

उत्पादनोन्मुखी सर्वेक्षण Production Oriented Survey

सहयोग

राज्य कृषि विश्वविध्यालय एवं कृषि विभाग

In collaboration with State Agricultural Universities and Department of Agriculture

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







भाकृअनुप-भारतीय चावल अनुसंधान संस्थान भारतीय कृषि अनुसंधान परिषद

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PRODUCTION ORIENTED SURVEY 2020

In collaboration with

AGRICULTURAL UNIVERSITIES

and

STATE DEPARTMENTS OF AGRICULTURE

All India Coordinated Rice Improvement Programme (AICRIP)

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Correct citation: ICAR-Indian Institute of Rice Research, 2021 Production Oriented Survey 2020 All India Coordinated Rice Improvement Programme ICAR-Indian Institute of Rice Research, Rajendranagar, Hyderabad-500 030, TS, India

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Production Oriented Survey-2020

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Production Oriented Survey-2020

SUMMARY

Production oriented survey is conducted by a team of subject matter experts (from different state agricultural universities and ICAR Insstitutes) along with officials from state department of agriculture with an objective to collect information on different aspects of rice cultivation from different rice growing states of India. The survey is based on both eye-ball survey and questionnaire based survey. The different aspects that are covered in the survey are prevailing climatic conditions for rice cultivation, varietal profile in a particular region, extent of use of organic manure and inorganic fertilizers, occurrence of different biotic and abiotic problems and their management and various needs of the farmers and problems faced by the farmers. During 2020, the survey was conducted in 10 states of India *viz.*, Andhra Pradesh, Bihar, Gujarat, Haryana, Karnataka, Maharashtra, Punjab, Telangana, Uttar Pradesh and Uttarakhand by 12 AICRIP centres. Due to Covid pandemic, many states could not be covered for survey. A total of 59 Scientific staffs from the different cooperating centres and selected officials from state department of agriculture surveyed 78 districts in 10 states.

The seasonal (June-September) rainfall over the country as a whole was 109% of its Long Period Average (LPA) in 2020. It was the third highest after 112% of LPA in 1994 and 110 % of LPA in 2019. Seasonal rainfalls over Northwest India, Central India, South Peninsula and Northeast (NE) India were 84%, 115%, 130% and 106% of their respective LPA. Out of 36 meteorological subdivisions, 2 subdivisions received large excess rainfall, 13 subdivisions received excess rainfall, 16 subdivisions received normal seasonal rainfall and 5 subdivisions received deficient season rainfall during the season. Monthly rainfall over the country as a whole was 118% of LPA in June, 90% of LPA in July, 127% of LPA in August, and 104% of LPA in September. Southwest monsoon current reached south Andaman Sea and Nicobar Islands on 17th May 2020 (5 days ahead of its normal date), but further advance was sluggish. It set in over Kerala on 1st June coinciding with its normal date for onset over Kerala; Monsoon covered the entire country on 26th June 2020; 12 days before its normal date (8th July). Monsoon started withdrawing from western parts of northwest India on 28th September 2020 against the normal date of 17th September 2020 with a delay of around 11 days. The Southwest Monsoon withdrew from the entire country on 28th October 2020 (IMD, 2020). Several cyclones during the season affected agricultural crops and human life. The season started with the severe cyclone 'Amphan' in May 16 which affected standing crops and human life large parts of Odisha and West Bengal. Severe Cyclone 'Nisarga' affected the Maharashtra coast during June 1-4, 2020. Another cyclone called 'Gati' affected parts of Kerala during November 4th week. Very severe cyclonic storm 'Nivar' affected during November 23-27 affected parts of Andhra Pradesh, Puducherry and Tamil Nadu. Another cyclonic storm 'Burevi' during November 30 to December 5, 2020 affected parts of Tamil Nadu and Kerala.

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. Hybrid rice varieties occupied a significant area in states like Uttar Pradesh, Haryana, Gujarat and Bihar and its area is increasing in states like Karnataka and Maharashtra. Among the diseases, leaf blast, neck blast, brown spot, sheath blight, false smut,

grain discoloration and bacterial blight were widespread. High intensity of leaf blast and false smut was recorded in parts of Telangana and Uttar Pradesh while bacterial blight was severe in parts of coastal Andhra Pradesh, Konkan region of Maharashtra and parts of Telangana. Among the insect pests, stem borer, leaf folder and BPH were very wide spread. Intensity of stem borer was more in Konkan region of Maharashtra.

Andhra Pradesh: Production Oriented Survey (rice) was conducted in the Godavari Zone of Andhra Pradesh viz., East Godavari and West districts. The season witnessed excess rainfall in the way of cyclones during October and November months. Crop damage has been reported due to continuous cyclonic rains which resulted in submergence. Preference for varieties varied with the location under survey. It has been observed that there is a gradual shift in dependence on one variety to cultivation of varieties based on their marketability and yields. However, Swarna (MTU 7029) was the preferred variety during *Kharif* in both the districts under survey. Whereas, during Rabi, MTU 1121 (Sri Druthi) was the most popular rice variety in West Godvari district and MTU 3626 (Prabhat) is the popular variety in East Godavari district during 2020-21. Private varieties viz., Sampada swarna (Nuziveedu seeds) was also gaining popularity in West Godavari district. In the West Godavari district of Andhra Pradesh, rice-rice is the predominant cropping pattern in majority of the locations whereas in East Godavari district, Rice-Pulses Cropping system is followed in areas dependent on monsoon rains. Average seed rate was 12-30 kg/ha. Seed treatment was not common among the farmers. For weed management, in addition to hand weeding, farmers used different herbicides like Topstar (oxadiargyl), Rifit (pretilachlor), Sofit (pretilachlor with safener), Londax power (Bensulfuron methyl 0.8% + pretilachlor 6%) Sathi (pyrazosulfuran ethyl), Nominee gold (bispyribac sodium), Almix (Metsulfuran methyl + Chlorimuran ethyl and others. About 10% farmers used organic manures. Most of the farmers applied overdose of nitrogen in most of the surveyed places. Among the biotic constraints, bacterial blight was observed in moderate to severe intensity in both the districts. Other diseases like neck blast, sheath blight, sheath rot, false smut and grain discoloration and insect pests like BPH, stem borer, leaf folder, mites and rats were observed in low to moderate intensity. Majority of the farmers adopted plant protection measures.

Bihar: Production oriented survey was conducted in three districts in this part of Bihar viz., Darbhanga, Samastipur and Muzaffarpur. Rainfall was good in these areas. However, there was some crop damage due to heavy rainfall in the month of August September. Common crop rotations were rice-wheat, rice-pulse, rice-mustard, rice-potato and rice-maize. Predominant rice varieties were HYVs like Rajendra Bhagwati, Rajendra Sweta, Rajendra Mansuri, Sugandha, Swarna, Rajendra Nilam, Rajendra Kasturi, Rajshree, BPT-5204, MTU-7029, Rajendra Subhasini and Dhanalaxmi and hybrids like Hybrid-644, Hybrid-6201, Hybrid-27P37, Hybrid-2731, PHB-71, 27P-31, Arize-6444, Pusa RH-10, Arize-6129, JK-401, AZ-6453, AZ-8433DT, JK-401 and Hybrid 1001 and NK-147221. In general, sowing was done in the month of June and planting in July. Many farmers used higher dose of nitrogenous fertilizers. A few farmers applied FYM, neem cake and vermi-compost in rice field. The common weeds were Ipomoea spp, Cyprus rotundus and Cynodonn dactylon. Hand weeding is local practice for removal of weeds from rice field within 45 days after transplanting. Herbicides like pendimethelene (Stamp and Penda), 2,4-d, Nominee gold and Adora were used by farmers in management of weeds. Average seed rate was 25-30 kg/ha. The average yield of different hybrid varieties ranged from 4000-6000 kg/ha. In high yielding and local varieties of rice the average yield varied from 3000-5000 kg/ha. Biotic constraints like bacterial blight, sheath rot, sheath blight, brown spot, false

smut, leaf folder, stem borer and rodent were observed in rice field. Pesticides like carbendazim, Saaf, mancozeb, hexaconazole, propiconazole were used by 5-10% farmers.

Gujarat: Production oriented survey was conducted in the 9 major rice growing districts of Gujarat State viz., Ahmedabad, Kheda, Anand, Mahisagar, Gandhinagar, Mehsana, Panchmahals, Chotta Udaipur and Vadodara. This year the climatic conditions were favorable for rice crop cultivation. The commonly cultivated rice varieties in different districts are presented in Table 2. Varieties like Gurjari, GAR-13, GR-11, GR-101, Mahisagar, GAR-14, Masuri, Jaya, Narmada, Moti-gold, Surva moti, Sonam, Versha, Nath Pauha, Krishna Kamod, Pioneer 121, US-312, MC-13, 25P25, VNR 2233, Buland 5050, Lxami-17, Gangamani, JK Suraksha etc. were mainly cultivated in different districts of Gujarat. The prevailing crop rotations were rice-wheat-rice, rice-chickpea, rice-tobacco, rice-wheat-vegetable crops, rice-rice, rice-wheat-maize, rice-beansummer green gram, rice-vegetable crops etc. adopted in different districts of Gujarat. All the fields surveyed were under irrigated ecosystem. Among the varieties, Gurjari and GAR 13 were widely cultivated. The average yield among different HYVs and hybrids in different surveyed districts ranged from 3500-6500 kg/ha. Average seed rate used by the farmers in different districts ranged from 20-35 kg/ha. The practice of treating the seeds before sowing was not very common among the farmers. Planting was mainly done during 1st week of July to last week of July. Most of the farmers adopted random method of planting where proper plant population was not maintained. Fertilzers were applied @ 30-120 kg N/ha, 15-69 kg P2O5/ha and 15-25 kg ZnSO₄/ha. Application of potassic fertilizers were not common among the farmers. All the farmers contacted applied organic manure like FYM (mainly), green manure and vermicompost in the main field. Intensity of common weeds like Echinochloa colona, Echinochloa crusgalli, Cyperus rotundus and Cynodon dactylon was low to medium. In addition to hand weeding (1-2), some farmers applied different herbicides for weed management. Different implements like tractor, rotavator, cultivator, laser leveler, puddler and combined harvester (either own or hire basis) were used by the farmers. Average seed replacement rate was 20-50%. In general, the intensity of different diseases and insect pests was low. In some fields of Mehsana district, false smut was more. Farmers used different pesticides for managing different pests and diseases. There were reports of zinc deficiency in different districts.

Haryana: Production oriented survey was conducted in 8 rice growing districts of Haryana during Kharif season of 2020 when the crops were booting to milk stage. The fields surveyed were under irrigated ecosystem and in general the weather conditions for rice cultivation was normal. Widely prevalent varieties were HYVs like PR 126, PR 114,PR 118, PR 127, PR 121, Pusa 44, HKR 47 and NDR 359; hybrids like 28p67, Sawa 127, Sawa 134, Hyb. 432, Bayer 777, Hyb 7726, Hyb. 2111, Hyb. 90m100, Hyb. 834, Hyb. 357, 28p67, Arize 6444, Syngenta 7002, Hybrid 2222, Rasi 834 and Syngenta Hyb and basmati varieties like Pusa Basmati 1121, Pusa Basmati 1509, Pusa Basmati 1718, Pusa Basmati 1, CSR 30 and Super 21. The main crop rotation followed by the farmers was rice-wheat. Average rice among HYVs ranged from 4750-10,000 kg/ha while in case of hybrid varieties it ranged from 6250-9250 kg/ha. In case of basmati varieties, average yield ranged from 3750-6000 kg/ha. Average seed rate was low (10-12 kg/ha). About 50-90% of the farmers contacted told that they treated the seeds by soaking a mixture of Bavistin (10g) + streptocycline (1g) for 24 h. Planting was done during second week of June to third week of July. Average fertilizer dose was 80-195 kg N/ha, 20-143 kg P₂O₅/ha and 23-57.5 kg K₂O/ha. Comparatively less number of farmers applied potash. On an average

about 58% farmers applied zinc sulphate. Intensity of common weeds like *Echinochloa* spp. and *Cyperus* spp. was low. Hand weeding was not common among the farmers and majority of the farmers applied different weedicides for management of weeds. Some of the common needs of the farmers were increase in the price of basmati rice, timely availability of Quality inputs, subsidy on implements, practical solution for residue management, short duration rice varieties and reduction in the cost of cultivation. Farmers used different implements like Tractor, trolley, harrow, cultivator, rotavator, combine harvester, power tiller, reapers and others. Progressive farmers had some of their own equipments and other farmers hired the implements. Intensity of different biotic constraints was low to medium. Most of the farmers adopted plant protection measures.

Karnataka: Production oriented survey was conducted in five districts of Karnataka viz., Chikkamagaluru, Davangere, Hassan, Mandya and Mysuru during *Kharif* 2020. The prevailing cropping pattern in the districts surveyed is Rice-Rice followed by Rice-sugarcane, Ricevegetables, Rice-Maize, Rice-Pulses, Rice-Ragi and Rice-Fallow. The climatic condition prevailed during the cropping period was normal except with cold temperature during September at tillering stage in Mandya and Mysuru district. The inputs in all districts were adequate except zinc micronutrient because of which deficiency was seen in many fields. State department of Agriculture distributed the seeds to the farmers timely during the season without any shortage under Covid -19 pandemic situation. State department in collaboration with universities opened agriclinic to provide better advisory service to farmers under COVID pandemic situations. In recent years farmers are adopting direct wet sowing using drum seeder in many districts. Alternate drying and wetting method of irrigation is picking up in Mandya and Mysuru districts in cauvery command area due to technology spread. The common method of cultivation is random planting. The density of weedy rice has decreased over the years due to timely application of weedicides (within 3 DAS). Mechanization in all the districts was adopted mainly for harvesting by using combine harvesters and baler. Mechanical Rice transplanters are being promoted from state department by providing subsidies in Davangere and other districts. Varieties viz., IR64, Intan, MTU 1001, MTU 1010, IET13901(Tunga), BR2655, Jyothi, BPT5204, JGL1798, KPR-1, MRH 836, RNR 15048, Java Kaveri sona and Jaishree Sona and hybrids viz., Arize, PAC 837, DRH836, MC13 and VNR2233 were grown in the surveyed districts. Usual seed rate was 25 kg/acre. About 50% of the farmers adopted seed treatment with carbendazim @ 2 to 4 g/Kg of seed. In the main field, N was applied in the form of Urea, DAP and other complex fertilizers, 10:26:26, 17:17:17, 19:19:19, 20:20:0:13 where in the available nitrogen varied from 6.9 kg to 40 kg/acre; P was applied as DAP and Potash (available form 19 -28 kg/acre), K was applied as MOP, and other complex fertilizers (available form 19 -23kg/acre) and S @ 13 kg/acre. The outbreak of insects and diseases was moderate due to timely sowing. As noticed in 2019 bloodworm problem is again notice in Cauvery command area because of which the crop was showing stunted growth and leaves were turning light yellow. The major diseases viz., leaf blast, bacterial leaf blight, brown leaf spot and neckblast appeared in patches in low to moderate level. However, in certain places, leaf blast severity up to 50% was recorded in Jyothi, MTU1001 and private varieties. The insect pests viz., case worm, leaf folder and stem borer infestation was moderate to high in summer while low to moderate in *Kharif* 2020. In Mandya and Mysuru the brown plant hopper infestation of 25-50% was recorded during tillering, dough and grain filling stage. Earhead bug infestation 15-20% was noticed at dough stage irrespective of the varieties. Brown plant hopper and earhead bug have been consistently recorded from past three years in Mandya, Mysuru and Hassan district.

Maharashtra: Production oriented survey was conducted in the Konkan region of Maharashtra comprising of five districts viz. Thane, Raigad, Palghar, Ratnagiri and Sindhudurg. The total area under rice cultivation in Kharif-2020 season in the region was 375896 ha, out of these 94 % area were sown under rice during this yearThe weather conditions were good during growth stages of crop but during maturity period and harvesting stage, heavy rainfall occurred in the month of October and November which caused in lodging and in situ germination. Commonly grown varieties were HYVs like NB 37, YSR, Avani, Jordar, 911, Shabari, Ratna, ,Shriram, Rupam, MTU 1008, Asmita, Wada Kolam, Jaya, Ankur Rupali, Karjat-7, Karjat-3, Silky-277, Om 125, Daptari-100, Krushidhan Komal-101, Poonam, Shabari, MTU-1010, Jyotika, Om Shriram, Daptari 1008, Daptari 125, Trupti, Avani, Jordar, Vaishnavi, Soubhagya, Devaki, Shubhangi and Suprim Sona and hybrids like Arize 6444, Sahyadri-2, Sahyadri-3, Gorakhnath and Lokhnath 509. The locally grown varieties are Bela, Walai, Somasal, Dongara, Sorti, Kothimbira/Ghansal, Turya and Yelkar. The most common cropping pattern adopted by farmers in the region is Rice-Fallow, Rice-Pulses and Rice-Vegetables. Pulses after Kharif rice on residual moisture is a common practice in Palghar, Raigad, Thane and Ratnagiri districts. The average seed replacement ratio in the region during Kharif 2020 was 46%. In general, farmers undertook sowing in the month of June and planting was done during July. Average seed rate used by the farmers ranged from 30-70 kg/ha. Abour 66-94% farmers in different districts told that they treated the seeds with thiram (2.5-3 g/kg) or Bavistin (1 g/kg). Most common practice for weed management in the region is burning of nursery area with organic waste referred as 'Rab'. Fertilizers were applied @ 22-152.5 kg N/ha, 7.5-66 kg P₂O₅/ha and 7.5-66 kg K₂O/ha. None of the farmers contacted applied zinc sulphate. Overall, intensity of weeds was low to medium. Hand weeding was common method of weed management in the region. In Thane and Palghar districts farmer has formed some "Farmers Agricultural Machinery and Tool Bank" to overcome labour problem in the district with support of Zilla-parishad. Among the biotic constraints, blast was moderate to severe in parts of Ratnagiri and Sindhudurg while bacterial blight was high in parts of Thane and Raigad. Among different insect pests, stem borer was high in Thane, Raigad and Palghar. Application of pesticides among the farmers was not common.

Punjab: Production oriented survey was conducted in 13 districts of Punjab viz., Ludhiana, Gurdaspur, Pathankot, Sangrur, Patiala, Ropar, Nawanshahar (SBS Nagar), Jallandhar, Kapurthala, Hoshiarpur, Bathinda, Muktsar and Faridkot when the crops were in tillering stage. During *Kharif* 2020 in Punjab, paddy was grown on an area of around 28.6 lakh hectares. Non-Basmati and Basmati varieties occupied around 78 and 22 per cent area, respectively. Among the non-Basmati group, PR 121 was the most popular variety and occupied about 22 per cent area. Other predominant varieties were Pusa 44, PR 126, PR 124, PR 122 and PR 114. On the other hand, among the Basmati group, Pusa Basmati 1121 was the most predominant variety followed by Pusa Basmati 1509, Pusa Basmati 1401 and Pusa Basmati 1718. During 2020, the predominant crop rotation remained the rice-wheat system. Average rice yield among the high yielding varieties ranged from 6500-8400 kg/ha while in case of basmati varieties, it ranged from 4500-5600 kg/ha. Average seed rate was 12-20 kg/ha. About 37-77% farmers in different districts followed seed treatment with carbendazim. Planting was random and proper plant population was not maintained. An area of about 5.04 lakh ha was under direct seeded rice

(DSR). Most of the surveyed farmers used over dose of nitrogen but many farmers skipped the application of P_2O_5 and K_2O in paddy crop, owing to higher status of these nutrients in their soils. Application of Zinc sulphate (either 21 or 33%) is practiced by farmers but they used under dose of Zinc. Overall, intensity of weeds was low throughout Punjab. Predominant weeds were *Echnochloa crusgalli* and *Leptochloa chinensis*, etc, in puddled transplanted rice and *Eragrostis* spp. and *Leptochloa chinensis in* case of direct seeded rice. Most of the farmers applied herbicides were Bispyribac Sodium, pretilachlor and butachlor. A small fraction of farmers did not use any weedicide but they adopted cultural method of weed control i.e. ponding of water for the first 15 days of crop cycle. Many progressive farmers used implements like Tractor, disc harrow, cultivator, planker, combined harvester. In general, intensity of different biotic constraints was low to medium. Severe incidence of bacterial blight (up to 40%) was recorded on varieties like Pusa Basmati 1401, Pusa 44 and Pusa Basmati 1509 in parts of Sangrur and Patila. Farmers used different pesticides for the management of different pests and diseases.

Telangana-1: Production Oriented Survey (POS) of rice growing areas was conducted in 14 districts of Telangana during 2020-2021. Overall, the weather conditions are highly favorable for growth of paddy crop. However, excess rainfall in September and October months posed the several biotic constraints in paddy. The major varieties grown in the surveyed districts during kharif, 2020 were Samba Mahsuri (BPT 5204), Telangana Sona (RNR 15048), Jai Sreeram, HMT Sona, Kunaram Sannalu, MTU 1010, Jagtial Rice-1 Siddi, IR 64, Ankur Pooja, Chintu, MTU 1061, MTU 1224, MTU 1153, MTU 1156, MTU 1001 and Tellahamsa. Majority of the farmers using seed rate of 50-60 kg/ha for fine grain varieties, whereas 75 kg/ha for coarse grain varieties in transplanting method. The farmers are adopting wet seed treatment to an extent of 10-15% across the surveyed villages by using carbendazim @ 1.0 g per kg of seed per liter of water by soaking for 24 hours. Majority of the farmers are applying NPK in the form of complex fertilizers viz., 20-20-0-13, DAP, 10-26-26, 16-20-0-13, 17-17-17, 19-19-19, 28-28-0). Among the complex fertilizers, 20-20-0-13, 28-28-0 and DAP are the most commonly used basal fertilizers across the districts surveyed. Majority of the farmers are applying DAP or other complex fertilizers (50-150 kg/acre) as basal followed by top dressing of nitrogen in the form of Urea (150-200 kg/acre) in 2-3 split doses, while potash is being used in the form of MOP (25-50 kg/acre). In addition, the farmers are also applying zinc sulphate @ 20 kg per acre. Many farmers were growing the green manure crops viz., Crotalaria and Sunhemp preceding to rice. Direct seeding with drum seeder, wet-DSR under puddled conditions or direct seeding using seed cum ferti drill or broadcasting and machine planting are gaining popularity among the progressive farmers in parts of Telangana. Intensity of common weeds like Echinocloa colanum, E. crusgalli, Cyandon dactylon, Cyprus rotundus, Leersia hexandra, Panicum ripens, Euphorbia spp. and Parthenium spp. was low to medium. Farmers in the surveyed districts are using various pre and post-emergence herbicide molecules depending upon the availability in the districts. Majority of the farmers (90-95%) are purchasing the seed from local dealers, TSSDC, HACA, PACs, Department of Agriculture and Research Stations. Only few farmers (5-10%) in the surveyed villages are using their own seed. Among different insect pests, BPH was comparatively high in parts of Sangareddy, Peddapalli and Nagarkurnool while gall midge was high in parts of Kamareddy and Warangal. Among diseases, bacterial blight was more in parts of Nizamabad, Warnagal and Nagarkurnool, neck blast was high in parts of Sangareddy and leaf blast was high in parts of Khammam and Ranga reddy. False smut was wide spread in many places. Farmers used varieties of pesticides for management of different pests and diseases.

Telangana-2: Production Oriented Survey (POS) in rice growing areas Northern Telangana zone was conducted in 5 districts *viz.*, Jagtial, Karimnagar, Nizamabad, Kamareddy and Rajanna Siricilla covering major rice growing areas of Northern Telangana zone of Telangana state. Overall, the weather conditions are highly favorable for growth of paddy crop. Rice – rice was

the predominant cropping system in all the surveyed districts. The other systems found were green manure-rice-rice, rice- maize, rice -fallow, rice-rice -vegetables depending on the water availability and other factors. The major varieties grown in the surveyed districts during kharif, 2020 were MTU 1010, Telangana Sona (RNR 15048), Jagtial Rice-1, Samba Mahsuri (BPT 5204), Jai Sreeram, HMT Sona, Kunaram Sannalu, Siddi, Bathukamma, IR 64, Chintu, MTU 1153, MTU 1156, MTU 1001 and Tellahamsa. Majority of the farmers were using seed rate of 20-25 kg/acre for fine grain varieties, whereas 30 kg/acre for coarse grain varieties. Majority of the farmers were using DAP or Complex fertilizers like, 20-20-0-13 as basal dose in all the surveyed districts. Nitrogen is being applied in 2-3 split doses as top dressing in the form of urea at 15-20 days after planting, during maximum tillering and panicle initiation to booting stage of the crop. Potassium is used in the form of MOP (25-50 kg/acre). Farmers are also applying Zinc sulphate in the form of chelated zinc sulphate as foliar application during tillering stage particularly during Rabi season. The green manure crops grown in the surveyed districts were Crotalaria and Sesbania species. Direct seeding with drum seeder under puddled conditions or direct seeding using seed cum ferti drill or broadcasting are gaining popularity among the progressive farmers in Jagtial, Karimnagar and Nizamabad districts. Weed intensity of low to medium was observed in all the surveyed districts. The major weed species found in the surveyed districts were Echinocloa, Cyandon, Cyprus, Leersia and Parthenium spp. The farmers in the surveyed districts are using various pre and post-emergence herbicide molecules depending upon the availability. Among the biotic constraints, higher intensity of leaf blast was observed in parts of Jagtial and Rajanna Sircilla while false smut was more in parts of Jagtial. Moderate to high intensity of stem rot was recorded in parts of Karimnagar. Bacterial blight intensity was high in Nizamabad district. Intensity of different insect pests like stem borer, BPH and rice hispa was low to moderate. Majority of the farmers undertook plant protection measures.

Uttar Pradesh 1: Production oriented survey of rice growing areas was conducted in Ayodhya, Sultanpur, Ambedkar Nagar, Barabanki, SantKabir Nagar and Basti districts of eastern Uttar Pradesh from tillering to maturity stage during Kharif 2020. High yielding rice varieties like NDR 2064, NDR 2065, NDR 3112-1, Sambha Mahsuri-Sub 1, NDR 359, Sarjoo-52, NDR 97, Swarna, Swarna-Sub-1, BPT 5204, Sonam, Komal, Chintu, Dhanrekha, Damini and hybrids like Arize 6444 Gold, 27p63, Gorakhnath-510 were found very popular among the farmers of eastern U.P. Major crop rotations adopted by farmers were rice-wheat, rice-sugarcane, rice-mustard, rice-pulses and rice-Vegetable Zinc and sulfur deficiency were observed in surveyed districts. To supply essential nutrient to the crop farmers were using inorganic fertilizers viz. Urea, DAP, SSP, MOP, and Zinc suphate. Use organic manure FYM, Compost and Green manure (Dhaincha, Urd bean, Moong bean) were observed by the farmers to improve the soil health. Plant growth regulators/promoters viz. Biozyme and Microzyme are being used by farmers to obtain good harvest. Use of Rotavator, combine harvester and paddy thresher was common practice by the farming community. Common weeds observed were Echinochloa colona, Eclipta alba, E. crusgalli, Cyperus iria, C. rotundus, Cloeme viscosa, Fimbristylis dichotoma and Paspalum distichum. Farmers were using weedicides like butachlor, pretilachlor, bispyribac sodium and 2, 4-D to control the weed infestation in rice crop. Shortage of farm labourers coupled with higher labour wages are the major constraint in rice production in the surveyed districts. Govt. agencies are providing subsidized seeds, agro-chemicals, plant protection inputs and farm machineries including solar pumps to the farmers. Water saving technologies viz. DSR

and laser leveller was also being promoted in the farming community by Agriculture University and Department of Agriculture U.P. Biotic stresses like diseases sheath blight and bacterial leaf blight and insects stem borer, leaf folder and gundhi bug were observed from low to moderate intensity. However, false smut was noticed in the late maturing/hybrids rice varieties from moderate to severe intensity in all the surveyed districts.

Uttar Pradesh-2: Production oriented survey was conducted in five districts viz., Bahraich, Barabanki, Gonda, Balrampur and Shravasti when the crops were in tillering to booting or grain filling to maturity stage. The fields surveyed were mainly in rainfed lowland ecosystem. In general, weather conditions were normal for rice cultivation. Predominant rice varieties were HYVs like NDR 359, Sarjoo 52, Samba Mahsuri, Jalpriya, Jalmagna, Lalmati, Madhukar and Pusa Basmati 1 and hybrids like Arize 6444 and Arize 6444 Gold. Different cropping system followed by the farmers were rice-wheat, rice-wheat-black gram, rice-vegetables, ricesugarcane/lentil, rice-wheat-mentha, rice-lentil+mustard, rice-pea +mustard, ricewheat+mustard-green gram, rice-lentil, rice-lentil + mustard + vegetables and others. Planting was mainly done during last week of June to 2nd week of July. A seed rate of 18-25 kg/ha was used by the farmers. Seed treatment was not common among the farmers. Farmers in general applied FYM in the nursery and main fields. In the main fields, fertilizers were applied @ 60-100 kg urea/ha, 60-100 kg DAP/ha amd 40-60 kg MOP/ha. In general, the population of weeds like Echinochloa colona, Cyperus rotundus and Cynodon dactylon was low-medium. Farmers adopted hand weeding for management of weeds and none of the farmers contacted applied any herbicides. Implements like tractor, cultivator, rotavator and harrow were used by the farmers. Staffs of University, state department of agriculture and private dealers advised the farmers regarding fertilizers and pesticide use. Among biotic constraints, blast was severe in some fields in Barabanki and Shravasti and brown spot was severe in some areas in Gonda and Shravasti. High intensity of sheath blight was recorded in some fields in Bahraich. Intensity of other diseases and insect pests was low to moderate. Application chemical pesticides were not common among the farmers. In some fields symptoms of zinc deficiency were noticed.

Uttarakhand: Production oriented survey was conducted in seven blocks in Udham Singh Nagar and three blocks in Nainital districts of Uttarakhand. In general the climatic conditions were favourable for rice cultivation. Predominant varieties were HYVs like PR113, HKR 47, PR 121, PR 126, NDR 359, Pant Dhan 11, Pant Dhan 23 and Govind and basmati varieties like Pusa Basmati 1509 and Pusa Basmati 1121. In hilly areas, varieties like Govind, VL Dhan 207, VL Dhan 208, and VL Dhan 209 were cultivated. In the main fields, fertilizers were applied @ 120 kg N/ha, 60 kg P₂O₅/ha and 40 kg K₂O/ha. Application of zinc sulphate was common among the farmers to check the khaira disease. In general, weed problem was less as most of the farmers applied weedicides like pretilachlor and bis-pyribac sodium (Nominee Gold). Average expected yield was 40-50 q/ha in case of HYVs and about 20-25 q/ha in case of basmati varieties. Diseases like blast, brown spot, sheath blight, false smut, grain discoloration and bacterial blight and insect pests like stem borer, leaf folder, BPH, WBPH, gundhi bug and rice hispa were recorded in low to moderate intensities. Most of the farmers used cartap hydrochloride, Reagent (fipronil 5 SC) and chlorantraniliprole (Coragen) to control stem borer and thiamethoxam or aephate to manage hoppers.

State/Region	District surveyed	Survey	Survey Personnel
		period	
Andhra Pradesh	East Godavari and	October to	APPRI and R.A.R.S, Maruteru-534 122, Andhra
	West Godavari	January 2020-	Pradesh
		21	Dr. M. Ramabhadra Raju, Sr. Scientist (Plant Pathology
			Dr. V. Bhuvaneswari, Sr Scientist (Plant Pathology)
			Dr. T. Usha Rani, Pr Scientist (Soil Science)
			Dr. M. Nanda Kishore, Pr Scientist (Entomology)
			Dr. P.V. Ramana Rao, Sr Scientist (Gen. & Plant Breeding)
			Dr. A V S Durga Prasad, Scientist (GPBR)
Bihar	Darbhanga, Smastipur	Kharif, 2020	Dr. R. P. Central Agricultural Univ, Pusa, Bihar-
	and Muzaffarpur		848125
~ .		~	Dr. R. K. Ranjan, Assistant Professor (Rice Pathology)
Gujarat	Ahmedabad, Kheda,	Sept 14-15,	Main Rice Research Station, AAU, Nawagam-387 540
	Anand, Mahisagar,	25, 29-30; Oct	Dr. M. B. Parmar, I/C Research Scientist, Rice
	Gandhinagar,	7, 9, 14, 19,	Dr. Rakesh K Gangwar, Asso. Res Scientist 9PI Pathology)
	Mahsana,	23; Nov 10-	Dr. D. B. Prajapati, Asso. Res Scientist (Pl. Breeding)
	Panchmahals, Chota	11, 28; Dec	Shri S. S. Thorat, Asso. Res Scientist (Entomology)
	Udaipur and Vadadara	16; 2020	Shri A. G. Pampaniya, Asst. Res Scientist (PI Breeding)
Uorwono	Vaaoaora Kaithal Kurukshatra		CCS HAU Diss Descende Station Koul 126 021
1 lai yalla	Karnal Vamunanagar	-	Dr Mahayaar Singh Bochalya, Asst Scientist, Pl. Pathology
	Ambala lind Sonepat		Dr Ashwani Kumar Asst Prof Pl Pathology
	and Panipar		Dr. Mangat Ram. Pr. Scientist. Agronomy
	ana 1 ampar		Dr. Maha Singh Asst Scientist, Entomology
			Dr. Rakesh Kumar, Asst Scientist, Elitoniology
Karnataka	Chikkamagaluru	Sep 24: Oct 5.	ZARS, VC Farm, Madya-571405, Karnataka
	Hassan, Mandva.	8. 27: Nov 11-	Dr. B. S. Chethana. Rice Pathologist
	Mysuru and	12, 21, 27-29:	Dr. G. R. Dinesh, Agronomist
	Davanagere	Dec 2, 15-16:	Dr. A. Deepak, Rice Breeder
	0	2021	Dr. M. S. Kitturmat, Entomologist
			Dr. Savitha, Soil Scienitst
			Mr. Praveen, Agricultural Officer, K.R. Nagara
			Manasa, Agricultural Officer, K.R. Nagara
			Mr. Virupakshappa, Agricultural Officer, Nanjanaguda
Maharashtra	Thane, Raigad,	Oct 15-16,	RARS, KARJAT, Raigad, Maharashtra 410201
	Palghar, Ratnagiri	19-23, 26-29;	Dr. (Mrs.) P. D. Patil, Plant Pathologist
	and Sindhudurg	2020	Dr. V. N. Jalgaonkar, Entomologist
			Dr. R. L. Kunkerkar, Rice Breeder
			Dr. A. S. Dalvi, Agronomist
			Shri. M. P. Gawai, Jr. Rice Breeder
			Dr. H. D. Pawar, Jr. Research Assistant
Punjab	Ludhiana, Gurdaspur,	Kharif, 2020	Punjab Agricultural University, Ludhiana-141004
	Pathankot, Sangrur,		Dr. R. S. Gill, Pr Rice Breeder
	Patiala, Ropar,		Dr. Jagjeet Singh Lore, Pr Plant Pathologist
	Nawanshahar (SBS		Dr. P.S. Sarao, Pr Entomologist
	Nagar), Jallandhar,		Dr. Buta Singh Dhillon, Agronomist
	Kapurthala,		Dr. Rupinder Kaur, Pr Rice Breeder
	Hoshiarpur, Bathinda,		Dr. Navjot Kaur Sidhu, Plant Breeder
T 1 1	Muktsar and Faridkot	0 11 10	Dr. Renu Khanna, Plant Breeder
I elangana-l	Kangareddy,	Sept 11, 16;	Kice Kesearch Center, AKI, PJTSAU, Rajendranagar,
1	Knammam. Warangal	I UCI I. 6-8. 20.	HVGeradad-500 0.50

Table 1: Production oriented survey, 2020-2021: Name of the state, districts surveyed, survey period and survey personnel

State/Region	District surveyed	Survey	Survey Personnel
		period	
	Rural, Kamareddy,	29, 31; Nov 2,	Dr. T. Kiran Babu, Scientist (Pl. Path.),
	Nizamabad,	4-5, 7, 13, 16,	Dr. N.R.G. Varma, Principal Scientist (Ento),
	Sangareddy,	18; Dec 5, 28-	Dr. Y. Chandramohan, Sr. Scientist (Pl. Br.),
	Vikarabad, Suryapet,	30; 2020	Dr. L. Krishna, Sr. Scientist (Pl. Br.)
	Nagarkurnool,	Jan 20, 25;	Dr. P. Spandana Bhatt, Scientist (Agro)
	Mahaboobnagar,	Feb 11, 22-23,	Dr. M. Venkata Ramana, PS (Agro) & Head
	Jagtial, Siricilla,	2021	Dr. P. Raghu Rami Reddy, PS (Rice) and Head
	Peddapalli and		Dr. N. Praveen
	Nalgonda		Dr. J. Hemantha Kumar, PC, KVK, Wyra.
	0		Scientists from Research Stations, DAATTCs and KVKs of
			PJTSAU
			DAO, ADAs, MAOs and AEOs of concerned districts.
			Progressive farmers
			Print and electronic media
Telangana-2	Jagtial, Karimnagar,	Kharif, 2020	RARS, Jagtial - 505 529 (PJTSAU)
U	Nizamabad,	Rabi 2021	Dr. N. Balram, Scientist (Pl. Path.),
	Kamareddy and		Sri. MRajendraprasad, Scientist (Pl. Path.)
	Rajanna Siricilla		
Uttar Pradesh-1	Ayodhya, Sultanpur,	Sep 1-2, 9, 12,	Crop Research Station, Masodha (NDUAT), Faizabad-
	Ambedkar Nagar,	15-16, 22,29;	224133
	Barabanki, Sant Kabir	Oct 7, 28;	Dr. V. Prasad, Jr. Pathologist & Team Leader
	Nagar and Basti	2020	Dr. S. K. S. Rajpoot, Asstt. Entomologist
			Dr. S.P. Giri, Asstt. Prof., Plant Breeding
			Dr. Saurabh Dixit, Rice Breeder
			Sri D.P. Singh, Asstt. Prof. Plant Pathology
			Dr. R.A. Singh, Agronomist
			Dr. A.K. Singh, Jr. Research Assoc.
			Sri C.B. Singh, Jr. Research Assoc.
			Dr. D.K. Dwivedi, Officer In-charge
			Deptt. of Agriculture, Govt. of U.P.
Uttar Pradesh-2	Bahraich, Barabanki,	Kharif, 2020	Crop Research Station, Ghaghraghat, Baharaich-
	Gonda, Balrampur		271901, UP
	and Shravasti		Dr Amrit Lal Upadhyay, Plant Pathologist
Uttarakhand	Udham Singh Nagar	Kharif, 2020	GBPUA&T, Pantnagar-263145
	and Nainital		Dr. Bijendra Kumar Asso Professor, Plant Pathology

District	Varieties
Andhra	HYVs: MTU 7029 (Swarna), MTU 1121, BPT 5204, MTU 1010, MTU 1061,
Pradesh	MTU 1064, Sampada Swarna, RGL 2537, RPBIO 226, PLA 1100, REVATHI,
	NLR 34449, SADHANA, MTU 3626, RNR 15048, MTU 1075, MTU 1153,
	MTU 1256, Pujita, MTU 1282, MTU 1156, MTU 1224 and MCM 103 (PRC)
Bihar	HYVs: Rajendra Bhagwati, Rajendra Sweta, Rajendra Mahsuri, Sugandha,
	Rajendra Nilam, Rajendra Kasturi, Rajshree, Parimal, Swarna Sub-I, Satyam,
	BPT-5204, MTU-7029 (Swarna), Rajendra Subhasini, CR 51 and Dhanalaxmi;
	Hydrids: Arize 6444, Arize-6201, Hydrid-2/P3/, Hydrid-2/31, PHB-/1, 2/P-
	51, Alize-0444, Pusa KH-10, Alize-0129, JK-401, AZ-0455, Hydrid 1001, AZ- 9422DT and NK 147221
Cuionat	0455D1 allu NK-14/221 IIVVa: Curiori CAD 12 Mahiaagar Java CD 101 CD 11 CAD 14 Mati
Gujarai	Gold Nath Pauha Sonam Surva Moti Mahsuri Punjah S Krishna Kamod IK
	Suraksha Daftri Om Sriram 125 GNR-3 Vershana and Narmada: Hybrids:
	Arize 6444. Arize 1121. VNR 2233. MC 13. Buland 5050. US-312 and US-25 P
	25
Haryana	HYVs: Pusa 44, PR 114, PR 118, PR 126, PR 127, HKR 47, Virat, PR 127, PR
	121, Pusa 44 and NDR 359 and PR 114; Hybrids: Arize 6444, 28p67, 28p37,
	25p35, 28p64, Sawa 127, Sawa 134, Syngenta 7002, Hyb. 432, Bayer 777, Hyb
	7726, Hyb. 2111, Arize 6129, Bayer 6565, Kaveri 468, Hyb. 90m100, Hybrid
	2222, Hyb. 2533, Arize 6633, Rasi 834 and Hyb. 357; Basmati: Pusa Basmati
	1121, Pusa Basmati 1, CSR 30, Pusa Basmati 1509, Pusa Basmati 1718 and
17 / 1	Super 21
Karnataka	HYVS: IR64, Intan, BR 2655, Iunga, Inanu, MIU1001, MIU 1010, IET12001(Tunga) DD2655, Junth: DDT 5204, ICI 1708, MC 12, MD1 826
	DND15048 KDD 1 Kayeri Sona Jaishree Sona and Jaya: Hybrids: Arize 6444
	VNR 2233 PAC 837 MC13 and DRH836
Maharashtra	HVVs: NB 37 YSR Avani Jordar 911 Shahari Ratna Shriram Runam
iviana usini u	MTU 1008. Asmita. Wada Kolam. Java. Ankur Rupali. Kariat-7. Kariat-3.
	Silky-277, Om 125, Daptari-100, Krushidhan Komal-101, Poonam, Shabari,
	MTU-1010, Jyotika, Om Shriram, Daptari 1008, Daptari 125, Trupti, Avani,
	Jordar, Vaishnavi, Soubhagya, Devaki, Shubhangi and Suprim Sona; Hybrids:
	Arize 6444, Sahyadri-2, Sahyadri-3, Gorakhnath and Lokhnath 509
Punjab	HYVs: PR 121, PR 126, PR 128, Pusa 44, Peeli Pusa and HKR 47; Basmati:
	Pusa Bas. 1121, Pusa Bas. 1718, Pusa Bas. 1401 and Pusa 1509
Telangana-1	HYVs: Samba Mahsuri (BPT 5204), Telangana Sona (RNR 15048), Jai
(RNR)	Sreeram, HMT Sona, Kunaram Sannalu, MTU 1010, Jagtial Rice-1 Siddi, IR 64,
	Ankur Pooja, Chintu, MIU 1061, MIU 1224, MIU 1153, MIU 1156, MIU 1001, and Tallahamaa. Habridge Arize (444 cold Arize Tai, KDU 412, KDU
	1001 and remananisa; Hydrids: Affize 6444 gold, Affize rej, KPH 412, KPH 272 Champion 27D31 27D25 27D63 27D38 and Bio 700
Telangana_?	BPT 5204 Lai sriram Lai Sriram Gold MTU 1010 KNM-118 Kayari Chintu
(Jactivel)	Telangana Sona (RNR 15048) JGL 24423 Devi IR 64 Super 64 Super Sona
(Jaguyal)	Swathi Gold. Sun Amani, HMT Sona, Batukamma, GK Chetana, GK Kaveri,

Table 2: Widely prevalent rice varieties cultivated in surveyed districts of India during 2020-2021

	Super Aman, IR 64, MTU 1153, MTU 1156 and RNR 10754 (Tella Hamsa),
	Super Aman and KNM 1638
Uttar Pradesh	HYVs: NDR 2065, NDR 97, NDR 2064, NDR 359, Shusk Samarat, Narendra
(FZB)	Lalmati, Sarjoo 52, Jallahri, Narendra Usar Dhan-3, Samba Mahsuri, Sambha
	Mahsuri Sub-1, Swarna, PB-1, NDR 3112-1, Sonam, Swarna Sub-1, PB-1, Moti
	Gold, Dhanversa, Jyotika, Dhanrekha, NDR 8002, Chintu, Prashanna, Purva and
	Basmati varieties; Hybrids: Karishma, Damini, Gorakhnath 510, Damini, Arize
	6444 Gold, US 305, Kaveri 9090, VNR 2377, 27p67, Ganga Kaveri, 27 P 31,
	Nandi 333, Dhanya 8655, Sampurna, VNR 2233, KN3, Karishma, Bayer 6633,
	Khusi 27, 27 P 37 and 28S41; Locals/Improved: Kala Jeera and Kalanamak
Uttar Pradesh	HYVs: NDR 359, Pusa Basmati 1, Sarjoo 52, Sukha Pankhi, Madhukar,
(GGT)	Lalmati, Samba Mahsuri, Jalpriya and Jalmagna; Hybrids: Arize 6444, Arize
	6444 Gold and Dhaniya
Uttarakhand	HYVs: PR 113, HKR 47, PR 121, PR 126, NDR 359, Pant Dhan 23, Pant Dhan
	11, Govind, Pant Dhan 18, VL Dhan 207, VL Dhan 208 and VL Dhan 209;
	Basmati: Pusa Basmati 1509 and Pusa Basmati 1121

Sates	Bl	NBI	BS	ShBl	ShR	FS	GD	StR	BAK	K.Bunt	Khaira	UDB	BLB	BLS
Andhra Pradesh		L		L-M	L	L	L						M-S	
Bihar			L-M	L-M	L-M	L-M							L-M	
Gujarat	T-L	L		L-M	L-M	L-M	L-M						L	
Haryana	L-M	T-L		L-M		L	T-L		L-M		T-L		L	
Karnataka	L	L	L	L	L	L						L	L	L
Maharashtra	М			L-M	L-M	Т	L-M						L-S	
Punjab		Т	L-M	L-M			L		L-M	L			М	
Telangana-1-RNR		L-S		L-S		L-S	L-M						L-S	
Telangana-2-JGTL	L-S		L-M	L-M		L-M	L	L-M					М	
Uttar Pradesh-1			L	L-M		M-S							L-M	
(FZB)														
Uttar Pradesh-2	M-S	L-M	М	М	L	L-M	L				М			
(GGT)														
Uttarakhand	L		L	L-M		L-M	L						L-M	

 Table 3: Biotic constraints (diseases) in different states of India during 2020

* In Rabi season

Bl: Blast, NBI: Neck Blast, BS: Brown spot, ShBI: 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.

Sates	SB	LF	BPH	WBPH	GLH	GM	RH	WM	GH	CW	GB	MT/ PM	AW/	Rats	BB
Andhra Pradesh	L-M	L	L									L	be	М	
Bihar	L-M	L-M									L-M			L	
Gujarat	L-M	L-M		L							Т	L	T-L		
Haryana	T-L	T-L	L	L				Т	Т						
Karnataka	L-M	L-M	L-M							L-M					
Maharashtra	M-S	L-M	L							T-L			L		L
Punjab	Т	T-L	L	T-L											
Telangana-1-RNR	L-M	L-M	L-M			L-S	L					L-M			
Telangana-2-JGTL	L		L				L								
Uttar Pradesh-1 FZB	L-M	L-M			L						М				
Uttar Pradesh-2 GGT	L								L		L			Т	
Uttarakhand	L-M	L	L-M	L			L				L				

 Table 4: Biotic constraints (insect pests) in different states of India during 2020

Low intensity of crabs in Maharashtra; SB: Stem Borer, LF: Leaf Folder, BPH: Brown Plant Hopper, WBPH: White Backed Plant Hopper, GLH: Green Leaf Hopper, GM: Gall Midge, RH: Rice Hispa, WM: Whorl Maggot, GH: Grass Hopper, CW: Case Worm, GB: Gundhi Bug, PM: Panicle Mite, MT: Mite, RT: Rice Thrips, RB: Rice Bug, AW: Army Worm, SC: Swarming caterpillar, Term: Termites; EHB: Ear head bugs; MB: Mealy Bug, WTN: White Tip Nematode, LM: Leaf Miner; BB: Blue beetles: T: Traces, L: Low, M: Moderate, S: Severe.

