa 134 and basmati varieties like Pusa Basmati 1, CSR 30, Pusa 1121 and Pusa 1509. Average rice yield in the district was 7500-8250 kg/ha in case of HYVs like PR 114, 6000-9000 kg/ha in different hybrids like 25P35, Sawa 134 and Sawa 127and 3000-4500 kg/ha in case of different basmati varieties like Pusa 1121 and CSR 30. Planting was done in between Middle of June to middle of July. Average seed rate was 12.5 kh/ha in case of HYVs and 7.5-12.5 kg/ha in case of hybrids. About 80% of the farmes contacted told that they adopted seed treatment with carbendazim (10 g) + streptocycline (1 g)/10 kg of seeds (soaking the seeds for 24 hours), Emisan (10 g/10 kg/10 l water; soaking for 24 hours), Emisan (10 g) + streptocycline (1 g)/10 kg of seeds (soaking the seeds for 24 hours) or only carbendazim (10 g/10 kg/10 l water; soaking for 24 hours). None of the farmers contacted applied FYM in the nursery. However, all of them applied chemical fertilizers like urea (8-15 kg/kanal; 1 kanal=500 sq m) or DAP (10 kg/kanal). Some farmers applied weedicides like Sofit and Nominee Gold and some applied insecticides like chlorpyriphos. In the main fields, fertilizers were applied @ 86.25-188.25 kg N/ha and 40.25-57.5 kg P_2O_5/ha. About 70% of the farmers contacted applied zinc sulphate (12.5-25 kg/ha).

About 80% of the farmers contacted told that they applied FYM (4-8 t/ha) in the main fields at the time of land preparation. Planting was random. The intensity of common weeds like *Echinochloa* spp. and *Cyperus* spp. was low in all the places survyed. Hand weeding was not very common among the farmers. All the farmers applied different weedicides like butachlor (1 l/acre), Topstar and pretilachlor (500 ml/acre). In Mohna village (in Pandri block), there were incidence of weedy rice (20-30 plant/acre) in some fields. Implements like tractor, trolley, harrow, tiller, fertilizer cum seed drill and rotavators were used by the farmers. Some farmers hired the implements. About 70% of the farmers contacted told that they purchased 30-100% of the seeds. Deep tube wells and canals were the main sources of irrigation. Electricity was the main source of power but was restricted to 6-8 hours/day. Apart form their own decisions, farmers were advised mainly by the dealers and staffs from the university. Diseases like sheath blight, leaf and neck blast, bakanae and false smut were recorded in low to moderate intensity. Among the insect pests, stem borer and WBPH were recorded in low to moderate intensity. However, BPH was severe in many places. High incidence of BPH (40-70 insects/hill) were recorded in varieties like PR 114 in villages like Pobala and Kheri Raiwali. Typical hopper burn symptoms were recorded in varieties like Pusa Basmati 1, Pusa 1121 and Sawa 127 in villages like Barot and Pundri. Similarly, high leaf folder damage (up to 25%leaf damage) was recorded in PR 114 in Pobala village. Farmers applied different pesticides like chlorpyriphos + cypermethrin (500 ml/acre) for termites; Cartap hydrochloride (7.5-10 kg/acre), fipronil (Regent) (7.5 kg/acre). Acephate (250 g/acre) + lamda cyhalothrin cyhalothrin (200 ml/acre) + *Pseudomonas fluorescens* (Bactvipe) (400 ml/acre), thiomethoxam (60 g/acre) + BPMC (fenobucarb) (250 ml/acre) + Lamda cyhalothrin cyhalothrin (200 ml/acre) + isoprothiolane (200 ml/acre), Sanvex (5 kg/acre) and Ferterra (4 kg/acre) for leaf folder and stem borer;

Thiomethoxam (60 g/acre) + BPMC (fenobucarb) (250 ml/acre) and DDVP (Nuvan) + buprofezin (330 ml/acre) for BPH and WBPH; Saaf (carbendazim + mancozeb) (500 g/acre) for bakanae; Beam (120 g/acre) + thiomethoxam (60 g/acre) and Beam (120 g/acre) + buprofezin (330 ml/acre) for neck blast and BPH/WBPH; imidacloprid (80 ml/acre) + hexaconazole (400ml/acre) for sheath blight and BPH/WBPH; buprofezin (330 ml/acre) + carbendazim (200 g/acre), buprofezin (330 ml/acre) + Tilt (200 ml/acre), buprofezin (330 ml/acre) + thifluzamide (200 ml/acre) and buprofezin (330 ml/acre) + validamycin (450 ml/acre) for sheath blight and BPH/WBPH; buprofezin (330 ml/acre) + tricyclazole (120 g/acre) for neck blast and BPH/WBPH and hexaconazole (400 ml/acre) + buprofezin (330 ml/acre) + propiconazole (200 ml/acre) for sheath blight, false smut and BPH/WBPH. Number or pesticide spray/application ranged from 2-6 in a season. All the farmers contacted told that they mixed 2-4 pesticides at the time of application.

Kurukshetra: Ten villages in this district were covered for production oriented survey. Three visits were made during August, September and October' 2017 when the crops were either in maximum tillering to PI or milk to dough stage or maturity stage. All the fields surveyed were under irrigated ecosystem and in general, the climatic conditions were favourable for rice cultivation. About 30% of the farmers contacted told that they used 50-55% of their land for other crops. Main crop rotation practice followed by the farmers was rice-wheat. Some also followed rice-potato-blackgram/maize. Different rice varieties cultivated by the farmers were HYVs like PR 114 and Narendra 361 and hybrids like Hyb 834, Hyb Swift, HYB 2222, BS 6444, Sawa 127 and RH 257, Pioneer 25P35 and basmati varieties like CSR 30, Pusa 1121, Pusa Basmati 1 and Pusa 1509. Average rice yield in the district was 5500-9000 kg/ha in different HYVs like PR 114, NDR 359 and HKR 47 and different hybrids likeBS 6444, Sawa 127 and Swift and 3000-5750 kg/ha in different basmati rice varieties like Pusa 1509, Pusa 1121, CSR 30 and Pusa Basmati 1. Planting was done during middle of June to middle of July. Average seed rate was 7.5-15 kg/ha and about 70% of the farmers adopted seed treatment with carbendazim (10 g) + streptocycline (1 g)/10 kg of seeds (soaking the seeds for 24hours), Emisan (10 g/10 kg/10 l water; soaking for 24 hours) and streptocycline (1 g/10 kg/10 l water). About 90% of the farmers contacted told that they did not apply any organic manure in the nursery. However, all the farmers applied chemcial fertilizers like urea (8-13 kg/kanal; 1 kanal=500 sq m), DAP (10-12 kg/kanal) or mixture of urea (8-10 kg/kanal) and DAP (5-6 kg/kanal). Some farmers applied weedicides like Sofit and Nominee Gold and few applied insecticides like chlorpyriphos. In the main fields, fertilizers were applied @ 57.5-172.5 kg N/ha and 20-57.5 kg P_2O_5/ha. All the farmers contacted applied zinc sulphate (12.5-25 kg/ha). Few applied chelated zinc (1.25 kg/acre) as spray. Few applied sulphur (12.5 kg/ha).

About 30% of the farmers contacted applied FYM (2-4 trolley/acre). Few also applied green manure (black gram) and growth factors. Planting was random and the intenisty of weeds like *Dactyloctenium aegyptium*, *Echinochloa* spp. and *Cyperus* spp. was low to medium. Hand weeding was not very common among the farmers. All the farmers applied different weedicides like butachlor (1 l/acre), anilophos (1500 ml/acre) and pretilachlor (500-1000 ml/acre). Some of the common needs of the farmers were machines for residue management in paddy and wheat and happy seeder. Implements like tractor, trolley, harrow, power tiller and planker were used by the farmers. Many farmers used implements on hire basis. About 80% farmers told that they purchased 100% of their seed requirement. Deep tube wells and canals were the main sources of irrigation. Electricity was the main source of power but was restricted to 6-8 hours/day. Apart form their own decisions, farmers were advised mainly by the dealers and staffs from the

university and state department of agriculture. Diseases like sheath blight, leaf and neck blast and bakanae were observed in low to moderate intensities. False smut intensity was more (up to 20% incidence with 5-6 smut balls/panicle) on Sawa127 in Ladwa village. Insect pests like stem borer, BPH, leaf folder and whorl maggot were observed in low to moderate intensities. However, WBPH incidence was more in some places and typical hopper burn symptoms were recorded on Pusa 1121 in Tikri village. Farmers applied different pesticides like Chlorpyriphos (1 l/acre) and Chlorpyriphos + cypermethrin (500 ml/acre) for termites; Cartap hydrochloride (5-7.5 kg/acre) and Ferterra (4 kg/acre) for leaf folder and stem borer; buprofezin (330 ml/acre) for BPH/WBPH; lamda cyhalothrin (250 ml/acre) + thiomethoxam (50 g/acre) for WBPH and leaf folder; buprofezin (330 ml/acre) + validamycin (450 ml/acre), hexaconazole (400 ml/acre) + thiomethoxam (60 g/acre) and Chess (250 g/acre) + tebuconazole (Folicur) (250 ml/acre) for sheath blight and BPH/WBPH; buprofezin (330 ml/acre) + Sheathmar (validamycin) (450 ml/acre) + lamda cyhalothrin (250 ml/acre) and Lusture (400 ml/acre) + buprofezin (330 ml/acre) for sheath blight, leaf folder and BPH/WBPH; Beam (120 g/acre)+ thiomethoxam (50 g/acre) and Beam (120 g/acre)+ buprofezin (330 ml/acre) for neck blast and BPH/WBPH and hexaconazole (400 ml/acre) + lamda cyhalothrin (250 ml/acre) + buprofezin (330 ml/acre) for sheath blight, WBPH, leaf folder and stem borer. Number or pesticide spray/application ranged from 2-3 in a season. About 80% of the farmers contacted told that they mixed 2-3 pesticides at the time of application.

Karnal: Production oriented survey was conducted in 10 villages during end of August, September and October' 2017. The crops were in booting to heading stage or stem elongation stage or dough to mature stage. All the fields surveyed were under irrigated ecosystem and in general, the climatic conditions were favourable for rice cultivation. Rice-wheat crop rotation was the only cropping sequence which was followed by the farmers. Different varieties cultivated by the farmers were HYVs like PR 114, PR 121 and PR 126, hybrids like Sawa 127 and basmati varieties like Pusa Basmati 1121, Pusa 1509 and CSR 30. Average rice yield in the district ranged from 6500-8250 kg/ha in different HYVs and hybrids and 3000-6500 kg/ha in different basmati varieties. Planting was done third week of June to third week of July. Average seed rate was 10-15 kg/ha and about 80% of the farmers contacted told that they adopted seed treatment with Emisan (10 g) + streptocycline (1 g)/10 kg of seeds (soaking the seeds for 12-24 hours) or carbendazim (10 g) + streptocycline (1 g)/10 kg of seeds (soaking the seeds for 12-24 hours) or Emisan (10 g/10 kg/10 l water; soaking for 12-24 hours) or only carbendazim (10 g/10 kg/10 l water; soaking for 24 hours). Majority of the farmers (90%) did not apply any organic manure in the nursery. However, all of them applied chemical fertilizers like urea (5-13 kg/kanal; 1 kanal=500 sq m) and/or DAP (5 kg/kanal). Some farmers applied weedicides Sofit, Eraze (100 ml/kanal) or Nominee Gold (100 ml/250 m^2). In the main fields, fertilizers were applied @ 80-195 kg N/ha, 20-57.5 kg P_2O_5/ha and K_2O (37.5 kg/ha) in case of HYVs and hybrids. However, applicaiton of potash was done by only few farmers. In case of basmati varities farmers applied 115-137.5 kg N/ha and 57.5 kg P_2O_5/ha. About 80% of the farmers contacted applied zinc sulphate (12.5-25 kg/ha).

About 50% of the farmers contacted applied FYM (4-8 trolley/acre) and about 20% applied green manures like green gram or dhaincha. Planting was random. The intensity of common weeds like *Echinochloa* spp. and *Cyperus* spp. was low. Hand weeding was not very common among the farmers. All the farmers applied different weedicides like butachlor (1 l/acre) and pretilachlor (500-800 ml/acre). Some of the common needs of the farmers were seed cum fertilizer drill,

rotavator and quality seeds. Commonly used implements were tractor, trolley, harrow, power tiller, planker, rotavator and seed cum fertilizer drill. About 50% of the farmers contacted told that they hired the implements. About 90% farmers told that they purchased 100% of their seed requirement. Deep tube wells and canals were the main sources of irrigation and about 30% farmers expressed scarcity of irrigation water. Electricity was the main source of power but was restricted to 6-8 hours/day. Apart form their own decisions, farmers were advised mainly by the dealers and staffs from the university and state department of agriculture. Among the diseases, leaf and neck blast, bakanae and false smut were observed in low to moderate intensities. However, sheaht blight was high in some place with a damage score up to 7. Among the insect pests, stem borer, WBPH, leaf folder and whorl maggot were observed in low to moderate intenisties. However, BPH was very widespread and recorded in high intensities (30-150 insects/hill) in varieties like Pusa 1509, Hyb 834, PR 126, CSR 30, PR 114 and PR 121 in villages like Labkhari, Majra Rodan, Buddanpur, Kachhwa and Kaimala. Farmers applied different pesticides like Chlorpyriphos + cypermethrin (500 ml/acre) for termites (along with irrigation water); cartap hydrochloride (5-7.5 kg/acre), Regent (7.5 kg/acre) and Ferterra (4 kg/acre) for leaf folder and stem borer; buprofezin (330 ml/acre) for BPH/WBPH; acephate (250 g/acre) + tebuconazole (350 ml/acre) + thiomethoxam (60 g/acre), for leaf folder , stem borer, sheath blight, WBPH; acephate (250 g/acre) + thiomethoxam (60 g/acre), imidacloprid (80 ml/acre) + Sheathmar (450 ml/acre) + lamda cyhalothrin (250 ml/acre) and thiomethoxam (60 g/acre) + lamda cyhalothrin (250 ml/acre) for stem borer, leaf folder and BPH/WBPH; thifluzamide (250 ml/acre) + imidacloprid (80 ml/acre), hexaconazole (400 ml/acre) + buprofezin (330 ml/acre), imidacloprid (80 ml/acre) + buprofezin (330 ml/acre) + thifluzamide (200 ml/acre), buprofezin (330 ml/acre) + Sheathmar (validamycin) (450 ml/acre) + acephate (250 ml/acre) and buprofezin (330 ml/acre) + tetraconazole (330 ml/acre) for sheath blight and BPH/WBPH. Number or pesticide spray/application ranged from 2-3 in a season. About 90% of the farmers contacted told that they mixed 2-3 pesticides at the time of application.

Jind: Production oriented survey was conducted in 10 villages in this district. Survey was done thrice in the cropping season viz., during end of August, end of September and end of October' 2017. The crops were tillering to booting stage, heading to milk stage and dough to mature stage at the time of survey. All the fields surveyed were under irrigated ecosystem and in general, the climatic conditions were favourable for rice cultivation. About 20% of the farmers contacted told that they cultivated other crops in 6-16% of their land during *Kharif* season. Rice-wheat crop rotation was the only cropping sequence which was followed by the farmers. Different varieties cultivated by the farmers were HYVs like PR 114; hybrids like RH Pioneer 27P31, Sawa 127 and RH Pioneer 25P35 and basmati varieties like Pusa 1121, CSR 30, Pusa Basmati 1 and Pusa 1509. Average rice yield in the district ranged from 5000-5500 kg/ha in HYVs like PR 114, 6500-6800 kg/ha in hybrids like Sawa 127 and 25P35 and 3250-5000 kg/ha in different basmati varieties like Pusa 1121, CSR 30 and Pusa Basmati 1. In some fileds of Pusa 1121, yield was drastically reduced due to outbreak of BPH/WBPH. Planting was done in between June 3rd week to July 2nd week. Average seed rate was 10-17.5 kg/ha and about 90% of the farmers contacted told that they adopted seed treatment with Emisan (10 g) + streptocycline (1 g)/10 kg of seeds (soaking the seeds for 12-24 hours) or carbendazim (10 g) + streptocycline (1 g)/10 kg of seeds (soaking the seeds for 12-24 hours) or Emisan (10 g/10 kg/10 l water; soaking for 12-24 hours) or only carbendazim (10 g/10 kg/10 l water; soaking for 24 hours). None of the farmers applied any organic manure in the nursery. However, all of them applied chemical fertilizers like urea (10-13 kg/kanal; 1 kanal=500 sq m) or DAP (10-12 kg/kanal) or mixture of urea (4-5 kg/kanal) and DAP (8-12 kg/kanal).

Some farmers applied weedicides Sofit, Sathi or Nominee Gold. In the main fields, fertilizers were applied @ 115-195 kg N/ha, 20-57.5 kg P_2O_5/ha and K_2O (37.5 kg/ha) in case of HYVs and hybrids. In case of basmati varities farmers applied 97.5-143 kg N/ha, 10-57.5 kg P_2O_5/ha and 37.5 kg K_2O/ha. However, applicaiton of potash was done by only few farmers (20%). About 70% of the farmers contacted applied zinc sulphate (12.5-25 kg/ha). Some farmers applied chelated zinc (1.25 kg as spray). Few applied sulphur (12.5 kg/ha).

About 50% of the farmers contacted applied FYM (3-6 trolley/acre) in the main fields. Veey few applied green manures like green gram. Planting was random. The intensity of common weeds like *Echinochloa* spp. and *Cyperus* spp. was low. Hand weeding was not very common among the farmers. All the farmers applied different weedicides like butachlor (1 l/acre), pretilachlor (Rifit) (500 ml/acre) or Fastmix (1 l/acre) for managment of weeds. One main demand of the farmers was residue managing machine. Commonly used implements were tractor, trolley, harrow, power tiller, planker, reaper, rotavator and seed cum fertilizer drill. About 50% of the farmers contacted told that they hired the implements. About 80% of the farmers contacted told that they purchased 30-100% of their seed requirement. Deep tube wells and canals were the main sources of irrigation. Electricity was the main source of power. Apart form their own decisions, farmers were advised mainly by the dealers. Diseases like sheath blight, neck blast and bakanae were observed in low intensities. Similarly, insect pests like stem borer, BPH, WBPH and whorl maggot were also in low intensities. Farmers applied different pesticides like Chlorpyriphos (1 l/acre) and chlorpyriphos + cypermethrin (500 ml/acre) for termites; Regent (fipronil) (4-5 kg/acre) and cartap hydrochloride (7.5 kg/acre) for leaf folder and stem borer; Beam (120 g/acre) + hexaconazole (400 ml/acre) for neck blast and sheath blight; imidacloprid (80 ml/acre) + Folicur (tebuconazole) (200 ml/acre), buprofezin (330 ml/acre) + BPMC (fenobucarb) (250 ml/acre) + hexaconazole (400ml/acre), buprofezin (330 ml/acre) + hexaconazole (400ml/acre) and Chess + Folicur (tebuconazole) (200 ml/acre) for BPH/WBPH and sheath blight; Diathane M 45 (500 g/acre) + flubendamide (80 ml/acre) for grain discolouration, leaf folder and stem borer; Beam (120 g/acre) + buprofezin (330 ml/acre) for neck blast and BPH/WBPH; thifluzamide (200 ml/acre) + Chess + carbendazim (200 g/acre) for neck blast, sheath blight and BPH/WBPH; validamycin (450 ml/acre) + lamda cyhalothrin (200 ml/acre) + isoprothiolane (200 ml/acre) + cytozyme (Biological plant growth enhancer) (170 ml/acre) and hexaconazole (400ml/acre) + lamda cyhalothrin (200 ml/acre) + imidacloprid (70 ml/acre)for sheath blight leaf folder, stem borer and BPH/WBPH. Number or pesticide spray/application ranged from 2-3 in a season. About 80% of the farmers contacted told that they mixed 2-4 pesticides at the time of application.

Yamunanagar: Ten villages were covered for production oriented survey during *Kharif* season of 2017. Three visits were made during end of of August, end of September and end of October' 2017. Crops were in booting to heading or dough to mature stage when surveys were made. All the fields surveyed were under irrigated ecosystem. Though, in general, the climatic conditions were favourable for rice cultivation, there was report of subnormal rainfall in some places. Rice-wheat crop rotation was the only cropping sequence which was followed by the farmers. Different rice varieties cultivated by the farmers were HYVs like PR 126 and HKR 47 and Sarbati, hybrids like Sawa 127, HYB 359, VNR 2355, VNR 6508, RH 257, Pioneer 25P35, Sudha, Swift Gold, Super 127, VNR 6508 and Sawa 137 and basmati varieties like Pusa Basmati 1. Average rice yield in the district was 7000-7250 kg/ha in HYVs like HKR 47, 6250-9000 kg/ha in different hybrids like Hyb. 359, Hyb. Sudha, Swift, Sawa 127 and Arize 6444 and 5000-6500 kg/ha in basmati

varieties like Pusa Basmati 1. Planting was done in between middle of June to middle of July. Average seed rate was 7.5-17.5 kg/ha and about 70% of the farmers contacted told that they adopted seed treatment with carbendazim (10 g) + streptocycline (1 g)/10 kg of seeds (soaking the seeds for 12-24 hours) or Emisan (10 g/10 kg/10 l water; soaking for 12-24 hours) or only carbendazim (10 g/10 kg/10 l water; soaking for 24 hours). Majority of the farmers (90%) did not apply any organic manure in the nursery. However, all of them applied chemical fertilizers like urea (5-12 kg/kanal; 1 kanal=500 sq m) or mixture of urea (4-5 kg/kanal) and DAP (10-12 kg/kanal). Some farmers applied weedicides Sofit. In the main fields, fertilizers were applied @ 115-195 kg N/ha, 40-57.5 kg P_2O_5/ha and 28.75-75 kg K_2O/ha in case of HYVs and hybrids. In case of basmati varities farmers applied 137.5 kg N/ha and 57.5 kg P_2O_5/ha. However, applicaiton of potash was done by only few farmers (30%). About 70% of the farmers contacted applied zinc sulphate (12.5-25 kg/ha). Some farmers applied chelated zinc (1.25 kg as spray). Few (~ 20%) applied sulphur (12.5 kg/ha).

About 30% farmers applied FYM (3-5 trolley/acre) in the main fields. All the farmers followed random planting. The intenisty of weeds like *Dactyloctenium aegyptium*, *Echinochloa* spp. and *Cyperus* spp. was low. Hand weeding was not very common among the farmers. All the farmers applied different weedicides like butachlor (1 l/acre), aniloguard (500 ml/acre) and pretilachlor (500 ml/acre). Farmers wanted good quality seeds of HYVs. Commonly used implements were tractor, trolley, harrow, power tiller, planker, rotavator and seed cum fertilizer drill. Some contacted told that they hired the implements. About 80% of the farmers contacted told that they purchased 100% of their seed requirement. Deep tube wells were the main sources of irrigation. Electricity was the main source of power. Apart form their own decisions, farmers were advised mainly by the dealers and occasionally by staffs of university and state department of agriculture. Different diseases like sheath blight, leaf and neck blast, bakanae and false smut were observed in low to moderate intensities. Among the insect pests, stem borer, leaf folder, WBPH and whorl maggot were observed in low to moderate intensities. However, BPH damage was high (50-60 insects/hill) in variety Sawa 127 in Gumthala village. Farmers applied different pesticides like chlorpyriphos (1 l/acre) and chlorpyriphos + cypermethrin (500 ml/acre) for termites (along with irrigation water); propiconazole (200 ml/acre) for false smut; cartap hydrochloride (5-7.5 kg/acre), Ferterra (4 kg/acre) and Regent (7.5 kg/acre) for leaf folder and stem borer; thiomethoxam (50 g/acre) and thiomethoxam (70 g/acre) + buprofezin (330 ml/acre) for BPH/WBPH; thiomethoxam (50 g/acre) + validamycin (450 ml/acre), buprofezin (330 ml/acre) + validamycin (450 ml/acre) and hexaconazole (400 ml/acre) + buprofezin (330 ml/acre) for sheath blight and BPH/WBPH; propiconazole (200 ml/acre) + imidacloprid (70 ml/acre) for WBPH, false smut and grain discolouration; buprofezin (330 ml/acre) + propiconazole (200 ml/acre) for BPH/WBPH and false smut and Beam (120 g/acre) + DDVP (250 ml/acre) for neck blast and BPH/WBPH. Number or pesticide spray/application ranged from 1-4 in a season. About 80% of the farmers contacted told that they mixed 2 pesticides at the time of application.

Ambala: Survey was conducted in 10 villages in this district. Survey was conducted thrice during the season viz., made during end of of August, end of September and end of October' 2017. Crops were in tillering to heading or mild to mature stage at the time of survey. All the fields surveyed were under irrigated ecosystem and in most of the places, visited, the general climatic conditions were favourable for rice cultivation. In one place there was report of excess rainfall and in one place sub-normal rainfall. About 50% of the farmers contacted told that they used 25-55% of their land for cultivation of other crops during *Kharif* season. Rice-wheat was

the only cropping sequence followed by the farmers. Different rice varieties cultivated by the farmers were HYVs like PR 113, HKR 47, PR 121, Pusa 44, NDR 359 and Sarbati; hybrids like Sawa 127, Swift Gold, BNR, PA 6129, Pioneer 27P31, HYB 2266, Pioneer 25P35, BS 6444, RH 257, Arize 6508, Hyb 834, Kaveri Seed 468, BNR 2375, Arize 6444 and Pusa Basmati 1509 and basmati varieties like Pusa Basmati 1121. Average rice yield in the district was 6000-7000 kg/ha in different HYVs like HKR 47, PR 121, NDR 359 and Pusa 44, 5500-8250 kg/ha in different hybrids like Sawa 127, RH 257, Swift, 25P35, Arize 6129, Hyb. Sudha and Swift Gold and about 4000 kg/ha in Pusa 1121. Planting was completed in between middle of June to middle of July. Average seed rate was 7.5-12.5 kg/ha and about 80% of the farmers contacted told that they adopted seed treatment with Emisan (10 g/10 kg/10 l water; soaking for 12-24 hours), carbendazim (10 g/10 kg/10 l water; soaking for 24 hours) or thiomethoxam 25% WG. None of the farmers applied any organic manure in the nursery. However, all of them applied chemical fertilizers like urea (8-13 kg/kanal; 1 kanal=500 sq m) or mixture of urea (4-5 kg/kanal) and DAP (10-12 kg/kanal). Some farmers applied weedicides Sofit. In the main fields, fertilizers were applied @ 86.25-195 kg N/ha, 28.75-74.75 kg P_2O_5/ha and 37.5 kg K_2O/ha in case of HYVs and hybrids. In case of basmati varities farmers applied 115 kg N/ha and 40 kg P_2O_5/ha. However, applicaiton of potash was done by only few farmers (40%). One farmer applied Omax K141 (26% K2O) @ 625 ml/ha. About 70% of the farmers contacted applied zinc sulphate (12.5-25 kg/ha). Some farmers applied chelated zinc (1.25 kg as spray). Very few (~ 10%) applied sulphur (12.5 kg/ha).

About 20% farmers applied FYM (2-3 trolley/acre)in the main fields and about 30% farmers applied different growth regulators like Biozyme, Top Flower (organic growth stimulant @ 500 ml/acre) and mycorrhiza (4 kg/acre). All the farmers followed random planting. The intenisty of weeds like *Echinochloa* spp. and *Cyperus* spp. was low. Hand weeding was not very common among the farmers. All the farmers applied different weedicides like butachlor (1 l/acre), pretilachlor (500 ml/acre), Top Star (50 g/acre), Fast Mix (butachlor) (1 l/acre) and Nominee Gold + pyrazosulfuron ethyl (80 g/acre) for management of weeds. One major demand of the farmers in the region was paddy straw managing machine. Commonly used implements were tractor, trolley, harrow, power tiller, planker, thresher, rotavator, combine harvester and seed cum fertilizer drill. Some contacted told that they hired the implements. About 90% of the farmers contacted told that they purchased 100% of their seed requirement. Deep tube wells were the main sources of irrigation and about 30% farmers expressed scarcity of irrigation water. Electricity was the main source of power. Apart form their own decisions, farmers were advised mainly by the dealers and occasionally by staffs of university and state department of agriculture. Diseases like sheath blight, bakanae and false smut were recorded in low to moderate intensities. However, damage by stem rot was more (up to 25%) in some places in Mohdi village on hybrid 27p35 where typical lodging of the plants was recorded. Similarly, insect pests like stem borer, leaf folder and WBPH were observed in low to moderate intensities. However, BPH incidence was very high (200-250 insects/hill) on hybrid Sawa 127 in Thumbad village. Farmers applied different pesticides like chlorpyriphos + cypermethrin (500 ml/acre) and chlorpyriphos (1 l/acre) for termites; cartap hydrochloride (5 kg/acre), Ferterra (1 kg/acre) for leaf folder and stem borer; thiomethoxam (60 g/acre) + chlorantraniliprole (0.5%) for BPH/WBPH; Virtako 40WG (Chlorantraniliprole + Thiamethoxam) and Thiamethoxam (60 g/acre) + acephate (300 ml/acre) for leaf folder, stem borer and BPH/WBPH; Saafilizer (UPL) and Saaf (500 g/acre) for bakanae; Tilt (200 ml/acre) + thiomethoxam (40 g/acre) for false smut, sheath blight and BPH/WBPH; propiconazole (200 ml/acre) + hexaconazole (400 ml/acre) for false smut and sheath blight; thiomethoxam (60 g/acre) +tebuconazole (250 ml/acre), thiomethoxam (60 g/acre) + Epic

(hexaconazole 75 WG) and buprofezin (330 ml/acre) + Epic (hexaconazole) for BPH/WBPH and sheath blight; lamda cyhalothrin (250 ml/acre) + thiomethoxam (50 g/acre) + propiconazole (200 ml/acre) for leaf folder, sheath blight and false smut. Number or pesticide spray/application ranged from 1-3 in a season. About 80% of the farmers contacted told that they mixed 2-3 pesticides at the time of application.

Panipat: Ten villages in this district were covered for production oriented survey during *Kharif* season of 2017. Three visits were made during end of of August, end of September and end of October' 2017. Crops were in tillering to stem elongation stage or heading to milk stage or in mature stage when surveys were made. All the fields surveyed were under irrigated ecosystem. The general weather conditions were favourable for rice cultivation in majority of the places except one place where sub-normal rainfall was reported. About 20% farmers told that they used 5-20% of their land for cultivation of other crops during *Kharif* season. Rice-wheat was the only cropping sequence followed by the farmers. Farmers mainly cultivated basmati rice varieties like Pusa 1121, CSR 30 and Pusa 1509 in this district. Average rice yield among different basmati rice varieties ranged from 3000-5500 kg/ha. Planting was done mainly during June 3rd week to July 2nd week. Average seed rate was 10-15 kg/ha and about 90% of the farmers contacted told that they adopted seed treatment with carbendazim (10 g) + streptocycline (1 g)/10 kg of seeds (soaking the seeds for 12-24 hours), Emisan (10 g/10 kg/10 l water; soaking for 12-24 hours), Emisan (10 g) + streptocycline (1 g)/10 kg of seeds (soaking the seeds for 12-24 hours) or only carbendazim (10 g/10 kg/10 l water; soaking for 12-24 hours). Very few farmers (10%) applied any organic manure in the nursery. However, all of them applied chemical fertilizers like urea (8-12 kg/kanal; 1 kanal=500 sq m) or mixture of urea (4-5 kg/kanal) and DAP (10 kg/kanal). Some farmers added *Hara Kashish* (plant growth promoter) and SSP also in the nursery. Some farmers applied weedicides Nominee Gold. In the main fields, fertilizers were applied @ 57.5-195 kg N/ha, 20-57.5 kg P_2O_5/ha and 75 kg K_2O/ha. About 50% farmers applied potash. About 70% of the farmers contacted applied zinc sulphate (12.5-25 kg/ha). Some farmers applied chelated zinc (1.25 kg as spray). Very few (~ 10%) applied sulphur (12.5 kg/ha).

About 40% of the farmers contacted applied FYM (2-5 trolley/acre) in the main fields and about 30% practiced green manuring with dhaincha and green gram. Planting was random. The intenisty of weeds like *Echinochloa* spp. and *Cyperus* spp. was low. Hand weeding was not very common among the farmers. All the farmers applied different weedicides like butachlor (1 l/acre), pretilachlor (500 ml/acre), Fast Mix (butachlor) (1 l/acre) and Nominee Gold (100 ml/acre) for management of weeds. Commonly used implements were tractor, trolley, harrow, planker and rotavator. Many farmers told that they hired the implements. About 80% of the farmers contacted told that they purchased 70-100% of their seed requirement. Deep tube wells and canal were the main sources of irrigation and about 40% farmers expressed scarcity of irrigation water. Electricity was the main source of power and about 40% farmers expressed scarcity of electricity. Apart form their own decisions, farmers were advised mainly by the dealers. Among the diseases, sheath blight, neck blast, bakanae and brown spot were observed in low to moderate intensities. However, leaf blast severity was high (up to a disease score of 7) in variety CSR 30 in Chhichhrana village. Insects pests incidence was low. Farmers applied different pesticides like chlorpyriphos + cypermethrin (500 ml/acre) and chlorpyriphos (1 l/acre) for termites; cartap hydrochloride (7.5-15 kg/acre), Agricartap (250 g/acre) + zinc sulphate (100 g, chelated zinc) + urea, Ferterra (5 kg/acre), Regent (5 kg/acre) and Foratox (5 kg/acre) for leaf folder and stem borer; buprofezin (330 ml/acre) + thiomethoxam (60 g/acre) + hexaconazole (400 ml/acre),

buprofezin (330 ml/acre) + validamycin (450 ml/acre) and azoxystrobin-tebuconazole combination + buprofezin (330 ml/acre) + 2, Bromo-2-nitro propane-1-3-diol for BPH/WBPH and sheath blight; Beam (120 g/acre) + buprofezin (330 ml/acre) for neck blast and BPH/WBPH; Caldan 50 SP (200 g/acre) + tricyclazole (120 g/acre) for leaf folder, stem borer and neck blast; Tilt (200 ml/acre) + Beam (120 g/acre) for false smut and neck blast; buprofezin (330 ml/acre) + cartap hydrochloride (250 g/acre) + validamycin (450 ml/acre) for stem borer, leaf folder, BPH/WBPH and sheath blight; Regent + hexaconazole (500 ml/acre) for leaf folder, stem borer and sheath blight; Saaf (500 g/acre) for bakanae and hexaconazole (500 ml/acre) + buprofezin (330 ml/acre) + Beam (120 g/acre) for sheath blight, neck blast and BPH/WBPH. Number or pesticide spray/application ranged from 2-5 in a season. All the farmers contacted told that they mixed 2-3 pesticides at the time of application.

Sonepat: Production oriented survey was conducted in 10 villages in this district. Survey was done thrice in the cropping season viz., during end of August, end of September and end of October' 2017. The crops were in tillering to stem elongation stage or heading to milk stage or dough to maturity stage at the time of survey. All the fields surveyed were under irrigated ecosystem and the general climatic conditions were favourable for rice cultivation. Major crop rotation among the farmers was rice-wheat. Some also followed rice-vegetables rotation. Farmers mainly cultivated basmati rice varieties like Pusa 1121, Pusa 1509 and CSR 30. Average rice yield in the district was 3000-6000 kg/ha. Some fields of CSR 30 was severely damaged by neck blast and yield was significantly reduced. Planting was done in between middle of June to middle of July. Average seed rate was 10-15 kg/ha. Very few farmers adopted seed treatment (~30%) with Emisan (10 g) + streptocycline (1 g)/10 kg of seeds (soaking the seeds for 24 hours) or only carbendazim (10 g/10 kg/10 l water; soaking for 24 hours). Majority of the farmers (90%) did not apply any organic manure in the nursery. However, all of them applied chemical fertilizers like urea (8-12 kg/kanal; 1 kanal=500 sq m) or DAP (10-12 kg/kanal) or mixture of urea (4-5 kg/kanal) and DAP (10-12 kg/kanal). Some farmers applied weedicides Nominee Gold. In the main fields, fertilizers were applied @ 80-195 kg N/ha, 28.75-57.5 kg P_2O_5/ha and 37.5 kg K_2O/ha. However, applicaiton of potash was done by only few farmers. About 50% of the farmers contacted applied zinc sulphate (12.5-25 kg/ha). Few (~ 20%) applied sulphur (12.5 kg/ha).

Application of FYM (4-6 trolley/acre) in the main fields was done by about 50% farmers. One farmer applied mushroom compost (4-5 t/acre). Planting was random. The intenisty of weeds like *Echinochloa* spp. and *Cyperus* spp. was low. Hand weeding was not very common among the farmers. All the farmers applied different weedicides like butachlor (1 l/acre), pretilachlor (750-800 ml/acre), Aniloguard (500 ml/acre), Topstar (50 g/acre) and Eraze (500 ml/acre) for management of weeds. Commonly used implements were tractor, trolley, harrow, power tiller, planker, reaper and rotavator. Many farmers told that they hired the implements. About 30% of the farmers contacted told that they purchased 100% of their seed requirement. Deep tube wells and canal were the main sources of irrigation and about 30% farmers expressed scarcity of irrigation water. Electricity was the main source of power and about 30% farmers expressed scarcity of electricity. Apart form their own decisions, farmers were advised mainly by the dealers. Incidences of diseases and insect pests was low to moderate. Farmers applied different pesticides like chlorpyriphos + cypermethrin (500 ml/acre) for termites; cartap hydrochloride (5-7.5 kg/acre), Regent (7.5 kg/acre) for leaf folder and stem borer; thiomethoxam (50 g/acre) + buprofezin (330 ml/acre) for BPH/WBPH; lamda cyhalothrin cyhalothrin (250 ml/acre) +

buprofezin (330 ml/acre) for leaf folder and BPH/WBPH; tricyclazole (Beam/Sivic) (120 g/acre) + buprofezin (330 ml/acre) for neck blast and BPH/WBPH; buprofezin (330 ml/acre) + hexaconazole (400ml/acre), buprofezin (330 ml/acre) + validamycin (450 ml/acre), buprofezin (330 ml/acre) + combination of azoxystrobin (12.5% SC) + tebuconazole (12.5% SC) (200 ml/acre) for BPH/WBPH and sheath blight and lamda cyhalothrin cyhalothrin (250 ml/acre) + validamycin (450 ml/acre) + buprofezin (330 ml/acre) for leaf folder, stem borer and sheath blight. Number or pesticide spray/application ranged from 1-4 in a season. About 80% of the farmers contacted told that they mixed 2-3 pesticides at the time of application.

Prevalence and severity of rice diseases recorded in different districts of Haryana during *Kharif* 2017

District	Sheath blight	Blast		Bakanae	False smut	Stem rot	Brown spot
		Leaf	Neck				
Kaithal (0)[b]	40 L-M PR 114, Sawa127, VNR 6508, Bas. CSR 30	20 L-M Bas. CSR 30	20 Tr-L (Tr-2%[a]) PB 1121, PB 1	40 Tr-L (Tr-0.1 %) PB-1, Bas. CSR-30, PB 1121	10 L (5-6% tiller 1-2 balls/tiller) Sawa 134	-	-
Kurukshetra (20)	40 L-M BS 6444, PR 114, HYB 2222	10 L Bas. CSR 30	10 L (2-3%) PB 1121	10 Tr PB-1121	30 M (Tr-20% tillers) 5-6 balls/tiller) BS 6444, Sawa 127	10 Tr PB 1121	-
Karnal (0)	70 L-S PR 114, PB-1509, PB-1121, HYB 834, Bas CSR 30; PR 121	10 L Bas. CSR 30	10 L (2-3%) PB 1121	40Tr-L (Tr-3%) PB-1121, PB-1509	10 L (2-3% tillers) 1-2 balls/tiller PR 121, PR 114	-	
Jind (10)	40 L-M PB 1121, PB 1	-	10 Tr PB-1121	60 Tr-L (Tr-4%) PB-1121	-	-	-
Yamuna-nagar (30)	30 L-M PR 126,Sawa 127, VNR 6508	10 L PB-1	10 L-M (8-10%) PB 1	10 Tr PB-1	30 L-M (2-10% tillers 1-4 balls/tiller) Sawa 127, PB-1, PA 6444, BS 6444	-	-
Ambala (50)	20 L-M BS 6444, Sawa 127	-	-	10 M (10-12%) PB-1121	20 L-M (8-20% Tillers; 2-4 smut balls/tiller) Sawa 127, Swift	10 M (20-25%) RH Pioneer 27P31	-
Panipat (0)	30 L-M PB 1121	30 L-S Bas CSR 30	30 L (Tr-3%) PB-1121	50 L (0.1-2%) PB 1121, Bas CSR 30	-	-	10 L PB 1121
Sonepat (10)	60L-M PB-1121, PB-1509	-	20 Tr PB 1121, Bas CSR 30	40 Tr-L (Tr-0.6%); PB-1121, PB-1509	-	10 L-M PB 1121	-

[a]: Disease incidence [b]: % disease free locations 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, bakanae, false smut, stem rot and grain discolouration. Likewise for bacterial blight, leaf blast, brown spot, narrow brown leaf spot and sheath blight, a disease score of 3, 5 and > 5 were treated as L, M and S, respectively.

Occurrence and severity of rice insect pests recorded in different districts of Haryana during *Kharif'* 2017

District	Stem borers	Plant hoppers		Leaf folder	Whorl maggot	Grasshopper
		BPH	WBPH			
Kaithal (0)[b]	60 Tr (Tr-2%)[a] PR114, VNR 6508, Bas. CSR 30, Sawa 127, PB 1121	50 L-S (15-70*) PB 114, PB 1509, PB-1, Sawa 127, Bas. CSR 30	70 L-M (Tr-20*) PB 1121, PB1,Sawa 127, Bas.CSR30, Swift Gold	70 L-S (Tr-25 %) PR 114, VNR 6508, Sawa 127, Bas. CSR-30	-	-
Kurukshetra (0)	30 Tr PB 1121, PR 114	40 L-M (Tr-40) PR 114, PB-1, Swift, Arize 6444	60 M (Tr-20) PB 1121,PR114,Sawa 127, PB1509	50 L (3-10%) PB-1121, PR 114	10 Tr PR 114	-
Karnal (0)	30 Tr (Tr-2%) PB 1121, PB 1509, Bas. CSR30	50 L-S (10-150) PB 1509, Bas. CSR 30, PB 121, PR 114	70 L-M (Tr-50) PB-1121, PB1509, PR126, PR114	70Tr-L (Tr-10%) PB-1121, Bas. CSR30, PR126,PR 114, PB-1509	10 Tr Bas. CSR 30	-
Jind (10)	10 Tr PB 1121	60 L (Tr-12) PB 1121, PB 1509, RH Pioneer 27P31, PB-1	40 Tr PB1121, Sawa127, PB1	-	10 Tr PB 1121	-
Yamuna-nagar (10)	20 Tr VNR 6508	40 L-S (Tr-60) PB-1, Sawa 127	40 L (Tr-10) PB-1, Sawa 127, Arize 6444	60 L-M (Tr-20%) PB-1, PR 126, VNR 6508, Sawa 127	-	10 L (4-5/m^2) PR 126
Ambala (30)	20 Tr Sawa 127, PR 113	40 L-S (Tr-250) Bas. CSR 30, Sawa 127, Arize 6444, PB 1121	- 20 L (Tr-5) RH Pioneer25P35, Sarbati	50 L-M (Tr-15%) Sawa 127, PB 1509, Swift Gold, Arize 6444, VNR 6508	-	-
Panipat (10)	50 Tr PB 1121, Bas. CSR 30	70 L-M (5-50) Bas CSR 30, PB 1121	40 L (Tr-10) PB-1121, Bas. CSR 30	40 Tr PB 1121, Bas CSR 30	-	-
Sonepat (0)	10 Tr Bas. CSR 30	90 L (Tr-12) PB 1121, PB 1509, Bas. CSR 30	50 L (Tr-12) PB 1121, Bas CSR 30, PB 1509)	20 Tr (Tr-0.6%) PB-1121, Bas. CSR 30	-	-

[a]: % insect damage [b]: % insect damage free locations, *: nymphs and adults/hill, Severity: Tr: traces; L: low; M: moderate; S: severe, insect-pests incidence < 5, 5-20, 20-50 and > 50 insects/hill in case of BPH & WBPH and per m^2 in case of grasshopper were designated as Tr, L, M and S in case of hoppers. Likewise for stem borers 1-5%, 6-10%, 11-20% and >20% damage is treated as Tr, L, M and S, respectively.

Himachal Pradesh

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

Particulars of survey

District	Blocks	Villages
Kangra	Nagrota Bagwan, Kangra, Rait, Baijnath, Bhawarna, Bhedu Mahadev, Dharamshala, Fatehpur and Indora	Malan, Kawari, Chahri, Kohala, Kaned, Rait, Shahpur, Dohab, Bagru, Rehlu haar, Passu Pantehar, Tang, Jadrangal, Mahakaal, Panchrukhi, Biara, Tikri Dukhi, Utrala, Harer, Jia, Dadh, Pathiar, Bagora, Bhagotla, Chimbalhaar, Mainjha, Nagri, Gopalpur, Bhawarna, Bhedu Mahadev, Saloh, Chanaur, Indora, Gangath and Palakh
Mandi	Balh	Nalsar, Bheora, Kummi, Charaur and Sundernagar
Una	Una and Haroli	Jankor, Fatehpur, Nandgran, Nangalkalan, Majra and Basal

Widely prevalent varieties

Kangra	**HYVs/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, PR 121, PR 122, PR 126, PR 134, Pusa 44, PR 3590 and PR 202; **Hybrids:** Raja, Arize 6129, Dhanya 111, PAC 807, Hybrid 834, Arize Swift Gold, Sri Ram Khushbu, Shahi Dawat, US 312, Raftaar, Hyb. 2266 and Nirmal-4; **Local:** Jhini
Mandi	**HYVs/Improved varieties:** Pusa 1121, Pusa 1509, Palam Basmati-1, HPR 2143, HPR 1068 and HPR 1156; **Hybrids:** Raja, US 312 and Arize 6129; **US 312 was highly predominating**
Una	**Hybrids:** Arize 6444, Hybrid 57, PR 121, PR 127, Hyb. 1067, Hyb. 257 and Hyb. 25P35

Area under rice crop in districts surveyed during *kharif* 2017

District	Total geographical area (ha)	Total cultivable area (ha)	Total cultivated area (ha)	Area Planted under rice (ha)
Kangra	5,77,681	1,43,952	1,15,748	34698
Mandi	3,97,948	93,280	88,775	18,740
Una	1,54,875	61,149	38,529	1663
Total Area under rice in HP				**72.5**

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

Parameters	**Kangra**	**Mandi**	**Una**
Total area under HYVs in the district (ha)	>90% including hybrids	>80% including hybrids	>90% including hybrids
Most prevalent HYVs in the district	HPR 2143, 1068, PR varieties	HPR 2143, HPR 1068, 1156	PR 121, PR 127, HPR 2143
Total area under rice hybrids in the district(ha)	-	-	-
Most prevalent rice hybrids in the district	Raja, PAC 807, Swift, Raftaar	Raja, US 312, Arize Swift	Arize 6444, Hyb. 1067, Hyb. 257, Hyb. 25p35
Total area under basmati in the district	-	-	-
Most prevalent basmati varieties in the district	Kasturi, Pusa 1121, 1509	Kasturi, Pusa 1121, HPR 2612	-
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	SRI	SRI
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	POP of the university pamphlet was given	POP of the university pamphlet was given	POP of the university pamphlet was given
What are the general problems in rice cultivation in the district?	Labour and market	Labour and market	Labour and market
Please provide any farmers association in the district	-	-	-
Whether availability of labours 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	-	Canal	-
Any soil testing program undertaken?	-	-	-
Any farmers' training program was organized by the state department of Agriculture/University	-	-	-

Production oriented survey was conducted in three districts viz., Kangra, Mandi and Una while Kangra district remains leading in the area under rice cultivation followed by Mandi district. The survey was done when the crops were in dough to maturity stage. The rice fields surveyed were under irrigated ecosystem. Climatic conditions were normal in all the surveyed places. Major crop sequence followed by the farmers was rice-wheat. Some farmers also followed maize-wheat and rice- potato crop rotations. The varieties grown under irrigated conditions were Palam

Basmati-1, Palam Lal Dhan-1, HPR 2143, HPR 1068, Kasturi, Sharbati, Pusa 1509, Pusa 1121, PR 121, PR 122, PR 126, PR 134, Pusa 44, PR 3590, PR 202 etc. Besides these, hybrids like Arize 6129, Dhanya 111, PAC 807, Hybrid 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). Farmers applied fertilizers like IFFCO-12:32:16, DAP and urea. Few applied $ZnSO_4$ and $FeSO_4$ in the main fields. Many farmers followed a modified system of SRI in addition to random planting. The intensity of common weeds was low. Hand weeding was not common among the farmers and application of weedicides like Nominee Gold, butachlor and pretilachlor was common. Some of the common needs of the farmers were market facility for sale of the produce, good quality seeds of basmati rice varieties and proper supply of inputs. Common implements used by the farmers were tractor, cultivator, power tiller and threshers. Seed replacement rate was quite high and was in the range of 75-100%. Some of the common problems faced by the farmers were widespread incidence of false smut on inbred as well as hybrid varieties ranging between low to moderate and severe outbreak of blast on susceptible varieties like, Pusa 1121, Pusa 1509, PAC 807 etc. in some places, inadequate application of pesticides (fungicides/ insecticides) by the farmers in the infested areas, inadequate and imbalanced use of chemical fertilizers, secession of rains during flowering onwards resulting in poorly filled grains particularly in normal and late planted crop in some parts of the State.

