उत्पादनोन्मुखी सर्वेक्षण : Production Oriented Survey

सहयोगः राज्य कृषि विश्वविद्यालय एवं कृषि विभाग

In collaboration with

State Agricultural Universities and Department of Agriculture

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Rajendranagar, Hyderabad - 500 030, India

PRODUCTION ORIENTED SURVEY 2024

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Production Oriented Survey-2024

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Summary-POS-2024-2025

Production oriented survey is conducted every year by a team of subject matter specialists (from different AICRPR centres) 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, cropping systems, rice consumption pattern, extent of use of organic manure and inorganic fertilizers, weed problem and their management, occurrence of different biotic and abiotic problems and their management and various needs of the farmers and problems faced by the farmers. During 2024, the survey was conducted in 15 states of India *viz*., Andhra Pradesh, Chhattishgarh, Gujarat, Haryana, Jammu and Kashmir, Karnataka, Kerala, Maharashtra, Puducherry, Punjab, Tamil Nadu, Telangana, Uttar Pradesh, Uttarakhand and West Bengal by 18 AICRIP centres. A total of 133 Scientific staffs from the different cooperating centres and several officials from state department of agriculture surveyed 972 villages in 125 districts in 15 states. A total of 1295 farmers were contacted during the survey.

Rainfall over the country as a whole during the 2024 southwest monsoon season (June- September) was 108% of its long period average (LPA). Thus the seasonal rainfall was above normal as per the IMD forecast. Seasonal rainfalls over Northwest India, Central India, South Peninsula and Northeast (NE) India were 107%, 119%, 114% and 86% of respective LPA. The southwest monsoon seasonal (June to September) rainfall over the monsoon core zone, which consists of most of the rain fed agriculture regions in the country received 122% of LPA. Out of the total 36 meteorological subdivisions, 2 subdivisions received large excess rainfall (9% of the total area of the country), 10 subdivisions constituting 26% of the total area received excess, 21 subdivisions received normal rainfall (54% of the total area) and 3 subdivisions (Arunachal Pradesh, Punjab, J & K and Ladak) constituting 11% of the total area) received deficient season rainfall. Monthly rainfall over the country as a whole was 89% of LPA in June, 109% of LPA in July, 115% of LPA in August, and 112% of LPA in September. Southwest monsoon current advanced over the south Andaman Sea and Nicobar Islands in time (19 May 2024, nearly two days before the normal date). It set in over Kerala on 30th May 2024 against the normal date of 1st June and covered the entire country on 2nd July 2024 against its normal date of 8th July. Monsoon withdrawal commenced from west Rajasthan on 23rd September (delay of 6 days).

In addition to several monsoon depressions in Bay of Bengal and Arabian sea, there were 4 major cyclones during 2024 which significantly affected normal human life and extensive damage to agricultural crops. Severe cyclonic storm ‘Remal’ occurred between 24-28 May, 2024 affecting parts of Odisha, West Bengal, Jharkhand and Northeast India. A tropical cyclonic storm ‘Asna’ affected parts of Gujarat, Rajasthan and Madhya Pradesh from 25th August to 2nd September, 2024. A severe cyclonic storm ‘Dana’ caused extensive damage in Odisha and West Bengal and parts of Chhattishgarh, Jharkhand, Andhra Pradesh and Karnataka from 22nd to 26th October, 2024. A deadly tropical cyclone ‘Fengal’ brought significant flooding and damage to south Indian states (Tamil Nadu, Andhra Pradesh, Kerala and Karnataka) from 25th November to 1st December, 2024. 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, Chhattishgarh and Gujarat and its area is increasing in states like Karnataka, West Bengal and Maharashtra. Among diseases, leaf and neck blast, brown spot, sheath blight, sheath rot, grain discoloration and bacterial blight were widespread in different rice growing states of India. Sheath blight and bacterial blight were observed in high intensities in several states. Among insect pests, stem borer, leaf folder and brown plant hopper were widespread in different rice growing states. Brown plant hopper infestation was very high in many areas of eastern Uttar Pradesh and parts of Kerala.

Andhra Pradesh: Production Oriented Survey (POS) was conducted in five districts of Godavari Zone viz., East Godavari, Kakinada, Konaseema, Eluru and West Godavari districts of Andhra Pradesh. Timely onset of monsoon has been recorded. Sufficient good rainfall was recorded in the entire five districts. However, During August to September months untimely heavy rains occurred and caused crop damage in Godavari zone. Heavy rains during last week of August to first fortnight of September 2024 resulted in crop damage in Godavari delta. Commonly cultivated rice varieties in the region were MTU 7029 (Swarna), MTU 1318, PLA 1100, RGL 2537, Sampadha Swarna, BPT 5204, MTU 1064, RP Bio 226, MTU 1061, RP Bio 226, PR-126, MTU 1224, NP 9558, Sadhana, SL 10 and MTU 1153. The major variety Swarna occupied major area in Kakinada, Konaseema and East Godavari districts. MTU 1318 (popular as non-lodging Swarna, medium duration, medium slender grain category) was cultivated in large extent in West Godavari and Eluru districts. Rice-rice was the predominant cropping pattern in the region. Other sequences followed by the farmers were rice-pulse-rice, rice-maize and others. Transplantation was found to be the preferred method of crop establishment in rice. Direct seeding was also practiced in Kakinada, East Godavari and Eluru districts. Average seed rate adopted by farmers is in the range of 15-20 kg/ac from the locations surveyed. However, for Bengal mode of planting, seed rate of 8-12 kg/acre was seen used. For Direct seeding 8-12/14 kg seed rate is used for wet direct seeding conditions. Farmers used different pre- and post-emergence herbicides for management of weeds. Only few farmers surveyed resorted to application of organic manures i.e FYM/Green Manure crops. Farmers commonly applied DAP, 14-35-14, 20-20-0, 10-26-26, 28-28-0 for top dressing in all installments. Potash at the time of P.I stage was applied effectively. Most of the diseases like neck blast, sheath blight, sheath rot, false smut, grain discoloration and bacterial blight and insect pests like stem borer, leaf folder, brown plant hopper, gall midge, mites and rats were observed in low to moderate intensities. Some of the common needs of the farmers were high non-lodging yielding rice varieties, facilities for seed drying, subsidy on fertilizers and pesticides, varieties having tolerance to submergence, increase in MSP, marketing facilities and immediate payment to farmers, tractors and others.

Chhattishgarh: Production oriented survey was conducted in three rice growing districts of Chhattishgarh viz., Jashpur, Gariyaband and Mahasamund when most of the crops were in milk to maturity stage. In general, weather conditions were favorable for rice cultivation except some incidences of prolonged dryness in some places in Jashpur and some instances of excess rainfall in Mahasamund. Common crop rotation practices followed by the farmers were rice-wheat, rice-rice, rice-mustard, rice-groundnut, rice-pea, rice-chickpea, rice-vegetables, rice-sugarcane, rice-lathyrus, rice-linseed and others. Commonly cultivated rice varieties in the region were HYVs like Swarna, MTU 1010, MTU 1001, Indira Aerobic-1, Vikram TCR, Jai Shree Ram, Geetanjali, Mahamaya, Indira 9, Dubraj, Danteshwari, Karma Mahsuri, Bamleswari and others and hybrids like Dhaaniya MR 8383, Dhaaniya MR 8336, Nandi-777, VNR Rice hybrid 2111, VNR GK-11, US 312, Kaveri 468, Mahindra MPR 404, Advanta PAC 807, Arize 6444 and others. Average rice

in farmers' field ranged from 3000-5800 kg/ha in case of HYVs and hybrids and 2500-4500 kg/ha in case of local varieties. Average seed rate for direct seeded rice (broadcasting) was 60-80 kg/ha. For regular transplanting, average seed rate was 25-40 kg/ha for HYVs and about 15-25 kg/ha for hybrids. Practice of seed treatment was not very common among the farmers. In addition to organic manures, farmers applied fertilizers like urea and DAP in the nursery. Fertilizers were applied @ 10-100 kg N/ha, 10-60 kg P_2O_5/ha and 5-35 kg K_2O/ha. Intensity of weeds was high in some places surveyed in Jashpur and Mahasamund. Almost all the farmers who applied herbicides also followed 1-2 hand weeding. About 11-35% farmers in different districts followed only hand weeding. Farmers used different equipments like tractor with cultivator, seed drill, transplanter, thresher, sprayer, reaper, power tiller, rotavator, combine harvester. Among the diseases, intensity of neck blast, brown spot and sheath blight was more in some fields while BPH and rice hispa were recorded in high intensity in some fields. Majority of the farmers adopted plant protection measures.

Gujarat: Production oriented survey was conducted in the 11 major rice growing districts of Gujarat State *viz.*, Ahmedabad, Anand, Dang, Kheda, Mahisagar, Navsari, Panchmahals, Surat, Tapi, Vadodara and Valsad when the crops were mostly in heading to dough stage. In general, weather conditions were normal and favourable for rice cultivation. Rainfall was timely, sufficient and well distributed during the season in most of the places. High yielding varieties like Gurjari, GAR 13, Mahisagar, GAR 14, GR 21, GAR 22, GNR 3, GR 4, GR 7, GR 11, GR 101, GR 17, GR 18, Moti Gold, Surya Moti, Sonam, Sriram 110, Sriram 125, Nath Pauha, Krishna Kamod, and others and hybrids like US-312, Hyb 27p37, MC-13, Hyb. 25p25, Kaveri 468, Arize 6444, Arize 6555 ST, Ankur 13555, Ankur 7434, Hyb. 471, VNR 2233, US-316, Arize-6201, etc. were mainly cultivated in different districts of Gujarat. Common crop rotations followed by the farmers in different districts were rice-wheat (main), rice-rice, rice-wheat-vegetables, rice-vegetables, rice-mustard, rice-green gram/chickpea, rice-tobacco, rice-pulses, rice-maize, rice-pigeon pea, rice-pearl millet, rice-sugarcane, rice-niger, rice-wheat-maize, rice-fodder sorghum and rice-bean-summer green gram. The average yield among different HYVs and hybrids in different surveyed districts ranged from 3000-5500 kg/ha. Average seed rate used by the farmers in different districts ranged from 23-30 kg/ha. Majority of the farmers except Dang told that they applied chemical fertilizers like urea and DAP in the nursery. In the main fields, fertilzers were applied @ 44-89 kg N/ha, 12-37 kg P_2O_5/ha and 20 kg $ZnSO_4$/ha. All the farmers contacted applied organic manure like FYM in the main field. In general, the intensity of common weeds like *Echinochloa colona, E. crusgalli, Cynodon dactylon, Cyperus rotundus, Eclipta alba* and others was low to medium except in Dand and Panchmahals where the intensity of weeds was medium to high. Hand weeding was the most common practice for weed management. Implements like tractor, rotavator, sprayers (knapsack and power), puddler, cultivator, thresher and combined harvester were used by the farmers. Major sources of irrigation were shallow tube wells and canal. In general, the intensity of different diseases and insect pests was low to moderate. However, higher intensity of false smut was recorded in some fields in Kheda district on varieties like Punjab S and GAR 13. Majority of the farmers contacted in different districts except Dang adopted chemical plant protection measures.

Haryana: Production oriented survey was conducted in 8 rice growing districts of Haryana viz., Kaithal, Kurukshetra, Karnal, Jind, Yamunanagar, Ambala, Panipar and Sonepat during Kharif season of 2024 when the crops were booting to maturity stage. The fields surveyed were under irrigated ecosystem and in general the weather conditions for rice cultivation were favourable.

Widely cultivated rice varieties were HYVs like PR 126, PR 114, PR 131 and others; hybrids like Hyb. 90m100, Sava 7501, Sava 7301, JKRH 2082, Sava 127, Sava 134, VNR 2111, Hyb. 2299, Hyb. KRH 7299, Hyb KRH 468, Arize 6444, 28p67, Arize 6129 and others and basmati rice varieites like Pusa Basmti 1121, CSR 30, Pusa Basmati 1509, Pusa Basmati 1885, Pusa Basmti 1718, Pusa Basmati 1692, Pusa Basmati 1401, Super 52, Pusa Basmati 1886, Pusa Basmati 1847 and Super 21. The main crop rotation followed by the farmers was rice-wheat. Some farmers also followed rice-mustard-sugarcane, rice-mustard, rice-potato-sunflower, rice-vegetables, rice-fodder (barseem), rice-potato, rice-wheat-sugarcane and rice-sunflower. Average rice yield among HYVs ranged from 6250-9500 kg/ha while in case of hybrid varieties it ranged from 6000-10250 kg/ha. In case of basmati varieties, average yield ranged from 2500-7600 kg/ha. Average seed rate was low (12.5-20 kg/ha). On an average about 56% of the farmers contacted told that they treated the seeds before sowing. Application of organic manure in the nursery was not common among the farmers. However, majority of the farmers contacted in different districts applied chemical fertilizers like urea and DAP in the nursery. Average nitrogen dose in case of HYVs was 101-252.5 kg N/ha while in case of basmati N dose was 86.25-230 kg N/ha. Other fertilizers were applied @ 10-85 kg P_2O_5/ha and 23-57.5 kg K_2O/ha. Most of the farmers contacted told that they applied FYM in the main field once in 2-4 years depending on its availability. In general, intensity of weeds in and around rice fields was low to moderate. On an average, about 80% of the farmers contacted told that they managed the weeds only by herbicides and rest told that they also adopted hand weeding along with herbicide application. Implements like harrow, rotavator, tractor, trolley, power tiller, combined harvester were used by the farmers. Among the disease, sheath blight, leaf and neck blast, bakanae, false smut, grain discoloration, bacterial blight and sheath rot were wide spread in low to moderate form. Among the insect pests, stem borer, leaf folder and plant hoppers were wide spread in low to moderate intensity.

Jammu & Kashmir: Production oriented survey was conducted in *Kharif* 2024 in Jammu district and two hilly viz., Rajouri and Poonch districts of Jammu and Kashmir. All the districts experienced a normal weather with well distributed rains throughout the season except at the fag end of the crop when there was a long dry spell particularly in Rajouri without affecting much the yield parameters of rice. Commonly cultivated rice varieties in these districts are basmati varieties like Basmati 370, Pusa 1121, Sarbati, Jammu Basmati 129, Jammu Basmati 118 and traditional varieties like Giza 14, K 39, China and Chandak Basmati. Seed replacement rate remains negligible and the farmers still opt for the age- old traditional course varieties of Giza 14, K 39 and Chandak Basmati for their taste preferences. Maize and Rice are the only cereal crops grown widely in the Kharif season. Rice-oats (fodder) and rice-wheat were most predominant cropping sequences in these districts. Other crop rotation practices followed by the farmers were rice-vegetables (knol khol, cucurbits), rice-barseem, rice-potato, rice-mustard and others. The rice yield among different basmati and improved rice varieties ranged from 2280-3300 kg/ha while among the local traditional varieties yield ranged from 1800-2650 kg/ha. Average seed rate was 25-30 kg/ha. Majorit of the farmers contacted told that they adopted seed treatment with carbendazim (2 g/kg). Most of the farmers contacted told that they applied organic manure like FYM in the nursery. All the farmers contacted told that they applied chemical fertilizers like DAP and urea in the nursery beds. In the main fields, fertilizers were applied @ 30-80 kg N/ha, 20-50 kg P_2O_5/ha and 30-40 kgK_2O/ha. Intensity of weeds was low to medium. Farmers followed hand weeding along with herbicide application. In many fields, a mixture of seeds and wild rice (*Oryza sativa* var. *spontanea*) was commonly observed which needs the replacement with pure seed. Some of the common needs of the farmers were timely supply of seeds, fertilizers, plant protection chemicals

and other inputs, improvement in farm mechanization, improvement in irrigation facilities and availability of soil testing facility at block level. Farmers used different equipments like Tractor, rotavator, cultivator, sprayer and combine harvester. Among the biotic constraints, diseases like leaf blast, brown spot, grain discoloration and bacterial blight were recorded in high intensity in some places. Most of the insect pests were recorded in low to moderate intensities.

Karnataka: Production oriented survey was conducted in eight districts of Karnataka *viz*., Mandya, Mysuru, Chamarajanagara, Hassan, Chikmagaluru, Kodagu, Davangere and Shivamogga districts of Southern Karnataka during Kharif 2024. The climatic conditions were in general normal during Kharif 2024 and favourable for rice cultivation. However, there were dry spells during September at tillering stage in Mandya, Mysuru and Shivamogga districts. Commonly cultivated rice varieties were HYVs like MTU 1001, Super Aman Gold, IR-64, Omkar (NP-3056), Jyothi, RNR-15048, Kaveri Prize, Amogh, Sanna Madhu, BR-2655, MTU1010, G K Chetana, Rajamudi, Thanu, MTU 1001, Tunga, BR-20658 and others and hybrids like VNR 2233, Meenakshi, Kaveri hybrids and others. The prevailing cropping pattern in the districts surveyed is Rice-rice followed by rice-sugarcane, rice-ragi, rice-maize, rice-pulses, green manure crops and rice-fallow. Farmers followed other cropping sequences like rice-finger millet, rice-vegetables, rice-potato, rice-dhaincha-rice, rice-sesamum, rice-cowpea, rice-black gram/green gram, rice-finger millet-black gram, rice-groundnut-cowpea and others. Average rice yield in different high yielding rice varieties and hybrids in different districts ranged from 4500-7000 kg/ha. Average seed rate used by the farmers ranged from 25-50 kg/ha. On an average, about 35% of the farmers contacted adopted seed treatment with carbendazim or thiram. On an average, about 72% of the farmers contacted applied organic manures like FYM and vermicompost in the nursery. All the farmers contacted applied chemical fertilizers like urea, DAP, MOP and complex fertilizers like 20:20:0:13 (factomphos), 19:19:19, 10:26:26, 17:17:17. In the main field, fertilizers were applied @ 22.5-140 kg N/ha, 21.25-115 kg P_2O_5/ha and 21.25-75 kg K_2O/ha. Overall, intensity of weeds was low to medium. Most of the farmers who applied herbicides, also adopted 1-2 hand weeding hand weeding at 30 and 60 days after planting. On an average about 54% farmers contacted in different districts told that they practice only hand weeding. Some of the common needs of the farmers were improvement in irrigation system, pest and disease resistant HYVs, improvement in marketing facility, timely availability of micronutrients, crop insurance, timely availability of quality seeds and other inputs like fertilizers and pesticides. Implements like rotavator, tractor, power tiller, JCB, cultivator, tiller, grass cutter and combined harvester were used by the farmers mostly on hire basis. Canal was the main source of irrigation followed by deep tube well. Almost all the farmers contacted expressed that there was scarcity of irrigation water. Diseases like leaf and neck blast, brown spot, sheath blight, sheath rot, false smut and bacterial blight were recorded in low to moderate intensity. Insect pests like stem borer, leaf folder, brown plant hopper were commonly recorded.

Kerala-1 (MCP): Production oriented survey was conducted during Kharif 2024 in 6 different districts of Kerala *viz*., Thiruvananthapuram, Alappuzha, Pathanamthitta, Kottayam, Ernakulam, and Kollam. A total of 83 village panchayats in 37 blocks were covered during the survey. Commonly cultivated rice varieties in the region were Uma (MO 16), Pournami (MO 23), Manurathna, Jyothi, Prathyasha, Manuratna, Red Triveni, Sreyas and Cherady. Uma was the most predominant rice variety. In Ernakulum district, farmers cultivated Pokkali rice varieties. Weedy rice and weeds like *Eichinochloa* spp., *Fimbristylis* spp., *Monochoria vaginalis*, *Cyperus* spp., Nagapola (*Limnocharis flava*), *Salvinia* spp. (watermosses) and others were commonly observed

in almost all padasekarams. A very unique pre-sowing weed control method termed "Stale seed bed preparation" is practiced by the Kuttanad farmers. Implements like tractor, tiller, drum seeder and combine harvester were used by the farmers mainly on hire basis. Labour shortage is the main issue in Kuttanad region. Among abiotic stresses, acidity was the major problem. Among diseases, blast, brown spot, sheath blight, bacterial blight and grain discoloration were observed in varying intensities. Among insect pests, stem borer, leaf folder, brown plant hopper, gall midge, case worm and thrips were recorded in different farmers' fields. Major problem faced by the farmers were shortage of agricultural labours and their high cost and increase in the cost of cultivation.

Kerala-2 (PTB): Production-oriented survey was conducted in the Palakkad, Thrissur, and Malappuram districts of Kerala from August 2024 to January 2025. The survey was carried out from the tillering to maturity stage of the crop. The predominantly cultivated rice varieties in these areas were Uma, Jyothi, Ponmani, Aishwarya, Supriya, Akshaya, Karuna, Bhadra, and Manuratna. Reported yield ranged widely from 1 t/ha to 8 t/ha. Major cropping sequences followed by the farmers were rice-rice, rice-rice-dhaincha, rice-rice-cowpea, rice-rice-fallow and others. Farmers adopted a seed rate of 75–80 kg/ha. For nursery preparation, they preferred applying only farm yard manure (FYM) in the nursery. Fertilizer application ranged from 25 to 85 kg N/ha, 12.5 to 25 kg P_2O_5/ha, and 0 to 40 kg K_2O/ha. Application of organic manure is not common among farmers. Farmers who are applying organic manures either use FYM or poultry manure and only a few adopted green manuring or green leaf manuring. A few farmers of Malappuram district used IFFCO product Seaweed Extract Concentrate (28% w/w) as a plant growth promoter. Transplanting is the common method of crop establishment and a few adopted dry sowing. The common weed species observed were *Echinochloa* spp., *Cyperus* spp., *Fimbristylis miliacea*, *Chara* spp. (green algae), *Pistia* spp. (aquatic weed), *Monochoria vaginalis*, *Isachne miliacea*, *Eichornia* spp., *Marcelia quadrifolia*, *Tridax procumbens*, *Sacciolepis interrupta* and others. *Oryza rufipogon* was a serious problem in some pockets. Farmers used hand weeding and chemical herbicides for weed management. The major diseases observed, were bacterial blight, brown spot, sheath blight, and false smut. Bacterial blight was very wide spread and was recorded in very intensity in many places surveyed. Among insect pests, stem borer and leaf folder were widespread and were recorded in high intensity in many places. The primary constraints faced by farmers included wild boar attacks, non-availability of good-quality seeds, pest and disease incidence, labour shortage, and high labour costs. Some of the common needs of the farmers were HYVs resistant to bacterial blight of rice and stem borer, medium to long duration rice varieties having resistance to lodging and sub-mergence, varieties suitable for DSR and bio-fortified rice varieties.

Maharashtra: Production oriented survey was conducted in the Konkan region of Maharashtra which is predominant rice growing belt with an average productivity of 2.58 (3.63 rough rice) t/ha. The region comprises of five districts viz. Thane, Palghar, Raigad, Ratnagiri and Sindhudurg. In Kharif-2024 season 360990 ha area was sown under rice cultivation in the region with HYV. The farmers of this region cannot grow any crop other than rice in Kharif because of high rainfall and geographically low land. Weather conditions were in general favourable for rice cultivation in the region. Commonly grown rice varieties were Karjat-3, Karjat-6, Karjat-7, Karjat-2, MTU 1010, Jaya, Rupali (Ankur), YSR, Spriha 911, Shubhangi, Daptari 1008, Daptari 100, Daptari 250, Om Sree Ram-125, Daptari 125, Jordar, Wada Kolam, Suvarna, Kranti, Samrudhi, Komal-101, Mahuli, Silk-277, Pooja Gold, Poonam Gold, RTN-5, RTN-8, Ratnagiri-6, Sampada, CO-51, Prasanna, Trupti, Wada Zinia, Sarathi, Swarna, Super Sona, Karjat5, Sonam, Shivani, Amani, Nath Poha, Janki, Swabhagya, Jai Shree Ram Gold, Chintu and Gold-78. Commonly grown rice hybrids

were Arize 6444, Gorakhnath-509, Loknath-505, Upaj Mahyco 5566, Arize-6129, VNR 2245, Kaveri-9090, Ankur-7576, Ankur-6077, Ankur-6444, KPH-468, Syn-5251, Tata-748 and others. The most common cropping pattern adopted by farmers in the region is rice-fallow, rice-pulses (chick pea, green gram, pigeon pea, black gram, horse gram, dolichos bean), rice-vegetables, rice-pearl millet/finger millet, rice-water melon, rice-sesamum and rice-groundnut. Rice yield in the region was low and ranged from 2000-5000 kg/ha. In general, planting was done during 2nd to 4th week of July. Average seed rate used by the farmers ranged from 30-45 kg/ha for high yielding rice varieties and about 25 kg/ha in case of hybrids. On an average, about 23% of the farmers contacted told that they treated the seeds with thiram. On an average 80% of the farmers contacted told that they applied organic matter like FYM and poultry manure in the nursery. 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'. Fertilizers were applied @ 23.23-262 kg N/ha, 3.75-75 kg P_2O_5/ha and 3.75-75 kg K_2O/ha. Overall, intensity of weeds was low. None of the farmers contacted applied any herbicides and all of them followed 1-2 hand weeding for managing the weed problem. Some of the common needs of the farmers were subsidy on inputs, good market price, improvement in irrigation facilities, financial support, improvement in mechanization and availability of quality seeds. 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. During 2024, intensity of most of the diseases and insect pests were recorded in low to moderate except bacterial blight was high in different fields in Thane, Palghar, Raigad and Ratnagiri.

Puducherry: During 2024-25, the Kuruvai crop (June-July) was cultivated across 802.72 hectares, producing 2,755.770 metric tons with a productivity of 3.433 metric tons per hectare. The Samba crop (August-January) covered 3,686.15 hectares, while Thalady (September-October) and Navarai (December-January) were grown on 768.17 hectares and 31.59 hectares, respectively, bringing the total cultivated area to 5,288.63 hectares. Farmers relied on canal water, bore wells and farm ponds for irrigation. Short-duration rice varieties such as IR 20 and CO 51 were cultivated during the Kuruvai season. In the Samba season, a diverse range of varieties, including ADT 37, ADT 38, ADT 39, ADT 45, ADT 46, ADT 51, BPT 5204 Improved White Ponni (IWP), CO 43, CO 50, CO 51, CR 1009 (Ponmani), CR 1009 Sub1, TKM 13, NLR, KKL (R) 2, TRY 3 were cultivated primarily utilizing Cauvery water. Among these varieties, BPT 5204 (Samba Masuri) is highly preferred by the farmers in this region for its high market demand, better selling price and better profitability. The predominant cropping sequences include rice-pulse and rice-rice-pulse**,** while in areas with assured borewell irrigation, farmers also practice the rice-cotton system. Farmers practiced both transplanting and direct sowing. The seed rate for direct sowing ranges from 50 to 75 kg per hectare**,** while for transplanting, it is 40 to 50 kg per hectare**.** Majority of the farmers contacted applied fertilizers like DAP (15-22 kg/ha) and urea (10-25 kg/ha) in the nursery. In the main fields (both in case of transplanted rice and in case of direct sowing), fertilizers were applied @ 100-150 kg N/ha, 30-50 kg P_2O_5/ha and 30-50 kg K_2O/ha. Organic manures such as FYM @ 12.5 t/ha, goat manure 2000-3000 kg/ ha and neem cake @ 12.5 t/ha were being applied by the farmers. Commonly observed weeds were *Leptochloa chinensis, Echinochloa colona*, *Echinochloa crusgalli*, *Digitaria* spp., *Cyperus rotundus*, *Cyperus iria*, *Cyperus deformis*, and *Fimbristylis miliacea, Marsilia quadrifoliate, Eclipta alba*, *Ludwigia parviflora* and *Ludwigia abyssinica*. In addition to hand weeding, farmers applied different herbicides for managing the weeds. Major insect pests observed during the survey were yellow stem borer, leaf folder, gall midge, brown planthopper and rice mite. Among the diseases, leaf blast, brown spot, sheath rot, grain

discoloration, false smut and bacterial leaf blight were observed. Among these, intensity of bacterial blight was high followed by sheath rot. Farmers used different pesticides for managing different pests and diseases.