INTRODUCTION

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

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

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

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

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

Andhra Pradesh-2020-2021(Maruteru)

Districts surveyed: East Godavari and West Godavari

Details of surv	ey				
District			Mandals		
East Godavari	Rajanagaram,	Jaggampeta,	Peddapuram,	Samalkota,	Rangampeta,
	Rajanagaram, I	Kothapeta and A	mbajipeta		
West	Ganapavaram,	Pentapadu, Kav	itam, Ballipadu,	Penumantra,	Pentapadu and
Godavari	Peravali				

Widely prev	valent rice va	arieties in (Godavari zone	of Andhra	Pradesh	(2020-21)
, inder, pre			Goda rai Lone		I I G G G G I I	(

District	Varieties
East Godavari	MTU 7029, MTU 1121, BPT 5204, MTU 1064, Sampada Swarna, RGL
	2537, RPBIO 226, PLA 1100, REVATHI, MTU 1061, NLR 34449,
	SADHANA, MTU 3626, RNR 15048, MTU 1075, MTU 1153, MTU 1156,
	MCM 103 (PRC) etc.
West	MTU 7029, Sampada Swarna, MTU 1061, MTU 1064, PLA 1100, MTU
Godavari	1121, MTU 1153, MTU 1156, MTU 1224, MTU 1256, Pujita, MTU 1075,
	BPT 5204, MTU 1010, MTU1282 etc.

A Production Oriented Survey (rice) was conducted in the Godavari Zone of Andhra Pradesh viz., East Godavari and West districts during October to January 2020-21 covering 15 mandals. The year witnessed a series of cyclones which impacted paddy production. The team of Scientists from RARS, Maruteru, Assistant Director of Agriculture (ADA's) and Mandal Agricultural Officers (MAO's) from respective mandals have participated in the survey. Preference for varieties varied with the location under survey. It has been observed that there is a gradual shift in dependence on one variety to cultivation of varieties based on their marketability and yields. However, Swarna (MTU 7029) was the preferred variety during *Kharif* in both the districts under survey. Whereas, during *Rabi*, MTU 1121 (Sri Druthi) was the most popular rice variety in West Godvari district and MTU 3626 (Prabhat) is the popular variety in East Godavari district during 2020-21. Private varieties *viz.*, Sampada swarna (Nuziveedu seeds) was also gaining popularity in West Godavari district.

GENERAL INFORMATION:

1.1 Seasonal conditions

The season witnessed excess rainfall in the way of cyclones during October and November months. Crop damage has been reported due to continuous cyclonic rains which resulted in submergence. The deviation is both in terms of increased rainfall (+193.8 mm and + 293.8 mm in East Godavari and West Godavari districts respectively). Similarly an increase of twenty rainy days and sixteen rainy days has been recorded in East and West Godavari districts respectively. Significant increase in rainfall and rainy days recorded during November 2020 coinciding with flowering stage of crop contributed to yield loss in paddy.

Month]	East Godavar	·i	West Godavari				
	Normal	Actual	Deviation	Normal	Actual	Deviation		
		(2020-21)	(mm)		(2020-21)	(mm)		
June	123.7	132.9	7.4	114.7	121.6	6.0		
July	239.1	319.2	33.5	250.2	391.5	56.5		
August	218.9	239.6	9.5	249.2	229.3	-8.0		
September	284.2	186.3	-34.4	280.9	280.9	0.0		
October	206.7	350.7	69.7	165.9	300.2	81.0		
November	88.4	152.7	72.7	63.4	121.6	91.8		
December	10.3	0.1	-99.0	10.3	0	-100.0		
January	8.7	2.0	-77.0	10.2	0	-100.0		
February	11.0	1.3	-88.2	7.5	1.0	-86.7		
Total	1191.0	1384.8	+ 193.8	1152.3	1446.1	+293.8		

Rainfall pattern (mm) in the Godavari zone of Andhra Pradesh (2020-21)

Rainy days (no.) during the season – Godavari zone of Andhra Pradesh

Month		East Goda	ivari		West Goo	lavari
	2019	2020	Deviation (%)	2019	2020	Deviation (%)
June	10	15	50.0	6	12	100.0
July	22	24	9.1	20	25	25.0
August	10	24	140.0	17	21	23.5
September	25	15	-40.0	21	17	-19.0
October	12.7	19	49.6	19	17	-10.5
November	1	6	500.0	1	6	500.0
December	1	1	0.0	1	2	100.0
January	3	1	-66.7	2	3	50.0
February	2	2	0.0	2	2	0.0
Total	86.7	107	+20	89	105	+16

1.2 Crop coverage

A trend in terms of decrease in cultivated area has been observed in both the districts under survey. A decrease in 5558 ha and 4383 ha of cultivated area has been observed. Actual area under cultivation drastically decreased in East Godavari district (reduction of 14021 ha). The reduction in area could be attributed to non availability of labour at reasonable cost (COVID19 crisis), urbanization, industrialization and conversion to aquaculture. However marginal increase (+3834 ha) in rice area in comparison to the previous season has been recorded in West Godavari district during *Kharif* 2020. However a loss of 499 ha was observed in East Godavari district.

District	Total Cu	ultivated A	rea (Kharif)	Area under Rice			
	2019	2020	Change	2019	2020	Change	
West Godavari							
Normal	255469	249911	-5558	229030	227161	-1869	
Actual	231758	232435	+677	217116	220950	+3834	
East Godavari							
Normal	261717	257334	-4383	224459	223431	-1028	
Actual	248404	234383	-14021	220931	220432	-499	

Source: Department of Agriculture 1.3 Varietal spread: The farmers of East Godavari District were growing more than 20 varieties of paddy, preference of varieties was based on marketability, millers preference, personal consumption and seed sale. Swarna (MTU 7029) was the predominant choice for farmers of both the districts under survey followed by Samba mahsuri (BPT 5204) and Sampada Swarna (Nuziveedu seeds) in East and West Godavari districts respectively. Whereas, var. Amara (MTU 1064) was grown in more than 20,000 ha in each of the Godavari districts. During rabi 2020-21, in the East Godavari district, major area under rice is occupied by MTU 3626 (63916 ha) followed by MTU 1121 (57564 ha), whereas, in West Godavari district, MTU 1121 is the dominant variety occupying more than 90% of paddy area. It is interesting to note that farmers of the zone were showing high preference to varieties released from Maruteru. Although, some of the farmers were cultivating rice hybrids promoted by private companies, they are often shifting to traditional varieties owing to lack of stable resistance to pests and diseases.

I	East Godavari District				West Godavari District			
Kharif	2020	Rabi 20	020-21	Kharif	2020	Rabi 2	020-21	
Variety	Area (ha.)	Variety	Area	Variety	Area (ha.)	Variety	Area	
MTU 7029	102064	MTU 3626	63916	MTU 7029	67277	MTU1121	147175	
BPT 5204	24621	MTU 1121	57564	Sampada				
				Swarna	37936	OTHERS	8731	
MTU 1064	23004	OTHERS	14918	MTU 1061	35889	MTU1153	6503	
Sampada	13377	RNR 15038	6202					
Swarna				MTU 1064	22949	MTU1156	4855	
RGL 2537	11917	MTU 1156	5828	PLA 1100	14489			
OTHERS	9386	MCM 103	4929	MTU 1121	13212			
MTU 1121	9248	BPT 5204	4096	Others (MTU				
				1224, 1156,				
				Pujita and				
				Private				
				varieties)	8500			
RPBIO 226	6587	RP Bio 226	2482	MTU 1075	8343			
PLA 1100	5316	MTU 1153	1446	BPT 5204	4918			
REVATHI	5309	MTU 7029	748	MTU 1010	4728			
MTU 1061	4022	NLR 34449	356	MTU1283	1618			
NLR	2595	MTU 1064	335	MTU1156	1091			
SADHANA	1516							
MTU 3626	972							
RNR 15038	321							
MTU 1075	177							
Total	220432		162820		220950		167264	

Source: Department of Agriculture, Andhra Pradesh

1.4 Crop condition

In majority of areas, transplanting were taken up during II fortnight of July in the West Godavari district. Whereas, in the East Godavari district, transplanting season ranged from Mid June to II fortnight of August depending on the availability of irrigation water. In the upland and tail end areas, transplantations were delayed. The year 2020-21, witnessed, uniform distribution of rainfall in most areas, making crop stand satisfactory until the state witnessed Nivar cyclone during November. Heavy rains during the period coincided with the booting to flowering stage of crop growth, coupled with high incidence of BLB in most of the varieties affected the crop. As a result of cyclonic rains, 2-10 bags reduction in yields has

been reported by the state agricultural department in most of the mandals of Godavari zone. Although, pest infestation is meager, the major yield constraint during kharif 2020 was the cyclonic rains during November.

1.5 Cropping pattern

In the West Godavari district of Andhra Pradesh, rice-rice is the predominant cropping pattern in majority of the locations under survey. In most of the locations under canal, with a meager gap of 7-10 days, second crop was planted. State Agricultural department repeated announcement of March 31 as deadline for irrigation water resulted in early preparedness of the farmers for second crop. In East Godavari district, Rice-Pulses Cropping system is followed in areas dependent on monsoon rains.

1.6 Crop establishment methods

Transplantation was found to be the preferred method of crop establishment in rice. Although, availability of labour from outside states was constrained, farmers hired local labour with enhanced cost. An increase of Rs. 150-300/ per person/ per day has been incurred due to COVID19 pandemic. Data suggests that local labourers were more involved during 2020-21. Migrant labour from Chattisgarh, Bengal contributed to 61350 acres transplantation in kharif 2020 in comparison to 60522 ac during the previous year. There is a marked demand for migrant labour for transplantation as the assigned work would be completed in time, in addition, shallow planting lead to more tillering and higher yields. In Bengal planting, it was observed that plants/ square meter was low (15-25) against plant population recommended for kharif (33 hills/m²). Significant decrease in preference to machine transplanting has been observed in West Godavari district. Poor establishment during early stages of crop growth owing to improper leveling and poor water management lead to decrease in preference to machine transplantation. Direct broadcasting method was becoming popular in the East Godavari district, it was observed that more than 50% area in East Godavari district is under direct seeded rice. SRI method of transplantation was practiced in 1205 ha in kharif 2020.

In the transplantation done using migrant labour, commonly called as Bengal transplantation, the cost of pulling and transplantation per acre has increased by Rs. 500-1200 yoy basis. Availability of migrant labour also became scarce during COVID19 crisis, resulting in delayed transplantations in some locations. This resulted in significant increase in cost of cultivation to the farmer.

Method	East Godavari district				West Godavari district			
	2019		2020		2019		2020	
	Kharif	Rabi	Kharif	Rabi	Kharif	Rabi	Kharif	Rabi
Transplantation					140772		142772	66007
(Local)	144271	67494	147757	62955	140773	07827	142773	00027
(Bengal)					60522	93333	61350	91921
Machine	-	-	-	353	11007	6100	1101	5442
Direct	75260	02014	71470	09160	1010	2516	5910	2416
(Broadcasting)	73200	96014	/14/0	98100	4012	2310	3012	2410
SRI method	1400	1016	1205	1352	2	0	5	0

Area (ha.) under different method of establishment in Godavari zone of Andhra Pradesh

Source: Department of Agriculture (East and West Godavari Dist., AP)

2.0 CROP MANAGEMENT

2.1 Seed rate

In the Godavari zone, farmers have adopted a seed rate of 12-30 kg/acre under normal transplanted conditions. Average seed rate adopted by farmers is in the range of 22 kg/ac from the locations surveyed. However, for Bengal mode of planting, a seed rate of 10-15 kg/acre was seen used.

2.2 Seed treatment

Seed treatment was not adopted by majority of farmers. Nitric acid seed treatment is a common practice in rabi season in comparison to kharif, as rabi seed is procured from kharif produce from neighbouring farmers. Wet seed treatment is a common practice in almost all the locations under survey. A few selected farmers in continuous liaison with state agricultural department or associated with University for demonstrations, practiced seed treatment with carbendazim or *Pseudomonas*.

2.3 Transplanting

The common method of transplanting followed in East and West Godavari districts of Andhra Pradesh was random transplanting of 20-30 days old seedlings raised in nurseries. Previously local labour were employed for transplanting, but with increase in other jobs with increased wages, there was a scarcity of local agricultural labour. Bengal transplantation employing migrant labour from Bengal/ Chattisgarh/ Odissha through their rapid transplanting technique became popular in the Godavari zone for the past 4-5 years. The COVID19 pandemic year saw a drastic scarcity of migrant labour. The available labour enhanced the work contract for transplanting from 3200 to 3800/4200 depending on the local need. This resulted in increased cost of transplantation in most locations.

2.4 Plant Population

Population per square meter ranged from 15-22 to 20-25 in the Bengal transplanting and random transplanting method respectively in the locations surveyed in comparison to the recommended 33 hills/m2 for 25 days aged seedlings. Although the plant population is less in Bengal transplantation method, superficial transplanting lead to quicker establishment of seedlings, profuse tillering and optimum yields. Alley ways has become a common practice in most of the locations surveyed.

2.5 Weed management

The use of herbicides, Topstar (oxadiargyl), Rifit (pretilachlor), Sofit (pretilachlor with safener), Londax power (Bensulfuron methyl 0.8% + pretilachlor 6%) Sathi (pyrazosulfuran ethyl), Nominee gold (bispyribac sodium), Almix (Metsulfuran methyl + Chlorimuran ethyl) was practiced by majority of locations surveyed. Weedicides were combined with fertilizer for application for pre-emergence application. In some instances, combination of 2-3 weedicides were also used both pre-emergence application. Although chemical weedicides were used, farmers also resorted to manual weeding for 1-2 times, depending on the availability of labour. Farmers opined that manual weeding was thought to aerate the soil and help in better tillering and enhancing yields.

2.6 Fertilizer application

Although farmers realize the importance of organic manures for soil health, only 10% of farmers under survey resorted to application of Farm yard manure/ compost. Among the

straight fertilizers, most of the farmers used Urea and MOP, majority of farmers resorted to application of complex fertilizers after transplantation, starting at 7 days after transplantation and repeating at 15-20 days. Farmers commonly used DAP, 14-35-14, 10-26-26, 28-28-0 or 20-20-0 for top dressing in all installments. The choice of complex fertilizers varied with the district and the dealer giving credit. On an average, 3-7 bags (45-50 kg/ bag) of fertilizers in different forms have been applied to the crop. Farmers applied more than recommended dose of nitrogen and Phosphorus in the surveyed locations.

2.7. Plant Protection

Farmers in the Godavari zone of Andhra Pradesh (East Godavari and West Godavari districts) resorted to 3-5 foliar sprays for protection against pests and diseases. Pesticides viz., Pexlon, Pulsar, VitchoG, Amistar, Token, Chess, Profenofos, Carbofuran, Acephate, monocrotophos, Hexaconzole, Coragen, Tricyclazole, etc. were used against biotic constraints. Although the pest and disease load is very low during kharif 2020, farmers underwent foliar application of pesticides, most often in combination of 2-3 chemicals as advocated by pesticide dealers/ neighbouring farmers/ company agents/ commission agents etc. Foliar sprays/ granule application were prophylactic in most of the instances. Climatic conditions, pest populations, crop stage etc were not considered in decision making for pesticide application. Indiscriminate use of pesticides is one of the reasons for increased cost of cultivation in the zone.

3.0 PRODUCTION CONSTRAINTS

3.1 Abiotic constraints

Kharif 2020 witnessed more than normal rainfall in both the districts under survey. Continuous rainfall for more number of days during August and November have been recorded during the year. Continuous rains by means of cyclones during August – September resulted in increased area under paddy inspite of COVID19 pandemic. Cyclonic weather coupled with increased number of rainy days during flowering stage of crop growth resulted in chaffy grains in most of the locations under survey. Heavy rains through Nivar cyclone during November, resulted in submergence in some locations damaging the crop.

3.2 Biotic constraints

Among the insect pests, stem borer, BPH were reported at low to moderate levels in both the districts under survey. Low rodent problem was noticed in the locations surveyed. Diseases viz., sheath blight, false smut and sheath rot were recorded at low level in both the districts under survey. However, intermittent rainfall by means of monsoon and cyclonic storms in East and West Godavari districts contributed to the development and spread of BLB. Moderate to high incidence of bacterial leaf blight has been recorded in all the locations in moderately susceptible and susceptible varieties. In fact, bacterial leaf blight was the most common complaint in all the locations surveyed. Lack of proper chemical/ cultural management practice resulted in spread to most of the locations. Severe BLB incidence was observed in Sampada Swarna, MTU 1121 and BPT 5204. Whereas, moderate BLB incidence was recorded in Swarna, MTU 1061, MTU 1064 etc. BLB incidence was recorded in all moderately resistant varieties during Kharif 2020.

3.3 Other constraints

Sale of produce and getting the receipts in time were reported as major constraints by farmers under survey. Farmers were discontent due to unavailability of labour during COVID19, increase in cost of hiring combined harvesters, contract labour wages, marketing of produce. In some instances, farmers were forced to sell the fine grain produce to local

commission agents @ Rs. 1100/ bag in comparison to Rs. 1300-1400 received during previous season. Shift towards prawn and fish culture has been observed during survey. Some of the rice farmers nearby fish ponds complained of poor growth owing to seepage from the ponds. Decrease in yields by 5-10 bags has been reported by farmers.

4.0 MECHANIZATION

COVID19 pandemic had a marked impact on farm mechanization. Due to COVID restrictions, machine transplanting in West Godavari district was reduced to 1100 ha in comparison to 11000 ha a year ago. However, harvesters were available in time with hiring charges increased by Rs. 500-1000/- per hour.

5.0 PLANT PROTECTION

Majority of farmers resorted to prophylactic spray of pesticides on news that pest has arrived at some location or on advise of local pesticide dealers. Although, low incidence of pest and disease has been recorded with exception of bacterial leaf blight, farmers used a variety of pesticides *viz.*, Pexlon, Pulsar, VitchoG, Amistar, Token, Chess, Profenofos, Carbofuran, Acephate, monocrotophos, Hexaconzole, Coragen, Tricyclazole, etc. mostly in combination. Bacterial leaf blight occurred severely in all varieties, Swarna which was field tolerant in the previous year's recorded severe incidence of BLB in some locations indicating change in virulence pattern. BPT 5204, MTU 1121 were also recorded severe incidence in most of the locations. Farmers in general, adopted 3-5 sprays during crop season. Farmers resorted to a number of practices for management of rodents, farmers paid competitive price of Rs. 15.0 – 50.0 per catch depending on the need. In some instances, when crop is nearing maturity, farmers paid Rs. 70 – 80 per catch.

Kharif ² 2020						
District	Diseases					
	NBI	ShBl	ShR	FS	GD	BLB
West Godavari	L	L-M	L	L	L	M-S
East Godavari	L	L-M	L	L	L	M-S

Prevalence of diseases and insect pests in Godavari zone, Andhra Pradesh during *Kharif* 2020

District	Insect Pests				
	BPH	SB	LF	Rats	Mite
West Godavari	L	L-M	L	М	L
East Godavari	L	L-M	L	М	L

6.0 MARKETTING

Rice farmers in the Godavari zone faced problems in marketing of produce during Kharif 2020. Farmers sold the produce below MSP during COVID19 pandemic. In Rajanagaram mandal, BPT 5204 (Samba mahsuri) was sold to middlemen at Rs. 1050/- per bag, which, under normal circumstances would fetch Rs. 1300-1400 per bag. Farmers also faced problem in marketing of paddy damaged during Nivar cyclone.

7.0 YIELDS

The season (Kharif 2020) witnessed periodical rains starting from June 2020. Increase in number of rainy days encouraged farmers to go for paddy cultivation. Pest and disease incidence was also low – moderate during the season. However, cyclonic storm in the form of

Nivar during November 2020 coinciding with flowering stage damaged crop in some locations. In addition, continuous intermittent rains favoured the development and rapid spread of bacterial leaf blight resulting in loss to farmers. Farmers reported 18-28 bags/ acre in comparison to 25-35 bags realized a year ago.

8.0 COST OF CULTIVATION

COVID19 crisis had marginal impact in increased cost of cultivation during kharif 2020. A number of factors viz., unavailability of labour, hike in labour wages due to COVID19, increased machine hiring costs, indiscriminate use of pesticides etc. Farmers reported incurring an amount of Rs. 25000 – 30000 per acre towards cultivation of rice.

9.0. NEEDS OF THE FARMERS

Need for Assured price for their produce Need to prevent seepage of salt water from fish ponds Need for high yielding BPH and BLB resistant varieties Need for quality seed with 135-140 duration varieties Need for availability of labour Need for proper drainage facilities

S.	Practice	Reasons for non adoption/ deviation by farmers
No.		
1	Seed treatment with	Farmers although know about seed treatment, lack of
	carbendazim	complete awareness on potential benefits of seed
		treatment.
2	Application of Zinc +	Lack of knowledge on synergistic and antagonistic
	Fertilizers/ Zinc + pesticides	effects during mixing of chemicals. Farmers incurring
		costs with less added advantage.
2	Indiscriminate use of	Lack of knowledge on importance of weather on
	combination of weedicides and	development of pests coupled with fear of damage of
	pesticides for weed and pest	crop, farmers in most instances were adopting
	management	prophylactic sprays only.
		Over reliance on local dealers for pest management.

10.0 Reasons for deviation from the recommended management practices

Bihar-2020-2021(Pusa)

Districts surveyed: Darbhanga, Smastipur and Muzaffarpur

r ar uculars of survey				
Districts	Villages surveyed			
Darbhanga	Bishanpur, Atarbel, Kadamchowk (Jale).			
Samstipur	Ladaura, Phulhara, Kalyanpur, Malinagar, Saidpur, Deopar, Harpur, Dighra, Tajpur.			
Muzaffarpur	Dholi, Bakhri, Dholi Farm, Sakra, Sabha, Mirapur, Muroual.			

Particulars of survey

Widely prevalent varieties

J I I I I I I I I I I I I I I I I I I I					
Darbhanga	HYVs: Rajendra Bhagwati, Rajendra mansuri, CR 51, MTU-7029,				
	Rajshree and Rajendra Sweta; Hybrids: Arize-6444, PHB-71, Pusa RH-				
	10, Arize-6129, JK-401 and Hybrid 1001				
Samastipur	HYVs: Rajendra Bhagwati, Rajendra Sweta, Rajendra Mansuri,				
	Sugandha, Swarna, Rajendra Nilam, Rajendra Kasturi, Rajshree, BPT-				
	5204, MTU-7029, Rajendra Subhasini and Dhanalaxmi; Hybrids:				
	Hybrid-644, Hybrid-6201, Hybrid-27P37, Hybrid-2731, PHB-71, 27P-				
	31, Arize-6444, Pusa RH-10, Arize-6129, JK-401, AZ-6453, AZ-				
	8433DT and NK-147221				
Muzaffarpur	HYVs: Rajendra Bhagwati, MTU-7029, Rajendra Nilam, Rajshree,				
	Satyam, Rajendra Subhasini, Dhanalaxmi, Parimal, Swarna Sub-1 and				
	BPT-5204; Hybrids: PHB-71, Arize-6129 and Arize-6444				

Particulars of rice area in the districts (in hectares)

Districts	Total	Total	Total	Total	Area
	geographical area (ha)	cultivable land (ha)	cultivated area (ha)	irrigated area (ha)	under Rice (ha)
Darbhanga	254000	172716	158200	102087	79959
Samastipur	262390	172873	162500	108176	97110
Muzaffarpur	315351	218850	191100	96908	162920

Weather data for the district surveyed: 2020

Month	Jun	Jul	Aug	Sep	Oct	Nov
Rainy days	15	21	11	14	0	0
Total rainfall (mm)	288.6	646.8	154.8	233.4	0	0
Monthly mean temperature						
Maximum	32.1	32.3	33.1	32.4	33.1	28.7
Minimum	19.6	21.1	24.7	25.8	24.3	16.0

<u>Rice varieties: Name and yield (q/ha)</u>

Rajendra Bhagwati (50), Rajendra mahsuri (50), Rajendra Subasini, Rajendra Kasturi (45), Rajendra Sweta (45), Rajshree (50), Sudha (30), Janki (25), Kamini (30), Turanta (30), Sita (50), Gautam (Boro dhan) (80), Dhanlaxmi (45), Santhosh (50), Saroj (50), Rajendra Nilam (45).

Production oriented survey was conducted in three districts in this part of Bihar viz., Darbhanga, Samastipur and Muzaffarpur. Rainfall was good in these areas. However, there was some crop damage due to heavy rainfall in the month of August September. Common crop rotations were rice-wheat, rice-pulse, rice-mustard, rice-potato and rice-maize. Predominant rice varieties were HYVs like Rajendra Bhagwati, Rajendra Sweta, Rajendra Mansuri, Sugandha, Swarna, Rajendra Nilam, Rajendra Kasturi, Rajshree, BPT-5204, MTU-7029, Rajendra Subhasini and Dhanalaxmi and hybrids like Hybrid-644, Hybrid-6201, Hybrid-27P37, Hybrid-2731, PHB-71, 27P-31, Arize-6444, Pusa RH-10, Arize-6129, JK-401, AZ-6453, AZ-8433DT, JK-401 and Hybrid 1001 and NK-147221. In general, sowing was done in the month of June and planting in July. Many farmers used higher dose of nitrogenous fertilizers. A few farmers applied FYM, neem cake and vermi-compost in rice field. The common weeds were Ipomoea spp. Cyprus rotundus and Cynodonn dactylon. Hand weeding is local practice for removal of weeds from rice field within 45 days after transplanting. Herbicides like pendimethelene (Stamp and Penda), 2,4-d, Nominee gold and Adora were used by farmers in management of weeds. Average seed rate was 25-30 kg/ha. The average yield of different hybrid varieties ranged from 4000-6000 kg/ha. In high yielding and local varieties of rice the average yield varied from 3000-5000 kg/ha. Biotic constraints like bacterial blight, sheath rot, sheath blight, brown spot, false smut, leaf folder, stem borer and rodent were observed in rice field. Pesticides like carbendazim, Saaf, mancozeb, hexaconazole, propiconazole were used by 5-10% farmers.

District wise details

Darbhanga: Three villages of Darbhanga districts were surveyed during *Kharif*² 2020 under productive oriented survey of rice. Good rainfall was received this year during early cropping season but in the month of August-September, due to heavy rainfall flood like situations occured. In the early cropping season, crop condition was very good and farmers expected bumper yield. But, due to heavy rainfall in August-September, disease and pest incidence severely affected the crop. Diseases like False smut, BLB, Sheath rot, Brown spot were more prominent and stem borer attack was more. The cropping systems being followed were ricewheat, rice-pulse, rice-mustard and rice-maize. Predominant rice varieties were HYVs like Rajendra Bhagwati, Rajendra mansuri, CR 51, MTU-7029, Rajshree and Rajendra Sweta and hybrids like Arize-6444, PHB-71, Pusa RH-10, Arize-6129, JK-401 and Hybrid 1001. Most of the farmers used hybrid seeds. Generally sowing of rice seeds were done in the month of June and transplanting in July. Farmers used higher doses of nitrogen (urea). Only few farmers were applied recommended dose of fertilizers. A few farmers applied FYM, neem cake and vermi-compost in rice field. Most of farmers adopt random method of planting. Hand weeding was common practice by farmers for removal of weeds in field. Bacterial blight, sheath rot, sheath blight, brown spot, false smut, Zn deficiency, leaf folder, stem borer and rodent were major problem in rice field. Pesticides like carbendazim, Saaf, mancozeb, hexaconazole, propiconazole were used by 5-10% farmers. For pesticides most of farmers were taking advice from local shops of insecticides/fungicides, Some of the farmers visit the University and KVK with their problems. Some of the common needs of the farmers were good quality seeds of HYVs, timely availability of fertilizers and pesticides and improvement in marketing facility.

Samastipur: The production oriented survey was conducted at flowering stage in 9 villages of Samastipur district of Bihar during Kharif, 2020. This year very good rainfall was received in Samastipur district. Common crop rotation practices followed by the farmers were ricewheat, rice-mustard and rice-rabi maize. Predominant rice varieties cultivated in the district were HYVs like Rajendra Bhagwati, Rajendra Sweta, Rajendra Mansuri, Sugandha, Swarna, Rajendra Nilam, Rajendra Kasturi, Rajshree, BPT-5204, MTU-7029, Rajendra Subhasini and Dhanalaxmi and hybrids like Hybrid-644, Hybrid-6201, Hybrid-27P37, Hybrid-2731, PHB-71, 27P-31, Arize-6444, Pusa RH-10, Arize-6129, JK-401, AZ-6453, AZ-8433DT and NK-147221. Mostly, farmers were interested in cultivation of Hybrid rice due to high yield. The average yield of different hybrid varieties ranged from 4000-6000 kg/ha. In high yielding and local varieties of rice the average yield varied from 3000-5000 kg/ha. Sowing of rice seeds were done during June and transplanting in month of July. The average seed rate was 25-30 kg/ha of high yielding varieties of rice. Many farmers of Samastipur district applied FYM, vermicompost and chemical fertilizers in rice field. Progressive farmers also applied neem oil cake and caster cake. The common weeds were *Ipomoea* spp, *Cyprus rotundus* and *Cynodonn* dactylon. Hand weeding is local practice for removal of weeds from rice field within 45 days after transplanting. Herbicides like pendimethelene (Stamp and Penda), 2,4-d, Nominee gold and Adora were used by farmers in management of weeds. Diseases like brown spot, sheath rot and bacterial blight insect pests like stem borer, gundhi bug, leaf folder and rats were commonly observed in rice field. Fungicides like propiconazole (2 ml/litre of water), Saaf (2 gm/lit of water), hexaconazole (2 ml/lit of water), mancozeb (2 gm/lit of water) and Bavistin (2 gm/lit of water) were used to manage different diseases. However, the rate of adoption of plant protection measures against pest/diseases/weeds among farmers was very limited up to 3-5% only.

Muzaffarpur: The production oriented survey was conducted in 7 villages from flowering to maturity stage of rice crop. The general climatic condition (rainfall) was good during *Kharif*, 2020. The common crop rotation was rice-wheat, rice-potato and maize and rice-mustard. Predominant rice varieties were HYVs like Rajendra Bhagwati, MTU-7029, Rajendra Nilam, Rajshree, Satyam, Rajendra Subhasini, Dhanalaxmi, Parimal, Swarna Sub-1 and BPT-5204 and hybrids like PHB-71, Arize-6129 and Arize-6444. Average rice yield was 3500-5000 kg/ha for HYVs, 3000 kg/ha for local varieties and 5500-6000 kg/ha for hybrids. Most of farmers applied Nitrogen (Urea) in rice crop and chemical fertilizers like urea (100-150 kg N/ha), SSP (30-50 kg P/ha) and MoP (15-20 kg K₂O/ha). The normal date of sowing is June and transplanting is in July. Hand weeding practice was common method for removal of weeds from field. Generally only one weeding was practiced by farmers after 45 days of transplanting. Only progressive farmers were using weedicides like butachlor, Nominee gold and Adora. Good quality seeds and fertilizers were major constraints among the farmers. Few farmers were reported false smut in hybrid rice. Commonly used fungicides were carbendazim, Saaf, mancozeb, streptocycline, hexaconazole and propiconazole. Blue bull (Nilgai) was a major problem in field in this region. Rodents also caused 5-10% yield loss from field to threshing. Zn and Fe deficiency were also constraint in rice crop after transplanting in field.

Gujarat-2020-2021(Nawagam)

Districts surveyed: Ahmedabad, Kheda, Anand, Mahisagar, Gandhinagar, Mahsana, Panchmahals, Chota Udaipur and Vadodora

Districts	Talukas	Villages
Ahmedabad	Daskroi, Sanand, Bavla and	Banch, Dhamatvan, Kanbha, Singarva, Daran,
	Dholka	Devdholera, Sankod, Rajod, Rasham, Kavitha and
		Arnej
Kheda	Kapadvanj, Vaso, Thasra, Mahudha, Mahembabad, Kathlal and Matra	Dana, Torana, Navapura, Vyashvasna, Dunjevar, Dahiyab, Khandholi, Heranj, Rashulpur, Aaurangpura, Vishnagar, Bordi, Chetarsumbha, Dandusar, Modaj, Akalacha, Makva, Kathana, Laxamanpura, Ladwel, Matar, Machhiyel, Garmala, Traj and Limbasi
Anand	Anand, Borsad, Karamsad, Petlad, Khambhat and Sojitra	Panchvati, Virasad, Naniner, Petlad, Vatadra, Popatpura, Virol, Madhrada, Palol and Devataj
Mahisagar	Lunawada	Kauncha, Kothmba, Kankariya and Dhamaniya
Gandhinagar	Gandhinagar, Dehgam and Kalol	Lavarpur, Ratanpura, Prantiya, Kanpur, Vashna Chaudhry, Adhana and Bheemasar
Mehsana	Kadi	Thol, Jhalora, Ambaliyara, Midadraj, Jetpura, Krishnapura (Jhalora) and Vamaj
Panchmahals	Shehra	Dharapur and Guneli
Chhota Udaipur	Bodeli	Bamroli and Alakpura
Vadodara	Savali, Desar, Waghodia	Dungarpura, Raswadi, Amrapura, Gothda,
	and Dabhoi	Varasda, Valavav, Jarod, Panchdevla, Vasai and
		Dholnagar
9 Districts	28 Talukas	78 Villages

Table 1: Details of survey

Widely prevalent rice varieties

District	Varieties
Ahmedabad	HYVs: Gurjari, GAR-13, Mahisagar, Jaya, GR-101, GR-11, GAR-14, Moti
	Gold, Nath Pauha, Sonam, Surya Moti and others
Kheda	HYVs: Gurjari, GAR-13, Mahisagar, GR-11, GAR-14, Masuri, Punjab S,
	Surya Moti, Nath Pauha, Moti Gold, Sonam, GR 101, Krishna Kamod, JK
	Suraksha and others
Anand	HYVs: GAR-13, GR-11, Mahisagar, Moti, Krishna Kamod, Gurjari, Daftri
	Om Sriram 125, Jaya, Masuri and Moti Gold; Hybrids: Arize 6444, VNR
	2233, Buland 5050 and others
Mahisagar	HYVs: Gurjari, GAR-13, GR-11, Pioneer 121, Nath Pauha and others
Gandhinagar	HYVs: Gurjari, GAR – 13, Mahisagar, GR-11, Jaya, Sonam and others
Mehsana	HYVs: GAR-13 and GR-11
Panchmahals	HYVs: Gurjari, GAR-13, GNR-3, Jaya, Masuri, Mahisagar, Versha, Sonam,
	Moti Gold and others

District	Varieties
Chhota Udaipur	HYVs: GAR-13, Hybrid MC 13, Gurjari, GR-11, Nath Pauha, Moti Gold,
	Surya Moti and others
Vadodara	HYVs: GAR-13, GR-11, Jaya, Gurjari, Narmada, Moti Gold and Nath
	Pauha; Hybrids: US-312, US-25 P 25 and others

Particulars of Rice area in the district

Name of District	Total geographical	Total cultivable	Total cultivated	Total Irrigated	Area under
	area (ha)	area (ha)	area (ha)	area (ha)	rice (ha)
Ahmedabad	6,79,414	4,97,532	4,11,264	-	1,32,795
Kheda	3,39,271	2,43,972	2,37,181	1,72,405	1,14,407
Anand	2,94,751	2,11,265	1,69,350	1,96,700	1,17,273
Mahisagar	2,00,411	1,57,245	1,26,080	-	38,026
Gandhinagar	2,15,838	1,58,479	1,34,681	1,02,100	12,126
Mehsana	2,11,772	1,87,862	1,81536	1,72,720	4,030
Panchmahals	3,16,433	1,95,000	1,71,152	88,120	55572
Chhota Udaipur	3,43,606	2,14,164	2,08,866	74,499	16,271
Vadodara	4,11,891	3,32,186	2,71,795	1,76,533	31,302

Production oriented survey was conducted in the 9 major rice growing districts of Gujarat State *viz.*, Ahmedabad, Kheda, Anand, Mahisagar, Gandhinagar, Mehsana, Panchmahals, Chotta Udaipur and Vadodara. A total of 28 talukas and 78 villages were covered during this survey. The details of the villages covered during the survey are presented in Table 1. The *Kharif* 2020 witnessed the timely monsoon (third week of June) with 940 mm rainfall in 40 days at Nawagam station. The rain was sufficient and well distributed during the season. This year the climatic conditions were favorable for rice crop cultivation. But the rainfall with moderate wind velocity during the first week of October at the milking to dough stage caused losses to the crop in some districts. The details of climatic data in different surveyed districts are presented in Table 2. Varieties like Gurjari, GAR-13, GR-11, GR-101, Mahisagar, GAR-14, Masuri, Jaya, Narmada, Moti-gold, Surya moti, Sonam, Versha, Nath Pauha, Krishna Kamod, Pioneer 121, US-312, MC-13, 25P25, VNR 2233, Buland 5050, Lxami-17, Gangamani, JK Suraksha etc. were mainly cultivated in different districts of Gujarat. The details of rice area in different surveyed districts are presented in Table 2. Varieties in different districts of Gujarat. Gar-14, Masuri, Jaya, Narmada, Moti-gold, Surya moti, Sonam, Versha, Nath Pauha, Krishna Kamod, Pioneer 121, US-312, MC-13, 25P25, VNR 2233, Buland 5050, Lxami-17, Gangamani, JK Suraksha etc. were mainly cultivated in different districts of Gujarat. The details of rice area in different surveyed districts are presented in Table 4.

District/Parameters	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Ahmedabad							
RD	4	10	14	4	0	0	0
TR (mm)	56.2	165.3	440.5	70.3	0	0	0
T. Max (^{0}C)	38.6	35.3	31.9	34.8	36.5	32.7	30.9
T. Min (^{0}C)	27.8	26.7	26.4	26.4	24.0	16.4	14.4
Kheda							
RD	7	10	18	6	2	0	1
TR (mm)	93.6	121.2	569.6	41.0	31.2	0	9.8
$MMT (^{0}C)$	31.2	30.4	28.5	29.8	28.4	23.8	18.7
T. Max (^{0}C)	42.3	34.5	31.7	33.5	34.8	32.2	27.5
T. Min (^{0}C)	25.7	26.4	25.3	26.2	22.0	15.5	9.9
SH	8.6	7.9	3.6	6.6	9.2	8.7	8.9
Anand							
RD	8	14	24	6	2	0	2
TR (mm)	95	59.6	723.6	69.2	23.6	0	16.4
$MMT (^{0}C)$	31.6	31.0	28.5	29.7	29.1	24.5	23.8
T. Max (^{0}C)	36.2	34.9	31.1	33.3	35.0	32.0	30.9
T. Min (^{0}C)	27.1	27.0	25.9	26.1	23.2	17.0	16.6
Mahisagar							
TR (mm)			Total r	ainfall = 7	53 mm		
Gandhinagar							
TR (mm)			Total ra	ainfall = 11	84 mm		
Mahsana							
RD	6	7	17	7	1	0	0
TR (mm)	134	109.9	541.4	116.2	14.6	0	0
T. Max (^{0}C)	38.7	36.6	31.4	31.6	29.4	27.5	26.5
T. Min (^{0}C)	36.2	33.6	29.1	26.7	27.1	24.1	25.1
Panchmahals							
RD	4	8	23	7	0	0	2
TR (mm)	141.2	89.2	584.2	99.0	0	0	11.4
T. Max (^{0}C)	35.8	24.2	31.3	32.7	34.4	32.2	28.9
T. Min (^{0}C)	26.1	26.8	25.4	24.1	22.0	14.5	13.9
SH	6.4	6.5	1.9	5.2	7.9	7.5	7.7
Chhota Udaipur							
RD	17	30	30	22	6	3	1
TR (mm)	149.1	523.5	492.9	208.9	43.6	13.2	2.9
Vadodora			1	1			
RD	5	15	25	8	0	0	2
TR (mm)	133.2	179.6	600	152.6	0	0	22.4
T. Max (^{0}C)	35.9	34.3	32.7	33.8	34.4	32.9	31.5
T. Min (0 C)	26.5	26.0	25.5	25.5	23.3	16.2	16.2
SH	2.94	2.8	0.68	4.4	74	66	52

 Table 4: Weather data for different districts of Mahararahtra during 2020

RD: Rainy days; TR: Total rainfall; MMT: Monthly Mean Temperature; T. Max: Maximum temperature; T. Min: Minimum temperature; SH: Sunshine hours

Table 5: General question on rice cultivation in district (to be filled by the cooperator in					
consultation with the officials from state department of agriculture)					
Demonsterne					

Parameters	Districts					
	Ahmedabada	Kheda	Anand			
Total area under HYVs	1,32,795 ha	1,14,407 ha	77,572 ha			
(ha)						
Most prevalent HYVs in	Gurjari, GAR 13	Gurjari, GAR 13,	GAR 13			
the district	5	Mahisagar				
Total area under rice	-	-	39,701 ha			
hybrids						
Most prevalent rice	-	-	Arize 6444, VNR 2233,			
hybrids in the district			Buland 50505			
Total area under basmati	-	-	-			
in the district						
Most prevalent basmati	-	-	-			
Seed replacement rate	20-50%	20-50%	30-100%			
Whether farmers are using	Laser land leveler.	Yes	Yes			
any heavy equipments like	transplanter and					
transplanter/combine	harvester					
harvester						
Mention water saving	Yes	Yes	Yes			
technologies like SRI/laser						
leveling/DSR being used						
by the farmers						
Whether survey team gave	Insect pests and disease	Integrated nutrient	Insect pests and disease			
any advice to the farmers	management	management, IPM and	management			
during survey? If yes, then		use of HYVs				
what are those						
What are the general	NA	-	-			
problems in rice						
cultivation in the district?						
Please provide any	-	-	-			
farmers association in the						
district						
Whether availability of	Yes	Yes	Yes			
agricultural labours is						
sufficient?						
Whether there is any	No	No	No			
marketing problem of the						
produce?						
Any major	Narmada Irrigation	Wanakbori Thermal	No			
irrigation/power	project	Power Station				
generation project in the						
district						
Any soil testing program	Yes; PM Soil Health	Yes	Yes; PMMSCY			
undertaken?	Card Scheme					
Any farmers' training	Yes	Yes	Yes			
program was organized by						
the state department of						
Agriculture/University						

Parameters	Districts					
	Mahisagar	Gandhinagar	Mehsana			
Total area under HYVs	3,80,26 ha	12,126 ha	4.030 ha			
(ha)	, ,					
Most prevalent HYVs in	Guriari, GAR 13	Guriari, GAR 13	Guriari, GAR 13			
the district						
Total area under rice	_	-	-			
hybrids						
Most prevalent rice						
hybrids in the district	-	-	-			
Total area under hasmati						
Total area under basmati	-	-	-			
in the district						
Most prevalent basmati	-	-	-			
Seed replacement rate	20-50%	30%	30-40%			
Whether farmers are using	Yes	Yes	Yes			
any heavy equipments like						
transplanter/combine						
harvester						
Mention water saving	Yes	Yes	Yes			
technologies like SRI/laser						
leveling/DSR being used						
by the farmers						
Whether survey team gave	IDM and use of HYVs	Integrated nutrient and	Integrated pest			
any advice to the farmers		nest management and	management			
during survey? If yes, then		use of HVVs	management			
what are those						
What are the general						
what are the general	-	-	-			
problems in rice						
cultivation in the district?						
Please provide any	-	-	-			
farmers association in the						
district						
Whether availability of	Yes	Yes	Yes			
agricultural labours is						
sufficient?						
Whether there is any	No	No	No			
marketing problem of the						
produce?						
Any major	Yes	Narmada Irrigation	No			
irrigation/power		project				
generation project in the		r -J				
district						
Any soil testing program	Ves	Ves	Ves			
undertaken?	105	105	103			
A ny formore' training	Vac	Vac	Vac			
Any farmers training	105	1 08	1 08			
program was organized by						
the state department of						
Agriculture/University		1				

 Table 5-Contd..: 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					
	Panchmahals	Chhota Udaipur	Vadodora			
Total area under HYVs	20,717 ha	16.271 ha	31,302 ha			
(ha)	,	,	,			
Most prevalent HYVs in	Guriari, GAR 13, Java	Guriari, GAR 13	Guriari, GAR 13			
the district		emjan, ernere				
Total area under rice	-	-	_			
hybrids						
Most prevalent rice	_	MC 13				
hybrids in the district	-	NIC 15	-			
Total area under hasmati						
in the district	-	-	-			
Most prevalent basmati	-	-	-			
Seed replacement rate	NA	25-100 %	NA			
Whether farmers are using	Yes	Yes	Yes			
any heavy equipments like						
transplanter/combine						
harvester						
Mention water saving	Yes	Yes	Yes			
technologies like SRI/laser						
leveling/DSR being used						
by the farmers						
Whether survey team gave	Integrated pest	Integrated nutrient and	Integrated pest			
any advice to the farmers	management and use of	pest management and	management and use of			
during survey? If yes then	HYVs	use of new HYVs	HYVs			
what are those						
What are the general	Nil	NΔ				
problems in rice		117				
problems in fice						
Diagon provide any						
forman approvide any	-	-	-			
list ist						
	* 7	* 7	**			
Whether availability of	Yes	Yes	Yes			
agricultural labours is						
sufficient?						
Whether there is any	No	No	No			
marketing problem of the						
produce?						
Any major	Yes	Yes	Yes			
irrigation/power						
generation project in the						
district						
Any soil testing program	Yes	Yes	Yes			
undertaken?						
Any farmers' training	Yes	Yes	Yes			
program was organized by						
the state department of						
A griculture/University						
- Shoulder On verbicy			1			

 Table 5-contd..: General question on rice cultivation in district (to be filled by the cooperator in consultation with the officials from state department of agriculture)
Parameters	Ahmedabada	Kheda	Anand
# of talukas/blocks	4	7	6
covered			
# of villages surveyed	11	25	10
# of farmers interviewed	17	43	14
Field ecosystem	Irrigated	Irrigated	Irrigated
Weather conditions	Normal	Normal	Normal
during cropping season			
Crop stage when survey	Dough to maturity	Heading to maturity	Heading to dough
was made			
Crop rotations	Rice- summer rice,	Rice-wheat, Rice-	Rice-wheat, Rice-
	rice-wheat/	tobacco/ vegetable/	tobacco/ vegetable/
	vegetable/	pearl millet/ fodder	pearl millet/ fodder
	fodder/castor and	Sorghum–lucerne/	Sorghum-lucerne/
	others	summer rice and others	summer rice and others

Table 6: General informations

Parameters	Mahisagar	Gandhinagar & Mehsana	Panchmahals, Chhota Udaipur and Vadodara
# of talukas/blocks covered	1	3 + 1 = 4	1 + 1 + 4 = 6
# of villages surveyed	4	7 + 7 = 14	2 + 2 + 10 = 14
# of farmers interviewed	10	14 + 6 = 20	5 + 2 + 14 = 21
Field ecosystem	Irrigated	Irrigated	Irrigated
Weather conditions during cropping season	Normal	Normal	Normal
Crop stage when survey was made	Dough to maturity	Milk to mature	Heading to maturity
Crop rotations	Rice–wheat, Rice–rabi maize/ castor, Rice– wheat–green gram Rice–chickpea and others	Rice–wheat, Rice- mustard/ gram, Rice–pigeon pea, Rice–castor and others	Rice-wheat, Rice-rabi maize/Peanut/ castor, Rice-wheat-green gram, Rice-chickpea and others

A. Cropping system and rice yield: The prevailing crop rotations were rice-wheat-rice, rice-chickpea, rice-tobacco, rice-wheat-vegetable crops, rice-rice, rice-wheat-maize, rice-bean-summer green gram, rice-vegetable crops etc. adopted in different districts of Gujarat (Table 6). All the fields surveyed were under irrigated ecosystem. Among the varieties, Gurjari and GAR 13 were widely cultivated. The average yield among different HYVs and hybrids in different surveyed districts ranged from 3500-6500 kg/ha (Table 7)

Varieties	Yield (kg/ha)					
	Ahmedabad	Kheda	Anand	Mahisagar	Gandhinagar	Panchmahals,
					& Mehsana	Ch Udaipur &
						Vadodara
Gurjari	4200-5750	4000-6400	4000	3950-5250	4600-5150	4000-5100
GAR 13	4000-5600	4500-5800	5000-5300	5200	4000-6500	4500-6000
Moti Gold	4500-4750	4200-6500	6500			6500
Sona	4500-4950					
Mahisagar	5000					
Surya Moti	4500	4300-5500	5500			5500
Jaya		4200				3500-3900
Mahsuri		4000-5000				
Nath Pauha		4600-4700		4200-4900		
Devmoti		4900				
Versa				4200		5350
Krishna					3000	
Kamod						
GAR 11					3800	4000
Arize 6444		4750-4900				
JK Suraksha		4800-5000				

Table 7: Average yields of different rice varieties as reported by the cooperators/farmers

Table 8: Details	of	nurserv	management
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Parameters	Ahmedabad	Kheda	Anand
Planting time	1 st -2 nd week of July	Last week of June	1 st to 4 th week of
		to 3 rd week of July	July
Seed rate	25-30 kg/ha	20-30 kg/ha	25-30 kg/ha
Seed treatment (% farmers	No (100%)	Yes (~19%)	Yes (50%)
adopted)			
Chemicals used for seed	NA	Thiram,	NA
treatment		carbendazim	
Organic manure in	Yes (100%); FYM &	Yes (88%); FYM,	Yes (93%); FYM,
nursery (% farmers	Green manure	GM, vermicompost	Poultry manure
adopted)			
Inorganic manure in	Yes (94%); Urea	Yes (100%); Urea	Yes (100%); Urea
nursery (% farmers	(135-200 kg/ha)	(135-240 kg/ha)	(130-180 kg/ha)
adopted)	and/or DAP (50-150	and/or DAP (50-100	and/or Ammonium
	kg/ha); Some applied	kg/ha)	sulphate (60-95
	Ammonium Sulphate		kg/ha). Some also
	(200 kg/ha)		applied DAP (45-65
			kg/ha)

B. Nursery and main field Management: Average seed rate used by the farmers in different districts ranged from 20-35 kg/ha. The practice of treating the seeds before sowing was not very common among the farmers. None of the farmers interacted in Ahmedabad, Panchmahals, Chhota Udaipur and Vadodora treated the seeds. In other districts 19-50% farmers treated the seeds before sowing with fungicides like thiram and carbendazim (Table 8). Planting was mainly done during 1st week of July to last week of July. Application of organic manure in the nursery was common among the farmers and 88-100% farmers applied FYM (mainly), green manure and vermicompost in the nursery. Almost all the farmers

contacted applied chemical fertilizers like urea, DAP and ammonium sulphate in the nursery. Most of the farmers adopted random method of planting where proper plant population was not maintained. Very few in Ahmdabad and Kheda followed line planting. Fertilizers were applied @ 30-120 kg N/ha, 15-69 kg P₂O₅/ha and 15-25 kg ZnSO₄/ha (Table 9). Application of potassic fertilizers were not common among the farmers. All the farmers contacted applied organic manure like FYM (mainly), green manure and vermicompost in the main field.