District-wise observations:

Kangra: Thirty five villages from nine blocks of Kangra district were covered under production oriented survey during *kharif* 2017 when the crops were either milk to dough stage or maturity stage. However, information in respect of rice cultivation was collected from the farmers of Panchrukhi, Bhawarna, Nurpur, Fatehpur and Indora blocks. The rice fields surveyed were under irrigated ecosystem. Climatic conditions were normal in all the surveyed places. Major crop sequence followed by the farmers was rice-wheat. Some farmers also followed maize-wheat and rice- potato crop rotations. The varieties grown under irrigated conditions were Palam Basmati-1, Palam Lal Dhan-1, HPR 2143, HPR 1068, Kasturi, Sharbati, Pusa 1509, Pusa 1121, PR 121, PR 122, PR 126, PR 134, Pusa 44, PR 3590, PR 202 etc. Besides these, hybrids like Arize 6129, Dhanya 111, PAC 807, Hybrid 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 Achhoo, Jhini, Tapta, Cheenu, Ramjawain and Begmi are still being practiced by the farmers though in declining pattern. However, Jhini was noticed in Jia Haar of Bhawarna block. The area under rice cultivation during *kharif* 2017 in Kangra district was around 35,000 hectares. Average rice yield in the district ranged from 2500-4000 kg/ha in varieties like HPR 1068, Pusa 1121 and Devgowda, 4000-5000 kg/ha in hybrids like Hyb 71, PAC 807 and Arize 6444, 5000-6000 in PR 47, PR 121 and PR 122, 3750-5000 kg/ha in Sharbati and 1800-2000 kg/ha in local varieties. Primary reasons for low rice yield in certain places were use of old seeds with seed mixture, practice of 'Halod' (ploughling in 25-30 days old seedlings during rainy season to get more space among

the seedlings and stagnation of water. Planting was done during mid June to mid July. Some farmers followed direct sowing. Average seed rate was 10-25 kg/ha depending on varieties. Seed treatment practice was not common among the farmers. However, seeds of hybrids were pretreated with fungicides. All the farmers applied FYM in the nursery. Few farmers applied inorganic fertilizers (IFFCO-12:32:16 @ 10-25 g/m^2 nursery). In the main fields, farmers applied either DAP (125 kg/ha) or IFFCO-12:32:16 @ 80-180 kg/ha. About 30% farmers from Indora block also applied zinc sulphate (12.5 kg/ha) and $FeSO_4$ (12.5 kg/ha). Fertlizer dose applied is less in mid hills than that the low hills (Zone 1). Three methods of rice cultivation viz., dry seeding, sowing of sprouted seeds in puddled fields and transplanting are being practiced in this district. System of rice intensification (SRI) was also observed with slight modifications followed by random planting. The farmers were found to plant younger seedlings maintaining a proper distance. Amongst the weeds *Digitaria sanguinalis*, *Paspalum paspalodes*, *Echinochloa colona*, *E. crusgalli*, *Cyperus rotundus, Cyperus iria, Commelina benghalensis, Eleusine indica, Phyllanthus niruri, Panicum dichotomiflorum, 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, Fimbristylis miliacea, Eclipta alba, Phylanthus niruri* and *Bonnaya veronicaefolia*. Two species of alligator weed, *Alternanthera echinata* and *A. sessilis* continued to predominate in this district. Hand weeding was not common among the farmers. Farmers applied weedicides like Nominee Gold (10-20 ml/15 l water) at 30 DAT, Machete (2.5 l/ha) and pretilachlor [120 ml/kanal (1 kanal = 400 m^2)]. Some of the common needs of the farmers were market facility for sale of the produce, good quality seeds of basmati rice varieties and proper supply of inputs. Common implements used by the farmers were tractor, cultivator, power tiller and threshers. Seed replacement rate in this district has been found to increase than previous *kharif* seasons and it was 75-100%. Main sources of irrigation were canal followed by deep tube well. Farmers used their own opinion or advices from private dealers for input use. Diseases such as leaf blast, neck blast, false smut, sheath rot, brown spot, sheath blight, narrow brown and grain discolouration were observed as low to moderate. Leaf blast severity was quite high on Pusa 1121 planted in some parts of Rait, Nagrota Bagwan and Bhawarna blocks. Some farmers used Bavistin 50 WP as seed treatment (2-2.5 g/ kg seed) as well as foliar application (1g/ L) against blast as well as chlorpyriphos (2.5 ml/l) and imidacloprid (1ml/ L) against hispa and leaf folder, respectively. The incidence of rice hispa was low and that of leaf folder, chaffer beetle as well as stem borer was low to moderate. However, incidence of black beetle in Tikri village of Panchrukhi block was moderate to severe on hybrids like PAC 807 and Raaftar. Other pests like grasshoppers and whorl maggot were observed in traces.

Mandi: Farmers from rice bowl of Mandi i.e. Balh 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 rice fields surveyed were under irrigated ecosystem. Climatic conditions were normal in all the surveyed places. About 50% of the farmers contacted told that they used part of their land (20-25%) for cultivation of maize and vegetables. Rice-wheat was the main crop rotation followed by maize-wheat. The area under rice cultivation during *kharif* 2017 in Mandi district was around 19,000 hectares. The predominant high yielding varieties in the district were Pusa 1121, Pusa 1509, Palam Basmati-1, HPR 2143, HPR 1068, HPR 1156 and Kasturi. Hybrids grown in Balh valley included US 312, Raja, Arize 6129 of which US 312 was the predominant one. Local germplasm seemed to be replaced by

hybrids in this block. Average rice yield in the district ranged from4500-5000 kg/ha in different hybrids. Planting was done during last week of May to first week of June. Average seed rate was 10-25 kg/ha. Hybrid seeds were pretreated with fungicides. All the farmers applied FYM in the nursery and application of inorganic fertilizers in the nursery was not common. In the main fields, all the farmers contacted applied IFFCO-12:32:16 @ 100-125 kg/ha. Farmers had adopted a modified system of rice intensification with random planting. Seed replacement rate in this district is quite high (80-100%) especially in Balh valley where maximum area is under hybrids. The most common weeds found in the district were *Cyperus iria, Echinochloa colonum, E. crusgalli, Monochoria vaginalis, Paspalum paspalodes., Eragrostis japonica, Alternanthera echinata, A. sessilis, Digitaria sanguinalis, Ageratum conyzoides* and wild rice. However, the weed intensity was low. Butachlor (2.5-3 l/ha) was used by almost all the farmers. Weedy rice was recorded in low intensity in few places. Some of the common needs of the farmers were implements, training on rice production technology, seeds of HYVs and basmati varieties, market and seeds of indigenous aromatic rice varieties. Common implements used by the farmers were tractor, cultivator, power tiller and threshers. Canal was the main source of irrigation. Farmers used their own opinion or advices from private dealers for input use. In few cases officials from state department and university also advised the farmers. Diseases such as false smut and neck blast appeared in moderate to severe forms in Balh valley. Other diseases like sheath rot, sheath blight and brown spot appeared as low to moderate while leaf blast and grain discolouration appeared as low. Severe outbreak of false smut and neck blast (Intensity > 50%), however, was observed in Nalsar and Bheora villages, respectively. Stem borer was observed as low to moderate. Very few farmers adopted the control measures for false smut and hispa.

Una: Survey was conducted in lower hills of Una distirct comprising Jankor, Fatehpur, Nandgran, 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 rice fields surveyed were under irrigated ecosystem. Climatic conditions were normal in all the surveyed places. The crops were in dough to mature stage at the time of survey. Rice-wheat was the main crop rotation practice followed by the farmers. The high yielding varieties grown by the farmers included HPR 2143, HPR 1068, HPR 1156, PR 127 and hybrids like Arize 6444, Hyb57, Hyb 1067, Hyb 257 and Hyb 25P35. Average rice yield in the region ranged from 5000-6000 kg/ha in case of different hybrids, ~6500 kg/ha in PR 121 while in case of Pusa 1121 it was 3500 kg/ha. Majority of planting was done during last week of June to 1st week of July. However, some farmers were practising late planting of (40-45 days old) seedlings. Average seed rate was 12.5-25 kg/ha. None of the farmers contacted followed seed treatment. All the farmers contacted applied FYM in the nursery and some also applied DAP (50 g/m^2 nursery). Farmers contacted applied IFFCO-12:32:16 (120-200 kg/ha) or combination of DAP (150 kg/ha) and urea (150 kg/ha). The top dressing of urea at tillering and heading stages was also done. Some farmers also applied zinc sulphate in the field. . Farmers had adopted a modified system of rice intensification in addition to random planting. The common weeds were *Cyperus iria, Echinochloa colonum* and *E. crusgalli, Monochoria vaginalis, Aeschynomene indica, Digitaria* etc. Farmers used Nominee Gold (10-25 ml/15 l of water) or Adora and butachlor (120 ml/kanal) for the control of weeds. Some of the common needs of the farmers were suitable pesticides for management of pests and diseases and technical knowledge. Common implements used by the farmers were tractor, cultivator, power tiller and threshers. Deep tube wells were the main

sources of irrigation. Farmers used their own opinion or advices from private dealers for input use. Diseases like sheath rot were observed as low to moderate while leaf blast, neck blast, grain discolouration and sheath blight were recorded as low. False smut was up to 40% on hybrid 1067 in Nangal Kalam village. Brown spot was also observed in moderate to severe form (> 50%) on Pusa 1121 at Nangalkalan. Leaf folder damage in this part of Una was moderate to severe on varieties and hybrids like 25p35, Hyb 1067 and PR 127 in Basal and Nangal Kalam villages. Pesticides like Tilt 25 EC against false smut and insecticide like chlorpyriphos or methyl parathion for leaf folder/ stem borer were used by some farmers.

Prevalence of diseases and insect pests in Himachal Pradesh during *Kharif*' 2017

District	**Diseases**								
	Bl	**NBl**	**BS**	**GD**	**FS**	**LS**	**NBLS**	**ShBl**	**ShR**
Kangra	L-M	L-M (2-15%)	L-M (5-10%)	L-M	L-M (2-15%)	L	L	L-M (5-10%)	L-M (5-10%
Mandi	L	M-S	L-M	L	M-S (5-50%)	L	L	L-M	L-M
Una	L	L-M (5-20%)	M-S (5-50%)	L	M-S (10-40%)	L	L	L-M	L-M

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

CB: Chaffer beetle; BB; Black Beetle

Jammu and Kashmir-1

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

Particulars of survey

Districts	Blocks	Villages
Anantnag	Anantnag, Matlan, Larkipora and Achabal	Wanpoli, Matlan, Keeri, Bonigam Bapora, Hakura and Kionpoh
Baramullah	Baramullah and Pattan,	Delina Ghat, Tapper, Kawhar, Kanispora, Hamrey, Hanjiwera Payeen and Hanjiwera Bala
Kupwara	Langate, Tangdar, Handwara and Tangdar (Karanh)	Khonoo, Gabra, Gund Chogal Handwara, Hajinar, Shath Pallah, Baba Gund and Khanu
Kulgam	Qaimoh	Bagh Wan Poh and Rampora

Widely prevalent varieties

Districts	Varieties
Anantnag	**HYVs:** Jhelum, SKAU-408, SR-4 and SR3; **Local:** China-1039 and China-1007
Baramullah	**HYVs:** Jhelum and SR4; **Local:** China-1039
Kupwara	**HYVs**: Jhelum, SR-3, SKAU-408, **Local**: Zag (local red rice), Mushk-Budgi (Local aromatic variety) and other local varieties
Kulgam	**HYVs:** Jhelum, SR-3 and SR-4

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
Baramullah	1,09,470	70,938	64,411	29,345	20,247
Kupwara	65,574	52,406	45,534	22,710	16,570
Kulgam	47,642	35,605	30,620	20,046	16,748

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

Parameters	Anantnag	Baramullah	Kupwara	Kulgam
Total area under HYVs in the district (ha)	>60%	50%	50%	60%
Most prevalent HYVs in the district	Jhelum	Jhelum	Jhelum	Jhelum
Total area under rice hybrids in the district(ha)	Nil	Nil	Nil	Nil
Most prevalent rice hybrids in the district	Nil	Nil	Nil	Nil
Total area under basmati in the district	Nil	Nil	Nil	Nil
Most prevalent basmati varieties in the district	Nil	Nil	Nil	Nil
Whether farmers are using any heavy equipments like	No	No	No	No

Parameters	Anantnag	Baramullah	Kupwara	Kulgam
transplanted/combine harvester				
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	No	No	No	No
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Use of HYVs with RDF and adoption of SRI	Use of HYVs with RDF and adoption of SRI	Use of HYVs with RDF and adoption of SRI	Use of HYVs with RDF and adoption of SRI
What are the general problems in rice cultivation in the district?	Non-availability of quality seeds	Non-availabi-lity of quality seeds and lack of irrigation	Non-availabi-lity of irrigation water and quality seeds	Non-availability of quality seeds
Please provide any farmers association in the district	Muskh-Budgi Growers Association	Nil	Nil	Nil
Whether availability of labours is sufficient?	Yes	Yes	Yes	Yes
Whether there is any marketing problem of the produce?	Mostly used for domestic purpose	Mostly used for domestic purpose	Mostly used for domestic purpose	Mostly used for domestic purpose
Any major irrigation/power generation project in the district	Nil	Hydroelecytric project, URI	Nil	Nil
Any soil testing program undertaken?	Nil	Nil	Nil	Nil
Any farmers' training program was organized by the state department of Agriculture/University	Yes	Yes	Yes	Yes

Variety wise area coverage (ha) in different districts of J & K-1 during *Kharif*' 2017

Varieties	Anantnag	Baramullah	Kupwara	Kulgam
Jhelum	~11,000	~8,000	~8,000	~10,000
K 332	~3,000	1,000	300	~248
SR-2			~500	
SR-3			~1,500	
China varieties			5,000	
China varieties + SR series	~10,000	10,000		5,000
Others	~1,147	1,247		1,500

Production oriented survey was conducted in four districts viz., Anantnag, Baramullah, Kupwara and Kulgam of Kashmir when the crops were mainly in 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/oilseeds and rice-oats. Most predominant rice varieties cultivated in this region were HYVs like Jhelum, SKAU-408, SR-4 and SR3. 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 1st 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 cooperator reported that majority of the farmers contacted (90-100%) adopted seed treatment with either carbendazim (2-3 g/kg) or mancozeb (3 g/kg). In the main fields, farmers applied 120 kg N/ha, 60 kg P_2O_5/ha and 30 kg K_2O/ha. All the farmers contacted FYM (5-10 kg/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*

spp., *Eichhornia* spp., *Ammannia* spp. and sedges was low to moderate. All and farmers adopted hand weeding and in addition applied herbicides like Eros (4 kg/acre) and butachlor (1.5 kg a.i./acre). 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

Anantanag: Production oriented survey was conducted in six 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 in milk to mature 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 Jhelum, SKAU-408, SR-4 and SR3. Some of the farmers also cultivated local varieties like China-1039 and China-1007. However, a large area is being cultivated with rice HYVs. Average rice yield in the region was 6300-6900 kg/ha in Jhelum. 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 1st 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 cooperator reported that majority of the farmers contacted (90%) adopted seed treatment with either carbendazim (2-3 g/kg) or mancozeb (3 g/kg). All the farmers contacted told that they applied FYM in the nursery bed and all of them applied urea (500 g/25 m^2), DAP (550 g/25 m^2) and MOP (150 g/25 m^2). In the main fields, farmers applied 120 kg N/ha, 60 kg P_2O_5/ha and 30 kg K_2O/ha. All the farmers contacted FYM (5-10 kg/ha) in the main field. Random method of transplanting was common among the farmers. The intensity of common weeds like *Echinochloa* spp., *Potamogeton* spp. and sedges was low to moderate. All and farmers adopted hand weeding and in addition applied herbicides like Eros (4 kg/acre) and butachlor (1.5 kg a.i./acre). 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. However, seed replacement rate was low. Canal was the main source of irrigation and farmers received advices from officials of state department of Agriculture and university. 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.

Baramullah: Seven villages in two blocks were covered for production oriented survey in this district when the crops were in maturity stage. A total of 10 farmers were contacted during survey. The fields were under irrigated ecosystem and the general weather conditions were normal for rice cultivation. All the farmers contacted told that a portion of their land (5-20%) is being used for cultivation of other crops like maize, vegetables and pulses, mainly for domestic consumption. The main cropping sequences in the district were rice-mustard and rice-oats. Predominant rice varieties in the district were HYVs like Jhelum and SR4 and local varieties like China 1039. Farmers are still growing China 1039 because of easy threshability. Average rice yield in the region was 5500-6500 kg/ha in HYVs like Jhelum and SR4 and 3500-3700 kg/ha in China 1039. Some of the reasons farmers attributed to higher yields in varieties like Jhelum and SR-4 are balanced dose of fertilizers, use of quality seeds, assured irrigation and other inputs at

proper stage and proper weed management. Optimum time of sowing was end of April to 1st 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 cooperator reported that all the farmers contacted adopted seed treatment with either carbendazim (3 g/kg) or mancozeb (2-3 g/kg). All the farmers contacted told that they applied FYM in the nursery bed and all of them applied urea (500 g/25 m^2), DAP (550 g/25 m^2) and MOP (150 g/25 m^2). In the main fields, farmers applied 120 kg N/ha, 60 kg P_2O_5/ha and 30 kg K_2O/ha. All the farmers applied FYM (6-9 t/ha) in the main fields and method of transplanting was random where plant population was not maintained. The intensity of common weeds like *Echinochloa* spp., *Potamogeton* spp., *Fimbristylis* miliacea, *Ammannia* spp. and sedges was low to moderate. In addition to hand weeding, all the farmers applied herbicides like butachlor (1.5 a.i./acre). Some of the common needs of the farmers were timely supply of quality seeds of HYVs, irrigation facilities, timely availability of fertilizers and herbicides, proper herbicides for *Potamogetn* spp. and above all, proper guidance by the rice experts. Commonly used equipments in this district were tractor and power tiller. The cooperator reported that the seed replacement rate in the district was 20-25%. Canal was the main source of irrigation and farmers received advices from officials of state department of Agriculture and university. Intensity of different biotic constraints was low and none of the farmers contacted applied any pesticides. The major problem faced by the farmers was non-availability of quality seeds of HYVs.

Kupwara: Survey was conducted in 7 villages involving 10 farmers when the crops were 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 rotations were rice-mustard, rice-oats and rice-fallow. Predominant rice varieties cultivated in the district were HYVs like Jhelum, SR-3 and SKAU-408 and local varieties like Zag (local red rice), Mushk-Budgi (Local aromatic variety) and other local rice varieties. Both Zag and Mushk-Budgi are high value verities but are having low yields. However, HYVs are spreading very fast in the region and on and average 60-70% area is covered with HYVs. Average rice yield in the region was 5700-6800 kg/ha in HYVs like Jhelum and SR-3, 3000-4000 kg/ha in local varieties like Zag and Mushk-Budgi. Primary reasons for higher yields in case of HYVs was use of recommended packages 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 1st week of May and optimum time of planting was end of May to 1st week of June. Average seed rate was 80 kg/ha and the cooperator reported that all the farmers contacted adopted seed treatment with carbendazim (3 g/kg). All the farmers contacted told that they applied FYM in the nursery bed and all of them applied urea (500 g/25 m^2), DAP (550 g/25 m^2) and MOP (150 g/25 m^2). In the main fields, farmers applied 120 kg N/ha, 60 kg P_2O_5/ha and 30 kg K_2O/ha. All the farmers applied FYM (5-10 t/ha) in the main fields and method of transplanting was random where plant population was not maintained. The intensity of common weeds like *Echinochloa* spp., *Potamogeton* spp., *Crotolaria* spp., *Eichhornia* spp., *Ammannia* spp. and sedges was low to moderate. In addition to hand weeding, all the farmers applied herbicides like 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 cooperator reported that the seed replacement rate in

the district was 8-10%. Canal was the main source of irrigation and farmers received advices from officials of state department of Agriculture and university. Among different biotic constraints, brown spot and blast were recorded in moderate to severe intensity (20-30%) on some local varieties in Gabra village of the district. The intensity of other biotic constraints was low. Very few farmers (20%) applied tricyclazole (0.06%) for management of blast. Symptoms of zinc deficiency were recorded in few fields. The major constraints faced by the farmers were non-availability of seeds, spraying equipments, fertilizers and pesticides and timely supply of inputs.

Kulgam: Two villages involving 5 farmers were covered for production oriented survey in this district when the crops were in dough to mature stage. All the fields surveyed were under irrigated ecosystem and the general climatic conditions were normal for rice cultivation. About 60% of 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 practice followed by the farmers was rice-oilseeds. The region was mainly dominated by rice variety Jhelum and the average yield was 6300-7000 kg/ha. Primary reasons for higher yield were use of recommended packages 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 1st week of May and optimum time of planting was end of May to 1st week of June. Average seed rate was 100 kg/ha and the cooperator reported that all the farmers contacted adopted seed treatment with carbendazim (3 g/kg). All the farmers contacted told that they applied FYM in the nursery bed and all of them applied urea (500 g/25 m^2), DAP (550 g/25 m^2) and MOP (150 g/25 m^2). In the main fields, farmers applied 120 kg N/ha, 60 kg P_2O_5/ha and 30 kg K_2O/ha. All the farmers applied FYM (5-10 t/ha) in the main fields and method of transplanting was random where plant population was not maintained. The intensity of common weeds like *Echinochloa* spp., *Potamogeton* spp., *Ammannia* spp. and sedges was low. In addition to hand weeding, all the farmers applied herbicides like Eros (4 kg/acre). Some of the common needs of the farmers were timely 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.

Prevalence of diseases and insect pests in Jammu and Kashmir-1 during *Kharif'2017*

Districts	**Diseases**				
	Bl	**NBl**	**ShBl**	**BS**	**GD**
Anantnag	L (1-5%)	T (1%)	L (1-5%)	L (1-7%)	T (1-2%)
Baramullah	T (1%)		L (1-5%)	L (1-5%)	L (1-3%)
Kupwara	M (20-25%)	L-M (7-10%)	L-M (2-15%)	L-S (1-30%)	L (1-5%)
Kulgam	T (1-2%)		L (3-4%)	L (2-6%)	

Districts	**Insect pests**			
	LF	**GH**	**RH**	**Rats**
Anantnag	T (1-2%)	L-M (5-10%)	L-M (5-10%)	L (1-3%)
Baramullah		L (1-5%)		L (1-2%)
Kupwara		L (2-7%)		L (1-2%)
Kulgam	T (1-2%)	L-M (6-12%)		T (1%)

Jammu and Kashmir-2

Districts Surveyed: *Rajouri* and *Poonch*

Particulars of survey

District	Block	Villages
Rajouri	Rajouri and Sunderbani	Tandwal, Kallar, Chanani Bagla, Pullian, Dalogra and Muradpur
Poonch	Poonch and Mendhar	Dagwar, Ajot, Salotri, Chandak, Dhigla, Allah Peer, Karmara, Ari, Uchaad and Guntria

Widely prevalent verities

District	Verities
Rajouri	K 448, K-39, K 343, Giza 14, PC 19 and Arize 6444
Poonch	K 39, K 343, Giza 14 and Basmati local

Particulars of rice area

District	Total Geographical area (ha)	Total Cultivable area (ha)	Area Under Rice (ha)	Area under rice hybrids (ha)	Irrigated Area (ha)
Rajouri	2,53,000	56,400	8,300	40	8,300
Poonch	NA	32,000	4,200	0	4,200

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

Parameters	Rajouri	Poonch
Total area under HYVs in the district (ha)	8000 ha	NA
Most prevalent HYVs in the district	K-39, K-448	K-343, Giza
Total area under rice hybrids in the district(ha)	40 ha	Nil
Most prevalent rice hybrids in the district	Arize 6444	-
Total area under basmati in the district	NA	NA
Most prevalent basmati varieties in the district	Local basmati	Local basmati
Whether farmers are using any heavy equipments like transplanted/combine harvester	No	No
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	Nil	Nil
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Package of practices for higher yield	Cultivation of HYVs in place of age old varieties
What are the general problems in rice cultivation in the district?	Irrigation facilities	Repairing of irrigation channels and timely availability of quality seeds
Please provide any farmers association in the	-	-

Parameters	**Rajouri**	**Poonch**
district		
Whether availability of labours is sufficient?	Yes	Yes
Whether there is any marketing problem of the produce?	No	No
Any major irrigation/power generation project in the district	No	No
Any soil testing program undertaken?	Yes	Yes; limited scale
Any farmers' training program was organized by the state department of Agriculture/ University	By KVKs	By KVKs

An extensive production oriented survey was undertaken in *Kharif* '2017 in the twin hilly districts of Jammu and Kashmir viz., Rajouri and Poonch by a team of scientists from the university and the respective KVK's. Both the districts experienced a normal weather with well distributed rains throughout the season except at the fag end of the crop when there was a long dry spell without affecting much the yield parameters of rice. The irrigation source for the crop was mainly connected through irrigation channels derived from river water basins. Land holding in the districts is generally less than one acre which impedes to go for the diversified farming. Maize and Rice are the only cereal crops grown widely in the *Kharif* season, whereas wheat as well as vegetables forms the sequence for crop rotation. Basmati rice is fast picking up especially in Poonch district. Seed replacement rate remains negligible and the farmers still opt for the age old traditional course varieties like K-343, K-448, K-39 and Giza 14 for their taste preferences. In many fields, Seed mixture was observed and there is a need of replacing the seeds with new and certified seeds. There was no radical change in agronomical practices for paddy crop in either of the districts. Potash was still found elusive in maximum areas while many farmers also skipped phosphorus application. Though some farmers applied DAP, application of phosphorus was not very common among the farmers. However, application of urea was common among the farmers. Hand weeding and limited herbicide application was common practice for management of weeds. Diseases like blast, neck blast, brown spot and bacterial blight and insect pests lilke stem borer, leaf folder, rice hispa and gundhi bugs were recorded in varying intensities. However, the intensity of blast was much less compared to previous years. Plant protection measures and seed treatment was not being practiced by the farmers.

District-wise observations

Rajouri: Production oriented survey was conducted in six villages in two blocks involving 13 farmers. The survey was carried out when the crops were in dough to maturity stage. Majority the fields surveyed were under irrigated ecosystem and the general climatic conditions were normal for rice cultivation. Some of the fields surveyed were under hill ecosystem and some in rainfed lowland ecosystem. About 70% of the farmers told that they used 30-80% of their land for raising other crops like maize (because these lands are under rainfed ecosystem). Rice is cultivated mostly along river-sides with kool system (canals extracted from local rivers to rice fields). It is mainly cultivated along river in Darhal, Thanamandi, Kotranka, Palma, Muradpur, Saranoo, Kallar, Bathuni, Potha and many other pockets falling near local rivers. Farmers follow rice-wheat or rice-barseem cropping sequences. Early to medium maturing coarse cultivars are being cultivated in the district and popular paddy grown varieties are K334, K448, Gizza 14 and few hybrids like Arize 6444, PHB 71. In addition, some area also falls under local varieties like Cheena and Ratna. Farmers are growing these local varieties because of their taste. Average rice

yield ranged from 2100-4000 in varieties like Giza and K-343 while it was 1100-2200 in case of local varieties. Most of the plantings were done in between middle of May to middle of June. Average seed rate in the district was 40-60 kg/ha and none of the farmers contacted adopted seed treatment. All the farmers told that they applied FYM in the nursery bed. However, none of them applied inorganic fertilizers. In the main fields, farmers applied 40-125 kg urea and/or 20-100 kg DAP per hectare. None of the farmers applied FYM or any other organic amendments in the main fields. Method of planting was random. Intensity of common weeds was moderate. Hand weeding was the common practice among the farmers though some farmers applied herbicides like butachlor. Some of the common needs of the farmers are timely availability of seeds of HYVs and fertilizers, irrigation facilities, equipments like threshers, soil testing and repairing of irrigation channels. Implements like tractor, cultivator and knapsack sprayers were used by the farmers. Most of the farmers used last year's harvested paddy as seeds. Canal was the main source of irrigation. During the current year, most of varieties suffer from leaf blast, brown spot and bacterial leaf blight. There are reports of false smut in a few fields, which is first ever complaint received from farmers. Severity of rice hispa, stem borer, leaf folder was also conspicuous besides rice gandhi bug which finds prominence in some fields of Muradpur, Dalogra and Kallar villages. High intensity (30%) of neck blast was reported on K-343 in Pullian village. Application of chemical pesticides was not common among the farmers. Very few farmers applied chlorpyriphos for management of insect pests.

Poonch: Survey was conducted in 10 villages in two blocks in this district involving 10 farmers. The crops were in dough to maturity stage at the time of survey. Fields surveyed were in irrigated or upland or hill ecosystem. In general, the climatic conditions were normal for rice cultivation. Paddy is the second most important crop both in terms of area and as staple cereal after maize in district Poonch. Due to hill eco-system of the district, majority of the rice cultivation land is maintained on terraces and on the banks of the local rivers. About 80% of the farmers told that they used 20-70% of their land for other crops like maize. Different cropping sequences followed by the farmers were rice-wheat, rice-mustard, rice-maize, rice-barseem and rice-vegetables. The commonly grown varieties of crop in the district include Cheena, Giza14, K-448, and other local varieties. Though farmers still prefers the old Giza 14 or the rice of K-series, many have shown interest upon Basmati and the acreage for the same is increasing year by year. The local basmati is grown on a limited area in Chandak. Average rice yields in the district was not very high and ranged between 3000-4000 kg/ha in varieties like K-448, K-343 and Giza14 and about 1500-2400 kg/ha in basmati varieties. Primary reasons for low yield in this region are due to rainfed conditions and poor seed quality. Planting was done during middle of May to middle of June. Average seed rate was 40-60 kg/ha and none of the farmers contacted adopted any seed treatment. All the farmers told that they applied FYM in the nursery but not any inorganic fertilizers. In the main fields, farmers applied urea (60-100 kg/ha) and/or DAP (40 kg/ha). Very few applied potash. Few applied FYM (after every 2-3 years) in the main fields depending on availability. The intensity of common weeds in and around rice fields was low. Hand weeding was most common among the farmers though some applied herbicides like butachlor. Some of the common needs of the farmers were quality seeds of HYVs and basmati varieties, irrigation facilities, repair of irrigation channels and dairy farming. Farmers used tractor and small equipments. Farmers in general used previous year's harvested paddy as seeds. Seed replacement rate is very low. Canal was the main source of irrigation and about 60% of the farmers told that there was scarcity of irrigation water. In addition to their own decisions,

farmers got advices from staffs of State department and private dealers. Unlike the preceding years, there was no hailstorm and winds. Different biotic constraints like blast, brown spot, bacterial blight, grain discoloration, stem borer, leaf folder, grasshoppers and gundhi bugs were observed in low to moderate intensities. In few fields, rat damage was recorded. Farmers used 'Kuppi system' of storage (making a heap of paddy and straw in fields and threshing as and when required). Major problems faced by the farmers were lack of irrigation facilities and non-availability of quality seeds of HYVs.

Prevalence of diseases and insect pests in Jammu & Kashmir-2 during *Kharif*' 2017

District	**Diseases**					
	Bl	**NBl**	**ShBl**	**BS**	**GD**	**BB**
Rajouri	M (5-25%)	M-S (30%)	L-M (10-16%)	L-M (5-20%)	L-M (15%)	L-M (2-20%)
Poonch	L-M (2-15%)	-	T (1-2%)	L-M (3-10%)	L (3-4%)	L-M (5-15%)

District	**Diseases**					
	SB	**LF**	**RH**	**GH**	**GB**	**Rats**
Rajouri	M (16-20%)	M (12-22%)	L (4-6%)	L-M (8-19%)	L-M (1-10%)	-
Poonch	L-M	L	-	L	L	M-S

Karnataka-1

Districts surveyed: *Chamarajanagar, Chickamagaluru, Hassan, Mandya, Mysuru* and *Uttar Kannada*

Particulars of survey

Districts	Taluks	Villages
Chamarajanagar	Yalandur, Kollegal and Chamarajanagar	Maderenahalli, Y. K. Mole, Gowdanahalli and Yadiyur
Chickamagaluru	Koppa, Narasimharajapura, Sringeri and Tarikere	Sringeri, Hariharpura, Lakkavalli, Ranguahalli, Mutthua Koppa, N. R. Pura and Jayapura
Hassan	Holenarsipura and Channarayapatna	Nirvanakoppa, Jakkali, Nagalapura, Sakleshpura,Ullennahalli and Jakkanahalli,
Mandya	Srirangapatna, Mandya, Pandavapura, KR Pete, Malavalli and Maddur	Shambunagar, Puttagowdanadoddi, Arakere, Chinakurali, Maddur Nagarakere, Akkihebbal, Gandalu, Doddankaty and Kirugaval
Mysuru	KR Nagara, HD kote, Tirumakudalu Narsipura, Hunusur, and Nanjanagud	Hebbalu, Mudakoppalu, Suttur, Indavala, Chakkalu, Toraganuru, Vysarajapura, Hunusur and Surgur
Uttara kannada	Sirasi, Haliyal and Mundgod	Bagi, Joida, Maragi, Kesarolli and Gundapura

Widely prevalent varieties

Districts	Varieties
Chamarajanagara	**HYVs**: IR-64, Jyothi and Private hybrids
Chickamagaluru	**HYVs**: IR64, Intan, MTU1001, IET13901, BR2655, Jyothi,BPT5204, JGL1798 and Jaya
Hassan	**HYVs**: IR-64, Thanu, BR2655, Tunga, MTU1001, Intan, Jaya, JGL1798, Rajamudy, Ratnachoodi, KPR-1, Purichickka, Akshaydaan and GK 5001; **Hybrids:** KRH-2 and VNR2233
Mandya	**HYVs**: 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**: Jyothi, IR 64, MTU 1001, MTU 1010, Jaya, Thanu, JGL 1798, BR 2655 and BPT5204; **Hybrids**: KRH-4, DRH836 and MC 13
Uttara kannada	**HYVs**: Abhilash, Jaya, MGD101, MTU1001, Intan, MTU1010, Alursanna, Jyothi and Berma

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)
Chamarajanagar	569901	213172	194692	77393	3043
Chickamagaluru	722075	313377	313000	25000	2700
Hassan	662602	260105	249246	10865	20858
Mandya	498244	330504	253118	140309	12509
Mysuru	676382	368528	489640	114100	57459
Uttara Kannada	1029100	124750	113277	25437	27990

Weather information during the cropping season (*Kharif* 2017)

Months	Districts Surveyed					
	Chamarajanagar	Chickamaglur	Hassan	Mandya	Mysure	Uttara Kannada
June 2017						
Max. Temp(°C)	35.70	34.10	34.10	32.1	35.60	38.30
Min Temp (°C)	18.60	17.70	17.70	19.5	19.10	19.30
Rainfall (mm)	20.32	260.30	123.35	10.5	48.94	670.16
July 2017						
Max Temp(°C)	35.80	34.3	33.5	31.5	36.70	34
Min Temp(°C)	18.30	16.5	17.20	20.0	19	19.40
Rainfall (mm)	25.70	316	149.38	21.2	54.92	824.41
August 2017						
Max Temp(°C)	35.80	34.0	34	31.1	37.18	34.20
Min Temp(°C)	18.50	17	17.70	19.7	18.70	19.60
Rainfall (mm)	151.94	191.5	179.39	206.3	137.63	445.81
September 2017						
Max Temp(°C)	35.70	36.0	35.60	31.2	36	37
Min Temp(°C)	17	15.10	15.80	19.4	17.40	17.70
Rainfall (mm)	250.16	205	239.95	216	231.32	255.08
October 2017						
Max Temp(°C)	35.60	35.3	36.60	30.5	42	37.80
Min Temp(°C)	15.10	10	13.20	20.4	15.10	15.10
Rainfall (mm)	134.57	124.4	109.37	79.9	98.81	122.55
November 2017						
Max Temp(°C)	33.80	35.50	34.30	29.9	35.60	37.80
Min Temp	14.30	11.50	11.50	18.1	10	11.40
Rainfall (mm)	31.20	18.26	14.04	36.7	7.81	12
December 2017						
Max Temp(°C)	34.50	35.90	35.70	29	35.70	36.80
Min Temp	10.20	7.20	7.30	26.5	11.30	8.10
Rainfall (mm)	42.84	1.86	6.01	18	28.31	4.75

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

Parameters	**Districts**		
	Chikamagaluru	**Chamarajanagar**	**Hassan**
Total area under HYVs in the district (ha)	2700	3043	17668
Most prevalent HYVs in the district	IET13901, IR64, Intan	IR-4 and Jyothi	IR64 and BR 2655
Total area under rice hybrids in the district	No hybrids cultivated	143	No hybrids cultivated
Most prevalent rice hybrids in the district	-	-	-
Whether farmers are using any heavy equipments like transplanter/combine harvester	Combine harvester	Combine harvester	Combine harvester
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	-	-	-
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Timely Plant protection measures to be followed.	Use certified seeds	Plant protection measures.
What are the general problems in rice cultivation in the district?	-	Labour, Water problem due to deficit rainfall	Water, electricity, support price, seed quality
Please provide any farmers association in the district	Karnataka Farmers association	Karnataka Farmers association	Karnataka Farmers association
Whether availability of agricultural labours is the 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	Bhadra river project	Krishna Raja sagara	Hemavathi irrigation project
Any soil testing program undertaken?	Soil health card	Soil health card	Soil health card mission by central govt
Any farmers training program was organized by the state department of Agriculture/University	Desi Training programme for dealers	Desi Training programme for dealers	Desi Training programme for dealers

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

Parameters	**Districts**		
	Mandya	**Mysuru**	**Uttara kannada**
Total area under HYVs in the district (ha)	12509	57459	24657
Most prevalent HYVs in the district	MTU-1001, IR64	Jyothi, IR64, MTU-1001	Abhilash, Jaya, MTU-1001, Jyothi, MTU1010,
Total area under rice hybrids in the district (ha)	750	150	-
Most prevalent rice hybrids in the district	KRH- 4, DRH836, MC13	VNR 2375 KRH-4 DRH 836,MC13	PAC837
Whether farmers are using any heavy equipments like transplanter/combine harvester	Combine harvester and Mechanical transplanters	Transplanter Harvester	Transplanter Harvester
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	DSR	DSR	DSR
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Application of Zn , pest and disease control, crop insurance, SRI Method.	Plant protection measures.	Plant protection measures.
What are the general problems in rice cultivation in the district?	Water problem due to deficit rainfall and Cauvery i river issue , Support price	Water problem due to deficit rainfall and Cauvery river issue , Support price	Water, electricity, support price, seed quality
Please provide any farmers association in the district	Karnataka Farmers association	Karnataka Farmers association	Karnataka Farmers association
Whether availability of agricultural labours is the 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	Krishna Raja sagara	Krishna Raja sagara	No
Any soil testing program undertaken?	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	Desi Training programme for dealers	Desi Training programme for dealers	Desi Training programme for dealers

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

Variety/Hybrid	Districts					
	Chikamagluru	**Chamara janagar**	**Hassan**	**Mandya**	**Mysuru**	**Uttara Kannada**
IR64	5000	2500	2394	7459	3249	-
MTU-1001	2500			2000	1982	5598
MTU-1010	-				357	4199
BR2655	2500		3137	1500	1404	
Jyothi	1000	400			6576	
Tanu	-		3202	750	0	
JGL 1798	1500		923		586	
Abhilash	-					8397
IET 13901	5000					
Jaya	1500		118	50		2239
Intan	1500		950			
Hemavathi	-	-	-	-		140
BPT5204	1500					
Tunga			5524	750		
MGD103						840
AnkurSona						
MGD 101	-	--	-	-		840
Rajamudy			1765			
Purichikka			650			
VNR Advant						
Super Amman				750		
Hybrids						
VNR2233						
GK 5003			625			
VNR2375						
GR2555			455			
DRH 836					95	
KHP-10			340			
MC13					22	
Others		125				
Local	5000					4478

Production oriented survey was conducted in six districts of Karnataka viz., Chamarajanagar, Chikamagalur, Hassan, Mandya, Mysuru and Uttara Kannada during Kharif 2017 by a team of Plant Pathologist, Entomologist, Agronomist and Breeder. The prevailing cropping sequence in the districts covered is Rice-Rice followed by Rice-sugarcane, Rice-Vegetables, Rice-Pulses, Rice-Ragi and Rice Fallow. Rice is grown in the state under irrigated, rainfed and tankfed conditions. The state received a total annual rainfall of 1155 mm (-8% deficit) but not timely and well distributed thus was not very favourable for paddy crop cultivation. South-west monsoon i.e June to September was deficit and delayed in Mandya, Mysuru and chamarajanagar districts; however in Hassan, Chikamagalur and Uttara Kannada onset of monsoon was normal. The sources of irrigation are Cauvery, Kabini, Hemavathi, Bhadra,Tunga and Nethravathi rivers. In Mandya and Mysuru district, state government suggested not to grow paddy in Kharif' 2017, since there was deficit rainfall and the reservoirs were not full. During August end due to rainfall received in the catchment areas, the water in Krishnaraja Sagar dam raised to the expected level and water was released. Farmers started sowing and nursery preparation using own seeds and seeds purchased from

the private dealers during August last week. Thus in Kharif 2017 there was delayed and inconsistent sowing in Cauvery command area of Karnataka in zone 6&7. In Mandya and Mysuru districts only 20% and 56% of the actual paddy area is cultivated in kharif 2017. In these districts paddy area was covered by finger millet and pulses. However in Bhadra command area (Chikmagalur district), some farmers have left the land fallow. In Cauvery and Bhadra command areas, farmers have taken paddy in the summer season as the government have assured for irrigation. In Uttar Kannda district paddy is grown under rainfed condition. The district had deficit rainfall (12% rainfall Deficit) and the crop suffered from severe drought during the cropping period followed by the crop failure. In this area, paddy is grown using ground water and tube well irrigation.

The main varieties grown during Kharif' 2017 are of medium duration i.e IR64, Jyothi, MTU-1001, MTU1010, JGL1798, Tunga, Thanu, IET13901, BPT5204 and some private varieties like Super Amman and Sri Ramsona. Some farmers also cultivated hybrids like PAC 837, DRH836, KRH-4, GK 5003 and VNR 2233. Local varieties grown are Rajamudi, Ratnachudi, Rajabhogha and Purichikka. In rainfed areas varieties predominantly occupied are Abhilash, Jaya, MTU1010, MGD101, MGD103, Hemavathi and the local varieties like Dodiga, Halaga, Sali and Poonam. In Mysuru and Mandya district the area covered by hybrids has increased. The weed infestation was low to medium and the common weeds were *Echinochloa colona*, *E. crusgalli* and *Cyprus* spp. More than 75% farmers in all the districts surveyed are using weedicides for weed management in addition to hand weeding. Many farmers in Mandya district have started organic method of paddy cultivation.

In all the districts surveyed, labour shortage was the major problem faced by the farmers due to urbanization. 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, conoweeder etc) on hire basis to the farmers at hobli level in every district is running successfully. Drum seeding method was adopted by many farmers as there was delay in release of water.

Among biotic stress, insect pest infestation has troubled farmers in *Kharif*' 2017. During the vegetative stage the crop was severely affected by case worm and leaf folder due to delayed sowing and planting especially in early tillering and tillering stage. In Mandya and Mysuru districts there was outbreak of brown plant hopper and white backed plant hopper above ETL (15-20/hill) during November I week when the crop was at tillering and booting stage. Later during the cropping period, outbreak of army worm was noticed an all the districts at different stage i.e booting, dough and in grain filling stage. Two species of army worm i.e *Mythimna separata* Walker (rice ear cutting caterpillar) and *Spodoptera mauritia* Boisdua (Swarming caterpillar) attacked the paddy on an average 10-15/hill. Farmers took management measures timely by taking the technical guidance from university scientist and with the help of state department of agriculture. Army worm infestation during grain filling stage incurred huge yield loss ranging from 25-30% in many fields. In Chikamagluru and Shivamogga districts poison bait technique was followed for the army worm management since the crop was at maturity stage and grain filling stage. In Mandya, Mysuru, Hassan and Chamarajanagar districts, as the crop was in booting to dough stage foliar spraying was undertaken during evening hours after 5.30 pm for armyworm management. The major

diseases usually noticed in the districts surveyed are blast, sheath blight, neck blast, brown spot, and sheath rot. During *Kharif'* 2017, the incidence of these diseases was lowto moderate in all the districts surveyed except in some fields on private hybrids. In Jyothi variety the udbatta disease incidence was ranged from 10-15% in Mysuru district. During 2017, the false smut disease was noticed in hybrids and high yielding varieties.

District-wise observations

Chamarajanagar: Chamarajanagar belongs to zone 6 (southern dry zone) of Karnataka. Production oriented survey was conducted in 4 villaages (3 blocks) when the crops were either in tillering or in milk stage. The fields surveyed were under irrigated ecosystem and in general the weather conditions were normal for rice cultivation. The district receives rainfall from southwest monsoon from June to September and northeast monsoon from October to December. Paddy is grown in two taluks i.e Chamarajanagar and Yalandur with rainfall 795 and 894 mm annually. Main cropping sequence followed by the farmers was rice-rice. IR-64 and Jyothi are the important varieties grown in the district. Average yield in these two varieties ranged from4500-5700 kg/ha. Planting was mostly done during 1st week of July to 1st week of August. Average seed rate was 60-65 kg/ha and about 60% of the farmers contacted told that they adopted seed treatment with carbendazim (4 g/kg). The farmers applied FYM in the nursery and in addition also applied inorganic fertilizers like 17:17:17 (1-1.5 kg/300 m^2) or 19:19:19 (1 kg/300 m^2). In the main fields, farmers applied 100 kg N/ha, 25-50 kg P_2O_5/ha and about 115 kg K_2O/ha. However, potash was applied by only few farmers. Farmers adopted green manuring with sunnhemp and followed line transplanting method. The incidences of common weeds like *Echinochloa crusgalli* and *Cyperus* spp. was low. In addition to hand weeding, some of the farmers applied weedicides like Topstar. Implements like tractor were commonly used by the farmers. Most of the farmers contacted told that they purchased seeds for sowing. Canal was the main source of irrigation. Other sources like minor irrigation reservoir, lake and ponds were also used for irrigation purpose. Officials from state department and university and personnel from dealers advised the farmers regarding input use. Disease incidence in the district was below threshold level. Moderate incidences of army worm were noticed at grain filling stage. Farmers applied pesticides like chlorpyriphos (2 ml/l), Rocket (Profenofos 40% + Cypermethrin 4%) (2 ml/l) and dichlorvos (1.5 ml/l) for case worm and army worm and quinalphos (2 ml/l) for leaf folder. The major concern of the farmers was proper market price of the produce.

Chickamagalur: Chickamagalur belongs to Zone 7 and 9 (Malnad zone) comprising of seven taluks. The area under paddy in the district is 2700 ha during kharif 2017. Paddy is grown in 5 taluks of the district i.e Mudigere, Narasimharajapura, Koppa, Sringeri and Tarikere. Survey was conducted in 7 villages (in 4 blocks) in this district when the crops were at maturity stage. The fields surveyed were under irrigated ecosystem and there were reports of deficit rainfall in all the places surveyed. Timely and normal rainfall received from June to September but very less rainfall prevailed from October to December. Thus crop suffered from moisture stress. Main cropping sequence followed by the farmers was rice-rice. Predominant rice varieties cultivated by the farmers were IR64, Intan, MTU1001, IET13901, BR2655, Jyothi, BPT5204, JGL1798 and Jaya. Farmers usually grow green manure crop for one month and incorporate to the soil. Nursery sowing and transplanting depends on the release of water from Bhadra dam. Planting was done during end of July to 1st week of August. Average seed rate was 60 kg/ha and the cooperator reported that all the farmers contacted adopted seed treatment with carbendazim (4 g/kg). All the farmers applied FYM in the nursery beds and in addition applied inorganic fertilizers like 17:17:17 (9 kg/300m^2 of

nursery area), 19:19:19 (8 kg/300m^2 of nursery area), DAP (3.25 kg/300m^2 of nursery area), 10:26:26 (6 kg/300m^2 of nursery area) and 20:20:20 (7.5 kg/300m^2 of nursery area). On and average, farmers applied 100-120 kg N/ha and about 50 kg P_2O_5/ha. Fertilizer usage is as per recommended but slightly more application of nitrogenous fertilizers. Different complex fertilizers applied by the farmers were 10:26:26, 19:19:19, 17:17:17 and 20:20:0:13. Farmers apply Znso4 as per the recommendation. All the farmers practiced green manuring with dhaincha. The common method of cultivation is random planting. They use micronutrients (Zinc and Boron) compulsory. The major weed flora observed was *Echinochloa* spp. and *Cyperus* spp. Farmers practiced hand weeding and also used weedicides viz., butachlor, @1-1.5 litre/acre, Londax Power and pretilachlor @ 600 ml/acre. Some of the common needs of the farmers were mechanical transplanter, proper market price of the produce and quality seeds of HYVs with resistance to pests and diseases. Average seed replacement rate was 20%. In general the intensity of different pests and diseases was low to moderate. Outbreak of rice ear cutting caterpillar (armyworm) *Mythimna separate* was noticed in many fields. Army worm was managed by poison bait method. Farmers used different pesticides like quinalphos (2 ml/l), Rocket (2 ml/l), dichlorvos (1.5 ml/l) and chlorpyriphos (2 ml/l) for different insect pests.

Hassan: Hassan belongs to Zone 7 (Agricultural zone 7) comprising of eight taluks. Paddy is cultivated in southern dry zone covering four taluks viz., Holenarsipura, Sakleshpura, channarayapattatna and Hassan. Survey was conducted during tillering to milk stage. The fields surveyed were under irrigated ecosystem and in general the weather conditions were normal for rice cultivation. The district received good rainfall from June to November. Rice-pulses and rice-rice are the prevailing crop rotation practiced. The predominant rice varieties in the district were BR2655, Intan, MTU 1001, IR-64 and Tunga. The local varieties grown were Rajamudy, Ratnachudi and Rajabhoga. These varieties were grown due to preference of the local people for its taste. They mainly use the local varieties for eating purpose. The seeds of the local varieties of Rajamudy are multiplied by farmers themselves. Farmers are demanding for geographical indication for Rajamudy variety. Some farmers also cultivated hybrids like KRH-2 and VNR2233. Average rice yield in the district ranged from 5000-6250 kg/ha in varieties like BR 2655, JGL 2655, Thanu and IR 64 and about 3700-4500 kg/ha in Rajamudy. Planting was done during 2-3 week of August. Average seed rate was 60-65 kg/ha and majority (70%) of the farmers adopted seed treatment with carbendazim (4 g/kg). All the farmers applied FYM in the nursery beds and in addition applied inorganic fertilizers like 17:17:17 (9 kg/300m^2 of nursery area), 19:19:19 (8 kg/300m^2 of nursery area), DAP (3.25 kg/300m^2 of nursery area), 10:26:26 (5 kg/300m^2 of nursery area) and 20:20:20 (7.5 kg/300m^2 of nursery area). On and average, farmers applied 75-110 kg N/ha, about 50 kg P_2O_5/ha and 50 kg K_2O/ha. Different complex fertilizers applied by the farmers were 10:26:26, 19:19:19 and 20:20:0:13. The farmers applied FYM in the main fields and also practiced green manuring with dhaincha. Intensity of common weeds like *Echnichloa crusgalli, E. colona* and *Cyperus* spp. was low. In addition to hand weeding, farmers applied weedicides like butachlor and Londax Power (4 kg/acre). Implements like harvester and tractor were commonly used by the farmers. Most of the farmers told that they purchased the fresh certified seeds for sowing. Different biotic constraints like blast, neck blast, stem borer and leaf folder were pests noticed and the incidence was low. In Holenarasipura and Channarayapatna taluk sheath blight severity was ranged from 10-20%. Outbreak of rice ear cutting caterpillar (armyworm) *Mythimna separate* was noticed in many fields. Farmers applied different insecticides like chlorpyriphos (2 ml/l), quinalphos (2 ml/l), Rocket (2 ml/l) and dichlorvos (1.5 m/l) for management of different insect pests. The major concern of the farmers was proper market price of the produce.