Punjab: Production oriented survey was conducted in 15 districts of Punjab viz., Ludhiana, Jallandhar, Bathinda, Mansa, Muktsar, Fazilka, SBS Nagar, Roopnagar, Mohali, Moga, Barnala, Ferozepur, Faridkot, Amritsar and Tarn Taran during Kharif season of 2024. Survey was conducted when the crops were in booting to heading stage. The climatic conditions were in general favourable for rice cultivation. During *Kharif*-2024 in Punjab state, paddy was cultivated on an area of around 31 lakh hectares of which 80 percent area was under non-basmati rice and 20 percent area was under Basmati rice. Among non-basmati rice, PR126 was most popular variety occupying 43 per cent area followed by PR 131. Other non-basmati varieties cultivated in the state were PR 128, PR 121, PR 114, PR 130, Supreme and Pusa 44 and hybrids like Sava 7301. Among basmati varieties commonly cultivated varieties were Pusa Basmati 1121, Pusa Basmati 1509 Pusa Basmati 1718, Pusa Basmati 1401 and Pusa Basmati 1847. Predominant crop rotation remained the rice-wheat system followed by rice-potato, rice-wheat-garlic, rice-wheat-vegetables. Average rice yield among the HYVs and hybrids ranged from 7460-8250 kg/ha while in case of basmati varieties, the yield ranged from 4280-4880 kg/ha. Most of the farmers used 12-20 kg/ha of seed rate for nursery sowing but for direct seeding they used 15-25 kg seed per ha. Almost all the farmers contacted told that they applied FYM in the nursery. Few applied poultry manure in the nursery. All the farmers contacted in different districts told that they applied chemical fertilizers like urea and DAP in the nursery. Many farmers also applied zinc sulphate in the nursery. An area of about 1.0 lakh ha was under direct seeded rice. Most of the surveyed farmers used overdose of nitrogen but some farmers skipped the application of phosphorus (P_2O_5) or applied less quantity of phosphorus due to higher status of it in their soils. Comparatively less number of farmers applied potash (K_2O) in paddy crop. Application of Zinc sulphate (either 21 or 33%) was practiced by about 61-83% farmers but they used under dose of Zinc. Overall intensity of weeds was low throughout the state. Along with herbicide applications, farmers also followed hand weeding for weed management. Some of the common needs of the farmers were higher MSP for HYVs, improved irrigation water availability, improved rice production and protection technologies and timely availability of seeds of HYVs. Most of the farmers contacted were progressive and have knowledge on improved rice production technologies. Implements like tractor, disc plough, cultivator, harrow, planker, laser leveller, combined harvester and others were used by the farmers. Overall, intensity of different diseases and insect pests was low to moderate in the state.

Tamil Nadu-1 (ADT): Production oriented survey was conducted in fourteen districts of Cauvery delta zone in Tamil Nadu viz., Ariyalur, Thanjavur, Nagappattinam, Mayiladuthurai, Thiruvarur, Tiruchirappalli, Perambalur, Pudukkottai, Villupuram, Thiruvannamalai, Kancheepuram, Thiruvallur, Cuddalore and Vellore. Area under rice was marginally increased. Short duration rice varieties ADT 36, ADT 43, ADT (R) 45, TKM 13 and medium / long duration varieties CR 1009 Sub 1, ADT 38, ADT 39, ADT (R) 46, ADT (R) 49, ADT 51, Annapoorani, Jaiganesh, Amman, Mahindra-404, CO 43, CO 51, NLR 34449, CO 51, Improved White Ponni, CR 1009 and BPT 5204 were predominantly grown. Common crop rotations followed by the farmers were rice-rice-pulses/gingelly, rice-pulses, rice-rice-rice, rice-sugarcane-rice and rice-onion. Overall incidences of different pests and diseases in different surveyed districts was low. Among the insect pests, leaf folder, stem borer, BPH and gall midge were recorded. Mild incidence of bacterial leaf blight, false

smut, blast, sheath blight, sheath rot and brown spot diseases were recorded. Labour scarcity was the major constraint to the farmers.

Tamil Nadu-2 (CBT): In the Production Oriented Survey (POS) program during the year 2024-25, ten districts were surveyed covering south and western parts of Tamil Nadu. These included Thiruvanamalai, Salem, Dharmapuri, Erode, Coimbatore, Krishnagiri, Kallakurichi, Namakkal, Kanyakumari and Tirunelveli. This year was a normal year for rice production without major outbreak of pest and diseases. Farmers solely depended on canal irrigation and were able to cultivate rice during *Kuruvai* season. Nearly half of the area surveyed was cultivated with two season rice crop in the current year. As in the past, short and medium duration varieties were generally chosen by the farmers for cultivation. Varieties like ADT 55, ADT 53, Amman and BPT 5204 were grown predominantly apart from CO 51, ASD 16, Sadana, IR 20 and IWP. Farmers are gradually shifting to DSR due to acute labour scarcity across the state. Mechanical transplanter suitable for small holdings was most sought-after machinery by the farmers. Crop insurance covering village level damages and better infrastructure at civil supplies corporation were also emphasized by some farmers. Herbicides butachlor (pre-emergence) was used along with one or two hand weeding for the control of weeds. Conoweeder was practiced by the farmers adopting SRI method of rice cultivation. NPK was applied by the farmers along with DAP as basal fertilizers. Urea and potash along with neem cake 50 kg/ha was also applied as top dressing in some of the rice growing areas. Many farmers have complained about huge increase in fertilizer prices. Zinc deficiency was noticed in some pockets and awareness about application of Zinc sulphate is very high among different group of farmers. Seed rate used by the farmers were varied from 40 to 60 kg per hectare and the seeds were purchased by the farmers every year from the local retailers and Agricultural Department. Seed rate of 10-12 kg/ha was adopted by farmers wherever the SRI method of cultivation was practiced. In the surveyed districts major sources of irrigation were canals and deep tube well. Labour scarcity was very high for rice cultivation. Farmers were getting an average yield of 4400-5300kg/ha. Diseases like blast, neck blast, brown spot, sheath blight, sheath rot, false smut and bacterial blight and insect pests like stem borer, leaf folder, case worm and leaf mite were recorded in low intensities in most of the places surveyed. Many farmers have used two sprays of plant protection chemicals as prophylactic spray along with micronutrients. Seed treatment with *Bacillus subtilis* @ 10 gm/kg was practiced by several farmers across the state. was no major outbreak of any pest or disease during this year.

Telangana: Production oriented survey was conducted in 16 districts of Telangana viz., Ranga Reddy, Kamareddy, Nizamabad, Khammam, Yadadri Bhuvanagiri, Medchal–Malkajgiri, Sangareddy, Medak, Vikarabad, Hanomkonda, Karimnagar, Wanaparthi, Nagarkurnool, Jagtial, Janagoan and Jogulamba Gadwal once during tillering to maximum tillering stage and again during grain filling to maturity stage. Overall, the average rainfall received in Telangana state from 01.06.2024 to 05.02.2025 is 1049.2 mm as against the normal rainfall of 859.3 mm with deviation of 22.10 per cent. Predominant rice varieties cultivated in the state were BPT 5204, MTU 1010, RNR 15048 – Telangana Sona, MTU 1224, Cintoo, JSR type, KNM 118, IR-64, JGL 24423, KNM 1638, MTU 1061, Pooja, Sriram gold, Ankur Sona, Super Aman, Sowbhaya, Aman gold, HMT Sona, RNR 21278, MTU 1271, Ganga Kaveri (local), Mahindra Sowbhagya, Kunaram Sannalu, MTU 1010, Jagtial Rice-1, Tellahamsa, Bathukamma, MTU 1061, MTU 1153, MTU 1156, MTU 7029 and MTU 1001. Some farmers cultivated hybrids like Kaveri 272, Kaveri 175, Kaveri 468, VNR 22258, Rasi 113, Mahindra 303, 27P31, RX 100 and Bio 799. Among various cropping systems, rice followed by rice was the most dominant practice across all surveyed districts. Other

cropping systems observed included rice-fallow, green manure-rice-rice, rice-pulses, rice-zero tillage sunflower, and rice-rice-vegetables. Direct Seeded Rice (DSR), both wet and dry, has been widely adopted in Khammam, Mahabubabad, Suryapet, and Nalgonda districts and is now gaining popularity across Telangana. In the nursery, farmers applied both organic manures like poultry manure or sheep manure and chemical fertilizers like DAP or other complex fertilizers. Majority of the farmers applied complex fertilizers *viz.,* 12-32-16, 20-20-0-13, DAP, 10-26-26, 16-20-0-13, 17-17-17, 19-19-19, 28-28-0 ranging from 1 to 3 bags per acre as a basal dose. Majority of the farmers are applying the complex fertilizers (50-150 kg/acre) as basal followed by top dressing of Urea (150-200 kg/acre) in 2-3 split doses at tillering stage, booting and just before panicle initiation depending on duration of the varieties. The predominant weed flora includes *Echinocloa colanum, E. crusgalli, Cyandon dactylon, Cyprus rotundus, Leersia hexandra, Panicum ripens, Leptochloa* spp. *Euphorbia spp. and Parthenium spp*. Majority of the farmers in the surveyed districts were applied the pre and post emergence herbicides in rice during *kharif* and *rabi* seasons. Among different biotic stresses stem borer, gall midge and bacterial blight were recorded in high intensities in some areas. Majority of the farmers adopted chemical plant protection measures.

Uttar Pradesh: Production oriented survey of rice growing areas was conducted in five districts of eastern Uttar Pradesh viz., Ayodhya, Ambedkar Nagar, Amethi, Sultanpur and Barabanki when the crops were in tillering to heading stage in Kharif 2024. Though overall, climatic conditions were normal for rice cultivation, there were dryness and less rainfall in the region except Barabanki. Rice varieties like NDR 2064, NDR 3112-1, NDR 2065, Sarjoo 52, Sambha Mahsuri-Sub 1, BPT 5204, NDR 97, Shahbhagi, NDR 359, Pusa Basmati 1, MTU 7029, Pan Mahsuri, Swarna Sub-1, Narendra Lalmati, Swarna-Sub-1, Damini and hybrids Arize 6444 Gold, Hyb. 27p63, Hyb. 27p38, Dilkhush, Gorakhnath-509, Pusa RH 10 and others were found very popular among the farmers of Eastern U.P. Major crop rotations followed by the farmers were rice-wheat (main), rice-mustard, rice-wheat-black gram/green gram/lentil, rice-wheat-mentha, rice-pea, rice-chick pea, rice-pea-green gram, rice-wheat-vegetables, rice-mustard-green gram, rice-wheat-sorghum and rice-pulses. Average rice yield among different HYVs ranged from 3800-4400 kg/ha while in case of hybrid varities the yield ranged from 3600-6000 kg/ha. Average seed rate used by the farmers ranged from 30-35 kg/ha for HYVs while in case of hybrids it was 15 kg/ha. On an average about 41% of the farmers contacted treated the seeds before sowing with carbendazim or with Trichoderma biocontrol formulation. Some of the farmers contacted applied organic manure in the nursery. However, all of them applied urea in the nursery. In the main fields, fertilizers were applied @ 100-120 kg N/ha, 50-60 kg P2O5/ha and 50-60 kg K2O/ha. Majority of the farmers contacted applied FYM or green manures like dhaincha in the main fields. Overall intensity of weeds was medium. Commonly recorded weeds were Echinochloa colona, E. crusgalli, Cynodon dactylon, Eclipta alba, Cyperus iria, Cyperus rotundus, Digitaria sanguinalis and Fimbristylis dichotoma. In addition to hand weeding, farmers applied herbicides were butachlor (1.5-2.5 l/ha), pretilachlor (1.5 l/ha), Nominee Gold (200 ml/ha) and others. Some of the common needs of the farmers were timely availability of quality seeds HYVs, high yielding varieties with medium slender grain, timely availability of fertilizers and plant protection chemicals, availability of labours, marketing facility, disease and pest tolerant rice varieties and farm machineries including solar pumps. Implements like sprayer, cultivator, tractor, paddy thresher, rotavator and combine harvester were used by the farmers. Most of the diseases and insect pests except BPH were observed in low to moderate intensities. BPH was recorded in severe intensities in most of the areas surveyed. All the farmers contacted adopted plant protection measures. Some of the common

problems were shortage of labours and their high wages, damage by stray animals, unavailability of fertilizers and quality seeds in time and micronutrient deficiency.

Uttarakhand: Production oriented survey was conducted in Udham Singh Nagar district of Uttarakhand which is a predominant rice growing area. The district Udham Singh Nagar falls under tarai belt of the state. Weather conditions for rice cultivation in general were normal. Most of the farmers in the district 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 the areas surveyed. Predominant rice varieties in the district were HYVs like PR 113, PR 121, PR 126, PR 130, PR 131 and HKR 47 and basmati rice varieties like Pusa Basmati 1509, Pusa Basmati 1121, Pusa Basmati 1692, Pusa Basmati 1847 and Pant Sugandh Dhan 27 were the major varieties predominantly grown in this district. Rice-wheat was the predominant cropping sequence. Other crops rotations followed by the farmers were rice-pea, rice-pea-potato, rice-wheat-mustard, rice-sugarcane, rice-mustard, rice-mustard-potato, rice-cole crops-mustard, rice-mustard-pea and others. Average rice yield among the high yielding varieties in plain area ranged from 5500-5800 kg/ha. Planting was done between 1st week to 4th week of July. Average seed rate was 20-25 kg/ha and farmers adopted random planting where plant population per unit area was not maintained. Majority of the farmers contacted told that they adopted seed treatment with carbendazim. None of the farmers contacted applied organic manure in the nursery beds. However, all of them applied chemical fertilizers like DAP or urea. In the main fields, farmers applied fertilizers @ 120 kg N/ha, 60 kg P_2O_5/ha and 40 kg K_2O/ha. Almost all the farmers contacted told that they applied zinc sulphate @ 25 kg/ha. Overall, intensity of weeds was low. Almost all the farmers contacted applied different pre-emergence and post emergence herbicides. Most of the farmers practiced hand weeding along with herbicide application. Implements like tractor, harrow, bund-maker, cultivator and combine harvester were used by the farmers. Combine harvested was hired by majority of the farmers. Among the diseases, sheath blight and bacterial blight were widespread. Sheath blight was recorded in low to moderate intensity and bacterial blight was recorded in low to severe intensity. Other diseases recorded were brown spot, false smut, grain discoloration, bakanae and khaira in low intensity. Among the insect pests, brown plant hopper, leaf folder and stem borer were widespread in low to moderate intensity. High intensity of leaf folder was recorded in some fields. All the farmers contacted told that they applied different pesticides and fungicides for management of different insect pests and diseases.

West Bengal-1 (BNK): Production oriented survey was conducted in four rice growing districts of this part of West Bengal viz., South 24-Parganas, Jhargram, Purulia and Bankura. Most of the crops were in maturity stage at the time of survey. In general, weather conditions were not very favourable for rice cultivation except South 24-parganas. There was long dry spell in many places visited in Jhargram and Bankura. In South 24-Parganas, there were reports of excess rainfall or water inundation in few places visited. Commonly cultivated rice varieties in these districts were HYVs or improved varieties like Dudheswar, Ajit, MTU 1010, Banskathi, Gitanjali, MTU-1001, Patnai, Gobindobhog, Gontra Bidhan 1/2/3, Mali-4, Santoshi, Swarna, GB1, Sabhagidhan, Lalat, IR 64, Parijat Amara, Badshabhog, MTU 1153, MTU 1156, Shatabdi, BB-11 and IR 36 and hybrids like PAN-802, GMS 2264, GMS-26081, Arize 6129 and Arize 6444 Gold. Some farmers cultivated local varieties like Kalma, Dadsal, Kanakchur. Rice-boro rice was major crop rotation in South 24-Parganas. Other common crop rotation practices were rice-vegetables, rice-sesame, rice lathyrus, rice-mustard, rice pulses, rice-potato-sesame, rice-mustard-sesame, rice-maize-sesame, rice-mustard-millet, rice-vegetables-sesame, rice-mustard-vegetables, rice-vegetables-

sesame and others. Average yield in farmers' field ranged from 4000-6372 kg/ha in case of HYVs and about 2700-3900 kg/ha in case of aromatic short grain varieties. In general, planting was done from middle of July to last week of August. Average seed rate ranged from 40-50 kg/ha. Majority of the farmers contacted told that they applied organic manure and chemical fertilizers like DAP, urea and 10:26:26 in the nursery. In the main fields, fertilizers were applied @ 40-125 kg N/ha, 10-65 kg P_2O_5/ha and 10-60 kg K_2O/ha. Overall, intensity of weeds was high in most of the places surveyed except South 24-Parganas where weed intensity was recorded low. The farmers followed either hand weeding or hand weeding and herbicide application. Some of the common needs of the farmers were HYVs with tolerance to submergence, lodging and salinity, short duration high yielding rice varieties, good market price, improvement in drainage facilities, disease and pest resistant rice varieties, improvement in irrigation facilities, timely availability of seeds and other inputs, availability of implements on hire basis and subsidy on inputs. Implements like tractor, power tiller, thresher, sprayers, pumpset, weeder and harvesters were commonly used by the farmers. Most of the farmers contacted used these implements on hire basis. Diseases like blast, neck blast, brown spot, sheath blight, sheath rot, grain discoloration and bacterial blight were recorded in varying intensities. High intensity of sheath blight, brown spot, sheath rot and bacterial blight were recorded in some fields in South 24-Parganas. Among the insect pests, stem borer and brown plant hopper was widespread in most of the districts. Leaf folder was widespread in low to moderate form in south 24-Parganas and Purulia. Zinc deficiency was reported from most of the places in Jhargram and Bankura.

West Bengal-2 (CHN): Production oriented survey was conducted in seven districts of this part of West Bengal viz. Nadia, Howrah, Hooghly, Purba Bardhaman, Purba Medinipur, North 24-Parganas and South 24-Parganas when the most of the crops were in maturity stage. In general, weather conditions were normal for rice cultivation. However, in Nadia, there were reports of prolonged dryness or drought like situation in about 60% places surveyed. On the other hand, there were reports of excess rainfall or flood like situation in many places in Howrah, Hooghly, Purba Medinipur and South 24-Parganas. Commonly cultivated rice varieties were HYVs/improved varieties like Swarna, IET 4786 (Shatabdi), Swarna Sub-1, Super Shyamali, Yamuna, MTU 1010, MTU 1156, IET 4094 (Ksitish), IR 36, Sabita,IR 64 MTU 1153, Pratiksha, Jira Kathi, Jamuna, CR-800, CR 1017, Bangabandhu, Khas Dhan, Ratna, Lalat, Nilanjana Mitali, Ranjit, Jatayu, Rajendra Mahsuri, Dudheswar, BM-20, Santoshi, Shreya, Ajit, CR-1018, Banskathi, Gitanjali, MTU 1001, Patnai, Gobindobhog, Badshabhog Gontra Bidhan 1/2/3 and others and hybrids like Mali-4, PAN 802, GMS 2264, GMS 2608, krh 2, Arize 6129 Gold, Arize 6444 Gold and others. Common crop rotation practices followed by the farmers in different districts were rice-rice, rice-mustard, rice-mustard-rice, rice-vegetables, rice-lentil, rice-lentil-rice, rice-fallow-jute, rice-vegetables-green gram, rice-potato-jute, rice-sugarcane, rice-mustard-vegetables, rice-vegetables-vegetables, rice-pulses-vegetables, rice-vegetables-sesame, rice-mustard-sesame, rice-pulses, and others. Average rice yield among different HYVs ranged from 3600-6000 kg/ha while in case of aromatic short grains the yield was 2250-3200 kg/ha. Average seed rate used by the farmers ranged from 30-50 kg/ha. On an average about 58% of the farmers contacted told that they adopted seed treatment with carbendazim or SAAF or thiram. About half of the farmers contacted told that they applied organic matter and most of them applied chemical fertilizer in the nursery. In the main fields, fertilizers were applied @ 60-113 kg N/ha, 22.5-69 kg P_2O_5/ha and 15-60 kg K_2O/ha. Overall intensity of weeds was medium except in Nadia and Howrah where weed intensity was recorded high in some places. Farmers followed both herbicide application and hand weeding for

weed management. Some of the common needs of the farmers were HYV with pest and disease resistance, improvement in marketing facility, availability of seeds and agricultural machineries, reduction in fertilizer cost, availability of agricultural labours, improvement in irrigation facilities, subsidy on inputs like fertilizers, seeds, pesticides and herbicides and suitable varieties for submergence. Implements like tractor, leveller, pump, power tiller, rotavator, thresher, power sprayer, sprayer and combine harvester were used by the farmers. Most of the diseases like sheath blight, brown spot, sheath rot, false smut and bacterial blight were observed in low to moderate intensities. However, High intensity of sheath blight was recorded in some fields in south 24 Parganas. Among the insect pests, stem borer, BPH and leaf folder were widespread. However, BPH was severe in some fields in Purba Bardhaman and south 24 Parganas. Majority of the farmers contacted told that they applied different pesticides to manage the biotic stresses.

Table 1: Production oriented survey, 2024-2025: Name of the state, districts surveyed, survey period and survey personnel

State/Region	District surveyed	Survey period	Survey Personnel
Andhra Pradesh	*East Godavari, Kakinada, Konaseema, West Godavari and Eluru*	Kharif, 2024	**R.A.R.S (ANGRAU), Maruteru-534 122, Andhra Pradesh** Dr. V. Bhuvaneswari, Pr. Scientist, Plant Pathology Dr. S. Dayakar, Pr. Scientist, Entomology Dr. Y. Suneetha, Senior Scientist, Genet & Pl. Breed Dr. V. Roja, Scientist, Biot & Molecular Breeding Dr. P. Prince Jayasimha, Research Associate, Pl. Path Dr. ASR Sharma, Coordinator, DAATTC, Peddapuram Dr. Ch. V. Narasimha Rao, Coord., DAATTC, Kakinada Dr. M. Nanda Kishore, Coord., DAATTC, Kakinada Dr. K. Phani Kumar, DAATTC, Eluru Dr. N. Mallikharjuna Rao, Project Coord, KVK, Undi Dr. Nagendra, DAATTC, Eluru Dr. Vinaya Kumari, KVK, Undi The staff of four DAATTCs, KVK, Undi, ADAs, A.Os and Department Staff of five districts
Chhattishgarh	*Jashpur, Gariyaband* and *Mahasamund*	Oct 19; Nov 5-9; 2024	**Indira Gandhi Krishi Viswavidyalaya, Raipur-492012** Dr. P. K. Tiwari, Pr. Scientist, Pl, Plant Pathology Dr. Sanjay Sharma, Pr. Scientist, Entomology Dr. Anil Kumar Verma, Principal Scientist Dr. Sunil Nayar, Pr. Scientist, Genetics & Pl Breeding Dr. Abhinav Sao, Asst. Prof, Plant Breeding Dr. Deepak Gaurah, Sr Scientist, Genet & Pl Breeding Dr. V. B. Kuruwanshi, Assoc Prof, Plant Physiology
Gujarat	*Ahmedabad, Anand, Dang, Kheda, Mahisagar, Navsari, Panchmahals, Surat, Tapi, Vadodara* and *Valsad*	Aug 3; Sept 13, 17, 19-20, 24-27, 30; Oct 1, 9-10, 14, 19 Nov 7; 2024	**Main Rice Research Station, AAU, Nawagam-387 540** Dr. Rakesh K Gangwar, Asso. Res Scientist (Pl Patho) Dr. M. B. Parmar, Res Scientist, Pl Breed, Rice I/C Dr. D. G. Kachha, Asst Res Scientist (Agronomy) Dr. S. S. Thorat, Asso. Res Scientist (Entomology) Mr. N. R. Makwana, Agricultural Officer
Haryana	*Kaithal, Kurukshetra, Karnal, Jind, Yamunanagar, Ambala, Panipat* and *Sonepat*	September to October, 2024	**CCS HAU, Rice Research Station, Kaul 136 021** Dr Mahaveer Singh Bochalya, Plant Pathologist Dr. Sumit Saini, Entomologist Dr. Vishal Gandhi, Plant Pathologist Dr. Rakesh Kumar, Plant Breeder

State/Region	District surveyed	Survey period	Survey Personnel
			Dr. Amit Kumar, Agronomist Dr. Charan Singh, Soil Scientist Dr. Sukham Maddan, Plant Physiologist
Jammu & Kashmir-Chatha	*Jammu, Rajouri and Poonch*	Sept 26-28 Oct 26-27; 2024	**SKUAST-Jammu, AICRPR, Chatha-180 009, Jammu** Dr. Vijay Bahadur Singh, Chief Scientist, Pl. Path Dr. Ravinder Singh Sudan, Chief Scientist, Pl. Breed Dr. Praveen Singh, Professor, Plant Breeding Dr. Rajan Salalia, Chief Scientist, Entomology Dr. Vikas Sharma, In-Charge, RARS, Rajouri Dr. Ajay Gupta, Head, KVK, Poonch
Karnataka	*Mandya, Mysuru, Chamarajanagara, Hassan, Chikkamangalur, Kodagu, Davangere* and *Shivamogga*	Aug 23; Oct 23; Nov 5; Dec 9-10, 13-14; 2024	**ZARS, VC Farm, Madya-571405, Karnataka** Dr. V. B. Sanath Kumar, Prof. Plant Pathology Dr. G. R. Denesh, Prof & Scheme Head, AICRPR, Rice Dr. M. S. Kitturmatt, Entomologist Dr. C. A. Deepak, Rice Breeder Dr. H. R. Savitha, Soil Scientist
Kerala-1 (MCP)	*Alappuzha, Kottayam, Pathanamthitta, Thiruvananthapuram, Kollam* and *Ernakulam*		**M. S. Swaminathan Rice Research Station (MSSRRS), Moncompu– 688 503, Alappuzha, Kerala** Dr. M. Surendran, Professor (Pl. Path.) and Head Dr. Nimmy Jose, Professor (Agronomy) Dr. Biju Joseph, Assoc. Prof (Soil Sci & Agrl. Chem) Dr. Jyothi Sara Jacob, Assistant Prof (Agrl. Ento) Smt. Hani Babu, Assistant Prof (Pl Breed and Genet) Dr. Neeraja, Asst. Professor, KVK, Kollam JDA, ADAs of Kerala Centre for Pest Management, Kalarcode, Alleppey. AOs of Thiruvananthapuram, Kollam, Alappuzha, Pathanamthitta, Kottayam and Ernakulam
Kerala-2 (PTB)	*Palakkad, Thrissur* and *Malappuram*	August 2024-January 2025	**Regional Agricultural Research Station, Pattambi-679306, Kerala** Dr. P. Raji, Professor (Plant Pathology) Dr. Karthikeyan. K, Professor (Entomology) Dr. Moossa P.P, Professor (SSAC) Dr. Sumiya K V, Assoc Professor (Plant Pathology) Dr. Thulasi V, Associate Professor (SSAC) Dr.Purushothaman S. M, Professor (Plant Pathology) Dr. Malini Nilamudeen, Asst. Professor (Entomology) Ms. Nisha N.S, Asst. Professor (Plant Physiology) Ms. Ramjitha P Asst. Prof (Pl. Biotech & Mol Bio). Ms. Aswathy T S, Asst. Professor (Horticulture) Dr. Jiji Allen, Asst. Professor (Horticulture) Dr. Biji K R Asst. Professor (Pl Breed and Genetics) Ms. Faseelsa K V Assoc Prof (Pl Breed and Genet) Dr. Vidhu Priyadarsini, Asst. Professor (Agronomy) Dr. Shahiba A, Asst. Prof (Plant breeding &Genetics) Ms. Mithra P. (Farm Officer) Ms. Shilpa Das M. (Farm Officer) Ms. Deepthi Das (Skilled Assistant) Ms. Devika K. (Farm Officer) Ms. Reshma I. T. (Farm Officer) Mr. Mohemmed Sahal T. H. (Farm Officer) **Department of Agriculture**