Parameters	Mahisagar	Gandhinagar &	Panchmahals, Ch
		Mehsana	Udaipur & Vadodara
Planting time	1 st to 3 rd week of July	1 st to 3 rd week of	1^{st} to 4^{th} week of
_		July	July
Seed rate	20-35 kg/ha	25-30 kg/ha	25-30 kg/ha
Seed treatment (% farmers	Yes (20%)	Yes (20%)	No (100%)
adopted)			
Chemicals used for seed	Thiram, carbendazim	Thiram,	-
treatment		carbendazim	
Organic manure in	Yes (100%); FYM,	Yes (100%); FYM,	Yes (90%); FYM,
nursery (% farmers	GM	GM	vermicompost
adopted)			
Inorganic manure in	Yes (100%); Urea	Yes (100%); Urea	Yes (100%); Urea
nursery (% farmers	(110-200 kg/ha)	(100-180 kg/ha)	(90-220 kg/ha)
adopted)	and/or DAP (40-100	and/or DAP (50-100	and/or DAP (35-55
	kg/ha)	kg/ha); Some also	kg/ha)
		applied Ammonium	
		sulphate @ 200-250	
		kg/ha	

 Table 8-contdd..: Details of nursery management

Table 9: Details of main	field management
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Details	Districts				
	Ahmedabad	Kheda	Anand	Remarks	
Planting method	Random transpla	ating and plant	population was not	Fertilizers	
	maintained; Very	like urea,			
	line planting			DAP and	
Total N applied	50-110 kg/ha	30-120 kg/ha	85-105 kg/ha	ammonium	
Total P ₂ O ₅ applied	23-69 kg/ha	15-46 kg/ha	20-30 kg/ha	sulphate	
Total K ₂ O applied	-	-	-	were used by	
ZnSO ₄ applied	20-40 kg/ha	15-25 kg/ha	15-20 kg/ha	the farmers;	
Organic fertilizers	Yes (100%);	Yes (100%);	Yes (100%): Mainly	K application	
applied	Mainly FYM (8-	mainly FYM	FYM (10-20 t/ha);	was not	
	15 t/ha); some	(10-20 t/ha);	some applied GM	common.	
	applied GM	Some GM and	and vermicompost	Most of the	
		vermicompost		farmers	
Growth factors	Nil			applied zinc	
applied				sulphate	

Details				
	Mahisagar	Gandhinagar & Mehsana	Panchmahals, Ch Udaipur & Vadodara	Remarks
Planting method	Random transplar area was not mair	nting and plant p ntained	population per unit	Fertilizers like urea, DAP and
Total N applied	40-110 kg/ha	52-100 kg/ha	52-120 kg/ha	ammonium
Total P ₂ O ₅ applied	20-46 kg/ha	18-48 kg/ha	15-30 kg/ha	sulphate were
Total K ₂ O applied	-	16-20 kg/ha	-	used by the
		(only 25%		farmers; K
		farmers)		application
ZnSO ₄ applied	20 kg/ha	15-20 kg/ha	15-20 kg/ha	was not
Organic fertilizers	Yes (100%);	Yes (100%);	Yes (100%); FYM	common.
applied	Mainly FYM	Mainly FYM	(all) @ 12-20 t/ha	Most of the
	(15-20 t/ha);	(12-15 t/ha);		farmers
	Few applied GM	Few applied		applied zinc
		GM and		sulphate
		vermicompost		

Table 10: Weeds and weed management

Details	Districts			
	Ahmedabad	Kheda	Anand	
Weed intensity	Low	Low	Low	
Names of the	Echinochloa colona, Echino	ochloa crusgalli, Cyperus ro	tundus and Cynodon	
weeds	dactylon			
Weedicides used	Hand weeding (1-2) was the	e most common practice for	weed management. Some	
	farmers used weedicides like bispyribac Sodium (200 ml/ha), pretilachlor 50 EC			
	(1.5 l/ha), pendimethalin 30% EC (5 l/ha) and butachlor (3 l/ha)			
Percentage of	Yes (18%)	Yes (44%)	Yes (64%)	
farmers applied				
herbicides				
Wild/weedy rice	Nil	Nil	Nil	
incidence				

Details	Districts			
	Mahisagar	Gandhinagar &	Panchmahals, Ch	
		Mehsana	Udaipur & Vadodara	
Weed intensity	Low	Low to medium	Low to medium	
Names of the	Echinochloa colona, Echino	ochloa crusgalli, Cyperus ro	tundus	
weeds				
Weedicides used	Hand weeding (1-2) was the	e most common practice for	weed management. Some	
	farmers used weedicides lik	e bispyribac Sodium (200-3	00 ml/ha), pretilachlor 50	
	EC (1.5 l/ha), pendimethalin	n 30% EC (5 l/ha) and butac	hlor (3 l/ha)	
Percentage of	Yes (30%) Yes (50%) Yes (52%)			
farmers applied				
herbicides				
Wild/weedy rice	Nil	Nil	Nil	
incidence				

C. Weeds and their Management: In general, the intensity of common weeds like *Echinochloa colona, Echinochloa crusgalli, Cyperus rotundus* and *Cynodon dactylon* was low to medium. Hand weeding (1-2) was the most common practice for weed management.

Some farmers (18-64%) used weedicides like bispyribac Sodium (200 ml/ha), pretilachlor 50 EC (1.5 l/ha), pendimethalin 30% EC (5 l/ha) and butachlor (3 l/ha) (Table 10).

D. Needs of the farmers: Some of the common needs of the farmers were high yielding rice varieties with biotic stress resistance, short duration fine grain rice varieties, high yielding aromatic rice varieties, disease and pest resistant bold seeded rice varieties, nutrient fortified rice varieties, good market price and increase in MSP

Details		Districts	
	Ahmedabad	Kheda	Anand
Implements used	Tractor, rotavator, cul	tivator, laser leveler, pud	dler and combined
	harvester (either own	or hire basis)	
Seed replacement rate in 2020	25-50%		
Source of irrigation	Canal (67%) and	Canal (98%), Deep	Canal (86%) and Deep
	shallow tube wells	tube wells (42%);	tube wells (43%)
	(52%)	shallow tube wells	
		(23%)	
Scarcity of irrigation water	No (100%)	No (100%)	No (100%)
Availability of	Yes (100%)	Yes (100%)	Yes (100%)
fertilizers/pesticides			
Quality of	Yes (100%)	Yes (100%)	Yes (100%)
fertilizers/pesticides			
Advisors to the farmers	Own decisions	Own decisions (98%);	Own decisions (93%);
	(100%); State dept	State dept (28%)	State dept (36%)
	(29%); Dealers	Dealers (49%)	Dealers (29%)
	(94%)	University (53%)	University (21%)
	University (71%)		

Table 11: Details of inputs used

Details	Districts								
	Mahisagar	Gandhinagar &	Panchmahals, Ch						
		Mehsana	Udaipur & Vadodara						
Implements used	Tractor, Puddler, com	bined harvester, rotavate	or, laser leveler,						
	power sprayer and th	power sprayer and thresher (either own or hire basis)							
Seed replacement rate in 2020	20-50%: In Chhota Udaipur and Vadodora, it ranged from 20-100%								
Source of irrigation	Canal (100%);	Canal (100%);	Canal (90%); Deep						
	Shallow tube wells	Shallow tube wells	tube wells (38%);						
	(100%)	(40%)	shallow tube wells						
			(33%)						
Scarcity of irrigation water	No (100%)	No (100%)	No (100%)						
Availability of	Yes (100%)	Yes (100%)	Yes (100%)						
fertilizers/pesticides									
Quality of	Yes (100%)	Yes (100%)	Yes (100%)						
fertilizers/pesticides									
Advisors to the farmers	Own decisions	Own decisions (85%);	Own decisions (95%);						
	(100%); State dept	State dept (30%)	State dept (19%)						
	(10%)	Dealers (50%)	Dealers (48%)						
	Dealers (100%)	University (50%)	University (23.8%)						
	University (10%)								

E. Input Use: Different implements like tractor, rotavator, cultivator, laser leveler, puddler and combined harvester (either own or hire basis) were used by the farmers (Table 11). Average seed replacement rate was 20-50%. Major sources of irrigation were canal followed

by deep and shallow tube wells. The farmers told that inputs like fertilizers and pesticides were available in time and they were happy with their quality. In addition to their own decisions, farmers took advices from private dealers and officials from state department of agriculture and university.

District				Disea	ises		
	Bl	NBl	ShBl	ShR	FS	GD	BLB
Ahmedabad	Т	L (2-	Т	L-M (2-	L (2-5%)	L-M (5-	Т
		3%)	(<2%)	17%)		15%)	
Kheda	L (2-	L	-	L-M (5-	L (3-9%)	L-M (2-	L (2-5%)
	7%)	(5%)		10%)		10%)	
Anand	L		-	L (7-8%)	L (5-9%)	L (2-4%)	L (2-3%)
Mahisagar	Т		М (12-	L-M (3-	L (3-	L-M	L (3%)
			18%)	15%)	10%)		
Gandhinagar &	L (5%)	L	-	L-M (2-	L-S (2-	L (2-	Т
Mehsana		(3%)		20%)	30%)	10%)	
Panchmahal,	Т		М (12-	L-M (5-	L-M (5-	L (3-6%)	L (2-4%)
Chhota Udaipur &			20%)	12%)	15%)		
Vadodara							

 Table 12: Prevalence of diseases and insect pests in Gujarat during Kharif' 2019

District		Insect Pests						
	SB	LF	WBPH	GB	Mt	AW		
Ahmedabad	L (2-10%)	L (2-8%)	Т	-	L (<5%)	Т		
Kheda	L-M (2-	L (3-10%)	L (5-10%)	Т	L (3-5%)	L (5%)		
	18%)							
Anand	L-M (3-	L-M (8-16%)	L (4-6%)	-	L (5%)	L (5%)		
	20%)							
Mahisagar	L (3-7%)	L (3-7%)	L-M (3-	-	-	-		
			15%)					
Gandhinagar &	L-M (2-	L (3-10%)	L (3-5%)	-	L(7%)	-		
Mehsana	11%)							
Panchmahal, Chhota	L-M (3-	L-M (5-13%)	L (3-6%)	-	Т	-		
Udaipur & Vadodara	20%)							

F. Biotic stresses and their management: In general, the intensity of different diseases and insect pests was low (Table 12). In some fields of Ambaliyara village of Mehsana district, false smut was more (25-30%) on rice varietiey Gangamani. The intensity of other diseases and insect pests was low. Yellow leaf mite was observed in low intensity in most of the districts. Farmers used different pesticides for managing different pests and diseases. (Table 13). About 62-90% farmers adopted chemical pest management. There were reports of zinc deficiency in different districts.

Details	Districts							
	Ahmedabad	Kheda	Anand					
% age farmers	88%	81%	85.7%					
adopting plant protection								
Names of pesticides	For Insect pest control : Cartap I chlorantraniliprole (10 kg/ha) and ml/ha) for Leaf folder and stern Propergite (2 ml/l), spiromesi Chlorantraniliprole + thiamethoxa For disease control : Carbendazi (500 ml/ha), chlorothalonil 75 W l/ha) for Sheath rot & grain disco blast; thiphenate methyl 70 WP (zineb (Avtar) (1 kg/ha) for prophy Combined application of ins mancozeb 63% (1 kg/ha) + discoloration and WBPH; propic g/ha) and Carbendazim 12% + m for False smut, sheath rot and BP	hydrochloride (20 kg/ha), and chlorpyriphos (50%) in borer; Phosphamidon (fen (0.5 ml/l) and dict am for Stem borer, leaf fol am 12% + mancozeb 63% P (1 kg/ha), Nativo (100 g ploration and false smut; t I kg/ha) for Sheath rot and glactive spray for false smut ecticides and fungicide thiamethoxam (250 g/ha onazole (500 ml/ha) + the nancozeb 63% (1 kg/ha) + H/WBPH	carbofuran 3G (25 kg/ha), + cypermethrin 5% (700 1 l/ha) for Army worm; ofol (1 l/ha) for mite; lder and BPH/WBPH (1 kg/ha), propiconazole (/ha) and hexaconazole (1 ricyclazole (400 g/ha) for l blast and hexaconazole + at es: carbendazim 12% +) for Sheath rot, grain iamethoxam 25 WG (300 imidacloprid (300 ml/ha)					
# of pesticide	1-2	1-2	1-2					
sprays								
Mixing of pesticides before application	Yes (12%); 2 pesticides	Yes (7%); 2 pesticides	No (100%)					

Table 13: Details of pest management

Details	Districts								
	Mahisagar	Gandhinagar &	Panchmahals, Ch						
	_	Mehsana	Udaipur & Vadodara						
% age farmers	90%	90%	62%						
adopting plant									
protection									
Names of	For Insect pest control: Carta	p hydrochloride (20 kg/ha	a), chlorantraniliprole (10						
pesticides	kg/ha), cartap hydrochloride 50	kg/ha), cartap hydrochloride 50 SP (1 kg/ha), chlorpyriphos (50%) + cypermethrin							
	5% (1.5 l/ha), triazophos (1.5 l/ha	5% (1.5 l/ha), triazophos (1.5 l/ha) and carbofuran 3 G (20 kg/ha) for Stem borer and							
	leaf folder; thiamethoxam (250 g/ha) and imidacloprid 17.8 SL (6 ml/10 l) for for								
	BPH and WBPH and Sulphur 80 WDG (1.5 kg/ha) for Leaf mite								
	For disease control: Nativo (2	50 g/ha), hexaconazole +	zineb (Avtar) (1 kg/ha),						
	chlorothalonil 75 WP (1 kg/ha)), carbendazim 12% + m	hancozeb 63% (1 kg/ha),						
	tebuconazole (1 l/ha), hexacona	zole 5 SC (1 kg/ha) and	propiconazole 6.78 % +						
	tricyclazole 20.35% (500 ml/ha)	for Sheath rot and sheath	blight; propiconazole 25						
	EC (500 ml/ha), chlorothalonil 7	5 WP (1 kg/ha) and manc	ozeb 75 WP (1 kg/ha) for						
	false smut and sheath rot; tricycla	zole 75 WP (350 g/ha) for	Leaf and neck blast						
	Mix application of insecticide	s and fungicides: Carber	ndazim 12% + mancozeb						
	63% (1 kg/ha) + imidacloprid (30	0 ml/ha) for False smut, sl	neath rot and BPH/WBPH						
# of pesticide	1-2	1-2	1-2						
sprays									
Mixing of	Yes (10%); 2 pesticides	Yes (5%); 2 pesticides	Yes (10%); 2 pesticides						
pesticides									
before									
application									

Haryana-2020-2021 (Kaul)

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

Districts	Blocks	Villages
Kaithal	Pundri and Rajound	Pabnawa, Rasina, Teontha, Khedarpur, Fharla,
		Sakra, Serdha, Dherdu, Chuharmajra and Pabla
Kurukshetra	Pehowa, Ladwa,	Byonsar, Guldehra, Mehra, Bakali, Bahlolpur,
	Shahbad, Kurukshetra	Sura, Deeg, Basti Ward No 24, Alampur and
	and Thanesar	Bahri
Karnal	Indri, Nilokheri, Karnal	Dungra, Dumsi, Sikri, Newal, Darar, Rambha,
	and Gharaunda	Kalsora, Sawant, Gheer and Kaimla
Yamunanagar	Radaur, Bilaspur,	Radaur, Changroli, Sandhala, Lal Chappar,
	Jagadhri, Mustafabad,	Panjupur, Sadhura, Nagla Jagir, Japrapur, Lidhi
	Chacharoli	and Talakaur
Ambala	Ambala-1, Saha, Barara,	Koth Kachua, Langar Channi, Thumber,
	Naraingarh and Mukana	Doggal, Chandsoli, Dhanana, Kathgarh, Sular,
		Hamidpur and Badana
Jind	Narnaund, Jind, Safidon	Petwar, Tikka, Malikpur, Nidani, Hatt, Ratta
	and Pillukhera	Khera, Paju Kalan, Dadrath, Joli Khera and
		Pillu Khera
Sonepat	Murthal, Ganaur,	Mandnor, Bhigan, Nanor, Mukimpur, Moi,
	Sonepat, Kharkhoda, Rai	Rohat, Sandal, Kumarpur, Boddi and Bidhal
	and Gohana	
Panipat	Panipat, Samalkha, Israna	Macchroli, Nain Kohi, Chhichhrana, Khalila,
	and Bapoli	Gwalda, Kiwana, Gaddi Malor, Goyla Khurd
		and Bapoli

Particulars of survey

Widely prevalent rice varieties

Districts	Varieties
Kaithal	HYVs: Pusa 44, PR 126, PR 127 and PR 114; Hybrids: Sawa 127 and Sawa
	134; Basmati: CSR 30, Pusa Basmati 1121 and Pusa Basmati 1718
Kurukshetra	HYVs: PR 114, PR 126 and PR 118; Hybrids: 28p67, Sawa 127, Sawa 134,
	Hyb. 432, Bayer 777, Hyb 7726, Hyb. 2111, Hyb. 90m100, Hyb. 834 and Hyb.
	357; Basmati: Pusa Basmati 1509, CSR 30 and Pusa Basmati 1121
Karnal	HYVs: PR 126, Virat, PR 114, PR 127, PR 121, Pusa 44 and NDR 359;
	Hybrids: Hyb. 834, 28p67 and 28p37; Basmati: Pusa Basmati 1, Pusa
	Basmati 1509, Pusa Basmati 1121, Pusa Basmati 1718 and CSR 30
Yamunanagar	HYVs: HKR 47 and PR 114; Hybrids: 28p67, Arize 6444, Syngenta 7002,
	Sawa 127, Hybrid 2222, Sawa 134, Rasi 834 and Syngenta Hyb.; Basmati:
	CSR 30, Pusa Basmati 1121 and Pusa Basmati 1
Ambala	HYVs: PR 126, PR 127, NDR 359, PR 114, HKR 47 and PR 121; Hybrids:
	Sawa 127, 25p35, Bayer 6565, Kaveri 468, Arize 6444, Arize 6129, Hyb.
	2533, Sawa 134, 28p64 and Arize 6633; Basmati: Pusa Basmati 1, CSR 30
	and Pusa Basmati 1121
Jind	Basmati: Pusa basmati 1121, Pusa Basmati 1509, Pusa Basmati 1718 and CSR
	30

Sonepat	Basmati: Pusa Basmati 1121, Pusa Basmati 1509 and Pusa Basmati 1718
Panipat	HYVs: PR 114; Basmati: Pusa Basmati 1121, Pusa Basmati 1509, Pusa
	Basmati 1718, CSR 30 and Super 21

Production oriented survey was conducted in 8 rice growing districts of Haryana during Kharif season of 2020 when the crops were booting to milk stage. A total of 79 villages in 8 districts were surveyed. The details of survey particulars are presented in Table 1 and Table 3. The fields surveyed were under irrigated ecosystem and in general the weather conditions for rice cultivation was normal. Widely prevalent varieties were HYVs like PR 126, PR 114,PR 118, PR 127, PR 121, Pusa 44, HKR 47 and NDR 359; hybrids like 28p67, Sawa 127, Sawa 134, Hyb. 432, Bayer 777, Hyb 7726, Hyb. 2111, Hyb. 90m100, Hyb. 834, Hyb. 357, 28p67, Arize 6444, Syngenta 7002, Hybrid 2222, Rasi 834 and Syngenta Hyb and basmati varities like Pusa Basmati 1121, Pusa Basmati 1509, Pusa Basmati 1718, Pusa Basmati 1, CSR 30 and Super 21.

Parameters	Kaithal	Kurukshetra	Karnal	Yamunanagar		
# of talukas/blocks	2	5	4	5		
covered						
# of villages surveyed	10	10	10	10		
# of farmers interviewed	10	10	10	10		
Field ecosystem	Irrigated	Irrigated	Irrigated	Irrigated		
Weather conditions	Normal	Normal	Normal	Normal		
during cropping season						
Crop stage when survey	Booting to milk	Heading to	Booting to	Heading to		
was made		milk	heading	milk		
Crop rotations	Rice-wheat was	the main crop rot	ation followed by	the farmers.		
	Few farmers in Kurukshetra and Yamunanagar also followed rice-					
	potato-sunflower	r and rice-vegetal	oles			

Table 3: General information

Parameters	Ambala	Jind	Sonepat	Panipat
# of talukas/blocks	5	4	6	4
covered				
# of villages surveyed	10	10	10	9
# of farmers interviewed	10	10	10	9
Field ecosystem	Irrigated	Irrigated	Irrigated	Irrigated
Weather conditions	Normal	Normal	Normal	Normal
during cropping season				
Crop stage when survey	Booting to	Booting to milk	Booting to milk	Booting to milk
was made	heading			
Crop rotations	The main crop ro	otation followed b	by the farmers wa	s rice-wheat.
	Few farmers in A	Ambala also follo	wed rice-potato	

A. Cropping system and rice yield: The main crop rotation followed by the farmers was rice-wheat. Few farmers in Kurukshetra, Yamunanagar and Ambala also followed rice-potato-sunflower and rice-vegetables (Table 3). The details of variety wise yield (as reported by the farmers during survey) are presented in Table 4. Average rice among HYVs ranged from 4750-10,000 kg/ha while in case of hybrid varieties it ranged from 6250-9250 kg/ha. In case of basmati varieties, average yield ranged from 3750-6000 kg/ha.

Voriety/barbaida	Yield (kg/ha)							
variety/hybrids	Kaithal	Kurukshetra	Karnal	Yamunanagar				
HYVs								
PR 126	7500-8000	6500-7500	7500-8750					
Pusa 44	4750-7000		8250					
PR 114	7500-8000	8000	6250-10000	7500				
NDR 359			8250					
PR 127			8250					
Basmati	•							
CSR 30	4500-5000		4250	4500				
Pusa Basmati 1121	4750-6250	4500	5000	4500				
Pusa Basmati 1509		5000-7000	5500-6250					
Pusa Basmati				6000				
Hybrids	•							
Sawa 127	6750-7500	6500-8250		7250-7500				
Sawa 134		9250		8000				
Arize 6444				7500				
Hyb. 7726		8000						
Hyb. 777		7500						
Hyb. 28p67		8250		7500				
Hyb. 432		7000						
Hyb. 90m100		8500						
Hyb. 834		8000	7500					

Table	4:	Average	yields	of	different	rice	varieties	as	reported	by	the
cooperation	ators	s/farmers									

V	Yield (kg/ha)						
variety/hybrids	Ambala	Jind	Sonepat	Panipat			
HYVs		·					
PR 126	5500-7250						
NDR 359	7000						
PR 127	7500						
HKR 47	6250-7000						
Basmati	•	·					
CSR 30	3750	4000-4500		4200			
Pusa Basmati 1121	4500	5000-5800	3750-6000	4250-5250			
Pusa Basmati 1509		5000-5500	5000	4500-5000			
Pusa Basmati 1	5000						
Pusa Basmati 1718		5250	5500	5000			
Super 21				5000			
Hybrids	•	·					
Sawa 127	7000-7500						
Arize 6444	7250						
Hyb. 25p35	7500-8000						
Hyb. 2533	6250						

B. Nursery and main field Management: Average seed rate was low (10-12 kg/ha). About 50-90% of the farmers contacted told that they treated the seeds by soaking a mixture of Bavistin (10g) + streptocycline (1g) for 24 h (Table 5). Few farmers purchased fungicide treated seeds. Planting was done during second week of June to third week of July. Very less number of farmers (30-40%) applied organic manure like FYM in the nursery. However, about 60-80% of the farmers applied chemical fertilizers like urea (3-5 kg/kanal) or DAP (5-10 kg/kanal) and mixture of urea and DAP. Our co-operator reported that most of the farmers contacted followed line planting. The details of fertilizers applied in the main field are given in Table 6. Average fertilizer dose was 80-195 kg N/ha, 20-143 kg P₂O₅/ha and 23-57.5 kg K₂O/ha. Comparatively less number of farmers applied potash. On an average about 58% farmers applied zinc sulphate (containing either 21% or 33% zinc) @ 10-25 kg/ha. Few farmers in Kurukshetra, Jind, Sonepat and Panipat applied sulphur. About 30% farmers applied farm yard manure in the main field (once in 2 years).

Parameters	Kaithal	Kurukshetra	Karnal	Yamunanagar	
Planting time	4 th week of June to	1 st week of June to	2 nd week of June to	3 rd week of June to	
_	3 rd week of July	2 nd week of July	2 nd week of July	2 nd week of July	
Seed rate	10-12 kg/ha	10-12 kg/ha	10-12 kg/ha	10-11 kg/ha	
Seed treatment	Yes (80%)	Yes (50%)	Yes (90%)	Yes (70%)	
(% farmers					
adopted)					
Chemicals used Soaking 10 kg seeds in Bavistin (10g) + streptocycline (1g) for 24 h; Few farmers					
for seed treatment	purchased fungicide	treated seeds			
Organic manure	Yes (40%)	Yes (40%)	Yes (40%)	Yes (30%)	
in nursery (%	FYM	FYM	FYM	FYM	
farmers adopted)					
Inorganic manure	Yes (70%); DAP @	Yes (60%): DAP @	Yes (80%): DAP @	Yes (80%): DAP @	
in nursery (%	5-10 kg/kanal*	5-10 kg/kanal or	5-10 kg/kanal or	5 kg/kanal or urea	
farmers adopted)		mixture of DAP (5	mixture of DAP (5	@ 5 kg/kanal or	
		kg) + urea (3-5 kg)	kg) + urea (5 kg)	mixture of DAP (5	
		per kanal	per kanal	kg) + urea (5 kg)	
				per kanal	

Table 5: Details of nursery management	of nursery management
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Parameters	Amhala	Jind	Sonenat	Paninat	
Planting time	3 rd week of June to	3 rd week of June to	Last week of June	Last week of June	
C	2 nd week of July	2 nd week of July	to 3 rd week of July	to 3 rd week of July	
Seed rate	10-11 kg/ha	10-11 kg/ha	10-12 kg/ha	10-11 kg/ha	
Seed treatment (%	Yes (80%)	Yes (80%)	Yes (80%)	Yes (66%)	
farmers adopted)					
Chemicals used for	Soaking 10 kg seeds	in Bavistin (10g) +	streptocycline (1g) f	or 24 h; Few	
seed treatment	farmers purchased fu	ngicide treated seed	S		
Organic manure in	Yes (30%)	Yes (30%)	Yes (50%)	Yes (33%)	
nursery (% farmers	FYM	FYM	FYM,	FYM	
adopted)			Vermicompost		
Inorganic manure in	Yes (70%): DAP @	Yes (80%): DAP	Yes (70%): DAP	Yes (77%): DAP	
nursery (% farmers	5-10 kg/kanal or	@ 10 kg/kanal or	@ 5-10 kg/kanal	@ 5-10 kg/kanal	
adopted)	urea @ 5 kg/kanal	urea @ 5 kg/kanal or urea @ 5		or mixture of DAP	
	or mixture of DAP	or mixture of DAP	kg/kanal	(5 kg) + urea (5	
	(5 kg) + urea (5 kg)	(5-10 kg) + urea		kg) per kanal	
	per kanal	(5-8 kg) per kanal			

* 1 Kanal = 500 m^2

Details		Dist	ricts				
	Kaithal	Kurukshetra	Karnal	Yamunanagar			
Planting method	Farmers followed lin	ne planting. Some far	mers adopted randor	n planting			
Total N applied	108.75-177.7 kg/ha	08.75-177.7 kg/ha 80-195 kg/ha 83-183.75 kg/ha 80-195 k					
Total P ₂ O ₅ applied	Yes (90%) @	Yes (50%) @	Yes (90%) @ 28.7-	Yes (60%) @ 10-			
	57.50-86.25 kg/ha	57.50-143.75 kg/ha	48.7 kg/ha	57.5 kg/ha			
Total K ₂ O applied	Yes (60%) @ 23-	Yes (20%) @ 23-	Yes (50%) @ 28.7-	Yes (30%) @			
	56.50 kg/ha	28.75 kg/ha	57.5 kg/ha	28.75-57.5 kg/ha			
ZnSO ₄ applied	Yes (80%) @ 25	Yes (50%) @ 12.5-	Yes (100%) @ 10-	Yes (40%) @ 12.5-			
(21% or 33%)	kg/ha	25 kg/ha	25 kg/ha	25 kg/ha			
Organic fertilizers	Yes (20%); FYM	Yes (30%); FYM	Yes (30%); FYM	Yes (30%); FYM			
applied	@ 2 trolley/acre	@ 2-3 trolley/acre	@ 2-3 trolley/acre	@ 2-3 trolley/acre			
Remarks	Nutrients were appli	ed in the form of ure	a, DAP, SSP, MOP a	and zinc sulphate			
	(21% or 33%). Some farmers applied chelated zinc in Karnal district. Few						
	farmers in Kurukshe	farmers in Kurukshetra applied sulphur. Very few farmers applied FYM in the					
	main field and once	in 2 years.					

Table 6: Details of main field management

Details	Districts				
	Ambala	Jind	Sonepat	Panipat	
Planting method	Farmers followed lin	ne planting. Some far	mers adopted randor	n planting	
Total N applied	80-177.5 kg/ha	68.75-177.50 kg/ha	68.75-137.5 kg/ha	68.75-166.25 kg/ha	
Total P ₂ O ₅ applied	Yes (70%) @ 20-	Yes (100%) @ 20-	Yes (100%) @ 20-	Yes (100%) @ 20-	
	86.25 kg/ha	86.25 kg/ha	57.50 kg/ha	57.5 kg/ha	
Total K ₂ O applied	Yes (50%) @	Yes (50%) @	Yes (60%) @	Yes (40%) @	
	28.75-46 kg/ha	28.75 kg/ha	28.75-57.50 kg/ha	28.75-57.5 kg/ha	
ZnSO ₄ applied	Yes (70%) @ 12.5-	Yes (60%) @ 12.5-	Yes (50%) @ 12.5-	Yes (20%) @ 12.5	
	25 kg/ha	25 kg/ha	25 kg/ha	kg/ha	
Organic fertilizers	Yes (30%); FYM	Yes (30%); FYM	Yes (40%); FYM	Yes (30%); FYM	
applied	@ 2-3 trolley/acre	@ 3 trolley/acre	@ 2-4 trolley/acre	@ 2-3 trolley/acre	
Remarks	Nutrients were appli	ed in the form of ure	a, DAP, SSP, MOP a	and zinc sulphate	
	(21% or 33%). Some farmers applied BASF zinc in Jind district. Few farmers in				
	Jind, Sonepat and Pa	anipat applied sulphu	r. Very few farmers	applied FYM in the	
	main field and once	in 2 years.			

(Figures in the parentheses indicate percentage of farmers who applied fertilizers/organic manure)

C. Weeds and their Management: Intensity of common weeds like *Echinochloa* spp. and *Cyperus* spp. was low (Table 7). Hand weeding was not common among the farmers. Majority of the farmers applied different weedicides like butachlor (1000 ml/acre), pretilachlor (500 ml/acre), Nominee Gold (bispyribac Sodium), Saathi (Pyrazosulfuron Ethyl), Topstar and others for management of weeds.

D. Common needs of the farmers: Some of the common needs of the farmers were increase in the price of basmati rice, timely availability of Quality inputs, subsidy on implements, practical solution for residue management, short duration rice varieties and reduction in the cost of cultivation

Details	Districts					
	Kaithal	Kurukshetra	Karnal	Yamunanagar		
Weed intensity		Low				
Names of the weeds	Commonly recorded weeds were <i>Echinochloa</i> spp. and <i>Cyperus</i> spp.					
Weedicides used	Pretilachlor (500 ml/acre), butachlor (1000 ml/acre), IFFCO herbicide, Topstar and others.					
Percentage of farmers applied herbicides	Almost all the farmers applied weedicides. About 30% farmers in Yamunanagar practiced only hand weeding					
Wild/weedy rice incidence	Nil	Nil	Nil	NII		

Table 7: Weeds and weed management

Details	Districts						
	Ambala	Jind	Sonepat	Panipat			
Weed intensity		Low					
Names of the	Commonly record	ed weeds were Ech	<i>inochloa</i> spp. and (<i>Cyperus</i> spp.			
weeds							
Weedicides used	Butachlor (1000 ml/acre), pretilachlor (500 ml/acre), Nominee Gold						
	(bispyribac Sodiu	m), Saathi (Pyrazos	sulfuron Ethyl) and	others			
Percentage of	Applied (100%)	Applied (60%)	Applied (80%)	Applied (88%)			
farmers applied		Hand weeding	Hand weeding	Hand weeding			
herbicides	(40%) (20%) (11%)						
Wild/weedy rice	Nil						
incidence							

E. Input Use: The details of inputs used by the farmers are presented in Table 8. Farmers used different implements like Tractor, trolley, harrow, cultivator, rotavator, combine harvester, power tiller, reapers and others. Progressive farmers had some of their own equipments and other farmers hired the implements. Majority of the farmers purchased new seeds for sowing. The main source of irrigation was deep tube well. Majority of the farmers told that there was no scarcity of irrigation water. Most of them also told that inputs like fertilizers and pesticides were available. The main advisors to the farmers were private dealers followed by officials from state department of Agriculture.

F. Biotic stresses and their management: The details of different diseases and insect pests in different surveyed districts are presented in Table 9 and 10. Among the diseases, sheath blight and bakanae were widespread in low to moderate form. Low to moderate incidence of leaf blast was reported from some fields in Kaithal, Jind, Yamunanagar, Sonepat and Panipat. Low to moderate bacterial blight was reported from some fields in Karnal. Other diseases like neck blast, false smut, grain discoloration and Khaira were reported in low intensity. Insect pests like stem borer, plant hoppers (BPH and WBPH) and leaf folder were widespread but in low intensity. Other pests recorded were whorl maggot, grasshoppers and termites. All the farmers contacted applied different pesticides for the management of different diseases and insect pests (Table 11). The number of pesticide application in different pesticides while application.

Details		Dist	ricts					
	Kaithal	Kurukshetra	Karnal	Yamunanagar				
Implements used	Tractor, trolley, h	arrow, cultivator,	rotavator, combin	e harvester,				
	power tiller, reap	power tiller, reapers and others. Progressive farmers had some of their						
	own equipments	and other farmers	hired the impleme	ents				
Seed replacement	NA	NA	NA	NA				
rate in 2019								
Source of seeds	About 70-100%	of the farmers in	n different distric	ts told that they				
	purchased 100%	of their seed requ	irement. About 10	0-30% farmers in				
	Kaithal, Karnal a	ind Yamunananga	r told that they us	sed part (50%) of				
	last years harvest	ed seeds		-				
Source of irrigation	Deep tube well	Deep tube well	Deep tube well	Deep tube well				
Scarcity of irrigation	No (100%)	No (100%)	No (100%)	No (100%)				
water								
Availability of	Yes (100%)	Yes (100%)	Yes (100%)	Yes (100%)				
fertilizers/pesticides								
Quality of	Satisfied (90%)	Satisfied	Satisfied	Satisfied				
fertilizers/pesticides		(100%)	(100%)	(100%)				
Advisors to the	Own decisions	Own decisions	Own decisions	Own decisions				
farmers	(30%); Dealers	(20%); Dealers	(30%); Dealers	(30%); Dealers				
	(100%); State	(80%); State dept	(80%); State dept	(80%); State dept				
	dept (50%)	(40%)	(20%)	(40%)				

Table 8: Details of inputs used

Details	Districts						
	Ambala	Jind	Sonepat	Panipat			
Implements used	Tractor, trolley, harrow, cultivator, rotavator, combine harvester, power tiller, reapers and others. Progressive farmers had some of their own equipments and other farmers hired the implements						
Seed replacement rate in 2019	NA NA NA			NA			
Source of seeds	In Ambala all the farmers purchased 100% of their seed requirement. About 20-60% farmers in Jind, Sonepat and Panipat used part (50%) of last years harvested seeds						
Source of irrigation	Deep tube well	Deep tube well	Deep tube well	Deep tube well			
Scarcity of irrigation water	No (100%)	No (100%)	No (100%)	No (100%)			
Availability of fertilizers/pesticides	Yes (100%)	Yes (100%)	Yes (100%)	Yes (100%)			
Quality of fertilizers/pesticides	Satisfied (90%)	Satisfied (100%)	Satisfied (100%)	Satisfied (100%)			
Advisors to the farmers	Own decisions (20%); Dealers (90%); State dept (30%)	Own decisions (10%); Dealers (70%); State dept (50%)	Own decisions (10%); Dealers (70%); State dept (50%); Univ. (10%)	Own decisions (20%); Dealers (60%); State dept (30%)			

District	Sheath blight	Leaf blast	Neck blast	Bakanae	False smut	Grain	Bacterial leaf	Khaira
						Discoloration	blight	
Kaithal	60 % L-M ^b	50 % L-M ^b	30 % Tr. –L ^a	40 % L-M ^a	20 % Tr. –L ^a	-	10 % TrL ^b	10 %
(20 %) ^C	PB 1121, Sawa 127, Sawa	CSR 30, PB	CSR 30, PB 1121	PB 1121, PB 1718	Sawa 127, Sawa		PB 1121	Tr. –L
	134, PR 114, PR 126	1121			134			PB 1121
Kuruks-	70 % L-M ^b	-	-	20 % TrL ^a	40 % Tr. –L ^a	30 % Tr. –L	20 % TrL ^b	-
hetra	PR 114, Sawa 134, Sawa			PB 1509	Bayer 777, Hyb.	Hyb. 28P67, PR	PR 114	
(20 %)	127, PR 126, PR 118,				357,	114, Bayer 777		
	Hyb. 28P67, 2111, 357							
Karnal	70 % L-M ^b	-	10 % TrL ^a	20 % Tr. –L ^a	40 % L – M ^a	20 % Tr. –L	60 % L-M ^b	-
(10%)	PR 126, PR 114, Pusa 44,		PB 1509	PB 1509, PB 1121	PR 126, PR 114,	PR 126, Hyb.	PB 1509, PR 126,	
	28P67				PR 127, Pusa 44	28P67	Pusa 44, CSR 30	
Jind	60% L-M ^b	20 % L-M ^b	10 % TrL ^a	40 % L – M ^a	-	-	-	-
(20 %)	PB 1509, PB 1121	PB 1121	PB 1121	PB 1121				
Yamuna	80 % L-M ^b	10 % L-M ^b	-	10 % Tr. –L ^a	40 % Tr. –L ^a	20 % Tr. –L	20 % TrL ^b	-
Nagar	HKR 147, 28P67, PB	PB 1121		PB 1121	HKR 147, 28P67,	PR 114, Sawa 127	HKR 147, 28P67	
(10 %)	1121, PR 114, Sawa 127,				60002, Sawa 127,			
	Hyb. 2222, Sawa 134				2222			
Ambala	60 % L-M ^b	-	-	10 % Tr. –L ^a	70 % Tr. –L ^a	-	10 % TrL ^b	-
(20 %)	PR 126, Sawa 127,			PB 1121	Sawa 127, 6444,		25P35	
	25P35, PB 1, Sawa 134,				6129, HKR 47			
	28P64							
Sonepat	70 % L-M ^b	10 % L-M ^b	20 % TrL ^a	60 % L – M ^a	-	-	-	10 % Tr. –L
(20 %)	PB 1121, PB 1509, PB	PB 1121	PB 1121, PB	PB 1121, PB 1509				PB 1121
	1728		1509, PB 1728					
Panipat	80 % L-M ^b	20 % L-M ^b	20 % TrL ^a	80 % L – M ^a	-	-	20 % TrL ^b	10 % Tr. –L
(10%)	Super 21, PB 1121, PB	PB 1509, PB	CSR 30, PB	Super 21, PB 1718,			PB 1121, PB 1718	PB 1121
	1509, PR 114	1718	1509, PB 1121	PB 1509, CSR 30, PB				
				1121				

Table 9. Prevalence and severity of rice diseases recorded in different districts of Haryana during kharif 2020

District	Stem borer	Planthoppers (WBPH /BPH)	Leaf folder	Whorl maggot	Grass hopper
Kaithal	70 % Tr L ^b ; (0.5-2.0 % dead	80 % L- M ^b ; (1-16 nymphs/hill)	100 % Tr- $L_{;}^{b}$ (0.5-2.0% damaged leaves)	-	10 % Tr ^b
	heart/WE); CSR30, PB 1121, Sawa	CSR30, PB 1121, Sawa 127, Sawa	CSR30, PB 1121, Sawa 127, Sawa 134 &		PR 126
	127, Sawa 134 & PR 126	134 & PR 112	PR 112		
Kurukshetra	$100 \% Tr^{b}_{;} (0.5-1.0\% \text{ dead})$	100% $L_{;}^{b}$ (1-10 nymphs/hill) ^a	100% Tr-L ^b	30 % Tr ^b	50 % Tr ^b
	heart/WE) ^a ; PR 126, Sava 127, PB	PR 126, Sava 127, PB 1509, PR	(0.5-3.0% damaged leaves) ^a	(< 1.0% damaged	PR 126, PB 1509,
	1509, PR 114, Hybrid 357, PR 118,	114, Hybrid 357, PR 118, PB 1718,	PR 126, Sava 127, PB 1509, PR 114,	leaves) ^a	PR114, Hybrid 777
	PB 1718, Hybrid 2111, Hybrid 777,	Hybrid 2111, Hybrid 777, Hybrid	Hybrid 357, PR 118, PB 1718, Hybrid	PR 126 & PB 1509	& Sawa 127
	Hybrid 90M100, Hybrid 7726,	90M100, Hybrid 7726, Sava 134,	2111, Hybrid 777, Hybrid 90M100,		
	Sava 134, 28P67& CSR 30	28P67& CSR 30	Hybrid 7726, Sava 134, 28P67& CSR 30		
Karnal	90 % $\text{Tr-L}^{b}_{;}$ (0.51.5 % dead	50% $L_{;}^{b}$ (1-10 nymphs/hill) ^a	$100 \% \text{ Tr-L}^{b}_{;}(0.5-4.0 \% \text{ damaged leaves})^{a}$	-	10 % Tr ^b
	heart/WE) ^a ; PR 114,PR 127, CSR	PR 114, PR 127, CSR 30, Pusa 44,	PR 114,PR 127, CSR 30, Pusa 44, PB		PR 114
	30, Pusa 44, PB 1509, PR 126,	PB 1509, PR 126, Virat, 28P37,	1509, PR 126, Virat, 28P37, 28P67 & PB		
	28P37, 28P67 & PB 1121	28P67 & PB 1121	1121		
Jind	80 % Tr $L_{;}^{b}$ (0.5-2.0 % dead	80 % $L_{;}^{b}$ (2-8 nymphs/hill) ^a	$100 \% L_{;}^{b}(1.5-4.0 \% \text{ damaged leaves})^{a}$	50 %Tr $L_{;}^{b}$ (0.5-2%)	40 % Tr ^b ; PB 1509,
	heart/WE) ^a ; PB 1718, PB 1121, PB	PB 1718, PB 1121, PB 1509 &	PB 1718, PB 1121, PB 1509 & CSR 30	damaged leaves) ^a ; PB	PB1121, CSR 30 &
	1509 & CSR 30	CSR 30		1121 &CSR30	PB 1718
Yamuna	90 % Tr ^b (0.5-1.0% dead	70 % Tr L ^b	90 % Tr-L ^b	-	20 % Tr ^b
Nagar	heart/WE) ^a ; HKR 47, 28P67, Arize	(0.5-6 nymphs/hill) ^a	(0.5-4.0 % damaged leaves) ^a		HKR 47, PB 1 &
	6444, PR 114, PB 1121, Sava 127,	28P67, Arize 6444, PR 114, PB	HKR 47, 28P67, Arize 6444, PR 114, PB		sava 127
	PB 1,Hybrid 2222, Sava 134, Rasi	1121, Sava 127, PB 1 & Sava 134	1121, Sava 127, PB 1, Hybrid 2222, Sava		
	834& Sygenta 60002		134, Rasi 834& Sygenta 60002		
Ambala	90 % Tr. $-L_{;}^{b}$ (0.5-1.0% dead	40 % L ^b	100 % Tr- $L^{b}_{;}(0.5-3\% \text{ damaged leaves})^{a}$	-	40 % Tr ^b
	heart/WE) $_{;}^{a}$ PR # 126, 114, 121,	(1-3 nymphs/hill) ^a	PR 126, PR 114, 25P35, Kaveri 468, PB		PR 126, Sava 127,
	25P35, Kaveri 468, PB 1, Hybrid	PR 126, PR 114, 25P35, Hybrid	1, Hybrid 30, Sava 127,Hybrid 6129,		PR 114, 25P35, PB 1,
	30, Sava 127, 134 Arize	30, Sava 127 & PB 1121	Arize 6444,PB1121,HKR 47, 28P64, Sava		Kaveri 468 & Hybrid
	6444,PB1121,HKR 47, 28P64		134& PR 121		6129
Sonepat	30% Tr- ^b . (<1.0% % dead	30 %Tr L ^b (0.5-2.0 nymphs/hill) ^a	70% Tr-L ^b (0.5-3.0% damaged leaves) ^a	20 % Tr. ^b	20 % Tr ^b
Bonepu	heart/WE) ^a PB 1121, 1718 & 1509	PB 1121	PB 1121 & PB 1509	PB 1121	PB1509 & PB 1121
	, 12 1121, 1110 a 1509				
Panipat	80 % Tr. $_{;}^{b}$ (<1.0% dead heart/WE) ^a	50 % Tr L ^b ;(0.5-3nymphs/hill) ^a	100% Tr- $L^{b}_{;}(0.5-2.0 \% \text{ damaged leaves})^{a}$	30 % Tr. ^b	20 % Tr ^b
	PB 1121, PB 1718, PB 1509 &	PB 1121, PB 1718 & PB 1509	PB 1121, PB 1509, Super 21 PR 114 &	PB 1121, Super 21 &	PR 114 & PB 1121
	Super 21		PB 1718	PB 1718	

Table 10. Occurrence and severity of rice insect- pests recorded in different districts of Haryana during Kharif, 2020

There was low incidence of termite (0.5% infested plants) in some fields in Jind, Sonepat and Panipat

Details		Dist	ricts						
	Kaithal	Kurukshetra	Karnal	Yamunanagar					
% age farmers adopting plant protection	100% farmers adopted chemical plant protection measures								
Names of pesticides	Insecticides: fipron kg/acre), lamda c lambda-cyhalothrin for stem borer a thiomethoxam (100 (80 g/acre) for BPH Fungicides: Lustur (350 ml/acre), Sh hexaconazole 8%), Nativo (0.4 g/l) ar g/acre), propiconaz Kasu-B (500 ml/acr neck blast; Amistar streptomycin for bla	il (7.5 kg/acre), Ferte yhalothrin (400 ml.), Virtako (chlorantra and leaf folder and) g/acre), buprofezin I and WBPH re (450 ml/acre), azo eathmar (400 ml/ac , Takeshi (azoxystro nd azoxystrobin for ole (200 ml/acre) and re) for bacterial bligh Top (200 ml/acre) sh ast and bacterial bligh	erra (4 kg/acre), cartag /acre), Ampligo (ch aniliprole + thiametho d Chess (pymetroz (350 ml/acre) and O xystrobin + tebucon cre), Ayaan (krexox obin 11% + tebucon sheath blight; coppe d mancozeb (400 g/a nt; tricyclazole (200 g neath blight and blast tt	b hydrochloride (7.5 hlorantraniliprole + bxam) and acephate ine) (120 g/acre), bsheen (dinotefuran) azole, thiafluzamide ky methyl 40% + hazole 18.3% SC), br oxychloride (500 hcre) for false smut; g/acre) for blast and and kasugamycin +					
# of pesticide sprays	1-4	1-3	1-3	1-3					
Mixing of pesticides	Yes (50%)	Yes (100%)	Yes (90%)	Yes (100%)					
before application	2-3 pesticides	2-3 pesticides	2-3 pesticides	2-3 pesticides					