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. In the district, state government suggested not to grow paddy as the Krishna raja sagar reservoir was not filled by the end of the August. Thus the state department did not distributed the paddy seeds. Only 20% of the paddy area was covered in Kharif 2017. Survey was conducted in 9 villages in this district when the crops were at dough to maturity stage. The fields surveyed were under irrigated ecosystem. However, the rainfall was not very well distributed. The district received very less rainfall in June and July but in August, September and October, rainfall was more than normal rainfall. Overall the rainfall is more than the normal rainfall in kharif 2017. Some farmers, in addition to rice, cultivated other crops like ragi, maize and pulses. Rice-Rice, Rice-Sugarcane and Rice fallow are the prevailing cropping pattern in the district. Average rice yield in the region ranged from 5500-7000 kg/ha in different HYVs like Superman, IR 64, Jyothi, VNR 2233, BR 2655, MTU 1001 and Jaya. Planting was done during 2nd to 4th week of September. Average seed rate was 60-62 kg/ha and about 40% of the farmers contacted told that they adopted seed treatment with carbendazim (4 g/kg). Majority of the farmers applied FYM in the nursery and all of them applied complex fertilizers like 17:17:17 (9 kg/300m^2 of nursery area), 19:19:19 (5-6 kg/300m^2 of nursery area), 10:26:26 (5-8 kg/300m^2 of nursery area) and 20:20:0:13 (4 kg/300m^2 of nursery area). In the main fields, farmers applied 50-125 kg N/ha, 30-50 kg P_2O_5/ha and 30-50 kg K_2O/ha. Few farmers also applied zinc sulphate. Commonly used fertilizers were 10:26:26, urea, ammonium sulphate, 20:20:0:13, SSP and MOP. All the farmers applied FYM in the main fields and also practiced green manuring. Intensity of common weeds like *Echnichloa crusgalli, E. colona* and *Cyperus* spp. was low. In addition to hand weeding, farmers applied weedicides like Londax Power (4 kg/acre). Some of the common needs of the farmers were mechanical transplanter, draught resistant varieties, good market price of the produce and pests and disease resistant HYVs. Farmers commonly used implements like tractor and harvester. Officials from state department and university and personnel from dealers advised the farmers regarding input use. The severity of blast and brown spot was below threshold level however sheath blight was noticed in patches with severity ranged from 10-25%. Among the insect pests, moderate to severe infestation of case worm, leaf folder and army worm was recorded in many areas. In some fields Maddur and Mandya infestation of caseworm was very severe and farmers took 2-3 sprays for the management. Two species of army worm i.e *Mythimna separata* Walker (rice ear cutting caterpillar) and *Spodoptera mauritia* Boisdua (Swarming caterpillar) attacked the paddy on an average 5-20/hill. Severe incidence of case worm (25-30%) was recorded on varieties like Superman and MTU 1001 in villages like Shambunahal and Maddur Nagarakere. Brown plant hopper was noticed in arakere and some villages of srirangapatna taluk at tillering stage and panicle emergence in Jyothi, IR64, and hybrids. Farmers applied different insecticides like chlorpyriphos (2 ml/l), quinalphos (2 ml/l), Rocket (2 ml/l), monocrotophos (1.5 ml/l) and dichlorvos (1.5 m/l) for management of different insect pests and hexaconazole (2 ml/l) for sheath blight. The main concerns of the farmers were labour shortage and proper market price of the produce.

Mysuru: Mysuru belongs to Zone (6 and 7) comprising of seven taluks. Survey was conducted in three taluks viz., T Narasipura, Nanjangud and K R Nagara. The survey was conducted during the maturity stage of the crop. The fields surveyed were under irrigated ecosystem. In general, the weather conditions were normal for rice cultivation. In addition to rice, some farmers cultivated other crops like capsicum, green gram, cowpea and other vegetables in parts of their land. Main cropping sequences were rice-rice, rice-puses, rice vegetable and rice-sugarcane. Predominant rice varieties cultivated in the district were HYVs

like Jyothi, IR 64, MTU 1001, MTU 1010, Jaya, Thanu, JGL 1798, BR 2655 and BPT5204 and hybrids like KRH-4, DRH836 and MC 13. Average rice yield in the district ranged from 4750-6500 kg/ha in different HYVs. Planting was main done during 2nd to 4th week of September. Average seed rate was 60 kg/ha and about 65% of the farmers contacted told that they adopted seed treatment with carbendazim (4 g/kg). All the farmers contacted applied FYM in the nursery and all of them applied complex fertilizers like 17:17:17 (9 kg/300m^2 of nursery area), 19:19:19 (8 kg/300m^2 of nursery area), 10:26:26 (5-6 kg/300m^2 of nursery area) and DAP (3.25 kg/300m^2 of nursery area). In the main fields, farmers applied 75-110 kg N/ha, 50 kg P_2O_5/ha and 50 kg K_2O/ha. Farmers applied FYM in the main fields and also adopted green manuring. The intensity of common weeds like *Echnichloa crusgalli, E. colona* and *Cyperus* spp. was low. In addition to hand weeding (30 and 60 DAT), farmers applied weedicides like Londax Power (4 kg/acre), butachlor 50 EC (0.8 l/acre) and pyrazosufuron Ethly (100 g/acre). Some of the common needs of the farmers were mechanical transplanter, draught resistant rice varieties, HYVs resistant to pests and diseases and proper market price. Most of the farmers used previous year's seeds for sowing. Canal water from Kabini, Cauvery river and open wells are the main source of irrigation. Planting was delayed in the canal irrigated areas due to delay in releasing water. Only 56% of the paddy area was covered in *Kharif* 2017. Officials from state department and university and personnel from dealers advised the farmers regarding input use. Overall the diseases incidence in the district was below economic threshold level. Sheath blight was noticed in patches but the severity was less. Bacterial blight of 10-20% severity was noticed in some fields of Bannur hobli of T Narasipura taluk on jyothi variety. Insects pests like leaf folder and stem borer were low to moderate due to delayed sowing. Outbreak of armyworm was noticed at booting, dough and grain filling stage. Army worm was managed by bund cleaning followed by foliar application of insecticide ie, chlorophyriphos 25 EC @ 2ml/ l or quinolphos 25 EC @ 2 ml/l or Rocket (profenophos 40 EC + cypermethrin 4 EC) @ 2ml/l during evening hour at 5.30 pm onwards.

Uttar Kannada: Uttara Kannada district is located in the mid-western part of Karnataka belongs to Zone 10 (coastal zone). It is a region of gentle undulating hills, rising steeply from a narrow coastal strip bordering the Arabian sea to a plateau at an altitude of 500 m with occasional hills rising above 600–860 m. Paddy is grown in taluks viz., Sirisi, Siddapura, Kumta, Honnavara, Batkal, Haliyal and Mundgod. Survey was conducted when the crops were at milk stage. The fields surveyed were under irrigated ecosystem. Climatic conditions range from arid to humid due to physiographic conditions ranging from plains, mountains to coast. During 2017, Uttara Kannda received an annual average rainfall of 2444 as against 2787 mm with 12% deficit. Rice-Rice, Rice-pulses, rice followed by fallow is common cropping system followed in this region. Varieties grown are Abhilasha, Jaya, MGD101, MTU1001, Intan, MTU1010, Alursanna, Jyothi and Berma. Average rice yield in the district ranged from 5000-5200 kg/ha in different HYVs. Direct sowing followed by hand weeding is in practice. None of the farmers contacted adopted any seed treatment. Fertilizer like 17:17:17; 20:20:0:13; Urea, MOP, SSP, DAP *etc*., are commonly used to supply NPK at the rate of 75: 75:90 Kg/ha. The NPK usage is less than or equal to the normal recommended dosage as the crop is being grown for non commercial purpose (Home consumption and fodder for animals). Zinc deficiency is a common problem during crop stage and only few farmers are following the corrective measures by applying ZnSo4. The intensity of common weeds like *Echnichloa crusgalli, E. colona* and *Cyperus* spp. was low. In addition to hand weeding (30 and 60 DAT), farmers applied weedicides like Londax Power (4 kg/acre and Nominee Gold (100 ml/acre). Some of the common needs of the farmers were HYVs with bold grains, pests and disease resistant rice varieties and mechanical

transplanter. Among the biotic constraints, sheath blight and false smut disease severity was low to moderate. However, neck blast was observed in high intensity in some fields on varity Poonam. Low to moderate incidence of gundhi bug and army worm was recorded in some areas. Farmers applied different insecticides like chlorpyriphos (2 ml/l), quinalphos (2 ml/l), Rocket (2 ml/l), monocrotophos (1.5 ml/l) and dichlorvos (1.5 m/l) for management of different insect pests. Major problem faced by the farmers was scarcity of labours.

Prevalence of disease and pests in Karnataka-1 during *Kharif*' 2017

Districts	**Diseases**							
	Bl	**NBl**	**BS**	**ShBl**	**ShR**	**FS**	**UDB**	**BLB**
Chamarajnagar	L	L	L	M (15-20%)	L	-	-	
Chikamagalur	L-M (5-10%)	L-M (5-10%)	L	L-M (5-25%)	L	L-M (5-10%)	L	L
Hassan	L-M (5-10%)	L-M (5-10%)	L	L-M (10-20%)	L	-	-	-
Mandya	L-M (5-10%)	L-M (5-10%)	L-M (10-20%)	L-M (10-25%)	L	L	L	-
Mysuru	L (5%)	L	L-M (10-15%	L-M (15-20%)	L	L	L-M	L-M (10-20%)
Uttarakannda	L	M-S (15-30%)	L	L-M (10-20%)	L	L-M (10-20%)	-	L

Districts	**Insect pests**					
	SB	**LF**	**BPH**	**CW**	**AW**	**GB**
Chamarajnagar	L	M (15-20%)		L-M (5-20%)	M (5-10/hill)	
Chikamagalur	L (5%)	L-M (5-10%)	L	L	M-S (5-20/hill)	
Hassan	L-M (5-10%)	L-M (5-10%)		L-M (5-10%)	M-S (10-15/hill)	
Mandya	L (2-5%)	M-S	M	M-S 10-30%)	M-S (5-20/hill)	
Mysuru	L (5%)	L-M (5-10%)	L-M (5-15%)	M-S	M-S (5-15/hill)	
Uttarakannda	L (5%)	L-M	L-M	L-M (10-15%)	M (5-10/hill)	L-M

Karnataka-2

Districts surveyed: *Koppal, Bellary, Raichur, Yadgir, Davanagere, Shivamogga, Chickkamagalur, Uttarkannada, Dharwad* and *Belagavi*

Particulars of survey

District	Talukas	Villages	Cropping type
Koppal	Gangavathi	Budagumpa, Hosahalli, Desai Camp, Agalkera, Anegundi, Bappi Reddy Camp, Hemagudda, Munirabad, Munirabaad (RS), Sharanabasaveshwara Camp, Jangamara Kalgudi, Herur, Kesaratti, Basapatna	Irrigated
Bellary	Sirguppa, Hospet and Bellary	Bairapura, Karur, Dhadesugur, Tekkalkot, Kampli, Buksagar, Ramsagar, Hampi, Kamalapur, Moka, Hagari, Kottur and Roopangudi	Irrigated
Raichur	Raichur, Manvi and Sindanur	Reddi Camp, Raith Nagar Camp, Kasabe Camp, Rampur, Kavithal, Vijayanagar Camp, Seventh Mile Cross, Nnermanvi, Kapagal, Amareshwara Camp, Potnal, Javalgere, Bengali camp, Mataldinni, Rampur Junction and Hanchinal camp	Irrigated
Yadgir	Yadgiri and Shapur	Mylapur, Devsugur, Kanapura and Hatiguddur,	Irrigated
Davanagere	Harihara and Honnali	Ditur, Karlahalli, Kodiyal, Kumarapatnam, Belludi, Kumarnagar, Malebennur, Harlahalli, Chilur, Nymathi and Gollarahalli	Irrigated and Rainfed
Shivamogga	Shivamogga, Bhadravathi and Sagar	Mattur, Sugur, Holalur, Hansuvadi, Aynur, Kumsi, Machenahalli, Nidhige, Malavagoppa, Hadlagatta, Mavinakere, Yerehalli, Maruthinagar, Barnduru, Kenchenahalli, Kalinganahalli, Shivapura, Ukundha, Antharagange, Bhadrapura, Virapura, Harlihalli, Attigunda, Srirampura, Talagoppa, Andanpur, Usur, Jogimat, Jog and Kugve	Irrigated and Rainfed
Chickkamagalur	Tarikere	Bhavikere, Lakkavalli, Byalenahalli, M.C. Halli, Karkuchi, Dodda Kundaur, Rangenahalli, Bargenehalli, Shanthipur, Lakkavali Cross	Irrigated and Rainfed
Uttarkannada	Sirsi and Halihal	Hoskoppa, Islur, Yekkambhi, Benagi, Mundgod, Havagi, Timmapura and Dori	Rainfed
Dharwad	Dharwad	Mugad, Halnavar, Harvatagi, Honnapur, Londa	Rainfed
Belagavi	Kanapur	Hebbal, Lalwad, Kasambenadagad	Rainfed

Widely prevalent rice varieties and sources of seed materials

District	Varieties	Source of seed material
Koppal	**HYVs:** BPT-5204, Gangavathi Sona, GNV-10-89, RNR-15048, Improved BPT-5204, Kauvery Sona, JGL1798, MTU1010, Ankur Sona, Sriram Gold, Gangavathi Emergency, Nellur Sona	UAS Raichur, State Agri Dept, Private firms, Progressive Farmers (Personal contacts)
Bellary	**HYVs:** BPT-5204, IR64, JGL1798, MTU1010, RNR-15048 MTU1001, Kauvery Sona, Ankur Sona, Gangavathi Sona, Gangavathi Emergency,	-do-

District	Varieties	Source of seed material
	Nindranni	
Raichur	**HYVs:** BPT-5204, Telhamsa, IR64, JGL1798, MTU1010, Kauvery Sona, Ankur Sona, Gangavathi Sona, Gangavathi Emergency	-do-
Yadgir	**HYVs:** BPT-5204, Telhamsa, IR64, JGL1798, MTU1010, Kauvery Sona, Ankur Sona, Gangavathi Sona, Gangavathi Emergency	-do-
Davanagere	**HYVs:** BPT-5204, Telhamsa, IR64, JGL1798, MTU1010, Kauvery Sona, Ankur Sona, Jaya	State Agri Dept, Private firms, Progressive Farmers (Personal contacts), Self produced
Shivamogga	**HYVs:** Jaya, BPT-5204, Telhamsa, IR64, JGL1798, MTU1010, Kauvery Sona, Ankur Sona, Jyothi, Abhilash, Thanu, RNR-15048	UAHS Shivamogga, State Agri Dept, Private firms, Progressive Farmers (Personal contacts), Self produced
Chickkamagalur	**HYVs:** Jyothi, Ankur Sona, Jaya, JGL1798, Thanu	-do-
Uttarkannada	**HYVs:** Abhilasha, Jaya, Berma, Jyothi	Self produced, Progressive Farmers (Personal contacts) and State Agri Department
Dharwad	**HYVs:** Abhilasha, Jaya, Berma, Jyothi, Amman Sona, Siri	UAS Dharwad, State Agri Dept, Private firms, Progressive Farmers (Personal contacts), Self produced
Belagavi	**HYVs:** Abhilasha, Jaya, Berma, Jyothi, Amman Sona, IR64	-do-

Rainfall pattern in the surveyed area of Karnataka during 2017

Districts	Pre-monsoon (1st January to 31st May)			South West Monsoon (1st June to 30th September)		
	Normal (mm)	Actual (mm)	% Def	Normal (mm)	Actual (mm)	% Def
Ballari	95	77	-19	352	438	24
Belagavi	107	56	-48	612	493	-19
Chikkmagalur	180	163	-9	1349	1127	-16
Davanagere	117	74	-37	373	449	20
Dharwad	141	105	-25	498	381	-23
Koppala	81	63	-22	376	489	8
Raichur	67	39	-42	450	520	16
Shivamogga	147	88	-40	1889	1483	-21
Uttara kannada	132	109	-18	2457	2195	-11
Yadgir	69	29	-58	592	468	-21

Rainfall pattern in the surveyed area of Karnataka during 2017 (Cntd..)

Districts	Noth East Monsoon (1st Oct to 31st Dec)			Annual Rainfall' 2017 (1st Jan to 31st Dec)		
	Normal (mm)	Actual (mm)	% Def	Normal (mm)	Actual (mm)	% Def
Ballari	150	129	-14	597	644	8
Belagavi	153	120	-21	872	670	-23
Chikkmagalur	228	144	-37	1757	1435	-18
Davanagere	173	199	15	662	722	9
Dharwad	159	123	-23	798	609	-24
Koppala	142	134	-6	600	686	14
Raichur	143	149	4	660	708	7
Shivamogga	202	108	-46	2237	1679	-25
Uttara kannada	198	140	-29	2787	2444	-12
Yadgir	150	135	-10	811	632	-22

Source: Karnataka state natural disaster monitoring centre, Govt. of Karnataka (https://www.ksndmc.org)

In Karnataka, Production Oriented Survey (POS) was conducted during *Kharif*' 2017 by multi-disciplinary team consisting of Pathologist, Entomologist, Breeder and Agronomist in ten districts representing Southern (Chickkamagalur, Davanagere and Shivamogga), North Western (Belagavi, Dharwad and Uttarkannada) and North Eastern (Bellary, Koppal, Raichur, and Yadgir) regions of Karnataka where paddy is grown as a major food/commercial crop. State received a total annual rainfall of 1063 mm against the state average of 1155 mm (-8% deficit), but, the distribution was erratic and most of the rain was received only during September to October (not congenial for *Kharif* paddy sowing).

During the survey, the crop was at tillering to heading stage. Erratic planting/sowing of paddy was the common scenario in almost all the surveyed area due to late rains in the rainfed area and late release of dam water in the irrigated regions. In many districts of irrigated belts, considerable area (30-40%) was left fallow/sown with other short duration crops due to no release of water or late release of water (Bhadra Project Irrigation-Chikkamagalur, Shivamogga and Davanagere districts; Tung Bhadra Project Irrigation-Koppal, Bellary and Raichur districts; Upper Krishna Project-Raichur and Yadgir districts). However, those farmers who could not plant in the *Kharif*-2017 are hoping to take paddy in the coming Rabi season (Bhadra project area is under planting for Rabi season, whereas, Tungh-Bhadra project farmers are unsure about the water availability for complete cropping period). The rainfed paddy of Dharwad (23% rainfall Deficit), Uttarkannda (12% rainfall Deficit), and Belagavi (rainfall Deficit) suffered severe drought during the cropping period followed by the crop failure. In this region, few farmers with tube well water facility could only take the crop up to harvesting (Rainfall data source from Karnataka State Natural Disaster Monitoring Centre and also Personal communication from the Paddy Scientist working in this region).

The major cropping practice in the irrigated region was rice-rice or rice-rice-green manures or rice-fallow, whereas, in rainfed areas it is predominately rice-fallow system. The main varieties grown in irrigated regions are BPT-5204, RNR-15048, Nellur Sona, GNV-10-89, Gangavathi Sona, JGL1798, MTU-1001, MTU-1010, IR-64, Gangavathi Emergency, *etc*., along with verities released from private firms such as, Ankur Sona, Kauvery Sona, Ankur Sona, Nindranni *etc*. The rainfed areas are predominantly occupied with varieties such as Abhilash, Jaya, Jyothi, JGL1798, Berma and Ankur Sona. The weed infestation was low to medium and the common weeds were *Echinochloa colona*, *E. crusgalli*, *Cyprus* spp., *Marsilia quadrifolia* etc. Zinc deficiency was commonly observed in all the districts and most of the farmers of irrigated regions are aware of zinc application and only few or no farmers are applying zinc.

Among biotic constraints, diseases such as brown spot, leaf blast, false smut and sheath rot were the major diseases under rainfed condition, whereas, leaf blast, BLB, neck blast, sheath blight, sheath rot, stem rot and false smut were observed at moderate to high intensity in all irrigated paddy. Compared to *Kharif*' 2016, this year false smut severity was more and about 10-12% incidence was observed in rainfed area whereas, up to 25% incidence was observed in some fields of irrigated paddy in Gangavathi, Sindhanoor, Bhadravathi, Shivamogga, Harihara. Among the insects pests in rainfed regions (Dharwad, Uttarkannada, Belagavi), Armyworm (*Mythimna separata*) damage was noticed in most severe form in many rice fields of Sirsi taluk and leaf folder was also appeared in moderate to severe form, whereas, BPH and WBPH were low to moderate in their infestation. Armyworm damage was a major limiting factor in *Khari*-2017 in Davanagere, Chikkamagalur and Shivamogga district and caused loss up to 40% (Personal communication from KVK, Shivamogga). In Irrigated paddy

of Tungh Bhadra Project area (Koppal, Raichur, Bellary) insects pests such as BPH, WBPH and leaf folder are more severe during post tillering stage whereas, leaf folder and stem borer are moderate to severe in post flowering stage.

More emphasis is given for mechanization to overcome the agriculture labour crisis. Mechanical transplanter is gaining popularity and combined harvesters are being used in larger area. Recently, farmers are shifting towards direct seeded rice cultivation from transplanted rice system to cope up with the acute shortage of labour and irrigation water during pudling to transplanting stage. In Kharif 2017, more than 5000 ha is under direct seeded rice in Gangavathi, Bellary and Raichur.

Districts/Region-wise Information

Bellary, Koppal, Yadgir and Raichur [**Tungh Bhadra Project Area (TBP) and Upper Krishna Project (UKP)]**

The survey was conducted during post tillering to flowering stage of the crop. Due to acute shortage of rainfall during June-July in the TBP catchment areas, dam water release was delayed by two months leading to the shortfall in the area under paddy during *Kharif*-2017 and more than 30-40% farmers of Raichur, Koppal and Bellary district could not able to take up paddy transplanting and are hoping for the Rabi planting (Present water storage in TBP is not adequate to support the full Rabi crop). Rice followed by rice was the main cropping system followed in these districts. But due to acute shortage of water in the TBP dam, only one rice crop followed by either fallow or other short duration crops has became the routine practise in last three years (Rice-Fallow or Rice-Green manures or Rice-Mustard or Rice-pulses). High yielding cultivars like BPT 5204, Gangavathi Sona, GNV-10-89, JGL-1798, RNR-15048, MTU-1001, Nellur Sona, Gangavathi Emergency, *etc*., along with verities released from private firms such as, Kauvery Sona, Ankur Sona, *etc*., are the commonly grown by the farmers. In 2017, nursery sowing was started from 1st week June and was extended up to July end due to delay in release of canal water. Normal seed rate @ 25-30 kg/ac was used by the majority of farmers. Fertilizers like 20:20:0:13, 10:26:26, 17:17:17, 20:20:20 Urea, MoP, SSP, DAP *etc*., were commonly used to supply NPK @ 250 to 300 kg N/ha, 100 to 125 kg P_2O_5/ha and 100 to 125 Kg of K/ha. The NPK usage is almost 1.5 to 2 times of the recommended for this region. Random transplanting method is practising predominantly in all the fields with planting density of 25-35 hills/m^2. Due to the intervention of scientist from UAS Raichur, direct seeded rice (DSR) is becoming more popular among the farmers. Weed management is practising satisfactorily with manual weeding as well by using advanced chemical weedicides. *Echinochloa* sp., *Cyprus* sp., *Marsilia* sp., *Eclipta* sp., *Ludwigia* sp., *Ammanica baccifera*, *Eclipta alba* are the predominant weeds with low to moderate intensity. Availability of inputs like farm equipment, seeds, water, power, fertilizers, pesticides and storage facility are adequate, except for drying facility which was major constraint in all the places. Application of micronutrients like Zn, Fe, Sulphur, etc., is being practised by many of the farmers. Among diseases leaf blast, sheath blight, stem rot, and sheath rot were observed with low to moderate intensity, whereas, false smut, BLB, grain discolouration and neck blast diseases were moderate to severe during the cropping period. Brown spot disease is a major problem in all direct seeded rice. The insect pests like BPH, WBPH, leaf folder and stem borer were the major problem during October- November, 2017.

Plant protection activities adopted by the farmers are more than adequate where 6 to 7 rounds of pesticide applications is being followed (Indiscriminate with respect to dose and frequency). Pesticides like pymetrozine, bufrofezin, dinotefuran, acephate, dichlorovas,

monocrotophos, and imidacloprid combination with ethiprol are being predominantly used to control the plant hoppers. Pesticides like flubendiamide, chlorantraniliprole, profenophos, chloropyriphos, lambda cyalothrin, profenophos in combination with cypermethrin and monocrotophos are being used for the control of leaf folder, hispa and stem borer. Fungal diseases are being managed with fungicides like hexaconazole, propiconazole, tricyclazole, carbendazim, tebuconazole, azoxystrobins, thiophonate methyl, mancozeb, tricyclazole+ Mancozeb, trifloxystrobin + tebuconazole, pyraclostrobin, picoxystrobin, *etc*., Whereas, BLB is managed with COC + streptocycline sulphate spray and also using Bronopol spray. BLB resistance cultivar Improved Sambha Mashuri (RP-Bio-226) is still not popular among the farmer and efforts are being made through AICRP-Rice team using FLDs, Farm trials, *etc*., for its popularizations.

Chickamagalur, Shivamogga and Davanagere (Bhadra Project Area)

Due to non-release of canal water from Bhadra Dam, most of the farmers could not take up the paddy crop during *Kharif*' 2017; however, few farmers having tube well facility and lift irrigation facility from either Bhadra River or Tungha River or Tungha Bhadra River planted paddy. The survey was conducted during post tillering to flowering stage of the crop. Rice followed by rice or other crops was the main cropping system followed in these districts (Rice-Fallow or Rice-fodder, Rice-Ragi, Rice-Maize, Rice-Green manures, Rice-Pulses, *etc*.,). High yielding cultivars like BPT-5204, JGL-1798 MTU-1001, MTU-1010, IR-64, Jyothi, Jaya, Thanu along with verities released from private firms such as, Kauvery sona, Ankur Sona, *etc*., are the commonly grown varieties. Normal seed rate @ 25-30 kg/acre was used by the majority of farmers. Fertilizer like 20:20:0:13, 10:26:26, 17:17:17, 20:20:20 Urea, MoP, SSP, DAP *etc*., are commonly used to supply NPK at the rate of 125-150 kg N/ha, 75-100 kg P_2O_5/ha and 75-125 Kg of K_2O/ha. The NPK usage is less than or equal to the normal recommended dosage as the crop is being grown for non commercial purpose (Home consumption and fodder for animals). Random transplanting method is being practised predominantly in all the fields with planting density ranging from 35-40 hills/m^2. Weed management is practising satisfactorily with both manual as well by using few advanced chemical weedicides. Zinc deficiency is a common problem during crop stage and only few farmers are following the corrective measures by applying ZnSo4. Among diseases leaf blast, brown spot sheath blight, udbatta, was observed with low to moderate intensity, whereas sheath rot, false smut and grain discolouration diseases were moderate to severe during the cropping period. Plant hoppers such as BPH, WBPH, are the major problem during cropping period and were being managed with the use of few traditional chemicals such as monocrotophos and imidacloprid.

Belagavi, Dharwad and Uttarkannda (Rainfed area)

These districts are known for *Kharif* paddy cultivation under rainfed condition. The total annual rainfall in these districts in *Kharif*' 2017 *viz* Belagavi 670 mm, Dharwad 609 mm, Uttarkannda 2444 mm against the average annual rain fall of 872 mm 798 mm and 2787 mm respectively leading to the deficit of 12-24%. Moreover, most of the rains were received during early stage after sowing and there was a severe drought during growth period leading to crop failure in most of the region. The farmers with supplementary irrigation facility could harvest the crop. Common varieties grown were Abhilasha, Jaya, Berma, Jyothi, Amman Sona, Siri and IR-64. Direct sowing with cattle drawn drill is a common practise for sowing and early weeding was done with inter-cultivation with cattle drawn harrow followed by hand weeding. Weedicide application was practiced by only few farmers. Rice followed by fallow or rice followed by fodder/pulses is common cropping system followed in this region. Fertilizers like 20:20:0:13, 10:26:26, 17:17:17, 20:20:20 Urea, MoP, SSP, DAP *etc*., were

commonly used to supply NPK @ 125-150 kg N/ha, 75-100 kg P_2O_5/ha and 75-125 Kg of K/ha. The NPK usage is less than or equal to the normal recommended dosage as the crop is being grown for non commercial purpose (Home consumption and fodder for animals). Zinc deficiency is a common problem during crop stage and only few farmers are following the corrective measures by applying ZnSo4. Among diseases leaf blast, brown spot are the most severe diseases during *Kharif*' 2017 whereas sheath rot, false smut and grain discolouration diseases were low to moderate during the cropping period. Plant hoppers such as BPH, WBPH, were the major problems during cropping period and were being managed with the use of few traditional chemicals such as monocrotophos and imidacloprid.

Prevalence of pest and diseases in surveyed areas of Karnataka during *Kharif*' 2017

Districts	**Diseases**									
	Bl	**NBl**	**Shbl**	**ShR**	**FS**	**GD**	**StR**	**BS**	**UDB**	**BLB**
Koppal	L-M	M-S	L-M	L-M	M-S	M-S	L-M	M-S	-	M-S
Bellary	L-M	M-S	L-M	L-M	M-S	M-S	L-M	M-S	-	M-S
Raichur	L-M	M-S	L-M	L-M	M-S	M-S	L-M	M-S	-	M-S
Yadgir	L-M	M-S	L-M	L-M	M-S	M-S	L-M	M-S	-	M-S
Davanagere	M-S	L-M	L-M	M-S	M-S	M-S	L-M	L	M-S	L
Shivamogga	M-S	L-M	L-M	M-S	M-S	M-S	L-M	L	M-S	L
Chikkamagalur	M-S	L-M	L-M	M-S	M-S	M-S	L-M	L	M-S	L
Belagavi	M-S	L-M	L-M	M-S	M-S	M-S	L-M	M-S	L	L
Dharwad	M-S	L-M	L-M	M-S	M-S	M-S	L-M	M-S	L	L
Uttarkannda	M-S	L-M	L-M	M-S	M-S	M-S	L-M	M-S	L	L

Districts	**Insect pests**			
	SB	**LF**	**BPH/WBPH**	**AW**
Koppal	L	M-S	S	-
Bellary	L	M-S	S	-
Raichur	L	M-S	S	-
Yadgir	L-M	M-S	S	-
Davanagere	L-M	L-M	S	S
Shivamogga	L-M	L-M	S	S
Chikkamagalur	L-M	L-M	S	S
Belagavi	L	L-M	L-M	M
Dharwad	L	L-M	L-M	M-S
Uttarkannda	L	L-M	L-M	M-S

Kerala

Districts surveyed: *Alappuzha* and *Kottayam*

Particulars of survey

Districts	Taluk	Village
Alappuzha	Kuttanad, Ambalapuzha and Harippad	Champakkulam, Ambalapuzha, Thakazhy, Karumady and Purakkad
Kottayam	Kottayam and Vaikom	Aymanam, Kumarakam and Vechoor Kallara

Widely prevalent varieties

District	Varieties
Alappuzha	Uma, Jyothi, Shreyas, Prathyasa, Chettivirippu, Pokkali, Mundakan
Kottayam	Uma, Jyothi, Shreyas, Njavara

Particulars of rice area

District	Total cropped area (ha)	Irrigated area (ha)	Total rice area (ha)
Alappuzha	25,800	23,860	13,350
Kottayam	17,500	17,500	5,865

Weather data in Alappuzha district during 2017

Weather Parameters	Months							
	May	June	July	Aug	Sept	Oct	Nov	Dec
Rainy days(No.)	15	24	20	14	22	14	9	4
Total rain fall (mm)	207.5	556.7	270.22	253.6	356.2	186.3	106.4	34.1
Temperature Minimum	32	31	31	31	32.5	36.6	32.2	32.1
Temperature Maximum	27	25	27	26	25.8	26.7	26.3	25.2
RH Minimum	1.85	91.5	91.3	93.48	93.13	86.48	89.16	90.4
Maximum	90.25	90.6	89.5	91.35	92.73	86.22	84.9	76.6

Weather data in Kottayam district during 2017

Weather data	Months							
	May	June	July	Aug	Sept	Oct	Nov	Dec
Rainy days(No.)	22	19	16	19	16	7	10	2
Total rain fall (mm)	122.6	374.9	236.5	232.5	144	184.3	190.1	44.2
Temperature Minimum	21.5	20.5	20.5	20	21.5	18.5	16.6	14.5
Temperature Maximum	34.5	33	33.2	33	32.5	33	33	33.5
RH Minimum	59	68	63	56	62	66	59	61
RH Maximum	95	93	95	92	92	92	95	95

Production oriented survey was conducted at Alappuzha (4200 acre) and Kottayam(1220 acre) districts during *Kharif* 2017 from booting stage to maturity stage of the rice crop. The survey covered four taulks in Alappuzha district, *Viz*., Ambalapuzha, Alappuzha, Kuttanad, and Harippad, while in Kottayam district two taluks namely Kottayam and Vaikom could be surveyed. The predominant cropping sequences were rice-fallow, rice-rice and fallow-rice. The predominant varieties in this district were Uma, Jyothi, Prathyasa, Njavara and Shreyas. The crop performance was good during this year. The average rice yield was 6.75 to 7.5

ton/ha. The ruling variety in the Kuttanad area is Uma (MO 16). All rice area was direct sown except few parts of upper Kuttanad region. Kuttanad farmers are normally using 40-50 HP 'Petti and Para' (locally devised motorized pump) for dewatering of land. They have fitted a 'Petti and Para' for an area of 50-75 acre land. Now it is slowly replaced by introduction of 20 HP vertical turbine pump /submersible pump due to shortage of technician for maintenance of the traditional 'Petti and Para'. The weed population was very high. Weeds like *Monochoria vaginalis, Cyperus difformis, Cyperus iria, Echinochloa crusgalli* and *Sacolepis interrupta* were the major weeds observed during the visit. *Echinochloa* spp. was the major weed found in both Alappuzha and Kottayam districts along with wild rice infestation. Moderate incidences of the biotic constraints like sheath blight, bacterial leaf blight, leaf folder, case worm, rice bug and rats were observed. Lack of sufficient labourers and high labour cost were the main problems faced by the farmers.

District-wise observations

Alappuzha: About 4200 acres of rice area was surveyed at Alappuzha district during *Kharif* 2017. Severe rainfall followed by flash floods affected rice cultivation in some parts of Alappuzha district. Rice crop in seven padasekharams in the Kuttanad region were totally lost due to bund breaching in the floods which occurred during the 3rd week of August 2017. About 705.28 ha rice area was vitiated due to flood. The predominant cropping sequences were rice-fallow, rice-rice and fallow-rice. The predominant varieties in the district were Uma and Jyothi. The ruling variety of Kuttanad area is Uma (MO 16). Other varieties like Prathyasa, Shreyas, Chettivirippu, Pokkali, Mundakan were cultivated in some part of the district. The rainfall received during *Kharif* 2017 was 1623.02 mm. Some of the padasekarams were severely affected by wild rice infestation and the yield was reduced during *Kharif* 2017. The wild rice problem was effectively managed with the help of special package developed by Rice Research Station, Moncompu. The newly designed wick applicator (sprayer) at RRS, Moncompu was highly useful for the Kuttanad farmers to control wild rice population at the time of flowering. The AICRIP Front line demonstration on above wild rice management practice was successfully conducted at five different locations of Kuttanad region. The scarcity of labourers during peak stages of crop growth and high labour cost for each operation was the main problems expressed by the farmers. Introduction of machineries like tillers, tractor, reaper, drum seeder, cono weeder, combined harvester etc made the agricultural operations easy and helps to overcome labour shortage problems. After the introduction of combined harvester, the wild rice population has increased in high level resulting in soil compaction and also weakening of bunds. The drum seeding has become popular in Kuttanad and adoption rate was high. The practice of applying dolomite/ lime was decreasing for managing the acidity because of increasing input cost and non-availability of good quality lime. Now most of the farmers are using mixed fertilizers instead of individual one. The organic products viz., Ecohume /Fraturon @ 5 kg/acre was applied for manage acidity during initial stage. Stanes Microfood application (5 kg/acre) was regular practice for some of the farmers for increasing the yield. Boron deficiency was noticed in most part of Kuttanad region and 2 to 4 kg/acre of Borox is recommended for the boron deficiency areas. The population of weeds was moderate. Weeds like *Monochorea vaginalis, Cyperus difformis, Cyperus iria, Echinochloa crusgalli* and *Sacolepis interrupta* were the major weeds found during the visit. *Echinochloa spp* was the major weed found in Alappuzha along with wild rice infestation. The farmers used weedicides like Nominee gold (120 ml/acre), Almix (8 g/acre), 2, 4 D, Sodium salt (500 g/acre), Affinity (carfentrazone 40 DF) (20 g/acre), Rice star (fenoxoprop-P-ethyl) (320 ml/acre), Adora (120 ml/acre) and Vivaya (1000 ml/acre) for

all broad leaf weeds and the selective weedicide like Clincher (320 ml/acre) was used against *Echinochloa* spp.

Severe incidence of brown spot disease was found in 289.1 ha followed by BLB incidence of 146.75 ha area at Ambalapuzha taluk. Moderate incidence of sheath blight, grain discolouration, green leaf folder and stem borer were observed in Pattathi varampinakam, Umbukkattu vadakku and chakkamkari of Champakkulam block, Poothiyottu varapinakam and Arunnoorum padam of Ambalappuzha block. Moderate incidence of BLB was found in Thekkekari of Alapuzha block and Padachal Padam of Kuttanad block. Severe incidence of brown spot was found in Madathil padam (75 ha) and Nalupadam (50 ha) of Ambalappuzha block. Most of the farmers applied bleaching powder @ 2 kg/ acre through irrigation water to prevent the BLB spread. Antibiotics like streptocycline @ 6 g/acre was used for Bacterial leaf blight disease control. Fresh cow dung extract (20 g/l of water) was applied in many padasekarams for the control of BLB. Fungicides like Bavistin (200 g/acre), Contaf (250 ml/acre), Taqat (250 g/acre), Nativo (80g /acre) and Folicur (250 ml/acre) were commonly sprayed against sheath blight and other foliar diseases like brown leaf spot and sheath rot. Against false smut disease, fungicides like Tilt, Zineb and Mancozeb were used as foliar spray at the time of flowering stage. Bio-control agent *Pseudomonas fluroscens* was used by the most the Kuttanad farmers for the control of major rice diseases. Severe incidence of BPH was found Ponga poopaally Padam (80 ha), Puthenkari padam (18 ha), Polepadam (54 ha), Thennedi vadakku padam (10 ha) of Kuttanad block. About 235.6 ha were found to severely affect due to BPH. The leaf folder attack was severe in 107 ha of Kuttanad block. The systemic insecticides Feterra (4 kg/acre), Cartap (5 kg/acre), Azataf (250 g/acre), Takumi (50 g/acre), Fame (20 ml/acre), Regent (5 kg/acre), Starthene (350 ml/acre) and Indane (5 kg/acre) were applied against leaf folder and stem borer. Insecticides like Tatamida (60 ml/acre) and Applaud (320 ml/acre) were sprayed to control Brown plant hopper. The pest and disease incidence were less in drum seeded plots compared to broadcasted crop. Most of the farmers applied overdose of pesticides and weedicides with the limited quantity of spray volume (50-60 litres water/acre). The cost for spraying one tank is around Rs. 150/-. So, the farmers reduced spray volume and increased the dose of pesticides. Most of the farmers applied insecticides like Feterra or Cartap along with fertilizers to manage stem borer and leaf folder. Application of Azataf (250g/acre) + Contaf (250 ml/) combination was normally followed by Kuttanad farmers at the time of booting stage. Some of the farmers used the insecticide fungicide combination product namely Origin (flubendimide + hexaconazole) @ 400 g/acre as prophylactic spray against major pest and diseases.

The production unit at RRS, Moncompu meets the demands of farmers and provides training on "Mass production of Bio-control agents" for progressive farmers on every season. Some farmers were found to use the bio-fertilizer namely PGPR mix 1 (KAU brand) which contains N fixing bacteria, "P" solubilizing bacteria and "K" mobilizing bacteria. The State Biocontrol Lab, NGOs and Research Stations are producing Trichogramma egg cards and supplied to the rice cultivating areas for the management of stem borer and leaf folder pest.

Kottayam: About 1220 acres of rice area was surveyed during *Kharif*' 2017 in Kottayam district. The predominant cropping sequences were rice-fallow, rice-rice and fallow-rice. The predominant varieties in the district were Uma, Jyothi, Shreyas and Njavara. Different weather parameters in the district during Kharif' 2017 are presented above. The rainfall received during *Kharif* 2017 was 1172.2 mm. Moderate weed infestation was noticed in almost all the areas during the visit. The major weeds were *Cyperus difformis, Cyperus iria,*

Echinochloa crusgalli and *Sacolepis interrupta*. *Echinochloa* spp. was the major weed found in Kottayam districts along with wild rice. The farmers used weedicides like Nominee gold (120 ml/acre), Almix (8 g/acre), 2,4 D (500 g/acre) and Rice star (320 ml/acre) against all broad leaf weeds and selective weedicide like Clincher (320 ml/acre) against *Echinochloa* spp. *The* wild rice infestation was very high in some padasekharams of Vaikom block.

Moderate incidence of the biotic constraints like sheath blight, bacterial leaf blight, blast, brown spot, brown plant hopper, leaf folder, and stem borer were observed in many padasekharams of Kallara and Vaikom village. Moderate incidence of Blast was found in Poovathinkari padam, Devaswam kari, Arikupuram padam in Kallara village and Chozhiyappara, Chirakkuzhy of Kottayam taluk. Fungicides like Bavistin (200 g/acre), Contaf (250 ml/acre), Taqat (250 g/acre), Folicur (250 ml/acre), Kitazin (200 ml/acre) and Nativo (80g/acre) were commonly sprayed against sheath blight and other foliar diseases like blast, brown leaf spot and sheath rot. Fungicides like Tilt, Zineb and Kocide were used as foliar spray at the time of flowering stage against false smut and grain discoluration diseases. The antibiotic Streptocycline @ 6g/acre or Bacterionashak (20 g/acre) was applied in severe Bacterial leaf blight affected fields. Similarly, insecticides viz., Ferterra (4 kg/acre), Cartap (5 kg/acre), Azataf (250 g/acre), Takumi (50 ml/acre), Fame (20 ml/acre) Regent (5 kg/acre), Starthene (350 ml/acre) and Indane (5 kg/acre) were applied against leaf folder and stem borer. Insecticides like Tatamida (60 ml/acre) and Applaud (320 ml/acre) were sprayed against Brown plant hopper. Most of the farmers followed combination spray of insecticide-fungicide formulations to cut down the cost of application. The farmers adopted plant protection measures by using knapsack sprayer. Some of the farmers used high dose of pesticides, weedicides and fertilizer that led to environmental pollution. Now the soil test based fertilizer application is recommended by the Agricultural University and Department.