State/Region	District surveyed	Survey period	Survey Personnel
			Ms. Shahana S Salim, Agricultural Officer,Kannadi Mr. Ajish P G, BTM, Kuzhalmannam Mrs. Preetha Prabhakaran, Tech Manager, LEADS Mrs. Maneesha T B, Technology Manager, LEADS Mrs. Pavithra K J, DTM, ATMA,Palakkad Mr. Jasbeer K Moideen, Ag Officer, Parudur KB Mrs. Mariyath Kibithiyya, ADA, Thrithala Block Mr. Sudarsan Ramakrishnan, Ag officer, Chalissery KB Mrs. Bindu Tech Manager Leads, Thrithala Block Mr. Jayananth, Sr Agriculture Assistant, Vilayoor KB Mrs. Jereena Banu K, Agriculture Assistant Mrs. Geetha Bai D, Agriculture Assistant, Melarcode Mrs. Greeshma K, Agriculture Assistant, Melarcode Mrs. Sunitha K, ATM Nenmara block Mrs. Sreedevi V M, Agricultural Officer, Nallepilly Mrs. Sruthy P R, Ag Assistant, Peringottukurishi Smt. Nisha Agriculture Assistant, Elamkulam KB Smt. Swega, Agriculture Officer, Arthat KB Mr. Vinayan M V, ADA Perumpadappu
Maharashtra	*Thane, Palghar, Raigad, Ratnagiri* and *Sindhudurg*	Oct 7, 9, 10, 11, 21, 22, 24	**RARS, KARJAT, Raigad, Maharashtra 410201** Dr. (Smt.) P. D. Patil, Plant Pathologist Dr. V. V Sagvekar, Agronomist Dr. (Smt.) M. H. Keluskar, Plant Physioilogist Dr. (Smt.) V. P. Sawant, Jr. Entomologist Dr. M. P. Gawai, Jr. Rice breeder
Puducherry	*Karaikal*	December 2024 and February 2025	**PJNCOA & RI, Karaikal – 609 603, UT of Puducherry** Dr. C. Jeyalakshmi, Professor, Plant Pathology Dr. R. Renuka, Asst. Professor, Plant Pathology Dr. Santosh Kumar Meena, Asst. Proffesor, Agronomy Dr. M. Anandhan, Asst. Prof., Genetics & Pl. Breeding Dr. R. Tamil Selvan, Asst. Professor, Entomology
Punjab	*Ludhiana, Jallandhar, Bathinda, Mansa, Muktsar, Fazilka, SBS Nagar, Roopnagar, Mohali, Moga, Barnala, Ferozepur, Faridkot, Amritsar* and *Tarn Taran*	Kharif, 2024	**Punjab Agricultural University, Ludhiana-141004** Dr. R. S. Gill, Principal Rice Breeder Dr. Jagjeet Singh Lore, Principal Plant Pathologist Dr. P. S. Sarao, Principal Entomologist Dr. Buta Singh Dhillon, Agronomist Dr. Harpreet Singh, Plant Pathologist Dr. Rupinder Kaur, Principal Rice Breeder Dr. Navjot Sidhu, Plant Breeder Dr. Gurpreet Kaur, Agronomist Dr. Jyoti Jain, Plant Pathologist Dr. Renu Khanna, Plant Breeder
Tamil Nadu-1 (Aduthurai)	*Ariyalur, Thanjavur, Nagappattinam, Mayiladuthurai, Thiruvarur, Tiruchirappalli, Perambalur, Pudukkottai, Villupuram, Thiruvannamalai, Kancheepuram, Thiruvallur, Cuddalore* and *Vellore*	Nov 8-9, 12-14; Dec 21; 2024	**Tamil Nadu Rice Research Institute, Aduthurai - 612 101, Tamil Nadu** Dr. K. Rajappan, Professor (Plant Pathology) Dr. S. Elamathi, Associate Professor (Agronomy) Dr. P. Anandhi, Associate Professor (Entomology) Dr. M. Dhandapani, Associate Professor (PB&G) Dr. R. Pushpa, Assistant Professor (PB&G)

State/Region	District surveyed	Survey period	Survey Personnel
Tamil Nadu-2 (Coimbatore)	*Thiruvanamalai, Salem, Dharmapuri, Erode, Coimbatore, Krishnagiri, Kallakurichi, Namakkal, Kanyakumari* and *Tirunelveli*	July 30; Aug 6-7; Sept 27; Nov 10-11, 27-29; 2024; Feb 3, 7, 26; 2025	**TNAU, Coimbatore - 641 003. Tamil Nadu** Dr. S. Manonmani, Professor and Head Dr. C. Gopalakrishnan, Professor (Plant Pathology) Dr. M. Umadaevi, Associate Professor (PB&G) Dr. R. Suresh, Associate Professor(PB&G) Dr. G.Senthil Kumar, Associate Professor (Agronomy) Dr. N. Sridharan, Assoc. Professor (Crop Physiology) Dr. S. Jeyarani, Professor (Entomology)
Telangana	*Ranga Reddy, Kamareddy, Nizamabad, Khammam, Yadadri Bhuvanagiri, Medchal–Malkajgiri, Sangareddy, Medak, Vikarabad, Hanomkonda, Karimnagar, Wanaparthi, Nagarkurnool, Jagtial, Janagoan* and *Jogulamba Gadwal*	Aug 27, 30; Sept 17, 21, 24, 30; Oct 5, 10-11, 17-18, 28, 30; Nov 1; Dec 12; 2024 Jan 20; Feb 8; 22; 2025	**Rice Research Center, ARI, Rajendranagar, Hyderabad-30, Telangana** Dr. T. Kiran Babu, Scientist (Pl. Path.) Dr. N.R.G. Varma, Principal Scientist (Ento.) Dr. L. Krishna, Principal Scientist (G&PB) Dr. Y. Chandra Mohan, Principal Scientist (G&PB) Dr. P. Spandana Bhatt, Scientist (Agro.) Dr. Ch. Damodar Raju, Pr. Scientist (Rice) & Head Dr. Padamavathi, IIRR, Rajendranagar Dr. Shashikala Dr. Omprakash Dr. Dileep Kumar Dr. R. Uma Reddy Dr. M. Shankar Sri. Raju Kumar, KVK, Rudur Sri. K. Vijay, KVK, Rudur Sri. A. Arun AEO Sri. Gopal, DAO, Bhuvanagiri Smt. Mamatha, DAATTC, Bhuvanagiri Mr. S. Srinivas, MAO, Aler Mr. M.A. Basith, MAO, Ghatkesar Mr. Shiva Kumar, AEO, Aler Smt. Saritha, DAATTC, Sangupet Smt. G. Ramadevi, ADA, Andole Sri. H. Srihari, MAO, Andole Sri. D.V. Rajashekar, MAO, Chilipichedu Sri. Ch. Shrikar, AEO, Jogipet Smt. Krishnaveni, AEO, Chitukula Sri. Lakshman, DAATTC, Vikarabad Smt. Yamuna, DAATTC, Vikarabad Sri. Ch. Rudramurthy, ADA, Tandur Sri. M. Suryaprakash, MAO, Yalal Sri. K. Ganesh, AEO, Yalal Sri. B. Naveen, AEO, Navindi Sri. Balakrishna, BTM, Kondangal Dr. Sreedhar Siddi Dr. N. Venkateshwara Rao, KVK, Jammikunta Dr. Srinivasa Reddy, KVK, Jammikunta Dr. Mahesh, KVK, Jammikunta Sri. Sreedhar, ADA, Manakondur Sri. Venkatesh, MAO, Shankarapatnam Sri. Lakshman, DAATTC, Vikarabad Sri. R. Ravinath, MAO, Yacharam Smt. M. Vidhyadhari, MAO, Ibrahimpatnam Sri. Sravan, AEO, Ibrahimpatnam Sri. S. Santhosh Kumar, AEO, Yacharam

State/Region	District surveyed	Survey period	Survey Personnel
			Sri. M. Ramesh, AEO, Yachraram Smt. Sai Vani, AEO, Manchala Sri. Ramu, AEO, Chintakani Dr. M. Shankar, RARS, Palem Dr. O. Shaila, KVK, Palem Dr. Ramakrishna, KVK, Palem Sri. O. Vinay Kumar, MAO, Atmakur Sri. Santhosh, AEO, Atamkur Smt. N. Sindhuja, AEO, Gummadam, Pebbair Sri. Viswatej, DAATTC, Warangal Sri. Lakshman, DAATTC, Vikarabad Sri. Sakriya Naik, DAO, Jogulamba Gadwal Sri. Lakshman, DATTC, Tandur
Uttar Pradesh	Ayodhya, Ambedkar Nagar, Amethi, Sultanpur and Barabanki	Sept 27, 29; Oct 5, 9-10, 14, 18-19, 25-26; 2024	**Crop Research Station, Masodha-224 133 (ANDUAT), Ayodhya, Uttar Pradesh** Prof. V. Prasad, Pathologist & Team Leader Prof. D.K. Dwivedi, Officer In-charge Prof. Saurabh Dixit, Rice Breeder Dr. Baudh Bharti, Assistant Breeder Dr. S. K. S. Rajpoot, Entomologist / Assoc. Professor Dr. Shweta Patel, Assistant Entomologist Dr. Manish Kumar Maurya, Assistant Plant Pathologist Dr. Sanjay Kumar, Assistant Agronomist Dept. of Agriculture, Govt. of U.P.
Uttarakhand	*Udham Singh Nagar*	Aug 3, 10, 24, 31; Sept 21, 28; Oct 5; 2024	**GBPUA&T, Pantnagar-263145, Uttarakhand** Dr. Bijendra Kumar, Professor, Plant Pathology Dr. A. K. Pandey, Professor, Entomology
West Bengal-1 (Bankura)	*South 24-Parganas, Jhargram, Purulia* and *Bankura*	Dec 8-9; 28; 2024	**Rice Research Station, Bankura-722101, WB** Dr. Chandan K Bhunia, Plant Patholgist & JDA Dr. Vivekananda Mandi, Asst. Botanist Dr. Rajib Das, Asst. Agronomist
West Bengal-2 (Chinsurah)	*Nadia, Howrah, Hooghly, Purba Bardhaman, Purba Madinipur, North 24 Parganas* and *South 24 Parganas*	Sept 30; Nov 27,29; Dec 4-6, 8-9; 2024 Feb 5; 2025	**Rice Research Station, Government of WB, Chinsurah712102** Dr. Dilip Patra, Plant Pathologist Dr. Samir Kumar Hembram, Agronomist (Water use) Dr. Malay Kumar Bhowmik Agronomist (AICRPR) Dr. Mitali Chatterjee, Asst. Botanist Dr. Subodh Kundu, ADA, Plant Prot, Purba Bardhaman Dr. Manoranjan Jana, Rice Physiologist Dr Keya Banerjee, Asst Agronomist Dr. Chiroshree Gangopadhyay, Asst. Entomologist Dr Suparna Gupta, Asst. Botanist Dr. Kaushik Majumdar, Jr. Soil Scientist Dr. Suman Debnath, Asst. Botanist Shri Sumit Murmu, Asst. Botanist Shri Arindam Ghosh Dr. Soma Sarkar, ADA Shri Arindam Dana, ADA, Galsi-I, Purba Bardhaman Prashanti Bandopadhyay, Student Upasana Nag, Student

Table 2: Widely prevalent rice varieties cultivated in surveyed districts of India during 2024-2025

State	Varieties
Andhra Pradesh	**HYVs**: MTU 7029 (Swarna), MTU 1318, PLA 1100, RGL 2537, Sampadha Swarna, BPT 5204, MTU 1064, RP Bio 226, MTU 1061, RP Bio 226, PR-126, MTU 1224, NP 9558, Sadhana, SL 10 and MTU 1153
Chhattishgarh	**HYVs/Improved:** Swarna, MTU 1010, MTU 1001, Indira Aerobic-1, Vikram TCR, IR 64, Jai Shree Ram, Geetanjali, Mahamaya, Indira 9, Dubraj, Rajeswari, Danteshwari, Karma Mahsuri, Bamleswari, MTU 1156, Pratiksha, Sambleshwari, Kalinga, Mahindra Improved seeds (MPR 404, 505, 606), RB Gold, Sriram, HMT, Devbhog, Chandra 10, Mahendra, IGKV R 1244, Sobhagidhan, Indira Barani 1Mahamaya, PAN, Panchojanya, HMT Sona, Kaveri Swaran, Jamuna Gold, Jaldubi, Indira Barani 1, Chitra, Kaveri Swarna, Shriram Swarna, Shyama Swarna, Vaishnavi, IGKV R 1& 2 and others; **Hybrids:** Dhaaniya MR 8383 (Tata hybrid), PAN-804-Jamuna, Dhaaniya MR 8336 (Tata hybrid), Nandi-777 (Biostadt India Ltd.), VNR Rice hybrid 2111, Sarpanch Gold, Advanta hybrids, VNR hybrids, JK Seeds hybrids, PAN 2423, VNR GK-11, US 312, Kaveri 468, Mahindra MPR 404, Advanta PAC 807, Advanta 860, Indiara Sona, Gajab-125 (Sudevi seeds), Suruchi MP-5401, Dhaanya DRH 775 (Tata), Silky 277, Mahidra hybrids (MP 3030), Arize 6444and others; **Local:** Jawaphool, Safri, Kalajeera, Vishnubhog, Tulsimala and others
Gujarat	**HYVs:** Gurjari, GR 4, GAR 13, GR21, GR 22, GAR 14, Mahisagar, GNR 3, Jaya, GR 101, GR 11, GR 17, Mahsuri, Punjab S, Krishna Kamod, Moti Gold, Sonam, Surya Moti, Laxmi, Daftari and Om Sriram, Sriram 110, Sriram 125, GR 7, GR 11, GNR 6, Mahisagar, Doodhmalai, Desi colum, Ambemore, Dhanya Gold, Annapurna, Pusa 1638, Kiran 3, Punjab S, Nath Pauha, Shri 101, JK Suraksha, Gangamani, Mahisagar, Versha, Rasi, GNR-7, Vada Kolum, Sweta, NAUR1, Sardar, Mahatma, GNR 4, IR 28, Lal Kada, Indrani and others; **Hybrids:** Arize 6444, Arize 6555 ST, Kaveri 468, Buland 5050 (Signet seeds), Dhadak Gold (Nath Seeds), : Navtej (Mahyco), US-312, US-2111, Arize 6129 Gold, NK 5231, PAC-807, Syngenta S 9001, Suruchi, MC-13 (Dhaanya Tata), VNR 2111, Hybrid 25 P 25, US 362, 27P37 DRRH-3, Advanta 807, Sri 2277, US-471, GNRH 1, Kabir 508 (Nath Bio-Genes Ltd), GRH 2, NK 5251, Annapurna, 9001, Navtej (Mahyco MRP 5639 Navtej), PAC 801, Arize 6201, Arize 6129, PRH-812, Ankur 13555, Ankur 7434, Kaveri KPH 471, Kaveri 468, VNR 2233, US-316, Arize 6201, Karishma 5151, US 312, JK-208, Hyb.745, 786, Reshma, Gorakhnath, Suruchi 5629 and others
Haryana	**HYVs:** PR 126, PR 114, PR 131, NDR 359 and others; **Hybrids:** Hyb. 303,VNR 2111, Sava 127,Hyb. 90m100, Sava 7501, Sava 7301, Hyb. 2222, Hyb KRH 468, Hyb. 2299, Hyb. KRH 7299, Sava 134, Hybrid 6222, JKRH 2082, Hyb. 368, Sava 7501, Hyb. 282, Hyb. 90m100, Hyb. KRH 468, Arize 6444, Hyb. 372, Hyb. 28p67, Hyb. 7299, Hyb. 8222, Arize 6129, Hyb. 471 and others; **Basmati/Scented:** CSR 30, Pusa Basmati 1509, Pusa Basmati 1885, Pusa Basmti 1718, Pusa Basmati 1692, Pusa Basmati 1401, Super 52, Pusa Basmati

State	Varieties
	1847, Pusa Basmti 1121, Pusa Basmati 1886, Pusa Basmati 1, Pusa Basmati 1125, Super 21 and others
Jammu-Chatha	**Improved/HYVs**: Chandak Basmati, China, Giza 14, K 39, VL 88 and some unknown local paddy; **Hybrids:** Arize6164 Gold and Arize 6444 Gold; **Basmati/Scented**: Basmati 370, Pusa 1121, Sarbati, Jammu Basmati 129 and Jammu Basmati 118
Karnataka	**HYVs/Improved:** MTU 1001, Super Aman Gold, IR-64, NP-3056-Omkar, Jyothi, RNR-15049, Kaveri Prize, Amogh, Sun Madhu, Glory, PENNA SUPER, BR-2655, MTU1010, Sowbhagya, G K Chetana, Rajamudi, Thanu, Ankur, JAYA, Sanna Madhu, Vasundara Samvruddi, Tualsi, Siri Suma, Akshay, KMP-220, MSN-99, RNR15048, Sampada, Super BPT, Kaveri Glory, Tunga, BR 2655, KPR 1, Intan, Sahyadri, Kempumukthi, Athira, Doddi, Chinnapuni, BKB, MTU1001, Kaveri, Super amman, Sona and Jaishree Sona, Padmavathi and others; **Hybrids:** VNR 2233, Meenakshi and others
Kerala-1 (Moncompu)	**HYVs**: Uma (MO-16), Pournami (MO 23), Jyothi, Manuratna, Prathyasha, Red Triveni, Sreyas, Cherady , Pokkali, Choottu Pokkali, Chettivirippu, Cheruvirippu, Kuruka, Anakodan, Eravapandy, Bali, Orpandy and others
Kerala-2 (Pattambi)	**HYVs**: Uma, Jyothi, Bhadra, Akshaya, Supriya, Manuratna, TC-5, Kanchana, CR, Matta, Ponmani, Aiswarya, Karuna and others
Maharashtra	**HYVs**: Karjat-2, Karjat-3, MTU 1010, Jaya, Rupali (Ankur), YSR, Spriha 911, Shubhangi, Daptari 1008, Daptari 100, Daptari 250, Om Sree Ram-125, Daptari 125, Devaki, Jordar, Shabri, Wada Kolam, Akshet, Shree-101, Asmita, Jyotika, Avni, RTN-8, Kajart-8, Komal, Ratna, Gujrat-11, Karjat-6, Komal 101, Silk 277, Suma, Saguna, Sindhu, Suvarna, Zordar, Poonam, Samrudhi, Sundar, YSR, Mahsuri, Daptari, Motu, Khushi, Kranti, MPR-404, Pooja Gold, Wada Zinia, Akshad, Sampada, Sonal, urga, Mahuli, Swarna, VIP, Safari, Shree-1008, Mohini, Gold-78, Kaveri Suprim Sona, Yarana, Shatayu, Karjat-7,Trupti, Ruchika, Ajita, Sarthi, MTU-7029, Avani, Supersona, KP 264, Kaveri Sona, Zordhar, Shubhangi, Shivani, Om Shri Ram, Amani, Narsimha, Ratna, Karjat-5, Swabhagya, Janaki, Jaya, Sonan, Ratnagiri 8, Sadna, Trupti, Poonam, Vaishnavi, NR-241, Pooja, Sairam, NR-9, Suvarna, Mohini, Ratnagiri 6, Jaya, Sai Ram, Karjat -9, Ratnagiri 1, Ratnagiri 8, Daptari, Puja, Mohini, Prasanya , Kasturi, Saguna, Poonam gold , Komal, Prasanna, Jaishriram Gold, Chintu , Nathpoha and CO-51; **Hybrids:** Arize 6444, Upaj, Arize 6129, NPH-30, Ankur-6077, Paturu 3434, VNR 2245, NP-125, Kaveri-9090, KPH-468, Loknath, Gorakhnath, Champion, Winer, NP-125, Ankur-7576, Ankur-7434, Rasi-336, Rasi-113, Gorakhnath-509, Loknath-505, NPH-30, Ankur 7576, Syn 5251, TATA -748, Upaj Mahiko 5566, Ankur 6444 , Raja and others
Puducherry	**Samba Season**: ADT 37, ADT 38, ADT 39, ADT 45, ADT 46, ADT 51, BPT 5204, Improved White Ponni (IWP), CO 43, CO 50, CO 51, CR 1009 (Ponmani), CR 1009 Sub1, TKM 13, NLR, KKL (R) 2, TRY 3, Karuppu Kavuni, Seeraga Samba and Thanga Samba; **Kuruvai Season**: IR 20 and CO 51
Punjab	**HYVs:** PR 126, PR 121, PR 122, PR 128, PR 131, Pusa 44, PR 129, PR 114, PR 130 and others; **Hybrids**: Sava 7301, Sava 134 and Supreme 110; **Basmati:**

State	Varieties
	Pusa Basmati 1121, Pusa Basmati 1509, Pusa Basmati 1637, Pusa Basmati 1401, Pusa Basmati 1718 and others
Tamil Nadu-1 (Aduthurai)	**HYVs/Imprved:** BPT 5204, Amman Ponni, I. W. P. CO 52, CO 55, TPS 5, CR 1009 Sub 1, ADT 45 , ADT 54, ADT 36, ADT 37, ADT 38, ADT 39, ADT 42, ADT 43, ADT 45, ADT 46, ADT 51, ADT 52, ADT 54, CR 1009, CR 1009 Sub 1, CO 50, CO 56, NLR 34449, MTU 1010, MTU 7029, IR 20, Swarna Sub 1, TRY 3, TPS 3, VGD 1, DR Dhan, ADT 47, ADT 38, ADT 53, ADT 57, TKM 13, CO I 50, CO 51, JGL 1786, ASD 16, I.W.Ponni, TKM 13, Mahindra 606 ,RNR 15048, RNR 15068, Narmada, Anna Ponni Uma and Ankur Sadhana.
Tamil Nadu-2 (Coimbatore)	**HYVs/Improved:** ADT 53, ADT 55, ADT 37, ADT 38, Amman, Co 51, ASD 16, Sadana, BPT 5204, ADT 43, Bharani, RNR 15048, ADT 45,IWP, TPS 5, ASD 19, ASD 16, Bharathi, Archana, IR 20 and Dhanuska
Telangana	**HYVs:** BPT 5204, MTU 1010, RNR 15048 – Telangana Sona, MTU 1224, Cintoo, JSR type, KNM 118, IR-64, JGL 24423, KNM 1638, MTU 1061, Pooja, Sriram gold, Ankur Sona, Super Aman, Sowbhaya, Aman gold, HMT Sona, RNR 21278, MTU 1271, Ganga Kaveri (local), Mahindra Sowbhagya, Kunaram Sannalu, MTU 1010, Jagtial Rice-1, Tellahamsa, Bathukamma, MTU 1061, MTU 1153, MTU 1156, MTU 7029 and MTU 1001; **Hybrids**: Kaveri 272, Kaveri 175, Kaveri 468, VNR 22258, Rasi 113, Mahindra 303, , 27P31, RX 100 and Bio 799
Uttar Pradesh	**HYVs:** NDR 2064, NDR 3112-1, NDR 2065, Sarjoo 52, Sambha Mahsuri-Sub 1, BPT 5204, NDR 97, Shahbhagi, NDR 359, Pusa Basmati 1, MTU 7029, Pan Mahsuri, Swarna Sub-1, Narendra Lalmati, Swarna-Sub-1, Damini and others; **Hybrids**: Arize 6444 Gold, Hyb. 27p63, Hyb. 27p38, Dilkhush, Gorakhnath-509, Pusa RH 10 and others
Uttarakhand	**HYVs/Improved:** PR 113, PR 121, PR 126, PR 130, PR 131, HKR 47, Pant Dhan 23, Pusa Basmati 1509, Pusa Basmati 1121, Pusa Basmati 1692, Pant Sugandh Dhan 27, Noori (farmer's local selection), Pusa Basmati 1847, Pant Basmati 2 and others
West Bengal-1 (Bankura)	**HYVs/Improved:** Dudheswar, Ajit, MTU 1010, Banskathi, Gitanjali, MTU-1001, Patnai, Gobindobhog, Swarna, Sindhu, BB-11, Pooja, Dhiren, Dhruba, Ajit, MTU 1153, Super Shyamali, Lalat and IR 64, GB1, Badshabhog, MTU 1156, Shatabdi, IR 36, Gaurav, Bullet Gontra Bidhan 1/2/3 and Santoshi; **Hybrids:** Mali-4, Pan-802, GMS 2264, GMS-26081, Arize 6129 and Arize 6444 Gold; **Locals:** Kalma, Dadsal and Kanakchur
West Bengal-2 (Chinsurah)	**HYVs**: Pratisksha, Lalat, Swarna, Swarna Sub-1, IET 4786 (Shatabdi), Gobindobhog, IET 4094 (Ksitish), Sabita, CR-800, Super Shyamali, Ratna, Yamuna, Ksitish, Gontra Bidhan, MTU 1010, MTU 1153, MTU 1156, Gontra Bidhan 3, Khas Dhan, Mitali, Badshabhog, IR 36, IR 64, GB-1, Santoshi, Rajendra Mahsuri, Nilanjana, Ranjit, Jira Kathi, Jamuna, CR 1017, Bangabandhu, Jatayu, Dudheswar, BM-20, Shreya, Ajit, CR-1018, Banskathi, Gitanjali, MTU 1001, Patnai, Gontra Bidhan 1/2/3 and others; **Hybrid**: PAN 802, Arize 6444 Gold, KRH 2, Mali-4, GMS 2264, GMS 2608, Arize 6129 Gold and others; **Locals:** Kalma, Dadsal, Kanakchur and others

Table 3: Biotic constraints (diseases) in different states of India during 2024

Sates	Bl	NBl	BS	ShBl	ShR	FS	GD	BAK	Khaira	BLB	BLS
Andhra Pradesh		L		L-M	L	L	L			L-M	
Chhattishgarh	L-M	M	M	M-S	L	L-M	L-M			M	
Gujarat	L-M	L-M		L-M	L-M	L-M	L-M			L-M	
Haryana	L-M	T-L		L-M	T-L	L	L-M	L-M		L-M	
J & K-Chatha	L-M		L-M		L	L-M	M			M-S	
Karnataka	L-M	L-M	L-M	L-M	L-M	L	L			L	
Kerala-1-MCP	L		M-S	M-S			M-S			S	
Kerala-2 PTB	L-M		L-M	M		M				M-S	L
Maharashtra	L-M			L-M	L-M	T-L				M-S	
Puducherry	L-M		L-M		L-S	L	L-M			L-S	
Punjab	L	L-M	L-M	L-M	T	T-M		L-M		L	
Tamil Nadu-1-ADT	L	T-L	L			L	T-L			L	
Tamil Nadu-2- CBT	L	L-M	L	L	L	L				L	
Telangana		L	L-M	L	L-M	L-M	L-M			L-S	
Uttar Pradesh			L-M	L-M		L-M				L-M	
Uttarakhand			L	T-M	T	L-M	L	L	T	L-S	
West Bengal-1-BNK	L-M	L	L-M	L-M	L-M		L-M			L-M	
West Bengal-2-CHN	L	T-L	L-M	M	L-M	L-M				L-M	

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

Table 4: Biotic constraints (insect pests) in different states of India during 2024

Sates	SB	LF	BPH	WBPH	GLH	GM	RH	AW	GH	CW	GB/RB	LM/ PM	RT	Rats	Term
Andhra Pradesh	L-M	L-M	L			L						L		L-M	
Chhattishgarh	L-M	M	L-M	T	L	L-M	L-M							L-M	L-M
Gujarat	L-M	L-M	L	L-M		T-L					T-L	L			
Haryana	L-M	T-L	T-L	T-L					T						
J & K-Chatha	M				L		M		L-M						
Karnataka	L	L-M	L-M	L											
Kerala-1-MCP	L-M	M-S	M-S			L				L-S			L-M		
Kerala-2-PTB	L-S	L-S	L-M			L-M		L-M		L-M	M-S				
Maharashtra	L-M	L						L-M		L-M	L-M			L	
Puducherry	L-M	M	L-M			L-M						L			
Punjab	T-L	T-L	T-L	T-L	T										
Tamil Nadu-1-ADT	L	L	L			L							T-L		
Tamil Nadu-2-CBT	L	L								L		L			
Telangana	L-S	L-M	L			L-S				L		L-M			
Uttar Pradesh	L-M	L-M	S		L						L				
Uttarakhand	L-M	L-S	L-M	L			L				L				
West Bengal-1-BNK	L-M	L-M	L-M	T-L	L				T-L		T-L			L	
West Bengal-2-CHN	L-M	L-M	M		T-L						L			L-M	

- **Low incidence of nematodes in Karnataka; Low to moderate incidence of leaf minor in Kerala-1 (MCP); Low incidence of crab in Maharashtra; Low incidence of whorl maggot in Uttarakhand and Telangana; Low incidence of ear head bug in Puducherry; minor incidence of pink stem borer and rice horned caterpillar in Telanagna**
- **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/RB**: Gundhi Bug/Rice 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 their 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 Research Project on Rice 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-Maruteru (2024-25)

Districts surveyed: *East Godavari, Kakinada, Konaseema, West Godavari* and *Eluru*

Particulars of survey

Districts	Mandal Name
East Godavari	Rajahmundry, Diwancheruvu, Narendrapuram of Rajanagaram, G. Ragampeta and Jonnada of Alamuru
Kakinada	Burugupudi, Kirlampudi mandal, Ramavaram of Jaggampeta, Mallepalli & Murari of Gandepalli and Prattipadu
Konaseema	Ravulapalem, Peravaram, Lolla and Bobbarlanka of Aatreyapuram
West Godavari	Peravali, Duvva of Tanuku, Tadepalligudem, Ganapavaram, Ahiveedu, Undi and Palakol
Eluru	Unguturu, Narayanapuram, Kaikaram, Bhimadolu and Pulla

Widely prevalent rice varieties in Godavari zone of Andhra Pradesh in *Kharif,* 2024

Varieties
MTU 7029 (Swarna), MTU 1318, PLA 1100, RGL 2537, Sampadha Swarna, BPT 5204, MTU 1064, RP Bio 226, MTU 1061, RP Bio 226, PR-126, MTU 1224, NP 9558, Sadhana, SL 10 and MTU 1153 etc.