Table 11: Details of pest management

Details		Dist	ricts						
	Ambala	Jind	Sonepat	Panipat					
% age farmers adopting plant protection	100% farmers adopted chemical plant protection measures								
Names of pesticides	 Insecticides: fipronil (7.5 kg/acre), Tatafen (fenvalerate 10% EC), Ferterra kg/acre), Coragen, cartap hydrochloride (7.5 kg/acre), lamda cyhalothrin (40 ml/acre), Phorate (10 kg/acre) and Virtako (chlorantraniliprole + thiamethoxar for stem borer and leaf folder; Chess (pymetrozine) (120 g/acre), pexale (triflumezopyrim 10% SC), thiomethoxam (100 g/acre) and buprofezin (32 ml/acre) for BPH and WBPH and chlorpyriphos (1 litre/acre), cypermethrin chlorpyriphos (1 litre/acre) for termite Fungicides: carbndazim (250 g/acre), Amistar Top (200 ml/acre), propiconazot (200 ml/acre), azoxystrobin + tebuconazole, validamycin (400-450 ml/acre) at Nativo (0.4 g/l) for sheath blight; copper oxychloride (500 g/acre), azoxystrobin tebuconazole and propiconazole (200 ml/acre) for false smut; Kasu-B (5 ml/acre) for bacterial blight; tricyclazole (200 g/acre) for blast and neck blast at propiconazole (200 ml/acre), Amistar Top (200 ml/acre), as preventive spra Some farmers in Ambala applied mustard cake as organic amendment 								
# of pesticide sprays	1-3	1-2	1-2	1-3					
Mixing of pesticides	Yes (40%) 2-3 pesticides	Yes (40%) 2 pesticides	Yes (20%) 2 pesticides	Yes (33%) 2 pesticides					

Karnataka-2020-2021 (Mandya)

Districts surveyed: Chikkamagaluru, Hassan, Mandya, Mysuru and Davanagere

Particulars of su	rvey	
Districts	Taluks	Villages
Chikkamagaluru	Koppa, Narasimharajapura,	Muthinakoppa, Hariharapura, Jayapura,
	Tarikere and Lakkavalli	Duglapura, Amrutapura, M.C. Halli,
		Siddaralli
Hassan	Holenarsipura	Mavanur, Chikkavahalli, Ankavalli,
		Halenarsipura, and Gunjeru
Mandya	Srirangapatna, Mandya,	Kudalakuppe, Chikkaharohalli,
-	Pandavapura, Malavalli and	Chaluvarasanakoppal, Bachnahalli,
	Maddur	Talagaradi, Shivalli, Goravali, Nagarakere
		and Malagaranahalli
Mysuru	KR Nagara, HD Kote,	G.Marahalli, Echagalli, Tippuru,
	Tirumakudalu Narsipura,	Jakkanahalli, Beechagalli, Kanuganahalli,
	Hunusur and Nanjanagud	Krishnapura, Muguru and Bidugalu
Davangere	Harihara, Davangere, Channagiri,	Sri Kantapura, Kakkaregolla,
	Honnali and Kumbalur	Chandranahalli, Haralahalli, C. Kadakatte,
		Haralahalli, Holaduru, Cheeluru and Jigali

Widely Prevailing rice varieties

Districts	Varieties
Chikkamagaluru	HYVs: IR64, Intan, IET13901(Tunga), BR2655, Jyothi, BPT5204, JGL1798,
	KPR-1 and Jaya
Hassan	HYVs: Intan, BR 2655, Tunga, IR64, MTU1001, Jaya, KPR1 and RNR15048
Mandya	MTU1001, IR64, BR 2655, Thanu, Jyothi, JGL1798, MC 13, MRH 836 and
-	RNR15048: Hybrids: Arize, VNR 2233, PAC 837, DRH836,
Mysuru	Jyothi, IR64, MTU 1001, MTU 1010, Jaya, JGL1798, RNR15048, Tanu, BR
	2655, and MRH 836. Hybrids: DRH836, MC13, PAC 837, VNR 2233 and
	Arize
Davanagere	RNR15048, JGL 1798, IR64, Jyothi, MTU1001, MTU1010, BPT 5204,
_	Kaveri sona and Jaishree Sona Hybrids: VNR2233

Particulars of Rice area (2020)

Districts	Total geographical area (ha)	Total cultivable area (ha)	Total cultivated area (ha)	Total irrigated area (ha)	Area under rice (ha)
Chikkamagaluru	722075	313377	313000	25000	19022
Davanagere	597597	244294	231615	156217	204941
Hassan	662602	45000	42693	24300	23690
Mandya	498244	330504	160990	79146	56850
Mysuru	676382	332535	393894	114519	101482

Months	Districts Surveyed						
	Mandya	Mysore	Hassan	Chikkamagaluru	Davangere		
June 2020							
Rainfall (mm)	58.6	69.5	117	201	80		
Total Rainy days	6	8					
July 2020							
Rainfall (mm)	84.3	118.7	180	300	147		
Total Rainy days	10	15					
August 2020							
Rainfall (mm)	67.1	123.7	282	518	104		
Total Rainy days	4	11					
September 2020							
Rainfall (mm)	149.2	130.2	202	336	210		
Total Rainy days	6	16					
October 2020							
Rainfall (mm)	222.5	105.7	153	167	159		
Total Rainy days	12	11					
November 2020							
Rainfall (mm)	64.6	55.2	21	28	8		
Total Rainy days	4	4					
December 2020							
Rainfall (mm)	9	9.8	17	20	5		
Total Rainy days	3	1					

Weather	informatio	n during the	cropping sea	son (<i>Kharif</i> 2020)

Production oriented survey was conducted in five districts of Karnataka viz., Chikkamagaluru, Davangere, Hassan, Mandya and Mysuru during *Kharif* 2020. The prevailing cropping pattern in the districts surveyed is Rice-Rice followed by Rice-sugarcane, Rice-vegetables, Rice-Maize, Rice-Pulses, Rice-Ragi and Rice-Fallow. Rice is grown in this state under irrigated, rainfed and tankfed conditions. The south west monsoon entered the Karnataka state on 6thJune and the onset of monsoon was timely in all the districts surveyed. The rainfall received between July and September was normal thus all reservoirs viz., Krishna Raja Sagar, Hemavathi, Tungabhadra and Bhadra project got filled. Timely sowing was done in all the districts surveyed. At tillering stage, in most of the fields the leaves showed yellowing especially in variety Jyothi. The climatic condition prevailed during the cropping period was normal except with cold temperature during September at tillering stage in Mandya and Mysuru district. The inputs in all districts were adequate except zinc micronutrient because of which deficiency was seen in many fields. State department of Agriculture distributed the seeds to the farmers timely during the season without any shortage under Covid -19 pandemic situation. State department in collaboration with universities opened agriclinic to provide better advisory service to farmers under COVID pandemic situations. In recent years farmers are adopting direct wet sowing using drum seeder in many districts. Alternate drying and wetting method of irrigation is picking up in Mandya and Mysuru districts in cauvery command area due to technology spread. Farmers have adopted it mainly due to yield advantage and to save the water.

General questions on rice cultivation in the district

Demonstrations	Districts						
Parameters	Chikkamagaluru Davanagere Hassan		Hassan	Mandya	Mysuru		
Total area under rice HYV in the district	18000	1,90,000	19000	45000	85000		
Most prevalent HYVs in the district	IET13901, IR64, Jyothi, Intan	RNR15048,JGL1798, BPT5204, MTU1001	IR64, IET13901, BR 2655	MTU-1001, IR64, Jaya, BR2655	Jyothi, IR64, MTU-1001, RNR15048		
Most prevalent rice hybrids in the district	-	Arize	VNR2233	KRH 4, VNR2233, DRH836, MC13	VNR2233, KRH-4,		
Total area under rice hybrids in the district	500ha	10000ha	1000ha	5000ha	20000ha		
Whether farmers are using any heavy equipments like transplanter/combine harvester	Combine harvester and Baler	Combine harvester and Baler	Combine harvester and baler	Combine harvester and baler	Transplanter, harvester and baler		
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	Direct seeded Rice	Alternate drying and wetting method and Direct seeded Rice	Direct seeded Rice	Alternate drying and wetting method and Direct seeded Rice	Alternate drying and wetting method and Direct seeded Rice		
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Water saving technologies, Plant protection measures to be followed.	Mechanized transplanting, Water saving technologies and Plant protection measures	Water saving technologies and plant protection measures	Water saving technologies, application of Zn, pest and disease control, crop insurance, SRI Method.	Water saving technologies and plant protection measures		
What are the general problems in rice cultivation in the district?	Labour, less minimum support price	Labour, marketing and less minimum support price	Labour and marketing, less minimum support	Labour marketing, less minimum	Labour, marketing and less minimum		

Demometers	Districts							
Farameters	Chikkamagaluru	Davanagere	Hassan	Mandya	Mysuru			
			price	support price	support price			
Please provide any farmers association in the district	Karnataka Farmers association	Karnataka Farmers association	Karnataka Farmers association	Karnataka Farmers association	Karnataka Farmers association			
Whether availability of agricultural labours is the sufficient?	No	No	No	No	No			
Whether there is any marketing problem of the produce?	Yes	Yes	Yes	Yes	Yes			
Any major irrigation/power generation project in the district	Bhadra river project	Tunga Bhadra reservoir	Hemavathi irrigation project	Krishna Raja Sagara	Krishna Raja sagara			
Any soil testing program undertaken?	Soil health card	Soil health card mission by central government	Soil health card mission by central government	Soil health card mission by central government	Soil health card mission by central government			
Any farmers training program was organized by the state department of Agriculture/University	Training programme for farmers under ATMA	Training programme for farmers under ATMA	Training programme for farmers under ATMA	Training programme for farmers under ATMA	Training programme for farmers under ATMA			

The common method of cultivation is random planting. The density of weedy rice has decreased over the years due to timely application of weedicides (within 3 DAS). During 2020 zinc deficiency was observed in many districts as the farmers could not apply the zinc due to non availability. Mechanization in all the districts was adopted mainly for harvesting by using combine harvesters and baler. Mechanical Rice transplanters are being promoted from state department by providing subsidies in Davangere and other districts. Varieties viz., IR64, Intan, MTU 1001, MTU 1010, IET13901(Tunga), BR2655, Jyothi, BPT5204, JGL1798, KPR-1, MRH 836, RNR 15048, Java Kaveri sona and Jaishree Sona and hybrids viz., Arize, PAC 837, DRH836, MC13 and VNR2233 were grown in the surveyed districts. Usual seed rate was 25 kg/acre. About 50% of the farmers adopted seed treatment with carbendazim @ 2 to 4 g/Kg of seed and in addition they applied FYM in the nursery. Farmers applied complex fertilizers viz., 20:20:20; 19:19:19; 10:26:26; DAP and Urea applied @ 2-9 kg for 300 sqm. In the main field, N was applied in the form of Urea, DAP and other complex fertilizers, 10:26:26, 17:17:17, 19:19:19, 20:20:0:13 where in the available nitrogen varied from 6.9 kg to 40 kg/acre; P was applied as DAP and Potash (available form 19 - 28 kg/acre), K was applied as MOP, and other complex fertilizers (available form 19 -23kg/acre) and S @ 13 kg/acre. Drum seeding technology (wet direct) is picking up in the district however farmers are facing problem of weed management as there are no pre-emergent selective weedicides available in the market. The most paddy fields Echinochloa common weeds in are viz., crusgalli, Echinochloa colonum, Cyperusiria, panicum repense and Monochoria vaginalis newly Leptochloa chinensisis noticed in some fields.

The outbreak of insects and diseases was moderate due to timely sowing. As noticed in 2019 bloodworm problem is again notice in cauvery command area because of which the crop was showing stunted growth and leaves were turning light yellow. The major diseases viz., leaf blast, bacterial leaf blight, brown leaf spot and neckblast appeared in patches in low to moderate level. Leaf blast severity of 15-50% was recorded in Jyothi, MTU1001 and private varieties. Sheath blight was noticed in patches with severity ranged from 20-30% on variety Jyothi. Bacterial blight intensity of 25-30% was noticed in endemic fields in variety Jyothi. False smut and grain discoloration incidence of 10-15% and 20-25% respectively was observed in variety Jyothi, MTU1001and Private varieties. The insect pestsviz.,case worm, leaf folder and stem borer infestation was moderate to high in summer while low to moderate in *Kharif* 2020. In Mandya and Mysuru the brown plant hopper infestation 15-20% was noticed at dough stage irrespective of the varieties. Brown plant hopper and earhead bug have been consistently recorded from past three years in Mandya, Mysuru and Hassan district. Farmers have expressed the need for scientific market price and high yielding resistant varieties.

District wise observations

Chikkamagaluru: Chikkamagaluru belongs to Zone 7 and 9 (Malnad zone) comprising of seven taluks. The area under paddy in the district is 19277 ha during *kharif* 2020. Paddy is grown in 5 taluks of the district i.e. Mudigere, Narasimharajapura, Koppa, Sringeri and Tarikere. Onset of south-west monsoon was timely and normal rainfall received from June to September. The survey was conducted at maximum tillering and during maturity stage of the crop. Rice followed by rice is the only crop rotation practice in this district. Farmers are replacing paddy with plantation crops as it is commercial and profitable. 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. Fertilizer usage is as per recommended but slightly more than the recommended dose of nitrogenous fertilizers and farmers using micronutrients (Zinc and Boron) compulsorily. The common method of cultivation is random planting. Usual seed rate was 25

kg/acre. About 50% of the farmers adopted seed treatment with carbendazim @ 2 to 4 g/Kg of seed and in addition they applied FYM in the nursery. Farmers applied complex fertilizers viz., 20:20:20: 19:19:19: 10:26:26: DAP and Urea applied @ 2-9 kg for 300 sqm. In the main field, N was applied in the form of Urea, DAP and other complex fertilizers, 19:19:19, 20:20:0:13 where in the available nitrogen varied from 6.9 kg to 40 kg/acre; P was applied as DAP and Potash (available form 19 - 23 Kg/acre), K was applied as MOP, and other complex fertilizers (available form 19 -23kg/acre) and S @ 13 kg/acre. The major varieties grown are IR64, Intan, MTU1001, BR2655, Jyothi, BPT5204, JGL1798, BPT 5204 and Java. Average yield of the adopted varieties was around 2200 to 3000 kg/acre. During *Kharif* 2020, transplanting was done between 12th June to 15th August. Weed infestation was medium to low and the major weed flora observed were Echinochloa spp, Cyperus spp. Commonly used weedicides were Butachlor 50 EC @ 100 -150g/acre; Saathi @ 100g/acre and Pretilachlor@600ml/acre. With respect to cultivation practices majority of the farmers hire the implements viz., Plough and Harvester. Seed replacement ratio was 0 to 10%. Many of the farmers are aware and follow up all the cultivation practices. They clarify their doubts regarding cultivation practices with state departments, University officials and dealers. During Kharif 2020 the incidence of insect's pests i.e. case worm, leaf folder and the stem borer infestation was low to moderate. Similarly incidence of leaf blast, sheath blight, false smut and neck blast was low to moderate. Farmers are using pesticides viz., carbendazim @ 1g/l, propiconazole 25EC @1ml/l, hexaconazole 25EC @ 2ml/l, kitazin, saaf, tricyclazole 0.6g/l, carbofuron 3G, fipronil, chloropyriphos @ 2ml/l, monocrotophos for plant protection.

Davanagere: Davangere belongs to Zone (Agricultural zone 7 & 8) comprising of six taluks viz., Davanagere, Harihara, Jagluru, Harappanahalli, Honnalli, and Chennagiri. Rice is grown mainly in Davangere, Harihara, Harappanahalli, Honnalli, and Chennagiri taluks. Rice followed by rice is the cropping system followed in the district. Few farmers replaced rice arecanut. Average yield of the crop varied between 2100 kg/acre to 3000 kg/acre. Farmers grow high yielding varieties viz., RNR15048, JGL1798, MTU1010, BPT5204, Kaverisona, Super ammam and Nellore sona. The farmers of the districts have more inclination towards cultivation of high yielding fine grain varieties. RNR15048 has covered 30-35% followed by JGL 1798 with 15-20% during kharif 2020. Red rice variety Sahyadri Kempu Mukti an alternate variety to Jyothi developed and released by UAHS Shivamogga is picking up in the district. In all the taluks rainfall received was normal. June 2nd fortnight and July 1st forthnight is the nursery sowing period. July 2nd fortnight and August 1st 2nd fortnight is the planting time. Random method of transplanting under puddle condition is the common practice in both the seasons. Many farmers are growing green manure crop and incorporating into the soil. In the district farmers are well aware of the package of practice of rice cultivation recommended by the Agricultural University (Bengaluru & Raichur). However, survey reveals that farmers are using 50-75% nitrogenous fertilizer more than recommendation. In nursery, farmers used different complex fertilizers viz., 10:26:26, 17:17:17, 19:19:19 and Urea @ 6 kg, 9 kg, 8 kg and 2 kg per 300 sqm respectively. The available form of nitrogen was varied from 9 to 138kg/acre; P varied from 20-28 kg/acre and K varied from 11.20 to 23 kg/acre. All the farmers apply ZnSO₄ @ 10kg/acre during summer. Few farmers applied 20:20:0:13 which contain 13kg of sulphate sulphur per hectare. They apply Butachlor and pretilachlor for the management of weeds and some farmers carry out two three manual weeding followed by weedicide application at the time of transplanting. Farmers are well versed with the plant protection measures staring from seed treatment to harvest. The farmers are depend largely on private dealers for the information and the inputs. All the farmers take up prophylactic spray for neck blast at booting stage and at 5% panicle emergence irrespective of the varieties. The incidence of diseases viz., Sheath blight (20%), Neck blast (15%) and bacterial leaf blight (15-20%) was low to medium. Leaf folder, stem borer and brown plant hopper infestation was low to

medium range. Farmers are spraying pesticides as prophylactic measure using the excess dose and irrespective of the pest occurrence. Pesticides *viz.*, carbendazim (1 g/l), propiconazole 25EC @ 1ml/I, chlorpyriphos 25EC @ 2ml/l, thiafluzamide 24% SC @ 1g/l, tricyclazole 0.6g/l, imidachloprid 1ml/l, acepahte @ 15g/l, flubendamide@ 1ml/I, quinolphos 25EC @ 2ml/l, native 0.4g/l and merger @ 2g/l used for plant protection. They do tank mix of 2-3 chemical at a time and take up 4-5 sprays per cropping period. Many farmers in the district are using growth promoters as per the instructions of the private dealers expecting to get good yield. In this district the farmers obtain information from private dealers. The scientific price fixation, high yielding resistant varieties /hybrids and market facility and scientific market price are some of the needs of the farmer in the district.

Hassan: Hassan belongs to Zone 7 comprising of eight taluks. Paddy is cultivated in southern dry zone covering six taluks viz., Holenarsipura, Sakleshpura, Channarayapattatna, Alur, Arakalgud and Hassan rural. The predominant rice varieties in the district were Tunga, IR-64, BR2655, IET7191, Intan, MTU1001, Jaya, KPR1, JGL1798, Thanu, RNR 15048. The traditional local varieties grown were Rajamudy, Ratnachudi and Rajabhoga. Rice-Rice and Rice-pulses is the prevailing crop rotation practiced. Seed rate of 25kg/ha was adopted by most of the farmers. Among the surveyed farmers only few were adopting seed treatment with carbendazim @ 2g/kg of seeds. In nursery, they applied complex fertilizer viz., 17:17:17 or 19: 19: 19: 0 5 kg to 10kg/ 0.07 acre. In the main field, available N was applied between 20 to 46 kg/acre; P @ 23kg/acre and K @ 9 to 23 kg/acre and S @ 13 kg/acre. Farmers used fertilizers viz., 20:20:0:13, Urea and Potash. Most of the farmers adopted random method of transplanting. Farmers grow sunhemp and Dhaincha as a green manure crop. Weed infestation was medium to low and predominant weeds are Cyprus spp. Weedicides viz., nominee gold (0.08 lt/acre), londax power (4 kg/acre) were used. Most of the farmers using local varieties and there was no scarcity of water and power. Farmers clarify their doubts through state department and university officials and dealers. Blast, leaf folder, and stem borer were pests noticed and the incidence was low. Farmers spray carbendazim (1g/l), tricyclazole @ 125g/acre against blast and quinolphos @ 400ml/acre and chloropyriphos for the management of stem borer and leaf folder; reagent @ 1.5 ml/acre for stem borer. Farmers usually apply two chemicals and give two sprays per cropping season. Most of the farmers reported zinc deficiency and few reported potash deficiency. Farmers were happy with rice cultivation and their needs were mechanization for small plots, resistant varieties with high yield, GI index for Rajamudy and Scientific market price for paddy.

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 and Pandavapura. Sowing was timely in the district initiated from June forthninght till August forthninght. Rice-Rice, Rice-Sugarcane and Rice fallow are the prevailing cropping pattern in the district. Average yield of the varieties (IR 64, Tanu, MTU 1001, Jaya, MC-13) varied from 2200 kg to 3000 kg/acre. Seed rate of 25kg/acre was followed by majority of the farmers. Majority of the farmers not adopted seed treatment but applied inorganic fertilizers and green manure in nursery. They applied 10: 26: 26, 17:17:17, 19:19:19, 20:20:20 complex fertilizers @ 6 to 9 kg per 300 sqm. In addition they applied urea @ 2 kg per 300 sqm. In main field the available nitrogen was applied @ 7.5 to 23 kg/acre; P @ 19.5 to 20.9kg/acre, K @ 19.5 to 23 kg/acre and S @ 13 kg/acre. Majority of the farmers applied ZnSO₄ @ 8 to 10 kg/acre. All the surveyed farmers adopted line method of transplanting. Echinochloa crusgalli, Echinochloa colonum, Cyperus iria, Panicum repense and Monochoria vaginalis are the common weeds and weed intensity was medium. Few farmers adopted hand weeding and most of them applied weedicides viz., topstar @ 125g/ha, londax Power - 4 kg/ha, Nominee gold - 0.08 lt/acre and butachlor 50EC @ 1 kg/ acre. Implements viz., Disc Harrow, Disc Plough were hired by the farmers. Seed

replacement ratio was very low between 1- 2% and seeds from the state department was distributed timely by state department and Karnataka state seed corporation. Availability of equipment, fertilizers, pesticides and storage facility was adequate. In many fields zinc deficiency was observed due to which growth was affected. In the current year farmers faced unavailability of zinc fertilizer, over and above the farmers are neglecting zinc application due to lack of knowledge on zinc deficiency. In unpuddled dry nursery, iron deficiency is noticed during summer season. In summer crop (2020) the neck blast incidence was ranged from 20-80% in MC13, DRH836 and Java, while insect pest leaf folder and stem borer infestation of 30-45 % was recorded. During kharif 2020, leaf blast severity was less, however 20-60% in MTU1001 was observed in patches in the fields supplied with high doses of urea. Sheath blight was noticed in patches with severity ranged from 10-15%. The neck blast disease incidence was less due less to rainfall during flowering and dough stage in November and December and prophylactic spray at booting stage. Blast, Bacterial blight, sheath blight and Brown Plant Hopper was observed in some farmers field in private paddy variety viz., sonam paddy (up to 75%) and paddy khazana (WBPH). Grain discoloration incidence was ranged from 20-25% in Jyothi, MTU1001and private varieties. Up to 45% stem borer infestation was reported in VNR 2233 plus. In I-rice 522 sever infestation of case worm was recorded (up to 75%). During dough and grain filling stage brown plant hopper and earheadbug (Gundibug) infestation of 50-75% and 15-20% was observed in patches in Jyothi and private varieties/hybrids. The pesticides used by the farmers are streptocycline @ 0.1 g/lt, copper oxychloride (@1 g/lt), carbendazim 50 WP (@ 1g/lt), tricyclazole 75WP (@0.6g/lt), hexaconazole 25 EC (@ 2 ml/lt), tebuconazole 50% + trifloxystrobin 25% (0.4g/lt), chlorpyriphos20%EC (@ 2ml/lt), fipronil 0.3% GR, dichlorovos 76%EC and lambda cyhalothrin 5%EC, malathion 50% EC, reagent (@ 1.5ml/lt) for the management of pest and diseases. Farmers reported labour and marketing as problems and their needs were viz., resistant fine grain varieties, marketing centre for rice, mechanization for small area and variety replacement for Jyothi (Red rice).

Mysuru: Mysuru belongs to Zone (6 and 7) comprising of seven taluks. The district received annual rainfall of 977 mm as against 815 mm normal rainfall with excess of 162 mm rainfall. The Survey was conducted in five taluks viz., Hunusur, HD Kote, T Narasipura, Nanjangud and K R Nagara. State department had distributed the seeds timely due to expected filling of reservoirs and timely release of water from Krishna Raja Sagar dam. The important varieties grown are Jyothi, IR-64, MTU 1001, Java, BR 2655 and RNR15048. Farmers are growing private varieties due to fine grain quality and yield. In recent years area under hybrid rice are picking up. The hybrid viz., VNR 2233 has covered around 13000ha area in the district. Many private varieties /Hybrids grown in the districts are Penna Super, Meenakshi, Vasundhara, SunMadhu, MTU-1010, SonamSiri, Vikram, Padmavati, MC-13 and Vikram. The common crop rotation systems in the district are rice-rice, rice-rice-sugarcane, rice-vegetables and rice-pulses. Canal water from Kabini, Cauvery River and open wells are the main source of irrigation. Normal sowing in I and II week of July and planting in I and II week august was followed in the open well and tank fed areas. Average rice yield varied between 2000 to 2700 kg/acre. Seed rate of 25kg/acre was followed and fifty percent of the farmers were adopted seed treatment with carbendazim @ 2-4 g/kg. In nursery majority of the farmers applied organic manure @ 8 to 10 tonnes/ acre and inorganic fertilizers. In organic fertilizers included 6 to 9 kg of complex fertilizers viz., 10:26:26, 17:17:17, 19:19:19 and 20:20:20. In addition farmes applied Urea 2 kg per 300 m². In the main fields, fertilizers were applied @ 7.5 - 23 kg N/acre, 19.5-20 kg P2O5/acre and 19.5-23 kg K2O/ha. Few farmers S @13 kg/acre applied along with N, P, through the application of complex fertilizer 20:20:0:13 and zinc sulfate (8.0-15 kg/acre). Farmers used fertilizers like urea and different complex fertilizers like 10:26:26, 17:17:17, 19:19:19 and 20:20:0:13. In the main field farmers grow sunnhemp, Dhaincha as green manure crop. Most of the farmers adopted line

transplanting and weed infestation was moderate. The populations of weeds like Echinochloa crusgalli, Echinochloa colonum, Leptochola chinensis and Cyperus iria were low to medium. The majority of the farmers are in the practice of using Butachlor, Nominee gold @ 0.08 lt/acre and Londax power @ 4 kg/acre, beside supplementary hand weeding at 30 and 60 days after planting. Among the biotic stress leaf blast and neck blast incidence was notice mainly in KR nagara taluk which is endemic area. Leaf blast severity of 15-50% was recorded in Jyothi, MTU1001 and private varieties. Sheath blight was noticed in patches with severity ranged from 20-30% on variety Jyothi. Bacterial blight of 25-30% was noticed in some fields of T. Narasipura and Nanjungud block on Jyothi variety. Neck and panicle blast of 10-75% was recorded in Jyothi variety in KR Nagarataluk. Udbatta disease incidence was less in Jyothi variety in the entire field. False smut incidence ranging 10-15% was observed in Jyothi, private varieties and hybrids. At tillering stage stunted growth and yellowing was observed due to potash deficiency in Jyothi variety. Insect pests viz., case worm, leaf folder and stem borer were low to moderate. Outbreak of brown plant hopper was recorded in T. Narasipura, Nanjungud and Bannur block of the district at dough and grain filling stage affecting to the range of 10-80%. Farmers have sprayed Dimethoate 30EC (Rogar) @1ml/l, buprofezin 25EC @1.4ml/l, acephate75WP (Starthane), carbendazim 50 WP, tricyclazole 75WP, tebuconazole 50% +trifloxystrobin 25%, chlorpyriphos 20% EC, cartap hydrochloride 4G & Fipronil 0.3% GR, acetamiprid 20% SP, dichlorovos76% EC, lambda cyhalothrin 5% EC, malathion 50% EC for the management. Farmers have faced marketing problem associated with Jyothi variety earlier which was fetching high market value. Need of the farmers are marketing value for paddy, mechanization for small area, high yield fine grain varieties and variety replacement for red rice Jyothi.

Districts		Disease					Insects					
	LB	NBL	BS	SHBL	SHR	BLB/ BLS	FS	UD	SB	BPH	LF	CW
Chikkamagaluru	L	L	-	L	L	L	L	L	L	L	L	L
Hassan	L	L	L	L	L	-	-	-	L	I	L	L
Mandya	L	L	L	L	L	L	L	L	L	L-M	L-M	L-M
Mysuru	L-M	L	L	L-M	L	L	L	L	L-M	М	L-M	L
Davangere	L	L	L	L	L	L	L	L	L-M	L	L-M	L

Prevalence of disease and pests in Southern Karnataka during Kharif 2020

Maharashtra-2020-2021(Karjat)

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

Districts	Taluka/Block	Villages
Thane	Kalvan. Bhiwandi.	Bhisol, Aane, Yewai, Chavindra, Mhasa, Kakadpada,
	Murbad. Shahapur and	Kanhol, Balegaon, Umbrai, Naravangaon, Cheravali,
	Ambarnath	Kundanpada and Kasgaon
Raigad	Karjat, Panvel, Uran,	Vadap, Tiwane, Akurle, Mulgaon, Sai, Dighati,
C	Pen, Alibag,	Kelavane, Sarade, Pandive, Vasheni, Kandalepada,
	Sudhagad, Pali, Roha,	Vadhav, Varavane, Maleghar, Masad, Shihu, Chole,
	Mangaon and	Katalpada, Aambeghar, Talwali, Bhalgul, Rasalgaon,
	Khalapur	Ekalghar, Vajroli, Pugaon, Vajroli, Rudravali,
		Shemadi, Vanave, Narangi and Tambati
Palghar	Palghar, Dahanu,	Vadrai, Mahim, holili, Sagave, Veti, Charoti, Sarani,
	Wada and Vikramgad	Nehalpada, Abitghar, Kambarath, Vasuri, Sajan and
		Onde
Ratnagiri	Mandangad, Dapoli,	Kumbale, Shenale, Chinchali, Gangawahi, Navashi,
	Khed, Chiplun,	Kumbhave, Vetalwadi, Chinchghar, Dhamani,
	Sangameshwar,	Dighewadi, Moravane, Golwali, Devtale, Velvande,
	Ratnagiri, Lanja and	Waked, Kuvegaon, Lanja, Pali, Panhale, Kondavali
	Rajapur	and Tambadwadi
Sindhudurg	Devgad, Kankavali,	Vareri, Devulbatle, Osargaon, Vagade, Ghadiwadi,
	Kudal, Malvan,	Pinguli, Nerur, Dhampur, Parad, Pendur, Talwade,
	Sawantwadi, Vengurla	Malgaon, Aadeli, Vetore, Math, Vajrat, Tulas, Karul,
	and Vaibhavwadi	Jamdarwadi, Yedgaon, Nadhawade and Kokisare

Table	1:	Details	of survey	
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Production oriented survey was conducted in the Konkan region of Maharashtra which is the predominant rice growing belt with an average productivity of 2.66 t/ha (3.84 t/ha rough rice). The region comprised of five districts viz. Thane, Raigad, Palghar, Ratnagiri and Sindhudurg. The total area under rice cultivation in Kharif-2020 season in the region was 375896 ha, out of these 94 % area were sown under rice during this year. The farmers of this region cannot grow any crop other than rice in *Kharif* because of high rainfall and geographically low land. Survey was organized at dough and maturity stage of crop during the month of October-November 2020. The details of the places surveyed are presented in Table 1. The details of different weather variables during the cropping season of 2020 in the five surveyed district are presented in Table 4. The onset of monsoon was early by 1week in South Konkan Costal Zone whereas, it was in time in North Konkan Costal Zone of the region. Moderate rain fall was received in almost all districts of Konkan region except Palghar and Thane. The maximum rainy days are in Sindhudurg, Ratnagiri and Raigad districts were 118, 95 and 95 days, respectively. Whereas, the maximum rain fall was high in Sindhudurg district (4837.5 mm) in 118 rainy days. The total rain fall and its distribution in Konkan region were much satisfactory. The weather conditions were good during growth stages of crop but during maturity period and harvesting stage, heavy rainfall occurred in the month of October and November which caused in lodging and in situ germination and resulted in significant yield loss.

Table 2: Widely	prevalent rice varieties	
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Districts	Varieties
Thane	NB 37, YSR, Avani, Jordar, 911, Shabari, Ratna, ,Shriram, Rupam, MTU
	1008, Asmita, Wada Kolam, Jaya, Ankur Rupali, Karjat-7, Karjat-3, Silky-277,
	Om 125, Daptari-100, Krushidhan Komal-101, Poonam, Shabari, MTU-1010,
	Jyotika, Om Shriram, Daptari 1008, Daptari 125, Trupti, Avani, Jordar,
	Vaishnavi, Soubhagya, Devaki, Shubhangi and Suprim Sona.
Raigad	Trupti, Rupali, Jyotika, Chintu, Suprim Sona, Kanchan, Kuber, Radha, Jaya,
	Prasanna, Komal 101, Karjat-2, Karjat -3, Karjat -5, Karjat -7, MTU 1010,
	Suvarna, Vaishnavi, Jordar, Sonal, NPH 256, YSR, Awani, Kranti and Sagar.
	The most popular varieties are Jaya, Suvarna, Karjat -2, Ratna, MTU 1001/
	1010, Rupali, and YSR. Some farmers cultivate hybrids Sahyadri-2, Sahyadri-
	3, Gorakhnath and Lokhnath 509
Palghar	Jaya, Masuri, Suvarna, Karjat 3, Karjat 8, Ratnagiri -5, MTU-1010, Ankur,
	Sonam, Rupali, Komal 101, Vada kolam, Laxmi, Silky 277, Shatayu, YSR,
	Daptari 100, Jyotika, Poonam, Suma, Sundar, Sonam, Jordar, Harshita and
	Bangalya for their fine quality, taste, special purpose and home consumption.
	MTU- 1010, Rupali, Komal-101, Silky-277, Mohini and YSR
Ratnagiri	Jaya, Suvarna, Karjat-2, Sonam, Pooja, Komal 101, Green gold mohini,
	Shriram and Trupti. The Hybrids grown in the districts are Sahyadri, Arise-
	6444, Arize 522. Most popular varieties in the district are Jaya, Ankur Sonam,
	Karjat-2, Sarthi, Green Gold Mohini, Suvarna, Trupti and Ankur Rupali.
Sindhudurg	Jaya, Masuri, Suvarna, Karjat-3, Karjat-5, Sonam, Rupali, Komal-101, Silky-
	277, Suprim Sona, Jai Shriram, Janaki and Green gold Mohini. Hybrids grown
	in the district are Sahyadri-1, Arize-6444, Ankur-7434 and Loknath-509. Local
	varieties are Bela, Walai, Somasal, Dongara, Sorti, Kothimbira/Ghansal, Turya
	and Yelkar. Farmers cultivate these varieties for boiled rice purpose and home
	consumption. Most popular varieties grown in the district are Jaya, Masuri,
	Suvarna, Karjat-3, Karjat-5, Sonam, Rupali, Komal-101, Silky-277, Suprim
	Sona, Jai Shriram, Janaki and Green gold mohini.

Table 3: Particulars of rice area in different	t districts of Konkan region o	f Maharashtra
(Kharif ² 020)	_	

District	Total Coographical	Total Cultivable	Total Cultivated	Net Irrigated	Area Under
District	Area (ha.)	Area (ha.)	Area (ha.)	Area (ha.)	Rice (ha.)
Thane	933700	210825	170656	2494	54951
Palghar	469699	263707	217338	15727	75678
Raigad	687000	141200	217400	9000	107356
Ratnagiri	816000	388000	260400	5900	74010
Sindhudurg	503950	465307	159200	3630	63900

The details of the varieties cultivated by different farmers are given in Table 2. Commonly grown varieties were HYVs like NB 37, YSR, Avani, Jordar, 911, Shabari, Ratna, ,Shriram, Rupam, MTU 1008, Asmita, Wada Kolam, Jaya, Ankur Rupali, Karjat-7, Karjat-3, Silky-277, Om 125, Daptari-100, Krushidhan Komal-101, Poonam, Shabari, MTU-1010, Jyotika, Om Shriram, Daptari 1008, Daptari 125, Trupti, Avani, Jordar, Vaishnavi, Soubhagya, Devaki, Shubhangi and Suprim Sona and hybrids like Arize 6444, Sahyadri-2, Sahyadri-3, Gorakhnath and Lokhnath 509. The locally grown varieties are Bela, Walai, Somasal, Dongara, Sorti, Kothimbira/Ghansal, Turya and Yelkar. The details of area under rice

cultivation in different districts are presented in Table 3. The details of area under different rice varieties in different districts of Konkan region of Maharashtra during Kharif' 2020 are given in Table 6.

Tuble II il cutifel auta for a	mer ente anser	iets of manie	ii ui uiiti u uu		
District/Parameters	Jun	Jul	Aug	Sep	Oct
Thane					
RD	16	26	27	17	4
TR (mm)	337.8	739.5	1211.0	321.9	22.6
MMT (⁰ C)	29.5	27.5	26.5	26.4	28.5
T. Max (^{0}C)	33.2	31.5	29.4	31.2	32.8
T. Min (^{0}C)	25.7	23.5	23.5	21.6	24
SH	3.7	2	1	3.6	5.6
Raigad	-			•	•
RD	17	26	28	18	6
TR (mm)	407	660.7	1433.4	356.1	225.2
MMT (⁰ C)	29.9	27.5	26.4	27.3	27.8
T. Max (^{0}C)	34.1	30.5	28.9	31.5	32.8
T. Min (^{0}C)	25.7	24.5	23.9	23.1	22.8
SH	2.5	1.6	1.2	3.5	4.9
Palghar	-			•	•
RD	15	27	27	17	2
TR (mm)	268.5	818.2	1688.6	287.8	20.0
MMT (⁰ C)	29	27.5	26.5	25.5	28.9
T. Max (^{0}C)	32.3	32.5	29.9	30.9	32.7
T. Min (^{0}C)	25.7	22.5	23.0	20.1	25.2
SH	4.8	2.4	0.8	3.6	6.2
Ratnagiri					
RD	19	26	25	17	8
TR (mm)	793.7	1253.7	1174.0	574.6	239.8
MMT (⁰ C)	27.75	26.95	27.2	27.0	27.55
T. Max (^{0}C)	31.5	29.7	30.1	30.2	31.0
T. Min (^{0}C)	24.0	24.2	24.3	23.8	24.1
SH	4.5	2.1	1.9	3.5	4.3
Sindhudurg					
RD	25	23	34	24	16
TR (mm)	1040.5	1470.7	1288.3	700.7	337.0
MMT (⁰ C)	27.9	26.5	26.6	27.2	27.7
T. Max (⁰ C)	31.9	29.4	29.5	30.6	32.6
T. Min (^{0}C)	23.9	23.6	23.7	23.7	22.8
SH	3.9	1.7	1.3	3.3	5.2

 Table 4: Weather data for different districts of Mahararahtra during 2020

RD: Rainy days; TR: Total rainfall; MMT: Monthly Mean Temperature; T. Max: Maximum temperature; T. Min: Minimum temperature; SH: Sunshine hours

Table 5: General question on rice cultivation in district (to be filled by the cooperator in consultation with the officials from state department of agriculture)

Danamatana	Districts				
Parameters	Thane	Raigad	Palghar		
Total area under HYVs (ha)	55477.5 ha	94403.00 ha	79177.5 ha		
Most prevalent HYVs in the district	YSR, Jordar, Karjat-3, Rupali, Karjat-2, 7, MTU- 1010, Daptari 125, Shabari, Spriha 911, Krushidhan Komal- 101, Vaishnavi, Trupti, Avani, Soubhagya, Devaki, Shubhangi, Suprim Sona, Ankur Silky-277, Om 125, Daptari-100, Jyotika	YSR, Jordar, MTU 1010, Suvarna, Vaishnavi, , Sonal, NPH 256, Awani, Kranti, Trupti, Rupali, Jyotika, Chintu, Suprim Sona, Kanchan, Kuber, Radha, Jaya, Prasanna, Komal 101, Karjat-2, 3, 5, 7, and Gangotri.	Jyotika, Poonam, Suma, Sundar, Sonam, Jordar, Masuri, Suvarna, Karjat 3, Ratnagiri -5, MTU-1010, Ankur , Sonam, Rupali, Komal 101, Vada kolam, Laxmi, Silky 277, Shatayu, YSR, Daptari 100		
Total area under rice hybrids	1722.5 ha	170.00 ha	678.5 ha		
Most prevalent rice hybrids in the district	Arize 6444, 3434, Upaj, Loknath, Ankur 7434, Mahyco 6129, Gorakhnath	Sahyadri 2, Sahyadri 3, Gorakhnath, Lokhnath 522.	Ankur 7042, Suruchi, Arize 6129, Upaj		
Total area under basmati in the district	Nil	Nil	Nil		
Most prevalent basmati	Nil	Nil	Nil		
Whether farmers are using any heavy equipments like transplanter/combine harvester	No	Yes, use transplanter and power tiller operated harvester.	Used Power tiller opareated harvester. Small Thresher.		
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	No	No	Nil		
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Guidence on integrated pest, disease and weed management and mechanization in rice cultivation. Different methods of rice cultivation.	Different methods of rice cultivation, INM in rice IPM in rice and mechanization in rice cultivation	Different methods of Rice cultivation, IPDM, INM and mechanization in rice cultivation.		
What are the general problems in rice cultivation in the district?	Non-availability of labour and High wages of the labour. Lack of irrigation facilities.	Non availability and high weges of the labour.	Due to small land holding, farmers needs low cost mechanization.		
Please provide any farmers association in the district	Farmer's groups registered under ATMA and "Agricultural Tools Bank" Association.	Co-operative Rice Seed Production Society, Vadap, Karjat Shetkari Vikas Sanstha, Mahad	Farmer's groups registered under ATMA.		
Whether availability of agricultural labours is sufficient?	No.	No	Non availability and High wages of the labour.		
Whether there is any marketing problem of the produce?	Yes	Yes.	Lack of marketing facilities.		
Any major irrigation/power generation project in the district	Small Irrigation projects-16	Pathas, Kal, Rajnala, Hetawane irrigation projets	Bhatsa, Surya and Wandri irrigation projects in the district.		
Any soil testing program undertaken?	Yes. Soil Health Improvement Programme.	Yes. Soil Health Improvement Programme.	Yes. Soil Health Improvement Programme.		
Any farmers' training program was organized by the state department of Ag/University	Integrated Rice Improvement Programme and demostations.	Integrated Rice Improvement Programme and demostations.	Integrated Rice Improvement Programme and demostations.		

Parameters	Districts			
	Ratnagiri	Sindhudurg		
Total area under HYVs (ha)	64967.5 ha	55530 ha		
Most prevalent HYVs in the district	Jaya, Suvarna, Karjat-2, Sonam, Pooja, Komal 101, Green gold mohini, Shriram, Trupti.	Jaya, Masuri, Suvarna, Karjat – 3, Karjat-2, Sonam, Rupali, Komal – 101, Silky – 277, Ratnagiri 1, Ratnagiri 24, Jai Shriram, YSR, Jordar, Shubhangi.		
Total area under rice hybrids	2728.5 ha	210 ha		
Most prevalent rice hybrids in the district	Sahyadri, Arise- 6444, Arize 522	Sahyadri-1, Buyer – 6444, Ankur- 7434, Loknath – 509.		
Total area under basmati in the district	Nil	Nil		
Most prevalent basmati	Nil	Nil		
Whether farmers are using any heavy equipments like transplanter/combine harvester	Nil	No		
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	Nil	No		
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Different methods of rice cultivation, INM, IPM of rice, chemical weed management and Machanization.	Mechanization in harvesting, threshing, drumseeding and INM, IPDM in rice cultivation.		
What are the general problems in rice cultivation in the district?	Shortage of labour, limitation for mechanization due to geographical situation and high labour wages.	Labour shortage, limitation on mechanization due to small land holding		
Please provide any farmers association in the district	Nil	Shetkari Kharedi Vikri Sangha-8, Shraddha Swayam Sahayata Bachatagat		
Whether availability of agricultural 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	Natu nagar Irrigation Project and Ratnagiri Power Company	Talamba, Aruna Tilari, Sarmala and Mahmmad wadi Irrigation projects		
Any soil testing program undertaken?	Yes. Soil Health Improvement Programme.	Yes. Soil Health Improvement Programme.		
Any farmers' training program was organized by the state department of Agriculture/University	Integrated Rice Improvement Programme and field demostations.	Integrated Rice Improvement Programme and demostations.		

Table 5-Contd..: General question on rice cultivation in district (to be filled by the cooperator in consultation with the officials from state department of agriculture)

Variaty/hybrids	Districts/area (ha)						
variety/liybrius	Thane	Raigad	Palghar	Ratnagiri	Sindhudurg		
HYVs/Improved							
Jaya	3243.00	10150.43	1321.75		2250.00		
YSR	3257.00	1250.35	1131.50	1199.75			
Mahsuri			986.25		2375.00		
Ratna					1000.00		
Jai Shreeram					550.00		
Ankur Rupali	1378.98	1260.00	1889.20	1236.50	425.00		
Ankur Sonam			538.00	535.00	825.00		
Ankur Sadhana				290.00			
Karjat – 7	1316.00	1750.00			325.00		
Karjat-2		755.28		986.00	2250.00		
Karjat – 3	1714.00	1070.50	1120.35	763.00	375.00		
Karjat-5		640.00					
Karjat 184					312.50		
Daptari 100			439.75				
Daptari-125	1020.00						
K. Komal- 101	599.00	1635.00	768.75	924.50	750.00		
Shabari	896.50			,			
MTU-1010	1221.00	975.00	1082.50				
Spriha 911	786.65	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	1002100				
Jordar	2912.00	1625.00	1756.50				
Vaishnavi	411 75	375.00	1100100				
Pranali	359.00	575100					
Vada Kolam	308.25						
Suvarna	300.25	3680.40	663.00		875.00		
Trunti		1215.20	005.00	488 50	075.00		
Sonal		460.00		100.50			
Ivotika		635.35	383 75				
Chintu		565.00	565.75				
Suprim Sona		524 40					
Kanchan		540.00					
Kuber		250.00					
Radha		375.00					
Prasanna		300.00		459.25			
NPH 256		620.00		437.23			
Awani		530.00					
Sagar		280.00					
Kranti		270.00					
Rianu Ratnagiri 1		270.00		638 50	750.00		
Rathagiri 5			357 50	038.30	730.00		
Rathagiri 24			557.50	568 75	630.00		
Vada Kolam			1870 75	508.75	030.00		
Vaua Kolalli Lovmi			1870.75				
Silley 277			611 75		350.00		
Shotovu			340.75		330.00		
Doonom			12/2 2	052.00	<u> </u>		
1 UUIIAIII Sumo			1243.2	732.00	<u> </u>		
Sullia			1340.73				
Sulluar			008.73	1			

Table 6: Variety/hybrid	wise area coverage	(ha) in different	districts of Maharashtra
during 2020			

Voriota /hashaida	Districts/area (ha)						
variety/hydrids	Thane	Raigad	Palghar	Ratnagiri	Sindhudurg		
Sonam			766.50	738.50			
Harshita			3.6.25				
Sarathi				657.00			
Mohini				549.50			
Indrayani					312.50		
Others	34765.12	16172.50	58802.25	56539.25	41175.00		
Hybrids							
Arize 6444	661.8			42.50	50.00		
3434	212.00						
Upaj	88.75		23.50				
Loknath	99.10						
Ankur 7434	239.00				40.00		
Ankur 7042			34.28				
Arize 6129	80.75		28.82				
Gorakhnath	92.85	88.24					
Loknath 509	29.41				45.00		
Sahyadri				32.50			
Sahyadri-1					75.00		
Sahyadri 2		5.88					
Sahyadri 3		7.35					
Suruchi			44.17				
Others	248.10	39.12	547.73	95.00			

Table 7: General informations

Parameters	Thane	Raigad	Palghar	Ratnagiri	Sindhudurg
# of talukas/blocks	5	10	4	8	7
covered					
# of villages surveyed	13	31	13	21	22
# of farmers interviewed	17	33	16	24	31
Field ecosystem	RL (100%)	RL (100%)	RL (100%)) RL (100%)	RL (100%)
Weather conditions	Weather conditions were moderately favourable in the region.				
during cropping season	However, hea	vy rainfall a	t the harves	ting stage cau	sed lodging of
	standing crop	and in situ g	ermination a	nd this resulte	d in significant
	yield loss				
Crop stage when survey	Maturity	Maturity &	Maturity	Maturity	Maturity
was made		Booting			
Crop rotations	Most common	n cropping p	attern in the	e region is ri	ce-fallow, rice-
	pulses, rice-be	an and rice-v	egetables. Th	ne farming syst	tems of Konkan
	were also included goat farming in Palghar district and fish farming in				
	Raigad district. Pulses after Kharif rice on residual moisture is a				
	common pract	ice in Palgha	, Raigad, Th	ane and Ratnag	giri districts.