Prevalence of diseases and insect pests in Kerala during *Kharif*' 2017

Districts	**Diseases**					
	BS	**ShBl**	**ShR**	**FS**	**GD**	**BLB**
Alappuzha	S	M	L	L	M-S	M
Kottayam	M	L-M	L	L	M	M

Districts	**Insect pests**					
	LF	**SB**	**BPH**	**Thr**	**EHB**	**Black bug**
Alappuzha	L-M	L-M	S	L	L	M-S
Kottayam	L-M	L-M	S	L	L	L

Madhya Pradesh

Districts surveyed: *Rewa, Satna, Sidhi, Shahdol, Anuppur, Katni* and *Umaria*

Particulars of survey

District	Block	Village Surveyed
Rewa	Rewa, Sirmour, Raipur Karchulian, Mauganj and Gangeo	Khuj, BudwaItaura, Barahadi, Barehi, Marhi, Janakhai, Saman, Mahsua, Ratahara, Semaria, Silpara, Amiliki, Raura, Laxmanpur, Kothi, Sirmour, Baikunthpur, Maghigama, Sitalha, Jawa, Deotalab, Tamara, Bida, Semaria, Barahula, Kosta, Joginhai, Gurh, Rithi, Barsaita, Mahansav and Badaganv
Satna	Ramnagar, Amarpatan, Maihar, Nagod and Rampur baghelan	Mankisar, Ladbad, Jhinna, Kaithaha, Sarai, Kothar, Bela, Kakalpur, Jhinna, Sannehi, Kothar, Kathaha, Mahauri, Lalpur, Nadan, Baretihia, Uchehara, Amadara, Kartaha, Deolond, Ladbad, Tala, Bela, Deoraj Nagar, Rampur, Baghelan, Nadantola, Inauta, Pipari, Nadantola, Bahelia, Bhat, Karahi, Hinauti, Jigana, Karahi, Mauhari, RamNagar, Choragadi, Hinauta, Piparikala, Gorhai, Uchehara and Amarpatan
Sidhi	Rampur, Naikin, Churahat and Sidhi	Banajri, Sonvarsha, Gopalpur, Baghawar,Parsili, Chorgadi Budgauna, Bharatpur, Barahath, Panwar, Kapuri, Badhaura, Chauphal, Pand, Jamudi, Mishirgama, Jhangh, Shivpur, Duara, Bairiha, Kherawa, Churahat, Dadhiya, Sonvarsha, Mamadar, Jhalwar, Barkheda, Raiduria, Semaria, Bhitari, Padkhuri, Misirgama, Amaha Rampur Naikin, Churahat and Kandawar
Shahdol	Beohari, Jaisingh Nagar, Gohaparu, Burhar and Sohagpur	Budwa, Mau, Bansukali, Tihiki, Ghorasa Khannaudhi, Tetaka, Burhar, Karkati, Karki, Ledara, Singhpur, Pathara, Kubara, Gohaparu, Lakhanauti, Singhpur, Tihiki, Koni, Sinduri, Barakach, Aswari, Burhar, Bhamaharah, Khamdand, Beohari, Bharri Sinduri, Barakach, Dhangama, Jaisingh Nagar, Kanchanpur, Khannaudhi, Chachai, Khadda, Sarai, Chatawai, Burhar, Dhanpuri and Deoganv
Anuppur	Pushparajgarh and Jaithari	Sakara, Keshwa, Rohania, Kanchanpur, Deohara, Pondifarm, Bhamaria, Jaitahari, Jamudi and Sindoorkhar
Katni	Badwara, Katni and Vijayraghavgarh	Hardua, Itama, Padkhuri, Khirwa, Piparai, Paraswara, Salaiya, Murwara Rohania, Pakaria, Patharahata, Bahoriband, Dhimar kheda, Mudwara, Badawara, Vijayraghavgarh, Rupandh, Gangewaria, Jhukehi, Sabhaganj, Khirahani, Kaudia, Sonwari, Ghunawara, Vilayatkala, Barahi, Mohantola, Rajwara and Pala
Umaria	Karkeli, Manpur and Pali	Manpur, Indawar, Bharewa, Karkeli, Dhamokhar, Goverdi, Kacharwar, Amaha, Bhauraula, Khutar, Masira, Kanadi, Khurd, Karki, Deori, Manpur, Khutar, Jarwahi Khurd, Indawar, Jobi, Sarasi, Virsinghpur, Baderi, Lodha, Kudari, Kareli, Chandia and Pali

Widely prevalent varieties

District	Varieties/ Hybrids
Rewa	**HYVs**: Shahbhagi,Winner, Champion, Supergold, Menaka , Dhanteswari, Jalkeshar, IR 64, Pusa sugandha 5, Sonali, Sonam, MTU 1010, Poorva, Rupali , Ankur Biranj, Pusa Sugandha 4, IR-36 and IR-50; **Hybrids**: Sava, Dhanya, JK401, PAC 801, Dhanya 775, Indum1011, Shahyadri, US312, PHB 27P31, PHB 25P35, Raja, PAC801, PAC807, Arize 6201, Arize 6444, Goraknath, JRH 4, JRH 5, Arize Tej, Arize 6111, Ganga Kaveri, JR-75, PRH 10, P221(Tata), Indum1011 and JK2082; **Locals**: Lochai, Sonkharchi, Rambhog, Sonachoor, Lonagi, Yashoda Bhog, Mansooria, Manisha, Reshma, Poonam, Khusboo, Shabnam, Lohandi Jiledar, Dehula, Newari and Govinda (Dominance of Improved varieties 80%)
Satna	**HYVs:** IR36, IR64, Rupali, Sonam, Jaya, Poorva, Ankur Sonali, Champion, IR-50, Sonam, Basmati, Roopali, MTU1010 and Pusa 1121; **Hybrids:** Arize 6201, Arize 6111, Arize 6444, Loknath, Hybrid 35P25, Bioseed 777, JRH 4 and JRH 5; **Locals:** Menaka, Lonagi, Bhantaphool, Biranj, Rambhog, Biranjphool, Dhanlaxmi, Balbhog, Laichi, Lochai, Mahak, Balkeshar, Rabina, Padmini, Lal Dhan, Dehula, Newari, Kaniga, Lonhadi, Jalkeshar,Yashoda Bhog, Karahani, Padmasar, Shabnam and Vishnubhog (Improved variety 85%)
Sidhi	**HYVs:** Danteswari, MTU7029, Poorva, Rupali, Ankur, Pusa Sugandha 5, Swarna, Sonali, MTU1010, Pusa Sugandha 5, Basmati, Pusa 1460, Pusa 1121, Sonali, IR-36, IR-64 and IR 50; **Hybrids:** US312, Loknath, Mahyco 117, Arize 6201, Arize 6444, PAC801, PAC807, RH-10, NPH105, JRH 4 and JRH 5; **Locals:** Karahani, Keshar, Rambhog, Badshah Phool, Chhinmauri, Balkeshar, Vishnubhog, Sumo Vardan, Badari, Dehula ,Tinpakhi, Karaga, Lal, Laichi, Bako, Methichoor, Hanskanak, Dadbako, Lawangchoor, Padmasar , Karanphool, Khoonta, Gurmatia, Ranikajal, Butanagar, Menaka, Reshma, Belari, Lonhadi, Lochai, Kalisugandh, Nadawal, Amagaur, Kanji, Poonam, Bhantaphool, Karaga, Nanhi, Kanakjir, Manisha and Shukla phool (Improved variety 65 %)
Shahdol	**HYVs:** Poorva, Rupali, Ankur, Winner, Champion, Pusa Sugandha 5, Pusa Sugandha 4 Swarna Sub-1, Pusa 1121, Sonali MTU1010 and Poonam; **Hybrids:** Loknath, Kaveri, KPH 199, Pioneer 27- P-31, Suruchi, Arize 6201, Goraknath, JRH 4, JRH 5, PAC 807, US312, US-10, Arize 6201, Arize 6444 and PAC801; **Locals:** Lochai, Kanak, Kerakhambh, Swarnkamal, Menaka, Rambhog, Chhinmauri, Amagaur, Champa, Gurmatia, Lonagi, Lonhadi, Kerakhambh, Reshma, Newari, Lonagi, Biranj, Ledua, Bohita, Sabnam, Ranikajal and Butanagar (Improved variety 70%)
Anuppur	**HYVs:** IRT64, IR36, Poorva and MTU1010; **Hybrids:** Dhanya, Ganga Kaveri, Goraknath, Arize 6201 and US312; **Locals:** Kioilari, Menaka, Khusboo, Guramatia, Laldhan, Rashutta, Bhejari, Newari and Bharra (improved variety60%)
Katni	**HYVs:** HMT, Sonali, IR36, IR 50, IR 64,Champion, Rupali, Ankur Juari, Dubaraj, Keshar, Sita, Subeej Sugandha, Pusa 1509 and Pusa 1121; **Hybrids:** PRH10, Goraknath, Arize 4444, Arize Tej, JRH 4 and JRH 5; **Locals:** Lochai, Menaka, Khusboo, Reshma, Poonam, Samrat, Dhau, Bhadaili, Kanak and Poorva (Improved variety 65 %)
Umaria	**HYVs:** Pusa Sugandha 5, Pusa Sugandha 4, IR64, MTU 1010, Champion , Dhanteswari and Sonam; **Hybrids:** Ganga Kaveri, NPH 101, NPH 105, Advanta 801, 807, Mulayam 999, Pioneer 25P35 and Pioneer 27P-31; **Locals:** Vishnubhog, Koilari, Kanakjir, Malti, Lalita, Laichi, Bagari, Koilari, Shahbhagi, Kanak, Swrankamal, Kosam, Biranj, Doodhi, Samasar, Govinda and Banspore (Improved variety 70 %)

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

Parameters	**Rewa**	**Satna**	**Sidhi**	**Shahdol**
Total area under HYVs in the district (ha)	82,000 ha	72,000 ha	65,000 ha	65% rice area
Most prevalent HYVs in the district	PS 4, PS5, MTU 1010	PS 4, IR 64, MTU 1010	PS 4, PS 5, MTU 1010	MTU 1010, IR 64
Total area under rice hybrids in the district(ha)	42,500 ha	42,000 ha	42,600 ha	35,000 ha
Most prevalent rice hybrids in the district	Arize 6444, 6201, Loknath, Kaveri, PHB 71	Kaveri, Arize 6444, 6201, Gorakhnath	Kaveri, Arize 6444, Gorakhnath, Arize 6201, PHB 71	Arize 6444, Arize 6201
Total area under basmati in the district	~15,000 ha	~12,000 ha	~12,000 ha	1500 ha
Most prevalent basmati varieties in the district	Taraori Bas, PS 4, PS 5	Basmati	Pusa Sugandha 4 and 5	Pusa Sugandha 4 and 5
Whether farmers are using any heavy equipments like transplanted/combine harvester	Yes	Yes	No	No
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	SRI-29747 ha	SRI-45,000 ha	SRI-30693 ha	SRI-40,000 ha
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Yes; DSR	Yes	Yes	Yes
What are the general problems in rice cultivation in the district?	Supply of inputs and electricity	Supply of inputs and electricity	Irregular electricity supply and shortage of labours	Irregular electricity supply
Please provide any farmers association in the district	-	-	-	-
Whether availability of labours is sufficient?	No	Yes	No	No
Whether there is any marketing problem of the produce?	Yes	Yes	Yes	No
Any major irrigation/power generation project in the district	Yes; Bansagar project	Yes; Bansagar project, Baragi dam	Yes; Bansagar project,	No
Any soil testing program undertaken?	Soil Health card	Yes		Yes
Any farmers' training program was organized by the state department of Agriculture/University	Yes	Yes	Yes	yes

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

Parameters	**Anuppur**	**Katni**	**Umaria**
Total area under HYVs in the district (ha)	~ 60 rice area	~ 70 rice area	~ 70 rice area
Most prevalent HYVs in the district	IR 64, MTU 1010	MTU 1010, IR 64, IR 36	IR 64, Reshma
Total area under rice hybrids in the district(ha)	~20 rice area	40,000 ha	-
Most prevalent rice hybrids in the district	Arize 6201, Arize 6444, Menaka, Kaveri	Arize 6444, Arize 6201, Kaveri	Arize 6201, Arize 6444
Total area under basmati in the district	-	~2000 ha	~ 1500 ha
Most prevalent basmati varieties in the district	Pusa Sugandha 4 and 5	Pusa Sugandha 4 and 5	Pusa Sugandha 4 and 5
Whether farmers are using any heavy equipments like transplanted/combine harvester	No	Yes	No
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	SRI-30,000 ha	DSR-60,000 ha	SRI-12,000 ha
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Yes	Yes	Yes
What are the general problems in rice cultivation in the district?	Irregular supply of electricity	Labour shortage and irregular electricity	Labour shortage and irregular electricity
Please provide any farmers association in the district	-	-	Yes
Whether availability of labours is sufficient?	Yes	No	Yes
Whether there is any marketing problem of the produce?	No	Yes	Yes
Any major irrigation/power generation project in the district	No	Baragi Dam	No
Any soil testing program undertaken?	Yes	Yes	Yes
Any farmers' training program was organized by the state department of Ag/ University	Yes	Yes	Yes

Particulars of rice Surveyed area during 2017

District	**Total rainfall (mm)**	**Total geographical area (000ha)**	**Total cultivated area(000ha)**	**Net cultivated area (000ha)**	**Irrigated area (000ha)**	**Total Rice Area (000 ha)**
Rewa	790	628.7	478.4	371.8	158.8	124.9
Satna	685	742.4	475.9	341.2	110.1	127.2
Sidhi	780	481.5	231.0	168.0	71.9	70.5
Shahdol	690	537.0	187.0	166.0	35.7	109.0
Anuppur	940	374.6	178.0	146.0	30.6	114.5
Katni	1025		296.0	.0209	157.0	105.8
Umaria	650		141.0	103.0	36.0	44.1

Seven districts *viz*. Rewa, Satna, Sidhi, Shahdol, Umaria, Katni and Anuppur situated in Kymore Plateau and Satpura hills under Rice-Wheat crop zone in Madhya Pradesh were surveyed during *Kharif* season. The weather conditions during the season were not favourable and very poor rainfall ranging from 780 to 1050 mm occurred in the surveyed area. The distribution of rainfall was not good in the state. Therefore, sowing of direct

seeded rice, either-un sprouted broadcasting or lehi (sprouted seeds) and transplanting was not carried out timely in rain fed and irrigated ecosystem in the state. The onset of monsoon was very late on 3rd July and therefore farmers have not sown the seeds in the nursery in the month of June and transplanting was delayed. It was noted that heavy losses appeared in rainfed rice due to very poor rainfall in the month of August and September and drought affected area declared by the administration. The transplanting of hybrid rice or improved varieties were undertaken by the farmers having assured irrigation in Rewa, Katni and Satna district but the farmers have sown direct seeding of rice under rainfed or partially irrigated area of Anuppur, Shahdol, Umaria, Katni and Sidhi districts. Predominant cropping systems in the state were rice-wheat, rice-gram and rice-pea, rice-lentil and rice-toria. Rice-fallow, rice-barley and rice-wheat are commonly practiced in Shahdol, Anuppur and Umaria districts where light poor soil, forest area, undulated land are predominant and irrigation facilities are not available. It was noted that approximately 40 % area of Shahdol and Umaria district are under rice-fallow in the rainfed areas due to lack of irrigation facilities. Different rice varieties cultivated by the farmers were HYVs like Shahbhagi,Winner, Champion, Supergold, Menaka , Dhanteswari, Jalkeshar, IR 64, Pusa sugandha 5, Sonali, Sonam, MTU 1010, Poorva, Rupali , Ankur Biranj, Pusa Sugandha 4, IR-36 and IR-50 and hybrids like Sava, Dhanya, JK401, PAC 801, Dhanya 775, Indum1011, Shahyadri, US312, PHB 27P31, PHB 25P35, Raja, PAC801, PAC807, Arize 6201, Arize 6444, Goraknath, JRH 4, JRH 5, Arize Tej, Arize 6111, Ganga Kaveri, JR-75, PRH 10, P221(Tata), Indum1011 and JK2082.

It was noted that rice hybrids are being popularized by the private sectors and government agencies in the state and farmers are taking interest to grow hybrid rice under irrigated ecosystem. In regard to hybrid rice adoption Rewa, Satna and Sidhi districts covered maximum area (approximate 60 %) by the progressive and medium farmers due to Bansagar command area under irrigated ecosystem whereas other districts like Shahdol, Anuppur, Katni and Umaria districts have comparatively less area of hybrid rice ranging from 25 to 30%. The rice productivity in the state was low (2.52 t/ha) due to dominance of local extra early and medium duration poor yielding rice varieties, imbalance use of fertilizer application, poor irrigation facilities, poor plant protection measures and poor socio-economic status of the farmers. However, the productivity of rice in Rewa and Shahdol division was tremendously increased from 2.5 to 3.8 t/ha. The progressive, medium and marginal farmers having irrigation facilities have adopted the cultivation of hybrids and obtaining the grain yield ranging from 60 to 70 q/ha. Weed infestation was very high in rain fed ecosystem and causing heavy economic yield losses as compared to transplanting system. It was estimated that approximate 20 to 25 % 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 pendimethalin, butachlor, pretilachlor, Web Super, bispyribac sodium and Almix for management of weeds. The specific needs of the farmers were availability of seeds of HYVs in time, paddy thresher, sprayers, duster, cono weeder and rotavator, rice transplanter and adequate power supply for irrigation. The inputs like seed fertilizers and pesticides were supplied by the department of agriculture. Application of organic resources like BGA, Azolla and mycorrhiza was commonly adopted by the progressive farmers in the region particularly in Rewa, Anuppur, Shahdol and Umaria district. Zinc deficiency was commonly noticed in Rewa, Satna, Sidhi, Anuppur, Umaria and Shahdol districts. The intensity of different biotic stresses was low to moderate. However, WBPH was severe in Rewa, Satna, Sidhi and Shahdol districts and heavy losses reported. It is worth mentioning that due to the efforts of MP Govt. the state has declared firth time successive Krishi Karman Award for optimum Agricultural growth rate (24.9%) in India. District level Kisan mela is being organized for demonstration of technology, agricultural equipments and literatures on

improved rice production technologies for updating the knowledge of the farmers and solving the problems at the spot.

Rewa: In Rewa district five blocks were surveyed when the crop was at tillering, dough stage and maturity stage. Most of the farmers in the district were marginal and sub marginal and land holding capacity is declining in the district. The weather condition during the crop growth period was found to be abnormal and found to be unfavorable for rice cultivation. There was less rainfall and prolonged dry period. The onset of monsoon was late (7th July), therefore direct seeding was adversely affected. Due to continuous rains in the month of July most of the farmers carried out transplanting in the district in the last week of July and to middle of August. It was noted that due to poor rainfall (790mm) the crops like black gram, green gram, soybean, sesamum and pigeonpea were found to be in good condition. The prominent cropping system in the district was Rice-wheat, soybean- gram, rice-gram and rice-lentil. Commonly cultivated varieties were HYVs like Shahbhagi,Winner, Champion, Supergold, Menaka , Dhanteswari, Jalkeshar, IR 64, Pusa sugandha 5, Sonali, Sonam, MTU 1010, Poorva, Rupali , Ankur Biranj, Pusa Sugandha 4, IR-36 and IR-50 and hybrids like Sava, Dhanya, JK401, PAC 801, Dhanya 775, Indum1011, Shahyadri, US312, PHB 27P31, PHB 25P35, Raja, PAC801, PAC807, Arize 6201, Arize 6444, Goraknath, JRH 4, JRH 5, Arize Tej, Arize 6111, Ganga Kaveri, JR-75, PRH 10, P221(Tata), Indum1011 and JK2082. It was noted that hybrid area was increased approximately to about 42500 ha in the district due to increasing the irrigated area under Bansagar Project. Farmers are still growing some local varieties for their resistance to biotic and abiotic stresses and quality. 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 rainfed area was severely affected due to poor rainfall in the month of August and September and drought appeared in the district. However, irrigated rice was grown successfully in the district. Modified SRI cultivation area was found to be tremendously increased in the district. The average rice yield for hybrids was 5500-6700 kg/ha while in case of HYVs it was 3500-4000 kg/ha.

Most of the farmers contacted told that they did not adopt seed treatment. The farmers applied organic manure like FYM and vermicompost in the nursery. Some of the farmers applied fertilizers like urea (100-250 g/10 m^2) and DAP (500 g/10 m^2). The source of fertilizers was from public, cooperative and private institutions. The basal fertilizer application consisted of 20-30 kg/ha Single super phosphate and 10-20kg/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. Whereas, 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 applied FYM in the fields. Farmers are taking interest in green manuring, vermicomposting and blue green algae culture to improve the soil health. Zinc deficiency was noticed in several fields. Method of transplanting was random. The intensity of common weeds like Echinochloa spp., Cypers rotundus, Paspalum spp. was low to medium. The intensity of weeds was more in rainfed system than transplanted rice. Hand weeding was commonly practiced by the farmers. However, some progressive farmers applied herbicides like pendimethalin as pre-emergence and bispyribac sodium/pretilachlor application as post emergence. In some places, weedy rice, locally know as jaljeera and jalkeshar were reported. Implements like tractor, sprayers and cono weeder were used by the farmers. The cropping intensity was 149% and seed replacement rate was 39%. Electricity supply has improved in comparison to past years for irrigation. 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.

Overall the incidences of pests and diseases were low to moderate due to poor rainfall .It was observed that Raipur Karchulian block and Gurha areas were severely affected with the incidence of WBPH causing high economic loss. All the rice hybrids were severely affected with WBPH and heavy losses reported in the villages Telai tola and Belawa Paikan where Tahalaka, Arize 6444, Amrit Bhog, Sonam, Goraknath and Badshah Basamati was grown. Pesticides like trizophos, imidacloprid, monocrotophos, chloropyriphos, and carbendazim/tricyclazole were applied by the progressive farmers for the management of pest and diseases. Overall, the adoption of hybrids and improved varieties in the district was very high (approx. 90%) and crop productivity of the district is expected 35 q/ha .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. The availability of labours are also becoming as a major constraint due to dominance of industries particularly cement units in the region.

Satna: Five blocks of Satna district were surveyed at grain filling stage and maturity stage. This year rainfall was very low (685 mm) in the district and severe drought occurred in the month of August and September. The onset of monsoon was on 10th July. Therefore nursery was prepared very late and farmers transplanted hybrid and improved varieties in last week of July and August in rainfed and irrigated area (32.5%). The rainfed rice was affected badly and The district was declared drought affected area due to very poor rainfall this year. It was observed that due to drought only irrigated rice was successfully grown whereas, rainfed area was badly affected and even unsown. The major crop rotations were soybean-gram, rice-wheat, rice-gram, rice-lentil and rice-barley. Different varieties cultivated by the farmers were HYVs like IR36, IR64, Rupali, Sonam, Jaya, Poorva, Ankur Sonali, Champion, IR-50, Sonam, Basmati, Roopali, MTU1010 and Pusa 1121 and hybrids like Arize 6201, Arize 6111, Arize 6444, Loknath, Hybrid 35P25, Bioseed 777, JRH 4 and JRH 5. Still many farmers are growing local varieties for their taste and resistance to various biotic and abiotic stresses. It was observed that hybrid rice cultivation is becoming popular and widely adopted by the farmers because of good productivity and good monetary returns under irrigated conditions. Average rice yield in different HYVs was 3500-4000 kg/ha whereas it was 6000-6500 kg/ha in case of hybrids. None of the farmers adopted seed treatment. Few applied FYM and chemical fertilizers like urea (100-150 g/10 m^2) in the nursery. In regard to fertilizer application it was observed that farmers used low doses of nitrogen in splits (40-70kg/ha) rather than balanced application of nutrients except progressive farmers. Some farmers applied FYM or vermicompost in the main fields. Application of azolla was followed by some farmers. Transplanting was random and some farmers adopted direct sowing. SRI is also becoming very popular in the district (approx 40000 ha). It was noted that weed population was high in direct seeded rice as compared to transplanted rice in Maihar block where direct seeding was commonly practiced. Hand weeding was commonly practiced; however progressive farmers applied herbicides viz., butachlor @ 1.5 lit/ha, Nominee Gold and Sathi for effective weed control. Weedicides like jalkeshar and laldhan were recorded in some places. Some of the common needs of the farmers were extra early maturing improved varieties, fertilizers, weeds control devices, paddy transplanters, Good quality of fertilizers, proper supply of electricity, trainings on improved package of practices, plant protection equipments in time and adequate supply of electricity for assured irrigation. Implements like tractor, sprayers and harvesters were used by the farmers. Seed replacement rate is 38% and cropping intensity was 130% in the district. Tank, canal and bore wells are the main source of irrigation. With regard to biotic stresses, leaf blast, sheath blight, leaf folder, case worm, stem borer and

gundhi bug were recorded in traces whereas; brown spot and WBPH incidence were recorded in moderate severity. It was noted that WBPH incidence in the village Raikwar, Bela, Kothar, Khutaha near Amarpatan was very severe and heavy economic losses noted. The crop was looking burning stage and 35 to 40 % yield losses noted. It was noticed that application of monocrotophos or chloropyriphos and trizophos were practiced by the farmers for controlling the pest. Khaira disease was commonly noticed in Ramnagar, Amarpatan, Rampur baghelan and Maihar blocks however farmers were not applied Zinc sulphate as basal dose. The availability of laborers is becoming a major problem in the district because of huge number of Cement industries in the district.

Sidhi: Four blocks were surveyed in this district at dough and maturity stage of the crop. A total of 12 farmers were contacted during the survey. The fields surveyed were in irrigated or upland condition. Transplanting of hybrids and improved varieties were carried out in Sidhi, Churahat and Rampur Naikin blocks under irrigated situations (30.5%). Rainfall in the district was 780 mm. Progressive farmers replaced the local rice varieties with hybrids and improved cultivars under irrigated ecosystem. Hybrid rice is being adopted by the farmers and SRI method is becoming very popular in the district. The predominant cropping systems were rice-wheat, rice-gram, rice-fallow, jowar-kodo-arhar, rice-toria and fallow-linseed were. Different varieties cultivated by the farmers were HYVs like Danteswari, MTU7029, Poorva, Rupali, Ankur, Pusa Sugandha 5, Swarna, Sonali, MTU1010, Pusa Sugandha 5, Basmati, Pusa 1460, Pusa 1121, Sonali, IR-36, IR-64 and IR 50 and hybrids like US312, Loknath, Mahyco 117, Arize 6201, Arize 6444, PAC801, PAC807, RH-10, NPH105, JRH 4 and JRH 5. The productivity was moderate ranging from 28.5q/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. Farmers did not adopt seed treatment. Application of chemical fertilizers in the nursery was also not common. Some farmers applied FYM in the nursery. Fertilizer application in *Kharif* crops was noted to be very poor. Due to light soil and low irrigation facilities farmers are not applying adequate doses of chemical fertilizers however, farmers are applying urea at tillering stage at very low doses (20-25kg/ha). 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 were applied single super phosphate, muriate of potash and zinc sulphate in low land/ bunded rice fields. Zinc deficiency was noted in Churahat ,Sidhi ,Maghauli and Rampur Naikin blocks. Most of the farmers applied FYM in the main fields. Transplanting was random. SRI was adopted in 30693ha and hybrid area increased to approximately 42600 ha in the district. The Churahat block had maximum irrigated area therefore; adoption of hybrid rice is becoming more popular as compared to other blocks. Weed infestation was observed high in direct seeded as compared to transplanted ecosystem. Hand weeding was commonly practiced and labour crisis was also noted in Churahat and Rampur Naikin Blocks in the district. In addition to hand weeding, some progressive farmers applied herbicides like Sathi, Nominee gold and butachlor. Bore wells, wells and canals irrigation were the main source of irrigation. The cropping intensity and seed replacement rate was 142% and 38% respectively**.** Electricity supply was improved as compared to past years in the surveyed area and farmers were developed their own irrigation resources like tube well and open wells for irrigation. Overall pest and disease incidences were low. Incidence of leaf blast, sheath blight, bacterial blight, false smut, grain discoloration, WBPH, leaf folder and case worm were recorded in traces in the surveyed area. False smut infection in hybrid rice was recorded in low intensities (5 to 7 %) in the district in hybrids only in the surveyed area. Very few farmers adopted plant protection measures. Some progressive farmers applied pesticides like monocrotophos, indoxacarb, chlorothalonil and carbendazim for management of different pests and diseases.

Shahdol: Five blocks in Shahdol district were surveyed at tillering, grain filling and maturity stage of the crop. A total of 8 farmers were contacted during the survey. Most of the fields surveyed were under rainfed lowland ecosystem and some were under irrigated ecosystem. In general, the weather conditions were not highly favourable for rice cultivation. The onset of monsoon was very late (7^{th} July) and therefore, the nursery preparation was delayed and transplanting was carried out in the last week of July and August in rain fed and ecosystem. The rainfall was 690 mm and distribution was very poor. There was a long dry spell in the crop season and crop growth was found to be extremely poor in rain fed ecosystem. The crop rotation practices followed by the farmers were rice-wheat, rice-barley and rice-fallow. Different varieties cultivated by the farmers were HYVs like Poorva, Rupali, Ankur, Winner, Champion, Pusa Sugandha 5, Pusa Sugandha 4 Swarna Sub-1, Pusa 1121, Sonali MTU1010 and Poonam and hybrids like Loknath, Kaveri, KPH 199, Pioneer 27- P-31, Suruchi, Arize 6201, Goraknath, JRH 4, JRH 5, PAC 807, US312, US-10, Arize 6201, Arize 6444 and PAC801. The productivity of rice was noted to be very good (3.9 t/ha) with even poor application of chemical fertilizer in the district. The district is known for rice monocropping because of dominance of sandy soil, forest area and low irrigation facilities. The fertilizer application was noted to be very poor (15-20kg/ha) because of less irrigation, light soil and existence of forest rich soil. However, only nitrogenous fertilizer was applied in rice at tillering stage. FYM was commonly practiced due to large number of domestic animals and rich forest area. The socio economic status of the farmers is also very poor due to dominance of tribes. Weed infestation was noted to be low to medium in transplanting ecosystem. SRI cultivation was very much popularized and adopted by the farmers in Burhar and Gohaparu blocks. Very good efforts were made by the Department of Agriculture and KVK scientists for promotion and adoption of SRI in the district. The area under SRI in the district increased to almost 40,000 ha. Herbicide application was adopted by the progressive farmers. However, hand weeding was commonly practiced in the district. In Sohagpur block, Farmers applied herbicide Londax Power as post emergence @ 4 kg/acre followed by Mycorhiza for the management of weeds and promoting the crop growth. Common needs of the farmers were equipment, irrigation facilities, electricity for different agricultural operations, improved seeds, storage facility and financial support from government organizations were the main requirements of farmers. The farmers are demanding early duration varieties less than 100 days maturity in Beohari, Sohagpur and Jaisingh Nagar blocks and mid duration 90 to 120 days maturity in Gohaparu and Burhar blocks with good productivity. The bore wells and tank are the main source of irrigation. The district has very low irrigated area however seed replacement rate was good 22%. The intensity of different pests and diseases was low. Different biotic stresses like bacterial blight, leaf blast, brown spot, false smut, seed discoloration case worm, leaf folders and rice bug were reported in traces. Leaf folder, gundhi bug, WBPH and case worm were noted in low lying area in late maturing varieties and caused considerable yield losses. Most severe incidence of WBPH was noted near Jaisingh nagar in all the cultivated varieties like Sonam, IR64 and PHB71. Plant protection measures adoption was noted to be very poor. Very few farmers were applied pesticides like chloropyriphos and monocrotophos for the management of pest. Khaira was commonly recorded in Beohari, Jaisingh Nagar and Burhar blocks.

Anuppur: Two blocks involving 5 farmers in this district were surveyed in dough and grain maturity stage. Majority of the fields surveyed were under rainfed lowland ecosystem. The weather conditions were not very favourable for rice cultivation as there was less rainfall. The commonly practiced crop rotations were rice-wheat, rice-gram, rice-niger and rice-fallow. Different rice varieties cultivated by the farmers were HYVs like IRT64, IR36, Poorva and MTU1010 and hybrids like Dhanya, Ganga Kaveri, Goraknath, Arize 6201 and US312. It was observed that farmers have grown local varieties like Gurmatia, Laldhan, Rashutta,

Bhejari, Newari and Bharra in Pusparaj garh block for their taste and resistance to different biotic and abiotic stresses. Average productivity in the district was less because of cultivation local varieties, undulated land, lack of proper irrigation and use of very low dose of fertilizers. None of the farmers contacted adopted any seed treatment. The fertilizer application was noted to be very poor (20kg/ha urea was applied) and due to dominance of tribal poor farmers, use of equipments and plant protection measures was very less. Some farmers adopted direct sowing. The intensity of different weeds like Echnichloa spp. was medium. Hand weeding was most common among the farmers and very few applied weedicides like Londax Power. Some farmers used tractor on hire basis. Most of the farmers used their own seeds for sowing. The intensity of different biotic stresses like leaf blast, brown spot, false smut, bacterial blight, WBPH, leaf folder and case worm were observed in low incidences. Plant protection measures were not common among the farmers in the region.

Katni: Three blocks involving 7 farmers were covered for production oriented survey in this district when the crops were in dough to maturity stage. The onset of monsoon was very late (7^{th} July); however, there was a good rain (1025 mm) in the month of July and August. The major cropping systems were Rice-wheat, Rice-gram and Rice- pea. Different rice varieties cultivated by the farmers were HYVs like HMT, Sonali, IR36, IR 50, IR 64,Champion, Rupali, Ankur Juari, Dubaraj, Keshar, Sita, Subeej Sugandha, Pusa 1509 and Pusa 1121 and hybrids like PRH10, Goraknath, Arize 4444, Arize Tej, JRH 4 and JRH 5. It was also noticed that the area under hybrid rice is very good (40,000 ha) as compared to other surveyed area even the farmers having assured irrigation. Due to Bansagar command area the irrigated area was tremendously increased therefore cropping intensity was increased (145%) in the district. The average yield of the district was moderate 30-35q/ha. The fertilizer consumption was moderate 40-45 kg/ha. Urea was applied in rice in two split doses. Application of FYM was commonly practiced and nutritional status of the field is good due to adoption of organic resources. The economic status of the farmers was found to be good in the district. Direct seeding was commonly practiced in the district in rain fed and irrigated upland ecosystem. However, progressive farmers have translated rice under irrigated ecosystem. SRI cultivation in the district was found very low (<1000 ha). Areobic cultivation was found to be commonly practiced in the district. Weed infestation was noted to be moderate and hand weeding was only practiced for weed management. Few progressive farmers applied weedicides like butachlor and pretilachlor. Some of the common needs of the farmers were low cost equipments, irrigation facilities, power supply for different agricultural operations, seeds of improved rice varieties and information on improved rice production technologies. Different biotic stresses like leaf blast, brown spot, false smut, bacterial blight, grain discolouration, sheath blight, leaf folders, case worm, WBPH and rice bug were recorded in traces. Khaira disease was recorded in few pockets in the surveyed area. Adoption of plant protection measures was noted to be poor in the region. Only few progressive farmers applied pesticides like triazophos, monocrotophos, chlorpyriphos and indoxacard.

Umaria: Three blocks involving 10 farmers were surveyed in the district when the crops were in dough to maturity stage. Majority of the fields surveyed in the districts were under rainfed lowland ecosystem and some were under irrigated ecosystem. The weather conditions were not very favourable for rice cultivation as monsoon was late and rainfall was poor. The onset of monsoon was very late (10^{th} July); therefore nursery preparation was carried out late and transplanting was delayed. There was very poor rainfall (650 mm) in the district. The district has a lot of variation in soil type but sandy soil is dominated and rice based cropping system is predominant. 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. Different rice varieties cultivated by the farmers were HYVs like Pusa Sugandha 5, Pusa Sugandha 4, IR64,

MTU 1010, Champion , Dhanteswari and Sonam and hybrids like Ganga Kaveri, NPH 101, NPH 105, Advanta 801, 807, Mulayam 999, Pioneer 25P35 and Pioneer 27P-31. It was observed that farmers have cultivated hybrid and improved high yielding varieties in irrigated ecosystem whereas, under rainfed direct seeding lehi was practiced. The average yield of the district was low 25-30 q/ha because of poor irrigation facilities, low dose of fertilizers, poor weed managment and cultivation local varieties. The fertilizer consumption was very poor 18.5 kg/ha. However, nitrogenous fertilizer was only applied in rice at tillering stage. FYM was commonly practiced and nutritional status of the field is good due to rich forest area. Azolla units has been established in the farmers field and huge application was adopted in rice and cattle feed. None of the farmers contacted adopted seed treatment. Transplanting was random and plant population was not maintained. SRI method of rice cultivation was also adopted by the farmers and farmers were obtaining grain yield of 50-65/ha in Karkeli, Pali and Chandia area. SRI was adopted in 12000ha and hybrid rice area was covered around 5500 ha. Weed infestation was observed to be low to moderate. Normally weeding was not practiced but very few farmers adopted hand weeding for weed management. Few progressive farmers used weedicides like Londax Power and pretilachlor. Weedy rice locally known as Jalkeshar and Laldhan were noticed in some fields. Equipment, irrigation, electricity, improved seeds and information on improved rice production technology were the main requirements of farmers. The seed replacement rate and cropping intensity was noted to be 20% and132% respectively. Farmers used their own seeds in the tribal dominated district. However, progressive farmers were grown hybrids and improved varieties. 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 etc. With regard to biotic stresses, leaf blast, bacterial blight, brown spot, false smut, case worm, leaf folders, armyworm and rice bug were reported in traces. Insect pests like case worm and leaf folder infestation were recorded in moderate under late sown crop in Manpur and Pali blocks. Khaira symptoms were also noted in moderate in the surveyed area. Adoption of plant protection measures was noted to be very poor. Some progressive farmers applied pesticides like monocrotophos, chlorpyriphos and traizophos for management of different insect pests.

Pest and disease scenario of rice in Madhya Pradesh in *Kharif*'2017

District	Bl	BS	ShBl	Khaira	FS	GD	BB
Rewa	L-M (3-10%)	M (10-15%)	L	M	L (3-5%)	L	L (5%)
Satna	M	M	T-	M	M	T	T
Sidhi	T	M	-	M	T	T	T
Shahdol	M	M	T	M	T	M	T
Anuppur	T	M	T	M	T	T	T
Katni	T	T	-	T	T	M	T
Umaria	T	M	T	M	T	T	T

District	LF	SB	WBPH	GLH	AW	CW	RB	Rat
Rewa	L (2-5%)	T	L-M (7-10%)	T	T	M	M	T
Satna	M	T	M	T	T	M	T	-
Sidhi	M	T	M	T	-	M	M	-
Shahdol	T	-	M	T	-	M	T	T
Anuppur	T	T	T	-	T	T	T	-
Katni	M	-	T	-	-	T	M	T
Umaria	M	T	T	T	T	T	T	T

Maharashtra

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

Particulars of survey

District	Taluka	Villages
Raigad	Alibag, Karjat, Khalapur, Mangaon, Panvel, Roha, Sudhagad pali and Murud	Chowl, Kurul, Mani, Mogaraj, Wanjale, Kalamb, Umroli, Pali Budruk, Chimchali, Koshte Budruk, Rawalje, Turde, Kasarbhat, Barwai, Bhokarpada, Chandgaon, Parangkhar, Tiware, Ekalghar, Tadwad, Chehar, Mandla and Suregaon
Ratnagiri	Chiplun, Dapoli, Khed, Lanja, Mandangad, Rajapur, Ratnagiri and Sangemeshwar	Mirjole, Pede, Khershet, Kapsala, Kumbhave, Talsure, Suseri-2, Suseri-1, Chinchghar, Gawane, Shenale, Panhale, Velwan, Nivali, Pali, Aarawali and Gholawali
Thane	Ambernath, Bhiwandi, Kalyan, Murbad, Shahapur and Thane	Saware, Dhawalegaon, Wahuli, Kalamboli, Koshimbi, Nilaje, Kolegaon, Weldyachiwadi, Kanur, Shirwali, Kheware, Kalambhe, Dahiwali, Khutghar, Neware, Khirkali and Desaigaon
Sindhudurg	Devgad, Dodamarg, Kankavali, Kudal, Malvan, Sawantwadi, Vaibhavwadi and Vengurla	Gawathanwadi, Fanasgaon, Sateli, Ghotage, Phondaghat, Halkul Khurd, Harkul, Janawali, Padave, Kasal, Pingoli, Sawarwad, Katta, Kalshe, Malgaon, Konapal, Lore No. 2, Vaibhavwadi, Kokisare and Hodawade
Palghar	Dahanu, Jawhar, Mokhada, Vikramgad and Wada	Sarawali, Veti, Tawa, Sadakpada, Kundachpada, Talachapada, Ghatkarpada, Wasuri, Allonda, Wonde, Bhadangepada, Wada, Warchawada and Jambhulpada

Widely prevalent varieties

District	Varieties
Raigad	**HYVs:** Jaya, Swarna, Karjat- 7, Ratna, MTU 1001/ 1010, Trupti, Krushidhan Komal 101, Supreme Sona Kaveri, Karjar -2, Ankur Sonam, Vaishnvi, YSR, Sarthi, Karjat- 3 and Karjat- 5
Ratnagiri	**HYVs:** Jaya, Ankur Sonam, Karjat-2, Sarthi, Green Gold Mohini, Swarna, Ankur Rupali, Trupti, Vaishnavi, Krushidhan komal 101, Karjat- 3, Laxmi, Shweta, Rasi Poonam and YSR; **Hybrids:** Arize 6444, Sahyadri, Sahyadri-3 and Sahyadri-2
Thane	**HYVs:** YSR, Jaya, Ankur Rupali, MTU-1010, Shreeram, Daptari-125, Karjat-7, Daptari-100, Karjat-2, Krushidhan Komal-101, Karjat-3, Mohini, Spriha, Vaishnavi and Shabari; **Hybrids:** Arize 6444 and KSL -81; **Locals:** Kolam, Zinia and Mhadi
Sindhudurg	**HYVs:** Masuri, Jaya, Ankur Rupali, Ankur Sonam, Krushidhan Komal 101, Silky, Daptari-100, YSR, Rasi Poonam, Karjat-2, Laxmi, Swarna, Karjat-3, Karjat-5 and S-911; **Hybrids:** Gorakhnath 505, Gorakhnath 509, Sahyadri 2 and Arize 6444; **Locals:** Bela, Walai, Somasal, Dongara, Sorti, Kolhyachi

District	Varieties
	Shepti, Kothimbira / Ghansal, Turya and Yelkar
Palghar	**HYVs:** Rasi Poonam, Shreeram, Karjat - 3, Suma, Kajat - 7, Laxmi, Anupam, Ankur - Rupali, MTU - 1010, Supreme Sona Kaveri, Jaya, Swarna, Krushidhan Komal -101, Silky- 277 and Avani; **Hybrids:** Sahyadri-3, Sahyadri-4 and Arize- 6444; **Locals:** Kolam, Wada Kolam, Bangalya, Shelwa Kothimbira, Kala Karjat, Wapali and Patani

Particulars of rice area in different districts of Konkan region of Maharashtra during *Kharif*' 2017

District	Total Geographical Area (ha)	Total Cultivable Area (ha)	Total Cultivated Area (ha)	Net Irrigated Area (ha)	Area Under Rice (ha)
Raigad	687000	141200	231000	21621	106595
Ratnagiri	816000	388000	275000	9000	68243
Thane	933700	210825	183244	10054	56579
Sindhudurg	503950	465307	139300	33910	61870
Palghar	469699	263707	217338	14502	70154

District-wise rainy days and rainfall during *Kharif*' 2017

District		June	July	Aug	Sept	Oct	Nov	Dec	Total
Raigad	RD	15	31	27	14	7	0	2	96
	TF	1018	1576.2	916	520.2	215.1	0.6	22.8	4268.9
Ratangiri	RD	23	31	29	16	08	00	2	109
	TF	1014.7	1096.8	576.0	758.8	135.7	0.0	23.6	3605.6
Thane	RD	15	27	23	12	6	0	1	84
	TF	933.6	1184.8	769.2	421.1	153.95	0.3	52.9	3515.85
Sindhudurg	RD	26	29	26	19	12	0	01	113
	TF	903.1	982.2	515.1	675.3	245.9	00	15.1	3336.7
Palghar	RD	15	23	19	10	5	00	2	74
	TF	849.2	793.4	622.4	322.0	92.8	00	83	2762.8

RD: Rainy Days **TF: Total Rain Fall (mm)**

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

Parameters	**Districts**		
	Raigad	**Ratnagiri**	**Thane**
Total area under HYVs in the district (ha)	106595 ha	66905 ha	56414 ha
Most prevalent HYVs in the district	Jaya, Swarna, Karjat -2, Ratna, MTU 1001 and MYU 1010	Jaya, Ankur Sonam, Karjat-2, Sarthi, Green Gold Mohini, Swarna and Ankur Rupali	YSR, Ankur Rupali, MTU-1010, Shreeram, Daptari-125, Karjat-7, Daptari-100, Karjat-2, Komal-101 and Karjat-3
Total area under rice hybrids in the district(ha)	Nil	1338 ha	165 ha
Most prevalent rice hybrids in the district	Nil	Arize 6444, Sahyadri, Sahiyadri-2, Sahiyadri-3	Arize 6444 and KSL 810
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	Yes	Nil	Yes
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	Yes	Nil	No
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	INM and IPM in rice and mechanization in rice cultivation	INM and IPM in rice, chemical weed management and mechanization	IPM and INM in rice cultivation; mechanization in rice cultivation
What are the general problems in rice cultivation in the district?	Non-availability and high wages of labour	Shortage of labour, limitation for mechanization and high labour wage	Non-availability and high wages of labour; lack of irrigation facilities
Please provide any farmers association in the district	Co-operative Rice Seed Production Society, Vadap; Karjat Shetkari Vikas Sanstha, Mahad; Farmers Producer Co. (ATMA)	Nil	Farmer's groups registered under ATMA and "Agricultural Tools Bank" Association
Whether availability of labours 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	Pathas, Amba, Kal, Rajnala, Hetawane and 16 lift irrigation projects	Natu Nagar Irrigation Project and Ratnagiri Power Company	Bhatsa, 16 minor and 2 lift irrigation project
Any soil testing program undertaken?	Yes; Soil health card Scheme under National Mission for Sustainable Agriculture	Yes; Soil health card scheme under National Mission for Sustainable Agriculture	Yes, Soil health card scheme under National Mission for Sustainable Agriculture
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 field Demonstrations	Integrated Rice Improvement Program and field Demonstrations

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

Parameters	**Districts**	
	Sindhudurg	**Palghar**
Total area under HYVs in the district (ha)	61144 ha	69924 ha
Most prevalent HYVs in the district	Masuri, Jaya, Ankur Rupali, Ankur Sonam, Krushidhan Komal 101	Rasi Poonam, Shreeram, Karjat - 3, Suma, Kajat - 7
Total area under rice hybrids in the district(ha)	726 ha	230 ha
Most prevalent rice hybrids in the district	Gorakhnath 505, Gorakhnath 509, Sahyadri-2 and Arize 6444	Sahyadri-3, Sahyadri-4 and Arize 6444
Total area under basmati in the district	Nil	Nil
Most prevalent basmati varieties in the district	Nil	Nil
Whether farmers are using any heavy equipments like transplanted/ combine harvester	No	Nil
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	No	Nil
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Mechaniztion in harvesting, threshing drumseeding and ICM in rice cultivation	IPM, INM and mechanization in rice cultivation
What are the general problems in rice cultivation in the district?	Labour shortage and high wages; limitation t mechanization due to small land holding andgeography	Labour shortage and high wages, lack of marketing and irrigation facilities and technical information
Please provide any farmers association in the district	Shetkari Kharedi Vikri Sangha: 8	Farmer's groups registered under ATMA
Whether availability of labours is sufficient?	No	No
Whether there is any marketing problem of the produce?	Yes	Yes
Any major irrigation/power generation project in the district	Talamba, Aruna, Tilari, Sarmala and Mahammad Wadi Irrigation projects	Surya, Vandri Irrigation projects and 18 minor irrigation projects
Any soil testing program undertaken?	Yes; Soil health card scheme under National Mission for Sustainable Agriculture	Yes; Soil health card scheme under National Mission for Sustainable Agriculture
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

Variety-wise area coverage in different districts of Maharashtra during *Kharif'2017*

Varieties	Districts				
	Raigad	**Ratnagiri**	**Thane**	**Sindhudurg**	**Palghar**
HYVs					
Jaya	9240	933	2507	756	620
Swarna	3002	272		212	610
Karjat-7	2200		656		2060
Ratna	1600				
MTU 1010	1075		1278		1212
Trupti	866	187			
Krushdhan Komal 101	833	186	389	455	444
Supreme Sona Kaveri	750				1062
Karjat-2	670	528	439	278	
Ankur Sonam	555	592		522	
Vaishnavi	555	186	286		
YSR	555	38	4130	322	
Sarthi	555	337			
Karjat-3	550	86	382	170	4164
Karjat-5	526			148	
Green Gold Mohini		311	352		
Ankur Rupali		254	1638	691	1613
Laxmi		82		244	1806
Shweta		58			
Rasi Poonam		51		293	13551
Shreeram			968		4486
Daptari-125			712		
Daptari-100			444	345	
Spriha			311		
Shabari			282		
Mahsuri				832	
S-911				148	
Suma					2462
Anupam					1755
Silky-277				364	346
Avani					333
Hybrids	Nil				
Arize 6444		597	28	116	4
Sahyadri		15			
Sahyadri-2		49		143	
Sahiyadri-3		70			112
Sahiadri-4					88
KSL 810			20		
Goraknath505/509				240	

The Konkan region of Maharashtra is predominant rice growing belt with an average productivity of 33.5q/ha. The regions comprise five districts viz. Raigad, Ratnagiri, Thane, Sindhudurg and Palghar. The total area under rice cultivation in *Kharif*-2017 season in the

region was 363441 ha. The farmers of the region cannot grow any other crop than rice in *Kharif* because of high rainfall and geographically lowland ecosystem. The Production Oriented Survey for rice was organized at dough and maturity stage of crop during the month of October-November 2017. Majority of the fields surveyed were under rainfed lowland ecosystem. The onset of monsoon was early by 1 week in South Konkan Costal Zone whereas, it was in time in North Konkan Costal Zone of the region. Very high rain fall was received in almost all districts of Konkan region except Palghar. The maximum rainy days in Ratnagiri and Sindhudurg districts were more than 100 days whereas, the maximum rain fall was high in Raigad district (4268.2 mm) in 96 rainy days. The total rain fall and its distribution in all the districts of the region was much satisfactory however, the late rainfall at the harvesting time in the month of October-December caused severe losses in the region. 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, rice-vegetables, rice-rice and rice-groundnut / sunflower. Pulses after *Kharif* rice on residual moisture is a common practice in Palghar, Raigad, Thane and Ratnagiri districts. The predominant varieties in the region were HYVs like Jaya, Swarna, Karjat- 7, Ratna, MTU 1001/ 1010, Trupti, Krushidhan Komal 101, Supreme Sona, Kaveri, Karjar -2, Ankur Sonam, Vaishnvi, YSR, Sarthi, Karjat-3, Karjat- 5, Laxmi, Shweta and Rasi Poonam and hybrids like Arize 6444, Sahiyadri, Sahiyadri-2, Sahiyadri-3, Sahiyadri-4, KSL 810 and Goraknath. Some farmers are still growing local varieties like Bela, Walai, Somasal, Dongara, Sorti, Kolhyachi Shepti, Kothimbira / Ghansal, Turya and Yelkar for their taste.

Almost all the farmers in the surveyed districts are preparing nursery by burning FYM and farm waste (Rabing). Farmers grown their nurseries with organic amendments, mostly FYM . They apply one fertilizers dose of urea @ 1 kg/101 m^2 nursery area. Few farmers of Raigad and Thane districts use Phorate for control of crabs. The majority of farmers adopting seed rate of 40-50 kg/ha in the region. Farmer to farmer spread is very common in case of high yielding and local varieties. Most of the farmers followed Rabing for weed management in nursery. More than 70% of the farmers contacted told that they treated the seeds with thiram (2 g/kg). 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, mostly 15:15:15. Few progressive farmers were applying FYM depending upon its availability. Usage of poultry manure in some extent was noticed in Raigad district. Only few farmers in the region were used *Glarycidia maculata* as a green manure. 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. Transplanting was random and average plant population was 30-35 hills/m^2. Some farmers from Thane, Raigad and Sindhudurg districts adopted direct sowing of one day old germinated seed on puddle soil with seed drill or by broadcasting. 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'*.

Weed infestation was in the range of low to high and the predominant weed composition in the surveyed districts was *Ichaemum rugosum, Isphaenae globosa, Cyperus* sp., *Echinochloa* sp., *Celosia* sp., *Ludwigia octovalvis, Alternanthera sessilis, Coix Lacryma*., *Eragostis major, Themeda cialita, Digitaria sanguinalis* and *Cynodon doctylon.* One to two hands weeding per season is a common practice followed by the farmers. Application of herbicides was practically nil. Some of the common needs of the farmers inputs on subsidized rates, training on nutrient, pest, disease and weed management, irrigation facilities, training on integrated rice cultivation, low cost mechanization in paddy cultivation, finance for developing irrigation facilities and farm sheds, proper price for the produce, threshing yards cum farm

shed because of late rainfall and good quality HYVs. Farmers used implements like tractor and power tiller on hire basis for ploughing their land. Other implements used by the farmers were hand tools and sprayers. Only few progressive farmers had their own power tiller, tractor and harvester. Most of the farmers in Konkan region are having small land holding. Because of fast urbanization, area under rice farming is decreasing in the district and farmers are facing with acute shortage of farm labourers and hence Jilha parishad in Thane district has formed farmers "**Farm Machinery and Tool Bank**" in the district from last year. The average seed replacement ratio in the region during Kharif 2017 was very high (80%). Some farmers use their own seed especially of local varieties. Seeds of improved varieties are supplied by Government agencies viz. Panchayat Samittee, Zilla Parishad, Agricultural Department, Agricultural University, Research Stations etc. Most of the farmers purchase seed every season, from private agro service centers and private seed companies. Most of the farmers expressed scarcity of irrigation water and power. However, fertilizers and pesticides were available and the farmers were happy with their quality. In addition to their own decisions, farmers took advices from local private dealers regarding choice of fertilizers and pesticides. The diseases like blast, grain discoloration and sheath rot were widely distributed. Intensity of blast was more in some fields in Thane and Sindhudurg while high intensity of sheath blight was recorded in some fields in Ratnagiri. Very high level of grain discoloration was reported from some fields in Ratnagiri and Palghar. Bacterial blight was high in some areas in Raigad and Thane. Among insect pests, high intensity of stem borer was recorded in many areas in Raigad, Thane and Palghar while army worm was high in some fields in Ratnagirir and Sindhudurg. Application of pesticides was not common among the farmers. Rainfall during maturity predisposed the crop to Chaffy grains in few pockets of the Konkan region but late rainfall at harvest caused heavy losses. Salt toxicity was noticed in some paddy field of Pen and Uran tahsil of Raigad district whereas Sulphate toxicity was notice in some pocket of Sindhudurg district.

District-wise observations

Raigad: A total of 23 villages in 8 blocks were covered for production oriented survey in this district when the crops were mainly in maturity stage. Some of the crops were heading to dough stage. All the fields surveyed were under rainfed lowland ecosystem. Twenty three farmers were contacted for this purpose. The onset of monsoon was in time and average rainfall was very high as compared to other districts of region during *Kharif*' 2017. The weather conditions during crop growth period were moderate because of rains in the month of October and December, when the crop was at maturity and harvesting stage respectively which caused lodging of matured crop and thus damaged the crop. There was no dry spell in the cropping season 2017. Main cropping sequences in the district was rice-pulses followed by rice-vegetables and rice-fallow. Pulses after *Kharif* rice on residual moisture is a common practice in this region. Predominant varieties cultivated in this district were Jaya, Swarna, Karjat- 7, Ratna, MTU 1001/ 1010, Trupti, Krushidhan Komal 101, Supreme Sona Kaveri, Karjar -2, Ankur Sonam, Vaishnvi, YSR, Sarthi, Karjat- 3 and Karjat- 5. None of the farmers cultivated hybrids in this district during *Kharif*' 2017. The most popular varieties are Jaya, Swarna, Karjat -2, Ratna and MTU 1010. Locally grown varieties are very less in the district. Average seed rate followed by the farmers was 35-45 kg/ha and about 82% of the farmers contacted told that they adopted seed treatment with thiram (2 g/kg). About 55% of the farmers told that they applied FYM in the nursery and almost all the farmers contacted told that they applied a dose of urea @ 1 kg/101 m^2 nursery. Some of the farmers applied 15:15:15 in the nursery. Almost all the farmers in the surveyed districts are

preparing nursery by burning FYM and farm waste (Rabing). The farmer had sown the seeds in the nursery in the month of May to 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. Few farmers of Raigad used phorate in the nursery for control of crabs. Most common practice for weed management in nursery in the district is burning of nursery area with organic waste referred as '*Rab*'. Though the balanced use of fertilizers is not practiced in the region, most of the farmers used urea with limited quantity of complex fertilizers mostly 15:15:15 and 18:18:18. In the main fields, fertilizers were applied @ 7.6-102 kg N/ha, 5-23.68 kg P_2O_5/ha and 5-18 kg K_2O/ha. Few progressive farmers (about 30%) applied FYM (0.25-6 t/ha) depending upon its availability. Very few adopted green manuring (50 kg/13R). Usage of poultry manure in some extent was noticed in Raigad district.