Production Oriented Survey (POS) was conducted in the Godavari Zone i.e., in the 3 districts i.e., East Godavari, Kakinada, Konaseema districts on 2.11.2024 & two districts i.e., Eluru and West Godavari districts on 5.12.2024 of Andhra Pradesh. The team of Scientists from RARS, Maruteru, DAATTC Scientists and KVK, Undi and Department Officials had participated in the survey. The major variety Swarna occupied major area in Kakinada, Konaseema and East Godavari districts. MTU 1318 (popular as non lodging swarna, medium duration, medium slender grain category) was cultivated in large extent in West Godavari and Eluru districts. However, Swarna variety of paddy (MTU 7029) was still the most preferred variety during *kharif* 2024 also. Seasonal conditions were found favourable for paddy cultivation. Direct seeding was followed in Kakinada & some extent in Eluru district during both seasons. Among the biotic constraints, bacterial leaf blight disease problem was observed in many areas. BPH stem borer, leaf folder is in low level during the season. Rodent problem is low to moderate in season in many locations surveyed.

A. GENERAL INFORMATION:

A1: Seasonal conditions

Timely onset of monsoon has been recorded. Sufficient good rainfall was recorded in the entire five districts. The crop growth was good at initial stages up to 25-30 DAT. Initial kresek phase of BLB was observed at some places in PLA 1100, MTU 1318 and BPT 5204 varieties. From August last week to September 1st F.N, 2024 heavy rainfall at many places caused crop damage and farmers forced to re-transplant the crop at few places. Intermittent rains and alarms regarding cyclonic weather warnings were conveyed to the farmers timely. The Avg. 70-80% of the crop was harvested by November month ending. The MTU 1318 variety was harvested during November, 2024 to December 1st F.N to 2nd F.N in West Godavari district.

Table 1a: Rainfall pattern in the Godavari zone of Andhra Pradesh (2024-25)

Month	Kakinada District			Konaseema District			Eluru District		
	Normal (mm)	Actual (mm)	% Deviation	Normal (mm)	Actual (mm)	% Deviation	Normal (mm)	Actual (mm)	% Deviation
June, 2024	112.8	210.2	86.34	111.4	175.3	57.36	99.8	193.1	93.5
July, 2024	198	223.8	13.03	241	339.9	41.1	100.2	428.1	327.2
August, 2024	179.9	256.6	42.63	229.7	247.1	7.6	229.7	247.1	7.6
Sept, 2024	179.5	236.4	31.69	196.8	229.3	16.5	171.1	273.7	60.0
October, 2024	201.3	134.5	-33.2	254.41	198.2	-22.09	134.4	117	-12.9
Nov, 2024	92.1	9.4	-89.8	122.33	11.1	-90.92	42	11.5	-72.6
Dec, 2024	7.1	34.2	381.7	19.36	37.9	95.76	7.64	21.38	179.8

Table 1b: Rainfall pattern in the Godavari zone of Andhra Pradesh (2024-25)

Month	East Godavari District			West Godavari District		
	Normal (mm)	Actual (mm)	% deviation	Normal (mm)	Actual (mm)	% Deviation
May, 2024	NA	NA	NA	55.58	72.59	-23
June, 2024	117	198.3	69.5	110.4	195.0	76.6
July, 2024	247.1	374.7	51.6	245.6	336.6	37.1
August, 2024	238.6	230.2	-3.5	250.4	264.5	5.6
September, 2024	173.2	218.8	26.3	186.3	229.7	23.3
October, 2024	169.1	86.1	-49.1	195.8	156.4	-23.14
November, 2024	56.8	5.3	-90.8	93.7	7.4	-92.07
December, 2024	8.4	12.0	42.9	16.3	55.8	242.3
January, 2025	9.6	0	-100			
February, 2025	3.2	0	-100			

A2: Crop coverage

The re-organized five districts i.e., Kakinada, Konaseema, East Godavari; Eluru and West Godavari districts in Godavari Zone of Andhra Pradesh have taken up good crop coverage. Significant reduction in total cultivated area was observed in all the five districts of Godavari Zone. Decrease in total cropped area and proportionate decrease in paddy area was highest in Eluru district (79.86%) followed by West Godavari district (85.52%). Decrease in these districts could be attributed to conversion to aqua culture, commercial lands etc. In other districts, viz., Konaseema, East Godavari and Kakinada paddy was cultivated to the tune of 92.95%, 93.06%, and 94.21% of the normal area.

Table 2a: Total cultivated area, area under rice particulars in Godavari Zone (*Kharif* 2024)

District	Total Cultivated Area (ha)			Area under Rice (ha)		
	Normal	Actual (2024)	% Area Covered	Normal	Actual (2024)	% Area Covered
Kakinada	97543	89686	91.94	90674	85422	94.21
Konaseema	68416	63513	92.82	68332	63513	92.95
East Godavari	82,420	72,479	87.94	77,634	72246	93.06
Eluru	1,05,558	81308	77.03	94631	75569	79.86
West Godavari	97192	82974	85.42	96925	82887	85.52

Table 2b: Total cultivated area, area under rice particulars in Godavari Zone (*Rabi,* 2024)

District	Total Cultivated Area (ha)			Area under Rice (ha)		
	Normal	Actual (2024)	% Area Covered	Normal	Actual (2024)	% Area Covered
Kakinada	84118	73210	87.03	71381	63894	89.5

Table 3: Crop Coverage in different district of Godavari Zone (*Kharif* 2024)

Table 3a: East Godavari District

S. No	Crop	Normal Area (ha)	Actual Area (ha)	% coverage
1	Paddy	77,634	72246	93.06
2	Maize	181	14	7.73
3	Red Gram	26	0	0
4	Green gram	8	0	0
5	Black gram	2,595	1,812	69.82
6	Sesamum	6	1	0
7	Groundnut	258	291	112
8	Sesamum	6	3	16.7
9	Cotton	502	18	3.58
10	Sugarcane	1,480	578	39.05
	Total	**82,420**	**72,479**	**87.94**

Table 3b: Konaseema District

S. No	Crop	Normal area (ha)	Actual area (ha)	% coverage
1	Paddy	68332	63513	92.95
2	Maize	5	0	0
3	Redgram	78	0	0
4	Greengram	0	0	0
5	Blackgram	0	0	0
6	Groundnut	0	0	0
7	Sesamum	0	0	0
8	Sugarcane	1	0	0
	Total	**68416**	**63513**	**92.84**

Table 3c: Kakinada District

S. No	Crop	Normal area (ha)	Actual Area (ha)	% coverage
1	Paddy	90674	85422	93.9
2	Maize	235	375	159.6
3	Cotton	3197	1898	59.4
4	Sugarcane	2208	417	18.9
5	Greengram	12	4	33.3
6	Blackgram	1055	615	58.3
7	Redgram	59	16	27.1
8	Sesamum	86	65	75.6
9	Groundnut	7	3	42.9
10	Ragi	6	365	6083.3
	Total	**97543**	**89686**	**91.94**

Table 3d: West Godavari District

S. No	Crop	Normal Area (ha)	Actual Area (ha)	% coverage
1	**Paddy**	96925	82887	85.5
2	Green Gram	1	0	0.0
3	Black Gram	20	6	30.0
4	Groundnut	5	3	60.0
5	Sugar Cane	241	77.5	32.2
	Total	**97192**	**82974**	85.4

Table 3e: Eluru District

S. No	Crop	Normal Area (ha)	Actual Area (ha)	% coverage
1	Paddy	94631	75569	79.8
2	Jowar	11	6	54.5
3	Maize	1046	315	30.1
4	Green gram	89	24	27
5	Blackgram	2284	2339	102.4
6	Groundnut	966	1136	117.6
7	Cotton	4362	2480	56.9
8	Sugarcane	2112	545	25.8
9	Others	57	5	8.8
	Total	**1,05,558**	**81308**	**77**

A3: Varietal spread

Swarna (MTU 7029) is a widely preferred variety followed by MTU 1318, PLA 1100, RGL 2537, Sampadha Swarna, BPT 5204, MTU 1064, RP Bio 226, MTU 1061, RP Bio 226, PR-126, MTU 1224, NP 9558, Sadhana, SL 10 and MTU 1153 were the other preferred varieties. Farmers of Godavari Zone now giving preference to fine grain varieties cultivating wide no. of varieties of paddy, preference of varieties was based on marketability, millers' preference, personal consumption and seed sale and long slender grains were cultivated for export purpose. MTU 1121 is the major variety during rabi season. PR 126 occupied more area during rabi season. The other varieties are MTU 1153, MTU 1156, SL 10 and other varieties.

Kharif season (2024)

In East Godavari district, Swarna (MTU 7029) is a widely grown variety followed by PLA 1100, MTU 1318, Sampada swarna, MTU 1064, BPT-5204, RP Bio-226, PR 126 were the most preferred varieties in East Godavari district during *Kharif* season. In Eluru district, MTU 1318 occupied the major area in Eluru district followed by Swarna (MTU 7029), PLA 1100, BPT 5204, MTU 1061, MTU 1224, MTU 1064 were the most preferred varieties in Eluru district. Dry DSR area: 14320 ha, Wet DSR area: 15 ha. In West Godavari district, the widely cultivated varieties were MTU 1318 followed by Swarna (MTU 7029), Sampada swarna, PR -126, PLA 1100, MTU 1061, MTU 1153, SL10, MTU 1064 were the preferred varieties in West Godavari district. PR-126 is widely grown in Tadepalligudem area, which is a miller preferred variety, long slender variety procured by millers at harvest and exported variety. The area under PR 126 increased drastically during rabi 2024 in five districts. In Konaseema district, Swarna (MTU 7029) is a widely preferred variety followed by MTU 1318, NP 9558, Sampada swarna, MTU 1064. Swarna (MTU 7029) is the leading variety in Kakinada district followed by MTU 1318, RGL 2537, Sampada swarna, BPT

5204, MTU 1064, RP Bio-226 were the preferred varieties in Kakinada district. RP bio-226 has the mark able area share also in the district.

Rabi season (2024)

In East Godavari district, Sridhruthi (MTU 1121) is a widely grown variety followed by Prabhath, RNR-15048, MTU 1153, 1156, SL-10 and PR-126 were the most preferred varieties during Rabi season. In West Godavari district, widely cultivated varieties were MTU 1121, PR-126, MTU-1153, MTU-1156 during rabi season. The area under PR 126 increased drastically during rabi 2024 in five districts. In Eluru district, normal area for rabi, season was 39970 ha and major varieties are MTU 1121, PR 126, MTU 1153 and MTU 1156.

Table 4: Variety wise area coverage (ha) in different surveyed districts of Andhra Pradesh in Kharif 2024

Variety	Districts				
	East Godavari	Eluru	West Godavari	Konaseema	Kakinada
MTU7029	24144	20994	18675	41035	24610
Sampada Swarna	9522		12984	798	8780
NP-9558			920	2451	
PLA 1100	14768	13870	2151	31	
BPT 5204	2573	3785		22	6158
MTU 1318	13042	27673	37599	18104	13527
MTU1064	3602	2004	443	198	3861
MTU1061	57	3067	1715		356
PR126	1315				
RP BIO 226	2388				2108
SL-10	25		893		
MTU 1121	73		99	27	
MTU 1224		2418			
PR 126			4571	43	
MTU 1153			1684		
BPT 5206				40	
Siri				28	
Amulya				17	
NP 9381 Kanak +				14	
NLR 4001				14	
MC 13				11	
RGL 2537					9905
MTU 1075					20
MTU 1262					142
RNR 21278					12
NLR varieties					1115
Others		1760	1153	91	14828
Total	**72,246**	**75569**	**82,887**	**63,573**	**85422**

Table 4: Variety wise area coverage (ha) in different surveyed districts of Andhra Pradesh in Rabi 2024

Variety	Districts	
	East Godavari	**West Godavari**
MTU 1121	39971	56445
MTU 3626	8460	
RNR-15048	4502	
MTU-1153	839	2218
MTU-1156	505	325
SL-10	411	4
PR-126	194	4148
Other varieties	192	
MTU-7029	160	
BPT-5204	77	
MTU-1064	1	
MTU-1282		60
MTU-3626		101
Others		156
Total	**55, 598**	**63,457**

A4: Crop condition

Timely South West monsoon and release of canal water during *khari*f, 2024 resulted in timely transplanting during last fortnight of June to 2nd Fortnight of July. Transplantations were delayed in tail end areas. Drainage problem was observed in some places. Untimely heavy rain fall resulted in crop damage in Eluru and West Godavari, Konaseema districts at early day's leads to second time transplanting in Eluru and west Godavari districts. Weather was favourable for crop growth up to November month. Kresek phase of BLB was observed during initial stages of crop growth in West Godavari, East Godavari and Konaseema districts of Andhra Pradesh. Low to moderate incidence of BLB and sheath blight was observed. False smut disease was recorded in few varieties in low level. Sheath rot incidence was low in many districts. The harvestings were completed at 80% area by November end to December first week. The left over crop was harvested during December month. Swarna, MTU 1318, other varieties and private hybrids resulted in good yield compared to previous years. Yield in the range of 35-42 bags/acre (75 kg bags) were recorded during the season.

A5: Cropping pattern

In the West Godavari district of Andhra Pradesh, rice-rice is the predominant cropping pattern in majority of the locations. Rice-pulse-Rice in Tadepalligudem and upland mandals of Eluru, Rice-Maize cropping system was also prevalent in Kakinada and East Godavari districts. As in previous years the migrant from Bihar, chattisgarh for transplanting operations and preference for mechanization (combined harvester) in rice was observed in many locations.

A6: Rice Consumption Pattern

The income status of the farmers was observed as medium to poor in most of the areas. Swarna, PLA 1100, Sona Mahsuri, BPT 5204, MTU 1075, RP Bio 226 varieties were used for consumption purpose in the surveyed area. Polished rice, coarse grain were also used for consumption purpose. Low to medium sections of farmers preferred rice, chapathi pattern also. Brown rice is also

preferred. Rice + wheat also preferred in Kakinada and East Godavari areas. A range of 20-30 kg rice is consumed per month for a family size of 5-8 members.

A7: Crop establishment methods
Transplantation was found to be the preferred method of crop establishment in rice. Direct seeding was also practiced in Kakinada, East Godavari and Eluru districts. Migrant workers from Bengal, Bihar, Chhattisgarh contributed to transplantation during *kharif*, 2024. Bengal planting is the most preferred method in Godavari Zone, commonly called as Bengal transplantation was still as one of the option for transplanting.

B. CROP MANAGEMENT

B1: Seed rate and Seed treatment
Most of the farmers purchased seed from local dealers/ farmers for the season. Average seed rate adopted by farmers is in the range of 15-20 kg/ac from the locations surveyed. However, for Bengal mode of planting, seed rate of 8-12 kg/acre was seen used. For Direct seeding 8-12/14 kg seed rate is used for wet direct seeding conditions. Many of the farmers preferred to soaking, incubation and broadcasting seed in nursery only. Seed treatment is generally not preferred during kharif season. Only few farmers under survey have adopted seed treatment with carbendazim @ 1.0 g/kg seed. Farmers invariably would undertake nitric acid seed treatment during *rab*i, for seed procured from previous season crop. Seed treatment is followed during rabi in some areas.

B2: Transplanting
Seedlings with an age of 16-22 days were transplanted in most of the locations in Godavari zone. Migrant labour preferred 15-18 day old seedlings for transplanting. However, seedling length was taken into consideration for planting by local labourers. Random transplantation was the most common practice in the Zone. However, migrant labour maintained alley ways during transplanting by using ropes.

B3: Plant Population
In the system of planting done by migrant labour from Chhattisgarh, Bengal etc. population per square meter ranged from 14 to 16 in Bengal transplanting in comparison to 20-25 seedlings in random transplanting done by local labour. Alley ways were maintained by majority of the farmers of the Zone. Special instructions were given for maintenance of plant population/sq.mt for gaining good yields during rabi season.

B4: Weed management
Awareness among farmers on possible benefits of herbicides and shortage of labour lead to wide scale adoptability of herbicides viz., LondaxPower (Bensulfuron methyl 0.8% + pretilachlor 6%) @ 4 kg/acre, Topstar (oxadiargyl), Rifit (pretilachlor), Sofit (pretilachlor with safener), Sathi (pyrazosulfuran ethyl), Nominee gold (bispyribac sodium), Almix (Metsulfuran methyl+ Chlorimuran ethyl) commonly used in most of the locations surveyed. Under direct seeding conditions at Kakinada district the private hybrids are under cultivation and weedicides were used timely for good crop growth. Pre emergence and post emergence weedicides were used and mostly in conjunction with fertilizer for saving labour cost. Weedicide spraying using drone was operated at research station premises.

B5: Fertilizer application
The use of chemical fertilizer was reduced for *kharif* paddy. Only few farmers surveyed resorted to application of organic manures i.e FYM/Green Manure crops. Farmers commonly applied DAP, 14-35-14, 20-20-0, 10-26-26, 28-28-0 for top dressing in all installments. Potash at the time of P.I stage was applied effectively.

B6: Plant Protection
Farmers in the Godavari zone of Andhra Pradesh resorted to 2-3 foliar sprays for protection against pests and diseases. Farmers adopted pesticide sprays immediately after observation of first symptoms or few times prophylactic sprayings were taken up. Farmers resorted to mixing of 2-3 chemicals for management of biotic constraints. Pesticides viz., Pexalon, Token, Chess, Fipronil, Profenofos, Carbofuran granules, Acephate, Monocrotophos, Azoxystrobin, Pulsar, copper hydroxide, Plantomycin, Hexaconazole, Custodia, Chlorantriniprole etc. were used against biotic constraints.

Drone spraying: Two drones were available to farmers. Drone facility was extended to the farmers on hiring basis or demonstrations were conducted to promote drone spraying in farmers' fields. Farmers have usually using the drones also on hiring basis. The cost is about Rs. 300-350/-per spraying.

C. PRODUCTION CONSTRAINTS

C1: Abiotic constraints
During August to September months untimely heavy rains occurred and caused crop damage in Godavari zone. Heavy rains during last week of August to first fortnight of September 2024 resulted in crop damage in Godavari delta.

East Godavari - Crop inundated due to recent rains
Paddy crop belongs to 3,758 farmers has been affected. However, remedial measures to be taken are suggested to farmers through press. An area of 2,836 ha paddy has been reported as inundated out of 32,341 ha area in 5 mandals in the district (8.77%). Sugarcane crop was also reported to be inundated to an extent of 20 ha. The details of crop damaged due to heavy rains in different surveyed districts are presented in Table 5a, 5b, 5c, 5d and 5e

Table 5a: Preliminary Crop Damage Report in East Godavari district due to Heavy Rains received during August, 2024 as on 31.08.2024

Name of the District	Name of the Crop	Sown /Transplantation details (in Ha)		No of Mandals affected	No of Villages Affected	No of Farmers	Stage of the crop	Remarks
		Area Sown / Transplanted	Area inundated					
East Godavari	Paddy	32341	2836	5	52	3738	Vegetative stage	-
	Sugarcane	20	20	1	1	10	Vegetative stage	-
Total		**32361**	**2856**	**5**	**53**	**3748**		

Table 5b: Preliminary Crop Damage Report in Kakinada district due to heavy rain received during August, 2024 as on 1.09.2024

Name of the District	Name of the Crop	Sown /Transplantation details (in Ha.)		No of Mandals affected	No of Villages Affected	No of Farmers	Stage of the crop
		Area Sown / Transplanted	Area inundated				
Kakinada	Paddy	84970	2540	19	99	3724	Maximum Tillering stage
	Cotton	1896	14.4	1	2	10	Vegetative stage
	Total	**86866**	**2554**	**20**	**101**	**3734**	

Table 5c: Preliminary Crop Damage Report in Eluru district due to heavy rain received during August, 2024 as on 1.09.2024

District	No. of villages inundated	Crop wise Area (ha) Inundated in Acres								
		Paddy	Cotton	Black gram	Green gram	Ground-nut	Sugarcane	Maize	Chilli	Total area
Eluru	133	7987	368	1428	7	19	16	2	45	9872

Table 5d: Report on crop inundation due to cyclonic rains: (Konaseema district)

District	Name of the crop	Normal area (ha)	Actual area (ha)	Area inundated (ha)	Stage of the crop	Pests and diseases observed
Konaseema	Paddy	68332	63405	483	Early tillering to Maximum tillering	Stemborer Leaf mite

Table 5e: Preliminary Crop Damage Report in West Godavari district due to heavy rain received during August, 2024 as on 1.09.2024

Name of the District	Name of the Crop	Sown /Transplantation details (in ha)		No of Mandals affected	No of Villages Affected	No of Farmers	Stage of the crop	Remarks
		Area Sown / Transplanted	Area inundated					
West Godavari	Paddy	78763	3063	18	101	2753	Tillering stage	11.26 ha Nursery damage

Crop Advisory suggested

For recovery from inundation

- Removal of excess water from the field within five days after inundation.
- Application of 20 kg urea +20 kg MOP as booster dose
- Spraying of carbendazim @ 1 g or Carbendazim + mancozeb @ 2 g/l.
- For stem borer spraying of chlorantraniliprole @ 0.3 ml/litre or
- Application of Carbofuran 3 G @ 10 kg per acre or cartap hydrochloride 4 G @ 8 kg/acre or chlorantraniliprole 0.4 G @ 4 kg per acre.

- For leaf mite spraying of Wettable sulphur 50 WP @ 3 g or Dicofol 18.5 EC @ 5.0 ml or profenophos 50 EC @ 2.0 ml/l

Deficiency of 'Zinc' was reported during *rabi* season. Farmers necessarily resort to 1-3 sprays with zinc sulphate during rabi season.

C2: Biotic constraints

Major biotic constraints – among diseases bacterial leaf blight- kresek phase at initial stages on MTU 1318, PLA 1100, BPT 5204 and other varieties. Bacterial leaf blight was Low to Moderate in most of the locations. Sheath blight disease is at low level in many places and farmers generally opt for 1 to 2 sprayings. BPH, Stem borer and leaf folder were the pest constraints as opined by the farmers. Kresek phase of bacterial leaf blight was observed on 15-35 DAT crop in most of the districts i.e., West Godavari, Eluru, Kakinada and Konaseema districts. Many farmers confused the kresek phase of BLB with stem rot and used to spray the fungicides for kresek phase and obtained increased cost of cultivation. But timely awareness was created in farmers for identification of Kresek phase of BLB compared to stem rot. University staff (RARS, Maruteru, DAATTC and KVK) through State Agricultural Department has taken up steps for timely identification and management of the problem with suitable bactericides. At later stages the BLB disease was observed at low to moderate level only. BLB problem was observed at Bhimadole area on PLA 1100 and on MTU 1318 at places of Undi and Penumantra mandals during November month. At fag end of the season stem rot was noticed in West Godavari and Eluru districts. With regard to pest problem, BPH, stem borer, leaf folder was effectively managed through use of latest available pesticides. Low stem borer infestation was observed in all the districts. Low to Moderate Rodent damage was reported in all the districts.

Table 6: Incidence of diseases and insect pests in surveyed districts of Andhra Pradesh in 2024

District	Diseases					
	NBl	ShBl	ShR	FS	GD	BLB
Eluru	L	L-M	L	L	L	M
West Godavari	L	L-M	L	L	L	M
Kakinada	L	L	L	L	L	L-M
Konaseema	L	L-M	L	L	L	L-M
East Godavari	L	L	L	L	L	L-M

District	Insect pests					
	SB	LF	BPH	GM	Mite	Rats
Eluru	L-M	L-M	L	L	L	L-M
West Godavari	L-M	L-M	L	L	L	L-M
Kakinada	L	L	L	L	L	L-M
Konaseema	L	L	L	L	L	L-M
East Godavari	L	L	L	L	L	L-M

C3: Other Constraints

- Need of high yielding varieties
- Sprouting problem in flood prone areas, seed dormancy varieties are needed.

- Cost of cultivation was high, most of the farmers were tenant farmers needs high MSP
- Low price offered by millers due to moisture content
- Timely availability of sprayers
- BLB and sterility problems
- Minikit seed provision in right time
- Scarcity of labour
- Millers problem
- Subsidy needed for tractors
- Crop lodging and low yield
- Needs immediate procurement after rains irrespective of moisture content
- Engine oils for water lifting
- Timely purchase of moistened raw rice/grains
- Extending time irrigation water for one more month
- Disease and pest resistant/tolerant varieties
- Proper storage facilities
- Seed purity is needed for MTU 1318
- Proper drainages cleaning

D. MECHANIZATION

Majority of the farmers hired different implements *viz*., power tillers, mini tractors and big tractors, battery sprayers, combined harvesters in Godavari Zone of Andhra Pradesh. Awareness campaigns were also conducted during 'Polam Pilustondi' programs and wide field level demonstrations were taken up on 'Drone spraying'. Farmers were using drones for spraying purpose also. Few private drone services were also available to farmers at Rs. 300/- per drone spraying.

E. PLANT PROTECTION

During *kharif* 2024, the rainfall and weather parameters were quite congenial for crop growth. As a general practice, farmers in general adopted 2-4 sprays during kharif and 5-6 sprayings during *rabi* season. Many farmers adopted prophylactic sprays for pest and diseases also and have taken up at least one spray for BPH even though the load of BPH was <ETL during *kharif* season. During rabi season 2 sprays for BPH, one spray each for sheath blight, blast and as a prophylactic spray for false smut with propiconazole were taken up even the load was <ETL. For stem borer, either spraying with caldan powder or granules application was followed. The pest load is low in both seasons. Low to moderate severity of BLB was observed on BPT 5204, PLA 1100, MTU 1318, Swarna varieties. Low incidence of sheath blight, false smut, sheath rot were noticed. Low incidence of stem rot was reported in MTU 1318 at fag end of the crop season in Velivela village. Red stripe disease in traces was observed on PLA 1100 during kharif and MTU 1121, PR 126 and other varieties during rabi season.

F. MARKETTING

Rice farmers in the Godavari Zone faced problems in marketing of produce at some places during *Kharif*, 2024. Farmers sold the produce to Rythu Seva Kendra's. Many farmers requested for immediate/early payment of money after selling of their produce.

G. YIELD

The swarna growing farmers reported 35-38 bags due to favourable weather as swarna was still a dependable variety in Godavari Zone. Farmers reported 30-34 bags/acre due to cultivation of non-lodging variety MTU 1318 compared to swarna. 80-90% of crop was harvested by November ending. The left over crop of MTU 1318 was harvested during 2nd week of December, 2024.

H. COST OF CULTIVATION

A number of factors viz., hike in fertilizer costs, hike in labour wages, increased machine hiring costs, use of pesticides etc influenced the cost of cultivation. Farmers reported incurring an amount of Rs. 40000/- for kharif and 50000/- for rabi season.