RL: Rainfed lowland

A. Cropping system and rice yield: The details of the villages surveyed and number of farmers contacted are presented in Table 7. Rice is grown as a rain fed crop due to heavy rains in the region. The most common cropping pattern adopted by farmers in the region is Rice-Fallow, Rice-Pulses and Rice-Vegetables. The farming systems of *Konkan* was also including goat farming in Palghar district and fish farming in Raigad district. Pulses after *Kharif* rice on residual moisture is a common practice in Palghar, Raigad, Thane and Ratnagiri districts. Most of the farmers in Konkan region are having small land holding. The

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average seed replacement ratio in the region during Kharif 2020 was 46% (according to Maharashtra state agriculture department). 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 purchased seed every season, from private agro service centers and private seed companies. Average rice yield was low in the region and ranged from 1700-3000 kg/ha (Table 8).

Varieties	Yield (kg/ha)					Remarks
v ul lettes	Thane	Raigad	Palghar	Ratnagiri	Sindhudurg	
YSR	1900-200	1900-2100		8	8	Rice yield in many
Komal	1700	2100-2800		2100-2800	1900-2200	places in most of
Jaya		1800-3200		2500	2000-2500	the surveyed
IR 8		2300				districts was
Mahsuri	2000			2000	1800-2300	significantly low
Chintu					2200	due to sub-normal
Karjat-2	2700			2800	2100-2800	dose of fertilizers,
Karjat-184			2000			uneven rainfall and
KJT-3, KJT-5			2100-3000			heavy rainfall
KJT-7		2200-2800				during maturity
Rupali					1800-2200	/harvesting stage
Pavan Putra					2250	Some of the
Om Shriram	1800			2800		formers are still
Daptari	1800					arowing local rice
RP-4-14				2100-2300		variaties for local
Sonam, Sairam		2200			1700	preference
Poonam			1500			preference
Suvarna		2200	2000	2200-2800	2000-2100	
Shubhangi				1500-2000	1900-2100	
Sadhana				1500		
Jordar	1700-2400	1800-2200				
Avani		2200				
Gujarat-11	1900	2200	1500-1600	1800-2200		
Laxmi			1200			
Vikram				1800-1900		
Ratnagiri-24			1900			
Ratnagiri 6				2000		
Sona			2000			
Jyothi					2000-2200	
Arize 6444					2080	
Goraknath		2100	2600		1800	
Walai					1500-2100	

Table 8: Average yields of different rice varieties as reported by thecooperators/farmers

		8							
Parameters	Thane	Raigad	Palghar	Ratnagiri	Sindhudurg				
Planting time	2 nd -4 th Week	$2^{nd}-4^{th}$	2 nd -3 rd Week	2 nd -3 rd Week	1 st -3 rd Week of				
_	of July	Week of	of July	of July	July				
		July	-	_	-				
Seed rate	40-70 kg/ha	30-50 kg/ha	40-55 kg/ha	25-60 kg/ha	30-55 kg/ha				
Seed treatment	Yes (94%);	Yes (75.7%	Yes (81%	Yes (66.6%	Yes (90% only)				
(% farmers	few	only)	only)	only)					
adopted)	purchased								
	treated seeds								
Chemicals used	Thiram (2.5	Thiram (2.5	Thiram (2.5-	Thiram (2.5-	Thiram (2.5-3				
for seed	g/kg seeds);	g/kg seeds)	3 g/kg	3 g/kg seeds)	g/kg)				
treatment	Bavistin (1		seeds)						
	g/kg)								
Organic manure	Yes (70%	Yes (12%	Yes (31%	Yes (50 %);	Yes (42%); FYM				
in nursery (%	only); FYM	only); FYM	only); FYM	FYM					
farmers									
adopted)									
Inorganic	Yes (29.4%	Yes (69.7%	Yes (31%	Yes (58%	Yes (45%				
manure in	farmers);	farmers);	farmers);	farmers);	farmers);				
nursery (%	Urea @ 1	Urea @ 1	Urea @ 05-	Urea @ 1	Urea @ 1 kg/R				
farmers	kg/R	kg/R	1 kg/R	kg/R					
adopted)					1R=1000 sq. ft				
	1R=1000 sq.	1R=1000	1R=1000 sq.	1R=1000 sq.					
	ft	sq. ft	ft	ft					
Weed	Most common practice for weed management in nursery in Palghar, Thane,								
management in	Raigad, Ratnagiri and Sindhudurg (partly) district is burning of nursery area								
nursery	with organic waste referred as 'Rab'.								

Table 9: Details of nursery management

B. Nursery and main field Management: In general, farmers undertook sowing in the month of June and planting was done during July (Table 9). Average seed rate used by the farmers ranged from 30-70 kg/ha. Abour 66-94% farmers in different districts told that they treated the seeds with thiram (2.5-3 g/kg) or Bavistin (1 g/kg). FYM was applied in the nursery by 12-70% farmers in different districts. About 46% farmers told that they applied urea in the nursery (@ 0.5-1 kg/R). Most common practice for weed management in nursery in Palghar, Thane, Raigad, Ratnagiri and Sindhudurg (partly) district is burning of nursery area with organic waste referred as 'Rab'. Farmers used 30 to 35 days old seedlings for transplanting. This year monsoon started in time and farmers completed their transplanting in time. Transplanting was random and average plant population was 30-35 hills/m². 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'. Fertilizers were applied @ 22-152.5 kg N/ha, 7.5-66 kg P₂O₅/ha and 7.5-66 kg K₂O/ha. None of the farmers contacted applied zinc sulphate. About 43% farmers applied FYM depending on availability (Table 10). Farmers used different complex fertilizers like suphala (15:15:15), 18:18:18 and others. Few farmers in Palghar also applied poultry manure and few farmers in Sindhudurg applied Jivamrut for better growth.

Details	Districts								
Details	There Deized Deleher Detrestini Sindhada				Sindhudung	Kelliai K5			
DI di	Inane Kalgad Palgnar Katnagiri Sindhudurg								
Planting	Farmers used 30 to 35 days old seedlings for transplanting. This year								
method	monsoon started in time and farmers completed their transplanting in								
	time. Transplanting was random and average plant population was								
	30-35 hills/m ² . In saline soils of Raigad district, farmers do not								
	transplant the rice seedling but uprooted seedlings are uniformly								
	scattered in the puddle fields locally called as 'Awatni'.								
Total N	22-122	53.5-122	30-69 kg/ha	38-152.5	30.5-122	Urea;			
applied	kg/ha	kg/ha		kg/ha	kg/ha	15:15:15			
Total	15-45 kg/ha	7.5-66 kg/ha	7.5-33 kg/ha	15-45 kg/ha	7.5-30 kg/ha	18:18:18			
P_2O_5	_	_	_	-	_	Few			
applied						farmers			
Total	15-45 kg/ha	7.5-66 kg/ha	7.5-33 kg/ha	15-45 kg/ha	7.5-30 kg/ha	applied			
K_2O	C	C	C C	C		only urea;			
applied						FYM app-			
	Nil	Nil	Nil	Nil	Nil	lication by			
ZnSO ₄						progressive			
applied						farmers			
Organic	Yes (64.5%)	Yes (18.2%)	Yes (25%)	Yes (50%)	Yes (58%)				
fertilizers	FYM (1-2	FYM (1-5	FYM (1-2	FYM (1-4	FYM (1-7				
applied	t/ha)	t/ha)	t/ha)	t/ha)	t/ha)				
uppnea	() Hu)	() Hu)	Few applied	u may	() 11(4)				
			noultry						
			manure (200						
			k_{α}/h_{a}						
Growth			Kg/IIa)		livamrut				
factors					(few farmers)				
applied					(iew farmers)				
appneu									

Table 10: Details of main field management

C. Weeds and their Management: Overall, intensity of weeds was low to medium. The details of different weeds recorded in different districts are presented in Table 11. For managing weeds in the nursery, farmers followed a local method, called *Rab*. None of the farmers contacted applied any herbicides and all of them followed 1-2 hand weeding for managing the weed problem.

D. Specific needs of farmers:

- > Farmers need all inputs on subsidized rate as paddy cultivation is not profitable.
- > Farmers need good market price for their produce.
- > Farmers want irrigation facilities or finance for developing irrigation facilities with electricity.
- > Farmers need training on integrated crop management.
- Farmers need low cost mechanization suitable for Konkan region to overcome labour problem.
| Details | | Remarks | | | | |
|----------------|--------------|---------------|---------------|---------------|------------------|-------------|
| | Thane | Raigad | Palghar | Ratnagiri | Sindhudurg | |
| Weed intensity | Low | Medium to | Low to | Low | Low to | |
| | toMedium | high | medium | tomedium | medium | |
| Names of the | Fimbristylis | miliacea, I | lschaene glo | bosa, Cyper | rus dufformis, | Weeds |
| weeds | Cyperus ro | tundus, Dig | gitaria setig | era (Indian | Crab grass), | were |
| | Echinochlod | a colona, E | chinochloa d | crusgalli, El | eusine indica, | common in |
| | Celosia arg | entea, Ludw | vigia octoval | vis, Alternar | nthera sessilis, | most of the |
| | Ichaemum | rugosum, | Eragostis 1 | najor, Thei | meda cialita, | fields |
| | Digitaria sa | nguinalis, C | ynodon dacty | lon and Mim | osa pudica. | surveyed |
| Weedicides | Nil; Out of | 131 farmers | contacted, n | one used we | edicide for the | |
| used | managemen | t of weeds. A | All the farme | rs contacted | practiced only | |
| | hand weeding | ng (1-2); non | e of them use | ed any herbic | vides. | |
| Percentage of | Nil | Nil | Nil | Nil | Nil | |
| farmers | | | | | | |
| applied | | | | | | |
| herbicides | | | | | | |
| Wild/weedy | Nil | Nil | Nil | Nil | Nil | |
| rice incidence | | | | | | |

 Table 11: Weeds and weed management

E. Input use: Most of the farmers prepared their land by own plough or hired Power Tiller/Tractor. Only few progressive farmers were having their own Power Tiller, Tractor and Harvester. In Thane and Palghar districts farmer has formed some "Farmers Agricultural Machinery and Tool Bank" to overcome labour problem in the district with support of Zilla-parishad. The average seed replacement ratio in the region during Kharif 2020 was 46% (according to Maharashtra state agriculture department) (Table 12). 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 purchased seeds every season, from private agro service centers and private seed companies. River water, canal and shallow tube wells were the main sources of irrigation. About 40% farmers told that there was scarcity of irrigation water and irrigation facilities. About 70% farmers told that fertilizers and pesticides were available in time and about 75% farmers told that they were satisfied with their quality. In addition to their own decisions, farmers got advices from officials of state department of agriculture and university and also from private dealers.

Details	Districts									
	Thane	Raigad	Palghar	Ratnagiri	Sindhudurg					
Implements used	Most of the far	mers prepared	or hired Power							
	Tiller/Tractor.	Tiller/Tractor. Only few progressive farmers were having their own								
	Power Tiller,	Fractor and H	larvester. In 7	Thane and Pa	lghar districts					
	farmer has for	med some "F	armers Agricu	ultural Machir	nery and Tool					
	Bank" to overc	ome labour pr	oblem in the d	listrict with su	pport of Zilla-					
	parishad.									
Seed replacement	The average see	ed replacement	t ratio in the re	gion during K	harif 2020					
rate in 2019	was 46% (accor	rding to Mahai	ashtra state ag	riculture depa	rtment).					
Source of seeds	Some farmers u	used their own	seed especiall	y of local vari	eties. Seeds of					
	improved varie	ties are supplie	ed by Governn	nent agencies	viz. Panchayat					
	Samittee, Zill	a Parishad,	Agricultural	Department,	Agricultural					
	University, Res	earch Stations	etc. Most of	the farmers pu	irchased seeds					
	every season,	from private	agro service	centers and	private seed					
~	companies.			<u></u>	<u> </u>					
Source of irrigation	River water	River water	River water	Shallow	Shallow tube					
	Shallow tube	Canal,	Canal	tube wells,	wells, canal,					
	wells	shallow tube		canal	river water					
a a	T T (7 00)	wells		T T (110)						
Scarcity of	Yes (53%	Yes (6%	Yes (31%	Yes (41%	Yes (64%					
irrigation water	farmers)	farmers)	farmers)	farmers)	farmers)					
Availability of	Available	Available	Available	Available	Available					
tertilizers/pesticides	(47%)	(94%)	(100%)	(62.5%)	(48%)					
Quality of fertile-	Yes (47%)	Yes (97%)	Yes (100%)	Yes (71%)	Yes (61%)					
zers/pesticides	<u> </u>		0.1.1	<u> </u>	<u> </u>					
Advisors to the	Own decisions	Own	Own deci-	Own deci-	Own decisions					
farmers	(100%)	(100%)	sions (25%)	$\frac{1}{2} = \frac{1}{2} = \frac{1}$	(100%)					
	State dept	(100%) State dent	(31%)	(25%)	State dept					
	(30%)	(100%)	(5170) State dept	(2570) State dept	(35%)					
	University (6%)	University	(62.5%)	(46%)	University					
	· J (- · · · J	(48%)	University	University	(16%)					
			(6%)	(21%)						

Table 12: Details of inputs used

F. Biotic stress and their management:

The details of occurrence of diseases and insect pests are presented in Table 13. Among the various diseases, incidence of leaf blast was very low in Palghar, Thane and Raigad and was moderate to severe in Ratnagiri and Sindhudurg district. The incidence of bacterial blight disease was found severe in Balegaon village of Murbad tehsil of Thane district and most of the fields were observed infected with bacterial leaf blight disease particularly on varieties viz., Gangotri, YSR, Jordar, Komal in village Kandalepada, Masad, Shirki chal, Vadhav and Vashi of Pen tehsil and Mulgaon and Vaijnath villages in karjat tehsil also suffered from bacterial leaf blight disease. The bacterial leaf blight was severe in some villages of Karjat, Pen, Panvel and Uran block. The intensity of other diseases was low to moderate. Rice crop was severely damaged by stem borer in Raigad, Thane and Palghar districts of Konkan region. Moderate incidence of leaf folder was also noticed in Raigad, Thane and Palghar districts. Intensity of other insect pests was low. None of the farmers contacted applied any

remedial measures against diseases. However, most of the farmers followed fungicidal seed treatment. Few farmers of Thane and Raigad district used granular insecticides in nursery and main field for control of crabs.

Table 13: Prevale	ence of diseases ar	nd insect pests in Kor	nkan region of Maharashtra
during Kharif' 202	20		

	Diseases								
District	Bl	ShBl GD		FS	ShR	BLB			
Thane	Т	-	L	Т	М	M-S			
Raigad	Т	Т	L (5%)	Т	М	M-S (5- 40%)			
Palghar	Т	-	L	Т	L-M (3- 22%)	L-M (10- 12%)			
Ratnagiri	М	М	L-S (8-50%)	Т	М	Т			
Sindhudurg	M-S (2-35%)	L (2-3%)	L	T (1-2%)	L (2- 5%)	-			

There was minor incidence of udbatta disease in Sindhudurg district

District	Insect pests									
District	SB	LF	CW	BPH	AW	BB	CRB			
Thane	S	М	-	-	-	-	L			
Raigad	S	М	L (8-10%)	L (8-10%)	-	-	L			
Palghar	S	М	Т	L (8-10%)	-	L	L			
Ratnagiri	Μ	L (4-5%)	Т	-	L (5-10%)	L	L			
Sindhudurg	Μ	L (4-5%)	Т	-	-	L	L			

There was minor incidence of gundhi bug (2-10%) in Palghar, Ratnagiri and Sindhudurg districts; BB: Blue beetle

Table 14: Details of pest management

Details	Districts	Districts							
	Thane	Palghar	Raigad	Ratnagiri	Sindhudurg				
% age farmers	NA	NA	NA	NA	NA				
adopting plant									
protection									
Names of	NA	NA	NA	NA	NA				
pesticides									
# of pesticide	NA	NA	NA	NA	NA				
sprays									
Mixing of	Nil	Nil	Nil	Nil	Nil				
pesticides before									
application									

Punjab-2020-2021(Ludhiana)

Districts surveyed: Ludhiana, Gurdaspur, Pathankot, Sangrur, Patiala, Ropar, Nawanshahar (SBS Nagar), Jallandhar, Kapurthala, Hoshiarpur, Bathinda, Muktsar and Faridkot

Districts	Villages surveyed
Ludhiana	Parjian, Falewal, Chhapar, Urna, Sehjo Majra, Manewal and Balliyewal
Gurdaspur	Abul Khair, Wadde Mattam, Bariar, Kahnuwan, Bamijal, Naushehra
	Bahadur, Athwal and Pahra
Pathankot	Sainni Manhas, Kattaruchak, Karouli, Ghiala, Chak Manhasan, Chak
	Bhatian and Andoi (Padhara)
Sangrur	Kheri, Dehar, Banhora, Khetla, Pasaur, Nayamatpur and Malarkotla
Patiala	Badshahpur, Harchand Pura and Nabha
Ropar	Ajouli, Bhanupli, Sajmour and Shurewal
Nawanshahar	Samudra, Jadla and Bhartakalar
Jallandhar	Budhanwal, Jamsher Khas, Udhowal, Bulanda and Jallowal
Kapurthala	-
Hoshiarpur	KVK-Hoshiarpur, Attowal, Chohal, Baruhi and Datarpur
Bathinda	Rampuraphool and Sidhana
Muktsar	-
Faridkot	-

 Table 1: Details of survey

Table 2: Widely prevalent rice varieties

Districts	Varieites
Ludhiana	PR 121, Pusa 44, Pusa Bas. 1121,
Gurdaspur	Pusa Bas. 1121, PR 121
Pathankot	Pusa Bas. 1121, Pusa Bas. 1718,
Sangrur	Pusa Bas. 1121, Pusa 44, Pusa Bas. 1401, Peeli Pusa, Pusa 1509
Patiala	Pusa Bas. 1401, PR 126, PUSA 44, Pusa Bas. 1121, Pusa Bas. 1509, PR 128
Ropar	HKR 47, PR 121, PR 126, Hybrid, HKR 126, PR 128
Nawanshahar	Pusa Bas. 1121, PR 121
Jallandhar	Pusa 44, Pusa Bas. 1121, Pusa Bas. 1718, PR 126, Peeli Pusa
Kapurthala	Pusa Bas. 1121, Pusa Bas. 1718
Hoshiarpur	PR 121,
Bathinda	Pusa Basmati 1121, Pusa Bas. 1509
Muktsar	Pusa Bas. 1121
Faridkot	Pusa Bas.1121, Pusa Bas.1718

Production oriented survey was conducted in 13 districts of Punjab viz., Ludhiana, Gurdaspur, Pathankot, Sangrur, Patiala, Ropar, Nawanshahar (SBS Nagar), Jallandhar, Kapurthala, Hoshiarpur, Bathinda, Muktsar and Faridkot when the crops were in tillering stage. During *Kharif* 2020 in Punjab, paddy was grown on an area of around 28.6 lakh hectares. Non-Basmati and Basmati varieties occupied around 78 and 22 per cent area, respectively. Among the non-Basmati group, PR 121 was the most popular variety and occupied about 22 per cent area. Other predominant varieties were Pusa 44, PR 126, PR 124, PR 122 and PR 114. On the other hand, among the Basmati group, Pusa Basmati 1401 and Pusa the most predominant variety followed by Pusa Basmati 1509, Pusa Basmati 1401 and Pusa

Basmati 1718. The details of the varieties cultivated by different farmers are presented in Table 2.

Table	3:	General	inforn	nations

Parameters	Districts						
	Ludhiana	Gurdaspur	Pathankot				
# of villages surveyed	7	8	7				
# of farmers interviewed	7	11	9				
Field ecosystem	Irrigated	Irrigated	Irrigated				
Weather conditions	Normal	Normal	Normal				
during cropping season							
Crop stage when survey	Tillering	Tillering	Tillering				
was made							
Main Crop rotations	Rice-wheat (main)	Rice-Wheat	Rice-Wheat				
	Rice-potato-wheat (few)						

Parameters	Districts							
	Sangrur &	Ropar &	Jallandar,	Bathinda,				
	Patiala	Nawanshahar	Kapurthala &	Muktsar &				
			Hoshiarpur	Faridkot				
# of villages surveyed	10	7	11	4				
# of farmers interviewed	14	8	14	4				
Field ecosystem	Irrigated	Irrigated	Irrigated	Irrigated				
Weather conditions	Normal	Normal	Normal	Normal				
during cropping season								
Crop stage when survey	Tillering	Tillering	Tillering	Tillering				
was made								
Main Crop rotations	Rice-Wheat	Rice-Wheat	Rice-wheat (main)	Rice-Wheat				
			Rice-potato-wheat					
			(few)					

A. Cropping system and rice yield: During 2020, the predominant crop rotation remained the rice-wheat system. Very few farmers adopted rice-potato-wheat crop rotation (Table 3). Average rice yield among the high yielding varieties ranged from 6500-8400 kg/ha while in case of basmati varieties, it ranged from 4500-5600 kg/ha (Table 4).

Table	4:	Average	yields	of	different	rice	varieties	as	reported	by	the	cooperators
farmer	S											

Varieties	Yield (kg/ha)				
	Ludhiana	Gurdaspur	Pathankot	Sangrur & Patiala	
PR121	7500-7700	7600-7800			
Pusa 44	8000-8400			8000-8500	
Peeli Pusa				8200	
PR 126				7700	
PR 128				8000	
PB 1121	4700	4700-4800	4600-4800	4700-4800	
PB 1718			4800		
PB 1401				5500-5600	
PB 1509				4600-4700	

Varieties	Yield (kg/ha)			
	Ropar &	Jallandar,	Bathinda, Muktsar	
	Nawanshahar	Kapurthala &	& Faridkot	
		Hoshiarpur		
PR121	7500-7700	7500-7700		
Pusa 44		7800-8000		
Peeli Pusa		8000		
PR 126	7600-7800	7700-7800		
PR 128	8000			
HKR 47	6500			
HKR 1256	6500			
PB 1121	4600-4800	4500-4700	4500-4700	
PB 1718		4700-4900	4900	
PB 1509			5000	

B. Nursery and main field Management: Average seed rate was 12-20 kg/ha. About 37-77% farmers in different districts followed seed treatment. Seed treatment was mainly done with carbendazim. Most of the farmers applied farm yard manure in the nursery and also applied chemical fertilizers like urea, DAP and zinc sulphate. Most of the HYVs were planted between 2-3rd week of June while basmati varieties were planted during 1st to 3rd week of July (Table 5). Planting was random and proper plant population was not maintained. In most of the cases, planting density was inadequate i.e. it varied from 18-22 plants/ m² as against recommended density of 33 plants/ m². Mostly farmers transplanted 30-40 days old nursery. An area of about 5.04 lakh ha was under direct seeded rice (DSR), whereas rest was under puddled transplanted rice (PTR). Majority of farmers did direct seeding during May 15 to June 10. Most of the surveyed farmers used over dose of nitrogen but many farmers skipped the application of P₂O₅ and K₂O in paddy crop, owing to higher status of these nutrients in their soils (Table 6). Application of Zinc sulphate (either 21 or 33%) is practiced by farmers but they used under dose of Zinc. Some farmers ploughed down DSR in early stages on account of poor establishment due to rainfall during germination.

Parameters	Districts			
	Ludhiana	Gurdaspur	Pathankot	
Planting time	HYVs: 2-3 week of	HYVs: 3 rd week of	Basmati: 2 nd -3 rd week of	
-	June; Basmati: 2 nd week	June; Basmati: 1 st to 3 rd	July	
	of July	week of July		
Seed rate	13-20 kg/ha	11.5-20 kg/ha	12-18 kg/ha	
Seed treatment (%	Yes (57%)	Yes (45%)	Yes (~ 77%)	
farmers adopted)				
Chemicals used for	Carbendazim	Carbendazim	Carbendazim	
seed treatment				
Organic manure in	Yes (100%)	Yes (100%)	Yes (100%)	
nursery (% farmers	FYM	FYM	FYM	
adopted)				
Inorganic manure in	Yes (100%)	Yes (100%)	Yes (100%)	
nursery (% farmers	Urea (50-60 kg/acre)	Urea (50-60 kg/acre)	Urea (50-60 kg/acre);	
adopted)	DAP (25 kg/acre)	DAP (25 kg/acre)	DAP (25 kg/acre)	
	ZnSO4 (12.5-15 kg/ha)	ZnSO4 (12.5-25 kg/ha)	ZnSO4 (12.5-20 kg/ha)	

 Table 5: Details of nursery management

Parameters	Districts		
	Sangrur & Patiala	Ropar & Nawanshahar	
Planting time	HYVs: 2-3 week of June;	HYVs: 2-4 week of June;	
	Basmati: 2-3 week of July	Basmati: 2-3 week of July	
Seed rate	15-20 kg/ha	12-20 kg/ha	
Seed treatment (% farmers adopted)	Yes (50%)	Yes (37%)	
Chemicals used for seed treatment	Carbendazim	Carbendazim	
Organic manure in nursery (%	Yes (100%)	Yes (100%)	
farmers adopted)	FYM	FYM	
Inorganic manure in nursery (%	Yes (100%); Urea (50-60	Yes (100%); Urea (50-60	
farmers adopted)	kg/acre); DAP (25 kg/acre)	kg/acre); DAP (25 kg/acre)	
	ZnSO4 (12.5-25 kg/ha)	ZnSO4 (12.5-20 kg/ha)	

Parameters	Districts			
	Jallandar, Kapurthala &	Bathinda, Muktsar &		
	Hoshiarpur	Faridkot		
Planting time	HYVs: 2-3 week of June;	Basmati: 2-3 week of July		
	Basmati: 1-2 week of July			
Seed rate	12-20 kg/ha	16-19 kg/ha		
Seed treatment (% farmers adopted)	Yes (71%)	Yes (50%)		
Chemicals used for seed treatment	Carbendazim	Carbendazim		
Organic manure in nursery (%	Yes (100%)	Yes (100%)		
farmers adopted)	FYM	FYM		
Inorganic manure in nursery (%	Yes (100%); Urea (50-60	Yes (100%); Urea (50-60		
farmers adopted)	kg/acre); DAP (25 kg/acre)	kg/acre); DAP (25 kg/acre)		
	ZnSO4 (12.5-20 kg/ha)	ZnSO4 (12.5-15 kg/ha)		

Table 6: Details of main field management

Details		Remarks		
	Ludhiana	Gurdaspur	Pathankot	
Planting method		Random transplanting		
Total N applied (Kg/ha)	80-170	90-170	60-80	Urea
Total P ₂ O ₅ applied	20 (~15% farmers)	30-50 (~ 45%	20 (~ 22% farmers)	DAP
(Kg/ha)		farmers)		
Total K ₂ O applied (Kg/ha)	15-20 (~28%	20-30 (~28%	15-20 (~33%	MOP
	farmers)	farmers)	farmers)	
ZnSO ₄ applied (Kg/ha)	15-20	15-30 (~ 82%	10-15 (~ 44%	Zinc
	(~ 43% farmers)	farmers)	farmers)	sulphate
Organic fertilizers applied	NA	NA	NA	

Details	Districts				
	Sangrur &	Ropar &	Jallandar,	Bathinda,	rks
	Patiala	Nawanshahar	Kapurthala &	Muktsar &	
			Hoshiarpur	Faridkot	
Planting method		Random ti	ansplanting		
Total N applied	60-170	80-160	90-170	70-100	Urea
(Kg/ha)					
Total P ₂ O ₅ applied	20-25 (~21%	30-40 (~37%	20-50 (~28%	30 (~25%	DAP
(Kg/ha)	farmers)	farmers)	farmers)	farmers)	
Total K ₂ O applied	15-20 (~35%	20-30 (~75%	15-50 (~50%	20-25 (~50%	MOP
(Kg/ha)	farmers)	farmers)	farmers)	farmers)	
ZnSO ₄ applied	10-15	15-20	15-25	20-25	Zinc
(Kg/ha)	(~ 50% farmers)	(~ 37% farmers)	(~ 71% farmers)	(~ 100% farmers)	sulphate
Organic fertilizers	NA	NA	NA	NA	
applied					

Details		Remarks		
	Ludhiana	Gurdaspur	Pathankot	
Weed intensity	Low	Low	Low	Few
Names of the	Predominant weeds wer	e Echnochloa crus	galli and Leptochloa	farmers
weeds	chinensis, etc, in puddle	d transplanted rice	and <i>Eragrostis</i> spp.	adopted
	and Leptochloa chinens	ponding		
Weedicides used	Commonly used herbici	of water		
	ml/ha), pretilachlor (1.5	l/ha) and butachlo	or (2.5 l/ha)	for the
Percentage of	Yes (100%)	Yes (100%)	Yes (100%)	first 15
farmers applied				days of
herbicides				crop cycle
Wild rice	Nil	Nil	Nil	for weed
incidence				control

Table 7: Weeds and weed management

C. Weeds and their Management: Overall, intensity of weeds was low throughout Puniab. Predominant weeds were *Echnochloa crusgalli* and *Leptochloa chinensis*, etc. in puddled transplanted rice and *Eragrostis* spp. and *Leptochloa chinensis in* case of direct seeded rice. Most of the farmers applied herbicides were Bispvribac Sodium, pretilachlor and butachlor (Table 7). A small fraction of farmers did not use any weedicide but they adopted cultural method of weed control i.e. ponding of water for the first 15 days of crop cycle.

Table 7	contdd:	Weeds	and	weed	management
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Details		Remarks					
	Sangrur &	Ropar &	Jallandar,	Bathinda,			
	Patiala	Nawanshahar	Kapurthala &	Muktsar &			
			Hoshiarpur	Faridkot			
Weed intensity	Low	Low	Low	Low	Few		
Names of the	Predominant	weeds were Echn	ochloa crusgalli a	nd <i>Leptochloa</i>	farmers		
weeds	chinensis, etc	, in puddled trans	planted rice and E	Eragrostis spp.	adopted		
	and Leptochle	and Leptochloa chinensis in case of direct seeded rice					
Weedicides	Commonly us	sed herbicides we	re Bispyribac Sodi	ium (250	of water		
used	ml/ha), pretila	achlor (1.5 l/ha)	and butachlor (2.5	l/ha)	for the		
Percentage of	Yes (100%)	Yes (100%)	Yes (100%)	Yes (100%)	first 15		
farmers applied					days of		
herbicides					crop cycle		
Wild rice	Nil	Nil	Nil	Nil	for weed		
incidence					control		

Table 8: Details of inputs used

Details	Districts				
	Ludhiana	Gurdaspur	Pathankot		
Implements used	Tractor, disc harrow, c	ultivator, planker, comb	ined harvester		
Seed replacement rate	100%	100%	100%		
Source of irrigation	Deep tube well	Deep tube well	Deep tube well		
	(100%)	(100%)	(100%)		
Scarcity of irrigation	No (100%)	No (100%)	No (100%)		
water					
Availability of	Available (100%)	Available (100%)	Available (100%)		
fertilizers/ pesticides					
Quality of fertilizers/	Good (100%)	Good (100%)	Good (100%)		
pesticides					
Advisors to the	State Dept (100%)	State Dept (100%)	State Dept (100%)		
farmers	Univ Staff (100%)	Univ Staff (100%)	Univ Staff (100%)		

Details		Districts				
	Sangrur &	Ropar &	Jallandar,	Bathinda,		
	Patiala	Nawanshahar	Kapurthala &	Muktsar &		
			Hoshiarpur	Faridkot		
Implements used	Tractor, disc harr	ow, cultivator, pla	anker, combined h	arvester		
Seed replacement rate	100%	100%	100%	100%		
Source of irrigation	Deep tube well	Deep tube well	Deep tube well	Deep tube well		
	(100%)	(100%)	(100%)	(100%)		
Scarcity of irrigation	No (100%)	No (100%)	No (100%)	No (100%)		
water						
Availability of	Available	Available	Available	Available		
fertilizers/ pesticides	(100%)	(100%)	(100%)	(100%)		
Quality of fertilizers/	Good (100%)	Good (100%)	Good (100%)	Good (100%)		
pesticides						
Advisors to the	State Dept	State Dept	State Dept	State Dept		
farmers	(100%)	(100%)	(100%)	(100%)		
	Univ Staff	Univ Staff	Univ Staff	Univ Staff		
	(100%)	(100%)	(100%)	(100%)		

Table 8-contdd..: Details of inputs used

D. Input use: Many progressive farmers used implements like Tractor, disc harrow, cultivator, planker, combined harvester. Seed replacement rate was also very high (Table 8). Deep tube wells were the main sources of irrigation and electricity was the main source of power for different agricultural operations. Fertilizers and pesticides were readily available and farmers were also happy with the quality of fertilizers and pesticides. In addition to their own decisions, farmers received advices from officials of state department of agriculture, university and private dealers.

Districts	Diseases									
	NBI	BS	ShBl	KB	GD	Bak	BB			
Ludhiana	T (1%)		L (1-5%)			L (2%)	M (20%)			
Gurdaspur	T (1-2%)		L (1-10%)			L (1-5%)				
Pathankot		L (10%)	L (1-5%)			L (1-7%)				
Sangrur & Patiala	T (1-2%)		L (1-10%)			L-M (2-20%)	L-S (2-40%)			
Ropar &		L-M (5-	L (5%)	L (2-	L (2-	L (5-10%)				
Nawanshahar		20%)		3%)	3%)					
Jallandar, Kapurthala		L (1-	L-M (2-			L (1-6%)				
& Hoshiarpur		5%)	20%)							
Bathinda, Muktsar &					L (2%)	L (1-7%)				
Faridkot										

 Table 9: Prevalence of diseases and insect pests in Punjab during Kharif' 2020

Districts	Insect Pests							
	SB	LF	BPH	WBPH				
Ludhiana	T (1%)	L (2-3%)	L (3-5%)	T (1-2%)				
Gurdaspur	T (1-2%)	L (2-3%)	L (2-5%)	T (1-2%)				
Pathankot	T (1%)	T (1-2%)	L (1-4%)	T (1-2%)				
Sangrur & Patiala	L (1-3%)	L (2-5%)	L (3-7%)	L (1-3%)				
Ropar & Nawanshahar	T (1%)	T (1-2%)	L (2-5%)	L (1-3%)				
Jallandar, Kapurthala & Hoshiarpur	T (1-2%)	L (3-4%)	L (2-7%)	L (2-4%)				
Bathinda, Muktsar & Faridkot	T (1%)	T (1-2%)	L (1-3%)	T (1-2%)				

E. Biotic stress and their management: The overall incidence of rice diseases was low during the Kharif-2020. Low to moderate level of sheath blight was recorded on different rice varieties viz., Pusa 44, Peeli Pusa, PR 121, PR 126, PR 128 and Pusa Basmati 1121 in districts of Jalandhar, Hoshiarpur, SBS nagar, Ludhiana, Gurdaspur, Pathankot, Sangrur, Patiala and Bathinda. Low incidence of the disease was observed on PR126, PR 128, Pusa 44 and Rice Hybrid SAVA- 127 in Roopnagar, Jalandhar and Sangrur districts. Low to moderate incidence of the brown spot was recorded on varieties PR121, PR126, PR 114, Pusa 44, HKR 47 and Pusa Basmati 1121 from districts of Jalandhar, Hoshiarpur, Gurdaspur, Pathankot, Roopnagar, Patiala and Bathinda. Low incidence was recorded from some fields in Ludhiana, Jalandhar, SBS nagar, Hoshiarpur, Gurdaspur and Pathankot districts on varieties Pusa 44 and PR 121. Moderate to high incidence of bacterial blight was recorded from Ludhiana, Sangrur and Patiala districts on Pusa 44, Peeli Pusa, Pusa Basmati 1401 and Pusa Basmati 1509. Severe incidence of bacterial blight (up to 40%) was recorded on varieties like Pusa Basmati 1401, Pusa 44 and Pusa Basmati1509 in Khetla and Nayamatpur village of Sangrur and Badshahpur village of Patila (Table 9). In general, the damage (stem borer and leaf folder) and population (Plant hoppers) of rice was below economic threshold during Kharif '2020 crop season at most of the locations surveyed in Punjab. During last week of September 2020, 0-2.5% and 0-4.76% stem borer incidence was observed in villages Maanwala and Dhadogal of Sangrur district on long duration rice variety Peeli Pusa. Farmers used different pesticides for the management of different pests and diseases (Table 10).

Details	Districts										
	Ludhiana	Gurdas- pur	Pathankot	Sangrur & Patiala	Ropar & Nawan- shahar	Jallandar, Kapur- thala & Hoshi- arpur	Bathinda, Muktsar & Faridkot				
% age farmers adopting plant protection	NA	NA	NA	NA	NA	NA	NA				
Names of	Pesticides 1	ised: Farme	ers used Pac	lan-4G as g	granular ins	ecticide in	the 2 nd and				
pesticides	3 rd week of August. The other spray formulations used by farmers were: Fame, Quinalphos, Emamectin benzoate, chlorpyriphos. In mid and later crop growth stage farmers used tank mixture of insecticides and fungicides Nativo + Emamectin Benzoate + Osheen; Khaas (Profenophos 40% with Cypermethrin 4%) + Soloman (Beta cyfluthrin + Imidacloprid) + Nativo; Emamectin Benzoate + thiamethoxam+Fungicide; Virtako (thiamethoxam + chlorantraniliprole), Ampligo (chlorantraniliprole + lamda cyhalothrin cyhalothrin) + Actara+ Tarnsport; Ampligo+ Amistar Top + Chess) for the control of rice insect-pests and diseases										
# of pesticide	NA	NA	NA	NA	NA	NA	NA				
Mixing of pesticides before application	NA	NA	NA	NA	NA	NA	NA				

Table 10: Details	of pest	Management
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Telangana-1-2020-2021(Rajendranagar)

Districts surveyed: Rangareddy, Khammam, Warangal Rural, Kamareddy, Nizamabad, Sangareddy, Vikarabad, Suryapet, Nagarkurnool, Mahaboobnagar, Jagtial, Siricilla, Peddapalli and Nalgonda

District	Mandal	Villages				
Rangareddy	Shankarpally, Shamshabad,	Kondalkan, Kothwalguda, Nank Nagar,				
	Yacharam, Maheshwaram,	Gaddamallaiahgudem, Thatiparthi, Raviryala,				
	Kothur, Abdullapurmet,	Sheriguda Bhadrayapally, Jafarguda, Mukunoor,				
	Ibrahimpatnam	Rayapol, Yengalguda, Polkampally, Nagampally				
Khammam	Chintakani, Chintakani,	Nagiligonda, Chintakani, Narasimhapuram,				
	Kusumanchi, Chintakani,	Mallepally, Narasimhapuram, KVK Wyra, Wyra,				
	Thallada, Wyra, Thallada,	Kotha Venkatagiri, Vengannapeta, Thallamada,				
	Sattupally, Vemsoor	Marlapadu				
Warangal Rural	Sangem, Damera,	Krishna Nagar, RARS, Warangal, Palakurthi				
Kamareddy &	Biknoor, SS Nagar, Gandhari,	Anthampally, Adlur Yellareddy, Pothangal, Jalapur,				
Nizamabad	Varni, Rudur, Kotagiri,	RS & RRS, Rudur, Ranampally				
Sangareddy	Hathnoor, Hathnoor, Pulkal,	Kasala, Chikmadoor, Eesojipet, Sangupet,				
	Jogipet, Choutipally	Choutipally				
Vikarabad	Yalala, Pudur	Yalala, Bennur, Pudur				
Khammam &	Munagala, Wyra, Thallada,	Repala, Somavaram, Kurnavalli, Yagna				
Suryapet	Kallur	Narayanapuram				
Nagarkurnool &	Kalvakurthi, Nagarkurnool,	Gundur, Narsaipally, Palem, Lalkota, Vattem,				
Mahaboobnagar	CC Kunta, Bijenapally					
Jagtial & Siricilla	Boinpally, Mustabad,	Stambhampalle, Morrapur, Puduru, RARS, Polasa,				
	Kodimial	Jagtial				
Peddapalli	Kalvasrirampur	Mangapet, Jafarkhanpet, Kunaram, ARS, Kunaram,				
		Kalva Srirampur				
Nalgonda	Tripuraram, Chintapally, PA	Kampasagar, Gudi Thanda, Kodanrampuram,				
	Pally, Peddavura, Peddavura,	Ghatnemalipuram, Lingampally, Peddavura,				
	Nidamanuru	Shankarapuram, Parvathipuram,				
		Bokkamunthalapadu, Nidamanuru, Pusulapadu				

 Table 1: Details of survey

The total cropped area of the state is 4.6 m. ha with an annual rainfall around 900 to 1100 mm. Seventy-five per cent of the rainfall is received from South West monsoon. Rice is the principal food crop cultivated throughout the state during *kharif* and *rabi* season providing food for its growing population, fodder to the cattle and employment to the rural masses. Any set back to the rice crop will have a perceptible impact on the state's economy and food security. In Telangana, rice is mostly cultivated under wells, tanks and canals in an area of around 53.33 lakh acres against normal area of 27.25 lakh acres with 196% sown to season normal during *kharif*, 2020, whereas 51.62 lakh acres against 22.19 lakh acres with 232.63% sown to season normal during *rabi*, 2020-21 (www.agri.telangana.gov.in). The area under cultivation of rice was increased by more than double to the normal rice area due to enhanced irrigation facilities created by the Govt. of Telangana. Among the rice growing farmers, 70% are small and marginal farmers with land holdings of less than 1 ha.

The Production Oriented Survey (POS) of rice growing areas was conducted in 14 districts *viz.*, Nizamabad, Kamareddy, Jagtial, Peddapalli, Rajanna Sirisilla Warangal Rural, Sangareddy, Khammam, Rangareddy, Mahaboobnagar, Nagarkurnool, Vikarabad, Nalgonda and Suryapet covering 66 villages in major rice growing areas of Northern, Central and Southern Telangana zones of Telangana state during *vanakalam*, 2020 and *yasangi*, 2020-21. The details of the POS visits containing the names of the districts, mandals and villages covered during survey along with the list of the team members participated in POS are furnished in Table (1). The information on various

Production Oriented Survey-2020

aspects of rice cultivation *viz.*, seasonal conditions, crop area coverage and item wise package of practices, abiotic/ biotic constraints and their management are discussed in the following headings. The information on the aforesaid aspects was collected from the progressive farmers, seed producers, AEOs, MAOs, ADAs, DAOs and Input dealers of the respective areas through interaction and participatory approach.

General question on Rice cultivation in Distri	ct during Kharif, 2020	& Rabi, 2020-21	(To be filled by the
Cooperator in consultation with the State Depa	artment of Agriculture	e)	

Parameters	Nizamabad	Kamareddy	Rajanna Sirisilla	Peddapalli	Jagtial
Total area under HYV	384453 (K) 383620 (R)	248475 (K) 234613 (R)	146841 (K) 166464 (R)	201254 (K) 197313 (R)	281123 (K) 293823 (R)
Most preferred HVV in	BPT 5204 RNR	BPT 5204 RNR	RNR 15048 Jagtial	RNR 15048 BPT	RNR 15048 Jagtial
the district (<i>Kharif</i> and	15048 KNM 118	15048 Jai	rice -1 KNM 118	5204 KNM 118	ric-1 KNM 118
Rabi)	MTU 1010. Jagtial	Sreeram., HMT	BPT 5204. MTU	Jagtial Rice-1.	MTU 1153 and
	Rice-1, Jai Sreeram,	Sona, KNM 118,	1010, Jai sreeram,	MTU 1010, MTU	MTU 1156,
	HMT Sona,	MTU 1010, Jagtial	MTU 1156 and 1153,	153, MTU 1156,	Telangana sona Jai
	Bathukamma and	Rice-1, MTU 1153		Jai sreeram and	sreeram, and MTU
	Ganga Kaveri	and MTU 1156		Chintu	1010
Total area under rice	-	-	-	-	-
hybrids in the district					
hybrids in the district	-	-	-	-	-
Total area under	Nil	Nil	Nil	Nil	Nil
basmati in the district	1111	1111	1111	141	1111
Most prevalent basmati	Nil	Nil	Nil	Nil	Nil
varieties in the district					
Whether farmers are	Yes, Transplanters,	Yes, Rotovator,	Yes, Rotovator,	Yes, Rotovator,	Yes, Rotovator,
using any heavy	Rotovator and	machine planter	machine planter and	Drum seeder,	machine planter
equipments like	combine harvester	and combine	combine harvester	machine planter	and combine
transplanter / combine		harvester		and combine	harvester
Mention water	AWD. Drum seeder	Drum seeder and	AWD. Drum seeder	Drum seeder. Wet	AWD, Drum
technologies like	and MSRI	MSRI	and MSRI	DSR and MSRI	seeder and MSRI
SRI/laser leveling/DSR					
being used by the					
farmers					
Whether survey team	Yes, regarding	Yes, regarding	Yes, varieties, MSRI,	Yes, varieties,	Yes, varieties and
gave any advice to the	varieties, crop	varieties, water	fertilizers,	MSRI, fertilizers,	management of
farmers during the	production and	saving technologies	and discasses	management of	pests and diseases
what are those	technologies	disease	and diseases.	pests and diseases.	
what are mose	teennoiogies	management			
What are the general	BLB, Blast, False	False smut, YSB,	Stem borer, gall	False smut, BPH,	False smut, BLB,
problems in rice	Smut, sheath blight	blast, gall midge	midge, panicle mite	YSB, Gall midge	YSB and Blast (K
cultivation in the	Leaf folder, YSB,	panicle mite, BPH,	and False smut, NB,	Sheath Blight and	& R)
district	BPH, Panicle mite	sheath blight, BLB	GD and Blast (<i>rabi</i>)	Blast (K & R)	
	and Leaf Blast (Rabi)	and Leaf Blast			
Please provide any	Rythu Samanyaya	(Kabi) Rythu Samanyaya	Rythu Samanyaya	Rythu Samanyaya	Rythu Samanyaya
farmers association in	Samithi and	Samithi and	Samithi and	Samithi and	Samithi and
the district	Cooperative Societies	Cooperative	Cooperative Societies	Cooperative	Cooperative
	1	Societies	1	Societies	Societies
Whether availability of	No	No	No	No	No
labour is sufficient			N	N	N. G. I.
whether there is any	No, Govt. 1s	No, Govt. 1s	No, Govt. 1s	No, Govt. 1s	No, Govt. 1s
the produce	IKP centers	IKP centers	IKP centers	IKP centers	IKP centers
Any major irrigation	SRSP	Nizamsagar and	Upper and Mid	Kaleshwaram and	Back water of
power generation		Alisagar	manair reservoirs	Yellampalli	Yellampally project
project in the district		0		projects	
Any soil testing	Yes, by department	Yes, by department	Yes, by department	Yes, by department	Yes, by department
programme undertaken	of Agriculture, Govt.	of Agriculture,	of Agriculture, Govt.	of Agriculture,	of Agriculture,
	of Telangana and	Govt. of Telangana	of Telangana	Govt. of Telangana	Govt. of Telangana
Any farmers training	Regular training	Regular training	Regular training	Regular training	Regular training
program was organized	programmes	programmes	programmes	programmes	programmes
by the state department	organized by Dept. of	organized by Dept.	organized by Dept. of	organized by Dept.	organized by Dept.
of Agriculture /	Agriculture, ATMA,	of Agriculture,	Agriculture, ATMA,	of Agriculture,	of Agriculture,
University	KVK and DAATTCs	ATMA, KVK and	KVK and DATTCs	ATMA, KVK and	ATMA, KVK and
	of the University.	DAATICs of the	of the University.	DATTCs of the	DATTCs of the
1	1	University.	1	University.	University.