Farmers adopted random method of transplanting with 21-30 days old seedlings and average plant population was 30-35 hills/m^2. This year the monsoon was started in time and farmers completed their transplanting in time. Some farmers also adopted direct sowing of one day old germinated seeds on puddle soil with seed drill or by broadcasting. 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'. Intensity of common weeds like *Alternanthera sessilis*, *Themeda cialita*, *Panicum repens*., *Cyperus* sp., *Celosia* sp., *Coix lacryma*, *Ludwigia octovalvis*, *Ichaemum rugosum*, *Echinochloa* sp. and *Spirogyra* spp (water silk; green algae) was in low to moderate intensity. Application of weedicides was not very common among the farmers and one to two hand weeding per season is a common practice followed by the farmers. Some farmers applied weedicide glyphosate. Some of the common needs of the farmers were availability of inputs on subsidized rates, training on nutrient, pest, disease and weed management, irrigation facilities, training on integrated rice cultivation, low cost mechanization in paddy cultivation, finance for developing irrigation facilities and farm sheds, proper price for the produce, threshing yards cum farm shed because of late rainfall and good quality HYVs. Farmers used implements like tractor and power tiller on hire basis for ploughing their land. Other implements used by the farmers were hand tools and sprayers. Only few progressive farmers had their own power tiller, tractor and harvester. Most of the farmers in Konkan region are having small land holding. The average seed replacement ratio in Raigad was 75 %. Some farmers used their own seed especially of local varieties. Seeds of improved varieties are supplied by Government agencies viz. Panchayat Samittee, Zilla Parishad, Agricultural Department, Agricultural University, Research Stations etc. Most of the farmers purchase seed every season, from private agro service centers and private seed companies. Most of the farmers expressed scarcity of irrigation water and power. However, fertilizers and pesticides were available and the farmers were happy with their quality. In addition to their own decisions, farmers took advices from local private dealers regarding choice of fertilizers and pesticides. The weather condition during the season was moderately favourable for bacterial leaf blight, sheath rot and false smut diseases development. Among the diseases, sheath rot was moderate to severe in some fields in Checher village on variety Gangotri and bacterial blight was moderate to severe (up to 30%) on variety Shubhangi in Cholw village. The bacterial leaf blight was moderate in Uran, Panvel and Karjat blocks, but in few fields only. Other diseases were in low to moderate intensities. Among insect pests, stem borer was recorded in high intensity in some fields in Rawalje village on variety Surekha. Application of pesticides was not common among the farmers. Few farmers applied phorate for control of stem borer. Some of the common problems faced by the farmers were flood, no technical information regarding rice cultivation, high wages of the labours, labour shortage, small land holding and urbanization around the fields. Majority of the farmers expressed their unwillingness to continue rice

cultivation. There was no any deficiency so far noticed during the survey. However, salt toxicity was recorded in some 'Kharland' area in Pen, Panvel and Uran tahasil.

Ratnagiri: Production Oriented Survey was conducted in 17 villages in 8 mandals of this district when most of the rice fields were in maturity stage. Seventeen farmers were contacted for this purpose. Most of the fields surveyed were under rainfed lowland ecosystem. The onset of monsoon was in time and average rainfall was very high (3605.6 mm) during *Kharif* 2017. The weather conditions were less favourable for rice cultivation because of rainfall at maturity and harvesting, results into considerable yield losses. There was no dry spell in the cropping season of Kharif 2017. Farmers are shifting from rice cultivation towards cultivation of different horticultural crops. Rice is grown as a rain fed crop due to heavy rains in the region. Main cropping sequences followed by the farmers were rice-pulses, rice vegetables and rice fodder. Pulses after *Kharif* rice on residual moisture is a common practice in the district. Most commonly grown high yielding varieties in the district are Jaya, Ankur Sonam, Karjat-2, Sarthi, Green Gold Mohini, Swarna, Ankur Rupali, Trupti, Vaishnavi, Krushidhan Komal 101, Karjat- 3, Laxmi, Shweta, Rasi Poonam,YSR. The Hybrids grown in the districts are Arize 6444, Sahyadri, Sahyadri-3 and Sahyadri-2. Most popular varieties in the district are Jaya, Ankur Sonam, Karjat-2, Sarthi, Green Gold Mohini, Swarna, Ankur Rupali. Average seed rate in the district was 25-50 kg/ha and about 75% of the farmers contacted told that they adopted seed treatment with thiram (2 g/kg). Majority of the farmers (>95%) grown their nursery with organic amendments, mostly FYM and almost all the farmers contacted told that they applied a dose of urea @ 1 kg/101 m^2 nursery. Some of the farmers applied 15:15:15 in the nursery. Almost all the farmers in the surveyed districts are preparing nursery by burning FYM and farm waste (Rabing). 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 using 21-30 days old seedlings. Most of the farmers followed Rabing for weed management in nursery. Though the balanced use of fertilizers is not practiced in the region, most of the farmers used urea with limited quantity of complex fertilizers mostly 15:15:15 and 18:18:18. In the main fields, fertilizers were applied @ 16-153 kg N/ha, 6-37 kg P_2O_5/ha and 6-37 kg K_2O/ha. About 65% farmers applied FYM (0.25-4 t/ha) depending upon its availability.

Farmers adopted random method of transplanting with 21-30 days old seedlings and average plant population was 30-35 hills/m^2. 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. It was observed that weed infestation was low to medium in most of the fields. The predominant weeds viz. *Isphaenae globosa*, *Cyperus* sp., *Echinochloa* sp., *Celosia* sp., *Ludwigia octovalvis*, *Alternanthera sessilis*, *Ichaemum rugosum*, *Eragostis major*, *Themeda cialita Mimosa pudica* and *Cynodon doctylon* were observed in the district. Hand weeding is common practice in the district and none of the farmers use weedicides in paddy field. Some of the common needs of the farmers were availability of inputs in subsidized rates, requirement of demonstrations on advanced rice production technology, training on integrated pest management, irrigation facilities, machineries on subsidized rates, farm shed (because of uncertain rainfall) and low cost machineries. Most of the farmers prepared their land by own plough or hired Power Tiller/Tractor. Only few progressive farmers having their own power tiller, tractor and harvester. Other small implements used by the farmers were sprayers and hand tools. Most of the farmers in Konkan region are having small land holding. The average seed replacement ratio in Ratangiri was 78 %. Some farmers use their own seed especially of local varieties. Seeds of improved varieties are supplied by Government agencies viz. Panchayat Samittee, Zilla Parishad, Agricultural Department, Agricultural University, Research Stations etc. Most

of the farmers purchase seed every season, from private agro service centers and private seed companies. Majority of the farmers expressed scarcity of irrigation water and power. However, fertilizers and pesticides were available and the farmers were happy with their quality. In addition to their own decisions, farmers took advices from local private dealers regarding choice of fertilizers and pesticides. 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. Sheath blight was also recorded in moderate to high intensities in some areas. Its intensity upto 60-90% was recorded on varieties like Jaya, Sahiadri and Karjat-9 in places like Mirjole, Pali and Nivali. Among the insect pests leaf folder, case worm and blue beetle were observed in some field but the intensity was very less. However, incidence of army worm was high in some fields in Panhale on variety Vikram. The rats and crabs infestation was common in most of the paddy fields. Application of pesticides was not common among the farmers. Few farmers applied lamda cyhalothrin for control of stem borer. Some of the common problems faced by the farmers were shortage of labour and high wages, lack of technical information, socio-economic conditions of the farmers and flood. There was no any deficiency or toxicity so far noticed during the survey.

Thane: Production Oriented Survey was conducted in 17 villages in 6 mandals in this district when the crops were in dough to maturity stage. A total 16 farmers were contacted for this purpose. Most of the farmers were marginal and sub-marginal. All the fields surveyed were under rainfed loaland ecosystem. The onset of monsoon was in time and average rainfall was very high during *Kharif*' 2017. The weather conditions during maturity and harvest period were very favourable because of late rain resulted in to heavy yield losses. There was no dry spell in the cropping season 2017. In addition to rice, farmers are cultivating vegetables and pulses in part of their land. In some part of their land, they are cultivating horticultural crops. Rice is grown as a rain fed crop due to heavy rains in the region. The most common cropping patterns adopted by farmers in the region are rice-pulses, rice-vegetables and rice-fallow. Pulses after Kharif rice on residual moisture is a common practice in Thane. The predominant rice varieties grown in this district were YSR, Jaya, Ankur Rupali, MTU-1010, Shreeram, Daptari-125, Karjat-7, Daptari-100, Karjat-2, Krushidhan Komal-101, Karjat-3, Mohini, Spriha, Vaishnavi, Shabari. It was observed that some farmers in the district still cultivate local 'Kolam, Zinia and Mhadi' varieties for their fine quality and taste. The most popular hybrids were Bayer -6444, KSL -81. Average seed rate in the district was 35-50 kg/ha and majority of the farmers (~ 85%) told that they treated their seeds with fungicides like thiram (2 g/kg). About 50% of the farmers contacted told that they grown their nursery with organic manure, mostly FYM and most of the farmers told that they applied a dose of urea @ 1 kg/101 m^2 nursery. Almost all the farmers in the surveyed districts are preparing nursery by burning FYM and farm waste (Rabing). The farmer has sown the seeds in the nursery in the month of May to June and the transplanting was done in time. Most of the farmers followed Rabing for weed management in nursery. Though the balanced use of fertilizers is not practiced in the region, most of the farmers used urea with limited quantity of complex fertilizers mostly 15:15:15. In the main fields, fertilizers were applied @ 10-115 kg N/ha, 1.37-28 kg P_2O_5/ha and 1.37-28 kg K_2O/ha. About 30% farmers applied FYM (0.25-3 t/ha) depending upon its availability. Few farmers applied poultry manure.

Farmers adopted random method of transplanting with 21-30 days old seedlings and average plant population was 30-35 hills/m^2. Some farmers adopted direct sowing of one day old germinated seed on puddle soil with seed drill or by broadcasting. 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* sp., *Panicum repens*, *Celosia* sp., *Ludwigia octovalvis*, *Alternanthera sessilis* and *Cynodon doctylon*. Hand weeding is common practice in the district. None of the farmers use weedicides. Most of the farmers prepared their land by own plough or hired Power Tiller/Tractor. Only few progressive farmers having their own power tiller, tractor and harvester. Other small implements used by the farmers were sprayers and hand tools. Because of fast urbanization, area under rice farming is decreasing in the district and farmers are facing with acute shortage of farm labourers and hence Jilha parishad has formed farmers "**Farm Machinery and Tool Bank**" in the district from last year. Some of the common needs of the farmers were availability of inputs in subsidized rates, requirement of demonstrations on advanced rice production technology, training on integrated pest management, irrigation facilities, machineries on subsidized rates, farm shed (because of uncertain rainfall) and low cost machineries. Average seed replacement rate in the district was 96%. Seeds of improved varieties are supplied by Government agencies viz. Panchayat Samittee, Zilla Parishad, Agricultural Department, Agricultural University, Research Stations etc. Most of the farmers purchase seed every season, from private agro service centers and private seed companies. Majority of the farmers expressed scarcity of irrigation water and power. However, fertilizers and pesticides were available and the farmers were happy with their quality. In addition to their own decisions, farmers took advices from local private dealers regarding choice of fertilizers and pesticides. Farmer to farmer spread is very common in case of high yielding and local varieties. The weather condition during the season was moderately favourable for bacterial leaf blight and blast in Shahapur and Murbad block of the district. The sheath rot and false smut diseases were low to moderate throughout the district. Among the biotic insect pests, stem borer was very high in most of the paddy fields. Stem borer intensity upto 60-80% was noticed on varieties like Radha and YSR in villages like Kanur and Dahiwali. High infestation of rice bug was also noticed in few fields of the district. The rat and crabs infestation was common in all paddy fields. Some farmers applied pesticides like phorate and organic 'Jeevamrit' for management of pests. Some of the common problems faced by the farmers were small land holding, urbanization, unseasonal rainfall and shortage of labours and high wages. Cultivation of pulses on bunds was observed in some places. There were also no any deficiencies so far noticed during the survey. Majority of the farmers expressed their unwillingness to continue rice cultivation.

Sindhudurg: Twenty villages in 8 mandals were covered for production oriented survey in this district when the crops were in maturity stage. Twenty farmers were contacted for this purpose. All the fields surveyed were under rainfed lowland ecosystem. The onset of monsoon started 1 week before and the average rainfall was very high (3336.7 mm) during *Kharif*' 2017. The weather conditions during crop growth period were moderately favourable as there was rain at maturity and harvest in the month of October and December 2017. Farmers have utilized parts of their land for different horticultural plantation (mango, cashew, coconut and arecanut) and for sugarcane cultivation. Different crop rotations followed by the farmers were rice-rice (main), rice-vegetables, rice-finger millet and rice pulses. Most commonly grown varieties in the district are HYVs like Masuri, Jaya, Ankur Rupali, Ankur Sonam, Krushidhan Komal 101, Silky, Daptari-100, YSR, Rasi Poonam, Karjat-2, Laxmi, Swarna, Karjat-3, Karjat-5 and S-911. The hybrids grown in the district were Gorakhnath 505/509, Sahyadri-2 and Arize-6444. 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. The most popular varieties grown in the district are Masuri, Jaya, Ankur Rupali, Ankur Sonam, Krushidhan Komal 101. Average seed rate adopted by the farmers in the district was 40-50 kg/ha and majority of the

farmers (~90%) told that they adopted seed treatment with thiram (2 g/kg). Many farmers in the district are preparing nursery by burning FYM and farm waste (Rabing). About 80% of the farmers told that they applied FYM in the nursery and majority of the farmers (90%) told that they applied a dose of urea @ 1 kg/101 m^2 nursery. Some of the farmers applied 15:15:15 in the nursery. In the main fields, fertilizers were applied @ 15.25-140 kg N/ha, 3.75-120 kg P_2O_5/ha and 3.75-75 kg K_2O/ha. About 80% farmers applied FYM (0.25-3 t/ha) depending upon its availability.

The farmer has sown the seeds in the month of June and transplanting was completed well in time. Transplanting was random and average plant population was 30-35 hills/m^2. Some farmers in the district adopted direct sowing of one day old germinated seed on puddle soil with seed drill or by broadcasting. The weed infestation was low to high and almost all the farmers followed one or two hand weeding and none of the farmers use weedicides in paddy field. It was also observed that infestation of weeds was very high in direct sown rainfed ecosystem than transplanting. The predominant weeds recorded during survey were *Isphaenae globosa*, *Cyperus* sp., *Echinochloa* sp., *Celosia* sp., *Ludwigia octovalvis*, *Alternanthera sessilis*, *Ichaemum rugosum*, *Eragostis major*, *Themeda cialita*, *Digitaria sanguinalis*, *Cynodon doctylon* and *Mimosa pudica*. Sulphate toxicity was noticed in some paddy fields of Malvan, Kudal and Vengurle tahsil of the district. Some of the common needs of the farmers in the district were low cost mechanization in paddy cultivation, irrigation facilities, technical information on rice cultivation, training on integrated pest and nutrient management, repairing of the existing wells, subsidy on inputs, training and demonstrations on integrated rice cultivation practices and financial support for farm shed preparation. Most of the farmers prepared their land by own plough or hired Power Tiller/Tractor. Only few progressive farmers having their own power tiller, tractor and harvester. Other small implements used by the farmers were sprayers and hand tools. Average seed replacement rate in the district was 82%. Seeds of improved varieties are supplied by Government agencies viz. Panchayat Samittee, Zilla Parishad, Agricultural Department, Agricultural University, Research Stations etc. Most of the farmers purchase seed every season, from private agro service centers and private seed companies. Majority of the farmers expressed scarcity of irrigation water and power. However, fertilizers and pesticides were available and the farmers were happy with their quality. In addition to their own decisions, farmers took advices from local private dealers regarding choice of fertilizers and pesticides. The weather condition during the season was moderately favourable for blast and it was severe in some paddy fields of all tahasils in the district. Severe intensity of leaf blast (up to 60%) was noticed on varieties like Chintu and Walai in Konapal village. Similarly, high intensity of leaf scald (up to 50%) was recorded on varieties like Sarathi and Silky in Fanasgaon village. The incidence of bacterial leaf blight was not noticed in the district. The false smut and sheath rot were common in most of the fields but intensity was very less. Most of the insect pests were observed in low to moderate intensities. However, high intensity of army worm (up to 30%) was recorded on variety Komal in Gawathanwadi village. None of the farmers contacted applied any pesticides. Some of the common problems faced by the farmers were lack of technical information regarding rice cultivation and shortage of labours and high wages. About 65% farmers expressed their inability to continue rice cultivation.

Palghar: Production Oriented Survey was conducted in 14 villages in 5 mandals when the crops were at maturity stage. A total 14 farmers were contacted for this purpose. Most of the farmers were marginal and sub-marginal. All the fields surveyed were under rainfed lowland ecosystem. The onset of monsoon was in time and average rainfall was moderate during *Kharif'2017*. The weather conditions during crop growth period were favorable for rice

cultivation. However, late rain at harvest caused heavy losses in most of the paddy fields. In some parts of their land, farmers are cultivating pulses and millets. Famers have used a major part of their land for horticultural crops like mango, sapota and cashew. Main cropping sequences followed by the farmers were rice-pulses and rice vegetables. Pulses after *Kharif* rice on residual moisture is a common practice in the district. In the Palghar district the most common high yielding varieties grown are Rasi Poonam, Shreeram, Karjat - 3, Suma, Kajat - 7, Laxmi, Anupam, Ankur - Rupali, MTU - 1010, Supreme Sona Kaveri, Jaya, Swarna, Krushidhan Komal -101, Silky- 277 and Avani. Some farmers cultivate hybrids Sahyadri-3, Sahyadri-4 and Arize- 6444 in the district. Locally grown varieties like Kolam, Wada Kolam, Bangalya, Shelwa Kothimbira, Kala Karjat, Wapali and Patani are being cultivated for their fine quality, taste, special purpose and home consumption. The most popular varieties in the district were Rasi Poonam, Shreeram, Karjat - 3, Suma and Kajat -7. Average seed rate in the district was 40-45 kg/ha and about 80% of the farmers contacted told that they treated the seeds with thiram (2 g/kg). Almost all the farmers in the district are preparing nursery by burning FYM and farm waste (Rabing). Most of the farmers apply Urea @ 1 kg/101 m^2 nursey area. during nursery growth stage. About 70% of the farmers contacted applied FYM in the nursery beds. In the main fields, fertilizers were applied @ 2.30-143 kg N/ha, 2.50-41 kg P_2O_5/ha and 2.50-25 kg K_2O/ha. Different fertilizers like urea and 15:15:15 were used by the farmers. About 55% farmers applied FYM (0.25-4 t/ha) depending upon its availability.

The farmers have sown the seeds in the nursery in the month of May to June and the transplanting was also in time. There was no dry spell in the cropping season of 2017. Transplanting was random and average plant population was 30-35 hills/m^2. Some of the farmers also adopted direct sowing in some fields. It was observed that weed infestation was low in most of the paddy field due to high rainfall. The predominant weeds observed during the survey were *Isphaenae globosa*, *Ichaemum rugosum*, *Cyperus* sp., *Coix lacryma*., *Ludwigia octovalvis*., *Themeda* Sp., *Panicum repens*, *Celosia* sp., *Alternanthera sessilis* and *Cynodon doctylon*. 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 subsidy on inputs, demonstration and technical information on advances on paddy cultivation, low cost mechanization in paddy cultivation, financial support for purchase of machineries, technical information on integrated pest management, irrigation facilities, farm sheds and good quality rice varieties. Most of the farmers prepared their land by own plough or hired Power Tiller/Tractor. Only few progressive farmers having their own power tiller, tractor and harvester. Other small implements used by the farmers were sprayers and hand tools. Average seed replacement rate in the district was 68%. Seeds of improved varieties are supplied by Government agencies viz. Panchayat Samittee, Zilla Parishad, Agricultural Department, Agricultural University, Research Stations etc. Most of the farmers purchase seed every season, from private agro service centers and private seed companies. Majority of the farmers expressed scarcity of irrigation water and power. However, fertilizers and pesticides were available and the farmers were happy with their quality. In addition to their own decisions, farmers took advices from local private dealers regarding choice of fertilizers and pesticides. Most of the diseases were recorded in low to moderate intensities. However, high incidence of grain discoloration was recorded in varieties like MTU 1010 and Rasi Poonam in Veti village. Among the insect pests stem borer was observed in most of the field and the intensity was very high. Very high infestation of stem borer (40-80%) was recorded on varieties like Kaver, Anupama and Swarna in villages like Towa, Allanda, Wonde and Bhadange Pada. The rice bug infestation was also very high in few paddy fields in Veti village on varieties like MTU 1010 and Rasi Poonam and caused 100% loss. The rat, crabs and leaf folder infestation was common in all

paddy fields. Very few farmers applied pesticides like phorate. Some of the common problems of the farmers in the region were poor socio-economic conditions, lack of technical information regarding rice cultivation, small land holding, shortage of labours and high wages and high cost of seed materials. There were no any toxicity and deficiencies so far noticed during the survey. Because of fast urbanization in some part of the district, area under rice cultivation is decreasing.

Prevalence of disease and pests in different districts of Maharashtra during *Kharif'* 2017

Districts	Diseases							
	Bl	**NBl**	**ShBl**	**GD**	**FS**	**LS**	**ShR**	**BLB**
Raigad	L	L	VL	L-M (2-10%)	M (20%)	M (15-20%)	L-S (2-30%)	L-S (2-30%)
Ratnagiri	L-M (2-20%)	L (5%)	M-S (15-50%)	L-S (1-90%)	L		L-S (1-60%)	L
Thane	L-S (3-30%)	L (5%)	-	L-M (2-15%)	M		L-M (2-10%)	L; S (up to 60%)
Sindhudurg	L-S (1-60%)	L	-	L-M (1-10%)	L (1-3%)	L-S (2-50%)	L-M (2-25%)	-
Palghar	L-M (2-15%)	L (3%)	-	L-S (1-40%)	L (1-2%)	L	L-M (2-20%)	L (2%)

Minor incidence of leaf smut in Sindhudurg

Districts	Insect pests							
	SB	**LF**	**CW**	**RB**	**AW**	**BPH**	**BB**	**CRB**
Raigad	L-S (2-30%)	L-M (2-10%)	L	-	L		-	L
Ratnagiri	L	L (1-5%)	L	-	L-S (2-30%)		L	L
Thane	M-S (10-80%)	L (2-5%)	L	-	L		-	L
Sindhudurg	-	L (1-5%)	L	L-M (1-10%)	L-S (5-30%)		M	VL
Palghar	L-S (2-80%)	L-M (2-15%)	L (3-5%)	S*	L	L-M (5-25%)	L	L

***Only in some fields**

Punjab

Districts surveyed: *Barnala, Bathinda, Faridkot, Fatehgarh Sahib, Ferozpur, Gurdaspur, Hoshiarpur, Jalandhar, Kapurthala, Ludhiana, Mansa, Moga, Muktsar, Nawanshahar, Patiala, Ropar, Sangrur, SBS Nagar* and *Taran Taran*

Particulars of survey

District	Villages
Muktsar	Sarar Nagar, Lambi dhab, Jhakelwali
Jalandhar	Shanpur, Atta, Gohawar, Kachrachi, Dayalpur, Raipuraraiyana, Bansian Dhak, Nagar, Gill Sowal, Mallion, Asmailpur, Shah kalan, Sanghwal, Rojari
Mansa	Bhani Bagha, Boha, Atta kalar, Kishan Singhwala
Fatehgarh Sahib	Harbanspura, Shampur, Khasosha, Mundi Jamal, Mandera, Mair mazari, Adampur, Khamanon
Sangrur	Lehragaga, Chajjari, Chintawala, Biggarwal, Kup kalan, Dhuri, Tolewal, Dhingi, Mardi, Hatha, Amargarh, Galwalti, Ratta Khera, Khera, Lehragaga, Sherpur, Mandi, Jhaloor
Faridkot	Hakamsinghwala, Dod, Jhotiwala Kalan, Moranwali, Chandbaja, Mudki, Golewala, Pipli Kalan, Raja Wala, Panjgrain kalan
Bathinda	Rampuraphul
Hoshiarpur	Hoshiarpur
Patiala	Bhadson, Nandpur Kesho, Chandanpur, Rauni, Cheetah wala, Rakhra, Kalyan, Uncha Gaon, Galwati, Khokh, Bibipur, Birarwal, Sidhuwal Maheri, Luwana and Kaidupur
Gurdaspur	Sulthanpur, Chauhan ke Kalan
Barnala	Sekha, Mangewal, Nihalsingh wala and Mehal Kalan
Ludhiana	Libra,Wadala Khurd, Churpur, Boparai Kalan, Sarabha, Pona, Lalton Kalan, Malak, Ghagra, Raikot, Tibba, Jodhan, Rakbe, Sidhwan Bet, Mullanpur, Bhawanipur
Ropar	Ghanauli, Malar, Bhurare
Moga	Budh Sighwala, Ghall Kalan
Kapurthala	Pal kalan, Basrampur
Taran Taran	Boliyan, Shisbarwal
Ferozpur	Bharona, Rattaul Rohi, Lohke Kalan, Toot, Mahu, Jaimal wala, Hakumat singh wala, Alawala, Rukna Begu, Kot Karor kalan, Mau Begu
Nawanshahar	Jadla, Nagar, Jhalar, Balani, Garhi, Bela
SBS Nagar	Ghataron

Widely prevalent varieties

District	Varieties
Barnala	**HYVs**: PR118, Pusa 44, PR114 and PR 118
Bathinda	**HYVs**: PR 121 and PR 122
Faridkot	**HYVs**: Pusa 44, PR114, PR 116, PR 118, KKR 47 and PR 122; **Basmati**: Pusa 1121
F'garh Sahib	**HYVs**: Pusa 44, PR 121, PR 126, HKR 127 and PR 118; **Basmati**: Pusa Basmati 1
Ferozpur	**HYVs**: PR 118, PR 114 and Pusa 44; **Basmati**: Pusa 1121
Gurdaspur	**HYV**: PR 121
Hishiarpur	**HYVs:** PR 126
Jalandhar	**HYVs**: PR 126, Pusa44, PR 121,PR 124, HKR 47 and HKR 127; **Basmati**: Pusa 1121 and Pusa 1121
Kapurthala	**HYV**:PR 121 and Pusa 44
Ludhiana	**HYVs**: PR127, PR126, PR 121, PR 118, HKR 47 and PR 116; **Basmati**: Pusa 1121
Mansa	**HYVs**: Peelipusa, Pusa 44, PR 121 and PR 122; **Basmati**: Pusa 1121

District	Varieties
Moga	**HYVs**: DSR Pusa Dogar, PR 126 and PR 114
Muktsar	**HYVs**: PR 114, HKR 47 and PR116; **Basmati**: Pusa 1121
Nawanshahar	**HYV:**PR 121, PR126, PR 116, PR 212, PR 114, Pusa 44 and HKR 127; **Basmati:** Pusa 1121
Patiala	**HYVs**: Peelipusa, PR 118, PR 124, PR 116, PR 116 and Pusa44; **Basmati**: Pusa 1121,
Ropar	**HYV**:PR 116, IR 8, Pusa 44 and HKR 127; **Basmati:** Pusa 1121
Sangrur	**HYVs**: Pusa 44, PR 121 and PR 124; **Basmati**: Pusa 1121
SBS Nagar	**HYV:**PR 126 and PR121
Tarantaran	**HYV:**PR 121, PR126 and PR 114

A total of nineteen districts were covered for Production Oriented Survey in the state of Punjab during the *Kharif* season of 2017. The weather conditions were normal throughout the state. The predominant varieties cultivated by the farmers in the state were Pusa 44, PR 126, PR 124, PR 122, PR 114, PR 118 were the other popular varieties, whereas, among the Basmati group, Pusa Basmati 1121 was the predominant variety. The most prevalent crop rotation was Rice-Wheat. Fertilizer use in general was more than the recommended level but some of the farmers followed the recommended dose of fertilizers in Punjab. Among the micronutrients, farmers applied 20-25 kg zinc sulphate/ha. 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. Application of zinc sulphate (either 21 or 33%) is practiced by more than 70% 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 Predominant weeds observed during the survey were *Echinochloa crusgalli*, *Leptochloa chinensis* and *Ischaemum rugosum*. Most of the farmers used pretilachor, butachlor, pyrazosulfuron ethyl and some farmers also used bispyribac sodium and fenoxaprop ethyl as a post emergence for weed control in rice crop. Among the biotic stresses, diseases like sheath blight, bakanae disease, brown spot, neck blast, false smut, and sheath rot were recorded at low to moderate level of intensity. Moderate to high incidence (25-30%) of the disease was recorded from some fields of districts Barnala, Ferozepur, Fridkot, Fatehgarh Sahib, SBS Nagar and Moga on varieties, Pusa 44, Pusa Basmati 1121, HKR 47, PR114 and PR 118. Among the insect pests, stem borer, leaf folder, WBPH and BPH were observed in low to moderate intensities. Regarding pesticides usage, most of the farmers applied imidacloprid @ 100 ml/acre, buprofezin @ 500 ml/acre+ yebuconazole @ 300 ml/acre.

District wise observations

Gurdaspur and Hoshiarpur: Survey was conducted during booting stage of the crop in 3 villages of Gurdaspur and in one in Hoshiarpur district. The main crop rotation was rice-wheat. The general climatic conditions during the crop growth stage were normal under irrigated rice ecosystem. The major varieties grown were PR 121, PR 114, and Pusa 44 among high yielding varieties. Rice yield of last season was ranged from 3100 kg -3250 kg/ha. Regarding seed rate about 15-20 Kg seed was used. The rice area ranged from 50 to 100 per cent. The farmers invariably used FYM and most of the farmers used NPK @ 140: 30: 20 kg/ha, along with the ZnSo4 12.5kg/ha. The sowing/planting method has been broadcasting in upland and random transplanting in lowland conditions. Most of the farmers used their own seed for sowing and canal irrigation was the main source of irrigation. Farmers are happy with the fertiliser quality and availability and got the advices regarding cultivation aspects from the State Department of Agriculture. Status of diseases, insect pests and weeds were to a moderate level. Leaf blast, sheath blight, Brown spot and false smut were the major diseases

observed in Barnacle district and where as it were Sheath blight and Sheath rot from Gurdaspur district. Very low incidence of BPH and WBPH was recorded. None of the farmers applied fungicides for the control of diseases but used Pretilachlor 50 EC and Pyrazo sulfuron @60kg/ac for the control of weed *Echinocloa crusgalli*.

Patiala and Sangrur: Survey was conducted in sixteen villages in Patiala district and 17 villages in Sangrur district during *kharif* 2017. The crop was at booting stage during the survey. The climatic conditions of the districts were normal. Major crop rotation followed was rice-wheat. Rice crop was transplanted between June 15th to July 5th and Basmati was transplanted during last week of June to third week of July at farmer's field. The prevalent varieties grown were Peelipusa, PR 118, PR 124, PR 116, PR 116, Pusa44 among the high yielding varieties and Pusa 1121 among the basmati varieties. Farmers maintained the seed rate for sowing was 12.5–15.0 kg/ac. Farmers applied organic manure in the form of FYM and also applied 60-75kg/ac urea for the nursery management The rate of fertilizer application was 120 kg N/ha and 20kg $ZnSO_4$. In the main field. Farmers followed random method of transplanting. The weed infestation found was low to moderate and in general, weedicides like Pretilachlor and Pyrazosulfuron @60kg/ac were used in addition to hand weeding for control of these weeds. The insect pest infestations observed were stem borer and leaf folder at low to moderate intensities. Hopper burn symptoms were mostly observed on Peeli Pusa, Pusa 44 and less on early maturing varieties like PR121, PR126 and PR124. Low to moderate intensities of leaf blast, sheath blight and bakanae disease were observed during the cropping season. Farmers applied chemical control measures like Imidachloprid @ 100 ml/acre, Buprofezin @500 ml/ acre+ Tebuconazole @ 300ml/acre.

Fatehgarh Sahib and Ropar The survey was conducted in 9 villages in Fatehgarh Sahib and 3 villages from Ropar district when the crop was at booting stage. The general climatic conditions for the rice crop were quite favourable during the year. The prevailing crop rotation followed in these districts was Rice-Wheat. The major high yielding and basmati varieties grown in both the districts were Pusa 44, PR 121, PR 126, HKR 127, PR 118 and Pusa basmati 1. Regarding seed rate about 15 Kg seed was used and at the time of nursery preparation and applied urea 50-75 kg/acre for raising the nursery. Nitrogen was mostly applied in the form of either DAP or urea. In the main field, NPK was used in the ratio of 130:30:20 including zinc sulphate 12.5 N/ha. Urea was applied in 3 split doses. The weed population was low or medium. Most of the farmers applied herbicides like bispyribac sodium @100 ml/ac and Pyrazosulfuron @60kg/ac for management of weeds. Only sheath blight at moderate to severe form was recorded among the diseases where as low to moderate intensity of BPH, WBPH and leaf folder infestation was observed during the season. Traces of false smut and bakanae diseases were observed.

Faridkot and Moga: The Production Oriented Survey was conducted in 10 villages in Faridkot district and 2 villages in Moga district when the crop was at booting stage. The general climatic conditions for the rice crop were favorable during the year. The prevailing crop rotation followed in these districts was rice-wheat. The major varieties grown in the district were Pusa 44, PR114, PR 116, PR 118, KKR 47, PR 122 and Pusa 1121. The rice yield of previous season was an average of 3250kg/ac. Most of the farmers followed the nursery management practices like seed treatment with fungicides, use of organic manure in the form of FYM. The fertilizer application consisted of 75 kg N and FYM @20q/acre at the time of nursery. Nitrogen was mostly applied in the form of either DAP or urea. The weed population was low or medium. Some farmers applied herbicides (pyrazosulfuron @ 60 g/ac) for management of weeds. Among the diseases, low to moderate incidence of sheath blight and among pests, stem borer and leaf folder at low intensities were observed. **In Moga district, incidence** of ***Erwinia* rot** was also observed. Source of irrigation was from canals

and deep tubes and there was no scarcity of irrigation. Farmers did not face any problem regarding the availability of fertilizers and electricity and got the technical know-how from the department of Agriculture.

Ludhiana and Barnala: The Production Oriented Survey was conducted in 17 villages in Ludhiana district and four villages in Barnala district was done when the crop was at booting stage. The general climatic conditions for the rice crop were favorable during the year. Most of the farmers were marginal. The prevailing crop rotation followed in these districts was rice-wheat. The major varieties grown in this district were PR127, PR126, PR 121, PR 118, HKR 47, PR 116 and Pusa 1121. Seed rate used was of 20 kg/ha. Planting was done from 2nd week of June to second week of July. Farmers followed the nursery management practices like seed treatment with fungicides, use of organic manure in the form of FYM, nutrient management and early planting. Nitrogen was mostly applied in the form of either DAP or urea. In the main field, NPK was applied at the ratio of 140:30:20 and 25 kg Zn SO_4. The weed population was medium. Some farmers applied herbicides (bispyribac sodium and Pretelachlor 50 EC @ 500 ml/acre) for management of weeds. Low to moderate incidences of sheath blight, bakanae and false smut were the most common diseases observed during the season. BPH, WBPH and leaf folder were recorded in low intensities. Farmers applied Fame 30ml/ac and confidor 40 ml/ac) for the control of pests.

Mansa, Mukatsar and Batinda: Production oriented survey was conducted in four villages in Mansa,three villages in Mukatsar and a single village in Batinda district during the *kharif* season of 2017. The weather conditions were normal in most of the places surveyed. At the time of survey, most of the rice fields were in at booting stage. The predominant varieties cultivated in these districts were: Peelipusa, Pusa 44, PR 121, PR 122 and Pusa 1121. Farmers adopted transplanting in 2nd to 3rd week of July. Few farmers applied FYM in the nursery. In the main fields, farmers applied 180-230 kg N/acre. The weed population was low medium in most of the places the predominant weeds were Echinchloa crusgalli and Leptochorea sp. They had followed water ponding method for removal of the weeds and alo applied weedicides like Bispyribac sodium @1000ml/ac. In Batinda, only false smut was noticed but in Mansa, neck blast was more severe on pusa1121 and sheath blight on pelli pusa. Among the biotic constraints, sheath blight and neck blast was moderate on PR 121, PR122 in some places. Insect pests like WBPH, stem borer and leaf folder were observed in trace or low intensities. Most of the farmers adopted plant protection measures. No abiotic factors and toxicity problems encountered in these regions and farmers are happy to continue the crop for the next season. Farmers are happy with the timely availability of fetilisers, seeds, pestivdes and electricity. Farmers followed proper weed and nutrient management practices and timely sowing of the crop there by achieved higher yields in the previous season (4800kg/ha)

Jalandhar and Kapurthala: Survey was conducted during booting stage of the crop in fourteen villages of Jalandhar and two villages of Kapurthala. The main crop rotation was rice- wheat. The general climatic conditions during the crop growth stage were normal. The major varieties grown in this area were PR 121, PR126 and PR 114. The levels of weed infestation in these districts were low. Farmers used 10-12 kg of seed per hectare as seed rate and random method of transplantation was followed. In the nursery, farmers applied 4-10 Kg N; DAP 60Kg; MOP 25Kg. In the main field farmers applied 130 Kg N and 12.5Kg Zn SO_4 as basal and another 50 Kg N in splits. The level of weed infestation in these districts was low. Among the biotic constraints, low incidence of sheath blight, grain discoloration, leaf blast and false smut were reported. Not much insect infestation was observed. Source of irrigation for rice cultivation was from canals. Farmers were happy with the timely availability of inputs like electricity and fertilizers and the technology transfer from Punjab Agriculture University and State department of Agriculture.

Taran Taran and Ferozpur: Production oriented survey was conducted in two villages in Taran Taran district, eleven villages in Ferozpur district. The general climatic conditions were very much favorable during the cropping season. During the survey period, the crop was at booting stage in both the districts. The widely grown varieties were: PR 118, PR 114, Pusa 44 and Pusa 1121. Optimum time of planting was 3rd week of June to 1st week of July in both the districts. The most common crop rotation prevailed in this area was paddy- wheat. Seed rate followed by the farmers was 15-20 kg/acre and followed seed treatment. Application FYM and inorganic fertilizers in the nursery was a common practice for the farmers. Fertilizer dose applied was Nitrogen @ 150 kg per acre another 150 kg Nitrogen was applied in three splits. Weed infestation was low to medium. Most of the farmers used herbicides pyrezo sulfuron and bispyribac sodium 1000 ml/ ac. Among insects, brown plant hopper, stem borer leaf folder was low to medium levels and insecticide like confider @3L/ha, chloripyriphos 20EC@1 l/ac, was were applied for control of insects., sheath blight, sheath rot, false smut and bakanae diseases were also observed in low to moderate level.

Nawanshahar and SBS Nagar: Production oriented survey was conducted in six villages of in Nawanshahar and one village of SBS Nagar in Punjab. The weather conditions were normal in all the places surveyed. At the time of survey, some of the rice fields were at booting stage Farmers took one rice crop in a year and rice-wheat rotation was the only crop rotation in these districts. The predominant rice varieties in these districts were PR 116, PR 121, PR122 and Pusa 1121. Farmers used 20 kg/acre seeds for sowing. In the main fields, farmers applied 100 kg N/ha and 20 kg P_2O_5/ha. However, P application was done only by few farmers. The method of transplanting was random. The population of weeds was low to negligible. The weedicides like butachlor (1200 ml/acre) and Rifit (600-700 ml/acre) were used by the farmers for the management of weeds. Low to moderate level of sheath blight disease was observed in all the four districts. Farmers applied different pesticides like chlorpyriphos (500-1000 ml/acre), Regent (7.5-10 kg/acre), for control of stem borer and leaf folder.

Prevalence of diseases and pests in Punjab during *Kharif*' 2017

Districts	**Diseases**								**Pests**			
	ShBl	**BS/GD**	**ShR**	**Bl**	**NBl**	**BLB**	**FS**	**BK**	**SB**	**LF**	**BPH**	**WBPH**
Muktsar	L-M	L-M	-	-	-	-	L	L	L	L-M	L-M	L-M
Jalandhar	L	-	-	-	L-M	-	-	L-M	L	L	L-M	L
Mansa	-	M	-	L-M	L-M	-	L	L-M	L	L-M	L-M	L
F'garh Sahib	L	-	-	-	-	-	-	-	L	L-M	L-M	L
Sangrur	M-S	M	-	M-S	M	-	-		T	L	M	M
Faridkot	M	-	-	L	M	-	L	L	T	M	L	L
Bathinda	-	-	-	-	-	-	L	L	T	L	L	L
Hoshiarpur	L-M	L-M	L-M	-	T	-	T	-	L	L	M	M
Patiala	-	-	-	-	-	-	M	L-M	T	L	M	M
Ferozpur	M-S	M	-	-	-	-	-	L-M	T	L	M	M
Gurdaspur	L-M	L-M	L	-	-	M-S	L-M	-	M	M	M-S	M
Barnala	M	L-M	-	-	-	-	-	L	L	M	M	M
Ludhiana	L-S	L	-	-	-	-	L	L	L	M-S	L-M	L-M
Ropar	M-S	L	L	-	-	-	L	-	L	L	M	-
Moga	-	-		-	-	-	-	-	M	L	M	M
Kapurthala	L-M	L	L	-	-	-	-	-	L	S	L-M	M
Taran Taran	M-S	-	-	L	-	-	-	-	L	L	L-M	L-M
Nawanshahar	L-M	-	-	-	-	-	L	-	Tr	Tr	L_M	L-M
SBS Nagar	L	-	-	-	-	-	-	-	T	T	L	L

Tamil Nadu

Districts Surveyed: *Thiruvanamalai, Dharmapuri, Krishnagiri, Theni, Tirunelvelli, Kanyakumari, Viruthunagar, Dindigul, Madurai* and *Thoothukudi*

Particulars of survey

Districts	Villages
Thiruvanamalai	Melehengam and Nagapadi
Dharmapuri	Pappampallam, Santhanapatti, Nathahalli, Attukottai, Nadappanahalli, Tarpayanahalli and Cinahanahalli
Krishnagiri	Arathanapatti, Periyapanamuttu and Kalveli
Theni	Periyakulam, Theni, Bodinayakkanur and Uttamapalaiyam
Tirunelvelli	Cherankovilpathu, Veeravanallur, Melavasal, Pathamadai, Moolaikaraipatti, Nanguneri and Unagkulam
Kanyakumari	Vembanur, Perumselvavilai, Puthalam and Pandavathoppu
Virudhanagar	Sattur and Rajapalayam
Dindigul	Attur, Nillakottai and Shanarpatti
Madurai	Thirumangalam, Madurai West, Melllur, Vadipatti and Allanganallur
Thoothukudi	Kataarimangalam, Kurumpus, Nazareth, Perikulum, Udayaarkulam, Aadhinathapuram, Meerangulam, Kunakatoor and Kanungulam

Widely prevalent varieties

Districts	Varieties
Thiruvanamalai	BPT5204 and Amman BT
Dharmapuri	Akshaya, Ponni, Archana, Amman, Sowbackya and Dhanista
Krishnagiri	ADT 39, ADT 49, CO(R) 51, TKM 13, Improved white ponni, BPT 5204, Paiyur 1, Amman, Amoga, Vasundra, Dhanuska
Theni	CO 51, BPT5204, ADT 45, White ponni, ASD 16
Tirunelvelli	ASD 16, NLR, ADT 45 and BPT 5204
Kanyakumari	TPS-3, ASD 16, CR 1009 and Kathisamba
Viruthunagar	Amman, NLR, ASD 16, CO 51
Dindigul	NLR, ADT 43, CO 51, BPT 5204
Madurai	NLR 3449, ASD 16, CO 51, BPT 5204, JGL-1798 and TKM 13
Thoothukudi	ASD16, ADT36 and CO51

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

Districts	Total geographical area in (ha)	Total cultivable area (ha)	Total cultivated area (ha)	Total irrigated area (ha)	Area under Rice(ha)
Thiruvanamalai	1,69,089	1,34,900	1,08,300	1,05,727	9,000
Dharmapuri	1,69,089	2,11,598	1,68,689	1,11,725	9,454
Krishnagiri	4,07,556	2,44,526	1,85,683	84,647	23,590
Theni	21,43,262	1,85,108	16,800	63,000	17,700
Tirunelvelli	6,82,308	1,91,618	1,68,733	1,00,751	79,765
Kanyakumari	3,24,330	1,11,400	15,200	72,200	10,200
Viruthunagar	4,24,323	2,01,600	1,77,700	1,01,500	1,38,800
Dindigul	25,107	10,100	7,800	4,050	1,200
Madurai	3,61,721	89,250	88,066	45,155	11,460
Thoothukudi	4,70,724	1,83,151	1,78,083	1,71,880	19,549

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

Parameters	Thiruvanamalai	Dharmapuri	Krishnagiri	Theni	Tirunelvelli
Total area under HYVs in the district (ha)	-	-	-	17700 ha	90974 ha
Most prevalent HYVs in the district	ADT-45	Ponni and BPT 5204	ADT 39, ADT 49,	BPT5204, ADT 45, NLR	ADT 45, ASD 16
Total area under rice hybrids in the district(ha)	Nil	Nil	Nil	Nil	Nil
Most prevalent rice hybrids in the district	Nil	Nil	Nil	Nil	Nil
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 equipments like transplanted/combine harvester	Yes	Yes	Combine harvester, paddy transplanter	Yes	Yes
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	-	SRI	SRI-14850 ha	SRI	SRI
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	-	Usage of plant protection chemicals	-	-	Usage of plant protection chemicals
What are the general problems in rice cultivation in the district?	-	Irrigation facilities	BPH, rice blast and zinc deficiency	Shortage of labours	Shortage of labours
Please provide any farmers association in the district	-	-	Tamil Nadu Vivasayaigal Sangam, Krishnagiri	-	-
Whether availability of labours is sufficient?	No	No	No	No	No
Whether there is any marketing problem of the produce?	No	No	Yes	No	No
Any major irrigation/power generation project in the district	No	-	KRP Dam and Kalavarapally dam irrigation project	No	-
Any soil testing program undertaken?	Yes	Yes	Soil health card	Yes	Yes
Any farmers' training program was organized by the state department of Agriculture/ University	-	-	yes	-	-

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

Parameters	Kanyakumari	Viruthunagar	Dindigul	Madurai	Thoothukudi
Total area under HYVs in the district (ha)	34500 ha	-	1500 ha	-	-
Most prevalent HYVs in the district	ASD 16, CR 1009, TPS 3, Ponni	ASD 16 and NLR	CO 51	ADT 45 and NLR	ADT 36, ASD 16
Total area under rice hybrids in the district(ha)	Nil	Nil	Nil	Nil	Nil
Most prevalent rice hybrids in the district	Nil	Nil	Nil	Nil	Nil
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 equipments like transplanted/combine harvester	Yes	Yes	Yes	Yes	Yes
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	SRI	SRI	SRI	SRI	SRI
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Usage of plant protection chemicals	Usage of plant protection chemicals	-	-	Usage of plant protection chemicals
What are the general problems in rice cultivation in the district?	Irrigation facilities	Shortage of labours	Irrigation facilities	Shortage of labours	Shortage of labours
Please provide any farmers association in the district	-	-	-	-	-
Whether availability of labours is sufficient?	No	No	No	No	No
Whether there is any marketing problem of the produce?	No	No	No	No	No
Any major irrigation/power generation project in the district	-	-	No	Periyar Vaigai River Command area	-
Any soil testing program undertaken?	Yes	Yes	Yes	Yes	Yes
Any farmers' training program was organized by the state department of Agriculture/ University	-	-	Yes	Yes	-

Ten districts *viz.*, Thiruvanamalai, Dharmapuri, Krishnagiri, Theni, Tirunelvelli, Kanyakumari, Viruthunagar, Dindigul, Madurai and Thoothukudi were surveyed during 2017. Lack of onset of southwest and delayed onset of northeast monsoon led to delayed planting in most of the districts surveyed. Cultivation of Kuruvai was affected in many districts. Farmers with deep well could alone cultivate during Kuruvai season. Farmers solely depended on canal irrigation were not able to cultivate rice during Kuruvai season. Delayed Thaladi cultivation was done in many districts due to delayed onset of northeast monsoon. Commonly grown varieties were Samba Mahsuri, Amman BT, Akshaya, Ponni, Archana, ADT 39, ADT 49, CO(R) 51, TKM 13, Improved White Ponni, ADT 45, White Ponni, ASD 16, Vasundra, Dhanuska, NLR 34449, JGL-1798 and ADT36. Average yield was 4000-5500 kg/ha. Complex fertilizers containing 17:17:17, NPK was applied by the farmers along with DAP as basal fertilizers. Urea and potash along with neem cake 50kg/ha was also applied as top dressing in some of the rice growing areas. Micro-nutrients, $ZnSO_4$ was also applied as basal fertilizer. Seed rate used by the farmers were varied from 30 to 90 kg per hectare and the seeds were purchased by the farmers every year from the local retailers. Seed rate of 10 kg/ha was adopted by farmers wherever the SRI method of cultivation was practiced. The intensity of weeds was low to medium. Herbicides nominee gold and butachlor were used along with one or two hand weeding for the control of weeds. Conoweeder was practiced by the farmers adopting SRI method of rice cultivation.

Farmers are facing insufficient labour for rice cultivation. Random transplanting, limited line transplanting and direct sowing were adopted by the farmers. Machine planting method of cultivation was also observed in few places in the surveyed districts. In the mechanized cultivation farmers are using the agricultural implements *viz.*, power tiller, tractor and machine harvester. Most of the places farmers are advised by the pesticide dealers for the usage fertilizers, pesticides and seed. In the surveyed districts major sources of irrigation were from canals and deep tube well. Farmers expressed scarcity of irrigation water and electricity. Harvesting is done by combine harvester and the use of combine harvester is gaining momentum among the various categories of farmers. Water scarcity and labour shortage are the common constraints faced by many farmers. Farmers are in need of short duration non-lodging market value varieties suitable for machine harvest. Among the diseases, blast and brown spot were widespread. Farmers applied different fungicides like tricyclazole, mancozeb and carbendazim for managing the diseases. The incidences of different insect pests were also low to moderate and different insecticides like acephate, profenophos, melathion, chlorpyriphos, moncrotophos and cartap were applied by the farmers. It was observed that 1-2 rounds of sprays were given for the control of pests. In several places higher dose of chemicals were used for the control of stem borer and leaf folder. Many places farmers routinely had the practice of mixing the insecticides with fungicides before application. This year also 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.