I. NEEDS OF THE FARMERS

- High yielding varieties
- Tarpaulins for seed protection, dryers for seed drying
- Fertilizers and pesticides on subsidy basis through Rythu Seva Kendras and good pesticides
- Non-lodging varieties
- Stem Rot Protection measures
- Monkey menace protection
- Development of submergence resistant varieties
- MSP for paddy and Suitable varieties for kharif season
- Water problem
- Krishi tractors & mini tractors
- Early/immediate payments to farmers after produce sale
- Improper drainage, so needs proper drainage cleaning, silt, broad weeds removal in Godavari delta
- Off types, seed quality problems in rice varieties
- Marketing options
- Drones for spraying, machinery for harvesting
- Combine harvester with dryer facilities
- Threshing floors, infrastructure storage godown/facilities
- Purchase of raw rice, procurement of raw rice if weather is not favourable or moisture content problems
- Pumps and engines on subsidy basis
- Low procurement rates than previous years
- Contract machinery for hiring, timely availability of machinery
- Moisture content problems, millers problems to farmers
- High yielding flood tolerant varieties

J. RESEARCHABLE ISSUES

- Lodging resistant, long dormancy, submergence tolerant, pest and disease resistant high yielding varieties i.e., BLB resistant/tolerant varieties
- 130-140 duration for kharif and 115-120 days duration for rabi season, more focused research for export, miller preferred, consumer preferred fine grain varieties

Chhattishgarh-Raipur (2024-25)

Districts surveyed: *Jashpur, Gariyaband* and *Mahasamund*

Particulars of survey

Districts	Blocks	Villages
Jashpur	Pathalgaon and Kunkuri	Baigiri (22.54038; 83.48543), Gharjiabathan (22.54038; 83.48543), Pandaripani (22.729738; 83.9198), Pharsakani (22.729738; 83.9198), Besrakani (22.729738; 83.9198), Balajhar (22.5560538;83.459927), Kerakachhar (22.5560538; 83.459927), Patrapali (22.729738; 83.9198), Jamargi (22.560538; 83.459927), Ludeg (22.560538; 83.459927), Sureshpur (22.560538; 83.459927) and Gala (22.560538; 83.459927)
Gariyaband	Fingeshwar	Arand (20.9962; 81.9731), Kurud (20.8160; 81.9748), Baruka (20.6854; 81.9997) and Chaitra (20.887692; 81.915643)
Mahasamund	Mahasamund and Bagbahara	Sher (21.060445; 82.101335), BK Bahara (21.075261; 82.319797) and M. K. Bahara (Bagbahara)

Table 2: Widely prevalent rice varieties

Districts	Varieties
Jashpur	**HYVs/Improved:** Swarna, MTU 1010, MTU 1001, Indira Aerobic-1, Vikram TCR, IR 64, PAN-804-Jamuna, Jai Shree Ram, Geetanjali, Mahamaya, Indira 9, Dubraj, Rajeswari, Basmati rice variety, Danteshwari, Karma Mahsuri, Bamleswari, MTU 1156, Pratiksha, Sambleshwari, Kalinga, and others; **Hybrids:** Dhaaniya MR 8383 (Tata hybrid), Dhaaniya MR 8336 (Tata hybrid), Nandi-777 (Biostadt India Ltd.), VNR Rice hybrid 2111, Sarpanch Gold, Advanta hybrids, VNR hybrids, JK Seeds hybrids, PAN 2423, VNR GK-11, US 312, Kaveri 468Mahindra MPR 404, Advanta PAC 807, Advanta 860, Arize 6444, Indiara Sona, Gajab-125 (Sudevi seeds) and others; **Local:** Jawaphool, Safri, Kalajeera, Tulsimala and others
Gariyaband	**HYVs**: MTU 1010, Vikram TCR, Swarna, Mahindra Improved seeds (MPR 404, 505, 606), RB Gold, Sriram, MTU 1001, HMT, Rajeswari, Devbhog, Chandra 10, Mahendra, IGKV R 1244, Sobhagidhan, Indira Barani 1Mahamaya, PAN Swarna and others; **Hybrids**: Mahidra hybrids (MP 3030), Arize 6444, Silky-277 and others
Mahasamund	**HYVs**: Swarna, Panchojanya, HMT Sona, Kaveri Swaran, MTU 1010, Jamuna Gold, Jaldubi, Indira Barani 1, Samleshwari, Chitra, Kaveri Swarna, Shriram Swarna, Shyama Swarna, Vaishnavi, IGKV R 1& 2, Bamleshwari, Rajeshwari and others; **Hybrids**: Kaveri 468, VNR GK-11, Arize 6444, Suruchi MP-5401, Indira Sona, Dhaanya DRH 775 (Tata), Silky 277 and others; **Local**: Vishnubhog, Jeeraphool and others

Table 3: Particulars of rice areas in the surveyed districts of Chhattisgarh during 2024

District	Total geographical area (ha)	Total cultivable area (ha)	Total cultivated area (ha)	Total irrigated area (ha)	Area under paddy (ha)	Area under DSR (ha)
Jashpur	655741	259953	245292	42735	158500	85838
Gariyaband	585500	288706	142590	77000	103434	77830
Mahasamund	496300	325620	302100	108200	246581	115620

Table 4: Total rainfall (mm) in the surveyed districts in 2024

Total rainfall (mm)	Months						
	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Jashpur	67.7	307.6	410.2	266.8	18.7	0.0	0.0
Gariyaband	79.4	478.5	285.9	213.0	24.7	0.0	0.0
Mahasamund	116.8	295.6	294.3	240.8	6.8	0.0	0.0

Production oriented survey was conducted in three rice growing districts of Chhattishgarh viz., Jashpur, Gariyaband and Mahasamund when most of the crops were in milk to maturity stage. Nineteen villages in 5 blocks in three districts were covered during the survey. A total of 58 farmers were contacted during the survey. The details of places surveyed are presented in Table 1. The gist of the survey is presented in Table 7. Majority of the fields surveyed in Gariyaband and Mahasamund districts were under irrigated ecosystem while majority of the fields in Jashpur were under rainfed lowland ecosystem (Table 7). In general, weather conditions were favorable for rice cultivation except some incidences of prolonged dryness in some places in Jashpur and some instances of excess rainfall in Mahasamund. The details of weather parameters are presented in Table 4. Common crop rotation practices followed by the farmers were rice-wheat, rice-rice, rice-mustard, rice-groundnut, rice-pea, rice-chickpea, rice-vegetables, rice-sugarcane, rice-lathyrus, rice-linseed and others (Table 7). The details of rice varieties cultivated in different districts are presented in Table 2. Commonly cultivated rice varieties in the region were HYVs like Swarna, MTU 1010, MTU 1001, Indira Aerobic-1, Vikram TCR, IR 64, PAN-804-Jamuna, Jai Shree Ram, Geetanjali, Mahamaya, Indira 9, Dubraj, Rajeswari, Basmati rice variety, Danteshwari, Karma Mahsuri, Bamleswari, MTU 1156, Pratiksha, Sambleshwari, Kalinga, RB Gold, Sriram, HMT, Rajeswari, Devbhog, Chandra 10, Mahendra, IGKV R 1244, Sobhagidhan, Indira Barani 1, Panchojanya, Jamuna Gold, Jaldubi, Vaishnavi,Mahamaya, PAN Swarna and others and hybrids like Dhaaniya MR 8383 (Tata hybrid), Dhaaniya MR 8336 (Tata hybrid), Nandi-777 (Biostadt India Ltd.), VNR Rice hybrid 2111, Sarpanch Gold, Advanta hybrids, VNR hybrids, JK Seeds hybrids, PAN 2423, VNR GK-11, US 312, Kaveri 468, Mahindra MPR 404, Advanta PAC 807, Advanta 860, Arize 6444, Suruchi MP-5401, Dhaanya DRH 775 (Tata), Silky-277, Mahidra hybrids (MP 3030), Indiara Sona, Gajab-125 (Sudevi seeds) and others. Some farmers cultivated local rice varieties like Jawaphool, Safri, Kalajeera, Tulsimala Vishnubhog, Jeeraphool and others. The particulars of rice area are presented in Table 3. The details of district wise area of predominant rice varieties are presented in Table 6. The details of rice yield of different varieties in different surveyed rice growing districts of Chhattishgarh are presented in Table 8. Average rice yield in farmers' field ranged from 3000-5800 kg/ha in case of HYVs and hybrids and 2500-4500 kg/ha in case of local varieties. In some of the fields, yield was drastically reduced due to lack of irrigation, sandy type of soil, erratic rainfall, sub-normal dose of fertilizers, use of local traditional rice varieties, late planting, excess rainfall and cyclone in some places and biotic stresses

Table 5: General Question of Rice Cultivation In District (To Be Filled By The Cooperator In With The Officials From State Department of Agriculture

Parameters	Districts		
	Jashpur	Gariyaband	Mahasamund
Total Area under HYVs in the district (ha)	62685 ha	42200 ha	59400 ha
Most prevalent HYVs in the District	MTU 1010	Swarna	Swarna
Total area under rice hybrids	8330 ha	7880 ha	72560 ha
Most prevalent rice hybrids	Arize 6444	Arize 6444	Arize 6444
Total area under basmati/scented	Nil	Nil	Nil
Most prevalent basmati varieties	NA	NA	NA
Seed replacement rate	70%	75%	75%
Whether farmers are using any heavy equipments like transplanted/combine harvester	Combine harvester	Combine harvester	Combine harvester
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	DSR, SRI and laser levelling	DSR, SRI and laser levelling	DSR, SRI
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Timely weeding and promotion of organic cultivation	Cultivation of drought tolerant rice varieties	Line planting and balanced use of fertilizers and pesticides
What are the general problems in rice cultivation in the district?	Undulating soil topography and small field size	Crop damage by wild animals	Lack of quality seeds
Please provide any farmers association in the district	Nil	Nil	Nil
Whether availability of labors is sufficient?	Yes	Yes	Yes
Whether there is any marketing problem of the produce?	No	No	No
Any major irrigation/power generation project in the district	No	No	Kodar dam
Any soil testing program undertaken?	Yes; by KVK and Agricultural Dept	Yes; by KVK and Agricultural Dept	Yes; by KVK and Agricultural Dept
Any farmers' training program was organized by the state department of Agriculture/ University	Yes; by KVK and Agricultural Dept	Yes; by KVK and Agricultural Dept	Yes; by KVK and Agricultural Dept

Table 6: Variety wise area coverage (ha) in different districts of Chhattishgarh during *Kharif* 2024

Variety/hybrid	Districts		
	Jashpur	Gariyaband	Mahasamund
HYVs/Improved			
MTU 1010	12300	10800	9680
MTU 1001	9800		
MTU 1156	9500		
Indira Aerobic-1	9385		
Vikram TCR	5000	1200	

Variety/hybrid	Districts		
	Jashpur	**Gariyaband**	**Mahasamund**
IR 64	9000		
Swarna	15000	13690	31260
Mahamaya	8750	8050	
HMT	500	1720	9800
Dubraj	800		
Indira-9	7750		
MTU 1153	8985		
Rajeswari	7950	2800	
Devbhog	6500	1500	
Mahendra		2885	
Chandra-10		1100	
RB Gold		1960	
Pan Swarna		1200	
Shri Ram		3200	
IGKV R 1244		2580	
Sobhagi Dhan		1200	
Indira Barani 1		1300	1250
Samleshwari	3080		3000
Panchojanya			3680
Chitra			1300
Kaveri Swarna			330
Shriram Swarna			5280
Shyama Swarna			4330
Vishnubhog			1050
Jeeraphool			2360
Vaishnavi			1500
Jamuna Gold			2500
IGKV R 1& 2			3580
Hybrids			
PAN 2423	1490		
Kaveri-468	1345		13800
Advanta 860	1330		
VNR GK-11	1380		3500
US 312	1385		
Arize 6444	1400	7880	43500
Silky-277		1580	4300
Suruchi MRP-5401			2160
Indira Sona			4700
Dhaanya DRH 775 (Tata)			1320
Others	29800	35709	89381

Table 7: General information

Parameters	Districts		
	Jashpur	**Gariyaband**	**Mahasamund**
# of talukas/blocks covered	2	1	2
# of villages surveyed	12	4	3
# of farmers interviewed	20	18	20
Field ecosystem	RL (80%); IR (20%); UL (15%)	IR (100%)	IR (85%); RL (15%)
Weather conditions during cropping season	Normal (87.5%); Drought (12.5%)	Normal (100%)	Normal (80%); Excess rainfall/ cyclone (20%)
Crop stage during survey	Dough to maturity	Milk to dough	Milk to dough
Crop rotations	Common crop rotation practices followed by the farmers were rice-wheat, rice-rice, rice-mustard, rice-groundnut, rice-pea, rice-chickpea, rice-vegetables, rice-sugarcane, rice-lathyrus, rice-linseed and others		

IR: Irrigated; RL: Rainfed lowland; UL: Uplands

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

Varieties	Yield (kg/ha)			Remarks
	Jashpur	**Gariyaband**	**Mahasamund**	
Swarna	7775	4300-4850	4800-5800	In some of the fields, yield was drastically reduced due to lack of irrigation, sandy type of soil, erratic rainfall, sub-normal dose of fertilizers, use of local traditional rice varieties, late planting, excess rainfall and cyclone in some places and biotic stresses
HMT			5720	
Kaveri Swarna			5350	
MTU 1010	3333-3750	4750-5300	4245-5200	
Jamuna Gold	4500		5743	
MTU 1001	3333-3750			
Jai Shree Ram	3000			
Geetanjali	3000			
Rathiya	2500			
Basmati	4000-4800			
Chandra 10		4250		
Mahamaya		4800		
Jeeraphool			5525	
Safri	2500-4500			
Jawaphool	3000			
Other local	2500			
Hybrids				
Silky-277		4800	4370-5000	
Nandi	4500			
VNR 2111	4500			
JK Seeds hybrid	4000			
PAN hybrids	3000			
Mahyco hybrids	3000			
Arize 6444	5000			
Other hybrids	4000-8883		5200	

Table 9: Details of rice consumption pattern

Parameters	Districts		
	Jashpur	**Gariyaband**	**Mahasamund**
Status of farmers	Medium income (75%); Poor (20%)	Medium income (83.3%); Poor (16.7%	Medium income (95%); Poor (5%)
Per capita monthly rice consumption (kg)	7-10 kg	6-9 kg	7-9 kg
Composition of main meal	Only rice (42%); Rice+wheat (58%)	Only rice (93.7%); Rice + wheat (6.3%)	Only rice (100%)
Preferred rice types	Polished rice (80%); parboiled rice-25%	Polished rice (100%)	Polished rice (100%)
Rice grain type preference	Fine grain (45%); Coarse grain (70%)	Fine grain (33.3%); Coarse grain (94.4%)	Fine grain (10%); Coarse grain (90%)
Any changes in food habit in last 10 years	No (90%); 10% people changed from parboiled to polished rice	No (100%)	No (95%); Yes (5%) .

Table 10: Details of nursery management

Parameters	Districts		
	Jashpur	**Gariyaband**	**Mahasamund**
Planting time	4th week of July to 1st week of August.	3rd week of July to 2nd week of August	1st week of July to 2nd week of August
Seed rate	30-40 kg/ha for HYVs; for hybrids (15-25 kg/ha)	30-40 kg/ha	25-40 kg/ha
Seed treatment (% farmers adopted)	Yes (only 8.3%)	Nil	Yes (only 5%)
Chemicals used for seed treatment	Carbendazim (Bavistin) @ 1-2 g/kg	-	NA
Organic manure in nursery (% farmers adopted)	Applied (88.9%); FYM (mainly), Vermi compost and poultry manure	Applied (100%); FYM (mainly), Vermi compost and poultry manure	Applied (100%); FYM (mainly), Vermi compost and poultry manure
Inorganic manure in nursery (% farmers adopted)	Applied (78.5%); Urea (5-20 kg/acre) or urea (5-50 kg/ acre) + DAP (3-20 kg/acre); Few additionally applied MOP and zinc sulphate	Applied (83.3%); Urea (10-20 kg/ acre) or DAP (10-15 kg/acre) or urea (5-20 kg/acre) + DAP (5-10 kg/acre)	Applied (89%); Urea (10-15 kg/acre) or DAP (3-20 kg/acre) or urea (5-10 kg/acre) + DAP (5-10 kg/acre)

A. Rice consumption pattern: Survey was conducted on consumption pattern of rice among the farmers in different districts of Chhattishgarh. Majority (75-90%) of the farmers contacted were in the medium income group (Table 9). Average per capita consumption of rice per month was 6-10 kg rice (Table 9). Majority of the farmers contacted are rice eaters and about 78% of the farmers contacted told that they consumed only rice. Rest of the farmers told that their main meal consisted

of both rice and wheat. Majority of the farmers contacted (on an average 93%) told that they preferred polished rice (Table 9). On an average about 85% farmers told that they preferred coarse grain rice and rest used fine grain rice for consumption. In general, there was no major change in the food habit.

Table 11: Details of main field management

Details	Districts			Remarks
	Jashpur	Gariyabad	Mahasamumd	
Planting method	Random planting (60%); Line planting (25%); Direct sowing (30%)	Random planting (100%)	Random planting (25%); line planting (15%); direct sowing (60%)	Most of the farmers adopted random transplanting method where plant population per unit area was not maintained. Fertilizers like urea, DAP, MOP and zinc sulphate were used by the farmers
Total N applied	10-100 kg/ha (90% applied)	20-60 kg/ha (100% applied)	50-90 kg/ha (100% applied)	
Total P_2O_5 applied	10-60 kg/ha (90% applied)	20-35 kg/ha (83% applied)	20-50 kg/ha (85% applied)	
Total K_2O applied	5-35 kg/ha (55% applied)	15-30 kg/ha (95% applied)	5-30 kg/ha (85% applied)	
$ZnSO_4$ applied	5-20 kg/ha (10% applied)	Nil	Nil	
Organic fertilizers applied	100% Applied FYM (1-3 trolly/ha) Vermicompost (1-3 trolly/ha)	100% Applied FYM (2-4 trolly/ha) Vermicompost (1-2 trolly/ha)	100% Applied FYM (1-5 trolly/ha) Vermicompost (1 trolly/ha)	

B. Nursery and main field Management: In general, planting was done from 1st week of July to 2nd week of August. Average seed rate for direct seeded rice (broadcasting) was 60-80 kg/ha. For regular transplanting, average seed rate was 25-40 kg/ha for HYVs and about 15-25 kg/ha for hybrids (Table 10). Practice of seed treatment was not very common among the farmers and about 5-8% of the farmers contacted in Jashpur and Mahasamund treated the seeds with carbendazim (1-2 g/kg). On an average about 96% of the farmers contacted from different districts applied organic manure like FYM, vermicompost or poultry manure in the nursery. On an average about 83% of the farmers from different districts applied chemical fertilizers like Urea (5-20 kg/acre) or DAP (3-20 kg/acre) or urea (5-50 kg/acre) + DAP (5-10 kg/acre) in the nursery. Few additionally applied MOP and zinc sulphate in the nursery. Majority of the farmers from Jashpur and Gariyaband adopted random transplanting method where plant population per unit area was not maintained. Some farmers in Jashpur and Mahasamund practiced line planting (Table 11). About 30% farmers contacted in Jashpur and 60% farmers contacted in Mahasamund adopted direct sowing (Table 11). Fertilizers were applied @ 10-100 kg N/ha, 10-60 kg P_2O_5/ha and 5-35 kg K_2O/ha. Few farmers from Jashpur applied zinc sulphate in the main field. Almost all the farmers contacted in different districts applied FYM (1-5 trolley/ha) in the main field. Some farmers applied vermicompost (1-2 trolley/ha).

C. Weeds and their Management: Intensity of weeds was high in some places surveyed in Jashpur and Mahasamund (Table 12). The details of different weeds recorded in different districts are presented in Table 12. Weeds were common in most of the fields surveyed. The details of

different weedicides used by the farmers are presented in Table 12. Almost all the farmers who applied herbicides also followed 1-2 hand weeding. About 11-35% farmers in different districts followed only hand weeding. Weedy rice (Murgipota, chilbili, Borunda, Kangra and Saamba) were found in some fields in Jashpur and Mahasamund.

Table 12: Weeds and weed management

Details	Districts			Remarks
	Jashpur	Gariyabad	Mahasamumd	
Weed intensity	Low to high	Low	Low to high	
Names of the weeds	*Aeschynomene* spp. (Chilbili weed), *Leersia hexandra* (Ghodghas) *Echinochloa colona* (Sanwa), *Echinochloa* spp. (Sarbana/Samna) *Ischaemum rugosum* (Badauri), *Cyperus rotundus* (Motha), *Marsilia quadrifolia*, *Eclipta alba* (False daisy), *Cynodon dactylon* (Doob grass), *Paspalum distichum* (Knot grass), *Monochoria vaginalis*, *Euphorbia hirta* (Badi dudhi), *Convolvulus arvensis* (Hirankhuri), *Eleusine indica* (Bankado) and some unidentified grassy and broad-leaved weeds			Weeds were common in most of the fields surveyed. Almost all the farmers who applied herbicides also followed 1-2 hand weeding. About 11-35% farmers in different districts followed only hand weeding.
Weedicides used	Herbicides like Bispyribac sodium 10% SC (Nomini gold/Top Gold), pyrazosulfuron Ethyl 10% WP (Saathi), Paraquat, glyphosate, halosulfuron Methyl 75% WG (Sempra), pretilachlor 30% + pyrazosulfuron ethyl 0.75% WG (Eros gold) and 2,4-D were most commonly used by the farmers			
Percentage of farmers applied herbicides	75%	89%	60%	
Weedy rice incidence	Weedy rice (Murgipota, chilbili, Borunda, Kangra and Saamba) were found in some fields in Jashpur and Mahasamund			

D. Specific needs of farmers: Some of the common needs of the farmers improvement in the irrigation facilities, farm mechanization and availability of farm machineries for hiring, availability of agricultural labours during peak hours, timely availability of fertilizers and pesticides and good quality seeds, guidance for weed, pest and disease management, availability of good herbicides and technical guidance for improved rice production technology.

E. Input use: Farmers used different equipments like tractor with cultivator, seed drill, transplanter, thresher, sprayer, reaper, power tiller, rotavator, combine harvester. Most of the farmers possessed small equipments but hired heavy implements like tractor and combine harvester (Table 13). In majority cases, farmers used their own (previous year's seeds). However, they purchased hybrid rice seeds. Seed replacement rate in general was low. Canal and deep tube wells were the main sources of irrigation (Table 13). Many farmers from Jashpur expressed the scarcity of irrigation water. Majority of the farmers told inputs like fertilizers and pesticides were available but most of the farmers from Gariyaband and Mahasamund were not happy with their quality. In addition to their own decisions, farmers took advices from private dealers, officials of state department of agriculture and university staffs.

Table 13: Details of inputs used

Details	Districts		
	Jashpur	**Gariyabad**	**Mahasamumd**
Implements used	Different implements like Tractor with cultivator (own or hire), seed drill (own or hire), Transplanter (hire), thresher (own or hire), sprayer (own), reaper (own), power tiller (own or hire), rotavator (own or hire), combine harvester (hire) and Chain harvester (hire) were used by the farmers		
Source of seeds	Previous year seed (45%), Purchased part of seed (55%)	Previous year seed (75%); Purchased part of seed (25%)	Previous year seed (90%); Purchased part of seed (10%)
Source of irrigation	Canal (20%); shallow tube, well & solar lift pump (25%); others (rain fall and form pond etc)	Canal (100%) and Deep tube well (28%)	Canal (80%); Shallow & Deep tube well (20%)
Scarcity of irrigation water	Yes (57.9%)	No (100%)	No (100%)
Availability of fertilizers/pesticides	Available (90%)	Available (100%)	Available (100%)
Quality of fertilizers/pesticides	Satisfied (90%)	Not Satisfied (100%)	Not Satisfied (100%)
Advisors to the farmers	Own decisions (25%); State dept (30%); University (20%); Dealers(60%)	Own decisions (84%); State dept (72%); University (5%); Dealers (22%)	Own decisions (95%); State dept (50%); Dealers(5%)

F. Biotic stress and their management: District wise prevalence of different diseases and insect pests are presented in Table 14. The diseases like leaf and neck blast, brown spot, sheath blight, sheath rot, false smut, grain discoloration and bacterial blight were commonly observed in the farmers' fields. High intensity (up to 30% incidence) of neck blast was observed in some fields at Besrakani village of Jashpur especially on hybrid varieties. Brown spot incidence was high in some fields in Jashpur. Sheath blight was widespread in Jashpur and Mahasamund. High intensity of sheath blight (up to 35%) was recorded in Besrakani village of Jashpur and Sher village of Mahasamund on Swarna variety. Similarly, bacterial blight incidence was high in some fields of Besrakani village of Jashpur. Among the insect pests, stem borer and leaf folder were recorded in higher intensity in some fields of Jashpur. High intensity of BPH was recorded in some fields of BK Bahara village of Mahasmund especially on variety Swarna. High intensity of rice hispa was recorded in some fields of Besrakani village of Jashpur on hybrid varieties. Majority (45-100%) of the farmers adopted plant protection measures. The details of different pesticides used are presented in Table 15. The number of pesticide application ranged from 1-4 and majority of the farmers from Gariyaband and Mahasamund told that they mixed two pesticides before application.

Table 14: Prevalence of diseases and insect pests in Chhattisgarh during *Kharif*' 2024

Districts	Diseases							
	Bl	**NBl**	**BS**	**ShBl**	**ShR**	**FS**	**GD**	**BB**
Jashpur	L-M (5-20%)	M-S* (30%)	M-S (10-30%)	M-S (10-35%)	-	L-M (5-20%)	L-M (5-10%)	M-S (20-30%)
Gariyabad	L-M (5-12%)	L-M (7-12%)	-	-	L-M (3-12%)	L (5%)	-	L-M (5-12%)
Mahasamumd	L-M (5-12%)	L (3-5%)	L-M (5-15%)	M-S (9-30%)		L-M (3-15%)	M (20-25%)	L-M (5-11%)

There were tungro like symptoms (15-20% incidence) in some fields of Jashpur and low incidence (5-7%) bakanae in some fields of Gariyaband

Districts	Insect pests								
	SB	**LF**	**BPH**	**WBPH**	**GLH**	**GM**	**RH**	**Term**	**PM**
Jashpur	L-S (5-45%)	M-S (10-50%)	L-M (5-20%)	T		L-S (5-60%)	S* (45%)	M-S (10-40%)	L-M (10-20%)
Gariyabad	L (3-7%)		L (3-5%)	T	L (5-8%)	L (5%)			L (5%)
Mahasamumd	L-M (5-10%)	L-M* (5-15%)	L-S (3-35%)		L (3-5%)				T

There was low to severe (5-50%) incidence of cut worm and rats and low to moderate (10-20%) incidence of case worm in some fields of Jashpur

* in few fields

Table 15: Details of pest Management

Details	Districts			Remarks
	Jashpur	**Gariyabad**	**Mahasamumd**	
% age farmers adopting plant protection	45%	100%	100%	Zinc deficiency symptoms were noticed in some fields in Jashpur. In general there was no report of iron deficiency symptoms or any toxicity symptoms
Names of pesticides	**Insecticides**: chlorpyriphos 50% + cypermethrin 5% EC (Hamla) (1 litre/acre), malathion (200 g/acre), Vayego (tetraniliprole) (100-120 ml/acre), cypermethrin (2 ml/l), chlorpyriphos (2 ml/l), bifenthrin (400 ml/acre), phenthoate, 50% EC (2-3 ml/l) and profenofos 40% + cypermethrin 4% EC for stem borer and leaf folder; pymetrozine (Chess) (120 g/acre), Pexalon (trifumezoprim 10% SC) (94 ml/acre) and fenobucarb 50% EC (1.5-2 ml/l) for BPH; Ethion 50% EC for BPH and mite and chlorpyriphos 50% + cypermethrin 5% EC (Hamla) (1 litre/acre) for case worm **Fungicides**: hexaconazole (300 ml/acre) for sheath blight and tricyclazole (120 g/acre), tricyclazole + hexaconazole for leaf blast			
# of pesticide sprays	1-3	1-2	3-4	
Mixing of pesticides before application	Nil	Yes (72.2%); 2	Yes (85%); 2	

G. Researchable issues: Among the biotic stresses, major problems in the region are blast, sheath blight, bacterial blight and false smut among the diseases and stem borer and BPH among the

insect pests (Table 16). Among the abiotic problems, Submergence/ drought (early drought) was reported by some farmers. Lack of irrigation facilities, scarcity of labours, unavailability of quality seeds and lack of mechanization were reported by some farmers. Farmers expressed the need for varieties suitable for DSR, varieties having resistance to sheath blight, false smut, bacterial blight, blast, stem borer and BPH. Farmers also expressed the need for varieties having tolerance to submergence, drought and salinity. Farmers also expressed the need of good aromatic short grain rice varieties, high yielding varieties with medium slender grain and with low GI and high protein.