General question on Rice cultivation in District during *Kharif*, 2020 and *Rabi*, 2020-21 (To be filled by the Cooperator in consultation with State Department of Agriculture)

D (171	D 11	X7*1 1 1
Parameters	warangal (R)	Sangareddy	Knammam	Rangareddy	Vikarabad
Total area under HYV in the	129713 (K)	76354 (K)	276703 (K)	71450 (K)	75258 (K)
district (ha)	117179 (R)	77934 (R)	225420 (R)	94281 (R)	68878 (R)
Most preferred HVV in the	BPT 5204 RNR	RNR 15048	BPT 5204 MTU 1061	Telangana Sona HMT	Telangana Sona
distant	15040 C:14: MTU	IMT Care La	DIT 5204, WITC 1001,	Conce Tallahamaa Dia	ICI 24422 KNIM
district	15048, Siddi, MITU	HMT Sona, Jai	KNR 15048, M10	Sona, Tellanamsa, Bio	JGL 24423, KINM
	1010, KNM 118, JGL	Sreeram, JGL	1262, MTU 1294,	799, KNM 118 and	118 and MTU 1010
	24423, HMT Sona, Jai	24423,	MTU 1153, MTU	MTU 1010, Jaisreeram	
	Sreeram, Ankur Sona,	Bathukamma.	1276. MTU 1156. JGL	and JGL 24423	
	MTU 1156 and 1153	KNM 118 and	24423 and KNM 118		
	W10 1150 and 1155	MTU 1010	24425 and KINN 116,		
		M10 1010			
Total area under rice hybrids	-	-	-	-	-
in the district (ha)					
Major prevalent rice hybrids	_	-	_	-	_
in the district					
	NT'1	NT'1	NT'1	NT'1	NT'1
Total area under basmati in	Nil	Nil	Nil	Nil	Nil
the district					
Most prevalent basmati	Nil	Nil	Nil	Nil	Nil
varieties in the district					
Whathar forman and we're	Vos Dotoustan MCDI	Voc Dotovotor	Voc Dotovict-	Vac Botovator and	Vac Dotovotor or 1
whether farmers are using	Yes, Rotovator, MSRI	res, Rotovator,	Yes, Rotovator,	Yes, Rotovator, and	Yes, Rotovator, and
any heavy equipment's like	and combine harvester,	machine planter	machine planter, seed	combine harvester	combine harvester
transplanter / combine	Tractor mounted	and combine	cum ferti drill,		
harvester	spraver	harvester. Drone	combine harvester and		
nui vester	sprayer	spray	Drone spray		
		spray	Dione spray	NT.) I
Mention water technologies	AWD, Drum seeder	AWD and	AWD, Dry converted	No	No
like SRI/laser leveling/DSR	and Dry converted wet	machine planting	wet rice, dry DSR and		
being used by the farmers	sowing		Drum seeder		
Whether survey team gave	Ves regarding the	Ves varieties	Ves varieties and	Ves regarding the	Ves regarding
whether survey team gave	incompany description and	res, varieties,	res, varieties and	incompany description and	res, regarding
any advice to the farmers	improved package and	methods of	management of pests	improved package and	varieties, water
during the survey? If yes.	practices of rice	establishment	and diseases	practices of rice	saving technologies
Then what are those		fertilizers,			and pest and
		management of			disease
		nests and			management
		discassos			management
	F 1 G 1	uiseases.			
What are the general	False smut, Gall	Neck Blast, BPH,	Leaf folder, false smut,	Labour shortage and	False smut, YSB,
problems in rice cultivation	midge, Leaf folder,	False smut, Leaf	blast (K & R), BLB,	water scarcity, blast,	whorl maggot,
in the district	BLB. YSB and BPH.	folder. Panicle	Gall midge, lodging,	false smut, lodging.	hispa and stem
	Leaf Blast (K & R)	mite and Lodging	Sheath blight VSB	Whorl magget and	borer and blast
	Leaf blast (R & R)	linte and Louging	and DDU	VCD	borer and brast
	Lodging			ISD.	
Please provide any farmers	Rythu Samanvaya	RSS and	Rythu Samanvaya	Rythu Samanvaya	Rythu Samanvaya
association in the district	Samithi and	Cooperative	Samithi and	Samithi and	Samithi and
	Cooperative Societies	Societies	Cooperative Societies	Cooperative Societies	Cooperative
					Societies
NT 1 1111 C	N	ŊŢ		N	Societies
wnetner availability of	INO	INO	NO	INO	INO
labour is sufficient					
Whether there is any	No, Govt. is procuring	No, Govt. is	No, Govt. is procuring	No, Govt. is procuring	No, Govt. is
marketing problem of the	through IKP centers	procuring through	through IKP centers	through IKP centers	procuring through
produce	unough hier contensi	IKP centers	unough hit contensi		IKP centers
		IN centers.	D1' 1 W		IRI centers:
Any major irrigation power	-	Manjeera and	Palair and Wyra	-	-
generation project in the		Singur project	Reservoirs (NSP		
district			ayacut)		
Any soil testing programme	Yes by department of	Yes by	Yes by department of	Ves by department of	Yes by department
undertairen	A arrigulture. Talangana	demonstration of	A grigulture Court of	A arigulture Talangana	of A grigulture
undertaken	Agriculture, Telangana	department of	Agriculture, Govi. of	Agriculture, Telangana	of Agriculture,
		Agriculture,	Telangana		Telangana
		Telangana			
Any farmers training	Regular training	Regular training	Regular training	Regular training	Regular training
program was organized by	programmes organized	nrogrammes	programmes organized	programmes organized	nrogrammer
the state of the s	have De t	programmes	have De t	base Dation	programmes
the state department of	by Dept. of	organized by	by Dept. of	by Dept. of	organized by Dept.
Agriculture / University	Agriculture, ATMA,	Dept. of	Agriculture, ATMA,	Agriculture, ATMA,	of Agriculture,
	KVK and DATTCs of	Agriculture,	KVK and DATTCs of	KVK and DATTCs of	ATMA, KVK and
	the University.	ATMA, KVK and	the University.	the University.	DATTCs of the
		DATTCs of the			University
		DATICS OF the			University.
		University.			

General question on Rice cultivation in District during Kharif, 2020 and Rabi, 2020-21 (To be filled by the
Cooperator in consultation with State Department of Agriculture)

Parameters	Nagarkurnool	Mahaboobnagar	Nalgonda	Suryapet
Total area under HYV in the district	97435 (K)	113175 (K)	397500 (K)	395818 (K)
(ha)	141526 (R)	118456 (R)	463314 (R)	422406 (R)
Most preferred HYV in the district	Telangana Sona, BPT 5204, HMT Sona, KNM 118, JGL 24423 and MTU 1010	Telangana Sona, KNM 118 and MTU 1010 and HMT Sona	Pooja, Ankur sona, Jaisreeram, Telangana Sona, BPT 5204, HMT Sona, JGL 24423, MTU 1010 and KNM 118	Ankur Pooja, BPT 5204, HMT Sona, Telangana Sona, KNM 118, JGL 24423, MTU 1153, MTU 1156 and MTU 1010
Total area under rice hybrids in the district (ha)	-	-	-	-
Major prevalent rice hybrids in the district	-	-	-	-
Total area under basmati in the district	Nil	Nil	Nil	Nil
Most prevalent basmati varieties in the district	Nil	Nil	Nil	Nil
Whether farmers are using any heavy equipment's like transplanter / combine harvester	Yes, Rotovator, machine planter and combine harvester	Yes, Rotovator, machine planter and combine harvester	Yes, Rotovator, MSRI and combine harvester	Yes, Rotovator, MSRI, and combine harvester
Mention water technologies like SRI/laser leveling/DSR being used by the farmers	MSRI and AWD	MRSI and Drum seeder	Drum seeder, wet DSR and AWD	Drum seeder and MSRI
Whether survey team gave any advice to the farmers during the survey? If yes. Then what are those	Yes, varieties, MSRI, fertilizers, management of pests and diseases.	Yes, varieties, MSRI, fertilizers, management of pests and diseases.	Yes, regarding varieties, water saving technologies and pest and disease management	Yes, varieties, MSRI, fertilizers, management of pests and diseases.
What are the general problems in rice cultivation in the district	False smut, BLB, BPH, leaf folder, sheath blight, lodging and blast (K & R).	BPH and YSB, False smut and GD, Blast (<i>rabi</i>) and Lodging	False smut, BLB, Lodging, YSB, Sheath Blight, Panicle mite and BPH Blast (<i>Rabi</i>)	Timely availability of canal water, Leaf folder, leaf folder and panicle mite BPH, False smut and sheath blight
Please provide any farmers association in the district	RythuSamanvayaSamithiandCooperative Societies	Rythu Samanvaya Samithi and Cooperative Societies	RythuSamanvayaSamithiandCooperative Societies	Rythu Samanvaya Samithi and Cooperative Societies
Whether availability of labour is sufficient	No	No	No	No
Whether there is any marketing problem of the produce	No, Govt. is procuring through IKP centers.	No, Govt. is procuring through IKP centers.	No, Govt. is procuring through IKP centers.	No, Govt. is procuring through IKP centers.
Any major irrigation power generation project in the district	Kalvakurthi Lift irrigation,	Jurala, koilasagar and sarlasagar projects, Bheema, Nettempadu	Nagarjuna Sagar irrigation (left canal)	Nagarjuna Sagar irrigation (left canal)
Any soil testing programme undertaken	Yes, by department of Agriculture, Telangana	Yes, by department of Agriculture, Telangana	Yes, by department of Agriculture, Govt. of Telangana	Yes, by department of Agriculture, Govt. of Telangana
Any farmers training program was organized by the state department of Agriculture / University	Regular training programmes organized by Dept. of Agriculture, ATMA, KVK and DATTCs of the University.	Regular training programmes organized by Dept. of Agriculture, ATMA, KVK and DATTCs of the University.	Regular training programmes organized by Dept. of Agriculture, ATMA, KVK and DATTCs of the University.	Regular training programmes organized by Dept. of Agriculture, ATMA, KVK and DATTCs of the University.

A. General information

A.1: Seasonal Conditions

The rainfall received from South West monsoon and North East monsoon during the period from June, 2020 to September, 2020 along with district wise rainfall situation is furnished in table 2a and 2b.

South West Monsoon-2020: During the South-west monsoon period, a total of 1078.3 mm rainfall received in Telangana as against normal rainfall of 720.4 mm showing deviation +50% with over all status is being excess.

North-East Monsoon: Normally, in Telangana State, only 14% of annual rainfall is received from North-East Monsoon. The average normal rainfall of North-East Monsoon is 124.9 mm and actual rainfall received is 179.4 mm showing the deviation of +45 with over all status is being excess during NE monsoon.

Overall, the average rainfall received in Telangana state from 01.06.2020 to 03.03.2021 is 1261.9 mm as against the normal rainfall of 857.5 mm with deviation of +47 per cent with over all status being excess. Among the districts, newly formed district Mulugu received the highest rainfall of 2054.3 mm with a deviation of +69% while, Nalgonda District received the lowest rainfall of 863.4 mm. Overall, the weather conditions are highly favorable for growth of paddy crop. However, excess rainfall in September and October months posed the several biotic constraints in paddy.

M 41-	Normal	Actual ra	infall (mm)	% deviation	<u>States</u>
Month	(mm)	2019-20	2020-21	to normal	Status
June, 2020	129.2	87.1	172.8	34	Excess
July, 2020	244.2	215.2	267.0	9	Normal
August, 2020	219.2	243.6	390.7	78	Excess
September, 2020	127.8	245.6	247.8	94	Excess
S W Monsoon	720.4	791.4	1078.3	50	Excess
October, 2020	95.5	162.0	170.9	79	Excess
November, 2020	23.9	7.7	8.5	-64	Scanty
December, 2020	5.5	3.3	0.0	-100	Scanty
N E Monsoon	124.9	173.0	179.4	45	Excess
January, 2021	6.8	6.2	1.9	-100	Scanty
February, 2021	4.6	0.1	2.3	-50	Deficit
March, 2021	0.8	0	0	-100	Scanty
Cumulative Total					
(01-06-2020 to	857.5	980.2	1261.9	47	Excess
03.03.2021)					

 Table 2: Month wise rainfall received in Telangana State from 01-06-2020 up to 03.03.2021

Table 3: District wise average rainfall for the period from 01.06.2020 to 03.03.2021

SI.	Annual District District		District Rainfall		NOR? (C (1 03.03.2	NORTH EAST M ONSOON (Oct to Dec) 01.10.2020 to 03.03.2021 (in M M)		Cumulative Total From 01-06-2020 to 03.03.2021 (inMM)		Corr. Period of Previous year		% Dev. Of current actual over previous actual	Status		
110.		Kalillali	Normal	Actual	% Dev.	Normal	Actual	% Dev.	Normal	Actual	% Dev.	Actual	% Dev.		Status
1	Adilabad	1199.0	1005.0	908.7	-10	144.7	70.6	-51	1149.7	979.3	-15	1056.8	-8	-7	Normal
2	Komarambheem	1195.5	1020.5	1041.5	2	132.0	105.1	-20	1152.5	1146.6	-1	1366.2	19	-16	Normal
3	Mancherial	1145.3	986.8	1095.2	11	123.7	84.2	-32	1110.5	1179.4	6	1195.1	8	-1	Normal
4	Nirmal	1127.6	953.4	821.9	-14	138.7	94.9	-32	1092.1	916.8	-16	1013.1	-7	-10	Normal
5	Nizambad	1042.4	860.0	910.8	6	146.2	75.7	-48	1006.2	986.5	-2	1313.4	31	-25	Normal
6	Jagtial	1034.6	854.7	934.8	9	134.7	112.8	-16	989.4	1047.6	6	1137.6	15	-8	Normal
7	Peddapally	1055.4	889.1	1192.7	34	127.7	103.8	-19	1016.8	1296.5	28	1255.1	23	3	Excess
8	Jayashanker	1088.0	931.3	1484.3	59	112.3	124.3	11	1043.6	1608.6	54	1390.2	33	16	Excess
9	Bhadradri	1132.6	904.0	1550.1	71	135.8	212.2	56	1039.8	1762.3	69	1151.5	11	53	Excess

SI. No.	District	Annual Normal Rainfall	SO M (Jt	SOUTH WEST MONSOON (June to Sept.)		NORTH EAST M ONSOON (Oct to Dec) 01.10.2020 to 03.03.2021 (in M M)		Cumulative Total From 01-06-2020 to 03.03.2021 (inMM)		Corr. Period of Previous year % I		% Dev. Of current actual over previous actual	Status		
1101		Tunnun	Normal	Actual	% Dev.	Normal	Actual	% Dev.	Normal	Actual	% Dev.	Actual	% Dev.		otutus
10	Mahabubabad	1007.7	793.3	1304.0	64	143.5	214.4	49	936.8	1518.4	62	985.7	5	54	Excess
11	Warangal (R)	1039.5	844.3	1535.3	82	128.9	201.5	56	973.2	1736.8	78	1146.2	18	52	Excess
12	Warangal (U)	889.5	709.1	1491.7	110	129.7	198.7	53	838.8	1690.4	102	1207.2	44	40	Excess
13	Karimnagar	898.3	717.0	1243.7	73	131.1	149.3	14	848.1	1393.0	64	1213.3	43	15	Excess
14	Rajanna	915.3	718.2	1181.7	65	147.8	124.8	-16	866.0	1306.5	51	1218.3	41	7	Excess
15	Kamareddy	1029.0	834.1	1071.8	28	153.8	125.2	-19	987.9	1197.0	21	1212.9	23	-1	Excess
16	Sangareddy	895.4	692.1	885.7	28	149.2	263.8	77	841.3	1149.5	37	765.5	-9	50	Excess
17	Medak	916.9	732.2	1045.8	43	139.3	198.3	42	871.5	1244.1	43	944.7	8	32	Excess
18	Siddipet	785.1	600.1	1232.2	105	133.1	222.8	67	733.2	1455.0	98	995.2	36	46	Excess
19	Jangoan	874.3	677.8	1155.0	70	134.8	214.3	59	812.6	1369.3	69	945.5	16	45	Excess
20	Yadadri	743.7	552.1	778.9	41	151.6	264.7	75	703.7	1043.6	48	747.8	6	40	Excess
21	Medchal	763.2	565.3	843.1	49	148.4	347.7	134	713.7	1190.8	67	818.3	15	46	Excess
22	Hyderabad	779.1	562.1	829.7	48	160.3	441.8	176	722.4	1271.5	76	849.1	18	50	Excess
23	Rangareddy	694.6	506.6	846.2	67	139.8	302.6	116	646.4	1148.8	78	686.5	6	67	Excess
24	Vikarabad	814.3	633.4	939.7	48	128.6	210.0	63	762.0	1149.7	51	713.0	-6	61	Excess
25	Mahabubnagar	626.9	475.7	999.1	110	116.8	145.0	24	592.5	1144.1	93	759.3	28	51	Excess
26	Jogulamba	533.0	385.3	877.9	128	118.2	191.9	62	503.5	1069.8	112	519.1	3	106	Excess
27	Wanaparthy	579.6	434.0	1085.9	150	113.1	185.4	64	547.1	1271.3	132	664.5	21	91	Excess
28	Nagarkurnool	642.3	460.9	844.1	83	145.0	174.6	20	605.9	1018.7	68	569.6	-6	79	Excess
29	Nalgonda	704.2	513.4	636.0	24	148.7	227.7	53	662.1	863.7	30	613.7	-7	41	Excess
30	Suryapet	836.8	646.2	811.8	26	142.2	150.9	6	788.4	962.7	22	690.9	-12	39	Excess
31	Khammam	1036.0	791.2	1077.7	36	163.1	220.3	35	954.3	1298.0	36	862.5	-10	50	Excess
32	Mulugu	1292.7	1099.8	1916.0	74	122.9	148.3	21	1222.7	2064.3	69	1610.2	32	28	Excess
33	Narayanpet	561.8	424.5	1010.2	138	112.9	152.1	35	537.4	1162.3	116	714.5	33	63	Excess
1	Total Average	905.4	720.4	1078.3	50	136.3	183.6	35	856.7	1261.9	47	979.8	14	29	Excess

Source: Directorate of Economics & Statistics, Govt. of Telangana, Hyderabad

Date is provisional & Limits for deviation from Normal

Excess = (+20% & above), Normal= (+19% to -19%), Deficit= (-20% to -59%), Scanty== (-60% to -99%), No rain= (-100%)

A.2: Crop coverage

In Telangana, rice is mostly cultivated under wells, tanks and canals in an area of around 53.33 lakh acres against normal area of 27.25 lakh acres with 196% sown to season normal during *kharif*, 2020, whereas 51.62 lakh acres against normal area of 22.19 lakh acres with 232.63% sown to season normal during *rabi*, 2020-21 (www.agri.telangana.gov.in).

	(Area in acres)								
S			Kharif, 2020			Rabi, 2020-21			
S. No	DISTRICT	Normal	Actual	% Cov.	Normal	Actual	% Cov.		
		Area	Area	over NA	Area	Area	over NA		
Sout	nern Telangana Zone								
1	Rangareddy	29922	71540	239.09	23,354	94,281	403.7		
2	Medchal-Malkajgiri	8958	15801	176.39	8,515	13,491	158.4		
3	Vikarabad	26075	75258	288.62	20,585	68,878	334.6		
4	Mahabubnagar	33898	113175	333.87	29,415	1,18,456	402.7		
5	Nagarkurnool	32274	97435	301.90	43,189	1,41,526	327.7		
6	Wanaparthy	85783	174325	203.22	53,461	1,40,572	262.9		
7	Gadwal (Jogulamba)	45875	76071	165.82	21,317	57,375	269.1		
8	Narayanpet	50837	97832	192.44	34,541	99,377	287.7		
9	Nalgonda	194865	397500	203.99	2,20,709	4,63,314	209.9		
10	Suryapet	200906	395818	197.02	2,09,783	4,22,406	201.3		
11	Yadadri Bhuvanagiri	106371	202586	190.45	1,18,225	2,43,331	205.8		
	Total	815764	1717341	210.52	783,094	18,63,007	237.9.		
No	rthern Telangana Zone								
12	Nizamabad	238140	384453	161.44	1,92,616	3,83,620	199.0		
13	Kamareddy	124111	248475	200.20	92,939	2,34,613	252.4		
14	Karimnagar	118623	250437	211.12	1,31,853	2,60,172	197.3		
15	Jagtiyal	128606	281123	218.59	1,32,648	2,93,823	221.5		
16	Peddapalli	126204	201254	159.47	1,13,520	1,97,313	173.8		
17	Rajanna Siricilla	59891	146841	245.18	70,677	1,66,464	235.5		
18	Adilabad	1858	2184	117.55	136	425	312.5		
19	Mancherial	90749	162311	178.86	49,571	1,09,968	221.8		
20	Nirmal	56696	106771	188.32	46,781	92,444	197.6		
21	Asifabad (K. Bheem)	32418	55361	170.77	7,421	15,963	215.1		
	Total	977296	1839210	188.19	838162	17,54,805	209.4		
C	entral Telangana Zone								
22	Medak	92091	188044	204.19	64,175	2,03,780	317.5		
23	Sangareddy	42964	76354	177.72	25,576	77,934	304.7		
24	Siddipet	82489	227948	276.34	1,01,132	2,61,527	258.6		
25	Warangal (Rural)	89264	129713	145.31	43,710	1,17,179	267.0		
26	Warangal (Urban)	40634	96019	236.30	53,288	1,04,850	196.8		
27	Jayashankar Bhupalpalli	66938	98691	147.44	35,009	78,220	223.4		
28	Janagoan	57375	149194	260.03	68,226	1,59,322	233.5		
29	Mehabubabad	93356	180756	193.62	50,874	1,71,191	336.5		
30	Mulugu	88992	108988	122.47	31,500	62,689	199.0		
31	Khammam	159991	276703	172.95	1,00,119	2,25,420	225.1		
32	Bhadradri Kothagudem	117904	166630	141.33	24,461	75,651	309.3		
	Total	931998	1699040	182.30	598,070	15,37,763	257.1		

 Table 4: District wise normal and actual rice area covered during Vanakalam, 2020 and Yasangi, 2020-21

 (Area in a cover)

Source: <u>www.tg.agrisinet.com</u>, Directorate of Agriculture, Telangana state.

A.3: Crop stage at the time of survey

The POS on rice was conducted both during *kharif* and *rabi* seasons (September, 2020 to February, 2021) in Telangana State. The roving survey was conducted in all the major rice growing districts of Telangana State, when the crop was between maximum tillering and booting to maturity stage.

A.4: Crop rotation practiced

Rice-rice was the predominant cropping system in all the surveyed districts varying from 80-90% The other systems found were green manure-rice-rice, rice –fallow, rice-pulses, rice – sesame, rice-rice-vegetables depending on the water availability and other factors.

A.5: Varietal profile

The major varieties grown in the surveyed districts during *kharif*, 2020 were Samba Mahsuri (BPT 5204), Telangana Sona (RNR 15048), Jai Sreeram, HMT Sona, Kunaram Sannalu, MTU 1010, Jagtial Rice-1 Siddi, IR 64, Ankur Pooja, Chintu, MTU 1061, MTU 1224, MTU 1153, MTU 1156, MTU 1001 and Tellahamsa *etc.*, whereas the private hybrids grown particularly in Karimnagar and Warangal districts were Arize 6444 gold, Tej (Bayer crop science Ltd.), KPH 412, KPH 272 (Kaveri seeds Pvt., Ltd.,), Champion (Nujiveedu Pvt. Ltd.,), 27P31, 27P25, 27P63, 27P38 (Pioneer Ltd.,) and Bio 799. But, the area under hybrids during *kharif* season is very less compared to *Rabi* season. The private hybrid (Bio 799) was popular in Musi belt of Ranga Reddy and Yadadri Bhuvangiri districts during *rabi*, 2020-21.

Overall data reveals that, in case of fine grain variety BPT 5204 was covered highest area during kharif 2020 in Nizamabad district (226208 acres). Fine grain variety RNR 15048 among all the districts, Siddipet (94811 acres) was occupied maximum area during kharif 2020. In case of variety Jaisreeram type was cultivated more area in Jagtial district (58326 acres) as compared to remaining districts during *kharif*, 2020. During Kharif, 2020, majority of the farmers were grown fine grain varieties in large scale. Coarse grain variety *i.e.* KNM 118, out of 32 districts Medak (8017 acres) was covered highest area during *kharif*, 2020. In case of coarse grain varieties, JGL 24423 and MTU 1010 were covered maximum area during *kharif* 2020 in Jagtial (8206 acres) and Kamareddy (123382 acres) respectively.

The newly released rice variety JGL 24423 (Jagtial Rice-1) was also gaining popularity and occupied in area of 17,585 acres during *kharif*, 2020 in the stage. Very good feedback was received on JGL 24423 (Jagtial Rice-1) in terms of yield and non-lodging nature, however, few farmers claimed that if crop is not properly dried in field, 10% grains are left over with panicles using harvester and susceptible to neck blast.

Telangana Sona, a short duration (125 days) fine grain variety grown in an area of 9,53,103 acres across the Telangana State during *kharif*, 2020 in Siddipet, Wanaparthy, Mahabubnagar, Narayanpet, Nagarkurnool, Jogulambha Gadwal, Janagoan, Mahabubabad, Vikarabad, Rangareddy, Karimnagar and Warangal (R). Majority of the farmers preferred the Telangana Sona because of its short duration, super fine grain and blast resistance and suitability to late planted situations and relatively requires less water. False smut and lodging were observed in RNR 15048 in surveyed villages.

Severe incidence of blast was observed in entire Telangana State during *rabi*, 2020-21 (January to March, 2021). Three coarse grain varieties (MTU 1010, KNM 118 and JGL 24423) were occupied in major area during *rabi*, 2020-21. In few districts, the farmers were grown fine grain varieties during rabi season especially in Nalgonda, Mahaboobnagar and Nagarkurnool districts (Pooja, Telangana Sona HMT Sona and Ankur Sona etc.,) All the fine and coarse grain varieties from public and private sector were found susceptible to blast during *rabi*, 2020-21. The POS team visited the blast affected fields at Nalgonda, Rangareddy and Khammam districts during *rabi*, 2020-21.

Table (5): District v	vise, varie	ty wise ri	ce area (ha)	covered	during	Kharif, 2	2020		(Area in	Acres)		
District	BPT 5204	RNR 15048	Jaisreeram type	HMT Sona	KNM 118	JGL 24423	MTU 1010	MTU 1001	MTU 1061	Tella- hamsa	IR 64	Others	Total
Adilabad	56	825	114	4.0	0.0	0.0	158	7.10	0.00	8.0	0.0	1014	2188
Bhadradri Kothagudem	67629	9722	18	49	550	15	1326	239	42979	1819	4.0	15905	140256
Jagtial	9086	13870	58326	2597	5113	8206	109715	957	13	820	769	29061	238538
Janagoan	42246	64580	1758	162	637	63	13295	274	1.0	3831	10784	7254	144887
Jayashankar	36372	12231	1932	731	668	23	6671	16197	5273	381	421	15231	96133
Bhupalpalli													
Jogulamba Gadwal	22966	32045	10	2.0	0.0	0.0	228	0.0	0.0	5513	27	1980	62772
Kamareddy	57456	25871	6154	271	2445	1329	123382	1105	106	842	457	14306	233726
Karimnagar	67264	36914	6956	642	4486	1672	102535	963	134	1154	1285	13911	237918
Khammam	180457	1508	20	257	198	32	542	206	41771	625	8.0	13177	238804
Komaram Bheem (Asifabad)	4686	24896	5847	215	258	677	353	36	1.0	1282	13	16276	54542
Mahabubabad	70875	33771	1625	969	703	143	1186	3172	1463	1433	35	51552	166930
Mahaboobnagar	11474	88971	28	66	220	15	2190	28	0.0	3578	64	1382	108017
Manchervial	9906	28457	49101	5981	320	432	1854	8135	813	419	11	49940	155371
Medak	3439	31041	2120	866	8017	528	43771	339	20	963	88	73383	164577
Medchal-Malkajigiri	6511	3189	315	31	199	2.0	928	2.0	3.0	57	20	3361	14620
Mulugu	64237	6528	441	85	50	49	1407	13423	4162	145	2.0	13705	104237
Nagarkurnool	17116	65838	26	111	53	5.0	1749	13	0.0	2322	46	5933	93214
Nalgonda	105219	10356	5461	2651	1659	113	96192	714	1.0	1058	601	135446	359473
Narayanpet	22474	65143	31	0.0	502	12	1067	122	8.0	7226	0.0	712	97300
Nirmal	1549	3507	29962	120	1193	345	33796	369	10	43	147	33139	104182
Nizamabad	226208	11196	10872	296	1382	576	89411	544	6.0	333	125	38733	379684
Peddapalli	97563	11182	2107	1004	2452	392	39821	9082	2712	201	153	3690	170362
Rajanna Siricilla	11900	40197	8424	130	4677	1426	62265	683	2.0	521	2942	6482	139651
Rangareddy	12222	36263	29	234	122	1.0	713	115	0.0	6406	63	10795	66965
Sangareddy	1382	7178	117	275	2263	278	39895	472	6.0	884	12	18774	71540
Siddipet	16561	94811	5796	635	1814	352	52997	658	36	4471	9,041	34152	221325
Suryapet	177948	2630	62	1672	110	25	4733	22	59	127	45	115641	303076
Vikarabad	5100	38673	3.0	607	163	6.0	18588	307	3.0	6682	27	4524	74685
Wanaparthy	40787	65616	49	90	613	24	1245	20	1.0	2502	51	15642	126642
Warangal (Urban)	30275	40893	1323	45	480	30	9265	1231	8.0	584	174	7240	91,550
Warangal (Rural)	38029	35266	1619	525	246	38	1487	2405	10	1282	10	44841	125760
Yadhadri Bhuvangiri	74231	9918	327	142	5628	761	59107	185	11	710	2464	35474	188960

A.6: Minikits visit:

The POS team visited the PJTSAU paddy minikits being conducted by DAATTCs and KVKs in farmers fields at different districts of Telangana State. Overall, all the rice minikilt cultures fared well in farmer's fields compared to respective local checks. However, the feedback of farmers on minikits especially plant type, reaction to insect-pests and diseases, grain type and quality characters *etc.* were recorded. The following minikit fields were visited by the POS team during *kharif*, 2020.

S.	Date of	Place	No. of minikits	Organized by
No.	visit			
1.	08.10.2020	Adlur Yellareddy (v), SS Nagar,	2 (WGL 962, KNM 1638)	DAATTC,
		Kamareddy (d)		Nizamabad
2.	08.10.2020	Ranampally (v), Kotagiri (m),	4 (WLG 1119, JGL 27356,	
		Nizamabad district	KNM 1638, RNR 21278)	
3.	20.10.2020	Coutipally (v), Sangareddy (m)	6	DAATTC,
				Medak
4.	02.11.2020	Kurnavalli village of Thallada	4 (KNM 1638, RNR 29325,	KVK, Wyra
		mandal, Khammam	RNR 21278 and KPS 2874)	
5.	02.11.2020	Y. N. Puram (v), Kallur (m),	2	
		Khammam (d)		
6.	04.11.2020	Palem (v), Nagarkurnool (m)	1 (KNM 1638)	KVK, Palem
7.	07.11.2020	Stambhampalle (v), Boinpally	3	DAATTC,
		(m), Rajanna Siricilla district		Karimnagar
8.	07.11.2020	Morrapur (v), Mustabad (m),	10	
		Rajanna Siricilla district		
9.	13.11.2020	Mangapet (v), Kalva Srirampur	6 (KNM 1638, JGL 28345,	ARS, Kunaram
		(m), Peddapalli (m)	RNR 29325, RNR 21278, JGL	
			27356 and RNR 15459)	
10.	05.11.2020	Pulukurthi (v), Damera (m),	1 (KNM 1638)	DAATTC,
		Warangal (Rural)		Warangal

4.7. Farmer's scientist's interaction program

The team participated in farmers-scientists interaction programme at PACS Building, Anthampally (v), Biknoor (m), Kamareddy district and a total of 50-60 farmers were attended the interaction programme.

The following points emerged during the interaction with farmers:

- In this village, 75% of the area belongs coarse grain and 25% of the area under fine grain varieties.
- The farmers opined that, the BPH, YSB, BLB and Blast are the major problems during *Vanakalam* season and false smut is becoming a major threat during *vanakalam* season. Majority of the farmers are seeking suggestions for control measures for false smut. However, few farmers are aware of time of spraying for control of false smut. Very few (10%) farmers were sprayed the fungicides at pre-flowering stage for control of false smut.
- Overall, severe incidence of false smut was observed at Anthampally. All the varieties were found to be susceptible to false smut. As per the farmers feedback, the reduction in yield due to false smut was ranged from 2-4 quintal per acre. The reason for severe incidence of false smut is due to heavy rains coincide with flowering stage of the crop.
- The incidence of BLB was also observed in the village. The incidence was severe in fine grain varieties (BPT 5204 and Jaisreeram) and BLB was noticed during II FN of August, 2020.
- The farmer shown interest on information of new paddy varieties for *Vanakalam* and cold tolerant varieties for *yasangi* season released by the PJTSAU and its characteristic features were explained by Dr. Y. Chandramohan,

- Very good feedback was received on JGL 24423 (Jagtial Rice 1) in terms of yield and non-lodging. However, few farmers claimed that if crop is not properly dried in field, 10% grains are left over with panicles using harvester and highly succumb to neck blast.
- The practice on application of Chlorpyriphos + Sand + Bio granules for control of stem borer at maximum tillering stage was observed.
- Fertilizer Schedule (Per Acre): Basal: 20-20 @ 50 kg; 1st: 20-20 @ 20 kg + Urea @ 45 kg (2-22 DAT); 2nd: Ammonia @ 50 kg + MOP @ 20-25 kg (50-60 DAT)
- The manual transplanting cost per acre is ranging from Rs. 4500-5000 per acre. The farmers have shown interest on machine transplanting.
- The cost of cultivation per acre ranged from Rs. 22,000 to 28,000/-.

B. Crop Management

B.1: Seed rate and source:

Majority of the farmers using seed rate of 50-60 kg/ha for fine grain varieties, whereas 75 kg/ha for coarse grain varieties in transplanting method. The seed rate for dry converted wet rice was ranged from 10-18 kg per acre for fine grain varieties, whereas, 12-25 kg of seed per acre for coarse grain varieties during *yasangi* season in Madhira, Wyra and Sattupally divisions of Khammam district. The seed rate used for dry direct sowing is 15 kg for fine and 18-20 kg for coarse grain varieties in Vemsoor mandal of Khammam district. It was observed that, the plant population is more and only 2-4 productive tillers were observed in the field. As per the farmers feedback, less seed rate (8-10 kg per acre for fine and 12-15 kg for coarse) will have more weed population and less yield. The majority of the farmers purchased the seed from TSSDC, NSC, Research Stations of PJTSAU, DCMS or private input dealers. During the POS, it was observed that, the farmers are sowing the 3-10 kg/acre of research paddy seed purchased from private companies.

B.2.: Seed treatment

The farmers are adopting wet seed treatment to an extent of 10-15% across the surveyed villages by using carbendazim @ 1.0 g per kg of seed per liter of water by soaking for 24 hours. However, the farmers are aware of seed treatment in paddy and its advantages. Majority of the farmers in Vemsoor mandal are adopting the seed treatment with Carbendazim in dry -DSR.

B.3: Sowing and Planting

In Telangana State, the sowing and planting time varied from district to district depending on variety, monsoons and canal water. In case of long duration varieties, majority of sowings were taken up in June and plantings were completed by second fortnight of July, 2020 except Khammam and part of Nalgonda district where the sowing and plantings were delayed for long duration varieties due to late receipt of canal water. The team concluded that, majority of sowings were taken up during July, 2020 and plantings were completed by August, 2020 for medium and short duration varieties.

B.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. Few farmers used FYM or sheep manure or poultry manure @ 600-850 kg per 3-4 cents of nursery area.

B.5: Fertilizer application

Information on application of fertilizers in the surveyed districts varied to a greater extent. Majority of the farmers are applying NPK in the form of complex fertilizers *viz.*, 20-20-0-13, DAP, 10-26-26, 16-20-0-13, 17-17-17, 19-19-19, 28-28-0). Among the complex fertilizers, 20-20-0-13, 28-28-0 and DAP are the most commonly used basal fertilizers across the districts surveyed. Majority of the farmers are applying DAP or other complex fertilizers (50-150 kg/acre) as basal followed by top dressing of nitrogen in the form of Urea (150-200 kg/acre) in 2-3 split doses coinciding at maximum tillering stage, booting and just

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before panicle initiation depending on duration of the varieties, while potash is being used in the form of MOP (25-50 kg/acre). In addition, the farmers are also applying zinc sulphate @ 20 kg per acre. During the survey, the team has made an attempt to collect the information on application of fertilizers in paddy by farmers.

Nutrient	Nizamabad/	Peddapalli/	Sangareddy	Warangal
(kg/ha)	Kamareddy	Jagtial / Rajanna Siricilla		(Rural)
Ν	150-180	120-130	150-180	113 - 137.5
P_2O_5	100 - 115	57.5-75	80-95	57.5 - 80
K ₂ O	30 - 45	45-55	30-45	50 - 82.5

Application of fertilizer in paddy by farmers during *Kharif*, 2020

Nutrient (kg/ha)	Khammam	Nalgonda / Suryapet	Nagarkurnool / Mahaboobnagar	Rangareddy / Vikarabad
Ν	131 - 137	165 - 200	195 - 210	120-160
P_2O_5	62.5-67.5	50 - 60	112.5- 150	75-115
K ₂ O	30–75	15 - 20	15 - 22.5	25-40

The data collected from randomly selected farmers in the surveyed villages.

B.6: Manures and organic amendments

Majority of the farmers (40-50%) were growing the green manure crops *viz.*, *Crotalaria* and Sunhemp preceding to rice in the surveyed villages. Majority of the farmers opined that, the timely availability of green manure seed is the major issue being faced by them. Across the districts surveyed, sulphide injury, 'Zn' deficiency, salinity or alkalinity was found to be the major abiotic problems noticed and their intensity is increasing several folds due to mono-cropping of rice, improper drainage system and excess usage of inorganic fertilizers.

B.7: Methods of planting

In all the surveyed districts, majority of the farmers adopted random or zig-zag planting method, which was found to be the common practice. Direct seeding with drum seeder, wet-DSR under puddled conditions or direct seeding using seed cum ferti drill or broadcasting and machine planting are gaining popularity among the progressive farmers in Khammam, Warangal, Jagtial, Nizamabad, Suryapet, Nalgonda and Peddapalli, in view of scarcity of labour. The transplanting cost across the surveyed districts was ranging from Rs. 3500-5500/- per acre. The machine planting is not picking up in all the districts of Telangana State due to higher prices of the machines, untimely availability of machine and difficulty in raising of nursery. During the visit, the team visited different methods of establishment of paddy (Drum seeder, seed cum ferti drill, machine planning, broadcasting and sagguna method of planting) at Pusulapadu village of Madgulapally (Sri. P. Ramulu, Mobile: 9866538548). The plant population in drum seeder and machine planting is good. The cost for machine planting is Rs.2200 per acre and manual transplanting in the village ranging from Rs. 3000-3500/-. Large scale adoption of paddy establishment method *i.e.* drum seeder was visited by the team at Cheruvupally (v) of Madgulapally (m). A total of 400 acres of paddy was grown using drum seeder method of establishment. The seed rate used for drum seeder is 7-8 kg per acre for fine grain varieties, 10-12 kg per acre for coarse grain varieties. A total of 40-50 drum seeder are available in the village. 3 acres will be sown with drum seeder by 2 persons in a day.

B.8: Dry converted wet rice & Dry-DSR:

The POS team also visited the crop cultivated under dry converted wet rice and dry DSR in Wyra and Sathupalli divisions of Khammam district. Dry converted wet rice cultivation is an alternative method to the conventional method of transplanted rice which could avoid late transplantings in view of delayed monsoon rains and availability of water in tanks/ canals commands. Dry-direct seeding (D-DSR) is gaining momentum as a pathway to address multiple problems of labour scarcity, raising water levels and to enhance system substantiality.

B.9: Planting density

A plant population of 15-23 hills/m² is generally maintained in majority of the fields, irrespective of the variety and planting time. Overall, less plant population was observed across the districts surveyed except in Nalgonda district where the plant populations is comparatively more (20-26 hills / m²) during *rabi*, 2020-21. The reason for low plant population in farmer fields is due to that, the transplanting activity was given to team of laborer's for one acre as a bulk (*guttha*). The plant population is more in dry converted wet rice in Khammam district. This situation is inevitable and therefore there is a need to identify varieties with high tillering ability to compensate to low plant population density in farmers fields.

B.10: Intensity of weeds

Weed intensity was in the range of low to medium in transplanted rice in all the major rice growing areas, whereas the weeds are becoming more problematic in dry converted wet rice, wet and dry DSR. The predominant weed flora includes *Echinocloa colanum*, *E. crusgalli, Cyandon dactylon, Cyprus rotundus, Leersia hexandra, Panicum ripens, Euphorbia spp. and Parthenium spp.* As per the farmers feedback, the diversity in weed flora was observed from the last 3-4 years. In the initial years of dry converted wet rice, the weed population was less, whereas drastic change in the weed flora was noticed during 2020-21. As per the farmers opinion, control of weedy rice is becoming difficult with many herbicides. Among the several herbicides available in the market, Basagran (Bentazone) is found to be best herbicide for control of weedy rice.

B.11: Method of weed control:

The farmers in the surveyed districts are using various pre and post-emergence herbicide molecules depending upon the availability in the districts. Non-availability of labourer's for manual weeding enforced the farmers to use herbicide molecules for management of weeds in rice. In few districts, farmers are taking up manual weeding at 25-35 DAT in all the surveyed districts. Under problematic soils, the farmers are taking up inter-cultivation to create aeration at root zone around 30-45 DAT.

The team observed that, the farmers are spraying / mixing the 2-3 herbicides their own combination for control of weed flora. Weed population was more in wet DSR compared to normal transplanted crop. Most commonly used herbicide in this system is Penoxsulam 1.02% + Cyhalofop-butyl 5.1 w/w OD (Repivox / Vivaya) @ 1000 ml + Almix @ 8 g per acre or Bispyribac Sodium 10%SC @ 100-125 ml + Almix @ 8 g at 18-20 days after sowing. Few farmers are spraying the excess dose of herbicide especially Bispyribac Sodium @ 125-130 ml per acre and drying of leaf tips were observed due to excess dose of herbicide toxicity. The farmers are also using the new herbicide molecule *i.e.* Bentazone 480 G/L (Basagran) @ 800 ml per acre which is selective post emergence herbicide recommended for control of sedges and broad leaf weeds in transplanted rice. Some of the farmers even spraying 2-4D @ 50 g per acre along with other herbicides for control of weeds. The cost on weed management in drum seeder, dry converted wet rice, Wet -DSR and Dry-DSR was ranging from 3000-5000 per acre in Nalgonda and Khammam districts. As per the farmers feedback from Cheruvupally village of Madgulapally (m), Nalgonda district, the combined application of herbicides *i.e.* Assert + nomnigod and also Vivaya were found to be the effective herbicide for control of weeds in drum seeder.

Pre / Post	Herbicides used by the farmers
Emergence	
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 g (mixed with 500 ml of water) within 3 to 5 days of
	transplanting.
	Dry converted wet rice: Pendimethalin @ 1.0 lit/acre or Pyrazosulfuron ethyl 10%

The most commonly used herbicides in nursery and main field are listed below:

Pre / Post	Herbicides used by the farmers				
Emergence					
	WP @ 60-80 g per acre after sowing.				
Post-Emergence	Pyrazosulfuran ethyl @ 80-100 g/ acre at 8-12 DAT or Bensulfuron methyl +				
	Pretilachlor @ 4 kg /acre at 3-5 DAT. 2,4- D SS@ 400 g / acre at 20-25 DAT to				
	control broad leaved weeds or Bispyribac sodium @ 100 ml/acre at 20 DAT to				
	control both grassy and broad-leaved weeds.				
	Dry converted wet rice: Bispyribac sodium @ 100-120 ml/acre, Penoxsulam 2.7%				
	@ 400 ml per acre (Assert) or Penoxsulam 1.02% + Cyhalofop-butyl 5.1 w/w OD				
	(Repivox / Vivaya) @ 1000 ml + Almix @ 8 g or Bentazone 480 G/L (Basagran)				
	@ 800 per acre at 18-25 DAT.				

B.12: Inputs (Seed, fertilizers and farm implements)

Majority of the farmers (90-95%) are purchasing the seed from local dealers, TSSDC, HACA, PACs, Department of Agriculture and Research Stations. Only few farmers (5-10%) in the surveyed villages are using their own seed. In the surveyed districts, the rice crop is grown under wells / bore wells (60%) and remaining are through canal water and tanks (40%). Electric motors were being used by all the farmers (98%) in the surveyed districts. During the survey farmers have expressed that there was no scarcity of power in the villages due to the intervention of Govt. of Telangana in providing 24 hours continuous power supply. Majority of the farmers have expressed their satisfaction that sufficient quantities of fertilizers and pesticides were made available timely through local input dealers, PACs and other agencies under the supervision of MAOs at mandal / ADAs at divisional level. Majority of the farmers are asking for supply of farm implements on subsidy basis through Dept. of Agriculture.

C. Insect-Pests & Diseases

The pest scenario in rice cultivation has been assessed during *kharif*, 2020 and *rabi*, 2020-21 in response to adoption of new varieties, cultivation practices and pest control methods being followed. The perusal of insect-pests incidence data collected across the surveyed districts, BPH was severe in Sangareddy (5-25%), Nagarkurnool (10-20%) and Peddapalli (15-20%). Overall, BPH incidence was low across the districts surveyed except few isolated patches. The reason for low incidence of BPH in the surveyed districts is due to high rainfall during *kharif*, 2020 especially September and October, 2020. It was observed that, majority of farmers in Nizamabad and Kamareddy are adopting the provision of alleyways for management of BPH followed by Nalgonda district. As a prophylactic spray, majority of farmers had sprayed the Pymetrozine @ 120 g or Pexalon @ 80 g or Dinotefuron 20% SG for control of BPH in paddy.

Incidence of rice yellow stem borer ranged from 1-15% across the districts with maximum incidence reported from Sangareddy (1-15%), followed by Nizamabad, Rajanna Sirisilla, Ranga Reddy and Jagtial (5-15%). Overall, Stem borer incidence was less in all the districts surveyed. Majority of the farmers (80-90%) in the surveyed districts are applying the Carbofuron 3G @ 10 kg or Cartaphydro Chloride 4G @ 8 kg or Chlorantraniliprole 0.4G @ 4 kg per acre at 18-25 days after transplanting. This has become a regular practice observed among the farming community across the districts surveyed. Overall, the gall midge incidence was moderate to severe in late planted situations across the district. As per the farmers feedback, the incidence of gall midge was severe at Thallada division of Khammam district. The farmers applied granules in nursery as well as in main field, but the incidence was not controlled. It was observed that, the farmers sprayed the Carbosulfan 25%EC @ 400 ml per acre to control the gall midge. As per their feedback, none of the chemicals were found effective against the gall midge. The severe incidence (40-50%) of gall midge was recorded at Pothangal (v), Gandhari (m) of Kamareddy district during *kharif*, 2020 followed by Warangal rural (10-40%) and 5-15% gall midge incidence was recorded in remaining

districts. During *rabi*, 2020-21, the incidence of gall midge (20-30%) was recorded in Cintoo variety (Pvt. Var.) at Parvathipuram (v) of Nidamanuru (m) of Nalgonda district.