District wise observations

Thiruvanamalai: In Thiruvannamalai district, survey was conducted in Melehengam and Nagapadi at the tillering to booting stage of the crop. The fields surveyed were under irrigated ecosystem. The common crop rotation was rice-rice. Rice varieties, BPT5204 and Amman BT were the preferred varieties by the rice growers of this district. Average rice yield in the district was 3000-5000 kg/ha. Average seed rate was 30-50 kg/ha. In the main fields, fertilizers were applied @ 50-60 kg N/ha, 20-30 P_2O_5 kg/ha, 20-60 kg K_2O/ha respectively

through Urea, DAP, MOP. Some farmers also used complex fertilizers. Farmers followed random transplanting method. Intensity of weeds in the field was low to medium. Machineries like power tiller, tractor, tractor tiller and machine harvesters used were used by the farmers. Deep tube wells were the main sources of irrigation. Electricity was the main sources of power for different agricultural operations and all the farmers contacted told that there was scarcity of power. Many farmers expressed that the quality of fertilizers and pesticides was not very good. Farmers took their own decision for use of inputs. Leaf blast infection and stem borer infestation was the most common. Some farmers applied pesticides like monocrotophos (500 ml/ha), profenophos (300 ml/ha) and chlorpyriphos (300 ml/ha) for managing the insect pests. Unusual pest during the harvesting stage was observed. Majority of the farmers used seeds from private seed companies.

Dharmapuri: Seven villages in Dharmapuri district *viz*., Pappampallam, Santhanapatti, Nathahalli, Attukottai, Nadappanahalli, Tarpayanahalli and Cinahanahalli were surveyed when the crops were in tillering to booting stage. The fields surveyed were under irrigated ecosystem. Crop rotation with varied crops like, Greengram, fodder crops, Sugarcane, Ragi, Brinjal and Tomato were practiced by the farmers. Rice varieties like Akshaya, Ponni, Archana, Amman, Sowbackya and Dhanista were the most commonly used by the farmers. Average rice yield in the region ranged from 4000-7500 kg/ha in different varieties. The varieties like Amman yielded very high. Yield was comparatively more in *Rabi* season. Some of the farmers contacted told that they adopted seed treatment with *Pseudomonas*. Farmers applied organic manure like FYM and inorganic fertilizers like DAP in the nursery. In the main fields, farmers applied fertilizers like DAP (50-135 kg/ha), urea (20-50 kg/ha) and complex fertilizers like 19:19:19 (57 kg/ha). Some farmers also used zinc sulphate. Some farmers applied FYM and green manure in the main fields. The intensity of common weeds *like Echinochloa colona, Cynodon dactylon, Cyperus rotundus* and *Eclipta alba* was low. Hand weeding was commonly practiced by the farmers and application of herbicides was not common among the farmers. Some of the common needs of the farmers were irrigation water, labour and machineries. Majority of the farmers using seeds of previous year therefore no dependency over private seed companies. Deep tube wells were the main sources of irrigation. Electricity was the main sources of power for different agricultural operations and many told that there was scarcity of power. Diseases like leaf blast and brown spot and insect pests like stem borer and leaf folder were most common in the district. Application of different pesticides like acephate, quinalphos, Rogor, imidacloprid and lamda cyhalothrin cyhalothrin was followed by some farmers to protect the crop.

Krishnagiri: Production oriented survey was conducted in three villages (Arathanapatti, Periyapanamuttu and Kalveli) in this district at the booting stage of the crop. The fields surveyed were under irrigated ecosystem. Rice-rice was the most common crop rotation followed by the farmers. Commonly grown rice varieties in the district were ADT 39, ADT 49, CO(R) 51, TKM 13, Improved white ponni, BPT 5204, Paiyur 1, Amman, Amoga, Vasundra and Dhanuska during Kharif/Rabi season. Average yield obtained during the year was around 2300 kg/acre. The fertilizers were applied @ 65-85 kg N/ha, 20-40 kg P_2O_5/ha and 20-40 kg K_2O/ha. Some farmers applied FYM in the main fields. The intensity of common weeds was low. Hand weeding was commonly practiced by the farmers. Implements like tractor, harvester and power tiller were used by the farmers. Majority of the farmers using seeds of previous year therefore no dependency over private seed companies. Most of the farmers contacted expressed scarcity of water and electricity. Biotic stresses like leaf blast, stem borer and BPH were observed during the survey. Some farmers applied Cartap/Monocrotophos to protect the crop from pest.

Theni: Four villages viz., Periyakulam, Theni, Bodinayakkanur and Uttamapalaiyam were surveyed when the crops were in tillering to booting stage. The fields surveyed were under irrigated ecosystem. Rice-rice was the most common crop rotation followed by the farmers. Commonly grown varieties in the region were CO 51, BPT5204, ADT 45, White ponni and ASD16. Average rice yield in the district was 4000-5000 kg/ha. The fertilizers were applied @ 60-85 kg N/ha, 20-32 kg P_2O_5/ha and 20-25 kg K_2O/ha and the nutrients were supplied through Urea, DAP and Complex fertilizers. Some farmers applied the growth hormones which are actually recommended for vegetable and fruit crops. Few applied FYM in the main fields. The intensity of common weeds was low to medium. Hand weeding was most common and only few applied butachlor. Farmers used hired yractor, power tiller and machine harvester for field operations. The source of irrigation is deep tube well and canal. The problem was late onset of monsoon. Incidence of diseases like leaf blast and insect pests like leaf folder and stem borer was low to moderate. Few farmers applied pesticides like monocrotophos and cypermethrin for management of insect pests.

Tirunelveli: Seven villages *viz*., Cherankovilpathu, Veeravanallur, Melavasal, Pathamadai, Moolaikaraipatti, Nanguneri and Unagkulam were surveyed during tillering to maturity stages of the crop. All the fields surveyed were under irrigated ecosystem. The general climatic conditions were not highly favourable for rice cultivation as there were reports of drought or drought like conditions in some places. In addition to rice, some farmers are diverting part of their land for cultivation of other crops like vegetables and banana. Rice-rice was the most common crop rotation followed by the farmers. Other crops like banana, cotton, vegetables and black gram were also rotated with rice. Commonly cultivated rice varieties were ASD 16, NLR, ADT 45 and BPT 5204. Rice yield in the district varied widely from 2000-6000 kg/ha. The low yield was due to climate abnormalities. The average seed rate was 30-50 kg/ha and for SRI, it was 8 kg/ha. some of the farmers contacted told that they adopted seed treatment with Azophos, Azospirillus and phosphobacteria. Application of organic manure was not common in the nursery; however, most of the farmers applied inorganic fertilizers in the nursery. In the main fields, the fertilizers were applied @ 60-150 kg N/ha, 20-60 kg P_2O_5/ha and 25-80 kg K_2O/ha and the nutrients were supplied through Urea, DAP, SSP and MOP. Few applied zinc sulphate. All the farmers applied FYM in the main fields. Some farmers applied organic growth regulators like *Panchagavya, Vasambu* and *Kayalkalpam*. Many farmers adopted SRI. The intensity of common weeds like *Echinochloa colona, Cyperus rotundus, Cynodon dactylon, Mimosa pudicawas* and *Eclipta alba* (Karisalankanni) low to medium. In addition to hand weeding, some farmers applied herbicides like butachlor, Nominee Gold, Rifit Plus and Topstar. Some of the common needs of the farmers were timely availability of inputs, cono weeder, sprayers, markers and timely supply of canal water. Implements like puddler, power tiller, tractor, rotavator and rice transplanter were used by the farmers. Canal was the main irrigation source and most of the farmers expressed the scarcity of water and electricity. Diseases like leaf blast and brown spot were most common in the field and minor incidence of false smut was also observed. Stem borer and brown plant hopper infestation were the most frequent in the fields. Some farmers applied pesticides like monocrotophos, ekalux and chlorantraniprole for management of insect pests.

Kanyakumari: Four villages in Kanykumari district viz., Vembanur, Perumselvavilai, Puthalam, and Pandavathoppu were surveyed when the crops were in tillering stage. A total of 11 farmers were contacted during the survey. This district faced the flood damage during the cropping season. The common cropping sequences followed by the farmers were rice-rice

and rice-blackgram. Predominant varieties were TPS-3, ASD 16, CR 1009 and Kathisamba. Average rice yield in the district ranged from 3500-6500 kg/ha in different HYVs. Low rice yield in some fields was due to pest and diseases. Average seed rate was 30-60 kg/ha and about 40% farmers told that they treated the seeds with *Pseudomonas* and *Azospirillum*. Most of the farmers applied organic manure like FYM and green manure. Few farmers also applied chemical fertilizers like DAP. Fertilizer dose applied by farmers varied among each other. Mostly practiced dose was 87:250:100 of NPK fertilizer (interms of Urea, SSP, and MOP). Some farmers followed SRI method of rice planting. The intensity of common weeds like Echinochloa spp. and Cyperus rotundus was low to medium. Hand weeding was most common among the farmers. Application of herbicide was not followed because of less weed problem during the season. Some demands of the farmers were methods for organic cultivation, proper supply of labour, machineries, regular visits by agricultural officers and supply of biofertilizers. Implements like cono weeder, tractor, harvesters, puddler and transplanters were used by some farmers. Seed replacement rate was in the range of 30-50%. Canal was main source of irrigation. In general, farmers took their own decisions regarding different agricultural operations. Brown spot, blast, stem borer and leaf folder damages were observed. Application of Neem oil (5-10 ml/l) as a pesticide was followed to protect the crop from the pest and diseases in some places.

Virudhunagar: Survey was conducted in two villages in this district when the crops were in tillering to heading stage. A total of 10 farmers were contacted during the survey. All the fields surveyed were under irrigated ecosystem. Major crop rotation was rice-rice and the predominant varieties were Amman, NLR, BPT 5204 and ASD 16. Average rice yield was 4100-4500 kg/ha in different HYVs. Seed rate was 30-50 kg/ha and none of the farmers adopted seed treatment. . In the main fields, the fertilizers were applied @ 60-85 kg N/ha, 20-30 kg P_2O_5/ha and 20-30 kg K_2O/ha and the nutrients were supplied through Urea, DAP, SSP and MOP. Some farmers applied zinc sulphate (20 kg/ha). Many farmers applied FYM in the main fields. Planting was random. The intensity of weeds in the field was medium. In addition to hand weeding, some farmers applied weedicides like butachlor and Topstar. Implements like power tiller, tractor and combine harvester were used by the farmers. Most of the farmers used previous year's seeds for sowing. Almost all the farmers contacted expressed scarcity of irrigation water and electricity. In general, farmers took their own decisions regarding different agricultural operations. Leaf blast infection and stem borer infestation was most common. Farmers applied fungicides like carbendazim and mancozeb and insecticides like cartap, chlorpyriphos and Monocrotophos to protect the crop from diseases and pests.

Dindigul: In this district, three villages viz., Attur, Nillakottai and Shanarpatti were surveyed when the crops were in booting stage. A total of 10 farmers were contacted during the survey. All the fields surveyed were under irrigated ecosystem. Rice followed by rice was the main cropping sequence followed by the farmes. Commonly grown varieties in the district were NLR, ADT 43, CO 51 and BPT 5204. Average yield of these varieties were 4500 Kg/ha. Average seed rate was 45-50 kg/ha and none of the farmers adopted any seed treatment. The dose of NPK was 80-100, 40-60 and 20-50 kg/ha and the nutrients were applied through Urea, DAP and MOP. Few farmers applied zinc sulphate (10-30 kg/ha). Intensity of weeds (*Echinochloa*) in the field was medium. Hand weeding was most common for weed management. Implements like tractor, harvester and power tiller were used by the farmers. Majority of the farmers are dependent on the private seed companies for seeds. Almost all the farmers contacted expressed scarcity of irrigation water and electricity. In general, farmers took their own decisions regarding different agricultural operations. Pest and disease incidence were less

Madurai: Five villages viz., Thirumangalam, Madurai West, Melllur, Vadipatti and Allanganallur were surveyed in this district when the crops were in booting to heading stage. A total of 10 farmers were contacted during the survey. Rice followed by rice was the main cropping sequence followed by the farmes. Commonly grown varieties in the district were NLR 3449, ASD 16, CO 51, BPT 5204, JGL-1798 and TKM 13. Average rice yield was 48005600 kg/ha. Average seed rate was 40-50 kg/ha and none of the farmers adopted seed treatment. In the main fields, the fertilizers were applied @ 65-85 kg N/ha, 25-35 kg P_2O_5/ha and 20-25 kg K_2O/ha and the nutrients were supplied through Urea, DAP, SSP and MOP. Planting was random. Intensity of weeds was medium and practiced hand weeding. Some farmers applied butachlor. Implements like power tiller and harvester were used by the farmers. Majority of the farmers purchased seeds from private seed companies. Almost all the farmers contacted expressed scarcity of irrigation water and electricity. In general, farmers took their own decisions regarding different agricultural operations. Diseases like blast and brown spot and insect pests like stem borers were commonly observed. Farmers applied combination fungicides (carbendazim 12% + mancozeb 63%WP) as a prophylactic measures against blast and brown leaf spot diseases.

Thoothukudi: Nine villages viz., Kataarimangalam, Kurumpus, Nazareth, perikulum, Udayaarkulam, Aadhinathapuram, Meerangulam, Kunakatoor and Kanungulam were surveyed in this district when the crops were in tillering stage. All the fields surveyed were under irrigated ecosystem. Common cropping sequences followed by the farmers were rice-pulses and rice-groundnut. Commonly grown varieties in the district were ASD16, ADT36, Karnataka ponni and CO51. Average yield of the crop was estimated around 4000Kg/ha for both ASD 16 and Karnataka Ponni. Fertilizers were applied @ 200-300 kg urea/ha, 200 kg SSP/ha and 50-80 kg MOP/ha. Most of the farmers applied FYM in the main fields. Intensity of weeds like Cuperus and Cynodon was low to medium and in addition to hand weeding, most of the farmers applied weedicides like butachlor and Nominee Gold. One major demand of the farmers was loan facility. Implements like rotary weeder, tractor, rotavator, cono weeder and power tillers were used by the farmers. Many farmers purchased seeds from private seed companies. Almost all the farmers contacted expressed scarcity of irrigation water and electricity. In general, farmers took their own decisions regarding different agricultural operations. Among the biotic stresses, brown spot and stem borer were frequently observed in the field. Application of Monocrotophos was done to contain the thrips infestation in the nursery and in the main field.

Prevalence of diseases and insect pests in Tamil Nadu during *Kharif*'2017

Districts	**Diseases**					
	Bl	**NBl**	**BS**	**ShBl**	**FS**	**BLB**
Thiruvanamalai	M	-	-	-	-	-
Dharmapuri	M	-	S	L	-	L
Krishnagiri	M	-	-	-	-	-
Theni	L-M	-	-	-	-	-
Tirunelvelli	M	M	S (20-60%)	-	L	-
Kanyakumari	M	-	M-S (10-30%)	L	-	-
Virudhanagar	L-M	-	-	-	-	-
Dindigul	-	-	-	-	-	-
Madurai	M	-	M	-	-	-
Thoothukudi	-	-	L-M	-	-	L

Districts	**Insect pests**				
	LF	**SB**	**BPH**	**Rice Skipper**	**Th**
Thiruvanamalai	-	10	-	-	-
Dharmapuri	15	10-15	-	-	-
Krishnagiri	-	10-15	-	-	-
Theni	5-10	0-15	-	-	-
Tirunelvelli	-	5-15	5	-	-
Kanyakumari	5-15	5-10	-	L-M	-
Virudhanagar	5-10	5-10	-	-	-
Dindigul	-	-	-	-	-
Madurai	-	5-15	-	-	-
Thoothukudi		2-5			L

Telangana

Districts surveyed: *Ranga Reddy, Medchal, Vikarabad, Medak, Sanga Reddy, Siddipet, Nizamabad, Kamareddy, Karimnagar, Peddapally, Jagtial, Warangal (R), Mahabubabad, Janagaon, Mahabubnagar, Wanaparthy, Nagarkurnool, Khammam, Bhadradri Kothagudem, Nalgonda* and *Suryapet*

Particulars of survey

District	Mandal	Villages
Ranga reddy	Chevella and Moinabad	Allor, Chenveli, Gollapalle, Khanapur, Kistapur, Amdapur. Sriramnagar and Surangal
Vikarabad	Pudur, Pargi, Doma and Kulkacherla	Cheelapur, Kandlapalle, Somangurthi, Kankal, Chintalapalle, Govindapur, Raghavapur, Raploe, Sultanpur, Mallepalle, Mothkur, dadapur, Dirsampalle, Chellapur, Malkapur and Venkatapur
Ranga Reddy	Maheswaram	Raviryal, Imamguda, Nagaram and Nagireddypalle
Nizamabad	Bodan, Varni, Kotagiri, Birkur and Renjal	Achampalle, Bardipur, Erajipalle, Narsapur, Akbarnagar, Chandur, Thimmapur, Mallaram, Hegdoli, Ethonda, Kothaplli, Eklaspur, Chincholi, Nachupalle, Kistapur, Nasurullabad, Dupally and Bageapple
Kamareddy	Banswada	ChinnaRampur, Thirmalapur, Konapur, Budmi, Hanmajipet and Desaipet
Jagtial	Jagtial and Gollapally	Polasa, Gullapet, Thakkellepally, Dharmaram, Goindapally, Thirmalapur, Shekkella and Chilvakoduru
Peddapally	Dharmaram and Sultanabad	Chamanpally, Dongathurthy, Mallapur, Katnepally, Neerukulla, Sultanabad and Regadimaddikunta
Karimnagar	Manakondur	Lingapur, Veldi and Pachnur
Bhadradri and Kothagudem	Sathupalli, Khammam and Palair	Vemsoor, Kallur, Kamepally, Nelakondapalli and Kusumanchi
Khammam	Vemsoor, Khammam (R), Kusumanchi, Nelakondaplli and Thirumaylaypalem	Adsarlapadu, Ammapalem, Duddipudi, Marlapadu, Venkatyaapalem, Gollapadu, Gurralapadu, Jakkepalli, Naykanigudem, Palair, Rajupeta, ErragaddaTanda, Guruva Reddy Gudem, Ammugudem, Chennaram, Chruvumadharam, Pinampalli, Beerolu, Eddulacheruvu and Thallachruvu
Medak	Papannapet	Arepalli, Gandharipalli and Laxminagar
Warangal (R)	Atmakur, Geesu-konda and Parkal	Venkatapur, Neerukulla, Pulkurthi, Katakshapur, Arepally, Gorrekunta, Elkurthy, Kommala, Cherlapalli,Nagaram, Narlapur and Sravapur
Jangoam	Station Ghanpur and Raghunathapalli	Fathepur, Kondapur, Malkapur, Raghavapur, Ashwaraopalli, Kanchanapalli and Jaffergudem
Mahabubabad	Mahbubababad, Kuravi and Kesamudram	Anataram, Edulapusapalli, Laxmipur, Ayyagripalli, Chintaplii, Mogilicherla, Narayanpur, Korukondaplli, Intikanne and Kalwala
Mahabubnagar, Wanaparthy, Nagarkurnool	Kothakota, Nawabpet, Pulkal, Farookhnagar and Kosgi	Gopannapet, Ajjakollu, Venkatapur, Choutukur, Elikatta, Lalkota, Chennaram, Chnadravancha, Husnabad, Pothireddypally, Sarjakhan Pet, Bijjaram, Chennaram and Mirjapur
Nalgonda	Chowtuppal, Shaligo-wraram, Miryalguda, Huzurngar and Damaracherla	Shaligowraram, Valigonda, Produtur, Chunga thanda, Ilapuram, Shetty palem and Miryalaguda
Suryapet	Jagireddigudem and Thirumalagiri	Parsaipally, Kunchamarthi, Thungathurti, Thimapur, Adivemula, Kommala, Anataram, Alalpuram and Mamidipaly

During *kharif* 2017, the POS was conducted in 21 districts *viz.*, Ranga Reddy, Medchal, Vikarabad, Medak, Sanga Reddy, Siddipet, Nizamabad, Kamareddy, Karimnagar, Peddapally, Jagtial, Warangal (R), Mahabubabad, Janagaon, Mahabubnagar, Wanaparthy, Nagarkurnool, Khammam, Bhadradri Kothagudem, Nalgonda, Suryapet covering major rice growing areas of Southern Telangana, parts of Northern Telangana and Central Telangana zones of Telangana state. Farmers' fields were surveyed randomly at 20-25 km distance and it is conducted twice in a crop season; once during tillering to maximum tillering stage and again during grain filling to maturity stage. The information on various aspects of rice cultivation *viz.*, seasonal conditions, crop coverage and package of practices, abiotic/ biotic constraints and their management are discussed. The information on the aforesaid aspects was collected from the progressive farmers, Mandal Agrl officers, Dist. Agrl Officers, Input dealers of the respective areas through interaction and participatory approach.

A. General information

A.1. Seasonal Conditions

The rainfall received from South West monsoon and North East monsoon during the period from June, 2017 – January, 2018 along with district wise rainfall situation is furnished in Table 1 and 2.

Table 1: Month wise Rainfall received in Telangana State from 01-06-2017 to 28.12.2017

Month	Normal	Rainfall during 2017	Rainfall during 2016	%Deviation to normal	Status
June, 2017	128.3	188.8	137.5	-47.7	Deficit
July, 2017	239.8	146.2	176.1	-40.0	Deficit
August, 2017	217.7	192.6	101.1	-12.0	Normal
September, 2017	129.5	118.0	271.1	-6.0	Normal
S W Monsoon	**715.9**	**645.6**	**685.8**	**-10**	Normal
October, 2017	97.0	127.53	19.8	+31.83	Excess
November, 2017	23.9	2.50	0.6	-90	Scanty
December, 2017	3.1	0.0	0.5	-100	Scanty
N E Monsoon	**124**	**130.03**	**20.09**	**-5.10**	**Normal**
Cumulative Total (01-06-2017 to 28-12-2017)	**839.8**	**774.7**	**706.20**	**-8**	**Normal**

Table 2: District wise average rainfall for the period from 1.6.2017 to 31.1.2018

District	Normal Annual rainfall	Cumulative total from 01-06-2017 to 31-1-2018 (in MM)						Status
		During the period			Corr. Period of		% Dev.of current actual over previous	
		Normal	Actual	% Dev.	Actual	% Dev.		
Nizambad	1039.0	978.5	713.3	-27	165.7	9	-33	Deficit
Jagtial	1034.6	963.7	646.4	-33	764.4	-21	-15	Deficit
Peddapally	1055.4	995.0	694.9	-30	695.8	-30	16	Deficit
Bhadradri	1132.6	1019.1	969.4	-5	890.0	-13	9	Normal
Mahabubabad	1007.7	920.3	872.3	-5	767.0	-17	14	Deficit
Warangal (R)	1037.4	955.2	903.6	-5	877.5	-8	3	Normal
Karimnagar	898.3	831.4	731.5	-12	669.7	-19	9	Normal
Kamareddy	1029.0	973.8	879.1	-10	897.9	-8	-2	Normal
Sangareddy	895.4	829.7	819.7	-1	831.8	0	-1	Normal
Medak	916.9	851.3	663.4	-22	814.8	-4	-19	Deficit
Jangoam	867.6	794.5	715.6	-10	604.0	-24	18	Normal
Rangareddy	694.6	638.8	806.0	26	453.3	-29	78	Excess
Vikarabad	814.3	751.0	690.7	-8	721.5	-4	-4	Normal
Mahabubnagar	599.4	562.3	786	40	458	-19	72	Excess
Wanaparthy	579.6	538.6	637.1	18	416.5	-23	53	Normal

District	Normal Annual rainfall	Cumulative total from 01-06-2017 to 31-1-2018 (in MM)						Status
		During the period			Corr. Period of		% Dev.of current actual over previous	
		Normal	Actual	% Dev.	Actual	% Dev.		
Nagarkurnool	642.3	602.2	532.7	-12	423.9	-13	26	Normal
Nalgonda	704.2	652.7	646.7	-1	560.4	-14	16	Normal
Suryapet	836.8	779.5	686.6	-12	564.7	-28	22	Normal
Khammam	1036.0	939.9	855.9	-9	548.5	-42	56	Normal
Telangana Average	**905.3**	**839.8**	**774.7**	**-8**	**706.2**	**-16**	**10**	**Normal**

Source: Directorate of Economics & Statistics, TG: 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%)

South West Monsoon (1.6.2017 – 30.9.2017): During the South-west monsoon period a total of 645.6 mm rainfall received in Telangana as against normal rainfall of 715.9 showing deviation -10 % with over all status being normal.

North-East Monsoon (1.10.2017 to 28.12.2017): Normally the Telangana state receives only 14% rainfall during North East monsoon. The average normal rainfall of north east monsoon is 125 mm. A total of 130.0 mm rainfall received as against normal rainfall of 124.1 mm, with deviation of +5.10% with over all status being normal. Over all the average rainfall received in Telangana State from 1.6.2017 to 31.1.2018 is recorded as 774.7 mm as against normal as on date 839.8 mm showing a deviation of -8 % with over all status being normal. District wise rainfall, Status and deviation of rainfall during the period from 01.06.2017 to 31.01.2018 in Table 3.

Table 3: Status and deviation of rainfall

Districts	No. of districts	Status & deviation
Ranga reddy, Mahabubnagar, Wanaparthy	3	Excess (20% & above)
Badradri, Mahabubabad, Warangal rural, Karimnagar, Kamareddy, Sanga Reddy, Medak, Jangaon, Nalgonda, Suryapet, Vikarabad and Khammam	13	Normal (+ 19% to -19%)
Nizambad, Jagtial and Peddapalli	3	Deficit (-20% to -59%)

A.2. Crop Coverage

In Telangana state, as against normal area of 9.34 lakh ha, the actual rice area covered during *Kharif*'2017 was 7.63 lakh ha (81.68%) compared to 9.87 lakh ha (83.7%) during *Kharif*' 2016 (Table 4).

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. Percentage of area coverage under rice

During *Kharif*' 2017, the overall percentage of rice area covered to the total cropped area was 19.57 % as compared to previous *Kharif*' 2016 (9.57%) in the surveyed districts maximum rice coverage (%) area to the total cropped area was maximum in Nizamabad district (Table 5).

Table 4: District wise normal and actual rice area (ha) covered during *Kharif*'2017 (as on 27.9.2017)

S.No.	District	Normal area (ha)	Actual area (ha)	% of coverage
1	Sanga Reddy	16305	19552	119.91
2	Peddapalli	42060	43932	104.45
3	Nizamabad	80886	80069	98.99
4	Jangoam	21907	21529	98.27
5	Kamareddy	38380	35978	93.74
6	Medak	38068	34874	91.61
7	Kothagudem	44246	39865	90.1
8	Jagtial	41669	37314	89.55
9	Warangal (R)	31954	25309	79.2
10	Wanaparthy	24007	18749	78.1
11	Khammam	62154	48506	78.04
12	Nalgonda	57567	44034	76.49
13	Karimnagar	38049	25308	66.51
14	Suryapet	66381	44051	66.36
15	Ranga Reddy	15655	9732	62.17
16	Mahabubabad	31234	16225	51.95
17	Mahabubnagar	36239	16161	44.6
18	Nagarkurnool	9004	3207	32.38
19	Vikarabad	13228	4032	30.48
Telangana Average		**934109**	**763023**	**81.68**

Source: www.tg.agrisinet.com, Directorate of Agriculture, TS& concerned district AOs, MAOs

Table 5: Percent rice area coverage to the total cropped area in different districts of Telangana during *Kharif*' 2017

S.No.	District	Total cropped area covered (ha)	Actual area (ha)	% of rice coverage to the total cropped area
1	Nizamabad	157029	80069	50.99
2	Peddapalli	86198	43932	50.97
3	Medak	76012	34874	45.88
4	Jagtial	93447	37314	39.93
5	Suryapet	126644	44051	34.78
6	Kothagudem	122368	39865	32.58
7	Wanaparthy	67051	18749	27.96
8	Karimnagar	93084	25308	27.19
9	Kamareddy	141101	35978	25.50
10	Khammam	196770	48506	24.65
11	Jangoam	107631	21529	20.00
12	Warangal (R)	129081	25309	19.61
13	Mahabubabad	102804	16225	15.78
14	Nalgonda	280052	44034	15.72
15	Sanga Reddy	194829	19552	10.04
16	Mahabubnagar	251997	16161	6.41
17	Ranga Reddy	163239	9732	5.96
18	Vikarabad	143207	4032	2.82
19	Nagarkurnool	196052	3207	1.64
Telangana Average		**3897979**	**763023**	19.57

Source: www.agri.telangana.gov.in, Directorate of Agriculture, TS& concerned district DAOs, MAOs

A. 5. Crop rotation practiced

Rice-rice was the predominant cropping system in all the surveyed districts varying from 60-70%. The other systems found were green manure-rice-rice, rice- maize, rice-groundnut, rice –fallow, rice-pulses, rice-rice –vegetables

A.6 to A.8: Varieties cultivated, change in varietal profile and reasons for cultivation of local varieties

The major varieties grown in the surveyed districts (Table 6) were Samba Mahsuri (BPT 5204), Telangana Sona (RNR 15048), HMT Sona, Jai Sreeram, Pooja, WGL 32100, WGL 14, MTU 1010, MTU 1001, Tellahamsa, Siddi, Bathukamma, Kunaram Sannalu, Chintu, etc., whereas the private hybrids grown particularly in Nalgonda, Warangal, Karimnagar 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.,). Among the fine grain popular varieties, the area under BPT 5204 was ranging from 13.98-48% as compared to previous *kharif* 2016 (28-47%) in all the surveyed districts. Telangana Sona a short duration (125 days) fine grain variety has replaced the BPT 5204 occupying considerable area in the surveyed districts ranging from 12-31%. Among the surveyed districts maximum area under Telangana Sona was covered in Peddapalli (31%) followed by Jagtial (28%), Warangal and Karimnagar (25%), Nagarkurnool (26.5), Vikarabad (24%), Rangareddy & Nalgonda (22%), Suryapet & Medak (21%), Khammam (18%), Nizamabad (13.5%), Kamareddy (12%), Mahabubnagar (11.4%) and Mahabubabad (10.93%). Majority of the farmers preferred Telangana Sona because of its short duration, super fine grain and blast resistance and suitability to late planted situations and requires less water. Further, farmers expressed that they could effectively manage BPH with one-two sprayings as compared to BPT 5204 wherein farmers resorting 4-6 sprays. Thus the farmers saved an amount Rs.2500 to 3500/- per acre (on plant protection and irrigation costs) by cultivating this variety.The newly released short duration coarse grain varieties (120 days) *viz*., Bathukamma (JGL 18047) and Kunaram Sannalu (KNM 118) are also becoming popular in all the surveyed districts covering an area ranging from (KNM-118: 1.45 to 14.81% and Bathukamma: 1.41-12.32%). These two varieties are mainly preferred by the farmers owing to their higher yields, moderate resistance to blast and non-shattering nature, which are replacing MTU 1010 in the surveyed districts. Similarly Siddi is gaining popularity in Warangal (R), Jangoan, Mahabubabad, Khammam, Kothagudem, Karimnagar, Jagtial, Peddapalli (3.33-8.15%) followed by WGL 32100 (1.67-4.76%). Tellahamsa, NLR 34449 are prevalent in Mahabubnagar, Nagarkurnool, Wanaparthy, Suryapet districts covering an area ranging from 4.86-10.20 and 2.38- 8.77% respectively.

A.9 and 10. Rice Yields harvested during previous season

The rice productivity in the surveyed districts during *kharif* 2017 was in the range of 3750 to 6800 kg/ha. The variation in the yield was mainly due to deficit rainfall, depletion of ground water in wells/ bore wells, late or non- release of canal water besides high incidence of BPH at later stages of crop growth resulted in poor yields. During *rabi* 2016-17,the rice area has been tremendouslyincreased due to late receipt of rains enhanced the ground water recharging besides favorable climate resulted in getting higher yields (4250 kg/ha).

Table 6: District wise, variety wise rice area (ha) covered during *Kharif* 2017

Varieties	R.R	VKB	NZB	KMR	MDK	SRD	MBNR	NGKL	WNP	NLG
Samba Mahsuri (BPT 5204)	2435 (25.02)	925 (23.00)	38435 (48.00)	15110 (42.00)	10450 (29.96)	4100 (20.96)	2260 (13.98)	485 (15.12)	3785 (20.18)	16325 (37.07)
Telangana Sona (RNR 15048)	2150 (22.09)	970 (24.00)	10810 (13.50)	4320 (12.00)	7325 (21.00)	3625 (18.14)	1930 (11.94)	850 (26.50)	3625 (19.33)	9725 (22.08)
Jai Sree Ram	370 (3.80)	80 (1.98)	15215 (19.00)	7525 (21.00)	5685 (16.30)	1225 (6.26)	585 (3.61)	125 (3.89)	675 (3.60)	750 (1.90)
HMT Sona	350 (3.59)	75 (1.90)	7565 (9.45)	5200 (14.45)	4650 (13.50)	875 (4.47)	475 (2.93)	95 (2.96)	585 (3.12)	685 (1.56)
Pooja	150 (1.54)	72 (1.80)	370 (0.50)	550 (1.52)	1225 (3.51)	1085 (5.54)	865 (5.35)	-	105 (0.56)	1125 (2.55)
Chintu	125 (1.78)	-	275 (0.34)	425 (1.18)	875 (2.50)	975 (4.98)	550 (3.40)	-	94 (0.50)	1575 (3.57)
MTU1010	1110 (11.40)	440 (10.91)	1450 (1.81)	1050 (2.91)	460 (1.31)	1725 (8.82)	2920 (18.06)	410 (12.78)	1225 (6.53)	36.50 (8.28)
MTU 1001	260 (2.67)	40 (1.00)	-	-	-	465 (2.37)	-	-	-	-
Kunaram Sannalu	840 (8.63)	525 (13.00)	2800 (3.50)	525 (1.45)	1265 (3.62)	1685 (8.61)	1905 (11.78)	475 (14.81)	2375 (12.66)	3275 (7.43)
Bathukamma	7.60 (7.80)	375 (9.30)	2375 (2.97)	510 (1.41)	1085 (3.11)	1550 (7.92)	1875 (11.60)	325 (10.13)	2310 (12.32)	3125 (7.09)
Siddi	-	-	-	-	375 (1.07)	810 (4.14)	-	-	-	-
WGL 14	-	-	-	-	285 (0.81)	570 (2.91)	-	-	-	-
WGL 32100	-	-	-	-	510 (1.46)	285 (1.45)	-	-	-	-
Tellahamsa	575 (5.90)	340 (8.43)	-	-	-	-	1650 (10.20)	325 (10.13)	1875 (10.00)	2450 (5.56)
NLR-34449	250 (2.56)	65 (1.61)	-	-	-	-	850 (5.25)	95 (2.96)	1645 (8.77)	1050 (2.38)
Others	357 (3.66)	125 (3.10)	724 (0.90)	763 (2.12)	684 (1.96)	577 (2.95)	296 (5.20)	22 (0.68)	450 (2.40)	299 (0.67)
Total	**9732**	**4832**	**80065**	**35978**	**34874**	**19552**	**16161**	**3207**	**18749**	**44034**

Source: Concerned district DAOs, MAOs,AMC

B. Nursery management

B.1. Seed rate

Majority of the farmers using optimum seed rate i.e. 50 kg/ha particularly for fine grain and super fine grain varieties whereas 75 kg/ha for coarse grain varieties.

B.2. Seed treatment

A portion of the farmers in surveyed districts adopted wet seed treatment to an extent of 40-48% by using carbendazim @1.0 g per kg of seed per liter of water by soaking for 24 hours and still majority of the farmers are sowing without any seed treatment resulting in poor establishment of seedlings both in nursery and main field.

B.3 & 4. 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. Only a few farmers used FYM or sheep manure @ 600-850 kg per 3-4 cents of nursery area.

Table 6-Continued: District wise, variety wise rice area (ha) covered during *Kharif* 2017

Variety	SURY	W (R)	JAN	MBD	KNM	KOTH	KAMN	JGL	PDP
Samba Mahsuri (BPT 5204)	16740 (38.00)	7085 (28.00)	5050 (23.45)	2350 (14.48)	23280 (48.00)	16750 (42.00)	9610 (38.00)	14150 (36.00)	17570 (40.00)
Telangana Sona (RNR 15048)	9250 (20.99)	6325 (25.00)	4855 (22.55)	1775 (10.93)	8730 (18.00)	5970 (15.00)	6330 (25.01)	10440 (28.00)	13620 (31.00)
Jai Sree Ram	950 (2.15)	975 (3.85)	750 (3.48)	555 (3.42)	925 (1.90)	865 (2.16)	750 (2.96)	965 (2.58)	1020 (2.32)
HMT Sona	975 (2.21)	930 (3.67)	655 (3.04)	545 (3.35)	755 (1.55)	595 (1.49)	625 (2.47)	985 (2.63)	915 (2.08)
Pooja	1020 (23.15)	985 (2.89)	585 (2.71)	625 (3.85)	615 (1.26)	625 (1.56)	550 (2.17)	885 (2.37)	850 (1.93)
Chintu	1110 (25.19)	1225 (4.84)	635 (2.94)	675 (4.16)	550 (1.13)	710 (1.78)	750 (2.96)	805 (2.15)	810 (1.84)
MTU1010	2755 (6.25)	675 (2.66)	665 (3.08)	1850 (11.40)	1670 (3.44)	1675 (4.20)	2180 (8.61)	2575 (6.90)	2085 (4.74)
MTU 1001	-	1530 (6.04)	1125 (5.22)	2150 (13.25)	1425 (2.93)	1560 (3.91)	750 (2.96)	1250 (3.34)	950 (2.16)
Kunaram Sannalu	3870 (8.78)	1875 (7.40)	1560 (7.24)	1865 (11.49)	2150 (4.43)	2250 (5.64)	1175 (4.64)	2125 (5.69)	2575 (5.56)
Bathukamma	3550 (8.05)	1650 (6.51)	1475 (6.85)	1750 (10.78)	2080 (4.28)	2165 (5.43)	895 (3.53)	2055 (5.50)	2025 (4.60)
Siddi	-	845 (3.33)	1225 (5.68)	985 (6.07)	2125 (4.38)	3250 (8.15)	875 (3.45)	350 (0.93)	750 (1.70)
WGL 14	-	575 (2.29)	1110 (5.15)	560 (3.45)	1665 (3.43)	1575 (3.95)	250 (0.98)	425 (1.13)	220 (0.50)
WGL 32100	-	425 (1.69)	1025 (4.76)	395 (2.43)	1125 (2.31)	1320 (3.31)	125 (0.49)	-	-
Tellahamsa	2150 (4.68)	-	-	-	-	-	-	-	-
NLR-34449	975 (2.21)	-	-	-	-	-	-	-	-
Others	706 (1.60)	208 (0.82)	814 (3.78)	165 (1.01)	871 (1.79)	555 (1.39)	443 (1.75)	304 (0.81)	542 (1.23)
Total	**44051**	**25309**	**21529**	**16225**	**48506**	**39865**	**25308**	**37314**	**43932**

C.MAIN FIELD

C. 1. Fertilizer application

Among the nineteen districts surveyed the usage of nitrogenous, phosphatic and potash fertilizers was varied to greater extent (Table 7). Majority of the farmers are applying NPK in the form of complex fertilizers (18-46-0, 16-20-0-13, 17-17-17, 19-19-19, 28-28-0, 20-20-13) besides as straight fertilizers in the form of Urea, SSP and MOP both as basal and as top dressers. In addition to this 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 7: District wise usage of major nutrients for *Kharif* rice 2017

Nnutrient (Kg/ha)	Districts surveyed							
	Vikarabad/ Ranga reddy	Nagarkurnool/ Mahabunagar/ Wanaparthy	Nalgonda/ Suryapet	Waranagal(R)/ Janagaon/ Mahbubabad	Karimnagar/ Peddapally/ Jagtial	Khammam/ BadradriKothgudem	Medak/ Sanga Reddy	Nizamabad/ Kamareddy
N	100-150	70-130	150-175	120-175	100-150	120-150	130-160	140-180
P_2O_5	50-75	50-100	60-120	50-100	50-60	50-75	50-105	50-105
K_2O	25-50	30-50	30-60	30-60	20-40	30-50	25-40	25-60

Source: Concerned district DAOs, MAOs

C. 2. Manures and organic amendments

Only a few farmers were growing green manure crops viz., Crotalaria, Sunhemp and green gram preceding to rice in NIzamabd,Kamareddy,Warangal and Karimnagar (20-25%), Khammam (10-15%) while in other districts usage was less than 10%. Usage of poultry manure in Nizamabad.Kamareddy,Khammam,Warangal/ Karimnagar was in the range of 5-15% and FYM application or Sheep manuring was minimum (5-20%).Across the districtssurveyed, sulphide injury, salinity or alkalinity was found to be major problem in Nalgonda, Suryapet, Jangoam, Mahabubabad, Nagrkurnool,MahabubnagarWanaparthy, Karimnagar, and Medak districts and its intensity is increasing several folds due to monocropping, improper drainage system and excess usage of inorganic fertilizers which containing more sulphurthan the recommended doses.

C.3. Method of planting

Random or Zig Zag method has been found to be the most common practice in all the surveyed districts and only a few elite group of farmers in Nizamabad, Kamareddy,Khammam, Warangal and Karimnagar are following line planting besides practicing alley ways in BPH endemic areas (<5%). Direct seeding with drum seeder under puddled condition or dry direct seeding with tractor drawn seed drill are gaining popularity among the progressive farmers in Khammam, Kothagudem, Suryapet, Nalgonda, Peddapally, in view of shortage of labour.

C.4. Intensity of weeds

Weed intensity was in the range of low to medium in all the major rice growing areas and predominant weed composition includes *Echinocloacolanum,E.crusgalli, Cyandondactylon, Cyprus rotundus, Leersiahexandra, Panicum ripens, Euphorbia spp. and Parthenium spp*.

C.5 & 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 framers**
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 500ml 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 bispyriback sodium @ 100ml/acre at 20 DAT to control both grassy and broad leaved weeds.

Majority of the farmers were taking up manual weeding at 25-30 DAT in all the surveyed districts.Under problematic soils the framers are taking up inter -cultivation to create aeration at root zone around 30-45 DAT along with application of Urea + Sprint. This practice helping in enhancing the nutrition of the plants.

C.6. 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.
- Development of multiple resistant hybrids varieties, particularly for BPH/ YSB/blast/sheath rot / grain discoloration.
- Supply of leveling machinery, transplaters ,power weeders/ motorized weeders suitable for mechanized planting/ direct seeding through custom hiring centres.
- Enhancing of the MSP Rs. 2700/- per quintal in view of the increased cost of cultivation.

D. Inputs

Majority of the small and marginal farmers are hiring the tractor drawn implements *viz*., cultivators, rotavators, disc plough, MB plough, leveler for their field preparation. Only progressive farmers are having their own tractor drawn implements including transplanters for undertaking rice cultivation. Majority of the farmers (92-97%) 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. As far as the source of irrigation water is concerned, in all the surveyed districts the rice crop is grown under wells/ bore wells (75%) and remaining are through canal water, tanks (25%). 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 the 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/divisional level.

The farmers were receiving advices with regard to fertilizer and pesticide recommendations through concerned mandal Agricultural Officers, Scientists of DAATTC and University Scientists, Kisan call centre and input dealers. Similarly, the Warangal farmers expressed their satisfaction for the recent introduction of IIRR mobile van for solving on the spot problems and analysis of soil samples and suggesting suitable remedial measures through interaction of IIRR scientists, KVK / Eruvaka staff and farmers at village level.

E.1. Insect pests & Diseases

Pest scenario in rice cultivation has been assessed in the 19 surveyed districts during *kharif* 2017 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 8. Among the minor insect pests, the incidence of whorl maggot ranged from 1-8% across the locations with maxium incidence in Kamareddy and Jangaon districts. However, out of 19 districts the incidence of whorl maggot was observed in only 8 districts. Rice hispa incidence was reported in 18 districts with maximum (3-12%) in Jangaon district.

Among the major insect pests, incidence of BPH was severe in almost all the 19 districts surveyed ranging from 3-36%. In all the districts incidence the severity ranged from 17-36% hopper burns. Overall the cultivation of susceptible varieties like BPT 5204, Aman Sona,

Jaisreeram etc., and high response to nitrogenous fertilizers due to frequent rains and use of resurgence causing chemicals like chlorpyriphos 50EC, Profenophos, Lamda Cyhalothrin and other synthetic pyrethroids resulted in high BPH incidence. Compared to BPT 5204, less incidence of BPH was noticed in Telangana Sona, KNM 118 and JGL 18047. Among the districts maximum damage due to BPH was reported from Nizamabad (5-36%), Kamareddy (5-32%), Nalgonda (5-32%), Khammam (10-35%) and Karimnagar (12-35%). In some districts like Nizamabad, Karimnagar, Khammam and Warangal districts the usage of bios resulting in plant succulence has further accentuated the BPH problem. Further, this year rainfall and high humidity prevailed during September of 2017 favoured BPH build up. Some farmers of Maheswaram mandal, Ranga Reddy district even used lambda cyhalothrin for BPH management due to lack of awareness.

Incidence of rice yellow stem borer ranged from 2-15% across the districts with maximum incidence reported from Jagtial (7-15%), Vikarabad (5-12%) and Karimnagar (5-12%) followed by Nagarkurnool, Warangal, Suryapeta and Peddapalli districts. Stem borer incidence was noticed in all the districts surveyed particularly during reproductive phase. Due to the rains, even though recommended chemicals for stem borer were used by the farmers, in some areas stem borer incidence was noticed. The gall midge incidence was minimal except in late planted situations of Karimnagar, Jagtial, Jangaon,Mahabubnagar and Nizamabad districts, wherein the gall midge incidence ranged from 2-10% silver shoots. The leaf folder incidence was also low ranging from 1-5% across the districts, except severe incidence of leaf folder in some pockets of Khammam. Numbers of minor pests have gained major pest status during the recent years and particularly incidence of panicle mite is increasing. The panicle mite incidence ranged from 3-18% across the districts and all the districts reported panicle mite.

Table 8: District wise insect pest damage recorded during *Kharif*, 2017

S.No.	District	BPH	YSB	Panicle mite	Gall midge	Rice hispa	Whorl maggot	Leaf folder
1	Ranga Reddy	3-18	5-9	3-12	3-5	2-5	1-3	2-5
2	Vikarabad	3-17	5-12	3-10	2-5	3-5	2-5	3-5
3	Nizamabad	5-36	3-10	5-15	3-8	2-5	-	2-5
4	Kamareddy	5-32	3-8	3-10	2-5	3-5	5-7	3-5
5	Medak	5-25	3-8	5-10	2-5	3-5	5-7	3-5
6	Sanga Reddy	3-20	5-7	3-8	2-5	2-5	-	-
7	Mahabubnagar	3-18	3-9	5-10	3-9	2-5	-	1-5
8	Nagarkurnool	5-17	5-10	3-7	3-8	3-5	-	2-5
9	Wanaparthy	5-18	3-7	5-8	2-5	2-5	-	3-8
10	Nalgonda	5-32	7-12	5-18	3-8	3-5	-	2-5
11	Suryapet	3-28	5-10	3-15	2-5	2-5	-	1-5
12	Warangal (R)	10-28	5-10	5-12	3-5	2-5	3-5	1-5
13	Jangoam	3-18	2-12	3-18	2-10	3-12	2-8	3-5
14	Mahabubabad	5-25	5-8	5-10	3-5	3-6	-	1-3
15	Khammam	10-35	3-8	3-10	2-5	3-7	2-5	2-5
16	Kothagudem	5-28	3-5	3-10	2-5	3-5	3-5	1-3
17	Karimnagar	12-35	5-12	3-10	3-10	2-5	-	1-3
18	Jagtiyal	5-17	7-15	3-8	3-8	2-5	2-5	2-5
19	Peddapalli	5-25	5-10	5-12	2-5	2-5	-	1-3

Source: Concerned district ADAs and Farmers Interaction

Perusal of the data on the incidence of various diseases (Table 9) revealed that the incidence of BLB was severe in 5 districts, mainly Khammam (5-28%), Nizamabad (3-28%), Kamareddy (3-25%), Kothagudem (3-25%) and Karimnagar (5-22%). Heavy rains coupled with winds disposed the crop to BLB infection. Sheath rot incidence was also moderate to severe in many districts with highest incidence reported from Kamareddy (3-30%) followed by Vikarabad, Warangal, Kothagudem and Khammam (3-26%) districts. Similarly grain discolouration was also moderate to severe across the districts. Eventhough leaf blast incidence was moderate to severe in Khammam (5-20%) followed by Warangal (5-10%) and Kamareddy (5-10%), in other districts only 3-8% incidence was observed. However, neck blast incidence in majority of the districts was severe ranging from 3-18%. Neck blast incidence was more in Khammam (3-18%), Kamareddy (5-17%), Mahbubabad (7-12%), Peddapalli (5-15%), Nalgonda and Karimnagar districts (5-12%). However, the incidence of stem rot was relatively low during *kharif* 2017.