Table 16: Researchable issues

Parameters/Issues	**Districts**		
	Jashpur	**Gariyabad**	**Mahasamumd**
Rice ecology in your area	IR (35%); Rainfed (85%)	IR (100%)	IR (100%)
Rice cultivation only in Kharif or both Kharif and Rabi	Kharif + Rabi	Kharif + Rabi	Kharif + Rabi
Number of years of experience in rice farming	10-20 years; > 20 years	10-20 years; > 20 years	> 20 years
Main biotic constraints (diseases) in your area according to you	Leaf blast, sheath blight, false smut and bacterial blight		
Extent of disease damage	10-25%		
Main biotic constraints (Insect pests) in your area according to you	BPH and stem borer		
Extent of insect pest damage	< 10 %		
Main abiotic constrains in your area according to you	Excess rainfall/submergence in some parts of Jashpur		
Production constraints in your area according to you	Lack of irrigation facilities, scarcity of agricultural labours, lack of mechanization, unavailability of good quality of seeds and other inputs in time		
Irrigation facilities in your area	Available (70%); No (30%); Bore well, canal, reservoirs	Available (100%); Bore well, canal, reservoirs	Available (100%); Bore well, canal, reservoirs
Normally how many years it takes to change the rice variety	More than 20 years		
Any other rice production issues in your area			
What is urgently required in your area as far as rice varieties are concerned			
Duration	Rice varieties suitable direct seeded rice		
Biotic stress resistance	HYVs with tolerance to rice blast, bacterial blight, sheath blight, false smut, stem borer and BPH		
Abiotic stress resistance	HYVs having tolerance to salinity, drought and submergence		
Preferred grain quality	Aromatic short grain rice varieties and HYVs with MS grain quality		
Nutritional quality	HYVs with high protein and low GI		

Gujarat-Nawagam (2024-25)

Districts surveyed: *Ahmedabad, Anand, Dang, Kheda, Mahisagar, Navsari, Panchmahals, Surat, Tapi, Vadodara* and *Valsad*

Table 1: Details of survey

District	Taluka	Villages
Ahmedabad	Daskroi, Bavla and Dholka	Bareja, Gamdi Chosar, Devdi, Bhoipura, Badodara, Bavla, Kochariya, Ambaliyara, Chandisar and Keliyavasna
Anand	Anand and Petalad	Bhalej, Chikhodara, Lambhvel and Sekhadi
Dang	Waghai and Ahwa	Baj, Dangdiamba, Sarvar, Jamlapada, Malegav, Baripada, Bilmal, Gotemal and Baradpani
Kheda	Kheda, Matar, Nadiad, Mahmedabad and Kapadvanj	Mahij, Samadra, Nawagam, Dharoda, Umiyapura, Lali Radhvanaj, Sandhana, Piplata, Kanij, Raska, Dahiap and Savali
Mahisagar	Balasinor and Lunawada	Balasinor, Sundarpura, Gandhanpur, Golana Palla, Ankalav, Madia, Dalkhodiya and Chuthona Muvada
Navasari	Vansda, Chikhali, Gandevi and Khergam	Vansda, Khundh, Kokan, Undach and Vadpada
Panchmahals	Godhara	Kakanpur, Padhiyar and Tinbani Muvadi
Surat	Olpad	Sonshak and Kadrama
Tapi	Dolvan and Vyara	Changdhara, Ambapani, Karanjvel, Dolara and Meerpur
Vadodara	Dabhoi and Bodeli	Latipura, Karnej, Samdhi and Popatiya
Valsad	Dharampur and Kaparada	Makadban, Bhesdara, Fulvadi, Nanapondha and Vadkhambha
Districts: 11	**Talukas: 26**	**Villages: 69**

Production oriented survey was conducted in the 11 major rice growing districts of Gujarat State *viz.*, Ahmedabad, Anand, Dang, Kheda, Mahisagar, Navsari, Panchmahals, Surat, Tapi, Vadodara and Valsad when the crops were mostly in heading to dough stage. A total of 26 talukas and 69 villages were covered during this survey. The details of the places visited during the survey are presented in Table 1. A total of 142 farmers were contacted during the period of survey (Table 7). The particulars of rice area in different rice growing districts of Gujarat are presented in Table 3. In general, weather conditions were normal and favourable for rice cultivation. Rainfall was timely, sufficient and well distributed during the season in most of the places. In Kharif 2024, monsoon appeared on time (third week of June) with 1134.8 mm rainfall in 49 days at Nawagam station. The details of different weather parameters in different districts are presented in Table 4. High yielding varieties like Gurjari, GAR 13, Mahisagar, GAR 14, GR 21, GAR 22, GNR 3, GR 4, GR 7, GR 11, GR 101, GR 17, GR 18, Mahsuri, Jaya, IR 28, Narmada, Indrani, Moti Gold, Surya Moti, Sonam, Sriram 110, Sriram 125, Versha, Nath Pauha, Krishna Kamod, Versha, Laxmi,

Gangamani and others and hybrids like US-312, Hyb 27p37, MC-13, Hyb. 25p25, Kaveri 468, Arize 6444, Arize 6555 ST, Ankur 13555, Ankur 7434, Hyb. 471, VNR 2233, US-316, Arize-6201, Hyb. 5151, US 312, JK-208, Hyb.745, 786, Reshma, Gorakhnath, Suruchi 5629 etc. were mainly cultivated in different districts of Gujarat. The details of different varieties cultivated in different surveyed districts are presented in Table 2. Variety wise are coverage in different surveyed districts are presented in table 6.

Table 2: Widely prevalent rice varieties

District	Varieties
Ahmedabad	**HYVs:** Gurjari, GAR 13, GR 21, GR 22, GAR 14, Mahisagar, GNR 3, Jaya, GR 101, GR 11, GR 17, Mahsuri, Punjab S, Krishna Kamod, Moti Gold, Sonam, Surya Moti, Laxmi, Daftari and Om Sriram; **Hybrids:** Arize 6444, Arize 6555 ST, Kaveri 468, Dhadak Gold (Nath Seeds) and other
Anand	**HYVs:** GAR 13, GR 11, Mahisagar, GR 21, GAR 14, GAR 22, Moti, Krishna Kamod, Gurjari, Sriram 110, Sriram 125, Jaya, Masuri, Moti Gold, Sonam and others; **Hybrids:** Arize 6444, Buland 5050 (Signet seeds) and others
Dang	**HYVs:** GR 7, GR 11, GNR 3, GNR 6, Mahisagar, Jaya, Doodhmalai, Desi colum, Ambemore, Mahsuri, Dhanya Gold, Annapurna and others; **Hybrids:** Kaveri 468, Navtej (Mahyco), US-312, US-2111, Arize 6129 Gold, NK 5231, PAC-807, Syngenta S 9001, Suruchi, Arize 6444, MC-13 (Dhaanya Tata), VNR 2111, Hybrid 25 P 25 and others
Kheda	**HYVs:** Gurjari, GAR 13, GAR 14, Mahisagar, GR 11, Pusa 1638, Mahsuri, Kiran 3, Punjab S, Surya Moti, Nath Pauha, Moti Gold, Sonam, GR 101, Shri 101, Krishna Kamod, JK Suraksha, Gangamani and others **Hybrids:** Arize 6444, Arize 6555 ST and others
Mahisagar	**HYVs:** Gurjari, GAR 13, Mahisagar, Nath Pauha, Versha, Laxmi, GR 11, Rasi etc.; **Hybrids**: US 362, Arize 6444, Arize 6555 ST, 27P37 and others
Navsari	**HYVs:** Gurjari, GAR 13, GR 11, Jaya, Mahsuri, GNR-3, Nath Pauha, GNR-7, Sweta and others; **Hybrids:** DRRH-3, Advanta 807, Kaveri 468, Sri 2277, Kaveri 468, MC-13, US-312, 471, Arize 6444 and others
Panchmahals	**HYVs:** Gurjari, GAR 13, GR 11, GR 4, GAR 14, Jaya, Masuri, Mahisagar, Laxmi, Versha, Sonam, Moti Gold etc.; **Hybrids:** Arize 6444 and others
Surat	**HYVs:** Gurjari, GAR 13, GNR 3, Vada Kolum, Jaya, GR 11, Nath Pauha etc.; **Hybrids:** GNRH 1, US 312, Kabir 508 (Nath Bio-Genes Ltd) and others
Tapi	**HYVs:** Gurjari, Masuri, NAUR1, GAR 13, Sardar, Mahatma, Jaya and others; **Hybrids:** GRH 2, MC 13 (Dhaanya Tata), PAC 807, NK 5251, Annapurna, 9001, Navtej (Mahyco MRP 5639 Navtej), PAC 801, Arize 6444, Arize 6201, Arize 6129, PRH-812, Hyb 27P37, US 312, 25P25, VNR 2111 etc.
Vadodara	**HYVs:** GAR 13, GR 11, Mahisagar, Jaya, Gurjari, Nath Pauha, Surya moti, Moti gold and others; **Hybrids:** US 312, 25 P 25, Kaveri 468, Arize 6444 and others
Valsad	**HYVs**: GNR 3, GNR 4, Mahisagar, GAR 13, GR-11, Gurjari, Masuri, Jaya, IR 28, Lal Kada, Indrani, Doodhmalai and others; **Hybrids:** Ankur 13555, Ankur 7434, Kaveri KPH 471, Kaveri 468, VNR 2233, US-316, Arize 6201, Karishma 5151, US 312, Arize 6444, Hyb 27P37, JK-208, Hyb.745, 786, Reshma, Gorakhnath, Suruchi 5629 and others

Table 3: Particulars of rice area

District	Total geographical area (ha)	Total cultivable area (ha)	Total Cultivated area (ha)	Total Irrigated area (ha)	Area under rice (ha)
Ahmedabad	6,79,414	4,97,532	3,34,327	1,51,028	1,51,028
Anand	2,94,760	2,16,870	1,77,835	2,08,320	1,21,793
Dang	1,76,600	61,852	58,208	16,390	30,798
Kheda	3,94,388	2,49,433	2,32,390	1,72,116	1,15,596
Mahisagar	1,98,973	1,50,550	1,15,697	75,742	41,354
Navsari	1,95,474	1,17,947	51,782	73,525	45,569
Panchmahals	3,21,656	1,81,800	1,73,771	29,321	49,328
Surat	4,32,697	2,36,528	1,19,137	1,62,534	46,721
Tapi	3,43,474	1,60,401	1,13,144	80,596	68,843
Vadodara	4,06,700	2,93,687	2,48,000	2,08,250	33,152
Valsad	2,94,412	1,64,547	1,15,789	1,02,933	75,511

Table 4: Weather data for different districts of Gujarat during *Kharif*' 2024

Weather Parameters/Districts	Months						
	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Ahmedabad							
RD	5	12	13	4	0	0	0
TR(mm)	84.2	164.8	417.5	106.2	0	0	0
M.mean(T)							
T.Max(ºC)	39.3	33.2	31.6	32.8	35.0	33.3	28.0
T.Min(ºC)	28.2	26.2	25.5	25.4	24.6	18.9	14.9
Sunshine hrs							
Anand							
RD	7	17	2	13	0	1	1
TR(mm)	194.5	501.7	15.2	216.6	0	10.6	12.8
T.Max(ºC)	36	32.6	32.1	32.9	35.2	32.3	28.2
T.Min(ºC)	27.2	26.5	26.2	25.9	22.3	18.5	17
Sunshine hrs	7	3.2	3.2	5.4	9.6	8.5	7.5
Dang							
RD	9	22	24	20	7	0	0
TR(mm)	115.0	904.5	1047.0	575.0	187.0	0	0
T.Max(ºC)	35.2	30.1	30.7	30.8	34.3	33.3	29.2
T.Min(ºC)	27.3	26.5	26.3	25.2	24	16.1	13.7
Kheda							
RD	6	14	15	11	2	0	0
TR(mm)	113.6	199.0	538.8	276.2	5.60	0	0
T.Max(ºC)	93.10	33.20	31	31.60	34.80	33	28.80
T.Min(ºC)	27.30	26	25.80	25.10	23.50	16.70	12.90
Sunshine hrs	6.79	2.39	2.99	6.05	7.75	9.21	7.26

Weather Parameters/Districts	**Months**						
	Jun	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Navsari							
RD	10	21	21	13	6	0	0
TR(mm)	238	1281.0	387	368	120	0	0
T.Max(ºC)	34.2	30.5	30	31.2	34.4	33.7	29.7
T.Min(ºC)	26	25.1	24.8	24.1	23.2	17.8	14.7
Sunshine hrs	5.3	0.9	1.8	3.7	6.5	8.1	5.0
Panchmahals							
RD	9	16	5	9	0	0	0
TR(mm)	14.0	242.0	525.0	82.0	451.0	0	0
T.Max(ºC)	36.05	31.9	38.4	31.7	32.7	33.6	26.9
T.Min(ºC)	27.41	25.4	24.9	24.2	22.2	17.6	17.2
Sunshine hrs	6.4	6.2	6.8	6.4	7.7	7.8	8.2
Surat							
RD	6	21	12	12	3	0	0
TR(mm)	135.0	669.0	223.0	252.0	56.0	0	0
T.Max(ºC)	34.28	29.72	29.18	29.26	35.35.43	32.58	29.55
T.Min(ºC)	28.40	25.30	26.68	25.78	23.80	20.68	16.63
Sunshine hrs	2.13	1.68	2.10	5.52	6.80	7.82	4.40
Tapi							
RD	8	21	23	19	7	0	0
TR(mm)	328.5	872.2	674.3	719.6	190.8	0	0
T.Max(ºC)	29.2	29.8	29.8	26.8	26.6	21	21
T.Min(ºC)	20.7	19.4	23.9	18.5	17.3	15.8	17
Sunshine hrs	6.3	0.4	0.8	0.9	4.1	5	4
Vadodara							
RD	6	17	17	14	3	0	0
TR(mm)	141.0	441.2	440.0	342.0	47.0	0	0
T.Max(ºC)	35.5	29.4	28.7	28.6	28.8	27.8	28.5
T.Min(ºC)	26.1	25.7	25.1	25.7	25.4	23.9	18.3
Sunshine hrs	10.94	9.76	9.32	10	3.79	2.56	5.47
Valsad							
RD	7	29	12	16	0	1	0
TR(mm)	495.1	1683.9	122.0	289.7	0	25	0
T.Max(ºC)	35.25	30.14	30.84	31.70	34.91	34.89	31.58
T.Min(ºC)	25.99	26.08	26.69	26.09	24.20	19.65	17.87
Sunshine hrs	7.58	0.56	3.20	3.60	8.48	7.98	7.71

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).

Parameters	Ahmedabad	Anand	Dang	Kheda
Total area under HYVs (ha)	150028	82257	Approx 10000	69400
Most prevalent HYVs in the district	Gurjari, GAR-13, GR-101, GNR-3 etc.	GAR-13, GR-11, Gurjari, GR-21 etc	GR-7, GR-11, GNR-3, GNR-6 etc.	GAR-13, GAR-17, Gurjari etc.
Total area under rice hybrids in the district	Approx 750-1000 ha	39536 ha	Approx 20000 ha	46196 ha
Most prevalent rice hybrids in the district	Bayer-6444, 6555, Kavri-46 etc.	Bayer 6444, Buland 5050, Sriram-110 etc	US-312, Bayer6444, Annapurna etc.	Sri-101, Laxmi-17, Moti gold etc.
Total area under basmati in the district	-	-	-	-
Most prevalent basmati varieties in the district	-	-	-	-
Seed replacement rate	20-60%	20-50%	75-100%	25-50%
Whether farmers are using any heavy equipments	YES	YES	No	Yes
Mention water saving technologies being used by the farmers	Laser leveler	Laser leveler	Laser leveler(only few farmers)	Laser Leveling
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Yes about IDM, IPM, INM, and high yielding varieties.	Yes about IDM, IPM, HYV and INM	Yes about improved varieties IDM and IPM etc	Yes about IDM, IPM, INM and high yielding varieties
General problems in rice cultivation in the district?	Varieties and technology for DSR	No	No	No
Please provide any farmers association in the district	Total –II FPO one under function	Yes	-	Yes, Kisan sangh
Whether availability of agricultural labours is sufficient?	Not sufficient	Yes	Yes	Yes
Whether there is any marketing problem of the produce?	No	No	No	No
Any major irrigation/ power generation project in the district	Sardar sarovar narmada canal	No		YesBadlkbori Thermal Power Station.
Any soil testing program undertaken?	Yes (SHCS)	Yes	Yes PMMSY	Yes
Any farmers' training program was organized by the state department of Ag/ University	-	Yes	Yes	Yes

Table 5 contd..:

Parameters	Mahisagar	Navsari	Panchmahals	Surat
Total area under HYVs (ha)	30000 ha	20,114	32064	Approx 41721 ha
Most prevalent HYVs in the district	Gurjari, GAR-13, GNR-3, GAR-17 etc.	Jaya, Gurjari, Masuri and GNR-3 etc.	Gurjari, GAR-14, Jaya etc.	Gurjari, GNR-3, GR-11, GAR-13, GR-17 etc.
Total area under rice hybrids in the district	9500 ha	24,243 ha	17264 ha	Approx 5000 ha
Most prevalent rice hybrids in the district	Bayer6444, US-312 etc.	US-312, Bayer-6444 US-312(Gold) etc.	Bayer 6444, Laxmi, Versha etc.	US-312, Kaveri-508 etc.
Total area under basmati in the district	-	-	-	-
Most prevalent basmati varieties in the district	-	-	-	-
Seed replacement rate	Yes	30-100%	50-100%	20-100%
Whether farmers are using any heavy equipments	Yes	Yes	Yes	Yes
Mention water saving technologies being used by the farmers	Yes	Laser leveling	Laser leveling	Laser leveling
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Yes about HYV, IPM, IDM etc.	Yes, AboutHYV of AAU,NAU, IDM, IPM and INM in rice crop.	Yes about IDM,IPM,HYV etc.	Yes about IDM, IPM &HYV
General problems in rice cultivation in the district?	Yes, Sheath blight is causing losses to the crop.	-	No	This year BLB incidence was very high in the district.
Please provide any farmers association in the district	Yes	-	Yes	Yes
Whether availability of agricultural labours is sufficient?	No	Yes	Yes	Yes
Whether there is any marketing problem of the produce?	Yes	No	No	No
Any major irrigation/ power generation project in the district	Yes	Yes -1.Jui irrigation project, 2.keliya project 3. Ukai daba project.	Yes panam irrigation project.	Yes
Any soil testing program undertaken?	Yes	Under SHC Scheme	Yes	Yes
Any farmers' training program was organized by the state department of Ag/ University	Yes	Yes, under ATMA and other scheme	Yes (NFSM & ATMA)	Yes

Table 5 contd..:

Parameters	Tapi	Vadodara	Valsad
Total area under HYVs (ha)	29393	23152	Approx 15,000
Most prevalent HYVs in the district	Gurjari, IR-28, GAR-13, GR-4, Sandar, Mahatma etc.	GAR-13, Gurjari etc.	Gurjari, Jaya, GNR-3, GNR-4, IR-28 etc.
Total area under rice hybrids in the district	39450 ha	10,000 ha	60,511 ha
Most prevalent rice hybrids in the district	US-312, MC-13, PAC-807, Bayer 6444 etc.	Kaveri-468, Bayer-6444 etc.	Bayer6444, US-312, Goraknath, Suruchi-529 etc.
Total area under basmati in the district	-	-	-
Most prevalent basmati varieties in the district	-	-	-
Seed replacement rate	20-100%	20-100%	30-100%
Whether farmers are using any heavy equipments	Yes	Yes	Yes
Mention water saving technologies being used by the farmers	Yes	Laser leveling	Laser leveling
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Yes about HYV, IPM, IDM, INM and weed management.	Yes about HYV, IPM, IDM, INM etc.	Yes about DSR IDM& INM
General problems in rice cultivation in the district?	No	-	No
Please provide any farmers association in the district	Yes	Yes bhartiya kisan sangh	-
Whether availability of agricultural labours is sufficient?	Yes	Yes	Yes
Whether there is any marketing problem of the produce?	No	No	No
Any major irrigation/ power generation project in the district	Yes Narmada & tapi irrigation project	Narmada irrigation project	Narmada irrigation canal project
Any soil testing program undertaken?	Yes	Yes	Yes (SHCH)
Any farmers' training program was organized by the state department of Ag/ University	Yes	Yes	Yes

Table 6: Variety/hybrid wise area coverage (ha) in different districts of Gujarat during 2024

Variety/hybrids	Districts/area (ha)				
	Ahmedabad	**Anand**	**Kheda**	**Mahisagar**	**Navsari**
Gurjari	90000	7641	10000	27500	9742
GAR 13	27500	47364	23500	1600	
GR 101	4000				
Nath Poha	7000				
GNR 3 & GR 21	2000				
GR 11		21438	5700		
Mahsuri		3423			5299
Krishna Kamod		2391			
Shri 101			10100		
GAR 17			30200		
Laxmi			12200		
Moti Gold			8200		
GNR 3				900	
Others	20528		7596	6504	11066
Hybrids					
US 312					7546
Arize 6444				4850	
Goraknath					1450
US 312 Gold					1587
MC 13					2376
Hybrids (all)		39536			

Table 6: contd..

Variety/hybrids	Districts/area (ha)		
	Panchmahals	**Tapi**	**Valsad**
HYVs			
Gurjari	15183	5641	1209
GAR 13		4789	
GR 11		1400	956
GAR 17	4672		
GNR 3			1087
GAR 14	8245		
GR 4	1195		1252
Jaya	2769	2855	1318
IR 20		5027	1284
Sardar		2029	
Mahatma		1905	
GR 7		855	
Hybrids			
PAC 807		9006	
US 312		8755	5367
MC 13		8539	
Arize 6444		2850	
Goraknath			5579
Suruchi 5629			4500
Others	17264	11136	52959

Table 7: General information

Parameters	Districts					
	Ahmedabad	**Anand**	**Dang**	**Kheda**	**Mahisagar**	**Navsari**
# of talukas/blocks covered	3	2	2	5	2	4
# of villages surveyed	11	4	9	13	8	5
# of farmers interviewed	17	11	13	28	13	10
Field ecosystem	Irrigated (100%)	Irrigated (100%)	Irrigated (100%)	Irrigated (100%)	Irrigated (100%)	Irrigated (90%); Hilly (10%)
Weather conditions during cropping season	In general, weather conditions were normal and favourable for rice cultivation. Rainfall was timely, sufficient and well distributed during the season in most of the places. In Kharif 2024, monsoon appeared on time (third week of June) with 1134.8 mm rainfall in 49 days at Nawagam station.					
Crop stage when survey was made	Milk	Heading to milk	Milk	Heading to milk	Heading to milk	Heading to dough
Crop rotations	Common crop rotations followed by the farmers in different districts were rice-wheat (main), rice-rice, rice-wheat-vegetables, rice-vegetables, rice-mustard, rice-green gram/chickpea, rice-tobacco, rice-pulses, rice-maize, rice-pigeon pea, rice-pearl millet, rice-sugarcane, rice-niger, rice-wheat-maize, rice-fodder sorghum and rice-bean-summer green gram					

Table 7: cond..

Parameters	**Panchmahals**	**Surat**	**Tapi**	**Vadodara**	**Valsad**
# of talukas/blocks covered	1	1	2	2	2
# of villages surveyed	3	2	5	4	5
# of farmers interviewed	10	10	9	9	12
Field ecosystem	Irrigated (100%)	Irrigated (100%)	Irrigated (100%)	Irrigated (100%)	Irrigated (91.7%); Hilly (8.3%)
Weather conditions during cropping season	In general, weather conditions were normal and favourable for rice cultivation. Rainfall was timely, sufficient and well distributed during the season in most of the places. In Kharif 2024, monsoon appeared on time (third week of June).				
Crop stage when survey was made	Heading to milk	Milk to dough	Heading to dough	Milk to dough	Heading to dough
Crop rotations	Common crop rotations followed by the farmers in different districts were rice-wheat (commonly followed), rice-rice, rice-vegetables, rice-tobacco, rice-sugarcane, rice-pulses, rice-rabi maize, rice-castor, rice-wheat-green gram/castor, rice-chickpea, rice-fodder sorghum, rice/cotton-vegetables, rice-beans, rice-niger/pigeon pea/sunhemp, rice-groundnut and others				

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

Variety/hybrids	Yield (kg/ha)					
	Ahmedabad	**Anand**	**Dang**	**Kheda**	**Mahisagar**	**Navsari**
HYVs						
GR-11	3000			3550-4300	4100	4200
GR-21	4200-4300	4550		5250		
Gurjari	4100-4400	4100-4400		4100-4400	4050-4300	4100-4350
Surya Moti				4600		
GAR-13	4100-5500	4200-5025		4000-5200	4100-4200	4100-4600
GR-101	3500			4350		
Moti Gold		4100				
Krishna Kamod		3025-3330				
Jaya			2950		4200	
Mahsuri			3500			4250
Annapurna			3800			
Nath Poha					5000	
Varsha					4100	
Ambe Mohar			2500			
Lal Kada			2800			
Desi Kolam			2650			
Punjab S				4200-4300		
Laxmi					3750	
Ankur						3300
GNR-7						4100
Hybrids						
US-312			3000-3700			4100-5000
Kaveri 468			3250-3750			
Arize 6444			2750-3250	4500-4700		

Table 8: Contd..

Variety/hybrids	Yield (kg/ha)				
	Panchmahals	**Surat**	**Tapi**	**Vadodara**	**Valsad**
HYVs					
Gurjari	4050-4750	4000-4250	3500-4100	4100-4250	4000
GAR-13	4150-5000	4500	4350	4000-5000	
GAR-17				4800	
Moti Gold				4200	
Sonam	4100				
Laxmi					4300
Jaya	3750-3800		4100		
Mahsuri					4300
Annapurna			4100		
Nath Poha	3900	4100-4300			
Amani					4100
Hybrids					
US-312			4400-4500		3150-4500
Mahyco Navtej			4100		
Arize 6444					4300-4750
KTPH-471					4000

A. Cropping system and rice yield: The fields surveyed were mostly under irrigated ecosystem except few field in Navsari and Valsad which were under hill ecosystem. Common crop rotations followed by the farmers in different districts were rice-wheat (main), rice-rice, rice-wheat-vegetables, rice-vegetables, rice-mustard, rice-green gram/chickpea, rice-tobacco, rice-pulses, rice-maize, rice-pigeon pea, rice-pearl millet, rice-sugarcane, rice-niger, rice-wheat-maize, rice-fodder sorghum and rice-bean-summer green gram (Table 7). Among the varieties, Gurjari and GAR 13 were widely cultivated. The average yield among different HYVs and hybrids in different surveyed districts ranged from 3000-5500 kg/ha (Table 8).

Table 9: Details of rice consumption pattern in different districts of Gujarat

Parameters	Districts					
	Ahmedabad	**Anand**	**Dang**	**Kheda**	**Mahisagar**	**Navsari**
Status of farmers	Rich (58.8%); medium income (41.2%)	Rich (18.2%); medium income (72.7%); poor (9.1%)	Rich (15.4%); medium income (84.6%)	Rich (39.3%); medium income (60.7%)	Rich (15.4%); medium income (84.6%)	Rich (10%); medium income (80%); poor (10%)
Per capita monthly rice consumption (kg)	3-6 kg	3-4 kg	6-9 kg	3-6 kg	3-5 kg	3-8 kg
Composition of main meal	Rice + Wheat (100%)	Rice + Wheat (90.1%); only rice (9.9%)	Rice+Wheat (23.1%); only rice (76.9%)	Rice + Wheat (100%)	Rice + Wheat (92.3%); only rice (7.7%)	Rice + Wheat (40%); only rice (60%)
Preferred rice types	Polished rice (100%)	Polished rice (100%)	Polished rice (100%)	Polished rice (100%)	Polished rice (100%)	Polished rice (100%)
Rice grain type preference	Fine grain (100%)	Fine grain (100%)	Fine grain (100%)	Fine grain (100%)	Fine grain (100%)	Fine grain (100%)
Any changes in food habit in last 10 years	No (100%)	No (100%)	No (100%)	No (100%)	No (100%)	No (100%)

Table 9: Contd..