The incidence of leaf folder was severe in Khammam district ranging from 5-25% followed by Warangal Rural (10-20%) at maximum tillering stage to boot leaf stage. The peak incidence was observed during II F.N. of August, 2020 in the surveyed districts. The panicle mite incidence was ranging from 5-15% in Nizamabad, Kamareddy, Peddapalli, Jagtial and Sangareddy districts. During *rabi* season, the incidence of whorl maggot is increasing across the districts of Telangana state

S. No.	District	BPH	YSB	Panicle	Gall midge	Rice	Leaf folder		
				mite		hispa			
1.	Nizamabad	5-15%	5-15%	10-15%	5-10%	-	-		
2.	Kamareddy	1-5%	-	10-15%	40-50%	-	-		
3.	Rajanna Siricilla	-	10-15%	-	10-15%	-	-		
4.	Peddapalli	15-20%	5-10%	10-15%	-	-	-		
5.	Jagtial	-	10-15%	10-15%	15-20%	-	-		
6.	Warangal (R)	5-10%	-	-	10-40%	-	10-20%		
7.	Sangareddy	5-25%	1-15%	5-15%	-	-	-		
8.	Khammam	10-15%	-	-	10-15%	-	5-25%		
9.	Rangareddy	-	1-15%	-	-	1-5%	1-6%		
10.	Vikarabad	1-5%	1-5%	-	-	-	-		
11.	Nagarkurnool	10-20%	1-8%	-	-	-	5-10%		
12.	Mahaboobnagar	-	5-10%	-	-	-	-		
13.	Nalgonda	-	1-10%	-	20-30% (R)	-	-		
14.	Suryapet	5-10%	1-5%	-	-	-	-		

Table 7: District wise insect-pest damage recorded during Kharif, 2020 and Rabi, 2020-21

Source: The data presented in the table is incidence of insect-pests and diseases in the surveyed farmer fields. The incidence of pests and diseases may vary from village to village in the respective districts. The information also collected from concerned district ADAs, MAOs, AEOs and farmers interaction. Note: BPH: Brown Plant Hopper; YSB: Yellow Stem Borer

Among the rice diseases, false smut is becoming as major problematic disease in Telangana state during *kharif*, 2020 due to heavy rains during September and October months coinciding the flowering stage of the crop in majority of the districts. The incidence of false smut was ranging from 1-60% in the surveyed districts. The maximum incidence (60%) of false smut was recorded in isolated patches at Nanak Nagar village of Yacharam mandal of Ranga Reddy district. The crop was completely damaged due to false smut. The incidence was reported in all the surveyed districts except Vikarabad district because the team visited the flowering stage of the crop at Vikarabad. Hence, the data was not recorded. Overall, the incidence was severe in all the surveyed districts compared to *kharif*, 2019.

The farmers are aware of false smut disease and its prophylactic measures for the management of disease during flowering stage. However, they are unable to spray the fungicides during flowering stage due to heavy rains in the surveyed districts. In contrast, none of the farmers aware of favorable weather conditions and prophylactic measures for control of false smut in paddy at Nanak Nagar and Thadiparthy villages of Ranga Reddy districts. The team was observed that, the incidence of false smut was less in coarse grain variety as compared to fine grain variety. The reason for severe occurrence of false smut is due to heavy rains coinciding with flowering stage of the crop favours development of false smut at milky to grain hardening stage.

The maximum incidence of BLB was recorded at RARS, Warangal (60-70%), followed by Nagarkurnool (5-40%) and Nizamabad (10-40%). The incidence was also noticed in isolated patches in Khammam (10-

20%), Jagtial and Kamareddy (10-15%). The incidence of BLB was noticed during II FN of August, 2020 and September, 2020 in the surveyed districts is due to heavy rains favored the development of BLB. Among all the varieties examined, BPT 5204 has succumbed to severe BLB infection with disease score ranging from 5-7 on 0-9 scale at Khammam district followed by HMT Sona and Jaisreeram. The farmers have sprayed the COC @ 30 g/l + Plantamycin @ 0.3-0.5 g/l for control of BLB.

Reasons for high incidence of BLB during kharif, 2020

- Continuous cultivation of BLB susceptible varieties (BPT 5204, HMT Sona and Jai Sreeram) during *kharif* season.
- The BLB infection-initiated coinciding with rains received from II F.N of August, 2020. High humidity (81-100%), intermittent rains prevailed during II F.N of August and September, 2020 coupled with top dressing of high doses of Urea @ 60-70 kg/acre aggravated the spread of the BLB in the rice fields.

Neck blast incidence was ranging from 5-60% in the surveyed districts during *kharif*, 2020. Severe incidence of neck blast was recorded in Sangareddy (5-60%) in MTU 1010 followed by Peddapalli (5-20%) and Rajanna Siricilla (10-15%). The incidence of sheath blight ranged from 1-30% across the districts surveyed, whereas severe incidence of sheath blight was noticed at Nagarkurnool (20-30%) followed by Nizamabad (20-25%) and Khammam (10-20%) and Vikarabad (1-10%). Grain discolouration was ranging from 1-15% in the surveyed districts.

				J /	/	
S. No.	District	BLB	NB	ShB	FS	GD
1.	Nizamabad	10-40	-	20-25	20-25	-
2.	Kamareddy	10-15	-	-	10-50	-
3.	Rajanna Siricilla		10-15	-	10-30	10-15
4.	Peddapalli	-	5-20	-	5-15	5-10
5.	Jagtial	10-15	-	-	30-40	
6.	Warangal (R)	60-70	-	-	10-15	
7.	Sangareddy	-	5-60	-	1-15	1-15
8.	Khammam	1-20	5-50 (LB)	10-20	1-15	-
9.	Rangareddy	-	1-45 (LB)		5-60	5-10
10.	Vikarabad	-	-	1-10%	-	-
11.	Nagarkurnool	5-40	-	20-30	5-10	5-15
12.	Mahaboobnagar	-	-		5-20	5-10
13.	Nalgonda	-	5-15 (LB)	-	5-15	_
14.	Survapet	-	-	-	5-10%	-

Table 8: District wise diseases (%) recorded in paddy during Kharif, 2020 and Rabi, 2020-21

Note: BLB: Bacterial Leaf Blight; NB: Neck Blast; ShB: Sheath Blight; FS: False smut; GD: Grain discolouration.

RICE BLAST DURING RABI, 2020-21 IN TELANGANA STATE

Based on the information received from DAATTCs, KVKs, Department of Agriculture, Govt. of Telangana, Scientists from Research Stations, severe incidence of leaf and neck blast was reported in Telangana state. The incidence of was observed in all the coarse varieties grown by the farmers during this season. The leaf blast incidence was observed in moderate to severe only in isolated patches at Jafarguda village of Abdullpurmet mandal, Yengaguda, Nagampally villages in Ibrahimpatnam mandal of Ranga Reddy district, Armoor division of Nizamabad, Raghunathapally of Janagoan, Yadadri Bhuvangiri, Warangal Rural, Nalgonda, Luxettipet, Jaipur and Dandepally mandals of Mancheriyal, Gangadhara mandal of Karimnagar. The incidence was reported from last week of January, 2021 onwards and was severe during February and March, 2021. The POS team visited the Nalgonda and Khammam district on 25.01.2021 and 23.02.2021 respectively to assess the blast incidence in farmers' fields. The scientists

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from DATTCs and KVKs from Warangal, Kampasagar, Rudrur, Bhuvangiri, visited the farmer fields and suggested control measures to farmers and through print and electronic media.

The prevailing weather conditions during last week of January and I FN of February, 2021 *i.e.* low night temperature (9.1 to 11°C) and high humidity (89-95%) and application of high doses of nitrogenous fertilizers favored the incidence of blast in different districts of Telangana state. The actual night temperature recorded during II FN January, 2021 to first week February, 2021 is ranging from 9.1 to 11.0°C, whereas the normal temperature during the above was ranging from 15.1 to 19.0°C and difference between the normal and actual night temperatures is 5°C coupled with high RH are the key factors favored for severe incidence of leaf blast and cold injury across the state. Among the fungicides, majority farmers are spraying the Picoxystrobin + Tricyclazole @ 400 ml or Trifloxystrobin + Tebuconazole @ 80 g or Isoprothiolane @ 300 ml or Tricyclazole + Mancozeb @ 500 g per acre for control of leaf blast. Drying the paddy field up to formation of hairline cracks also aggravated the severe incidence of leaf blast was increasing in few districts of the state and farmers are taking up the spraying with fungicides to control the spread of the disease.

The team also identified the hot spot locations for leaf blast in farmers fields *i.e.* Gangadhara mandal of Karimnagar district. Severe incidence of leaf and neck blast also reported in Gangadhara mandal during *rabi*, 2019-20 and leaf blast during 2020-21. The farmers in this mandal are growing the coarse grain varieties like MTU 1010, JGL 24423, KNM 118, MTU 1153, MTU 1156 and other private company varieties. The reason for severe incidence of leaf blast is mainly due to highly favorable weather conditions (temperature and RH) and agronomic practices being adopted by the farmers. Alert message on rice blast was prepared and circulated to print and electronic media, Agril. Department and farmers groups. YouTube module will be prepared with the help of Electronic Wing, PJTSAU and will be posted in PJTSAU YouTube channel for wide publicity among the farming community. The extension functionaries are creating the awareness on symptoms of leaf blast and cold injury in paddy and its management through print and electronic media and WhatsApp group messages.

Leaf Blast incidence at Ranga Reddy and Khammam during Rabi, 2020-21

The severe incidence of leaf blast (7-9 score) was recorded at Jafarguda, Yangalguda and Nagampally villages of Ranga Reddy district in KNM 118, JGL 24423 and other private varieties. The incidence of blast was observed in timely planted crop (*i.e.* Nursery sowing during II FN November, 2020 and planting during II FN December, 2020) at 35-45 days age old crop (Maximum tillering stage). The paddy crop planted during January, 2021 was free from leaf blast, but severe incidence of stem borer (Dead hearts, 10-15%) was observed. At Marlapadu village, severe incidence of leaf blast (20-50%) was observed in isolated patches in this season (Sri. P. Ramakrishna Reddy) in MTU 1010. So far, the farmer not sprayed any chemicals for control of leaf blast. The incidence blast was increased due to drying of field. The incidence was observed in adjacent fields of other farmers. It was suggested to take up the spraying with Tricyclazole + Mancozeb @ 500 g or Picoxystrobin + Tricyclazole @ 400 ml per acre.

C.1: Pesticide application equipment

Taiwan / Power sprayer and hand operated pneumatic sprayer were most commonly used pesticide spraying equipment in all the surveyed districts. Tractor mounted sprayers were used for spraying of pesticides in paddy especially at Nalgonda, Jagtial, Karimnagar, Nizamabad, Kamareddy and Warangal. The farmers were hiring the Taiwan sprayer and tractor mounted sprayers. Majority of the farmers are spraying the 80-150 liters of spray fluid per acre. The farmers are also using battery operated sprayers. It was observed that, spraying of pesticides using drones were noticed at Khammam and Sangareddy districts on outsourcing basis without permission from DGCA. Normal recommendation of pesticides per acre was used with drone spraying. The cost for spraying of pesticides using drones per acre was ranging from Rs. 400-500 per acre and spray fluid used per acre was 10-20 liter per acre.

C.2: Total no. of pesticides sprayed in the crop season

Majority of the farmers have sprayed 1-3 times during *kharif*, 2020 in all surveyed districts. The team clearly observed that, majority of the farmers have not sprayed fungicides at flowering stage even though rainfall occurred during flowering to milky stage. The farmers said that due to continuous rains farmers were unable to takeup spraying of fungicides at flowering to milky stage. During *rabi*, 2020-21, the severe incidence of leaf blast enforced the farmers to spray the fungicides for 3-4 times. It was observed that, majority of farmers (90-95%) are mixing the insecticide + fungicide or two insecticides at a time. A common practice of application of Carbendazim 25% + Mancozeb 50% WS @ 2.5-3.0 g per kg of urea was observed in the surveyed districts during *kharif* and *rabi*, 2020-21 for control of sulphide injury and stem rot of rice. It is also noticed that, spraying of Propineb 70% WP @ 3 g per liter at 20-25 DAP is a common practice in Nizamabad and Kamareddy districts.

S .	Insect-pests	Chemicals used
No.	/diseases	
1.	Gall midge	Carbofuran 3G, Carbosulfan 25% EC
2.	Stem borer, Hispa, whorl maggot and leaf folder	Nursery to Tillering stage: Carbofuran 3G, CartapHydro Chloride 4G, Chlorantraniliprole 0.4G, Fipronil 0.3%G, Flubendiamide 0.7%G Chlorpyriphos 50%EC + Sand PI to Booting stage: Chloranthraniliprole 18.5 SC (Coragen), Cartap Hydrochloride 50% WP, Chlorantraniliprole 9.6% + Lambda cyhalothrin
		4.6% (Ampligo), Flubendiamide 39.35 SC, Acephate 75 SP. Chlorpyriphos 50%EC and 20%EC, Thiamethoxam + Chlorantraniliprole (Virtako)
3.	BPH	Buprofezin, Acephate 75 SP and 95SG, Phenthoate, Dinotefuran 20% SG (Token/Osheen), Imidacloprid + Ethiprole 80WG, Acephate 50% + Imidacloprid 1.8% SP (Lancer Gold), Pymetrozine (Chess), Triflumezopyrim 10% SC (Pexalon), Thiamethoxam + Chlorantraniliprole (Virtako), Imidacloprid 40% + Fipronil 40% (Lacenta)
4.	Leaf/panicle mite	Dicofol, Propargite and Spiromesfin
5.	Blast (Leaf and	Tricyclazole 18% + Mancozeb 64%WP (Merger/Trozole), Isoprothiolane
	Neck blast)	40%EC, Kasugamycin 3%L, Kresoxim methyl 44.3%SC, Picoxystrobin 6.78% + Tricyclozole 20.33% SC (Galileo Sensa/Salsa/Fanton), Propiconazole 10.7% + Tricyclazole 34.2% SE (Filia/Slogan), Pyraclostrobin 100 g/L (Seltima), Azoxystrobin 12.5 + Difenoconazole 11.4% SC, Azoxystrobin 16.7% + Tricyclazole 33.3% SC
6.	Sheath Blight	Hexaconazole 5%EC, Propiconozole 25%EC, Validamycin 3%L, Tebuconazole + Trifloxystrobin (Nativo). Azoxystrobin + Tebuconazole (Custodia), Picoxystrobin 7% + Propiconozole 12%SC (Galileo Way), Thifluzamide 24%SC (Pulsor), Propiconozole 10.7% + Tricyclozole 34.2% SE (Filia), Captan 70%+Hexaconazole 5% WP (Taqat), Carbendazi, 25% + Flusilazole 12.5% (Lusture), Flupyroxad 62.5 g/L + Epoxiconazole 62.5 g/L EC
7.	BLB	Copper oxy chloride + Plantamycin or Paushamycin or Crocin or Agrimycin; Kasugamycin 5% + Copper Oxychloride 45% (Conika)
8.	Stem rot	Validamycin 3%L, Propiconazole 25%EC, Hexaconazole 5%EC, Iprobenphos 48%EC, Carbendazim 25% + Mancozeb 50% WS (Sprint)
9.	Sheath rot and GD	Propiconozole 25% EC, Carbendazim 12% + Mancozeb 63% WP (Saaf),
10.	False smut	Propiconazole 25% EC, Carbendazim 12% + Mancozeb 63% WP (Saaf), Trifloxystrobin + Tebuconazole (Nativo)

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

C.3: Mixing of different pesticides and spraying of Bio's for the management of pests and diseases

Majority of the farmers in surveyed districts were mixing at least one insecticide and fungicide compulsorily while others are using cock-tail mixtures of various molecules in different proportions without knowing the compatibility of the molecules. It was also observed that, the input dealers are giving the nutrients / poshak formulations along with pesticides. It is a regular practice observed in all the districts surveyed. In Khammam, Warangal, Mahabubabad, Badradri-Kothagudem, the use of bios for control of insect-pests and diseases were observed.

The following are the common cocktail mixtures pesticides and bios being used by the farmers

- 1. Pymetrozine + Isoprothiolane
- 2. Isoprothiolane + Chlorantraniliprole + Acephate
- 3. Chlorantraniliprole + Acephate + Propineb
- 4. Chlorpyriphos + Acephate + Saff (Carbendazim + Mancozeb)
- 5. Buprofezin + Acephate + Tricyclozole
- 6. Cartap hydrochloride + Tricyclozole
- 7. Cartap hydrochloride + Spiromesfin
- 8. Profenophos + Acephate + Saff
- 9. Lambda Cyhalothrin + Acephate
- 10. Propiconazole + Chlorantraniliprole
- 11. Cartaphydro Chloride + Isoprothiolane

The points emerged during the POS, *Kharif*, 2020 and *Rabi*, 2020-21, which needs immediate attention:

- False smut, BLB, BPH and Blast are the common problems in Telangana state causing substantial yield losses in paddy every year. Majority of the farmers are asking for development of False smut, BLB, Blast and BPH tolerant fine grain varieties with Jai Sreeram grain type.
- Farmer are seeking information on different methods of crop establishment in rice (Dry-DSR, Wet DSR, Dry converted wet rice, Drum seeder and MSRI)
- Farmers have also sought information on compatibility of insecticides and fungicides and chemicals for control of false smut.

Needs of the stakeholders:

- > Improvement of Telangana Sona for lodging tolerance and BLB resistance
- Development of high yielding multiple resistant varieties having BPT 5204 and Jai Sreeram quality and duration.
- > BPH tolerant fine grain varieties with 130-135 days duration.
- Development of multiple resistant hybrids particularly for BPH/ YSB / blast /BLB / sheath rot / grain discoloration.
- Standardization of protocols for use of drones in agriculture for plant protection.
- Supply of leveling machinery, transplanters, power weeders suitable for mechanized planting / direct seeding through custom hiring centers.
- Farmers are asking for post-harvest mechanization especially for drying of paddy immediately after harvest (broilers / dryers). They are not getting the space and time for drying of the *kharif* harvest.

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

- ➤ Labour scarcity during peak time of field operations.
- Minimum support price
- Drum seeder with different spacing's, fertilizer applicator, machine planting, power weeders, drones for spraying of pesticides, reapers, threshers, combine harvesters and bagging machines are essentially needed on subsidized rates.

D. Cost of Cultivation

The cost incurred for cultivation of paddy / acre was computed by using sampled farmers in the surveyed districts was ranged from Rs. 20,000 to 30,000/-. More expenditure was incurred on a long duration and susceptible variety like BPT 5204 and less on medium / short duration resistant variety like Telangana Sona, KNM 118 and Jagtial rice-1. Due to lodging of the crop inincrease in harvesting costs was observed. For instance, due to lodging, chain harvester price was increased to Rs. 3000 per hour (Rs. 2000 for normal field) in Jagtial and Karimnagar districts. Harvesting time per acre increased due to lodging of the field and it took one to one and half an hour extra time for harvesting an acre.

	1 1	0
S. No.	Name of the district	Cost of cultivation (per acre)
1.	Nizamabad and Kamareddy	20,000 - 28,000
2.	Peddapalli	22,000 - 25,000
3.	Jagtial & Rajanna Siricilla	25,000 - 30,000
4.	Mahaboobnagar and Nagarkurnool	19,000 - 25,000
5.	Suryapet	22,000 - 30,000
6.	Khammam	22,000 - 28,000
7.	Sangareddy	20,000 - 20,000
8.	Warangal Rural	20,000 - 28,000
9.	Nalgonda	22,000 - 25,000

Cost of cultivation of paddy in different districts of Telangana state

E. Harvesting

Majority of the farmers are harvesting the paddy using combined harvester. The cost of harvester was increased drastically during *kharif*, 2020. Due to lodging the crop, harvesting also increased (One and half hour to 2 hours per acre). The cost of harvesting per acre was ranging from 2200 to 3500 per acre. The information collected from farmers on use of paddy bailer for preparation of straw bundles revealed that, aprox. 40 bundles will be realized from one acre and cost of each bundle ranging from Rs. 45-50 including transport and bailer charge. As per the farmers feedback, the paddy yields recorded during *vanakalam*, 2020 in different districts ranging from 18-26 quintals per acre for fine grain varieties. The yields were drastically reduced due to heavy rains, lodging and severe incidence of false smut in Raga Reddy district.

F. Farmers outreach programmes

In order to forecast the incidence of pests and diseases in rice, Principal Scientist (Rice), PJTSAU, Rice Research Centre, Rajendranagar, has given **14 alert messages and 5 YouTube modules (PJTSAU YouTube channel)** to farmers, Commissionerate, Dept. of Agriculture, DAATTCs, KVKs, NGOs and wide publicity was given through print and electronic media. During the POS team visit to different districts, PS (Rice) & Head, RRC, ARI, Rajendranagar addressed the print and electronic media, to alert the farmers encountering similar problems in the respective districts. The farmers were receiving advices on fertilizer and pesticide recommendations through concerned AEOs, MAOs, Scientists of DAATTCs, KVKs and Research Scientists and input dealers. However, the progressive farmers are managing the crop based on self-experience by timely application of fertilizers / pesticides or following the recommendations of university vyavasaya panchangam / Annadata and other publications. Now a days, farmers are uploading the photographs of pest or disease infected field / plants to the scientists / MAOs through Whatsapp for suitable control measures and remedial measures are being suggested by scientists.

Telangana-2-2020-2021(Jagtial)

Districts surveyed: Jagtial, Karimnagar, Nizamabad, Kamareddy and Rajanna Siricilla

Districts	Mandals	Villges		
Jagtial	Sarangapur, Ibrahimpatnam,	Rechapally, Ammakapeta, Mula Rampur,		
	Korutla, Raikal, Korutla,	Vempet, Ammakapeta, Singarayapeta, Allipur,		
	Jagtial and Kathalapur	Arpapally, Madhapur, Nagulapet, Aekinpur,		
		Battepally Potaram, Sarangapur, Muthyampeta,		
		Regunta, and Bhushanraopet		
Karimnagar	Gangadhara, Hujurabad,	Ramadugu, Puduru, Sirsapally, Kanukula Gidde		
	Shankarapatnam and	Potireddypeta, Venkatraopet, Kannapur and		
	Manakondur	Srinivasanagar		
Nizamabad	Varni and Rudrur	Varni and Ranampalli		
Kamareddy	Gandhari	Timmapur, Medipally, Chinnapotangal, Nerella		
		Tanda, J.K. Tanda and Rampur gadda tanda		
Rajanna	Boinpalli and Chandurthi	Tadagonda and Mudapalli		
Siricilla				

 Table 1: Details of survey

Table 2: Widely prevalent rice varieties

District	Variety
Jagtial	BPT-5204, Jai sriram, Jai Sriram Gold, MTU1010, KNM-118, Kaveri
	Chintu, Telangana Sona (RNR 15048), JGL24423, Devi, IR-64,
Karimnagar	MTU 1010, Jai Sriram, Telangana Sona (RNR 15048), BPT 5204, Jai
	Sriram Gold, JGL 24423, KNM 118, Super 64, Super sona, Swathi Gold,
	Sun Amani, and HMT Sona
Nizamabad	Batukamma, Telangana Sona (RNR 15048), BPT 5204, GK Chetana,
	GK Kaveri, Super Aman, IR 64, JGL 24423, KNM 118, MTU 1010,
	MTU 1153, MTU 1156 and RNR 10754 (Tella Hamsa)
Kamareddy	Batukamma, Telangana Sona (RNR 15048), BPT 5204, GK Chetana,
	GK Kaveri, Super Aman and IR 64
Rajanna Siricilla	MTU 1010, MTU 1153, MTU 1156, KNM-118, Jai Sriram, Telangana
	Sona (RNR 15048), BPT 5204, Jai Sriram Gold, JGL 24423, KNM
	1638, Super 64, Super sona, Swathi Gold, Sun Amani, and HMT Sona
	and Chintu

Table 3: 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)
Jagtial	2, 91,580	179229.2	96,046	1,04,254	2,30,021 (2 seasons)
Nizamabad	4,28,930	2,68,650	1,55,946	2,23,837	,38,683.232

				v				
Parameters/	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Districts								
Jagtiyal								
RD	7	15	16	7	9	0	0	0
TR (mm)	72.1	216.7	311.7	235.5	153.7	0.0	0.0	0
MMT	30.85	28.8	27.35	28.25	27.15	24.3	22.05	24.3
MMaxT	36.2	33.1	31.6	32.4	32.2	31.8	30.7	30.9
MMinT	25.5	24.5	23.1	24.1	22.1	16.8	13.4	17.7
SH	5.2	4.9	2.9	5.6	5.6	5.6	7.6	6.5
Karimnagar								-
RD	11	19	14	14	10	0	0	1
TR (mm)	195.8	265.7	535.4	246.5	104.9	22.4	6.0	9.0
MMT	30	29	28	29	27	25	22	23
MMaxT	39	35	35	34	33	33	31	32
MMinT	24	24	24	24	22	15	12	16
Nizamabad								
RD	15	21	17	16	8	0	0	0
TR (mm)	164.2	188.6	353.2	203.1	99.0	22.4	6.3	12.0
MMT	30	28	27	27	27	25	23	25
MMaxT	38	34	33	33	35	34	32	32
MMinT	23	23	23	23	21	15	13	17
Kamareddy								
RD	13	22	18	17	7	0	0	2
TR (mm)	173	277.4	316.6	304.8	111.5	24.1	7.3	8.9
MMT	29	26	26	27	26	25	23	25
MMaxT	36	32	33	34	32	30	29	32
MMinT	22	21	21	21	20	12	10	15
Rajanna Siricilla								
RD	12	20	14	15	9	0	0	2
TR (mm)	203.3	274.4	400.9	303.1	104.9	22.4	6.0	9.0
MMT	30	29	28	29	27	25	22	23
MMaxT	39	35	35	34	33	33	31	32
MMinT	24	24	24	24	22	15	12	16

 Table 4: Details of weather data in the surveyed districts

The Production Oriented Survey (POS) in rice growing areas Northern Telangana zone was conducted in 5 districts *viz.*, Jagtial, Karimnagar, Nizamabad, Kamareddy and Rajanna Siricilla covering major rice growing areas of Northern Telangana zone of Telangana state during Vanakalam (Kharif), 2020 and Yasangi (*rabi*), 2020-21. The details of the POS visits containing the names of the districts, mandals and villages covered during survey along with the list of the team members participated in POS are furnished in Table (1). The information on various aspects of rice cultivation viz., seasonal conditions, crop area coverage and item wise package of practices, abiotic/ biotic constraints and their management are discussed in the following headings. The information on the aforesaid aspects was collected from the progressive farmers, millers, seed producers, AEOs, MAOs, ADAs, DAOs and input dealers of the respective areas through interaction and participatory approach.

Table 5: General questions on rice cultivation in district (To be filled by the co-operator in consultation with
the Officials from State department of Agriculture)

Parameters	Districts				
	Jagtial	Karimnagar	Nizamabad		
Total area under HYVs in the district	2,62,583.85	66,822.4	596708.07		
Most prevalent HYVs in the district	MTU-1010	MTU1010	MTU 1010		
Total area under rice hybrids in the district	-	-	NA		
Most prevalent rice hybrids in the district	-	-	NA		
Total area under basmati in the district	95.25(acre)	-	NA		
Most prevalent basmati varieties in the district	Basmathi R 20	-	NA		
Seed replacement rate	100%	100%	100%		
Whether farmers are using any heavy equipments like transplanter/combine harvester	Transplanter/combine harvester	Transplanter/combine harvester	Transplanter and Harvesters		
Mention water saving technologies like SRI/laser levelling/DSR being used by the farmers	AWD	AWD, Direct seeded rice	DSR		
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	For management of leaf blast spraying of Tricyclazole@120 gram per acre	For management of leaf blast spraying of Tricyclazole@120 gram per acre	Yes, application of Agrimycin 4g per 10 liters of water for management of BLB		
What are the general problems in rice cultivation in the district?	 Pest and disease incidence Sulphide injury Zinc deficiency 	 Pest and disease incidence Sulphide injury Zinc deficiency 	Pest and disease attack, Labour shortage		
Please provide any farmers association in the district	Laxmipur Farmers' Cooperative Society	NA	Dherpally Intideepam MACS, Bichukonda Intideepam MACS		
Whether availability of agricultural labours is sufficient?	No	No	No		
Whether there is any marketing problem of the produce?	Till now no, but if Govt. stop to procure through IKP then there may be problems in the future	Till now no, but if Govt. stop to procure through IKP then there may be problems in the future	Yes		
Any major irrigation/power generation project in the district	SRSP canal	LMD	Sriramsagar		
Any soil testing program undertaken?	yes	yes	Department of Agriculture, TS		
Any farmers' training program was organized by the state department of Agriculture/University	yes	yes	Yes		

Table 5 contd General questions on rice cultivation in district (To be filled by the co-operator in consultation
with the Officials from State department of Agriculture)

Parameters	Districts			
	Kamareddy	Rajanna Siricilla		
Total area under HYVs in the district	98073.2 ha			
Most prevalent HYVs in the district	MTU-1010			
Total area under rice hybrids in the district	NA	-		
Most prevalent rice hybrids in the district	NA	-		
Total area under basmati in the district	NA	-		
Most prevalent basmati varieties in the district	NA	-		
Seed replacement rate	100%	100%		
Whether farmers are using any heavy equipments like transplanter/combine harvester	Transplanters and harvesters	Transplanter/combine harvester		
Mention water saving technologies like SRI/laser levelling/DSR being used by the farmers	AWD	AWD		
Whether survey team gave any	Spraying of Tricyclazole@ 0.6gper	For management of leaf blast		
advice to the farmers during survey? If yes, then what are those	liter of water for management of leaf blast disease	spraying of Tricyclazole@120 gram per acre Spraying of Zinc sulphate @2gper liter of water		
What are the general problems in rice	Labour shortage, pest and disease	1.Pest and disease incidence		
cultivation in the district?	attack and abiotic stresses like sulphide injury and zinc deficiency	 Sulphide injury Zinc deficiency 		
Please provide any farmers association in the district	Dharani FPO	NA		
Whether availability of agricultural labours is sufficient?	No	No		
Whether there is any marketing problem of the produce?	Traders sometimes, purchase the produce less than MSP	Till now no, but if Govt. stop to procure through IKP then there may be problems in the future		
Any major irrigation/power generation project in the district	Nizamsagar dam	SRSP canal		
Any soil testing program undertaken?	Yes	Yes		
Any farmers' training program was organized by the state department of Agriculture/University	Yes	Yes		

	Districts			
varieues/Hybrids	Jagtiyal	Nizamabad		
MTU 1010	1,32,400.38	210,207.06		
Jai Sriram	72,094.2			
Telangana Sona (RNR 15048)	15,437.39	1,503.38		
BPT 5204	10,585.04	5,002.21		
Jai Sriram Gold	9,925.31			
JGL 24423	9081.05			
Chintu	7137.15			
Ankur Sona	458.08			
Batukamma	613.08	296.07		
BPT 2595	503.18			
Daftari Shree 1008	640.12			
Divya	502.24			
HMT	4,356.18			
HMT SONA	3,336.19			
IR 64	823.21	1,185.20		
JGL 24423	9081.05	7,361.26		
Kaveri 468	438.34			
KNM 118	5923.33	7,680.17		
GK Chetana		50,697.31		
GK Kaveri		78,515.38		
Super Aman		540.37		
MTU 1153		1,517.27		
MTU 1156		3,626.20		
RNR 10754 (Tella Hamsa)	450.32	9,791.07		

Table 6: Variety/hybrid wise area cov	erage (ha) in different dis	tricts of Telangana during
2020		

A. General information

A.1: Weather Conditions

South-West Monsoon-2020:

The South-West Monsoon is crucial for the Agriculture sector. Rainfall received during the period from June to September, 2020 is 1078.3 mm as against the normal of 720.4 mm showing deviation of 50%, over all status being excess.

North-East Monsoon:

Normally, in Telangana State, 14% of annual rainfall is received from North-East Monsoon. The average normal rainfall of North-East Monsoon is 124.9 mm. During this week, actual rainfall received is 0.0 mm as against normal of 2.9 mm with deviation of -100%.

		Actual Rainfall			
Month	Month	Previous year	Current year	% deviation to	Status
	Normal	(2019-20)	(2020-21)	Normal as on date	
June,2020	129.2	87.1	172.8	34	Excess
July-2020	244.2	215.2	267.0	9	Normal
August-2020,	219.2	243.5	390.7	78	Excess
September-2020	127.8	245.6	247.8	94	Excess
SE Monosoon	720.4	791.4	1078.3	50	Excess
October,2020	95.5	162.0	170.9	79	Excess
November2020	23.9	7.7	8.5	-64	Scanty
December-2020	5.5	3.3	0.0	-100	Scanty
NE Monsoon	124.9	173.0	179.4	45	Excess
January 2021	6.8	6.2	1.9	-100	Scanty
February-2021	4.6	0.1	2.3	-50	Deficit
(01.02.21 to 24.02.21)					
Cumulative total	856.7	979.8	1261.9	47	Excess
(1.6.20 to 24.2.21)					

Table 7. Month wise rainfall received in Telangana State from 01-06-2020 up to 17.03.2021

Overall, the average rainfall received in Telangana State from 1.6.2020 to 24.2.2021 is recorded as 1261.9 mm as against the normal of 856.7 mm, showing a deviation of 47%.

Table 8. District	wise Status and	deviation of	rainfall during	the period from 0	1.06.2020 to
17.03.2021				-	

S.No.	Districts	No. of	Status &
		Districts	deviation
1	Peddapally, Jayashankar, Bhadradri, Mahabubabad, Warangal (R),	27	Excess (20% &
	Warangal (U), Karimnagar, Rajanna, Kamareddy, Medak,		above)
	Siddipet, Jangoan, Yadadri , Medchal, Rangareddy,		
	Vikarabad, Mahabubnagar, Jogulamba, Wanaparthy, Nagarkurnool,		
	Khammam, Mulugu, Hyderabad, Suryapet, Nalgonda Sangareddy		
	and Narayanpet.		
2	Adilabad, Komarambheem, Mancherial, Nirmal, Nizamabad and	6	Normal (+19%
	Jagtial		to -19%)
3	NIL	0	Deficit (-20% to
			-59%)
4	NIL	0	Scanty (-60% to
			-99%)
5	NIL	0	No rain (-100%)

Source: Department of Agriculture, Govt. of Telangana, Hyderabad

Date is provisional & Limits for deviation from Normal

Excess = (+20% & above), Normal = (+19% to -19%), Deficit= (-20% to -59%), Scanty==(-60% to -99%), No rain=(-100%)
S NO	Districts	Cumulative Rainfall (mm) from 01/06/2020 to 17/03/2021					
5.110	Districts	Actual	Normal	Deviation(%)	Status		
1	Adilabad	979.3	1156.7	-15	Normal		
2	Kumuram Bheem	1146.6	1155.7	-1	Normal		
3	Mancherial	1179.4	1115.9	6	Normal		
4	Nirmal	916.8	1096	-16	Normal		
5	Nizamabad	986.5	1009.8	-2	Normal		
6	Jagtial	1047.6	996.4	5	Normal		
7	Peddapalli	1296.5	1022.5	27	Excess		
8	Karimnagar	1393	856	63	Large Excess		
9	Rajanna Sircilla	1306.5	870.6	50	Excess		
10	Kamareddy	1197	992.5	21	Excess		
	State Average	1261.9	861.6	46	Excess		

 Table 9: Northern Telangana zone district wise Status and deviation of rainfall during the period from 01.06.2020 to 17.03.2021

Source: TSDPS, Govt. of Telangana, Hyderabad

A2: Crop coverage

In Telangana state, paddy is cultivated in an area of around **1,03,91,605** acres during kharif, 2020 and rabi, 2020-21. As against the normal area of 47,64,011, the actual rice area covered during kharif, 2020 was 53,33,477(196% increase over the NA) compared to 41,19,551 during kharif, 2019. During rabi, 2020-21 the crop is grown in area of 50, 58, 128 against normal rice area of 20,38,953 with an increase of 227.91 % over normal area (Table 10). The area during rabi season has increased by more than double the normal rice area in Telangana State due to enhancement of irrigation potential.

Table 10: District	Wise Normal	And Actual	Paddy A	reas (Acres)	During '	Vanakalam -	2020
and Rabi, 2020-21							

Name Of The District	Kharif,2020		Rabi	
	Normal	Actual	Normal	Actual
Jagtial	128606	283107	132648	140166
Karimnagar	118623	252957	131853	138923
Nizamabad	238140	386156	192616	209787
Kamareddy	124111	254527	92939	85044
Rajanna Siricilla	59891	148810	70677	75608

A3: Crop stage at the time of survey

First of its kind, the POS on rice was conducted both during kharif and rabi seasons in Nortern Telangana Zone. The roving survey was conducted in all the major rice growing areas, when the crop was from nursery, maximum tillering and booting to maturity stage.

A4: Crop rotation practiced

Rice – rice was the predominant cropping system in all the surveyed districts. The other systems found were green manure-rice-rice, rice- maize, rice –fallow, rice-rice –vegetables depending on the water availability and other factors.

A5: Varietal profile

The details of different rice varieties grown in different districts of Northern Telangana are presented in Table 2 and Table 6. The major varieties grown in the surveyed districts during kharif, 2020 were MTU 1010, Telangana Sona (RNR 15048), Jagtial Rice-1, Samba Mahsuri (BPT 5204), Jai Sreeram, HMT Sona, Kunaram Sannalu, Siddi, Bathukamma, IR 64, Chintu, MTU 1153, MTU 1156, MTU 1001 and Tellahamsa etc., whereas the private hybrids grown particularly in Karimnagar districts were OP-505 of siri seeds, KPH 412, KPH 272 (Kaveri seeds Pvt., Ltd.,), Champion (Nujiveedu Pvt. Ltd.,). The newly released rice variety JGL 24423 (Jagtial Rice-1) was gaining popularity among the farming community in the surveyed districts. Good feedback was received on JGL 24423 (Jagtial Rice-1) in terms of yield and non-lodging nature in all the surveyed districts. Telangana Sona, a short duration (125 days) fine grain variety was cultivated in an area of 15,437.39acres in Jagtial district and slowly replacing BPT 5204. Majority of the farmers preferred the Telangana Sona because of its short duration, super fine grain and blast resistance and suitability to late planted situations and relatively requires less water. May be due to heavy rains during PI to booting stage grain discoloration was noticed.

B. Crop Management

B1: Seed rate and source:

Majority of the farmers were using seed rate of 20-25 kg/acre for fine grain varieties, whereas 30 kg/acre for coarse grain varieties. The farmers purchased the seed from TSSDC and private dealers. It was also noticed during the POS that, the farmers are using the 5-10 kg/acre research paddy seed purchased from private companies.

B2: Seed treatment:

Upon interaction with farmers, it was noticed that, though, the farmers were aware of the seed treatment practice but not following it while nursery sowings. It was also noticed that few farmers were treating seed using <u>carbendazim @1g/kg</u> seed per liter of water by soaking over night. The farmers expressed that, it was difficult in treating seed sufficient for large acreage of area

B3: Sowing and Planting

In the surveyed district, the sowing and planting time varied from district to district depending on variety and release of canal water. In case of long duration varieties, majority of sowings were taken up in the month of June and plantings were completed by second fortnight of July particularly in Nizamabad district and it was delayed in other districts like Jagtial and Karimnagar. Majority of sowings were taken up during July and plantings were completed by August with medium and short duration varieties.

B4: Fertilizer application

The fertilizer use varied in the surveyed districts. The major source of fertilizers Nitrogen, Phosphorous and Potassium were 20-20-0-13, DAP, 10-26-26, 16-20-0-13, 17-17-17, 19-19-19, 28-28-0 and MOP. Majority of the farmers were using DAP or Complex fertilizers like, 20-20-0-13 as basal dose in all the surveyed districts. Nitrogen is being applied in 2-3 split doses as top dressing in the form of urea at 15-20 days after planting, during maximum tillering and panicle initiation to booting stage of the crop. Potassium is used in the form of MOP (25-50 kg/acre). Farmers are also applying Zinc sulphate in the form of chelated zinc sulphate as foliar application during tillering stage particularly during Rabi season.

B5: Manures and organic amendments

The green manure crops grown in the surveyed districts were *Crotalaria* and *Sesbania* species. Timely availability of green manure seed is the major issue being faced by them. The other amendments being done to soil by farmers were application of poultry manure, FYM. Sheep penning in paddy fields was also practiced by famers based on availability of the sheep heard.

B6: Methods of planting

The major method of planting in the surveyed districts were random or zig-zag planting method. Direct seeding with drum seeder under puddled conditions or direct seeding using seed cum ferti drill or broadcasting are gaining popularity among the progressive farmers in Jagtial, Karimnagar and Nizamabad districts. The machine planting is not picking up in all the districts of Telangana State due to higher prices of the machines, untimely availability of machine and difficulty in raising of nursery etc., the farmers were also expressed that the machine planted crop takes more time for establishment as compared to random planting and transplanting with machine was difficult in fields where the fields do not have straight bunds. In view of the labour shortage for transplanting during peak season, the machine planting is the best alternative to complete transplanting in time. In this connection, RARS, Jagtial, PJTSAU has conducted several demonstrations to farmers on machine planting and raising of mat nursery using polythene sheet, to create awareness among the farming community. The main aim of this programme was to encourage the farmers towards the machine transplanting.

B7: Weeds

Weed intensity of low to medium was observed in all the surveyed districts. The major weed species found in the surveyed districts were *Echinocloa*, *Cyandon*, *Cyprus*, *Leersia* and *Parthenium* spp.

B8: Weed management:

The farmers in the surveyed districts are using various pre and post-emergence herbicide molecules depending upon the availability. Scarcity of labourer's for manual weeding forced farmers to use herbicide molecules for management of weeds in rice. In addition to herbicide application, farmers were taking up manual weeding at 25-35 DAT in all the surveyed districts. Up on interaction, the farmers expressed that the manual weeding helps in well establishment of root system in paddy. Pretilachlor + safener@ 40 ml or Butachlor @ 50 ml or Pyrazosulfuron ethyl @ 5 g in 10 liters of water for five cents nursery and 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.

C. Biotic Stresses

The disease scenario in rice cultivation has been assessed during *vanakalam*, 2020 and Yasangi, 2020-21. The district wise disease scenario has been presented in Table 11. The incidence of False smut and grain discoloration was severe during Vanakalam, 2020. Majority of the farmers were not aware of the disease, particularly rainfall at flowering stage (September and October) which favores the incidence of false smut. Some of the farmers were knowing the disease and its favorable conditions but not able to apply correct fungicide in right time because of non availability fungicides due to lock down of the country due to COVID-19 pandemic.

The incidence of bacterial leaf blight started in Jagtial district in Arpally village of Sarangapur mandal on KNM-118 variety in the month of September, 2020. Though the disease appeared but it was totally under control in Jagtial district. Leaf and neck blast disease were under control but grain discoloration and false smut were had high incidence in farmer's field as well as in RARS, Jagtial. However, severe leaf blast (30-90%) was recorded on IR 64 in Tirupathireddy and Shankaravva villages in Jagtiyal district. Severe false smut and sheath blight were recorded in RARS, Jagtiyal. The incidence of bacterial leaf blight in rice was observed in BPT 5204 variety in Varni (V&M) of Nizamabad district and ranged from 40-100%. In Nizamabad district BLB disease started appearing during third week of August, 2020 in BPT-5204. In the Varni village where disease was very severe, the farmers applied chemicals 5 times. Severe brown spot (20-50%) was recorded in Potireddypeta village in Karimnagar district on BPT 5204. High incidence of stem rot (18-29%) was observed in some fields in Kanukula Gidde village in Karimnagar district. The incidence of different insect pests like stem borer, BPH and rice hispa were recorded in low to moderate intensities.

The chemicals applied were Lambda-cyhalothrin, Azoxystrobin+ Plantmycin, profenophos, Plantamycin+Copper oxychloride. for the management of BLB and BPH. The incidence of BLB was not observed in Kamareddy district where plantings were done late as compared to Nizamabad district. In the Kamareddy district leaf blast disease was in its initial stage of appearance. Severe incidence of BLB was observed in RS&RRS, Rudrur under natural inoculation conditions.