Table 9: District wise per cent disease incidence recorded during *Kharif*, 2017

S.No.	District	BLB	Leaf blast	Neck blast	Sheath blight	Sheath rot	Grain discoloration
1	Ranga Reddy	1-3	1-3	3-7	2-5	5-18	2-5
2	Vikarabad	3-5	1-3	3-5	1-3	3-25	3-5
3	Nizamabad	3-28	5-8	5-12	3-7	5-28	3-8
4	Kamareddy	3-25	5-10	5-17	3-8	3-30	3-9
5	Medak	2-5	3-5	5-8	3-5	3-25	5-10
6	Sanga Reddy	2-5	3-5	5-8	3-5	3-17	3-5
7	Mahabubnagar	1-3	3-5	5-7	3-5	3-15	3-7
8	Nagarkurnool	3-5	2-3	4-5	3-5	3-20	3-8
9	Wanaparthy	3-5	2-3	3-7	5-7	3-18	3-10
10	Nalgonda	-	3-10	5-12	3-5	5-18	3-10
11	Suryapet	-	3-5	7-10	3-5	3-20	5-12
12	Warangal (R)	3-7	5-10	7-12	3-10	3-25	3-20
13	Jangoam	-	-	3-5	-	3-18	3-10
14	Mahabubabad	3-10	3-5	7-12	5-10	3-25	5-18
15	Khammam	5-28	5-20	3-18	5-12	5-26	3-20
16	Kothagudem	3-25	3-5	3-10	3-10	5-25	3-18
17	Karimnagar	5-22	3-8	5-12	5-1	3-17	3-25
18	Jagtiyal	3-12	3-5	7-12	3-8	3-20	3-18
19	Peddapalli	3-10	3-5	5-15	5-9	5-15	3-20

Source: Concerned district ADAs and Farmers Interaction

E. 2. Usage of plant Protection Chemicals

Perusal of data on usage of plant protection chemicals in rice was found to be maximum accounting for 97% in Warangal followed by Nalgonda (95%), Karimnagar (90%), Mahabubnagar (87%) and Ranga Reddy (40-52%). The following are most commonly used insecticides and fungicides against various insect pests and diseases based on the stage of the crop (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 during flowering stage of the crop was used for thorough coverage. Except hand sprayer, Power sprayer and Taiwan sprayer were

procured on hire basis during the crop season @ Rs 200/acre/day. 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 5-6 sprays during the crop growth period and at certain locations particularly at Warangal, Nizamabad, Khammam, Karimnagar, Jangaon, Peddapalli and Kamareddy they have gone even up to 6 to 8 sprays for the management of BPH, blast, neck blast, sheath rot, panicle mite and associated grain discolourtaion.

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

Stage of the crop	Insect pests/diseases	Chemicals used
Insect Pests		
Nursery	Sucking pests, gall midge, stem borer, thrips, whorl maggot and hispa	Phorate 10 G, carbofuran 3 G, fipronil 5SC, chlorpyriphos 50% EC, quinalphos 25%EC, lamdacyhalothrin, profenophos, acephate
Vegetative Stage	Hispa, whorl maggot, leaf folder, horned caterpillar	Phorate10G, carbofuran 3G, cartap hydrochloride 4G, Cartap Hydrochloride 50SP, acephate, chlorphyriphos 50%EC, monocrotophos 36SL, profenophos, chlorantraniliprole 0.4%G, chlorantraniliprole 18.5 SC
Vegetative Stage / 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 39.35SC, acephate 75 SP and acephate 95SG
Max.Tillering to Flowering Satge	BPH	Acephate 75 SP and 95SG, Ethofenprox, Buprofezin, Dinotefuran (Token, Osheen), Imidacloprid + Ethiprole (Glamore) 80WG , Pymetrozine (Chess), Lamdacyhalothrin, Fipronil 0.3G
Max.Tillering to Flowering	Green leafhopper	Acephate 75SP, ethofenprox. monocrotophos 36SL
Max. Tillering to Flowering Stage	Leaf mite / panicle mite	Wettable sulphur 50WP, dicofol, ethion. Omite, diafenthiuron, propargite
Reproductive Phase	Cut worm	Chlorpyriphos 50% EC, quinolphos 25%EC, acephate monocrotophos) + dichlorvos, quinalphos + dichlorvos
Diseases		
Nursery	Leaf blast / Seed borne diseases	Seed treatment with carbendazim
Vegetative/ Reproductive Phase	Leaf blast/ Neck Blast	Carbendazim, tricyclazole, isoprothiolane kasugamycin, kresoxim methyl, Custodia (azoxystrobin + tebuconazole)
Max.Tillering to Flowering Stage	Sheath Blight	Hexaconazole, validamycin, tebuconazole + trifloxystrobin (Nativo),
Max.Tillering to Flowering Stage	Stem rot	Validamycin, propiconazole, benomyl, hexaconazole, iprobenphos48%EC, carbendazim, Benomyl, topsin-M, tebuconazole (Folicure)
Flowering / Milky/ maturity	Grain discoloration	Propiconazole, tebuconazole + trifloxystrobin (Nativo), carbendazim, carbendazim+ mancozeb, antracol.

E. 5. Whether farmer is mixing different pesticides at the time of spraying, If Yes, then how many pesticides

During *Kharif*'2017, it has been observed that the majority of the framers 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. Common mixtures being used by the farmers in the surveyed districts were chlorantraniliprole + carbendazim + mancozeb; dinotefuran/ pymetrozine+ dichlorvos; dinotefuran/ pymetrozine+ carbendazim / tricyclazole/saaf; cartaphydrochloride 50sp+propiconazole; chlorantraniliprole + tricyclazole; acephate+ buprofezin + carbendazim / tricyclazole/saaf; acephate+nuvan+ carbendazim / tricyclazole/saaf; thiamethoxam+ acephate; chlorpyriphos+cypermethrin; profenophos+propiconazole; propineb+neem oil+mop; phorate 10g +urea; imidacloprid+acephate+dichlorovos; imidacloprid+tricyclazole; lamdacyhalothrin+ carbendazim / tricyclazole/saaf

Whether farmer is happy and wants to continue rice cultivation

The rice productivity in the surveyed districts during *kharif* 2017 was in the range of 2250-4750 kg/ha (Table 11) and this was very less compared to previous *kharif* 2016.The main reason for reduction yields was found to be late planting of rice crop (BPT 5204, HMT Sona, Jaisree Ram) pre disposed to severe cold , outbreak of BPH, BLB and neck blast leading to poor yields. Further, cloudy weather during reproductive phase contributed to no yields compared to previous *khairf* season. Based on the interaction with framers, more rice would be cultivated during *rabi* 2017-18 as water resources were improved in majority of rice growing districts of Telangana.

Table 11: District wise provisional yields (kg/ha) recorded during *kharif* 2017

S. No.	District	Provisional Yields (kg/ha)*
1	Ranga Reddy/Vikarabad	2850-3865
2	Mahabubnagar/Wanaparthy/Nagarkurnool	2465-3460
3	Nalgonda/Suryapet	2750-3200
4	Warangal/Janagaom/Magabubadad	2870-4100
5	Karimnagar/Peddapally/Jagtial	2250-4200
6	Khammam/Badradri Kothagudem	4100-4750

*Provisional yields calculated based on sampled farmers

J. Cost of Cultivation

The cost incurred for cultivation of paddy / acre was computed by using sampled farmers around 30 in the surveyed districts and details are furnished in the Table (11).

Table 11: Details of cost of cultivation of paddy in different districts (Rupees/acre)

S. No	Details of work / expenditure	MBNR/ NGKL/ WNP	RR/ VKB	NLG /SUY	KRNR/ JGL/PDP	KMM/ KOTH	WGL/ JAN/ MABD	NZB/ KMR	MDK/ SRD
1	Land preparation, Puddling & Levelling	950	1000	850	850	950	850	1000	1000

S. No	Details of work / expenditure	MBNR/ NGKL/ WNP	RR/ VKB	NLG /SUY	KRNR/ JGL/PDP	KMM/ KOTH	WGL/ JAN/ MABD	NZB/ KMR	MDK/ SRD
2	Bund Trimming	450	525	675	525	600	600	675	525
3	Seed Cost	900	900	900	900	900	900	900	900
4	Nursery raising	1000	850	850	900	850	1000	850	900
5	Nursery pulling and transplanting	1800	2000	1750	1800	1800	2000	1900	2000
6	Fertilizers	2500	2000	2500	2500	2600	2800	3000	3000
7	FYM/ manures	2500	2400	2800	2400	2600	2500	2500	2500
8	Pesticides	2725	1500	1800	3800	3500	3400	3850	2850
9	Weedicides	750	750	750	750	750	750	750	750
10	Hand Weeding	2000	2200	2300	2000	2300	2400	2400	2500
11	Manual harvesting, threshing	5500	5000	5200	5500	5200	5500	5200	5500
12	Machine harvesting	4500	5000	5500	4500	4500	5000	5000	4500
13	Miscellaneous	1000	1200	1000	1000	1200	1500	1200	1200
Total (manual harvesting) (Sl. No. 1 to 10, 11 and 13)		22075	20325	21375	22925	23250	24200	24225	23625
Total (machine harvesting) (Sl. No. 1 to 10, 12 and 13)		21075	20325	21675	21925	22550	23700	24025	22625

Uttar Pradesh-1

Districts Surveyed: *Faizabad, Ambedkarnagar, Barabanki, Sultanpur, Basti, Sant Kabir Nagar* and *Siddhrarth Nagar*

Details of survey

Districts	Block/Taluka	Villages
Faizabad	Masodha, Pura, Maya, Bikapur, Sohawal and Tarun	Dasarathpur, Rajepur, Bithalpur, Beusandhi (Roshan Nagar), Sariyawa and Mishrauli
Ambedkar Nagar	Akberpur, Bhiawan, Ramnagar, Tanda, Bhiti, Katehari and Jalalpur,	Anwa, Ansanpur, Burganna, Tajnapur, Bankathwawa, Ratnathpur, Batalipur, Manikapur, Tandwa Malhi, Kasimpur, Hazipur, Patana and Baskhan
Barabanki	Banki, Hydergarh, Trivediganj, Banikodar and Nidura	Narayanpur, Chandrauli, Iliaspur, Devapur, Bathola, Nivada, Shivdaspur, Alipur, Anwari and Amarsanda
Sultanpur	Dhanpatganj, Jaisinghpur. Baldirai and Kurebhar	Akrohi, Sarangpur, Baraita, Bishuhia, Pipergaon and Dubeypur
Basti	Harriya, Vikramjot and Kaptanganj	Shankarpur, Pachwas, Fatehpur, Khutehna, Tangpara, Rikkipur, Lalpur, Pudwa Mishra, Sidhawra and Katari
St. Kabir Nagar	Mehdawal, Khalilabad, Haiser and Pauli	Bairan, Mishanlia, Kanela, Rajnauri, Katari, Bissapur and Jorwa
Siddarth Nagar	Birdpur, Jogiya Uadaiveer, Methwal and Naugard	Kodera Grant, Dubripur, Madoripur, Debra Basan, Tingora, Asnar and Manikpur

Widely prevalent rice varieties

Districts	Varieties
Faizabad	**HYVs:** NDR 97, NDR 2064, NDR 2065, Sarjoo 52, NDR 359,Shusk Samarat, Narendra Lalmati, Jallahri, Narendra Usar Dhan-3, Sambha Mahsuri, Swarna, PB-1, Karishma, Idea and Moti Gold; **Hybrids:** Gorakhnath 509, Arize 6444 Gold, Syngenta 6302, Damini, US 312 PAC 801, PAC 832, Ganga Kaveri and 27P63
Ambedkar Nagar	**HYVs:** Narendra Lalmati, Dhanrekha, Super 115, NDR-97, Shusk Samarat, Sarjoo 52, NDR 359, Sambha Mahsuri, Swarna, Swarna Sub-1, Sawrnarekha and Moti Gold; **Hybrids:** 27 P 31, 27 P 63, Damini, Kaveri 9090, Dhanya 748, Syngenta 6302, US 312, Arize 6444 and Arize 6444 Gold
Barabanki	**HYVs:** NDR-97, Shusk Samrat, Sarjoo 52, NDR 359, Sambha Mahsuri, Swarna, Komal, Basmati and Narendra Lalmati; **Hybrids:** Arize 6444, US-312, JK 401, Pusa 1509, 27 P 31, Syngenta 6302, Arize 6444 Gold, Super 125, Super 115,27 P 63, Kaveri, Dhanya, Chandan 21 and Dhanuka 778
Sultanpur	**HYVs:** Narendra Lalmati, Narendra Usar Dhan-3, Komal, Sonam, Sambha Mahsuri, Swarna Sub1, PB - 1, NDR 2064, NDR 2065, Sarjoo

Districts	Varieties
	52, NDR 359,Shusk Samarat and Moti Gold; **Hybrids:** Gorakhnath 509, Damini, Arize 6444 Gold, Syngenta 6302, PAC 832, Ganga Kaveri, 27 P 31, 27P63, NDR 97 and Advanta 837
Basti	**HYVs:** NDR 359, Kalanamak, Moti Gold, NDR 8002, NDR 97, Swarna, BPT 5204, Basmati, 27P63, Komal and Jalpriya; **Hybrids:** Arize 6444 Gold, Syngenta 6302, Super 125, Gorakhnath 509, Damini, US 312 and Arize 6444
Sant Kabir Nagar	**HYVs:** NDR 97, Sambha Mahsuri, Swarna, Swarna Sub 1, NDR 359, Kalanamak and Sampurna; **Hybrids:** Gorakhnath-510, Gorakhnath-509, US -312, Arize 6444 Gold, Damini, 27P31,27P63, Syngenta 6302, Dhanya 8666 and VNR 2205
Sidharath Nagar	**HYVs:** NDR 97, Sambha Mahsuri, Swarna, Swarna Sub 1, NDR 359, Kalanamak and Pusa Basmati 1; **Hybrids:** Arize 6444 Gold, 27P63, Syngenta 6302, Dhanya 748, Gorakhnath -510, JK 401, Gorakhnath-509, Arize 6444 and US 312

Area under rice cultivation in surveyed districts during *Kharif*' 2017

Districts	Area (ha) under rice cultivation			
	Scented/ Basmati	Hybrid	Other	Total
Faizabad	1801	35002	60832	97635
Ambedkar Nagar	1100	75002	40269	116371
Barabanki	2026	48012	133320	183358
Sultanpur	1402	45000	49609	96011
Basti	2702	37503	62365	102570
St. Kabir Nagar	2630	28000	67165	97795
Sidharath Nagar	2602	63033	107921	173526

Rainfall distribution in surveyed districts during *Kharif*' 2017

Districts	Rainfall (mm)							
	June		July		August		September	
	Normal	Actual	Normal	Actual	Normal	Actual	Normal	Actual
Faizabad	106.5	53.5	306.1	239.6	282.0	28.5	196.7	0.0
Ambedkar Nagar	106.5	43.0	306.1	424.2	282.5	63.1	196.7	0.0
Barabanki	98.4	29.2	299.7	385.9	281.6	18.5	203.6	0.0
Sultanpur	87.3	76.7	307.1	260.7	289.5	24.9	202.8	0.0
Basti	126.2	47.65	279.4	299.58	368.0	151.54	141.2	94.48
St. Kabir Nagar	183.0	76.67	349.7	387.67	312.7	278.67	190.7	178.0
Sidharath Nagar	163.0	39.52	381.1	236.32	325.3	368.36	231.3	103.38

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

Parameters	Faizabad	Ambedkarnagar	Barabanki	Sultanpur
Total area under HYVs in the district (ha)	60832 ha	40269 ha	133320 ha	49609 ha
Most prevalent HYVs in the district	NDR 359, NDR 2065, NDR 2064, Sambha Mahsuri, Swarna	NDR 359Sambha Mahsuri, Swarna	NDR 359, NDR 2065, NDR 97, NDR 2064, Sambha Mahsuri, Swarna	NDR 359, NDR 2064, Sambha Mahsuri, Swarna
Total area under rice hybrids in the district(ha)	35002 ha	75002 ha	48012 ha	45000 ha
Most prevalent rice hybrids in the district	Arize 6444 Gold, 27P63	Arize 6444 Gold, 27P63, Gorakhnath 509	Arize 6444 Gold, 27P63, Damini	Arize 6444 Gold, 27P63, Damini, Syngenta 6302
Total area under basmati in the district	1801 ha	1100 ha	2026 ha	1402 ha
Most prevalent basmati varieties in the district	PB-1, Narendra Lalmati	PB-1, Lalmati	PB-1, Lalmati	PB-1, Lalmati
Whether farmers are using any heavy equipments like transplanted/combine harvester	Yes, Rotavator and combine harvester	Yes, Rotavator and combine harvester	Yes, Rotavator and combine harvester	Yes, Rotavator and combine harvester
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	By few farmers	By few farmers	Nil	Yes; Laser leveling
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Yes: regarding plant protection	Yes: regarding plant protection and proper spacing	Use of plant protection chemicals and fertilizers	Use of balanced fertilizers and plant protection measures
What are the general problems in rice cultivation in the district?	Shortage of labours and lack of quality seeds	Shortage of labours	Shortage of labours	Shortage of labours
Please provide any farmers association in the district	Yes	No	Yes	No
Whether availability of labours is sufficient?	No	No	No	No
Whether there is any marketing problem of the produce?	-	Yes	No	Yes
Any major irrigation/power generation project in the district	Canal network is available	NPTC Tanda	Canal network is available	Sarda Sahayak Canal
Any soil testing program undertaken?	Yes	Yes	Yes	Yes
Any farmers' training program was organized by the state department of Agriculture/University	Regular training/ Kisan Gosthi and Kisn mela is organized by Dept of Agriculture and KVKs of University	Regular training/ Kisan Gosthi and Kisn mela is organized by Dept of Agriculture and KVKs of University	Regular training/ Kisan Gosthi and Kisn mela is organized by Dept of Agriculture and KVKs of University	Regular training/ Kisan Gosthi and Kisn mela is organized by Dept of Agriculture and KVKs of University

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

Parameters	Basti	St. Kabir Nagar	Siddharth Nagar
Total area under HYVs in the district (ha)	62365 ha	67165 ha	107921 ha
Most prevalent HYVs in the district	NDR 359NDR 97, Sambha Mahsuri, Swarna	NDR 359, Samba Mahsuri, NDR 97	NDR 359, Samba Mahsuri, NDR 97
Total area under rice hybrids in the district(ha)	37503 ha	28000 ha	63003 ha
Most prevalent rice hybrids in the district	27P63, Gorakhnath 509	27P63, Gorakhnath 509	27P63, Gorakhnath 509, Arize 6444 Gold
Total area under basmati in the district	2702 ha	2630 ha	2602 ha
Most prevalent basmati varieties in the district	PB-1, Kalanamak	Kalanamak, PB-1	Kalanamak, PB-1
Whether farmers are using any heavy equipments like transplanted/combine harvester	Yes; Combine harvester	Yes, Rotavator and combine harvester	Yes; Combine harvester
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	No	Laser leveling and DSR	No
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Use of pesticides and herbicides and line transplanting	Use of pesticides and herbicides and line transplanting	Use of medium duration varieties and plant protection chemicals
What are the general problems in rice cultivation in the district?	-	Shortage of labours and high wages	Some areas are flood prone
Please provide any farmers association in the district	Yes	No	No
Whether availability of labours is sufficient?	No	No	Yes
Whether there is any marketing problem of the produce?	No	Yes	No
Any major irrigation/power generation project in the district	Some area is covered with canal	No	Some area is covered with canal
Any soil testing program undertaken?	Yes	Yes	Yes
Any farmers' training program was organized by the state department of Agriculture/University	Regular training/ Kisan Gosthi and Kisn mela is organized by Dept of Agriculture and KVKs of University	Regular training/ Kisan Gosthi and Kisn mela is organized by Dept of Agriculture and KVKs of University	Regular training/ Kisan Gosthi and Kisn mela is organized by Dept of Agriculture and KVKs of University

The production oriented survey of rice growing areas was conducted in Faizabad, Ambedkar Nagar, Barabanki, Sultanpur, Basti, Sant Kabir Nagar and Sidharth Nagar districts of eastern Uttar Pradesh during tillering to maturity stage during *Kharif*' 2017. The fields surveyed were under irrigated ecosystem and in general, the weather conditions were normal for rice

cultivation. Major crop rotation practices adopted by the farmers were rice-wheat, rice-mentha, rice-pulses, rice-mustard/potato, rice-pulses and rice-sugarcane. Different rice varieties cultivated by the farmers in the district were HYVs like NDR 97, NDR 2064, NDR 2065, Sarjoo 52, NDR 359,Shusk Samarat, Narendra Lalmati, Jallahri, Narendra Usar Dhan-3, Sambha Mahsuri, Swarna, PB-1, Karishma, Idea and Moti Gold and hybrids like Gorakhnath 509, Arize 6444 Gold, Syngenta 6302, Damini, US 312 PAC 801, PAC 832, Ganga Kaveri and 27P63. Most of the planting activities were done during last week of June to 1st week of July. Average seed rate was 30-35 kg/ha in case of HYVs and about 15 kg/ha in case of hybrids. Seed treatment was not common among the farmers and only few farmers treated seeds with carbendazim or *Trichoderma* formulations. In the main fields, fertilizers were applied @ 80-150 kg N/ha, 40-60 kg P_2O_5/ha, 40-50 kg K_2O/ha and 10-25 kg $ZnSO_4$/ha. However, potash application was done only by few farmers. Progressive farmers were using FYM, Compost and Green manure (Dhaincha, Urd bean, Moong bean) to improve the soil health resulted in better grain yield. Many farmers applied plant growth regulators like Hizyme, Biozyme, Microzyme and Boom flower in the field for better growth and yield. Planting was random. The intensity of weeds like *Echinochloa colona, Eclipta alba, E. crusgalli, Cyperus iria, C. rotundus, Cloeme viscosa, Fimbristylis dichotoma and Paspalum distichum* was low to medium. Hand weeding was the most common practice among the farmers. In addition to hand weeding, farmers also applied herbicides like butachlor, Nominee Gold, 2,4-D and pretilachlor. Use of Rotavator and combine harvester was common practice among the farming community. Shallow Tubewells/ canals are the main source of irrigation. Zinc and sulphur deficiency was observed in some fields in the surveyed districts. Implements like tractor, rotavator, harrow, combine harvester and cultivator were used by the farmers, mainly on hire basis. Diseases like sheath blight, bacterial blight, false smut, sheath rot and grain discolouration and insect pests like stem borer, leaf folder and gundhi bugs were recorded in low to moderate intensities. Fungicides like carbendazim, propiconazole, Taqat (captan+hexaconazole), hexaconazole and insecticides like Coragen, cartap hydrochloride, Acephate, cabofuron and Folidol were commonly used by the farmers for management of diseases and insect pest. Major problems faced by the farmers were shortage of labours and their high wages.

Department of Agriculture, Govt. of U.P. with the help of agriculture scientists were providing regular trainings to farmers to adopt newly developed technologies/ varieties to minimize the cost of cultivation and improving rice productivity. Govt. agencies were providing subsidized seeds, agro-chemicals, plant protection inputs and farm machineries to the farmers. Kisan Mela, Kisan Gosthies and training programmes were regularly organized by Agriculture universities and Department of Agriculture, Govt. of U.P. to promote new varieties/technologies for enhancing the productivity of rice growing areas. Govt. of U P is providing subsidized solar pumps to minimize the cost of irrigation. Newly developed technologies viz. SRI, DSR and laser leveler was also being promoted among farming community through NFSM and BGERI projects. Soil Health Card Scheme of Govt. of India was also promoted by State Govt. among the farmers of eastern Uttar Pradesh. The main source of farmers finance are own resources, cooperative societies and kisan credit card.

District wise observations:

Faizabad: Production oriented survey was conducted in six villages in this district and a total of 7 farmers were contacted during the survey. Survey was conducted when the crops were in tillering or milk stage. The fields surveyed were under irrigated ecosystem and in general, the weather conditions were normal for rice cultivation. Total area under rice

cultivation in the district was 97635 hectare (HYVs-60862 ha, hybrids-35002 and under basmati-1801 ha). Major cropping sequences followed by the farmers in the district were rice-wheat-blackgram/green gram, rice-sugarcane, rice-potato, rice-mustard-sugarcane, rice-pulses and rice-mustard-black gram. The prevailing rice varieties in the district were HYVs like NDR 97, NDR 2064, NDR 2065, Sarjoo 52, NDR 359,Shusk Samarat, Narendra Lalmati, Jallahri, Narendra Usar Dhan-3, Sambha Mahsuri, Swarna, PB-1, Karishma, Idea and Moti Gold and hybrids like Gorakhnath 509, Arize 6444 Gold, Syngenta 6302, Damini, US 312 PAC 801, PAC 832, Ganga Kaveri and 27P63. Most of the planting activities were done during last week of June to 1st week of July. 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 contacted applied FYM in the nursery and about 70% farmers applied inorganic fertilizers like DAP (50-100 kg/ha) or urea (40-50 kg/ha) in the nursery. In the main fields, fertilizers were applied @ 100-120 kg N/ha, 50-60 kg P_2O_5/ha, 40-50 kg K_2O/ha and 15-25 kg $ZnSO_4$/ha. However, potash application was done only by few farmers. Some farmers were using Moong bean and Dhaincha (Sesbaina spp.) as green manure and FYM before transplanting as organic manure. Few farmers also applied plant growth regulators or plant bio-stimulators. Planting was random and plant population was not maintained. The intensity of common weeds like *Echinochloa crusgalli, E. colona, Dactylactelium* spp.*, Digiteria sanguinalis, Cyperus rotundus, Paspalum distichum* L. *and Fimbristylis dichotoma* was low. Hand weeding was common practice among the farmers and only few farmers (25%) applied weedicides like butachlor (2.5 l/ha) or Nominee Gold (200 ml/ha) + @,$-D (750 g/ha). Some of the common needs of the farmers were good quality seeds of HYVs and basmati varieties, storage facilities, market for the produce and proper market price of the produce. Implements like tractor, rotavator and cultivator were used by the farmers, mainly on hire basis. Seed replacement rate in the district is more than 60 %. The main source of irrigation is tubewell/pumping sets and canal. SRI technology was adopted by the few progressive farmers only. Biotic stresses such as diseases (Sheath blight, Bacterial leaf blight and False smut) and insects (stem borer, leaf folder, Gundhi bug and hoppers) were observed in low to moderate intensity. Fungicides like carbendazim, propiconazole, Taqat (captan+hexaconazole), hexaconazole and insecticides like Coragen, cartap hydrochloride, Acephate, cabofuron and Folidol were commonly used by the farmers for management of diseases and insect pest. Farmers were facing shortage of farm laborers. Micronutrient mixtures were used to meet out the micro-nutrient deficiency.

Ambedkar Nagar: Thirteen villages in 7 blocks involving 14 farmers were covered for production oriented survey when the crops were in tillering to heading stage. The fields surveyed were under irrigated ecosystem and in general, the weather conditions were normal for rice cultivation. Farmers are using 70-90% of their land for rice cultivation and in the rest of the land, they are cultivating other crops like sugarcane, vegetables, black gram and green gram (for domestic use). The prevailing cropping systems in the district were rice-wheat, rice-sugarcane, rice-potato, rice-mustard and rice-pulses. Different rice varieties cultivated by the farmers in the district were HYVs like Narendra Lalmati, Dhanrekha, Super 115, NDR-97, Shusk Samarat, Sarjoo 52, NDR 359, Sambha Mahsuri, Swarna, Swarna Sub-1, Sawrnarekha and Moti Gold and hybrids like 27 P 31, 27 P 63, Damini, Kaveri 9090, Dhanya 748, Syngenta 6302, US 312, Arize 6444 and Arize 6444 Gold. Average rice yield in the district ranged from 4100-5800 kg/ha in different HYVs and 5000-6200 kg/ha in hybrids likeArize 6444. Most of the planting operations were done during end of June to 1st week of July. Seed rate adopted by the farmers was 30-35 kg/ha in case of HYVs and about 15 kg/ha in case of hybrids. About 40% farmers told that they treated the seeds with carbendazim (2 g/kg) or with *Trichoderma* formulation (4 g/kg). All of them applied FYM in the nursery and

also applied inorganic fertilizers like DAP (40-70 kg/ha). Some farmers also applied complex fertilizers like 12:32:16 in the nursery. In the main fields, fertilizers were applied @ 80-120 kg N/ha, 50-60 kg P_2O_5/ha, 50-60 kg K_2O/ha and 10-15 kg $ZnSO_4$/ha. However, potash application was done only by few farmers. Some of the farmers contacted applied FYM or plant growth regulators like Microzyme (4 kg/acre) or Zyme (4 kg/acre). SRI technique was adopted by some progressive farmers for rice cultivation. Random transplanting is the most common method of crop establishment. Common weeds were *Echinochloa crusgalli, E. colona, C. rotundus and Fimbristylis dichotoma* and their intensity was low to moderate. In addition to hand weeding, all the farmers applied herbicides like butachlor (2.5-3.3 l/ha), 2,4 - D and Nominee Gold (200 ml/ha) to control the rice weeds. Some of the common needs of the farmers were good quality seeds of HYVs and basmati rice, proper supply of electricity for irrigation, market for hybrids, good quality agrochemicals and early and medium duration varieties. Implements like tractor, combine harvester and cultivator were used by the farmers, mainly on hire basis. Many farmers told that they purchased 70-80% of their seed requirement. Shallow tube wells were the main source of irrigation and majority of the farmers expressed scarcity of irrigation water. In addition to their own decision, officials from department of Agriculture and university advised the farmers regarding use of inputs. Biotic stresses such as diseases (sheath blight, BLB and false smut) and insects (stem borer, hoppers and Gundhi bug) were observed from low to moderate intensity. Some of the farmers applied fungicides like carbendazim @ 500g/ha, propiconazole @ 500 ml/ha and hexaconazole @ 1.0 l/ha for managing sheath blight and insecticides like carbofuran, cartap hydrochloride, Coragen, Acephate and Folidal for management of different insect pests.

Barabanki: Production oriented survey was conducted in 10 villages (in 5 blocks) in this district involving 10 farmers when the crops were in tillering to heading stage. All the fields surveyed were under irrigated ecosystem and the general climatic conditions were normal for rice cultivation. Farmers are using 80-90% of their land for rice and in the rest of their land, they are cultivating other crops like vegetables, black gram, green gram and sugarcane. Major crop rotation practices adopted by the farmers of the Barabanki were rice-wheat, rice-mentha, rice-pulses, rice-mustard/potato and rice-sugarcane. Different varieties cultivated by the farmers in the district were HYVs like NDR-97, Shusk Samrat, Sarjoo 52, NDR 359, Sambha Mahsuri, Swarna, Komal, Basmati and Narendra Lalmati and hybrids like Arize 6444, US-312, JK 401, Pusa 1509, 27 P 31, Syngenta 6302, Arize 6444 Gold, Super 125, Super 115,27 P 63, Kaveri, Dhanya, Chandan 21 and Dhanuka 778. Average rice yield in the district ranged from 3900-4000 kg/ha in Samba Mahsuri and 5800-6300 kg/ha in hybrids like Arize 6444. Most of the planting operations were done during end of June to 1st week of July. Seed rate adopted by the farmers was 30-35 kg/ha in case of HYVs and about 15 kg/ha in case of hybrids. None of the farmers contacted adopted any seed treatment. All of them applied FYM in the nursery and also applied inorganic fertilizers like DAP (50-80 kg/ha). In the main fields, fertilizers were applied @ 100-120 kg N/ha, 50-60 kg P_2O_5/ha, 50 kg K_2O/ha and 10-15 kg $ZnSO_4$/ha. However, potash application was done only by few farmers. About 50% of the farmers contacted told that they applied FYM in the main fields and 20% of the farmers applied plant growth regulators like Zyme (4 kg/acre). The intensity of common weeds like *Cyprus iria, C. rotundus, Digiteria sanguinalis, Echinochloa crusgalli, E. colona, Paspalum distichum* L. *and Fimbristylis dichotoma* was low to medium in different rice fields. Hand weeding was the most common practice among the farmers for management of weeds. In addition to hand weeding, majority of the farmers applied weedicides like butachlor (2.5 l/ha) and Nominee Gold (200 ml/ha). Some of the common needs of the farmers were early duration HYVs, proper supply of electricity for irrigation purpose, proper supply of labours, good basmati varieties and timely availability of inputs. Implements like tractor, sprayers,

combine harvester and cultivator were used by the farmers, mainly on hire basis. Many farmers told that they purchased 70-80% of their seed requirement. Shallow tube wells followed by canal were the main source of irrigation and majority of the farmers expressed scarcity of irrigation water. In addition to their own decision, officials from department of Agriculture and university advised the farmers regarding use of inputs. Different diseases like sheath blight, bacterial blight, false smut and brown spot and insect pests like stem borer and leaf folder were observed in low to moderate intensity. Fungicides like carbendazim for sheath blight and carbofuran for insect pests were used by some farmers. The major problem faced by the farmers was scarcity of labours.

Sultanpur: Six villages in 4 blocks involving 11 farmers were covered for production oriented survey in this district when the crops were either in tillering or in heading to milk stage. All the fields surveyed were under irrigated ecosystem and the general climatic conditions were normal for rice cultivation. Farmers are using 70-80% of their land for rice and in the rest of their land, they are cultivating other crops like vegetables, pigeon pea, black gram, green gram and sugarcane. Main cropping sequences followed by the farmers were rice-wheat, rice-mustard, rice-pulses and rice-potato. Different varieties cultivated by the farmers were HYVs like Narendra Lalmati, Narendra Usar Dhan-3, Komal, Sonam, Sambha Mahsuri, Swarna Sub1, PB - 1, NDR 2064, NDR 2065, Sarjoo 52, NDR 359,Shusk Samarat and Moti Gold and hybrids like Gorakhnath 509, Damini, Arize 6444 Gold, Syngenta 6302, PAC 832, Ganga Kaveri, 27 P 31, 27P63, NDR 97 and Advanta 837. Average rice yield in the district was 6000-6200 kg/ha in Swarna, 4200-4500 kg/ha n NDR 359 and 5900-6300 kg/ha in Arize 6444. Most of the planting operations were done during end of June to 1st week of July. Seed rate adopted by the farmers was 30-35 kg/ha in case of HYVs and about 15 kg/ha in case of hybrids. Majority of the farmers contacted told that they did not adopt any seed treatment. All of them applied FYM in the nursery and about 50% of the farmers contacted also applied inorganic fertilizers like DAP (60-80 kg/ha). In the main fields, fertilizers were applied @ 100-120 kg N/ha, 50-60 kg P_2O_5/ha, 50 kg K_2O/ha and 10-15 kg $ZnSO_4$/ha. However, potash application was done only by few farmers. Some of the farmers applied FYM and different plant growth promoters like Zyme (4 kg/acre) and Microzyme (4 kg/acre) in the main fields. Transplanting was random and the intensity of common weeds like *Cyprus iria, C. rotundus, Digiteria sanguinalis, Echinochloa crusgalli, E. colona, Paspalum distichum* L. *and Fimbristylis dichotoma* was low to medium in different rice fields. Hand weeding was the most common practice among the farmers for management of weeds. In addition to hand weeding, majority of the farmers applied weedicides like butachlor (2.5 l/ha). Some of the common needs of the farmers were good quality seeds of early and medium duration varieties, proper electricity supply for irrigation, HYVs for user (saline) land and proper supply of labours. Implements like tractor, sprayers, harrow, combine harvester and cultivator were used by the farmers, mainly on hire basis. Harvesting by combine harvester was common practice in the district. Many farmers told that they purchased 70-80% of their seed requirement. Shallow tube wells were the main source of irrigation and majority of the farmers expressed scarcity of irrigation water. In addition to their own decision, officials from department of Agriculture and university advised the farmers regarding use of inputs. Biotic stresses viz. sheath blight, bacterial leaf blight, false smut, stem borer, leaf folder and gundhi bug were observed from low to moderate intensity. Fungicides like propiconazole (500 ml/ha), Contaf plus (1 l/ha0 and Saaf (750 g/ha) for sheath blight and insecticides like chlorpyriphos and cartap hydrochloride were used by the farmers for managing different diseases and insect pests. Zinc deficiency was also observed in Kurebhar and Baldirai block of the district. The major problems faced by the farmers were shortage of labours, scarcity of electricity and lack of proper markets.

Basti: Production oriented survey was conducted in 10 villages (1n 3 blocks) in this district involving 11 farmers when the crops were in booting to dough stage. All the fields surveyed were under irrigated ecosystem and the general climatic conditions were normal for rice cultivation. Different cropping sequences followed by the farmers were rice-wheat, rice-vegetables, rice-pulses, rice-mustard and rice-potato. Different varieties cultivated by the farmers in the district were HYVs like NDR 359, Kalanamak, Moti Gold, NDR 8002, NDR 97, Swarna, BPT 5204, Basmati, 27P63, Komal and Jalpriya and hybrids like Arize 6444 Gold, Syngenta 6302, Super 125, Gorakhnath 509, Damini, US 312 and Arize 6444. Average rice yield in the district ranged from3900-4100 kg/ha in Samba Mahsuri and 5500-6200 kg/ha in different hybrids likeArize 6444 and Goraknath 509. Planting was mainly done during last week of June to 1st week July. Seed rate adopted by the farmers was 30-50 kg/ha in case of HYVs and about 15 kg/ha in case of hybrids. None of the farmers contacted adopted any seed treatment. All of them applied FYM in the nursery and inorganic fertilizers like DAP (50-80 kg/ha). Some of the farmers added urea and MOP also in the nursery. In the main fields, fertilizers were applied @ 100-120 kg N/ha, 40-50 kg P_2O_5/ha, 40-50 kg K_2O/ha and 10-15 kg $ZnSO_4$/ha. However, potash application was done only by few farmers. About 45% of the farmers contacted told that they applied plant growth regulators like Zyme (4 kg/acre) and Microzyme (4 kg/acre). Few applied FYM and few adopted green manuring. The most common rice weeds of rice were *Echinochloa crusgalli, E. colona, Cyprus* spp. *and Fimbristylis dichotoma*. However, their intensity was low to medium. Hand weeding was adopted by all the farmers and in addition, some farmers applied herbicides like butachlor (2.5 l/ha), Nominee Gold (200 ml/ha). Some of the common needs of the farmers were timely availability of quality seeds of HYVs, proper supply of electricity for irrigation, proper market and medium duration HYVs. Implements like tractor, sprayers, harrow, combine harvester and rotavator were used by the farmers, mainly on hire basis. Harvesting by combine harvester was common practice in the district. Many farmers told that they purchased 20-80% of their seed requirement. Shallow tube wells were the main source of irrigation and majority of the farmers expressed scarcity of irrigation water. In addition to their own decision, officials from department of Agriculture and university advised the farmers regarding use of inputs. Diseases like sheath blight, bacterial leaf blight and false smut and insect pests like stem borer and leaf folder were observed in low intensity. Some of the farmers applied pesticides like carbendazim (500 g/ha) and propiconazole (500 ml/ha) for sheath blight and cartap hydrochloride (1.5 kg/ha) for different insect pests.

Sant Kabir Nagar: Seven villages in 4 blocks were covered for production oriented survey in this district when the crops were in booting to dough stage. A total of 10 farmers were contacted for survey. The fields surveyed were under irrigated ecosystem and in general the weather conditions for rice were normal. The predominant cropping sequences in the district were rice-wheat, rice-pulses, rice-mustard, rice-potato and rice-vegetables. Different varieties cultivated by the farmers in the district were HYVs like NDR 97, Sambha Mahsuri, Swarna, Swarna Sub 1, NDR 359, Kalanamak and Sampurna and hybrids like Gorakhnath-510, Gorakhnath-509, US -312, Arize 6444 Gold, Damini, 27P31,27P63, Syngenta 6302, Dhanya 8666 and VNR 2205. Average rice yield in the district ranged from 3500-4000 kg/ha in case of HYVs like Samba Mahsuri and NDR 359 and 5200-6100 kg/ha in case of different hybrids like Arize 6444 and Gorakhnath 509. Planting was done during end of June. Average seed rate was 30-35 kg/ha in case of HYVs and about 15 kg/ha in case of hybrids. Seed treatment was not common among the farmers in the district. All the farmers told that they applied FYM in the nursery and about 80% told that they also applied inorganic fertilizers like DAP (40-80 kg/ha). Some also applied urea and SSP in the nursery. In the main fields, fertilizers were applied @ 100-150 kg N/ha, 50-60 kg P_2O_5/ha, 50 kg K_2O/ha and 10-20 kg

$ZnSO_4$/ha. However, potash application was done only by few farmers. Majority of the farmers told that they applied plant growth regulators like Zyme (4 kg/acre), Microzyme (4 kg/acre) and Biozyme (4 kg/acre). Some applied FYM (10 t/ha) in the main fields. Planting was random and plant population per unit area was not maintained. The intensity of common weeds like *Echinochloa crusgalli, E. colona, C. rotundus, C. iria*, *Cleome viscosa* and *Fimbristylis dichotoma* was low to medium. Weed population in the rice fields were observed in high intensity at later growth stages of crop due very less rainfall. Hand weeding was adopted by all the farmers and in addition, some farmers applied herbicides like butachlor (2.5 l/ha), Nominee Gold (200 ml/ha) and pretilachlor (3.3 l/acre). Micro nutrient deficiency was observed in Mehdawal and Khalilabad blocks of the district. Some of the common needs of the farmers were early and medium duration rice varieties, proper electricity supply for irrigation, quality seeds of hybrids and HYVs and proper market for the produce. Implements like tractor, sprayers, combine harvester and rotavator were used by the farmers, mainly on hire basis. Harvesting by combine harvester was common practice in the district. Many farmers told that they purchased 20-80% of their seed requirement. Shallow tube wells were the main source of irrigation and majority of the farmers expressed scarcity of irrigation water. In addition to their own decision, officials from department of Agriculture and university advised the farmers regarding use of inputs. Diseases like sheath blight, bacterial blight and false smut and insect pests like stem borer and leaf folder were observed in low to moderate intensities. Some of the farmers applied pesticides like cartap hydrochloride and carbofuran for stem borer and propiconazole (500 ml/ha), hexaconazole (1 l/ha) and carbendazim (500 ml/ha) for sheath blight. The major problems faced by the farmers were shortage of labours and high wages.

Siddharth Nagar: Production oriented survey was conducted in 7 villages (in 5 blocks) in theis district when the crops were in booting to dough stage. A total of 10 farmers were contacted for this survey. The fields surveyed were under irrigated ecosystem and overall climatic conditions were normal for rice cultivation. However, flood at vegetative stage adversely affected crop establishment in Jogiaveer, Bansi and Methwal block of the district. Predominant cropping sequences followed by the farmers were rice-wheat, rice-pulses, rice-vegetables, rice-mustard and rice-potato. Different varieties cultivated by the farmers were HYVs like NDR 97, Sambha Mahsuri, Swarna, Swarna Sub 1, NDR 359, Kalanamak and Pusa Basmati 1 and hybrids like Arize 6444 Gold, 27P63, Syngenta 6302, Dhanya 748, Gorakhnath -510, JK 401, Gorakhnath-509, Arize 6444 and US 312. Average rice yield in the district ranged from 3700-4000 kg/ha in HYVs like Amba Mahsuri and 5600-6400 kg/ha in different hybrids like Arize 6444 and 27P63. Planting was done during end of June. Average seed rate was 30-35 kg/ha in case of HYVs and about 15 kg/ha in case of hybrids. About 20% of the farmers contacted told that they adopted seed treatment with carbendazim (2 g/kg). All the farmers told that they applied FYM in the nursery and about 80% told that they also applied inorganic fertilizers like DAP (70-90 kg/ha). In the main fields, fertilizers were applied @ 100-140 kg N/ha, 50-60 kg P_2O_5/ha, 40-50 kg K_2O/ha and 10-15 kg $ZnSO_4$/ha. However, potash application was done only by few farmers. About 40% farmers told that they applied plant growth regulators like Zyme (4 kg/acre) and Microzyme (4 kg/acre). Some applied green manures like dhaincha. Farmers followed random transplanting. The intensity of common weeds like *Echinochloa crusgalli, E. colona, C. rotundus* and *Fimbristylis dichotoma* was low. Hand weeding was adopted by all the farmers and in addition, some farmers applied herbicides like butachlor (2.5 l/ha) and Nominee Gold (200 ml/ha). some of the common needs of the farmers were quality seeds of HYVs, market for the produce, proper supply of electricity for irrigation purpose, early and medium duration rice varieties and proper supply of labours. Implements like tractor, sprayers, combine harvester and

rotavator were used by the farmers, mainly on hire basis. Harvesting by combine harvester was common practice in the district. Many farmers told that they purchased 20-90% of their seed requirement. Shallow tube wells followed by canal were the main source of irrigation and many of the farmers expressed scarcity of irrigation water. In addition to their own decision, officials from department of Agriculture and university advised the farmers regarding use of inputs. Diseases like sheath blight, bacterial blight and false smut and insect pests like stem borer and leaf folder were observed in low to moderate intensities. Some of the farmers applied pesticides like streptocycline + copper oxychloride for bacterial blight, and carbendazim (500 ml/ha) and propiconazole (500 ml/ha) for sheath blight. The major problems faced by the farmers were timely supply of canal water.

Prevalence of diseases and Insects in Eastern Uttar Pradesh-1 during *Kharif*' 2017

Districts	Diseases					
	ShBl	**FS**	**BS**	**GD**	**ShR**	**BLB**
Faizabad	L-M	L (1-2%)	L (5%)	L (2-5%)	L (5%)	L
Ambedkar Nagar	L-M (5-20%)	L (1-5%)				L (5%)
Barabanki	L-M (5-15%)	L (5%)	L-M (8-10%)			L (5%)
Sultanpur	L-M (5-10%)	L (5%)				L
Basti	L-M (5-15%)	L				L (5%)
St. Kabir Nagar	L-M (5-15%)	L-M			L (5%)	L (5%)
Siddharth Nagar	L-M (5-15%)	L	L (5%)		L-M (5-10%)	L-M (5-8%)

Districts	Insects		
	SB	**LF**	**GB**
Faizabad	L	L	L-M
Ambedkar Nagar	L	L	L-M
Barabanki	L	L	L-M
Sultanpur	L-M	L	L
Basti	L	L	L-M
St. Kabir Nagar	L-M	L	M
Siddharth Nagar	L-M	L	L

Uttar Pradesh-2

Districts surveyed: *Varanasi, Sant Rabidas Nagar, Chandauli, Jaunpur, Ghazipur, Azamgarh, Mau* and *Ballia*

Particulars of survey

Districts	Blocks	Villages
Varanasi	Araziline Kashi Vidya peeth and Harauha	Dhaurasra, Umraha, Lahartara, Bithari, Kuarikala, Pallia, Virapatti, Sihorwa, Virbahnpur and Barthana
St Ravidas Nagar	Gyanpur and Digh	Kansapur, Danapur, Jorai, Pali, Milki, Arata, Bankant Khas, Ojhapur, Raiyapur, Gandhi and Bichhiya
Chandauli	Chakiya, Chandauli, Niyamtabad and Sahabganj	Jagdispur, Bathariya, LatifShah, Kaudihar, Thekha, Paura, Inayatpur, Lakhapur, Chitauri, Ganela, Saidupur, Arjee, Bilaspur, Palpur and Ben
Jaunpur	Shahganj and Badlapur,	Tarwa, Rajdharpur, Samodhpur, Kuthan, Pattinarendrapur, Phatehgarh Takha Naupadwa, Badlapur and Daulatpur
Ghazipur	Mardha and Bara Chawar	Patar, Bharauli, Pathepur, Uttarao, Akathi., Abnishan, Prithivipur, Khojua and Dumrao Tezpura
Azamgarh	Lalganj and Phulpur	Ismailpur, Jugarnath pur, Kabilaha, Madanpur, Parsaura, Handia, Imam Garh, Jakhawan, Galibpur, Fulawaria and Hissa Sohani
Mau	Ratanpura and Pardaha	Telswa, Unaich, Dumarao, Duraona, Katra, Haldharpur, Pilkhi, Rajanpur, Sahroj and Parmanand Patii
Ballia	Sohao and Rasra	Chitbaragao, Bhagani, Nahari, Nibu, Sardaspur, khazhari, Dehri, Laxmanpur, Chaura and Katharia Athilapur

Widely prevalent rice varieties

Districts	Rice Varieties
Varanasi	**HYVs:** Sarjoo-52, Pant Dhan 10, NDR-359, BPT-5204, MTU-7029, HUBR 2-1, Pusa Basmati, Komal, Moti, Moti Gold, Pusa 1121, HUR-917 HUR-105 and Swanra Sub-1; **Hybrids:** PHB-71
Chandauli	**HYVs/Improved:** Sarjoo-52, Moti, Sonam, Badshah bhog, NDR-359, BPT-5204, MTU-7029, HUBR 2-1 and HUR12
St Ravidas Nagar	**HYVs:** Sarjoo-52, NDR-97, NDR-359, BPT-5204, MTU-7029, Pant-12, Sonam and Rupali; **Hybrids:** PHB-71, Arize-6444 and PRH-10
Jaunpur	**HYVs:** Sarjoo-52, Pant Dhan 10, Pant Dhan 12, NDR-97, NDR-359, BPT-5204, MTU-7029, Rupali, Sonam, Jaisurya, Kalanamak, Pusa Basmati and Komal; **Hybrids:** Ganga Kauveri
Ghazipur	**HYVs:** Sarjoo-52, Sonam, NDR-359, BPT-5204, MTU-7029, Kalanamak and Moti; **Hybrids:** Arize 6444
Azamgarh	**HYVs/Improved:** Sarjoo-52, Pant Dhan 10, NDR-97, NDR-359, BPT-5204, MTU-7029, Moti and Kalanamk
Mau	**HYVs/Improved:** Sarjoo-52, NDR-97, NDR-359, BPT-5204, MTU-7029, Pusa Basmati, Moti, Sonam and Kalanamak
Ballia	**HYVs:** Sarjoo-52, NDR-359, BPT-5204, MTU-7029, Moti, Moti Super, Swarna Sub-1 and Pusa 1121; **Hybrids:** PHB-71 and Arize 6444

Rice is the major *Kharif* season crop cultivated in entire state of Uttar Pradesh. The tentative area of rice crop during this kharif season 2017-18 was nearly 58,97,871 ha area with the total state rice production of 1,54,41,951 mt and have average productivity of 26.18 q/ha. Production oriented survey was conducted during *Kharif* season at flowering to maturity stage of the crop in 8 of the Districts of Eastern Uttar Pradesh(Varanasi, Chandauli, Sant Ravidas nagar (Badohi), Jaunpur, Ghazipur, Azamgarh, Mau, and Ballia) coming under Varanasi and Azamgarh division. Rainfall was regular and well distributed. Most of the farmers interacted were marginal or sub marginal having small holdings and they grow rice crop mainly for their own consumption. Predominant varieties cultivated were HYVs like Sarjoo-52, Pant Dhan 10, NDR-359, BPT-5204, MTU-7029, HUBR 2-1, Pusa Basmati, Komal, Moti, Moti Gold, Pusa 1121, HUR-917 HUR-105 and Swanra Sub-1 and hybrids like PHB-71, Arize 6444 and Ganga Kaveri. The prevailing crop rotations in this region which farmers adopted are rice-wheat/mustard, rice-sugarcane, rice- pulses, rice-vegetables. In most of the field surveyed weed infestation was found medium to high. The average productivity of rice crop varies in surveyed districts varied from 23q/ha to 31 q/ha in the surveyed districts. The most predominant weeds were *Echinochloa colona, E. crusgalli, Eclipta alba, Cyperus rotundus¸ C. iria,* and *Cynadon dactylon.* For weed management two to three hand weeding were common in practice while some of the farmers were using weedicides like butachlor, Eraze, pendimethalin and Nomani Gold. Fertilizers were applied in the form of Urea (as basal and top dressing), DAP, SSP and few applied Murate of Potash. Farmers purchased seeds from State seed supplying agencies or by private vendors but most of the marginal and sub-marginal farmers grow the seed harvested from last year crops there seed replacement rate is also very poor. Farmers usually hire or share plant protection equipment from the market at per hour basis or share from each other whenever required in the field. The specific needs of the farmers were irrigation facilities, market facilities, timely availability of good quality seeds and fertilizers. Among the diseases, blast, brown spot, sheath blight, false smut and bacterial blight were observed regularly in the surveyed fields. Brown spot and blast were recorded in higher intensity in many places. Among the insect pests, stem borer, leaf folder and gundhi bugs were recorded in low to moderate forms. In transplanted rice field few fields were noticed having nematode causing root galls. The chemicals like mancozeb (2-2.5 kg/ha), carbendazim (0.5-1.0 kg/ha) or hexaconazole (1 l/ha) were used by farmers for disease control. Some progressive and marginal farmers used chloropyriphos, cartap hydrochloride, imidacloprid, achephate and fipronil for the management of insects and pests.