Parameters	Districts				
	Panchmahals	**Surat**	**Tapi**	**Vadodara**	**Valsad**
Status of farmers	medium income (80%); Poor (20%)	Rich (10%); medium income (90%)	Rich (22.2%); medium income (77.8%)	Rich (22.2%); medium income (77.8%)	medium income (91.7%); poor (8.3%)
Per capita monthly rice consumption (kg)	3-5 kg	3-5 kg	3-7 kg	4-6 kg	3-10 kg
Composition of main meal	Rice + Wheat (100%)	Rice + Wheat (70%); only rice (30%)	Rice + Wheat (44.4%); only rice (55.6%)	Rice + Wheat (100%)	Rice + Wheat (16.7%); only rice (83.3%)
Preferred rice types	Polished rice (100%)	Polished rice (100%)	Polished rice (100%)	Polished rice (100%)	Polished rice (100%)
Rice grain type preference	Fine grain (100%)	Fine grain (100%)	Fine grain (88.9%); coarse grain (11.1%)	Fine grain (100%)	Fine grain (100%); coarse grain (25%)
Any changes in food habit in last 10 years	No (100%)	No (100%)	No (100%)	No (100%)	No (100%)

B. Rice consumption pattern: Survey was conducted on consumption pattern of rice among the farmers in different districts of Gujarat. On an average about 76% of the farmers contacted belonged to medium income group, 19% were from higher income group and rest were from low-income group. Average per capita consumption of rice per month ranged from 3-10 kg rice in different districts. The primary meal of majority of the farmers from most of the districts consisted of both rice and wheat. Many farmers (30-83%) from Dang, Navsari, Surat, Tapi and Valsad told that they mainly consumed rice (Table 9). Almost all the farmers contacted in different districts told that they used polished rice. Regarding grain quality, most of the farmers expressed that though they preferred fine grain. However, some farmers used both fine grain and coarse grain rice varieties for consumption. In general, there was no change in the food habit.

Table 10: Details of nursery management

Parameters	Districts					
	Ahmedabad	**Anand**	**Dang**	**Kheda**	**Mahisagar**	**Navsari**
Planting time	2nd to 3rd week of July	2nd to 3rd week of July	1st to 3rd week of July	1st to 3rd week of July	1st to 3rd week of July	1st to 3rd week of July
Seed rate	23-30 kg/ha	24-26 kg/ha	25-30 kg/ha	23-26 kg/ha	24-30 kg/ha	23-26 kg/ha
Seed treatment (% farmers adopted)	Nil	Nil	Nil	Nil	Nil	Nil
Chemicals used for seed treatment	NA	NA	NA	NA	NA	NA
Organic manure in nursery (% farmers adopted)	Yes (100%) FYM	Yes (72.3%) FYM	Yes (100%) FYM	Yes (3.6%); FYM	Nil	Yes (20%) FYM
Inorganic manure in nursery (% farmers adopted)	Yes (100%); Urea (100-150 kg/ha) + DAP (40-60 kg/ha)	Yes (100%); Urea (80-140 kg/ha) + DAP (40-60 kg/ha)	Nil (100%)	Yes (100%); Urea (68-140 kg/ha) + DAP (30-80 kg/ha)	Yes (100%); Urea (100-140 kg/ha) + DAP (50-60 kg/ha)	Yes (80%); Urea (100-140 kg/ha) + DAP (30-60 kg/ha)

Table 10: Contd..

Parameters	Districts				
	Panchmahals	**Surat**	**Tapi**	**Vadodara**	**Valsad**
Planting time	1st to 3rd week of July	2nd to 3rd week of July	2nd to 3rd week of July	2nd to 3rd week of July	1st to 3rd week of July
Seed rate	24-30 kg/ha	24-30 kg/ha	24-30 kg/ha	24-30 kg/ha	24-26 kg/ha
Seed treatment (% farmers adopted)	Nil	Nil	Yes (11.1%)	Nil	Nil
Chemicals used for seed treatment	NA	NA	Thiram	NA	NA
Organic manure in nursery (% farmers adopted)	Nil	Nil	Nil	Nil	Yes (41.6%); FYM
Inorganic manure in nursery (% farmers adopted)	Yes (100%); Urea (100-120 kg/ha) + DAP (50-60 kg/ha)	Yes (100%); Urea (100-140 kg/ha) + DAP (50-60 kg/ha)	Yes (100%); Urea (100-120 kg/ha) + DAP (40-60 kg/ha)	Yes (100%); Urea (100-140 kg/ha) + DAP (50-65 kg/ha)	Yes (91.7%); Urea (90-130 kg/ha) + DAP (40-60 kg/ha)

C. Nursery and main field Management: Average seed rate used by the farmers in different districts ranged from 23-30 kg/ha. None of the farmers contacted except few from Tapi adopted seed treatment. However, many farmers used certified seeds and seeds already treated with fungicide. Farmers from Dang did not adopt any chemical seed treatment as this is a organic district (Table 10). Many farmers (20-100%) from Ahmedabad, Anand, Dang, Navsari and Valsad applied FYM in the nursery. But organic matter application in the nursery in other districts was not common (Table 10). Majority of the farmers (80-100%) in different districts except Dang told that they applied chemical fertilizers like urea and DAP in the nursery (Table 10). Farmers from Dang did not apply any chemical fertilizers either in the nursery or in the main fields as it is a organic district. Planting was mainly done during 1st to 3rd week of July. Majority of the farmers contacted followed random method of transplanting where plant population per unit area was not maintained. Few farmers from Ahmedabad and Anand followed direct sowing while few from Kheda, Mahisagar, Navsari, Panchmahals and Valsad followed line transplanting method. In the main fields, fertilzers were applied @ 44-89 kg N/ha, 12-37 kg P_2O_5/ha and 20 kg $ZnSO_4$/ha (Table 11). Application of potassic fertilizers was not common among the farmers. All the farmers contacted applied organic manure like FYM (8-19 t/ha) in the main field. Fertilizers like urea, DAP, SSP and ammonium sulphate were used by the farmers.

Table 11: Details of main field management

Details	Districts					
	Ahmedabad	**Anand**	**Dang**	**Kheda**	**Mahisagar**	**Navsari**
Planting method	Majority of the farmers contacted followed random method of transplanting where plant population per unit area was not maintained. Few farmers from Ahmedabad and Anand followed direct sowing while few from Kheda, Mahisagar and Navsari followed line transplanting method					
Total N applied	55-80 kg/ha (100% applied)	44-89 kg/ha (100% applied)	Nil	48-77 kg/ha (100% applied)	54-73 kg/ha (100% applied)	51-75 kg/ha (80% applied)
Total P_2O_5 applied	23-28 kg/ha (100% applied)	18-28 kg/ha (100% applied)	Nil	12-37 kg/ha (100% applied)	23-25 kg/ha (100% applied)	14-28 kg/ha (80% applied)
Total K_2O applied	Nil	Nil	Nil	Nil	Nil	Nil
$ZnSO_4$ applied (21% or 33%)	20 kg/ha (100% applied)	20 kg/ha (100% applied)	Nil	20 kg/ha (100% applied)	20 kg/ha (100% applied)	20 kg/ha (80% applied)
Organic fertilizers applied	Yes (100%); FYM (8-15 t/ha)	Yes (100%); FYM (10-13 t/ha)	Yes (100%); FYM (14-19 t/ha)	Yes (100%); FYM (8-13 t/ha)	Yes (100%); FYM (10-12 t/ha)	Yes (100%); FYM (10-18 t/ha)
Remarks	Nutrients were applied in the form of urea, DAP, SSP, Ammonium sulphate and zinc sulphate					

Table 11: contd..

Details	Districts				
	Panchmahals	**Surat**	**Tapi**	**Vadodara**	**Valsad**
Planting method	Majority of the farmers contacted followed random method of transplanting where plant population per unit area was not maintained. Few farmers from Panchmahals and Valsad followed line transplanting method				
Total N applied	55-66 kg/ha (100% applied)	55-75 kg/ha (100% applied)	54-70 kg/ha (88.9% applied)	61-85 kg/ha (100% applied)	48-70 kg/ha (91.7% applied)
Total P_2O_5 applied	23-28 kg/ha (100% applied)	23-28 kg/ha (100% applied)	23-28 kg/ha (88.9% applied)	23-30 kg/ha (100% applied)	18-28 kg/ha (91.7% applied)
Total K_2O applied	Nil	Nil	Nil	Nil	Nil
$ZnSO_4$ applied (21% or 33%)	20 kg/ha (100% applied)	20 kg/ha (100% applied)	20 kg/ha (88.9% applied)	20 kg/ha (100% applied)	20 kg/ha (25% applied)
Organic fertilizers applied	Yes (100%); FYM (10-12 t/ha)	Yes (100%); FYM (8-12 t/ha)	Yes (100%); FYM (9-16 t/ha)	Yes (100%); FYM (10-12 t/ha)	Yes (100%); FYM (8-16 t/ha)
Remarks	Nutrients were applied in the form of urea, DAP, SSP, Ammonium sulphate and zinc sulphate				

Table 12: Weeds and weed management

Details	Districts					
	Ahmedabad	**Anand**	**Dang**	**Kheda**	**Mahisagar**	**Navsari**
Weed intensity	Low	Medium	Medium to high	Low to medium	Low to medium	Low to medium
Names of the weeds	Commonly recorded weeds were *Echinochloa colona, E. crusgalli, Cynodon dactylon, Cyperus rotundus, Eclipta alba* and others					
Weedicides used	pyrazosulfuron Ethyl 70% WDG (30 gm/ha), bispyribac Sodium 10 SC (200 ml/ha), pendimethalin (1.5-2.5 l/ha),					
%age of farmers applied herbicides	Only hand weeding (76.5%); Hand weeding + herbicide (23.5%)	Only hand weeding (36.4%); Hand weeding + herbicide(54.5%); only herbicide (9.1%)	Only hand weeding (100%)	Only hand weeding (67.9%); Hand weeding + herbicide (32.1%)	Only hand weeding (53.8%); Hand weeding + herbicide (23.1%); only herbicide (23.1%)	Only hand weeding (100%)
Wild/weedy rice incidence	Nil	Nil	Nil	Nil	Nil	Nil
Remarks	One to two hand weeding was a general practice for the management of weeds					

D. Weeds and their Management: In general, the intensity of common weeds like *Echinochloa colona, E. crusgalli, Cynodon dactylon, Cyperus rotundus, Eclipta alba* and others was low to medium except in Dand and Panchmahals where the intensity of weeds was medium to high. Hand weeding (1-2) was the most common practice for weed management. On an average about 35%

farmers applied weedicides like pendimethalin (2 l/ha), bispyribac Sodium 10 SC (200 ml/ha) and pyrazosulfuron Ethyl 70% WDG (30 gm/ha) in addition to hand weeding. Remaining farmers followed only hand weeding (Table 12). None of the farmers from Dang applied any weedcides (Table 12).

Table 12: Contd..

Details	**Districts**				
	Panchmahals	**Surat**	**Tapi**	**Vadodara**	**Valsad**
Weed intensity	Medium to high	Low to medium	low to medium	low to medium	low to medium
Names of the weeds	Commonly recorded weeds were *Echinochloa colona, E. crusgalli, Cynodon dactylon, Cyperus rotundus, Eclipta alba* and others				
Weedicides used	pendimethalin 30 EC (1.5 l/ha), bispyribac Sodium 10 SC (200 ml/ha), pyrazosulfuron Ethyl 70% WDG (30 gm/ha)				
%age of farmers applied herbicides	Only hand weeding (40%); Hand weeding + herbicide (40%); only herbicides (20%)	Only hand weeding (50%); Hand weeding + herbicide (50%)	Only hand weeding (88.9%); only herbicide (11.1%)	Only hand weeding (55.5%); Hand weeding + herbicide (44.5%)	Only hand weeding (83.3%); Hand weeding + herbicide (16.7%)
Wild/weedy rice incidence	Nil	Nil	Nil	Nil	Nil
Remarks	One to two hand weeding was a general practice in the management of weeds				

E. Needs of the farmers: Some of the common needs of the farmers were varieties suitable for direct seeded rice, early maturing and aromatic varieties with high yield potential, varieties resistant to pest and diseases, fine grain and early maturing high yielding varieties, bold rice varieties suitable for rice poha making, salt tolerant rice varieties, special policy and higher price for organic rice, increase in minimum support price, improvement in irrigation facilities, improvement in mechanization to tackle the labour scarcity problems, bio-fortified varieties, varieties suitable for organic rice cultivation and technical support to farmers.

F. Input Use: Implements like tractor, rotavator, sprayers (knapsack and power), puddler, cultivator, thresher and combined harvester were used by the farmers. Progressive farmers had some of their own equipment and other farmers hired the implements. Most of the farmers used combine harvester on hire basis (Table 13). About 53 - 100 % of the farmers contacted in different districts told that they purchased 20-100% of their seed requirement. Average seed replacement rate was 25-50%. Major sources of irrigation were shallow tube wells and canal. Very few farmers contacted expressed that there was scarcity of irrigation water. Majority of 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 university and state department of agriculture (Table 13).

Table 13: Details of inputs used

Details	Districts					
	Ahmedabad	**Anand**	**Dang**	**Kheda**	**Mahisagar**	**Navsari**
Implements used	Implements like tractor, rotavator, sprayers (knapsack and power), puddler, cultivator, thresher and combined harvester were used by the farmers. Progressive farmers had some of their own equipment and other farmers hired the implements. Most of the farmers used combine harvester on hire basis					
Seed replacement (as reported by Cooperator)	25-60%	20-50%	75-100%	25-50%	50-100%	30-100%
Source of seeds	53.8 - 100 % of the farmers contacted in different districts told that they purchased 20-100% of their seed requirement					
Source of irrigation	Canal (17.6%); shallow tube well (82.4%)	Canal (18.2%); shallow tube well (90.1%)	Canal (15.4%); shallow tube well (92.3%)	Canal 14.3%); Deep tube well (10.7%); shallow tube well (75%)	Canal (7.7%); shallow tube well (92.3%)	Canal (10%); shallow tube well (90%)
Scarcity of irrigation water	No (100%)	No (100%)	Yes (15.4%)	Yes (17.8%)	Yes (7.7%)	Yes (10%)
Availability of fertilizers/pesticides	Yes (100%)	Yes (90.1%)	-	Yes (100%)	Yes (84.6%)	Yes (60%)
Quality of fertilizers/pesticides	Satisfied (100%)	Satisfied (100%)	-	Satisfied (92.8%)	Satisfied (84.6%)	Satisfied (80%)
Advisors to the farmers	Own decisions (100%); Dealers (82.3%); Univ (17.6%)	Own decisions (63.6%); Dealers (72.7%); Univ (45.4%)	Own decisions (69.2%); Dealers (38.5%); Univ (61.5%); State dept (7.7%)	Own decisions (78.6%); Dealers (35.7%); Univ (78.6%)	Own decisions (53.8%); Dealers (15.4%); Univ (76.9%)	Own decisions (70%); Dealers (50%); Univ (50%)

Details	Districts				
	Panchmahals	**Surat**	**Tapi**	**Vadodara**	**Valsad**
Implements used	Implements like tractor, rotavator, sprayers (knapsack and power), puddler, cultivator, thresher and combined harvester were used by the farmers. Progressive farmers had some of their own equipment and other farmers hired the implements. Most of the farmers used combine harvester on hire basis				
Seed replacement (as reported by Cooperator)	50-100%	20-100%	20-100%	20-100%	30-100%
Source of seeds	77.7 - 100 % of the farmers contacted in different districts told that they purchased 20-100% of their seed requirement				
Source of irrigation	Canal (20%); shallow tube well (80%)	Deep tube well (20%); shallow tube well (80%)	Shallow tube well (100%)	Canal (22.2%); shallow tube well (77.8%)	Shallow tube well (100%)
Scarcity of irrigation water	No (100%)	No (100%)	No (100%)	No (100%)	No (100%)
Availability of fertilizers/pesticides	Yes (80%)	Yes (90%)	Yes (88.9%)	Yes (100%)	Yes (83.3%)
Quality of fertilizers/ pesticides	Satisfied (90%)	Satisfied (90%)	Satisfied (100%)	Satisfied (100%)	Satisfied (83.3%)
Advisors to the farmers	Own decisions (40%); Dealers (20%); Univ (80%)	Own decisions (40%); Dealers (30%); Univ (60%)	Own decisions (100%); Dealers (22.2%); Univ (77.8%)	Own decisions (100%); Dealers (55.5%); Univ (44.4%)	Own decisions (66.7%); Dealers (41.7%); Univ (58.3%); State dept (8.3%)

Table 14: Prevalence of diseases and Insects in Gujarat during *Kharif* 2024

Districts	Diseases						
	Bl	**NBl**	**ShBl**	**ShR**	**GD**	**FS**	**BLB**
Ahmedabad	L-M (5-10%)	L (2-7%)	L (2-4%)	L-M (2-15%)	L-M	L-M (5-13%)	L-M (3-10%)
Anand	L-M (2-12%)		L-M (2-14%)	L-M (4-20%)	L-M (5-12%)	L-M (4-20%)	L-M (5-12%)
Dang	L-M (5-12%)	L-M (5-10%)	-	L-M (5-15%)	L	L-M (4-13%)	M (8-25%)
Kheda	L-M (3-20%)	-	L-M (5-12%)	M (6-15%)	L-M (5-13%)	M-S (8-26%)	L-M (5-20%)
Mahisagar	L-M (6-11%)	L (<5%)	M (8-15%)	L-M (5-14%)	M (11-17%	M (8-20%)	L-M (6-16%)
Navsari	L-M (6-10%)	L-M (3-10%)	L (5%)	M (8-20%)	M (8-16%)	L-M (5-15%)	L-S (5-26%
Panchmahals	T-L	L (5-6%)	L-M (5-10%)	M (8-12%)	L-M (6-15%)	L-M (6-16%)	L-M (5-12%)
Surat	L-M (6-13%)	-	L-M (6-12%)	L-M (3-16%)	NL-M (3-15%)	L-M (4-10%)	M-S (10-30%)
Tapi	L-M (2-13%)	L-M (5-9%)	-	L-M (6-12%)	L-M (5-10%)	L-M (5-15%)	L-M (2-20%)
Vadodara	L (2-3%)	-	L (4-5%)	L-M (6-15%)	L-M (5-10%)	L-M (5-15%)	M (8-17%)
Valsad	L-M (6-11%)	L-M (4-8%)	L-M (5-9%	L-M (5-15%)	L-M (2-15%)	L-M (4-20%)	M (8-20%)

L (3-5%) brown spot in few places in Tapi

District	Insect Pests						
	SB	**LF**	**BPH**	**WBPH/ Hopper**	**GB**	**GM**	**Leaf/ Sheath Mite**
Ahmedabad	L-M (4-9%)	L-M (3-8%)		L (<5%)	-		-
Anand	L-M (3-9%)	L-M (2-9%)		L-M (5-8%)	-	L (5-7%)	T
Dang	L (3-7%)	L-M (2-9%)		L-M (3-9%)	L		-
Kheda	L-M (5-9%)	L-M (3-12%)	L (3-4%)	L-M (4-8%)	-		T
Mahisagar	L-M (3-14%)	L-M (2-10%)		L-M (4-8%)	N		-
Navsari	L (4-6%)	L (2-5%)	L-M (3-15%)	N-L	L (<5%)		L (<5%)
Panchmahals	L-M (5-8%)	L-M (3-9%)		L-M (5-10%)	L (4-5%)		-
Surat	L-M (4-9%)	L-M (3-8%)		L-M (3-8%)	-		-
Tapi	L-M (5-9%)	L (4-6%)		L-M (4-8%)	T-L		T
Vadodara	L-M (4-8%)	L-M (2-8%)		L (6-7%)	-		T
Valsad	L (3-6%)	L-M (2-8%)		L (4-6%)	L		L (4-5%)

Low (5-6%) incidence of GLH in few places in Mahisagar

G. Biotic stresses and their management: In general, the intensity of different diseases and insect pests was low to moderate (Table 14). Diseases like leaf blast, sheath rot, false smut, grain discoloration and bacterial blight were wide spread but in low to moderate intensity (Table 14). However, higher intensity of false smut was recorded in some fields in Kheda district on varieties like Punjab S and GAR 13. Similarly, higher intensity of bacterial blight was recorded in some fields of Navsari and Surat on varieties like Gurjari and Mahsuri (Table 14). Insect pests like stem borer, leaf folder and WBPH were widespread but in low to moderate intensity (Table 14). Low incidence of mite was observed in some of the surveyed districts. Farmers used different pesticides for managing different pests and diseases (Table 15). Majority of the farmers contacted (50-100%) in different districts except Dang adopted chemical plant protection measures (Table 15). None of the farmers contacted mixed different pesticides before application. Zinc deficiency symptoms were commonly observed in surveyed field. Some of the common problems faced by the farmers were low market price for paddy, scarcity of labours, high cost of inputs resulting higher cost of cultivation and less profitability, uncertain rainfall, low return from rice culyivation, low market price for organic rice, high price of diesel engine fuel and micro-nutrient deficiency. A general view shared by most of rice growing farmers during our survey that day by day the profitability of rice cultivation is decreasing because of increase in input cost. Some farmers are growing rice under organic and natural farming and they want some additional price for their produce.

Table 15: Details of pest management

Details	Districts					
	Ahmedabad	**Anand**	**Dang**	**Kheda**	**Mahisagar**	**Navsari**
% age farmers adopting plant protection	100%	100%	Nil	100%	92.3%	80%
Names of pesticides	Insecticides: chlorantraniliprole (0.4%) @ 10 kg/ha and cartap hydrochloride 4G (20 kg/ha) for stem borer and leaf folder and leaf folder and thiomethoxam (200 g/ha), imidacloprid 17.8 SL (150 ml/ha) and pymetrozine (300 g/ha)for plant hoppers Fungicides: tricyclazole 75 WP (300 g/ha), propiconazole (500 ml/ha) and picoxystrobin 6.78 + tricyclazole 20.33 @ 100 ml/ha for blast and neck blast; propiconazole (500-750 ml/ha), carbendazim (12%) + mancozeb (63%) @ 1-1.25 kg/ha and Nativo (trifloxystrobin + tebuconazole) @ 200 g/ha, for false smut, grain discoloration and sheath rot and hexaconazole (500 ml/ha) for sheath blight					
# of pesticide sprays	1-2	1-2	1-2	1-2	1-2	1-2
Mixing of pesti-cides before application	Nil	Nil	Nil	Nil	Nil	Nil
Zinc deficiency	Yes (100%)	Yes (100%)	Yes (100%)	Yes (100%)	Yes (100%)	Yes (100%)

H. Researchable issues: Among the biotic stresses, major problems in the region are leaf blast, sheath rot, false smut and bacterial blight among the diseases and stem borer, leaf folder and WBPH among the insect pests. Among the abiotic problems, drought and salinity were the main problem. Major problems faced by the farmers were lack of irrigation facilities, scarcity of agricultural labours and lack of mechanization. Farmers want high yielding rice varieties suitable for DSR, short duration rice varieties, varieties having tolerance leaf blast, BLB, false smut, sheath rot, WBPH, leaf folder and stem borer. Farmers also expressed the need for varieties having

tolerance to salinity and drought, varieties with medium slender grains and with high zinc, high protein and low GI.

Table 15: contd..

Details	Districts				
	Panchmahals	**Surat**	**Tapi**	**Vadodara**	**Valsad**
% age farmers adopting plant protection	90%	100%	100%	100%	50%
Names of pesticides	**Insecticides**: chlorantraniliprole (0.4%) @ 10 kg/ha and cartap hydrochloride 4G (20 kg/ha) for stem borer and leaf folder and leaf folder; imidacloprid 17.8 SL (150 ml/ha), pymetrozine 50 WG (300 g/ha) and thiamethoxam 25 WC (200 g/ha) for hoppers **Fungicides**: tricyclazole 75 WP (300 g/ha) for blast and neck blast; propiconazole (500-1000 ml/ha), carbendazim (12%) + mancozeb (63%) @ 1.25 kg/ha and Nativo (trifloxystrobin + tebuconazole) @ 200 g/ha, for false smut, grain discoloration and sheath rot and hexaconazole (500 ml/ha) for sheath blight				
# of pesticide sprays	1-3	1-2	1-2	1-2	1-2
Mixing of pesticides before application	No (100%)	No (100%)	No (100%)	No (100%)	No (100%)
Zinc deficiency	Yes (100%)	Yes (100%)	Yes (100%)	Yes (100%)	Yes (83.3%)

Table 16: Researchable issues

Parameters/Issues	Districts					
	Ahmedabad	**Anand**	**Dang**	**Kheda**	**Mahisagar**	**Navsari**
Rice ecology in your area	Irrigated	Irrigated	Irrigated	Irrigated	Irrigated	Irrigated
Rice cultivation only in Kharif or both Kharif and Rabi	Kharif	Kharif	Kharif	Kharif	Kharif	Kharif
Number of years of experience in rice farming	10-20 years	10-20 years	10-20 years	5-20 years	10-20 years	10-20 years
Main biotic constraints (diseases) in your area according to you	Leaf blast, false smut, sheath rot and bacterial blight					
Extent of disease damage	10-25%					
Main biotic constraints (Insect pests) in your area according to you	Stem borer, leaf folder, WBPH/BPH					
Extent of insect pest damage	<10%	<10%	<10%	<10%	<10%	<10%
Main abiotic constrains in your area according to you	NA	NA	NA	Salinity	NA	NA
Production constraints in your area according to you	Main production constraint is lack of proper irrigation facilities and lack of mechanization					
Irrigation facilities in your area	Bore well (main), canal, river	Bore well (main), canal, river	Bore well (main), canal, river	Bore well (main), canal, river	Bore well (main), open well	Bore well (main), canal
Normally how many years it takes to change the rice variety						
Any other rice production issues in your area which the rice scientists need to address						
What is urgently required in your area as far as rice varieties are concerned						
Duration	Varieties suitable for DSR					

Parameters/Issues	Districts					
	Ahmedabad	Anand	Dang	Kheda	Mahisagar	Navsari
Biotic stress resistance	Varieties tolerant to blast, BLB, false smut, sheath blight, WBPH/BPH, leaf folder and stem borer					
Abiotic stress resistance	Varieties with tolerance to drought and salinity					
Preferred grain quality	High yielding rice varieties with medium slender grain quality					
Nutritional quality	Varieties with high zinc and low GI					

Table 16: contd..