Bl	BS	ShBl	GD	FS	StR	BLB
L-S (3-	L (2%)			M-S		L-M (3-
90%)						13%)
L-M (4-	L-S (10-	L (10%)	L-M (5-		M-S (18-	
20%)	50%)		12%)		29%)	
L (5-8%)		M (13-				M-S (10-
		15%)				100%)
L (2-6%)						L (2-7%)
L-S (4-						
70%)						
	BI L-S (3- 90%) L-M (4- 20%) L (5-8%) L (2-6%) L-S (4- 70%)	Bl BS L-S (3- 90%) L (2%) L-M (4- 20%) 50%) L (5-8%)	Bl BS ShBl L-S (3- L (2%) - 90%) - - - L-M (4- L-S (10- L (10%) 20%) 50%) - - L (5-8%) M (13- L (2-6%) - - 15%) L-S (4- - - 70%) - - -	Bl BS ShBl GD L-S (3- L (2%) - - 90%) - - - - L-M (4- L-S (10- L (10%) L-M (5- 20%) 50%) - 12%) L (5-8%) M (13- L (2-6%) - - - L-S (4- - - - 70%) - - - - -	Bl BS ShBl GD FS L-S (3- L (2%) M-S M-S 90%) L L (2%) M-S M-S L-M (4- L-S (10- L (10%) L-M (5- 12%) L (5-8%) M 13- 15%) Image: March 13- Image: March 13- L (2-6%) Image: March 13- Image: March 13- Image: March 13- Image: March 13- L-S (4- Image: March 13- Image: March 13- Image: March 13- L (2-6%) Image: March 13- Image: March 13- Image: March 13- Image: March 13- L-S (4- Image: March 13- Image: March 13- Image: March 13- D-S (4- Image: March 13- Image: March 13- Image: March 13- L-S (4- Image: March 13- Image: March 13- Image: March 13- D-S (4- Image: March 13- Image: March 13- Image: March 13- D-S (4- Image: March 13- Image: March 13- Image: March 13- </td <td>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</td>	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$

 Table 11: Prevalence of diseases and insect pests in Northern Telangana during 2020-2021

Districts	SB	BPH	Rice Hispa
Jagtial	L (3%)	L (5%)	L (4-8%)
Karimnagar	L-M (5-20%)		
Nizamabad	L (4-6%)		
Kamareddy			
Rajanna Siricilla			

C. Abiotic Stresses

The abiotic stress being faced by farmers at field level were sulphide injury, nutrient deficiency, salinity or alkalinity. Zinc deficiency was recorded in many fields in Jagtiyal and Karimnagar

Uttar Pradesh-1-2020-2021 (Faizabad)

Districts surveyed: *Ayodhya, Sultanpur, Ambedkar Nagar, Barabanki, Sant Kabir Nagar* and *Basti*

Particulars of survey

Districts	Block/Taluka Villages
Ayodhya	Rudauli, Sohawal, Maya, Barenpur, Padoua, Shantipur, Sarairashi,
	Bikapur, Masodha, Pura, Khazurahat, Madhupur, Ruskhas, Paliya, Gopalpur,
	Harringtongani and Tarun Puraye, Mohtipur, Pure Bajaj and Jamuniaman
Sultanpur	Baldirai, Dhanpatganj and Saraiya, Bhagwanpur, Pipergaon, Kanawa Pure
	Kurebhar Saghan Pawri and Bishuhia
Ambedkar	Bhiti, Katehari, Akberpur, Narayanpur, Dhanwari, Hanumapur, Aushanpur,
Nagar	Tanda and Jalalpur Aushanpur Barhwa, Burganna, Manwalpur, Golpur,
_	Bahrajwa and Mahmoodpur
Barabanki	Ramsanehighat, Ramnagar, Sukhipur, Mohd. Pur, Markumman, Bhitana
	Pure Dalai and Sirauli (Ujjidinpur), Bhitana, Sukenpur and Kakpurva
St. Kabir	Khalilabad and Pauli Baghauli, Parospur, Siara, Birosi, Bairan, Ranipur,
Nagar	Bisrapur, Sarauli, Barani and Shaochara
Basti	Vikramjot, Harraiya, Sadar Shankarpur, Raipur, Ram Hatiya, Nepdanrh,
	and Saughat Nariyaw, Ramgarh, Fattepur, Banjaria, Malhani and
	Bhadohi

Widely prevalent varieties

Districts	Varieties
Ayodhya	HYVs: NDR 2065, NDR 97, NDR 2064, NDR 359, Shusk Samarat, Narendra
	Lalmati, Sarjoo 52, Jallahri, Narendra Usar Dhan-3, Samba Mahsuri, Sambha
	Mahsuri Sub-1, Swarna and PB-1; Hybrids: Karishma, Damini, Gorakhnath 510,
	Damini, Arize 6444 Gold, US 305, Kaveri 9090, VNR 2377 and 27p67
Sultanpur	HYVs: NDR 359, NDR 3112-1, NDR 2065, Shusk Samarat, Narendra Lalmati,
_	Narendra Usar Dhan-3, Sonam, Samba Mahsuri, Swarna Sub-1, PB-1, NDR 97,
	NDR 2064, Sarjoo 52, Moti Gold and Dhanversa; Hybrids: Damini, Gorakhnath
	510, Arize 6444 Gold, Ganga Kaveri, 27 P 31, 27P63 and Nandi 333
Ambedkar	HYVs: NDR 2064, NDR 2065, NDR 359, NDR 97, Shusk Samarat, Sarjoo 52,
Nagar	Samba Mahsuri, Swarna, Narendra Lalmati, Samba Mahsuri Sub 1 Swarna Sub-1,
_	Basmati, Jyotika and Dhanrekha; Hybrids: 27P31, 27P63, Damini, Kaveri 9090,
	US 305, Arize 6444 Gold and Gorakhnath 510
Barabanki	HYVs: NDR-97, Sambha Mahsuri, Swarna, Kala Jeera, Shusk Samrat, Sarjoo 52,
	NDR 359, Basmati, Narendra Lalmati, NDR 2064 and NDR 2065; Hybrids:
	Arize 6444 Gold, US-305, 27 P 31, 27P63, Kaveri and Pioneer hybrids
St Kabir	HYVs: NDR 3112-1, Samba Mahsuri Sub-1, BPT 5204, NDR 8002, Swarna,
Nagar	Swarna Sub 1, NDR 359, NDR 97, Kalanamak, Dhanvarsha, Chintu, Moti and
	Prashanna; Hybrids: Gorakhnath-509, US-305, Arize 6444 Gold, 27P31, 27P63,
	Damini, Dhanya 8655, Sampurna, VNR 2233, KN3, Karishma, Bayer 6633, Khusi
	27, 27 P 37 and 28S41
Basti	HYVs: NDR 97, Samba Mahsuri Sub 1, Purva, BPT 5204, NDR 359, Kalanamak,
	Swarna, Swarna Sub 1, NDR 2064, NDR 2065 and Basmati varieties; Hybrids:
	Khusi 27, Gorakhnath 510, 27P31, Arize 6444 Gold, Arize 6444, 27P63, Damini,
	Dhanya 8655, Bayer 6633 and KN3

Districts	Area (ha) under rice cultivation					
	Scented/ Basmati	Hybrid	Other	Total		
Ayodhya	2100	39450	56950	98500		
Sultanpur	6202	49000	42709	93311		
Ambedkar Nagar	1300	8200	31192	116492		
Barabanki	2401	56002	126428	184831		
St. Kabir Nagar	3005	31014	59997	94016		
Basti	3000	41000	63185	107185		

Area	under	rice	cultivation	of	surveyed	districts	during	Kharif 2020

Rainfall	distribution	in surveyed	districts during	Kharif2020
Naman	uistituutun	in sui veyeu	uisti icts uui ma	5 Milling 2020

Districts			Rainfall (mm)					
	Ju	ne	July		August		September	
	Norm	Actual	Normal	Actual	Normal	Actual	Normal	Actual
	al							
Ayodhya	106.5	232.9	306.1	204.2	282.0	223.9	196.7	118.1
Sultanpur	87.3	309.5	307.1	226.2	289.5	235.7	202.8	176.7
Ambedkar Nagar	106.5	564.0	306.1	409.0	282.0	67.0	196.7	253.0
Barabanki	98.4	165.5	299.7	444.2	281.6	370.2	203.6	97.2
St. Kabir Nagar	183.0	376.3	349.7	462.0	312.7	185.0	199.7	218.3
Basti	126.3	203.63	279.4	218.9	368.0	143.6	141.2	176.7

Production oriented survey of rice growing areas was conducted in Ayodhya, Sultanpur, Ambedkar Nagar, Barabanki, SantKabir Nagar and Basti districts of eastern Uttar Pradesh from tillering to maturity stage during Kharif 2020. High yielding rice varieties like NDR 2064, NDR 2065, NDR 3112-1, Sambha Mahsuri-Sub 1, NDR 359, Sarjoo-52, NDR 97, Swarna, Swarna-Sub-1, BPT 5204, Sonam, Komal, Chintu, Dhanrekha, Damini and hybrids like Arize 6444 Gold, 27p63, Gorakhnath-510 were found very popular among the farmers of eastern U.P. Major crop rotations adopted by farmers were rice-wheat, rice-sugarcane, rice-mustard, rice-pulses and rice-Vegetable Zinc and sulfur deficiency were observed in surveyed districts. To supply essential nutrient to the crop farmers were using inorganic fertilizers viz. Urea, DAP, SSP, MOP, and Zinc suphate. Use organic manure FYM, Compost and Green manure (Dhaincha, Urd bean, Moong bean) were observed by the farmers to improve the soil health. Plant growth regulators/promoters viz. Biozyme and Microzyme are being used by farmers to obtain good harvest. Use of Rotavator, combine harvester and paddy thresher was common practice by the farming community. Tube wells/canals are the main source of irrigation. Common weeds observed were Echinochloa colona, Eclipta alba, E. crusgalli, Cyperus iria, C. rotundus, Cloeme viscosa, Fimbristylis dichotoma and Paspalum distichum. Farmers were using weedicides like butachlor, pretilachlor, bispyribac sodium and 2, 4-D to control the weed infestation in rice crop. Shortage of farm labourers coupled with higher labour wages are the major constraint in rice production in the surveyed districts. Govt. agencies are providing subsidized seeds, agrochemicals, plant protection inputs and farm machineries including solar pumps 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 to minimize the cost of

Table: 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				
	Ayodhya	Sultanpur	Ambedkarnagar		
Total area under HYVs in the district (ha)	56950 ha	42709 ha	31192 ha		
Most prevalent HYVs in the district	NDR 2065, NDR 359, NDR 97, Swarna Sub-1	NDR 2065, Narendra usher dhan, NDR 359, Swarna Sub-1	NDR 2065, NDR 2064, Samba Mahsuri, Swarna		
Total area under rice hybrids in the district	39450 ha	49000 ha	82000 ha		
Most prevalent rice hybrids in the district	Arize 6444 Gold, 27p63, Damini	Damini, Arize 6444 Gold, 27p63	27p63, Arize 6444 Gold, Goraknath 510		
Total area under scented/basmati in the district	2100 ha	1602 ha	1300 ha		
Most prevalent basmati varieties in the district	Narendra Lalmati, basmati	N. Lalmati	Pusa Basmati 1		
Seed replacement rate	70%	70%	70%		
Whether farmers are using any heavy equipments like transplanter/combine harvester	Yes, combine harvester	Combine harvester	Combine harvester		
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	SRI and laser levelling by some farmers	-	-		
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Use of balanced fertilizers & plant protection measures	Plant protection measures	Use of plant prot- ection measures and balanced ferti- lizers		
What are the general problems in rice cultivation in the district?	Labour shortage	-	-		
Please provide any farmers association in the district	-	-	Yes		
Whether availability of agricultural labours is sufficient?	No	Yes	No		
Whether there is any marketing problem of the produce?	No	No	Yes		
Any major irrigation/power generation project in the district	Irrigation project; Sharda Sahayak canal	Irrigation project; Sharda Sahayak canal	NTPC , Tanda Ambedkarnagar		
Any soil testing program undertaken?	Yes	Yes	Yes		
Any farmers' training program was organized by the state department of Agriculture/University	Regular training by dept. of agriculture, Univ and KVK,	Training by university, KVK and Dept of	Regular kisan trai- ing program by dept of Agri and		
	Ayodhya	Agriculture	KVK		

Table: 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				
	Barabanki	St Kabir Nagar	Basti		
Total area under HYVs in the district (ha)	126428 ha	59997 ha	63185 ha		
Most prevalent HYVs in the district	NDR 97, NDR 2065,	NDR 2065, NDR	NDR 359, NDR		
	Swarna Sub-1,	2064, Samba	2065, Samba		
	Swarna	Mahsuri, NDR 359	Mahsuri, Swarna		
Total area under rice hybrids in the district	56002 ha	31014 ha	41000 ha		
Most prevalent rice hybrids in the district	27p63, Arize 6444 Gold, Goraknath 510	27p63, 27p31, Arize 6444 Gold, Goraknath 510	27p63, Arize 6444 Gold, Goraknath 510		
Total area under basmati in the district	2401 ha	3005 ha	3000 ha		
Most prevalent basmati varieties in the district	N. Lalmati & Pusa Basmati 1	Kala Namak Basmati var.	Basmati var., Kalanamak, N Lalmati		
Seed replacement rate	60%	60%	-		
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	SRI by some farmers	Yes, SRI	Laser levelling and SRI by some farmers		
Whether survey team gave any advice	Use of plant	Use of plant prote-	Use of plant prot-		
to the farmers during survey? If yes,	protection	cttion measures &	ection measures		
then what are those	measures	organic amend- ments			
What are the general problems in rice cultivation in the district?	-	-	-		
Please provide any farmers association in the district	Yes	Yes	No		
Whether availability of agricultural labours is sufficient?	No	No	No		
Whether there is any marketing problem of the produce?	Yes	Yes	No		
Any major irrigation/power generation project in the district	Irrigation project; Sharda Sahayak canal	No	No		
Any soil testing program undertaken?	Yes	Yes	Yes		
Any farmers' training program was	Regular training by	Regular training by	Farmers' training		
organized by the state department of	dept. of agriculture,	dept. of agriculture	by dept. of		
Agriculture/University	Univ and KVK	and KVK	agriculture, Univ and KVK		

cultivation for enhancing the productivity of rice growing areas. Majority of the farmers are small in holding size and using farm machinery on hired basis in the surveyed districts. Soil testing program is being promoted by the govt. agencies and Soil Health Cards are being provided to the farmers. Water saving technologies viz. DSR and laser leveller was also being promoted in the farming community by Agriculture University and Department of Agriculture U.P. The main source of farmers finance are own resources, cooperative societies, Kisan credit card and P.M. Kisan Samman Nidhi. The farmers are also protecting their crop through crop insurance policy of government. Biotic stresses like diseases sheath blight and bacterial leaf blight and insects stem borer, leaf folder and gundhi bug were observed from low to moderate intensity. However, false smut was noticed in the late maturing/hybrids rice varieties from moderate to severe intensity in all the surveyed districts.

District wise details

Ayodhya: Production oriented survey was conducted in 13 villages (in 8 blocks) involving 13 farmers in this district. The crops were in tillering to milk stage at the time of survey. The fields surveyed were under irrigated ecosystem. In general, the weather conditions were normal for rice cultivation. The major cropping systems adopted by the farmers were rice-wheat, rice-sugarcane rice-mustard and rice-pulses. The prevailing rice varieties were HYVs like NDR 2065, NDR 97, NDR 2064, NDR 359, Shusk Samarat, Narendra Lalmati, Sarjoo 52, Jallahri, Narendra Usar Dhan-3, Sambha Mahsuri, Sambha Mahsuri-Sub 1, Swarna, Pusa Basmati-1, Karishma and Damini and hybrids like Gorakhnath 510, Arize 6444 Gold, US 305, Kaveri 9090, VNR 2377 and 27P67. Average rice yield in the district ranged from 5000-5800 kg/ha. Most of the planting was done during 3rd week of June to last week of June. Farmers used an average seed rate of 30-35 kg/ha and about 23% farmers contacted told that they treated the seeds with carbendzim (2 g/kg). About 85% farmers applied farm yard manure in the nursery. Few farmers also applied DAP in the nursery. In the main field, fertilizers were applied @ 100-120 kg N/ha, 50 kg P2O5/ha, 50 kg K2O/ha and 20 kg zinc sulphate/ha. Potash application was done by very few farmers (15%). Almost all the farmers contacted applied zinc sulphate. About 70% farmers told that they applied FYM in the main field. Few progressive farmers also applied green manures like Moong bean and Dhaincha (Sesbaina spp.). Planting was random and SRI technology was adopted by the few progressive farmers only. Intensity of common weeds like Common weeds of rice were Echinochloa crusgalli, E. colona, Dactylactelium aegyptium, Digiteria sanguinalis, Cyperus rotundus, Paspalum distichum and Fimbristylis dichotoma was low to medium. Most of the farmers practised hand weeding. In addition to hand weeding about 85% farmers also applied different weedicides like Nominee gold, pretilachlor, butachlor and 2,4-D. Commonly used implements were tractor, rotavator, sprayers and combine harvester. Some farmers expressed the need of quality seeds of HYVs and medium duration varieties. Seed replacement rate in the district is more than 60%. The main source of irrigation is tube well/pumping sets, solar pump and canal. All the farmers told that inputs like fertilizers and pesticides were available in time and they were happy with their quality. Official from the state department of agriculture and university advised the farmers. Biotic stresses such as diseases (Sheath blight and Bacterial leaf blight) and insects (stem borer, leaf folder, Gundhi bug and hoppers) were observed in low to moderate intensity. Severe outbreak of False smut was recorded during this year in many hybrids and in some inbreed verities. Commonly used fungicides were carbendazim, propiconazole, copper oxychloride + streptocycline and hexaconazole while common insecticides were cartap

hydrochloride, acephate, cabofuron and Folidol. Mixing of different pesticides was not common among the farmers. Farmers were facing shortage of farm labourers. Zinc and sulfer deficiency were also noticed.

Sultanpur: Survey was conducted in 5 villages (in three blocks) involving 10 farmers. The crops were in booting to milk stage at the time of survey. The fields surveyed were under irrigated ecosystem and climatic conditions were normal for rice cultivation. Commonly followed crop rotation practices were rice-wheat, rice-pulses, rice-mustard and rice- sugarcane. Predominant rice varieties in the district were HYVs like NDR 359, NDR 3112-1, NDR 2065, Shusk Samarat, Narendra Lalmati, Narendra Usar Dhan-3, Sonam, Sambha Mahsuri, Swarna Sub1, Pusa Basmati-1, Damini, Gorakhnath 510, Arize 6444 Gold, Ganga Kaveri, 27p31, 27p63, NDR 97, NDR 2064, Sarjoo 52, Moti Gold, Nandi 333 and Dhanversa. Average rice yield in the district ranged from 4800-5500 kg/ha. Planting was done during 3rd week of June to last week of June. Average seed rate was 30 kg/ha. None of the farmers contacted adopted any seed treatment. All the farmers contacted applied FYM in the nursery and some of them also applied DAP. In the main fields, fertilizers were applied @ 100-120 kg N/ha, 50 kg P₂O₅/ha and 10-20 kg zinc sulphate. About 30% farmers applied FYM in the main field. About 50% of the farmers contacted applied 'Zyme' plant growth regulator for better tillering and yield. Farmers followed random planting. Intensity of common weeds like Echinochloa crusgalli, E. colona, C. rotundus, C. iria, Paspalum distichum and Fimbristylis dichotoma was low to medium. Hand weeding was common among the farmers. About 50% of the farmers contacted also applied different herbicides like butachlor (2.5 l/ha), Nominee Gold, pretilachlor and Top star. Commonly used implements were tractor, sprayer, combine harvester and others. Harvesting by combine harvester is popular in the district. Seed replacement rate was 70-80%. Some farmers expressed the need of quality seeds of HYVs and medium duration varieties. Tube well and canals are the major source of irrigation of rice crop and there was no scarcity of irrigation water. All the farmers told that inputs like fertilizers and pesticides were available in time and they were happy with their quality. Official from the state department of agriculture and university advised the farmers. Biotic stresses viz. sheath blight, bacterial leaf blight, stem borer, gundhi bug and leaf folder were observed in low to moderate intensity. False smut was observed in severe form especially in hybrids and late maturing varieties. Fungicides viz. carbendazim, Indofil M 45, propiconazole, streptocycline + copper oxychloride and hexaconazole were used to control fungal/bacterial diseases of rice while folidol and cartap hydrochloride were used for the management of rice insect pests. Zinc deficiency was also observed in surveyed aeras of the district. Mixing of different pesticides was not common among the farmers. Farmers were facing shortage of farm labourers.

Ambedkar Nagar: Ten villages in 5 blocks were covered for production oriented survey in this district when the crops were in tillering to milk stage. A total of 12 farmers were contacted during the survey. The fields surveyed were under irrigated ecosystem and in general, the weather conditions were normal for rice cultivation. Commonly followed crop rotation practices were rice-wheat, rice-sugarcane, rice-mustardand, rice vegetables and rice-pulses. Predominant rice varieties were HYVs like NDR 2064, NDR 2065, NDR 359, NDR 97, Shusk Samarat, Sarjoo 52, Sambha Mahsuri, Swarna, Narendra Lalmati, Sambha Mahsuri-Sub 1 Swarna Sub-1, Damini, Jyotika and Dhanrekha and hybrids like 27p31, 27p63, Kaveri 9090, US 305, Arize 6444 Gold and Gorakhnath 510. Average rice yield in the district ranged from 4500-5900 kg/ha.

Most of the planting was done during 3rd week of June to last week of June. Average seed rate was 30-35 kg/ha for HYVs and about 15 kg/ha in case of hybrids. Very few farmers (~10%) adopted seed treatment with carbendazim (2 g/kg). Most of the farmers applied FYM in the nursery and some of them also applied DAP. In the main field, fertilizers were applied @ 10-120 kg N/ha, 50 kg P2O5/ha, 50 kg K2O/ha and 10-20 kg zinc sulphate/ha. Potash was applied only by 25% farmers. About 80% farmers applied FYM in the main field. About 20% farmers applied plant growth regulators like multiplex and Zyme. Planting was random. Intensity of common weeds like Echinochloa colona, Echinochloa crusgalli, Cyperus rotundus, C. iria and Fimbristylis dichotoma was low. In addition to hand weeding, weedicides like butachlor, pretilachlor and Nominee gold were used to control the rice weeds by majority of the farmers. Commonly used implements were tractor, rotavator, sprayer, combine harvester and others. Use of rotavator for field preparation and combine machine for harvesting was very popular among the farming community. Seed replacement rate was 70-80%. Main source of irrigation was shallow tube well. All the farmers told that inputs like fertilizers and pesticides were available in time and they were happy with their quality. Official from the state department of agriculture and university advised the farmers. Biotic stresses such as diseases (Sheath blight and BLB) and insects (stem borer, hoppersand Gundhi bug) were observed in low intensity. False smut was observed in severe form in the district. Pesticides like carbendazim, propiconazole, streptocycline and hexaconazole for different diseases and cartap hydrochloride, Coragen, and folidal for different insect pests were by the farmers. Mixing of different pesticides at the time of application was not common among the farmers.

Barabanki: Production oriented survey was conducted in 7 villages (in 4 blocks) involving 10 farmers. The crops were in booting to heading stage at the time of survey. The fields surveyed were under irrigated ecosystem. The weather conditions were normal for rice cultivation. Prevailing crop rotation practices were rice-wheat, rice-mentha, rice-mustard/potato, rice-pulses and rice-sugarcane. Predominant rice varieties in the district were HYVs like NDR-97, Sabha Mahsuri, NDR 2064, NDR 2065, Kala Jeera, Swarna, Shusk Samrat, Sarjoo 52, NDR 359, Basmati and Narendra Lalmati and hybrids like Arize 6444 Gold, US 305, 27p31, 27p63 and Kaveri and Pioneer hybrids. Average yield in the district ranged from 3800-5900 kg/ha. Planting was done during 3rd week of June to last week of June. Average seed rate was 30-35 kg/ha for HYVs and about 15 kg/ha for hybrids. Very few farmers (~ 10%) adopted seed treatment with carbendazim (2 g/kg). Most of the farmers applied FYM in the nursery and some of them also applied DAP. In the main fields, fertilizers were applied @ 100 kg N/ha, 40-50 kg P2O5/ha and 10-20 kg zinc sulphate/ha. None of the farmers applied potash. About 20% farmers applied FYM in the main field and 20% farmers applied 'Zyme' (plant growth promoter) @ 10 kg/acre. Planting was random. Intensity of weeds was low. Common weeds recorded were Common weeds of rice were Cyperus rotundus, Cyprus iria, Digiteria sanguinalis, Echinochloa crusgalli, E. colona, Paspalum distichum and Fimbristylis dichotoma. All the farmers followed hand weeding and about 30% of the farmers contacted applied weedicides like butachlor (2.5 litre/ha). Implements like tractor, rotavator, sprayer and combine harvester were used by the farmers. Some farmers expressed the need of quality seeds of HYVs and medium duration varieties. Seed replacement rate was 60-70%. Most of the farmers were using certified seeds provided by Govt. agencies. Major sources of irrigation were tube well and canal and all the farmers told that there was no scarcity of irrigation water. All the farmers told that inputs like fertilizers and pesticides were available in time and they were happy with their quality. Official from the state department

of agriculture and university advised the farmers. Major diseases like sheath blight and bacterial blight and insects like stem borer, hopper, leaf folder and Gundhi bug were observed in low to moderate intensity. However, false smut was found in moderate to severe intensity. Fungicides like propiconazole, carbendazimand and hexaconazole were used to control the disease and insecticides like folidal, cartap hydrochloride and Coragen were used to manage insect pest damage. Mixing of different pesticides at the time of application was not common among the farmers.

Sant Kabir Nagar: Ten villages in 2 blocks were covered for production oriented survey when the crops were in heading to milk stage. During the survey, 11 farmers were contacted. The fields surveyed were under irrigated ecosystem. The weather conditions were normal for rice cultivation. Prevailing crop rotation practices were rice-wheat, rice-mentha, rice-mustard/potato, rice-vegetables, rice-pulses and rice-sugarcane. Predominant rice varieties in the district were improved varieties like NDR 3112-1, Samba Mahsuri-Sub 1, BPT 5204, NDR 8002, Swarna, Swarna Sub 1, NDR 359, Kalanamak, Dhanvarsha, Chintu, Moti and Prashanna and hybrids like Gorakhnath 509, NDR 97, US 305, Arize 6444 Gold, 27p31, 27p63, Damini, Dhanya 8655, Sampurna, VNR 2233, KN3, Karishma, Bayer 6633, Khusi 27, 27 P 37 and 28S41. Average rice yield in the district ranged from 4200-6000 kg/ha. Planting was done during 3rd week of June to last week of June. Average seed rate used by the farmers was 30-35 kg/ha. About 45% farmers contacted treated the seeds with carbendazim (2 g/kg). Majority of the farmers applied FYM in the nursery and some of them also applied DAP. In the main fields, fertilizers were applied @ 100-120 kg N/ha, 50-60 kg P2O5/ha and 50 kg K2O/ha. About 20% farmers applied potash in the field. All the farmers contacted applied zinc sulphate. About 45% farmers applied FYM in the main field and about 30% farmers applied 'Zyme' plant growth regulator in the field for better yield. Planting was random. Intensity of common weeds like Cyperus rotundus, C. iria, Echinochloa crusgalli, E. colona, Cleome viscosa and Fimbristylis dichotoma was low to medium. Most of the farmers followed hand weeding and about 70% of them also applied weedicides like pretilachlor, Nominee gold, 2-4 D and butachlor. Implements like tractor, rotavator, sprayer and combine harvester were used by the farmers. Some farmers expressed shortage of labours and need of seeds of HYVs and good marketing facility. Seed replacement rate was 60-80%. Shallow and deep tube wells were major source of irrigation. All the farmers told that inputs like fertilizers and pesticides were available in time and they were happy with their quality. Official from the state department of agriculture and university advised the farmers. The major rice diseases sheath blight and bacterial blight and insect pests viz. stem borer, hopper and gandhi bug were observed from low to moderate intensity. False smut was recorded in severe form. Fungicides like carbendazim, propiconazole and Nativo and insecticides like chloropyriphos, Folidol and cartap hydrochloride were used by the farmers. Micro nutrient deficiency was noticed in this district. Mixing of different pesticides at the time of application was not common among the farmers.

Basti: Production oriented survey was conducted in 10 villages (in 4 blocks) involving 11 farmers in this district when the crops were in booting to milk stage. The fields surveyed were under irrigated ecosystem and in general, the weather conditions were normal for rice cultivation. Common crop rotation practices followed by the farmers were rice-wheat, rice-sugarcane, rice-mustard and rice-pulses. Predominant rice varieties in the district were HYVs like NDR 97, Sambha Mahsuri-Sub 1, Purva, Khusi 27, BPT 5204, NDR 359, Kalanamak, NDR

2064, NDR 2065, Swarna and Swarna Sub-1 and hybrids like Gorakhnath 510, 27p31, Arize 6444 Gold, Arize 6444, Basmati, 27P63, Damini, Dhanya 8655, Bayer 6633 and KN3. Average rice yield in the district ranged from 4800-6000 kg/ha. Planting was done during 3rd week of June to last week of June. Farmers used a seed rate of 30-35 kg/ha for HYVs and about 15 kg/ha for hybrids. Seed treatment was not common among the farmers and only abot 10% farmers adopted seed treatment with carbendazim (2 g/kg). Almost all the farmers applied FYM in the nursery and some of them also applied DAP. In the main field, fertilizers were applied @ 120 kg N/ha, 40-50 kg P2O5/ha and 15-10 kg zinc sulphate/ha. About 10% farmers applied potash. More than 60% farmers applied FYM in the main field. Farmers adopted random method of planting. Intensity of common weeds like Echinochloa crusgalli, E. colona, Cyprus spp. and Fimbristylis dichotoma was low to medium. Hand weeding was common among the farmers. Farmers were also using herbicides like butachlor, pretilachlor and Nominee Gold to control the weeds of rice. Majority of the rice growing farmers used rotavator and combine harvester. Major sources of irrigation were tube well/pumping sets and canal. Major diseases of rice (sheath blight and bacterial blight) and insects (stem borer, hopper and gundhi bug) were observed in low to moderate intensity. However, false smut was observed in moderate to severe intensity. Fungicides like propiconazole, carbendazim, hexaconazole and mancozeb were used by the farmers to control the rice diseases and cartap hydrochloride, chloropyriphos and Folidol were used for the control of rice insect pests. Mixing of different pesticides at the time of application was not common among the farmers.

Districts	Diseases				Insects			
Districts	ShB	FS	BS	BLB	SB	LF	GB	GLH
Ayodhya	L-M (5-15%)	S		L (5%)	L-M	L-M	Μ	L
Sultanpur	L-M (5-15%)	M-S		L (10%)	L-M	L	Μ	L
Ambedkar	L-M	S		L	L-M	L	Μ	L
Nagar								
Barabanki	L-M (5-15%)	M-S	L (10%)	L-M	L-M	L-M	Μ	L
St. Kabir	L-M (5-15%)	S		М	L-M	L	М	L
Nagar								
Basti	L-M	M-S		L-M	L-M	L	Μ	L

Prevalence of diseases and Insects in Eastern Uttar Pradesh during Kharif 2020

Uttar Pradesh-2-2020-2021(Ghaghraghtat)

Districts surveyed: Bahraich, Barabanki, Gonda, Balrampur and Shravasti

I di ficularis di sui veg					
Districts	Blocks	Villages			
Bahraich	Jarwal Kasba, Kaisarganj and	Adampur, Tappe Sipah, Ichchapur			
	Phakharpur	(Gajodharpur), Umari, Badrauli and Nandwal			
Barabanki	Ramnagar, Sirauli and	Namipur, Ramnagar, Sirauli Gauspur, Ganespur			
	Gauspur	and Gobaraha			
Gonda	Colonelganj and Mankapur	Chhataivani and Bandraha			
Balrampur	Balrampur and Rehara Bazar	Bhagabatiganj and Rehra			
Shravasti	Sirsiya and Ekona	Khairi Pershona and Ekona			

Particulars of survey

Widely prevalent rice varieties

Districts	Varieties
Bahraich	NDR 359, Pusa Basmati 1, Sarjoo 53, Arize 6444 and Arize 6444 Gold
Barabanki	Sukha Pankhi, Madhukar, Lalmati, Dhaniya, Arize 6444, Arize 6444 Gold and
	Pusa Basmati 1
Gonda	NDR 359, Samba Mahsuri and Pusa Basmati 1
Balrampur	Sarrjoo 52, Arize 6444 and Pusa Basmati 1
Shravasti	Jalpriya, Jalmagna, Madhukar, Pusa Basmati 1 and Arize 6444

Production oriented survey was conducted in five districts viz., Bahraich, Barabanki, Gonda, Balrampur and Shravasti when the crops were in tillering to booting or grain filling to maturity stage. The fields surveyed were mainly in rainfed lowland ecosystem. In general, weather conditions were normal for rice cultivation. Predominant rice varieties were HYVs like NDR 359, Sarjoo 52, Samba Mahsuri, Jalpriya, Jalmagna, Lalmati, Madhukar and Pusa Basmati 1 and hybrids like Arize 6444 and Arize 6444 Gold. Different cropping system followed by the farmers rice-wheat, rice-wheat-black gram, rice-vegetables, rice-sugarcane/lentil, rice-wheatwere mentha, rice-lentil+mustard, rice-pea + mustard, rice-wheat+mustard-green gram, rice-lentil, rice-lentil + mustard + vegetables and others. Planting was mainly done during last week of June to 2nd week of July. A seed rate of 18-25 kg/ha was used by the farmers. Seed treatment was not common among the farmers. Farmers in general applied FYM in the nursery and main fields. In the main fields, fertilizers were applied @ 60-100 kg urea/ha, 60-100 kg DAP/ha amd 40-60 kg MOP/ha. In general, the population of weeds like Echinochloa colona, Cyperus rotundus and Cynodon dactylon was low-medium. Farmers adopted hand weeding for management of weeds and none of the farmers contacted applied any herbicides. Implements like tractor, cultivator, rotavator and harrow were used by the farmers. Staffs of University, state department of agriculture and private dealers advised the farmers regarding fertilizers and pesticide use. Among biotic constraints, blast was severe in some fields in Barabanki and Shravasti and brown spot was severe in some areas in Gonda and Shravasti. High intensity of sheath blight was recorded in some fields in Bahraich. Intensity of other diseases and insect pests was low to moderate. Application chemical pesticides were not common among the farmers. In some fields symptoms of zinc deficiency were noticed.

District wise details

Baharaich: Production oriented survey was conducted in 6 villages (in 3 blocks) in this district involving 8 farmers. There crops were tillering to booting or grain filling to maturity stage at the time of survey. The fields surveyed were under rainfed lowland and semi-deep ecosystems. In general the weather conditions were normal for rice cultivation. Predominant rice varieties in the district were NDR 359, Pusa Basmati 1, Sarjoo 53, Arize 6444 and Arize 6444 Gold. Farmers followed a variety of crop rotation practices viz., rice-wheat, rice-wheat-black gram, ricevegetables, rice-sugarcane/lentil, rice-wheat-mentha, rice-lentil+mustard, rice-pea + mustard, rice-wheat+mustard-green gram, rice-lentil, rice-lentil + mustard + vegetables and others. Average rice yield among HYVs and hybrids ranged from 4500-5200 kg/ha while in case of basmati varieties, it was about 2500 kg/ha. Planting was done mainly during 1st- 3rd week of Julv. Average seed rate was 18-25 kg/ha while in case of hybrids, it was 12-15 kg/ha. None of the farmers contacted adopted any seed treatment practices and in some places, there were incidences of leaf blast, sheath blight and khaira disease. All the farmers contacted applied FYM/compost in the nursery. Few also applied urea or mixture of urea and DAP in the nursery. In the main fields, fertilizers were applied @ 60-100 kg urea/ha, 60-100 kg DAP/ha amd 40-60 kg MOP/ha. Potash was applied by about 50% farmers. About 25% farmers applied zinc sulphate. All the farmers applied FYM in the main field. Planting was random. In general, the population of weeds like Echinochloa colona, Cyperus rotundus and Cynodon dactylon was low-medium. Farmers adopted hand weeding for management of weeds and none of the farmers contacted applied any herbicides. Implements like tractor, cultivator, rotavator and harrow were used by the farmers. Staffs of University, state department of agriculture and private dealers advised the farmers regarding fertilizers and pesticide use. Diseases like blast, neck blast, brown spot, false smut, sheath rot, grain discoloration were recorded in low to moderate intensity. Sheath blight was wide spread and its intensity was high (up to 30%) on Pusa Basmati 1 in Adampur village. Intensity of insect pests like stem borer and gundhi bug was low. Application of chemical pesticides was very less. There were symptoms of zinc and iron deficiency in some of the places.

Barabanki: Five villages in 3 blocks in this district were covered for production oriented survey involving 6 farmers. The crops were in tillering to heading or milk to mature stage at the time of survey. Majority of the fields surveyed were under rainfed ecosystem. In general, the weather conditions were normal for rice cultivation. Commonly grown rice varieties were Sukha Pankhi, Madhukar, Lalmati, Dhaniya, Arize 6444, Arize 6444 Gold and Pusa Basmati. Many farmers are growing variety Lalmati because it is early maturing, fine grained, less susceptible to pests and diseases and have better market price. Different crop rotations followed by the farmers were ricelentil + mustard, rice-wheat-mentha, rice-vegetables and rice-wheat. Average yield in the district was 3600-4800 kg/ha. Planting was done during last week of June to 1st week of July. Average seed rate was 15-20 kg/ha. None of the farmers contacted adopted any seed treatment. All the farmers contacted applied FYM in the nursery. None of them applied any chemical fertilizers in the nursery. In the main fields, fertilizers were applied @ 80-100 kg urea/ha and 60-80 kg DAP/ha. Very few applied muriate of potash. All the farmers applied FYM in the main fields. Planting was random. In general, the intensity of common weeds like Cyperus spp. and Echnochloa spp. was low. Farmers adopted hand weeding for management of weeds and none of the farmers contacted applied any herbicides. Implements like tractor, cultivator, rotavator, power tiller and disc harrow were used by the farmers. Shallow tube wells were the main source

of irrigation and farmers used diesel for different agricultural operations. Staffs of state department of agriculture and private dealers advised the farmers regarding fertilizers and pesticide use. Among the biotic constraints, leaf blast was wide spread and its intensity was high (up to 35%) on Sukha Pankhi variety in Namipur village. Intensity of other diseases and insect pests was low to moderate. Application of pesticides was not common among the farmers. There were symptoms of zinc and iron deficiency in some of the places.

Gonda: Production oriented survey was conducted in two villages (in 2 blocks) involving 3 farmers in this district when the crops were in tillering stage or milk to mature stage. The fields surveyed were under upland ecosystem. In general, the weather conditions were normal for rice cultivation. Commonly cultivated varieties were NDR 359, Samba Mahsuri and Pusa Basmati 1. Common crop rotation practices followed by the farmers were rice-wheat, rice-lentil + mustard, rice-sugarcane + black gram and rice-sugarcane. Average rice yield in the district ranged from 4900-5000 kg/ha in case of HYVs and 3200-4000 kg/ha in case of Pusa Basmati 1. Planting was done during 1st to 2nd week of July. Average seed rate was 18-20 kg/ha. All the farmers contacted applied FYM in the nursery and few of them also applied chemical fertilizers like urea. In the main fields, fertilizers were applied @ 100-120 kg urea/ha and 60-80 kg DAP/ha. All of them applied FYM in the main fields. Plant was random and intensity of common weeds like Cyperus spp. and Echinochloa spp. was low. Farmers in general did not apply herbicides and hand weeding was the common practice for weed management. Implements like rotavator, cultivator, tractor and power tiller was used by the farmers. Shallow tube well was the main source of irrigation and diesel was the main power source. Officials from state department of agriculture and private personnel were the main advisors to the farmers. Among the diseases, brown spot was severe (up to 28%) in some fields in Chhataivani village. Other diseases like blast, neck blast, sheath blight and false smut and insect pests like stem borer and grasshoppers were in low to moderate intensities. Application of pesticides was not common among the farmers. There were symptoms of zinc and iron deficiency in some of the places.

Balrampur: Production oriented survey was conducted in two villages (in 2 blocks) in this district when the crops were in tillering or maturity stage. The fields surveyed were either in upland or rainfed lowland ecosystem. The weather conditions were normal for rice cultivation. Prominent rice varieties in this area were Sarrjoo 52, Arize 6444 and Pusa Basmati 1. The main cropping systems were rice-wheat, rice-lentil + mustard and rice-vegetables. Average rice yield was 4000-5000 kg/ha in case of HYVs and about 3200 kg/ha in case of Pusa Basmati 1. Planting was mainly done during last week of June. A seed rate of 20 kg/ha was used by the farmers. None of them adopted seed treatment. All of them applied FYM in the nursery. In the main fields, fertilizers were applied @ 100 kg urea/ha and 89 kg DAP/ha. Few also applied muriate of potash (60 kg/ha). All the farmers contacted applied FYM in the main fields. Farmers adopted random method of planting. Weed population was low and farmers practiced only manual weeding. Intensity of different biotic constraints was low to moderate. Symptoms of zinc deficiency were noticed in some places.

Shravasti: Two villages (in 2 blocks) were covered for production oriented survey in this district when the crops were in tillering or maturity stage. The fields surveyed were under rainfed lowland ecosystem. In general, the weather conditions were normal for rice cultivation. Popular rice varieties cultivated in this area were Jalpriya, Jalmagna, Madhukar, Pusa Basmati 1 and

Arize 6444. Different cropping systems followed by the farmers were rice-wheat, rice-mustard + lentil, rice-vegetables and rice-lentil + sugarcane. Average yield was 3500-4200 kg/ha. A seed rate of 18-22 kg/ha was used by the farmers and none of the farmers contacted adopted seed treatment. All of them applied FYM in the nursery and few of them also applied urea. In the main fields, fertilizers were applied @ 80-100 kg urea/ha, 80 kg DAP/ha and 60 kg MOP/ha. Intensity of weeds in and around rice fields was low and farmers managed weed problem by manual weeding. Severe incidence of rice blast (up to 45%) was recorded in varieties like Jalpriya in Ekona village and on Madhukar variety in Pershona village. High incidence of brown spot was recorded in some fields of NDR 359 in Ekona village. Intensity of other diseases and insect pests was in low to moderate intensity. Symptoms of zinc deficiency were noticed in some places.

Districts	Diseases							
	Bl	NBI	BS	ShBl	FS	ShR	GD	Khaira
Bahraich	М (12-	L (8%)	L-M (3-	L-S (8-	L-M (1-	L (8%)	L (5%)	М
	20 %)		25%)	30%)	15%)			
Barabanki	M-S (12-	L (5-8%)		L (8%)	T (1-2%)	T (<2%)		
	35%)							
Gonda	L-M (10-	L (5-8%)	M-S (12-	L-M (8-	T (2%)			
	12%)		28%)	18%)				
Balrampur	L (8-	L (6%)	L-M (10-		T (2%)	L (5%)		
	10%)		15%)					
Shravasti	M-S (12-	L-M (8-	L-S (10-	M (15-		L (5-8%)		
	45%)	20%)	30%)	18%)				

Prevalence of diseases and insect pests in Uttar Pradesh-2 during *Kharif*^{*} 2020

Districts	Insect pests					
	SB	GB	GH	Rat		
Bahraich	L (2-5%)	L (2-3%)		T (2%)		
Barabanki	L (5-8%)	L (2-5%)	L (2-3%)	T (1-2%)		
Gonda	L (5%)		T (1%)			
Balrampur	L (5%)					
Shravasti	L (5%)	L (5%)				

There was low incidence (10%) of narrow brown leaf spot in Barabanki and Shravasti districts. Low incidence (8%) of node blast was noticed in some fields of Shravasti district

Uttarakhand-2020-2021(Pantnagar)

Districts surveyed: Udham Singh Nagar and Nainital

Particulars of survey

District	Blocks surveyed
Udham Singh Nagar	Khatima, Sitarganj, Rudrapur, Gadarpur, Bazpur, Kashipur and Jaspur
Nainital	Ramnagar, Kotabagh and Haldwani

Widely prevalent rice varieties

District	Prevalent varieties
Udham Singh Nagar	HYVs: PR 113, HKR 47, PR 121, PR 126, NDR 359 and Pant Dhan 23;
	Basmati: Pusa Basmati 1509 and Pusa Basmati 1121
Nainital	Bhabar area: Pant Dhan 11, Govind, Pant Dhan 18 and PR 113,
	Hilly area: Govind, VL Dhan 207, VL Dhan 208, and VL Dhan 209

Particulars of rice area

District	Area (ha)	Production (tonnes)	Productivity (q/ha)
Udham Singh Nagar	105400	372500	35.34
Nainital	9815	34089	34.73

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

Parameters	Districts			
	Udham Singh Nagar	Nainital		
Total area under HYVs in the district	50-55%	25-30%		
Most prevalent HYVs in the district	PR 113, PR 121, PR 126,	Bhabar area: Pant Dhan 11,		
	NDR 359, HKR 47	Govind, Pant Dhan 18 PR		
		113		
		Hilly area: Govind, VL		
		Dhan 207, VL Dhan 208,		
		VL Dhan 209		
Total area under rice hybrids in the	NA	NA		
district				
Most prevalent rice hybrids in the	NA	NA		
district				
Total area under basmati in the	Less than 1%	Less than 1%		
district				
Most prevalent basmati varieties in	Pusa Basmati 1509, Pusa	NA		
the district	Basmati 1121, Pusa			
	Basmati 2511.			
Whether farmers are using any heavy	Yes	No		
equipments like transplanter				
/combine harvester				
Mention water saving technologies	Yes (DSR on small scale)	Yes (DSR in hilly upland		

Parameters	Districts				
	Udham Singh Nagar	Nainital			
like SRI/laser levelling/DSR being		areas)			
Whether survey team gave any advice to the farmers during survey? If yes, then what are those?	Avoid cultivation of summer rice. Need based and application of recommended dose of pesticides.	Use of quality seeds of latest varieties, Need based and application of recommended dose of pesticides.			
What are the general problems in rice cultivation in the district?	Insufficient rice grain purchase counters, higher wages of labour	Insufficient rice grain purchase counters and non availability of agriculture labour			
Please provide any farmers association in the district	Not known	Not known			
Whether availability of agricultural labours is sufficient?	No	No			
Whether there is any marketing problem of the produce?	Insufficient rice grain purchase counters	Insufficient rice grain purchase counters			
Any major irrigation/power generation project in the district	No	No			
Any soil testing program undertaken	Yes	Yes			
Any farmers training program was organized by the state department of agriculture/university	Trainings by Ag department and university KVKs	Trainings by Ag department and university KVKs			

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Weather conditions	during	Kharif 2020 at	Pantnagar	(Lidham	Singh Nac	(ar)
vicamer conditions	uuimg	ismain 2020 at	I antinagai	(Cullain	Dingititug	Sur /

Weather Data	Months							
	May	June	July	Aug	Sep	Oct	Nov	Dec
Rainy Days (No.)	5	5	12	18	6	1	0	1
Total Rain Fall (mm)	47	148.6	421.8	665.5	222	6.8	0	2.5
Temperature Max (^O C)	36.6	35.7	32.4	30.8	31.7	30.7	26.7	20.83
Temperature Min (^O C)	22.3	26.2	26	25.2	23.6	15.1	11.2	7
RH (%): Morning	69.4	81	87.8	92.1	91.2	86.4	93.8	94.5
RH (%): Evening	42.7	59.8	75.4	79.9	74.32	57.1	58	59.25

Production oriented survey was conducted in seven blocks in Udham Singh Nagar and three blocks in Nainital districts of Uttarakhand. In general the climatic conditions were favourable for rice cultivation. Predominant varieties were HYVs like PR113, HKR 47, PR 121, PR 126, NDR 359, Pant Dhan 11, Pant Dhan 23 and Govind and basmati varieties like Pusa Basmati 1509 and Pusa Basmati 1121. In hilly areas, varieties like Govind, VL Dhan 207, VL Dhan 208, and VL Dhan 209 were cultivated. In the main fields, fertilizers were applied @ 120 kg N/ha, 60 kg P_2O_5 /ha and 40 kg K_2O /ha. Application of zinc sulphate was common among the farmers to check the khaira disease. In general, weed problem was less as most of the farmers

applied weedicides like pretilachlor and bis-pyribac sodium (Nominee Gold). Average expected yield was 40-50 q/ha in case of HYVs and about 20-25 q/ha in case of basmati varieties. Diseases like blast, brown spot, sheath blight, false smut, grain discoloration and bacterial blight and insect pests like stem borer, leaf folder, BPH, WBPH, gundhi bug and rice hispa were recorded in low to moderate intensities. Most of the farmers used cartap hydrochloride, Reagent (fipronil 5 SC) and chlorantraniliprole (Coragen) to control stem borer and thiamethoxam or aephate to manage hoppers.

District wise details

Udham Singh Nagar: Production oriented survey was conducted in 32 villages of 7 blocks of district Udham Singh Nagar when rice crop was almost matured. The general weather conditions for rice cultivation were normal. Most of the farmers were marginal or sub-marginal. Since rice is the major crop in the Kharif season, most of the fields (50-55%) were occupied with rice. Due to favourable weather conditions, there was nice crop stand, in almost all areas surveyed. PR 113, PR 121, PR 126, NDR 359, HKR 47, Pant Dhan 23, Pusa Basmati 1121, Pusa Basmati 1509 and Pusa Basmati 1121 are the predominant varieties in this district cultivated by the farmers. In seven blocks of U.S. Nagar namely; Jaspur, Kashipur, Bazpur, Gadarpur, Rudrapur, Sitarganj and Khatima the farmers adopted rice-wheat, rice-sugarcane, Sugarcane-toria/lentil-sugarcane and maize-wheat-rice-vegetable pea cropping system. Entire area under the district is irrigated and farmers followed recommended agronomic package of practices. In the main fields farmers used about 120 kg nitrogen, 60 kg phosphorus and 40 kg potassium per hectare. Farmers in the district regularly applied zinc sulphate @ 25 kg/ha or sprayed the crop with 5 kg zinc sulphate and 20 kg urea/ha to manage khaira disease. Different equipments like tractor, power tiller, rotavator and combine harvester were used by the farmers. Shallow wells are the main sources of irrigation in the district.

High yielding varieties under bold and medium grain categories like PR 113, PR 126, HKR 47 and PR 121 were predominantly cultivated in the district. However, in basmati categories Pusa Basmati 1509 and Pusa Basmati 1121 varieties were cultivated only in limited areas. Yield of rice was expected to be 45-50 q/ha in case of bold and medium grain varieties and 20-25q/ha in case of basmati rice. During survey for diseases and insect-pests, low to moderate incidence of Sheath blight, bacterial blight, false smut, brown spot, grain discoloration, BPH, WBPH and stem borer was observed during the crop season. Most of the farmers used cartap hydrochloride, Reagent (fipronil 5 SC) and chlorantraniliprole (Coragen) to control stem borer and thiamethoxam or aephate to manage hoppers. Crop was free from weeds at most of the places as most of the farmers used pretilachlor and bis-pyribac sodium (Nominee Gold).

Nainital: The farming system of Nainital district is an integration of food grains, vegetables, fruits and livestock production system. The district is comprised of 4 farming situations namely; Bhabar plain including foot hills, lower hills (rainfed and irrigated), mid hills (rainfed and irrigated) and high hills (rainfed). Crops like rice, wheat, maize, soybean, ragi, ginger, lentil, pea, tomato, cole crops, brinjal, ladies finger, guava, jackfruit etc. are mainly grown in bhabar and foot hills, while rice, wheat, soybean, maize, tomato, couliflower, French bean, mango, lime, peach and pear are mainly cultivated in lower hills. In Nainital, production oriented survey was conducted in 15 villages of 3 blocks of two farming situations namely Bhabar plain including foot hills, and lower hills (rainfed and irrigated) at crop maturity. The general weather

conditions for rice cultivation were normal. Most of the farmers were sub-marginal. The area under rice cultivation was more in Bhabar as compared to hills. Good crop stand was noticed in Bhabar compared to hilly areas. Varieties like Govind, Pant Dhan 11 and PR 113 were grown by the farmers in Bhabar region, whereas, VL Dhan 207, VL Dhan 208, VL Dhan 209, Govind Pant Dhan 18 were common in foot and lower hills in Kotabagh and Ramnagar blocks of Nainital district. Only Bhabar area is irrigated and farmers followed recommended agronomic package of practices. Farmers used about 120 kg nitrogen, 60 kg phosphorus and 40 kg potassium per hectare in the main fields. They also applied zinc sulphate @ 25 kg/ha to avoid khaira disease.

The average productivity was expected to be around 40-45q/ha. During survey for diseases, leaf blast was noticed during vegetative phase of the crop while sheath blight in late tillering stage. Neck blast, brown spot and bacterial blight were observed after panicle emergence. The incidence of brown spot was more in rainfed conditions compared to plains. Low to moderate incidence of stem borer and BPH were observed during the crop season. Farmers in the Bhabar region used cartap hydrochloride, Reagent (fipronil 5 SC) and chlorantraniliprole (Coragen) to control stem borer and bis-pyribac sodium (Nominee Gold) for weed control. However, hilly farmers still continue to grow rice in traditional way.

Districts	Diseases							
	Bl	BS	ShBl	FS	GD	BB		
US Nagar	-	L	L-M	L-M	L	L-M		
Nainital	L	L	L-M	-	-	L-M		

 Table: Prevalence of major diseases and insect pests in Uttarakhand during Kharif' 2020

Districts	Insect Pests							
	SB	LF	BPH	WBPH	GB	RH		
US Nagar	L-M	L	L-M	L	L	L		
Nainital	L	L	L	L	-	-		

Abbreviations:

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

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

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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 Andhra Pradesh, Bihar, Gujarat, Haryana, Karnataka, Maharashtra, Punjab, Telangana, Uttar Prades and, Uttarakhand 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.