District wise observations

Varanasi: In the Varanasi district, this year (2017-18) area under rice crop was 51,719 ha with a total production of 1,31,832 t with the average productivity of 25.4 q/ha. The main crop rotation followed by farmers was rice-wheat though some farmers grow pulses after the harvest of the rice crop. Prevailing varieties in the district were HYVs like Sarjoo-52, Pant Dhan 10, NDR-359, BPT-5204, MTU-7029, HUBR 2-1, Pusa Basmati, Komal, Moti, Moti Gold, Pusa 1121, HUR-917 HUR-105 and Swanra Sub-1 and hybrids like PHB-71. Some progressive farmers used Dhaincha as green manure and FYM before transplanting the crop. Some progressive farmers adopted RCT (Resource Conservation Technology) with zero tillage for utilization of moisture from the rice field for early wheat sowing. The common weeds of rice were *Echinochloa colona*, *E. crusgalli*, *Cyperus rotundus*, *Digitaria* and *Fimbryles dichotoma*. Most of the farmers preferred hand weeding though some applied Nominee gold and butachlor @ 1.5 -2 L /ha to control the weeds. Main sources of irrigation in the district were tube wells and canal but farmers mainly depended upon rainfall for getting good crop production. Biotic stresses such as diseases (sheath blight, bacterial leaf

blight, sheath rot, false smut and glume discolouration) and insects (stem borer, gundhi bug, leaf folder) were found in low to medium intensity irrespective of varieties. In some fields termites and root knot was also observed which is becoming a serious concern mainly in rice-wheat cropping system because both the crops shows root galling in their roots. Farmers used different pesticides like Sheathmar, Contaf, Tilt, Nativo, carbendazim, propiconazole, hexaconazole, monocrotophos, carbofuran, chloropyriphos for the management of different diseases and insect pests.

Chundauli: The area under the rice crop in the Chandauli district was 1,14,635 ha with the total production of 3,52,159 tonnes and with a productivity of 30.72 q/ha. This district is also called rice bowl of Uttar Pradesh and the entire district is covered by canal irrigation network and farmers mostly preferred to grow late maturing varieties like Samba Mahsuri (BPT 5204) and Nati mahsuri (MTU 7029). In some of the region which is not a catchment area of canal farmers were also growing varieties like Badshahbhog, Ganga Cauveri, Moti, Sonam and Roopali. Major crop rotations adopted by the farmers in this district were rice-wheat and some farmers followed rice- pulses also. The common weeds of rice were *Echinochloa colonum*, *E. crusgalli*, *Cyperus rotundus* and *C. irria*. In addition to hand weeding, some farmers used herbicides like butachlor for the management of weeds. Most of the progressive farmers of the district have all the implements required in farming including zero till machine also. This year sheath blight and bacterial leaf blight were observed in moderate to severe form in early stages of the crop. This year False smut was also observed in severe form in this district and farmers could not control even after the application of chemical spray. Insect pests like stem borer was common in most of the fields surveyed while gundhi bug and leaf folder was also observed in low moderate intensity. Farmers generally used fungicides like hexaconazole and validamycin to control sheath blight and copper oxychloride Kocide for the control of false smut. Leaf blast and brown spot were observed in late maturing varieties in moderate to severe intensity but their occurrence was noticed late stages of the crops and farmers did not apply any chemical for its management. Farmers used phorate for the control of insects

Sant Ravidas nagar (Badohi): The area under rice in this district was 28,105 ha with a production of 89430 tonnes and a productivity of 31.82 q/ha. The survey was conducted in the district when the crop was at maturity stage. Most of the farmers were marginal to sub marginal and the general weather conditions were good for rice cultivation this year. The commonly followed crop rotations were rice-wheat, rice-potato, rice-lentil, rice-wheat- black gram and rice-sugarcane. Predominant varieties in the district were HYVs like Sarjoo-52, NDR-97, NDR-359, BPT-5204, MTU-7029, Pant-12, Sonam and Rupali and hybrids like PHB-71, Arize-6444 and PRH-10. The common weeds recorded in and around rice fields were *Echinochloa colonum*, *E. crusgalli*, *Cyperus rotundus* and *Ageratum conyzoides.* None of the farmers contacted followed any seed treatment. Some of the common needs of the farmers in the region were supply of labour and implement and proper storage facilities. Sheath blight, bacterial leaf blight, false smut and grain discolouration were observed in low to moderate intensities in most of the varieties. Fungicides like Tilt, Sheathmar, Indofil M-45 and carbendazim were used for management of the above diseases by farmers. Insect pests like stem borer, leaf folder, gundhi bug and termite were controlled by applying with insecticides like phorate 10G @ 5-6 kg/ha, chloropyriphos. Zinc deficiency was also recorded in some of the field and some farmers were applying 20 kg/ha $ZnSO_4$ and Sulphur dust.

Jaunpur: Area under rice in this district was 1,57,278 ha with a production of 3,62,683 tonnes and a productivity of 23.06 q/ha. The crop rotations followed by most of the farmers

were rice-wheat, rice-sugarcane and rice- pulses. Predominant rice varieties cultivated in this district were HYVs like Sarjoo-52, Pant Dhan 10, Pant Dhan 12, NDR-97, NDR-359, BPT-5204, MTU-7029, Rupali, Sonam, Jaisurya, Kalanamak, Pusa Basmati and Komal and hybrids like Ganga Kauveri. Common weeds of rice were *Echinochloa colonum, E. Crusgalli* and *Cyperus rotundus*. Most of the farmers practiced hand weeding. Some farmers, in addition to hand weeding also used butachlor for management of weeds. Biotic stresses such as diseases (sheath blight, Sheath rot, bacterial leaf blight, glume discolouration and false smut) and insects like (stem borer, leaf folder, gundhi bug and termite) were observed in low to moderate intensities. Fungicides like sulphur dust, carbendazim and Sheathmar were used to control the diseases and insecticides like fipronil @ 18-20 kg/ha and Cartap hydrochloride 4G @ 20 kg/ha were used against stem borer. Farmers are using chloropyriphos 1 l/acre against termites and malathion (20-25 kg/ha) against gundhi bugs.

Ghazipur: During 2017, area under rice crop in this district was 1,54,815 ha with a production of 362683 tonnes and a productivity of 23.06 q/ha. The crops were in maturity stage at the time of survey. Different rice varieties cultivated by the farmers in the district were HYVS like Sarjoo-52, Sonam, NDR-359, BPT-5204, MTU-7029, Kalanamak and Moti and hybrids like Arize 6444. The weed population was low to medium and most of the farmers practiced hand weeding for weed control. Only few of the farmers were using herbicides like butachlor and Nominee Gold. Most of the farmers grow rice crop by following random transplanting. Most of the agricultural inputs like equipments, seeds, power, water, pesticides, fertilizers, drying and storage facilities were scarce and farmers were more concern about its marketing and price. Diseases like sheath blight, sheath rot, bacterial leaf blight and false smut were found in moderate to severe intensity while insect pests like stem borer and leaf folder were found with low intensity. Few farmers occasionally used fungicides like carbendazim, tricyclazole, Contaf and sulhur dust against diseases and insecticides like cartap hydrochloride, imidacloprid and acephate for the control of insects. Termite problem was also noticed in some fields. Zinc deficiency was also recorded in some of the field and some farmers were applying 20 kg/ha $ZnSO_4$ and Sulphur dust.

Azamgarh: During 2017, area under rice crop was 2,16,041 ha with a production of 5,12,233 tonnes and productivity of 23.71 q/ha. Major cropping system was adopted by the farmers is rice-wheat, rice-potato and rice-sugarcane. Predominant varieties cultivated by the farmers were HYVs like Sarjoo-52, Sonam, NDR-359, BPT-5204, MTU-7029, Kalanamak and Moti and hybrids like Arize 6444. The common weeds in and around rice fields were *Echinochloa colona, E. crusgalli, Cyperus rotundus* and *Fimbrilis dichotoma.* Biotic stresses such as diseases (sheath blight, bacterial leaf blight and false smut) were observed moderate to low intensity. False smut was observed in all the surveyed field especially on variety Moti. Insect pests like leaf folder and gundhi bug were observed in the surveyed fields in low to moderate intensity.

Mau: The area under rice crop in this district during 2017 was 91,322 ha with a production of 2,17,894 tonnes and productivity of 23.86 q/ha. The crops were at maturity stage when the production oriented survey was conducted. The common crop rotation practice in the district was rice-maize, rice wheat and rice-pulses. Different rice varieties cultivated by the farmers were Sarjoo-52, NDR-97, NDR-359, BPT-5204, MTU-7029, Pusa Basmati, Moti, Sonam and Kalanamak. The common weeds recorded were *Echinochloa colonum, E. crusgalli, Cyperus rotundus* and *Fimbrilis dichotoma*. Most of the farmers followed hand weeding and only few farmers applied weedicides like butachlor (2.5 l/ha). The common needs of the farmers were seeds of high yielding varieties, fertilizers, irrigation water and timely availability of inputs.

Among the diseases false smut was observed in nearly all the fields surveyed. Sheath blight was recorded in moderate form. Foliar diseases like leaf blast and brown leaf spot were recorded in low intensity. Insect pests like stem borer and termite were found in low to moderate intensity. In some field some patches of zinc deficiency symptoms were observed. Some farmers applied zinc sulphate @ 8 kg/acre. The fungicides like Bavisitn, Blitox-50, copper oxychloride and Contaf were used against different diseases and insect pests like trizophos (2 ml/l), monocrotophos (1 ml/l) and cartap @ 5 kg/acre were applied for the management of insect pests.

Ballia: In this district area under rice crop during 2017 was 1,15,684 ha with a production of 2,89,550 tonnes and productivity of 25.03 q/ha. The major cropping systems adopted by the farmers were rice-wheat, rice-pulses and rice-mustard. Different varieties cultivated by the farmers were HYVs like Sarjoo-52, NDR-359, BPT-5204, MTU-7029, Moti, Moti Super, Swarna Sub-1 and Pusa 1121 and hybrids like PHB-71 and Arize 6444. The common weeds observed were *Echinochloa colona*, *E. Crusgalli* and *Cyperus rotundus*. In addition to hand weeding, some farmers used herbicides like butachlor @ 2.5 l/ha for the control of weeds. Among the biotic stresses diseases like sheath blight, Bacterial leaf blight and false smut were observed in moderate to severe form. High incidence of false smut was reported mainly in the Moti variety which was grown by many farmers. Most of the farmers did not adopt any plant protection measures for disease control but for insect control they used imidacloprid (60 ml/acre) and acephate (250 g/acre). The number of spray done by farmers was 1-2 times.

Prevalence of diseases and insect pests in Uttar Pradesh-2 during *Kharif*'2017

Districts	**Diseases**						**Insect pests**				
	Bl	**BS**	**ShB**	**ShR**	**FS**	**BLB**	**SB**	**LF**	**GB**	**Term**	**RKN**
Varanasi	M	S	M	L	M	M	M	M	M	L	L
Chaundauli	M-S	M-S	M-S	L	S	M	M	L	M	L	L
St Ravidas Nagar	M-S	M	L	-	M-S	L	M	M	M	L	-
Jaunpur	M	M-S	L	-	M	M	M	L	M	-	-
Ghazipur	M	M-S	M-S	-	M	M	L	L	M	L	-
Azamgarh	M	M	M	L	M	M	L	L	M	L	-
Mau	M-S	M-S	M	-	M	M	M	L	M	L	-
Ballia	M-S	M-S	M	-	M	M	L	L	M	-	-

Uttar Pradesh-3

Districts surveyed: *Baharaich, Barabanki, Gonda, Balrampur* and *Shrawasti*

Particulars of survey

Districts	Blocks	Villages
Baharaich	Kaisarganj, Jarwalkasba, Phapharpur, Mahsi Maharajganj, Prayagpur and Visheshwarganj	Ainehentashi, Adampur, Dhansari, Loniyapurva, Kotwalkalla, Badroli, Belhari, Maharajganj, Murkhi, Ramdas Purwa, Harchanda, Sukla Purwa, Visheshwarganj, Tappe sipah, Musapur and Chukiya
Barabanki	Ramnagar	Namipurchiroli, Kurda, Chuhanpur and Badolpur
Gonda	Gonda, Hardhar Mau, Katra, Nababgunj, Maskanava, Mankapur and Colonelgunj	Misroliya, Rajpur, Katra, Nababgunj, Durgapur, Bandrha, Chhitona, Dutnagar and Hardhar Mau
Balrampur	Balrampur, Uttrolla and Tulsipur	Shekhuiya Kalan, Uttrolla, Ahiranpur, Bhuri, Gunwaria and Tulsipur
Shrawasti	Gilaula and Econa	Gilaula, Benkata, Matukura, Bhaluhiya and Pandit Purva

Widely prevalent varieties

Districts	Varieties
Baharaich	**HYVs:** NDR 359, Pusa Basmati 1, Sarjoo 52, Indrasan and Samba Mahsuri; **Hybrids:** PHB 71 and Arize 6444 Gold
Barabanki	**HYVs/Improved:** Madhukar, Sarjoo 52, Indrasan, Sukha Pankhi and Ram Kajra; **Hybrids:** Arize 6444 Gold
Gonda	**HYVs:** Indrasan, NDR 359, Samba Mahsuri, Sarjoo 52 and Pusa Basmati 1: **Hybrids:** Arize 6444 Gold
Balrampur	**HYVs:** NDR 359, Sarjoo 52, Indrasan and Pusa Basmati 1; **Hybrids:** Arize 6444 Gold
Shrawasti	**HYVs:** Sarjoo 52 and Pusa Basmati 1; **Hybrids:** Arize 6444 Gold

Production oriented survey was conducted in 5 districts in this part of Uttar Pradesh viz., Baharaich, Barabanki, Gonda, Balrampur and Shrawasti when the crops were in tillering or heading to dough or maturity stage. Majority of the fields surveyed were under rainfed lowland ecosystem. Different cropping sequences followed by the farmers were rice-wheat, rice-mustard/mentha, rice-lentil/mustard, rice-sugarcane/lentil, rice-potato+pea (mixed cropping), rice-vegetables, rice-sugarcane, rice-wheat/mustard and rice-potato-sugarcane. Different rice varieties cultivated by the farmers were HYVs like NDR 359, Pusa Basmati 1, Sarjoo 52, Indrasan and Samba Mahsuri and hybrids like PHB 71 and Arize 6444 Gold. Average yield was 4000-5000 kg/ha in HYVs and hybrids and in case of Pusa Basmati 1, it was 3000-3500 kg/ha. Farmers did not follow seed treatment. However, most of the farmers applied FYM in the nursery and in the main fields. In the main fields, fertilizers were applied @ 80-120 kg urea/ha, 40-80 kg MOP/ha and 40-80 kg DAP/ha. Some applied zinc sulphate (20-25 kg/ha). All the farmers contacted told that they applied FYM in the main fields. Planting was random. The intensity of common weeds like *Cyperus* spp., *Echinochloa* spp. and *Cynodon dactylon* was low to medium. Farmers did not apply any herbicides and hand

weeding was the common method of weed management. Implements like tractor, rotavator, cultivator and harrow were used by the farmers. Seed replacement rate was low and most of the farmers contacted told that they used last year's harvested seeds for sowing. Among the biotic constraints, brown spot and sheath blight were observed in higher intensities in some fields. Other diseases like leaf and neck blast, sheath rot, false smut, grain discoloration and insect pests like stem borer and gundhi bugs were observed in low to moderate intensities. Application of pesticides was not very common. In some fields, zinc deficiency symptoms were observed.

District wise observations

Baharaich: Survey was conducted in 16 villages (in 6 blocks) when the crops were either in tillering or heading or dough to maturity stage. Majority of the fields surveyed were under rainfed lowland ecosystem and some were under irrigated ecosystem. In general, the climatic conditions were normal. Different cropping sequences followed by the farmers were rice-wheat, rice-mustard/mentha, rice-lentil/mustard, rice-sugarcane/lentil, rice-potato+pea (mixed cropping), rice-vegetables, rice-sugarcane, rice-wheat/mustard and rice-potato-sugarcane. Different rice varieties cultivated by the farmers were HYVs like NDR 359, Pusa Basmati 1, Sarjoo 52, Indrasan and Samba Mahsuri and hybrids like PHB 71 and Arize 6444 Gold. Average rice yield in the district ranged from 4000-6000 kg/ha in different hybrids and HYVs and about 3000-3500 kg/ha in Pusa Basmati 1. Average seed rate was18-20 kg/ha and none of the farmers adopted any seed treatment. Almost all the farmers contacted applied FYM in the nursery and about 25% farmers also applied chemical fertilizers like urea and DAP. In the main fields, fertilizers were applied @ 80-120 kg urea/ha, 40-80 kg MOP/ha and 40-80 kg DAP/ha. About 40% farmers applied zinc sulphate (20-25 kg/ha). All the farmers contacted told that they applied FYM in the main fields. Planting was random. The intensity of common weeds like *Cyperus* spp., *Echinochloa* spp. and *Cynodon dactylon* was low to medium. Farmers did not apply any herbicides and hand weeding was the common method of weed management. Implements like tractor, rotavator, cultivator and harrow were used by the farmers. Seed replacement rate was low and most of the farmers contacted told that they used last year's harvested seeds for sowing. Shallow tube wells were the main sources of irrigation and diesel was the main source of power. In addition to their own decisions, farmers took advices from private dealers and university staffs. Different diseases like blast, neck blast, sheath rot, false smut, grain discoloration and narrow brown leaf spot were observed in low to moderate intensity. However, brown spot was severe on NDR 359 and Indrasan and sheath blight was severe on PHB 71 in some fields. Among the insect pests, stem borer and gundhi bugs were observed in low intensities. Application of pesticides was not very common. In some fields, zinc deficiency symptoms were observed.

Barabanki: Production oriented survey was conducted in four villages in Ramnagar block when the crops were in tillering or heading to milk or dough to mature stage. All the fields surveyed were under rainfed lowland ecosystem and in general, the climatic conditions were normal for rice production. Common crop rotation practices followed by the farmers were rice-wheat, rice-lentil-mentha, rice-lentil+mustard, rice-mentha, rice-potato, rice-sugarcane+lentil, rice-sugarcane and rice-wheat+mustard. Different rice varieties cultivated by the farmers were HYVs like Madhukar, Sarjoo 52, Indrasan, Sukha Pankhi and Ram Kajra and hybrids like Arize 6444 Gold. Average rice yield was 4000-5000 kg/ha in different HYVs and hybrids and aobut 3000-3500 kg/ha in improved varieties like Sukha Pankhi and Ram Kajra. Average seed rate was15-20 kg/ha and none of the farmers adopted any seed treatment. Almost all the farmers contacted applied FYM in the nursery. Few also applied

chemical fertilizers like urea and DAP. In the main fields, fertilizers were applied @ 80-120 kg urea/ha, 40-60 kg MOP/ha and 60-80 kg DAP/ha. Few applied zinc sulphate. Majority of the farmers contacted told that they applied FYM in the main fields. Planting was random. Some followed direct sowing. The intensity of common weeds like *Cyperus* spp., *Echinochloa* spp. and *Cynodon dactylon* was low to medium. Farmers did not apply any herbicides and hand weeding was the common method of weed management. Implements like tractor, rotavator, cultivator and harrow were used by the farmers. Seed replacement rate was low and most of the farmers contacted told that they used last year's harvested seeds for sowing. Shallow tube wells were the main sources of irrigation and diesel followed by electricity was the main source of power. In addition to their own decisions, farmers took advices from private dealers and university staffs. Among the diseases, moderate to severe intensity of leaf blast (up to 32%) on variety Ram Kajra (in Namipurchiroli village) and false smut (up to 30%) on Arize 6444 Gold (in Namipurchiroli village) were observed. Other diseases and insect pests were observed in low to moderate intensity. Application of pesticides was not very common.

Gonda: Nine villages involving 14 farmers were covered for production oriented survey in this district when the crops were in tillering or maturity stage. All the fields surveyed were under irrigated ecosystem. The general climatic conditions were normal for rice production. Common crop rotation practices followed by the farmers were rice-wheat, rice-lentil, rice-mustard+wheat, rice-lentil+mustard, rice-sugarcane+mustard, rice-pulses, rice-vegetables (potato, pea), rice-sugarcane, rice-potato-sugarcane and rice-mustard-sugarcane. Different varieties cultivated by the farmers were HYVs like Indrasan, NDR 359, Samba Mahsuri, Sarjoo 52 and Pusa Basmati 1 and hybrids like Arize 6444 Gold. Average rice yield was 4000-5000 kg/ha in different HYVs, 3500-4000 kg/ha in Pusa Basmati 1 and 4800-5500 kg/ha in hybrids like Arize 6444 Gold. Average seed rate was about 20 kg/ha and none of the farmers adopted any seed treatment. All the farmers contacted applied FYM in the nursery. About 50% of the farmers contacted also applied chemical fertilizers like urea and DAP. In the main fields, fertilizers were applied @ 100-160 kg urea/ha, 40-60 kg MOP/ha and 60-80 kg DAP/ha. Few applied zinc sulphate (20-25 kg/ha). Majority of the farmers contacted told that they applied FYM in the main fields. Planting was random. The intensity of common weeds like *Cyperus rotundus*, *Echinochloa colona* and *Cynodon dactylon* was low to medium. Farmers did not apply any herbicides and hand weeding was the common method of weed management. Implements like tractor, rotavator, cultivator and harrow were used by the farmers. Seed replacement rate was low and most of the farmers contacted told that they used last year's harvested seeds for sowing. In addition to their own decisions, farmers took advices from private dealers and university staffs. Among the diseases, brown spot was observed in severe intensity (up to 40%) mainly on NDR 359 in different villages like Hardhar Mau, Rajpur, Durgapur, Nababgunj and Katra. Similarly, high intensity of sheath blight (up to 30%) was recorded on Pusa Basmati 1 in Chhitona village. Other diseases and insect pests were recorded in low intensities. Application of pesticides was not very common. In some fields, zinc deficiency symptoms were observed.

Balrampur: Six villages in 3 blocks were covered for production oriented survey when the crops were in tillering or maturity stage. Majority of the fields surveyed were under irrigated ecosystem and some were under rainfed lowland ecosystem. The general climatic conditions were normal for rice cultivation. Different crop rotation practices were rice-wheat+mustard, rice-wheat, rice-lentil+mustard, rice-sugarcane, rice-lentil, rice-mustard and rice-potato. Different rice varieties cultivated by the farmers were HYVs like NDR 359, Sarjoo 52, Indrasan and Pusa Basmati 1 and hybrids like Arize 6444 Gold. Average yield was 4500-

5000 kg/ha in different HYVs and hybrids and 3600-4000 kg/ha in Pusa Basmati 1. Average seed rate was about 18-20 kg/ha and none of the farmers adopted any seed treatment. All the farmers contacted applied FYM in the nursery. Few also applied chemical fertilizers like urea and DAP. In the main fields, fertilizers were applied @ 60-120 kg urea/ha, 40-60 kg MOP/ha and 40-80 kg DAP/ha. Few applied zinc sulphate (20-25 kg/ha). Majority of the farmers contacted told that they applied FYM in the main fields. Planting was random. The intensity of common weeds like *Cyperus rotundus*, *Echinochloa colona* and *Cynodon dactylon* was low to medium. Farmers did not apply any herbicides and hand weeding was the common method of weed management. Implements like tractor, rotavator, cultivator and harrow were used by the farmers. Seed replacement rate was low and most of the farmers contacted told that they used last year's harvested seeds for sowing. Shallow tube wells were the main sources of irrigation. In addition to their own decisions, farmers took advices from private dealers and university staffs. Among the diseases, brown spot was recorded in high intensity (up to 40%) mainly on NDR 359 in villages like Gunwaria, Ahiranpur and Uttrolla. Other diseases and insect pests were recorded in low to moderate intensities. Application of pesticides was not very common. In some fields, zinc deficiency symptoms were observed.

Shrawasti: Five villages in two blocks were covered for production oriented survey when the crops were in tillering or maturity stage. Majority of the fields surveyed were under rainfed lowland ecosystem and in general, the climatic conditions were normal for rice cultivation. Different cropping systems followed by the farmers were rice-wheat, rice-lentil+mustard, rice-lentil, rice-potato, rice-mustard and rice-sugarcane. Different rice varieties cultivated by the farmers were HYVs like Sarjoo 52 and Pusa Basmati 1 and hybrids like Arize 6444 Gold. Average rice yield was 4500-5000 kg/ha in HYVs and hybrids and about 3500 kg/ha in Pusa Basmati 1. Average seed rate was about 15-20 kg/ha and none of the farmers adopted any seed treatment. All the farmers contacted applied FYM in the nursery. However, none of them applied any chemical fertilizers in the nursery. In the main fields, fertilizers were applied @ 80-120 kg urea/ha, 60 kg MOP/ha and 40-80 kg DAP/ha. Few applied zinc sulphate (20-25 kg/ha). Majority of the farmers contacted told that they applied FYM in the main fields. Planting was random. Implements like tractor, cultivator and harrow were used by the farmers. Seed replacement rate was low and most of the farmers contacted told that they used last year's harvested seeds for sowing. Shallow tube wells were the main sources of irrigation. In addition to their own decisions, farmers took advices from private dealers and university staffs. Intensity of most of the biotic constraints was low to moderate. Application of pesticides was not very common. In some fields, zinc deficiency symptoms were observed.

Prevalence of diseases and insect pests in Uttar Pradesh-3 during *Kharif*' 2017

Districts	**Diseases**							
	Bl	**NBl**	**ShBl**	**BS**	**ShR**	**FS**	**GD**	**NBLS**
Baharaich	L-M (3-25%)	L (2-8%)	M-S (8-35%)	M-S (10-35%)	L-M (2-12%)	L-M (5-20%)	L (6-8%)	M (20%)
Barabanki	L-S (5-32%)	L (2-8%)	L (5%)	L-M (8-20%)	L (2-8%)	L-S (2-30%)	L (2-8%)	-
Gonda	L-M (8-12%)		L-S (5-30%)	M-S (12-40%)	L (5%)	L-M (2-15%)	L (5-8%)	L (2%)
Balrampur	L (5-8%)	L (4-5%)	M (12-20%)	L-S (8-40%)	L (2-5%)	L-M (1-10%)	L (2-8%)	-
Shrawasti	L (5-8%)	L (5%)	M (10-12%)	M (15%)	L (5%)	T-L (1-8%)	L (2-5%)	-

Districts	**Insect pests**			
	SB	**GB**	**Rats**	**Term**
Baharaich	L-M (5-10%)	L (5%)	L	L
Barabanki	L (2-8%)		L	L
Gonda	L-M (8-12%)		L	L
Balrampur	L (2-8%)		L	L
Shrawasti	L (4-5%)			

Uttarakhand

Districts surveyed: *Udham Singh Nagar*

Particulars of survey

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

Widely prevalent rice varieties

District	Varieties
Udham Singh Nagar	Pant Dhan 4, Pant Dhan 18, NDR 359, HKR 47, PR 113, PR 121, Pusa Basmati 1121, Pusa Basmati 1509

Particulars of rice area

District	Area (ha)	Production (tonnes)	Productivity (q/ha)
Udham Singh Nagar	104216	3699668	35.50

Production oriented survey was conducted during last week of October, 2017 covering 34 villages (sites) in 7 blocks of the district Udham Singh Nagar, Uttarakhand when the crops were in maturity stage. In general, the climatic conditions with reference to rice 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 (40-45%) were occupied with rice. Entire area under the district is irrigated and farmers followed recommended agronomic practice. The predominant varieties in this district were Pant Dhan 4, Pant Dhan 18, NDR 359, HKR 47, PR 113, PR 121, Pusa Basmati 1121 and Pusa Basmati 1509. However, basmati varieties viz., Pusa Basmati 1121 and Pusa Basmati 1509 were cultivated only in limited areas. The main crop rotation practices were rice-wheat, rice-sugarcane, sugarcane-toria/lentil-sugarcane, maize-wheat-rice-vegetable pea, sugarcane-sugarcane. In seven blocks viz., Khatima, Sitarganj, Rudrapur, Gadarpur, Bazpur, Jaspur and Kashipur of the district, most of the farmers adopted rice-wheat, rice-sugarcane, sugarcane-toria/lentil-sugarcane, maize-wheat-rice-vegetable pea, sugarcane-sugarcane cropping system. Yield of rice was expected to be 35-40q/ha in case of bold and medium grain varieties and that of basmati to be 20-25q/ha. Farmers applied high doses of nitrogenous fertilizers as basal and top dressing to maximize the yield. Farmers in the district unanimously applied zinc sulphate @ 25 kg/ha as basal application to avoid khaira disease. Crop was free from weeds at most of the places as most of the farmers used bis-pyribac sodium (Nominee Gold). The biotic constraints like brown spot, bacterial leaf blight, sheath blight, false smut and grain discoloration among the diseases and leaf folder, stem borer, BPH, WBPH, rice hispa and Gandhi bug were recorded in low intensities. At some places moderate incidence of Gandhi bug was also noticed. Most of the farmers used Cartap hydrochloride and Regent (fipronil) to control stem borer. Grain discoloration was also noticed in the fields at some places where crop was attacked by Gandhi bug.

Prevalence of diseases and insect pests in Uttarakhand during *Kharif'2017*

District	Diseases					Insect pests					
	BS	ShBl	GD	FS	BLB	SB	LF	BPH	WBPH	GB	RH
US Nagar	L	L	L	L	L	L	L	L	L	L-M	L

West Bengal

Districts surveyed: *Bankura, Purba Medinipur, Coochbehar* and *South Dinajpur*

Particulars of survey

Districts	Blocks	Villages
Bankura	Ranibandh and Raipur	Chendapathar and Phulkusma
Purba Medinipur	Kantai-III and Chanmdipur	Kantai, Bhaitgar and Korkhali
Coochbehar	Mahthabhanga-II, Mahthabhanga-I and Coochbehar-I	Phulbari, Chonger Khata, Giranpur and Brahmattor Kasaldanga
South Dinajpur	Balurghat and Tapan	Jalghar and Nimnagar Hazaratpur-3

Widely prevalent rice varieties

Districts	Varieties
Bankura	**HYVs:** Swarna, Swarna Sub-1,Lalat, MTU 1010, IET 4786, GB-1, Annada and IR 36; **Scented**: Badshahbhog and Gobindobhog
Purba Medinipur	**HYVs:** Swarna, Swarna Sub-1, Santoshi, GS-1, Super Shyamali, Rajlakshmi, WGL-20471, MTU 1010, CR-1001, IET 4786, Sabita,Gitanjali, Barsha, Pratiksha and Rajendra Mahsuri; **Local**: Lathisail
Coochbehar	**HYVs:** Swarna, Swarna Sub-1, Ranjana, Nilanjana, Mahsuri, MTU 1075, IET 5656, Gotara Bidhan-1, Annada, Jamuna, Shatabdi, Rajendra Mahsuri, Lalat and Pratiksha; **Hybrids:** Arize 6444,Suruchi and JKMH-401; **Local:** Kalomani and Yamuna
South Dinajpur	**HYVs:** Swarna, Khitish, IET 4094, Samba Mahsuri, Swarna Sub-1, Lalat, GB-1 and GB-3; **Hybrids:** Arize 6444; **Locals:** Chini

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)
Bankura	688100	419286.46	395841	133206	382665
Purba Medinipur	430140	305915	304800	176784	255520
Coochbehar	338700	266265	250611	136056	296500*
South Dinajpur	221000	175620	175620	68000	210000*

* Total paddy area (Aush, Aman, Boro)

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

Parameters	Districts			
	Bankura	**Purba Medinipur**	**Coochbehar**	**South Dinajpur**
Total area under HYVs in the district (ha)	347600 ha	255520 ha	287800 ha	168000 ha
Most prevalent HYVs in the district	MTU 7029	MTU 7029, Super Shymali	Swarna, Swarna-Sub-1	Swarna, GB1 & 3
Total area under rice hybrids in the district(ha)	1500 ha	10,000 ha	7300 ha	250 ha
Most prevalent rice hybrids in the district	Arize 6444	Mumpy Gold	JKRH 401, Arize 6444, Suruchi	Arize 6444
Total area under basmati in the district	-	Nil	-	Nil
Most prevalent basmati varieties in the district	-	NA	-	-
Whether farmers are using any heavy equipments like transplanted/combine harvester	Yes	Combine harvester, thresher, but limited area	Transplanter, Combine harvester	Yes; Combine Harvester
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	SRI	Drum seeder in few fields	SRI	SRI and zero tillage
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	-	-	Regarding seed bed preparation and control of sheath blight and mealy bugs	Yes; rice production technology
What are the general problems in rice cultivation in the district?	Irrigation problem	Algal weed and drainage problem	Low dose of fertilizers and irrigation	Water logging due to poor drainage
Please provide any farmers association in the district	FPO-Farmers Producer Organiztion, FarmersClub-15 NOs.	Panskura Vegetables Growers Organization	Petanepara Suphala Shaw nirvar Gosthi, Post Barama-richa Block-Sitalkuchi, Sub-Division-Mathabhanga District-Coochbehar	-
Whether availability of labours is sufficient?	Yes	Yes	No	No; 30% less during peak agricultural operation season
Whether there is any marketing problem of the produce?	-	Yes	Needs more organized marketing facilities	Yes
Any major irrigation/power generation project in the district	Kangsavati, DVC	Kolaghat thermal power project	No	-
Any soil testing program undertaken?	NMSA	Yes; Universa-lizationn of SHC through NMSA	Soil Health Card	Yes
Any farmers' training program was organized by the state department of Agriculture/University	Yes	Many; by NFSM, NMOOP, NMSA, ATMA, State plan	Training programs by Dept of Agriculture, KVK, Pundibari and UBKV	Yes; under various schemes like BGREI

Variety wise area coverage (ha) in different district of West Bengal during 2017

Variety/Hybrid	Districts			
	Bankura	**Purba Medinipur**	**Coochbehar**	**South Dinajpur**
MTU 7029	2,40,620	75,000	1,06,486	1,20,000
Mahsuri			57,560	
GB-1	36,340			20,000
Gb-3				20,000
Lalat	33,420		8,634	
MTU 1010	15,570	30,000	8,634	
MTU 1075			5,756	
IET 5656			28,780	
Gotra Bidhan-1			14,390	
Annada			14,390	
IET 4786	6,830	15,000	8,634	5,000
Jamuna			4,317	
Shatabdi			8,634	
Rajendra Mahsuri			1,439	
Pratikshya		40,000	2,878	
SuperShyamali		25,000		
Sabita		15,000		
Gitanjali		5,000		
Swarna Sub-1		5,000	17,268	
Badshabhog, Gobindobhog	34,480			
Dudherswar		10,000		
Others	15,405			3,000
IET 4094 (Boro)				25,000
GB-34 (Boro)				17,000
Hybrids				
Mumpy Gold, Vaishnavi		10,000		
Arize 6444			500	
Suruchi			365	
JKRH-401			1,825	

Production oriented survey was conducted was conducted in four districts in West Bengal viz., Bankura, Purba Medinipur, Coochbehar and South Dinajpur when the crops were in dough to maturity stage. Majority of the fields surveyed were under rainfed lowland ecosystem. Predominant cropping sequences followed by the farmers were rice-mustard, rice-potato, rice-rice, rice-jute, rice-rice-black gram, rice-rice-groundnut, rice-lentil and rice-rice-lathyrus and rice-wheat. Different rice varieties cultivated by the farmers were HYVs like Swarna, Swarna Sub-1, Ranjana, Nilanjana, Mahsuri, MTU 1075, IET 5656, Gotara Bidhan-1, Annada, Jamuna, Shatabdi, Rajendra Mahsuri, Lalat and Pratiksha. Some farmers also cultivated hybrids like Arize 6444, Suruchi and JKMH-401. Some farmers also cultivated aromatic short grains like Badshabhog and Gobindobhog and local varieties like Kalomani and Yamuna mainly for taste. Average rice yield was 4000-5000 kg/ha. Fertilizers were applied @ 65-70 kg N/ha, 20-35 kg P_2O_5/ha and 20-32 kg K_2O/ha through urea, SSP, MOP,

10:26:26, DAP and Suphala. Application of FYM was common among the farmers from Southern parts of West Bengal like Bankura and Purba Medinipur but not in northern parts of West Bengal like Coochbehar and South Dinajpur. About 50% of the farmers contacted told that they adopted seed treatment with Bavistin or Captan or Diathane M-45. ntensity of common weeds like *Marsilea minuta, Digitaria sanguinalis, Echinochloa colona, Echinochloa crusgalli, Euphorbia hirta, Cyperus rotundus* and *Solanum* spp. was moderate to high. Common method of weed management was hand weeding. Implements like tractor, cultivator, sprayers and power tillers were used by the farmers. Among the diseases, leaf blast was moderate to severe in Purba Medinipur and Coochbehar. Sheath blight was widespread in moderate to severe intensities. Severe incidence of brown spot was observed in Coochbehar. Other diseases and insect pests were observed in low to moderate intensities. Different pesticides were applied by the farmers for management of diseases and insect pests.

District wise observations

Bankura: Production oriented survey was conducted in two villages (in 2 blocks) in this district when the crops were in booting to dough stage. Fields surveyed were either in upland or rainfed ecosystem. In general, the climatic conditions were favourable for rice cultivation. Farmers used their entire land for rice cultivation during *Kharif* season. Predominant cropping sequences followed by the farmers were rice-mustard, rice-potato, rice-rice and rice-wheat. Different rice varieties cultivated by the farmers were HYVs like Swarna, Swarna Sub-1, Lalat, MTU 1010, IET 4786, GB-1, Annada and IR 36 and aromatic short grain varieties like Badshahbhog and Gobindobhog. Average rice yield in the district ranged form 4500-4800 kg/ha in varieties like Swarna and Swarna Sub-1 and 5000-5200 kg/ha in varieties like IR 36 and Lalat. Transplanting was done mainly during second to third week of July. Average seed rate was 37-52 kg/ha. About 50% of the farmers contacted told that they adopted seed treatment with Bavistin (2 g/kg). Almost all the farmers applied FYM in the nursery. However, application of chemical fertilizers in the nursery was not common. All the farmers applied 75-90 kg/ha urea and 75-90 kg/ha 10:26:26 in the main fields. All the farmers applied FYM (30 cart loads/ha) in the main fields. Intensity of common weeds like *Marsilea minuta, Digitaria sanguinalis, Cyperus rotundus* and *Solanum* spp. was moderate to high. Common method of weed management was hand weeding. Some farmers applied weedicides like butachlor. Implements like tractor, power tiller, hand sprayer and country plough were commonly used by the farmers. Seed replacement rate was low and majority of the farmers used previous year's seed for sowing. Canal was the main source of irrigation and there was scarcity of irrigation water in the district. There was shortage of electricity in the region. Farmers took advices from private dealers and staffs from state department of Agriculture regarding use of various inputs. Among the diseases, sheath blight was very widespread in moderate to severe form (up to 30%) especially on variety Swarna. Sheath rot was also recorded in some fields in low to moderate intensity. Among the insect pests, BPH was vey widespread in high intensities on Swarna. Stem borer was recorded in low to moderate intensity. Farmers applied different pesticides like validamycin + Contaf (2 ml/l) and tricyclazole + mancozeb (30 g/16 l) for sheath blight; acephate (20 g/16 l), Glamour + Confidor (10 ml/16 l), Bipvin (30 ml/16 l) and Tarjan (25 ml/16 l) for BPH. Farmers made 2-3 pesticide application and about 20% farmers mixed 2 pesticides before application. Zinc deficiency symptoms were observed in some places.

Purba Medinipur: Survey was conducted in three villages (in 2 blocks) involving 5 farmers in this district when the crops were at dough stage. All the fields surveyed were under rainfed

lowland ecosystem. In general, the weather conditions were favourable for rice cultivation. All the farmers used their entire land for rice cultivation during *Kharif* season. Predominant cropping sequences followed by different farmers were rice-rice, rice-rice-black gram, rice-rice-groundnut, rice-lentil and rice-rice-lathyrus. Different rice cultivars grown by the farmers were HYVs like Swarna, Swarna Sub-1, Santoshi, GS-1, Super Shyamali, Rajlakshmi, WGL-20471, MTU 1010, CR-1001, IET 4786, Sabita,Gitanjali, Barsha, Pratiksha and Rajendra Mahsuri. Some farmers are growing local varieties like Lathisail because of local demand. Average rice yield in the region was 4000-5500 kg/ha in different HYVs. Planting was mainly completed during 1st week to middle of July. Average seed rate was 35-70kg/ha and about 80% of the farmers told that they adopted seed treatment with Captan (3 g/kg) or Bavistin (2 g/kg). About 80% of the farmers contacted told that they applied FYM in the nursery and only few applied chemical fertilizers like urea, DAP and MOP. In the main fields, farmers applied 100-150 kg/ha urea or DAP, 100-150 kg/ha SSP and 50-75 kg/ha MOP. Majority of the farmers (~80%) applied FYM in the main fields. Farmers followed random transplanting. The Intensity of common weeds in and around rice fields was low. Application of herbicides was not common and hand weeding was most common among the farmers. Some of the common needs of the farmers were timely availability of quality seeds, fertilizers, plant protection chemicals, mechanization and improvement of drainage system. Implements like power tiller, thresher, sprayer and tractor were commonly used by the farmers. Farmers purchased 10-100% of their seeds. Shallow tube wells were the main sources of irrigation and all of them expressed about scarcity of irrigation water. In addition to their decision, staffs from state department of Agriculture advised the farmers. Among the diseases, leaf blast was widespread in moderate form. Its intensity was very high (up to 50%) on Lathisail in Bhaitgar in Contai. Other diseases like sheath blight, brown spot, false smut and bacterial blight were recorded in low to moderate form. The insect pests like stem borer, leaf folder and BPH were observed in low to moderate intensities. Different pesticides like imidacloprid, Furadan, acephate, flubendamide, carbendazim, Amistar and tebuconazole were applied by the farmers for management of different pests and diseases. Number of pesticide application ranged from 2-3 and the major problems faced by the farmers were pests and diseases and drainage problems.

Coochbehar: Four villages in 3 blocks involving 7 farmers were covered for production oriented survey. The crops were at dough to maturity stage at the time of survey. All the fields surveyed were in rainfed lowland ecosystem. In general, the climatic conditions were favourable for rice cultivation. All the farmers contacted used their entire land for rice cultivation during *Kharif* season. Common cropping sequences followed by the farmers were rice-rice, rice-pulses, rice-oilseeds and rice-jute. Different rice varieties cultivated by the farmers were HYVs like Swarna, Swarna Sub-1, Ranjana, Nilanjana, Mahsuri, MTU 1075, IET 5656, Gotara Bidhan-1, Annada, Jamuna, Shatabdi, Rajendra Mahsuri, Lalat and Pratiksha. Some farmers also cultivated hybrids like Arize 6444, Suruchi and JKMH-401. Some farmers also cultivated local varieties like Kalomani and Yamuna mainly for taste. Average rice yield in the district ranged from 4200-5500 kg/ha in different HYVs like Swarna, Swar Sub-1 and Ranjan and 3000-4000 kg/ha in local varieties Kalamunia and Yamuna. Planting was mainly done during middle of July to end of July. Seed rate ranged from 25-60 kg/ha. Very few farmers (15%) adopted seed treatment. Application of organic manures or chemical fertilizers in the nursery was not common among the farmers. In the main fields, fertilizers were applied @ 100-120 kg urea/ha, 75-125 kg DAP/ha, 25 kg MOP/ha and about 20 kg zinc sulphate/ha. Some farmers also applied complex fertilizers like 10:26:26 (45-75 kg/ha). Application of FYM in the main fields also was not common. Farmers followed random and double transplanting method. Intensity of common weeds was

medium. None of the farmers contacted applied any weedicides and hand weeding was the most common practice for weed management. Some of the common needs of the farmers were mechanization, irrigation facilities, proper market, quality seeds and pesticides and improvement in drainage system. Farmers told that they purchased 30-100% of their seed requirement. Shallow tube wells were the main sources of irrigation and majority expressed scarcity of irrigation water. In addition to their decision, staffs from state department of Agriculture advised the farmers. Among the diseases, leaf blast, sheath blight and brown spot were widespread. High intensity of leaf blast (up to 30% on Yamuna) and sheath blight (up to 40% on Swarna) was recorded in some fields. Severe brown spot (50-60%) was recorded on varieties like Swarna Sub-1 and Ranjana in Phulbari village. Different pesticides like Amistar (0.1%) for blast; Nativo (0.4 g/l), Tilt (0.1%) and Score (1 ml/l) for blast, sheath rot and brow spot; Sheathmar (1.5 ml/l) for sheath blight; imidacloprid (1 ml/5 l) for BPH, Regent, acephate (1.5 ml/l) for stem borer and leaf folder were applied by the farmers. Number of pesticide application ranged from 2-4 in a season. About 20% farmers told that they mixed two pesticides before application. Major problems faced by the farmers were flood and drainage problems.

South Dinajpur: Production oriented survey was conducted in 2 villages (in 2 blocks) involving 9 farmers in this district when the crops were in milk to dough stage. Majority of the fields surveyed were under rainfed lowland ecosystem. Some were in upland and some under irrigated ecosystem. Different cropping sequences followed by the farmers were rice mustard-jute, rice-mustard-rice, rice-potato, rice-pulses, rice-pulses-jute, rice-rice-fallow, rice-rice-jute and rice-jute. Different rice varieties cultivated by the farmers in the district were HYVs like Swarna, Khitish, IET 4094, Samba Mahsuri, Swarna Sub-1, Lalat, GB-1 and GB-3. Few also cultivated hybrid Arize 6444. Some farmers are cultivating local varieties for their taste. Average rice yield ranged from 3500-5500 kg/ha in different HYVs. Planting was mainly done during 1st week to 2nd week of July. Average seed rate was 25-50 kg/ha and almost all the farmers contacted told that they adopted seed treatment with Diathane M-45 (2.5 g/kg) or Bavistin (2.5 g/kg; Wet seed treatment). About 15% of the farmers contacted told that they applied FYM in the nursery. However, all of them applied chemical fertilizers like urea. Fertilizers were applied @ 65-70 kg N/ha, 20-35 kg P_2O_5/ha and 20-32 kg K_2O/ha through urea, SSP, MOP and Suphala. Very few (~10%) applied FYM in the main fields. Farmers followed line transplanting. The intensity of common weeds like *Cynodon dactylon, Euphorbia hirta, Echinochloa colona, E. crussgalli* and *Avena fatua* was low. Hand weeding was the common method of weed management. Some of the common demands of the farmers were quality seeds of HYVs at subsidized rates, financial support and good support price. Implements like tractor and cultivators were used by the farmers mainly on hire basis. Farmers used previous year's seeds and purchased a part of their seed requirement (20-30%). Shallow tube wells were the main sources of irrigation. Officials from state department of Agriculture advised the farmers regarding input use. Intensity of most of the biotic stresses was in low to moderate intensity except sheath blight which was recorded in higher intensity (up to 30%) on Swarna in some fields. Different pesticides like Diathane M-45 (2.5 g/l), Bavistin (1 g/l), hexaconazole (2 ml/l) and propiconazole (0.1%) for sheath blight, sheath rot, grain discolouration and false smut; kitazin (2 ml/l) for blast; hostathion (1.5 ml/l) and Ustaad for leaf folder and stem borer and Confidor (1 ml/4 l) for BPH were applied by the farmers. Number of pesticide application ranged from 2-3 per season. Symptoms of zinc deficiency were observed in some fields. Some of the farmers expressed their unhappiness towards rice cultivation

Prevalence of diseases and insect pests in West Bengal during *Kharif*' 2017

Districts	**Diseases**					
	Bl	**ShBl**	**ShR**	**BS**	**FS**	**BLB**
Bankura		M-S (20-30%)	M (10-15%)			
Purba Medinipur	M-S (10-50%)	L-M (5-15%)	T	M (20-25%)	L (1-7%)	M (20-25%)
Coochbehar	M-S (10-30%)	M-S (15-40%)	L	M-S (20-60%)	L-M (5-10%)	L-M(2-20%)
South Dinajpur	L-M (3-13%)	M-S (13-30%)	M (10-15%)	M (11-15%)	L_M (8-12%)	L (5-7%)

Districts	**Insect pets**		
	SB	**BPH**	**LF**
Bankura	L-M (8-12%)	S (30-60%)	
Purba Medinipur	L-M (2-10%)	L (5-7%)	L-M (5-10%)
Coochbehar	L-S (5-30%)	L (2-5%)	L (2-10%)
South Dinajpur	M (12-21%)	M (10-20%)	L-M (7-15%)

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

Production Oriented Survey-2017 reports were compiled by the following scientists of Department of Plant Pathology, ICAR-IIRR

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Acknowledgements

Thanks are due to scientists of Agricultural Universities, and staff in the state Departments of Agriculture, who participated in the Production Oriented Surveys. Thanks are also due to the Directors of Institutes, Directors of Agriculture, Directors of Research at Agricultural Universities in Bihar, Chhattishgarh, Gujarat, Haryana, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Punjab, Tamil Nadu, Telangana, Uttar Pradesh, Uttarakhand and West Bengal for according permission to their respective officers and scientists to participate in these surveys. We are also grateful to Indian Meteorological Department for climatic data.