Parameters/Issues	Districts				
	Panchmahals	Surat	Tapi	Vadodara	Valsad
Rice ecology in your area	Irrigated	Irrigated	Irrigated	Irrigated	Irrigated
Rice cultivation only in Kharif or both Kharif and Rabi	Kharif	Kharif	Kharif	Kharif	Kharif
Number of years of experience in rice farming	5-10/10-20 years	10-20 years	10-20 years	10-20 years	5-10/10-20 years
Main biotic constraints (diseases) in your area according to you	Leaf blast, false smut, sheath rot and bacterial blight				
Extent of disease damage	10-25%	10-25%	10-25%	10-25%	10-25%
Main biotic constraints (Insect pests) in your area according to you	Stem borer, leaf folder and WBPH/BPH				
Extent of insect pest damage	<10%	<10%	<10%	<10%	<10%
Main abiotic constrains in your area according to you	-	-	-	-	-
Production constraints in your area according to you	Lack of irrigation facilities and lack of mechanization				
Irrigation facilities in your area	Available; Bore well (main) canal	Available; Bore well (main), canal	Available; Bore well (main)	Available; Bore well (main), canal	Available; Bore well (main), open well
Normally how many years it takes to change the rice variety	5-20 years	5-20 years	5-20 years	5-10 years	5-20 years
Any other rice production issues in your area which the rice scientists need to address					
What is urgently required in your area as far as rice varieties are concerned					
Duration	Varieties suitable for DSR				
Biotic stress resistance	Varieties tolerant to blast, BLB, false smut and WBPH/BPH				
Abiotic stress resistance	Varieties with resistance to drought and high temperature				
Preferred grain quality	MS grain high yielding rice varieties and aromatic short grain/scented varieties				
Nutritional quality	Varieties with high zinc, high protein and low GI				

Haryana-Kaul (2024-25)

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

Table 1: Particulars of survey

Districts	Blocks	Villages (latitude; longitude)
Kaithal	Pundri, Tajaund, Cheeka and Seevan	Sakra (29.81411, 76.693256; 29.822183, 76.688675), Fatehpur (29.798658; 76.54504), Rajaund (29.556649; 76.478604), Serdha (29.61845; 76.501163), Bhana (29.68006; 76.522095), Jatehri (29.739582; 76.547295), Pedal (30.005326; 76.340279), Firozpur (29.891943; 76.384791) and Polad (29.920113; 76.57457)
Kurukshetra	Babain, Ladwa, Thanesar, Ismailabad and Pehowa	Gisarpur (30.092912; 77.009777), Bhaini (30.068847; 76.990408), Bir Mangoli (30.141873; 77.028944), Mathana (29.985044; 76.947452), Bakali (30.026698; 77.055585), Jalbehra (30.084822; 76.665815), Shergarh (30.095219; 76.641674), Bodhni (30.037335; 76.570144), Jakhawala (30.084249; 76.581151) and Pindarsi (29.924186; 76.710901)
Karnal	Indri, Nilokheri, Nissing, Karnal and Gharaunda	Nanhera (29.870682; 77.093319), Haibatpur (29.855214; 76.784921), Labkhari (29.899817; 77.149771), Sambhli (29.769509; 76.799536), Kacchhwa (29.714074; 76.916229), Janesaro (29.850447; 77.030987), Darar (29.776074; 76.990299), Anjanthali (29.846710; 76.875690), sarai Kohand (29.50234; 76.97224) and Arainpura (29.563348; 76.976091)
Jind	Jind, Uchana, Julana, Pillukhera, Alewa and Saffidon	Igrah (29.316705; 76.316695), Jiwanpur (29.408116; 76.38017), Gadwali (29.167852; 76.342765), Bhambhewa (29.230012; 76.544886), Singhu Khera (29.286613; 76.404828), Khokari (29.361786; 76.362105), Alewa (29.458093; 76.435842), Katwal (29.501921; 76.452182), Jaipur (29.390068; 76.582352) and Haat (29.345313; 76.63618)
Yamunanagar	Radaur, Jagadhri, Mustafabad, Bilaspur and Sarswatinagar	Gumthala Road (29.767599; 77.11338), Nagal (30.070742; 77.271348), Lal Chhapar Dera (30.0009777; 77.223565), Bambholi (30.186536; 77.228647), Hargarh (30.113592; 77.219259), Kapuri Kalan (30.317551; 77.249574), Saravi (30.339342; 77.206501), Gyanewala (30.285234; 77.251551), Sabilpur Jattan (30.230620; 77.188293) and Sarsvatinagar (30.124354; 77.090396)
Ambala	Barara, Naraingarh, Saha and Shahzadpur	Manka (30.243566; 77.113818), Sohana (30.255686; 77.02449), Kulari (30.409222; 77.079896), Baragaon (30.449548; 77.112563), Hadodi (30.190095; 77.034438), Kesri (30.225991; 76.91276), Shahpur (30.275886; 76.966599), Mahmoodpur (30.338344; 76.98274), Padarhedi (30.411525; 77.023322) and Rajjauli (30.373645; 77.039921)

Panipat	Bapoli, Israna, Panipat and Samalkha	Dadola (29.337774; 77.018462), Seek (29.305913; 76.670406), Sewah (29.337837; 77.011314), Ujha (29.315233; 77.027792), Pawti (29.232403; 77.036019), Passina Kalan (29.291486; 76.99907), Bapura (29.251162; 77.020055), Badoli, Karad (29.316679; 76.815692) and Brahman Majra (29.317138; 76.853729)
Sonepat	Mundlana, Gohana, Rai, Murthal and Ganaur	Jagsi (29.239712; 76.662721), Mehmudpur Maan (29.190397; 76.703761), Khandrai (29.17151; 76.651678), Ishapur Kheri (29.209378; 76.57822), Jakhauli (28.933139; 77.137159), Aterna (28.902167; 77.146361), Nangal Khurd (29.016277; 77.080019), Hasanpur (29.07542; 77.079291), Bhakharpur (29.18046; 77.837114) and Chirsmi (29.158768; 77.066598)

Table 2: Widely prevalent rice varieties

Districts	Varieties
Kaithal	**HYVs:** PR 126, PR 114, PR 131 and others; **Hybrids:** Hyb. 90m100, Sava 7501, Sava 7301, Hyb. 2222, Hyb. 2299 and others; **Basmati/Scented:** CSR 30, Pusa Basmati 1509, Pusa Basmati 1885, Pusa Basmti 1718, Pusa Basmati 1692, Pusa Basmati 1401, Super 52, Pusa Basmati 1847, Pusa Basmti 1121 and others
Kurukshetra	**HYVs:** PR 126, PR 114, PR 131 and others; **Hybrids:** Sava 7301, VNR 2111, Sava 7501, Sava 127, Hyb. KRH 7299 and others; **Basmati/Scented:** Pusa Basmati 1509, Pusa Basmati 1121, CSR 30, Pusa Basmati 1401, Pusa Basmti 1885, Pusa Basmati 1886 and others
Karnal	**HYVs:** PR 114, PR 126 and others; **Hybrids:** Sava 7301, Hyb. 303, Hyb. VNR 2111, Sava 7501, Hyb. KRH 7299 and others; **Basmati/Scented:** Pusa Basmati 1509, Super 52, CSR 30, Pusa Basmati 1885, Pusa Basmati 1692, Pusa Basmati 1121, Pusa Basmati 1718 and Pusa Basmati 1401
Jind	**Hybrids:** Sava 7501, Hyb. 2222, Hyb KRH 468 and others; **Basmati/Scented:** Pusa Basmati 1509, Pusa Basmati 1718, Pusa Basmati 1121, Pusa Basmati 1885, Pusa Basmati 1847, Pusa Basmati 1886 and Pusa Basmati 1401
Yamunanagar	**HYVs:** PR 126, NDR 359 and others; **Hybrids:** Sava 7501, Sava 134, Hybrid 6222, Hyb. VNR 2111, Hyb. 2222, Sava 7301, JKRH 2082, Hyb. 368, Sava 127, Sava 134 and others; **Basmati/Scented:** Pusa Basmati 1509, Pusa Basmati 1718, Pusa Basmati 1121, Pusa Basmati 1, Super 52 and CSR 30
Ambala	**Hybrids:** sava 7301, Sava 7501, Hyb. 282, Sava 127, Hyb. 90m100, Hyb. KRH 468, Arize 6444, Hyb. 372, Hyb. 28p67, Hyb. 2222, Hyb. 7299, Hyb. 8222, Arize 6129, Hyb. 471 and others; **Basmati/Scented:** Pusa Basmati 1509 and others
Panipat	**Hybrids:** Hybrid 2222 and others; **Basmati/Scented:** Pusa Basmati 1121, Pusa Basmati 1509, Pusa Basmati 1401, Pusa Basmati 1718, Pusa Basmati 1885, Pusa Basmati 1692, Pusa Basmati 1886, Pusa Basmati 1847, Pusa Basmati 1125, Pusa Basmati 1885, Super 21 and others
Sonepat	**Basmati/Scented:** Pusa Basmati 1718, Pusa basmati 1692; Pusa Basmayi 1885, Pusa Basmati 1121, Pusa Basmti 1509, Pusa Basmati 1847, Pusa Basmati 1401 and others

Production oriented survey was conducted in 8 rice growing districts of Haryana viz., Kaithal, Kurukshetra, Karnal, Jind, Yamunanagar, Ambala, Panipar and Sonepat during Kharif season of 2024 when the crops were booting to maturity 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 were favourable. However, few places in Kaithal, there were reports of less rainfall. Widely cultivated rice varieties were HYVs like PR 126, PR 114, PR 131 and others; hybrids like Hyb. 90m100, Sava 7501, Sava 7301, Hyb. 2222, JKRH 2082, Hyb. 368, Sava 127, Sava 134, VNR 2111, Hyb. 2299, Hyb. KRH 7299, Hyb. 303, Hyb. 2222, Hyb KRH 468, Hyb. 282, Arize 6444, Hyb. 372, 28p67, Hyb. 8222, Arize 6129, Hyb. 471 and others and basmati rice varieites like Pusa Basmti 1121, CSR 30, Pusa Basmati 1509, Pusa Basmati 1885, Pusa Basmti 1718, Pusa Basmati 1692, Pusa Basmati 1401, Super 52, Pusa Basmati 1886, Pusa Basmati 1847 and Super 21. The details of different rice varieties cultivated in different districts of Haryana are presented in Table 2.

Table 3: General information

Parameters	Kaithal	Kurukshetra	Karnal	Jind
# of talukas/blocks covered	4	5	4	5
# of villages surveyed	9	10	10	10
# of farmers interviewed	10	10	10	10
Field ecosystem	Irrigated	Irrigated	Irrigated	Irrigated
Weather conditions during cropping season	Normal (100%)*	Normal (100%)	Normal (100%)	Normal (100%)
Crop stage when survey was made	Booting to dough	Booting to mature	Booting to mature	Heading to dough
Crop rotations	Rice-wheat was the main crop rotation followed by the farmers. Some farmers also followed rice-wheat-mustard/vegetables/barseem, rice-mustard and rice-vegetables			

Few places in Kaithal experience little less rainfall

Table 3 Contd..: General information

Parameters	Yamunanagar	Ambala	Panipat	Sonepat
# of talukas/blocks covered	5	4	4	5
# of villages surveyed	10	10	10	10
# of farmers interviewed	10	10	10	10
Field ecosystem	Irrigated	Irrigated	Irrigated	Irrigated
Weather conditions during cropping season	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)
Crop stage when survey was made	Booting to heading	Heading to milk	Heading to mature	Milk to mature
Crop rotations	The main crop rotation followed by the farmers was rice-wheat. Some farmers also followed rice-mustard-sugarcane, rice-mustard, rice-potato-sunflower, rice-vegetables, rice-potato, rice-wheat-sugarcane and rice-sunflower			

Table 4: Average yields of different rice varieties as reported by the cooperators/farmers

Variety/hybrids	Yield (kg/ha)			
	Kaithal	Kurukshetra	Karnal	Jind
HYVs				
PR 126	7000	7500-9500	7500-8750	
PR 131		9000		
PR 114	8500	8750	6250-7250	
Basmati				
CSR 30	3250-4000	2500-3000		
Pusa Basmati 1121		4500	5500	4300-6000
Pusa Basmati 1509		4750-5750	4000-6250	
Pusa Basmati 1401	2500		3500	6200-6500
Pusa Basmati 1718	5750		3500	5500-7000
Pusa Basmati 1692			6250	
Pusa Basmati 1847	6000			5750
Pusa Basmati 1885				5250
Hybrids				
Sava 7501	9500-10250	9500-10000		
Sava 7301	9250-10000	8000-8750	9000	
Hyb. 2222	8250-9500			
Sava 127		8000-9000		
KRH 7299	7500			
Hyb. 90m100	7250			
Hyb. 2111		8250	7250	

Table 4 contd:..

Variety/hybrids	Yield (kg/ha)			
	Yamunanagar	Ambala	Panipat	Sonepat
HYVs				
PR 126	4000			
Basmati				
Pusa Basmati 1121	4000-5500		4500-5250	5000-5500
Pusa Basmati 1509	6000		5500-6500	5750-6500
Pusa Basmati 1	5250			
Pusa Basmati 1847			6000	5200-7600
Pusa Basmati 1718			5750	5500-6200
Pusa Basmati 1401			6250	
Pusa Basmati 1885			5000	5500-6000
Hybrids				
Sava 7501	9750	8000-8500		
Sava 7301	7500-8000	8000-8750		
Sava 127	8000	8000-8250		
Sava 134	7000-7500			
Hyb. 2222	7250	5750		
Hyb. 368	7500			

Variety/hybrids	Yield (kg/ha)			
	Yamunanagar	Ambala	Panipat	Sonepat
Arize 6129		8250		
Arize 6444		6000-8750		
Hyb.2111	7500			
Hyb. 90m100		7750		
Hyb. 372		8000		
Hyb. 28p67		7750		
Hyb. 7299		7750-8000		

A. Cropping system and rice yield: The main crop rotation followed by the farmers was rice-wheat. Some farmers also followed rice-mustard-sugarcane, rice-mustard, rice-potato-sunflower, rice-vegetables, rice-fodder (barseem), rice-potato, rice-wheat-sugarcane and rice-sunflower (Table 3). The details of variety wise yield (as reported by the farmers during survey) are presented in Table 4. Average rice yield among HYVs ranged from 6250-9500 kg/ha while in case of hybrid varieties it ranged from 6000-10250 kg/ha. In case of basmati varieties, average yield ranged from 2500-7600 kg/ha.

Table 5: Details of rice consumption pattern in different districts of Haryana

Parameters	Districts			
	Kaithal	Kurukshetra	Karnal	Jind
Status of farmers	Medium Income (80%); poor (20%)	Medium Income (100%); poor (20%)	Medium Income (70%); poor (20%); rich (10%)	Medium Income (30%); poor (40%); rich (30%)
Per capita monthly rice consumption (kg)	1.5-4 kg	2-6 kg	1.5-4 kg	1.5-5 kg
Composition of main meal	Rice + Wheat (100%)	Rice + Wheat (100%)	Rice + Wheat (100%)	Rice + Wheat (100%)
Preferred rice types	Polished rice (100%)	Polished rice (100%)	Polished rice (100%)	Polished rice (100%)
Rice grain type preference	Basmati (80%); Fine grain (20%)	Basmati (80%); Fine grain (20%)	Basmati (50%); Fine grain (40%); coarse grain (10%)	Basmati (80%); Fine grain (20%)
Any changes in food habit in last 10 years	No (60%); 40% told rice included in diet	No (60%); 40% told rice included in diet	No (60%); 40% told rice included in diet	No (60%); 40% told rice included in diet

B. Rice consumption pattern: Survey was conducted on consumption pattern of rice among the farmers in different districts of Haryana. Majority (average 71%) of the farmers contacted were in the medium income group while about 19% farmers belonged to poor category and rest were from higher income group. Average per capita consumption of rice per month was 1-6 kg rice (Table 5). All the farmers contacted told that their main meal consisted of both rice and wheat and all of them they told that they preferred polished rice. On an average about 67% of the farmers contacted in different districts told that they preferred basmati rice and rest consumed fine grain varieties. In general, there was no change in the food habit except that some farmers told that they included of rice in their diet.

Table 5 contd..: Details of rice consumption pattern in different districts of Haryana

Parameters	Districts			
	Yamunanagar	**Ambala**	**Panipat**	**Sonepat**
Status of farmers	Medium Income (90%); rich (10%)	Medium Income (70%); poor (30%)	Medium Income (80%); rich (20%)	Medium Income (50%); poor (20%); rich (30%)
Per capita monthly rice consumption (kg)	1.5-5 kg	2-5 kg	2-5 kg	1-5 kg
Composition of main meal	Rice + Wheat (100%)	Rice + Wheat (100%)	Rice + Wheat (100%)	Rice + Wheat (100%)
Preferred rice types	Polished rice (100%)	Polished rice (100%)	Polished rice (100%)	Polished rice (100%)
Rice grain type preference	Basmati (70%); Fine grain (50%)	Basmati (60%); Fine grain (40%)	Basmati (60%); Fine grain (50%)	Basmati (60%); Fine grain (50%)
Any changes in food habit in last 10 years	No (60%); 30% told rice included in diet	No (60%); 40% told rice included in diet	No (50%); 50% told rice included in diet	No (70%); 30% told rice included in diet

Table 6: Details of nursery management

Parameters	Districts			
	Kaithal	**Kurukshetra**	**Karnal**	**Jind**
Planting time	2nd week of June to 3rd week of July	2nd to 4th week of June	4th week of May to 2nd week of June	3rd week of June to last week of July
Seed rate	15-20 kg/ha	12.5-20 kg/ha	12.5-25 kg/ha	12.5-20 kg/ha
Seed treatment (% farmers adopted)	Yes (60%); Used treated seeds (40%)	Yes (60%); Used treated seeds (40%)	Yes (70%); Used treated seeds (20%)	Yes (70%); Used treated seeds (20%)
Chemicals used for seed treatment	Soaking 10 kg seeds in carbendazim (1-2 g/kg) or mixture of carbendazim (10g) + streptocycline (1g) or mixture of carbendazim (12%) + mancozeb (63%) @ 2 g/kg in 10 litre of water for 24 h			
Organic manure in nursery (% farmers adopted)	Yes (10%) FYM	Nil (100%)	Yes (10%); FYM	Nil (100%)
Inorganic manure in nursery (% farmers adopted)	Yes (80%); Urea (5-7 kg/kanal) and/or DAP @ 5-10 kg/kanal*	Yes (60%); Urea (5-7 kg/kanal) and/or DAP @ 5-7 kg/kanal*	Yes (70%); Urea (5 kg/kanal) and/or DAP @ 5 kg/kanal*	Yes (70%); Urea (5-8 kg/kanal) and/or DAP @ 5 kg/kanal*

* 1 Kanal = 500 m^2

C. Nursery and main field Management: Average seed rate was low (12.5-20 kg/ha). On an average about 56% of the farmers contacted told that they treated the seeds by soaking them in carbendazim (1-2 g/kg) or a mixture of Bavistin (10g) + streptocycline (1g) or mixture of carbendazim (12%) + mancozeb (63%) @ 2 g/kg in 10 litre of water for 24 h (Table 6). Other farmers told that they used already treated seeds from market for sowing (Table 6). Application of organic manure in the nursery was not common among the farmers. However, majority of the farmers contacted (60-100%) in different districts applied chemical fertilizers like urea and DAP in the nursery (Table 6). Planting was done during second week of June to third week of July. Almost all the farmers adopted random planting where plant population per unit area was not maintained. Few farmers (10-20%) in Jind, Panipat and Sonepat adopted direct sowing. The details of fertilizers applied in the main field are given in Table 7. Average nitrogen dose in case of HYVs

was 101-252.5 kg N/ha while in case of basmati N dose was 86.25-230 kg N/ha. Other fertilizers were applied @ 10-85 kg P_2O_5/ha and 23-57.5 kg K_2O/ha. On an average, about 22% farmers contacted applied potash in the main field. On an average about 56% farmers applied zinc sulphate (containing either 21% or 33% zinc) @ 10-25 kg/ha. Some farmers applied chelated zinc. About 45% farmers applied farm yard manure or vermicompost or green manure in the main field. Most of the farmers contacted told that they applied FYM in the main field once in 2-4 years depending on its availability. Few farmers from Kaithal, Kurukshetra and Yamunanagar applied IFFCO Sagarika granules for better growth.

Table 6 contd..: Details of nursery management

Parameters	Districts			
	Yamunanagar	Ambala	Panipat	Sonepat
Planting time	1st week of June to1st week of July	2nd week of June to 1st week of July	3rd week of June to 1st week of July	2nd week of June to 3rd week of July
Seed rate	12.5-15 kg/ha	12.5-17.5 kg/ha	12.5-17.5 kg/ha	12.5-15 kg/ha
Seed treatment (% farmers adopted)	Yes (20%); Used treated seeds (50%)	Yes (10%); Used treated seeds (70%)	Yes (90%); Used treated seeds (70%)	Yes (70%); Used treated seeds (30%)
Chemicals used for seed treatment	Soaking 10 kg seeds in carbendazim (1-2 g/kg) or mixture of carbendazim (10g) + streptocycline (1g) or mixture of carbendazim (12%) + mancozeb (63%) @ 2 g/kg in 10 litre of water for 24 h			
Organic manure in nursery (% farmers adopted)	Nil (100%)	Nil (100%)	Nil (100%)	Nil (100%)
Inorganic manure in nursery (% farmers adopted)	Yes (90%); Urea (5-10 kg/kanal) and/or DAP @ 5-7 kg/kanal*	Yes (60%); Urea (5-6 kg/kanal) and/or DAP @ 5-10 kg/kanal*	Yes (90%); Urea (5-10 kg/kanal) and/or DAP @ 5-10 kg/kanal*	Yes (100%); Urea (5-10 kg/kanal) and/or DAP @ 5-10 kg/kanal*

Table 7: Details of main field management

Details	Districts			
	Kaithal	Kurukshetra	Karnal	Jind
Planting method	Almost all the farmers contacted adopted random planting where plant population per unit area was not maintained; Some farmers in Jind (10%) adopted direct sowing			
Total N applied	HYVs: 155-252.5 kg/ha; Basmati: 97.5-195 kg/ha	HYVs: 101-147 kg/ha; Basmati: 86.25-172.5 kg/ha	HYVs: 143.75-195 kg/ha; Bas-mati: 108.75-200 kg/ha	HYVs: 172.5-230 kg/ha; Basmati: 115-195 kg/ha
Total P_2O_5 applied	Yes (80%) @ 16-57.5 kg/ha	Yes (60%) @ 28.75-57.5 kg/ha	Yes (70%) @ 28.75-57.5 kg/ha	Yes (60%) @ 20-57.5 kg/ha
Total K_2O applied	Yes (30%) @ 28.75 – 57.5 kg/ha	Yes (40%) @ 28.75 – 57.5 kg/ha	Yes (20%) @ 28.75 – 57.5 kg/ha	Yes (60%) @ 28.75 – 57.5 kg/ha
$ZnSO_4$ app-lied (21% or 33%)	Yes (60%) @ 12.5-28.75 kg/ha	Yes (70%) @ 12.5-25 kg/ha	Yes (40%) @ 12.5-25 kg/ha	Yes (30%) @ 12.5-37.5 kg/ha
Organic fertilizers applied	Yes (40%); FYM (2-3 trolly/acre) or green manure once in 3-4 years depending on availability;	Yes (50%); FYM (2-3 trolly/acre) once in 2-3 years depending on availability;	Yes (40%); FYM (2-3 trolly/acre) or vermicompost or green manure once in 3-4 years depending on availability	Yes (50%); FYM (2-3 trolly/acre) or vermicompost or green manure once in 3-4 years depending on availability

Details	Districts			
	Kaithal	Kurukshetra	Karnal	Jind
Remarks	Nutrients were applied in the form of urea, DAP, SSP, MOP and zinc sulphate (21% or 33%). Few (10%) farmers from Kaithal applied growth regulator (Rutog); few farmers from Kaithal, Kurukshetra applied IFFCO Sagarika granules for better growth. Few farmers in Kurukshetra applied sulphur			

Table 7 Contd..: Details of main field management

Details	Districts			
	Yamunanagar	Ambala	Panipat	Sonepat
Planting method	Almost all the farmers contacted adopted random planting where plant population per unit area was not maintained; Some farmers in Panipat and Sonipat (10-20%) adopted direct sowing			
Total N applied	HYVs: 165-172.5 kg/ha; Basmati: 115-137.5 kg/ha	HYVs: 165-252.5 kg/ha	HYVs: 195 kg/ha; Basmati: 155-252.5 kg/ha	Basmati: 166.25-230 kg/ha
Total P_2O_5 applied	Yes (80%) @ 10-67.5 kg/ha	Yes (100%) @ 28.75-57.5 kg/ha	Yes (100%) @ 20-85 kg/ha	Yes (100%) @ 30-57.5 kg/ha
Total K_2O applied	Yes (40%) @ 28.75 kg/ha	Yes (50%) @ 28.75 kg/ha	Yes (60%) @ 28.75-57.5 kg/ha	Yes (40%) @ 23-57.5 kg/ha
$ZnSO_4$ applied (21% or 33%)	Yes (80%) @ 12.5-25 kg/ha	Yes (60%) @ 12.5-25 kg/ha	Yes (40%) @ 12.5-26.25 kg/ha	Yes (70%) @ 12.5-30.6 kg/ha
Organic fertilizers applied	Yes (40%); FYM (2-3 trolly/acre) or green manure once in 3-4 years depending on availability;	Yes (40%); FYM (2-3 trolly/acre) or green manure once in 3-4 years depending on availability;	Yes (50%); FYM (2-3 trolly/acre) or green manure once in 3-4 years depending on availability;	Yes (50%); FYM (2-3 trolly/acre or 10-15 t/acre) or green manure or vermicompost once in 3-4 years depending on availability;
Remarks	Nutrients were applied in the form of urea, DAP, SSP, MOP and zinc sulphate (21% or 33%). Few farmers from Yamunanagar applied IFFCO Sagarika granules for better growth. Few farmers in Yamunanagar applied sulphur			

D. Weeds and their Management: In general, intensity of weeds in and around rice fields was low to moderate. Commonly recorded weeds were Sawank (*Echinochloa colona*), doob (*Cynodon dactylon*), *Leptochloa chinensis*, Deela (*Cyperus rotundus*), Chinese grass (local name), Makra weed (*Dactyloctenium aegyptium*), Ghoda grass (local name), Chaatri grass (local name), mirchi butti (local name) and some unidentified weeds (Table 8). All the farmers contacted in different districts applied different herbicides. On an average, about 80% of the farmers contacted told that they managed the weeds only by herbicides and rest told that they also adopted hand weeding along with herbicide application (Table 8). The details of weedicides are presented in Table 8.

E. Common needs of the farmers: Some of the common needs of the farmers were increase in MSP and the price of selling of basmati rice varieties, solution for paddy straw management, subsidy on farm implements, proper supply of DAP during the season, high rates of pesticides and fertilizers, varieties suitable for DSR, suitable herbicides for management of weeds, subsidy in seeds and other inputs and reduction in the cost of cultivation.

Table 8: Weeds and weed management

Details	Districts			
	Kaithal	**Kurukshetra**	**Karnal**	**Jind**
Weed intensity	Low-medium			
Names of the weeds	Commonly recorded weeds were Sawank (*Echinochloa colona*), doob (*Cynodon dactylon*), *Leptochloa chinensis*, Deela (*Cyperus rotundus*), Chinese grass (local name), Makra weed (*Dactyloctenium aegyptium*), Ghoda grass (local name), Chaatri grass (local name), mirchi butti (local name) and some unidentified weeds			
Weedicides used	Different herbicides like pretilachlor (800 ml/acre), Rifit Plus (500 ml/acre), Vinia (pretilachlor 50% EC), butachlor (1-1.2 litre/acre), pendimethalin (1.25 l/acre), Nominee Gold and others were used by the farmers			
Percentage of farmers applied herbicides	All the farmers contacted in different districts applied weedicides. About 50-90% of the farmers contacted managed the weeds only by herbicides and rest of the farmers (10-50%) in the surveyed districts also practiced hand weeding along with herbicide application.			
Wild/weedy rice incidence	NA	NA	NA	NA

Table 8 contd..: Weeds and weed management

Details	Districts			
	Yamunanagar	**Ambala**	**Panipat**	**Sonepat**
Weed intensity	Low-medium			
Names of the weeds	Commonly recorded weeds were Sawank (*Echinochloa colona*), doob (*Cynodon dactylon*), *Leptochloa chinensis*, Deela (*Cyperus rotundus*), *Cyperus iria*, Chinese grass (local name), Hiran Khuri (*Convolvulus arvensis*), Makra weed (*Dactyloctenium aegyptium*), Ghoda grass (local name) and some unidentified weeds			
Weedicides used	Different herbicides like Rifit Plus (pretilachlor 37%) @ 800 ml/acre, pretilachlor (500 ml/acre), Nominee Gold, butachlor (1.2 litre/acre), Fast Mix (butachlor @ 1 lt/acre), paraquat and others were used by the farmers.			
Percentage of farmers applied herbicides	About 80-100% of the farmers contacted in different districts managed the weeds problems only by applying herbicides. About 10% farmers from Ambala and Sonipat applied herbicides and practiced hand weeding. About 10% farmers contacted from Sonipat practiced only hand weeding.			
Wild/weedy rice incidence	NA	NA	NA	NA

F. Input Use: The details of inputs used by the farmers are presented in Table 9. Implements like harrow, rotavator, tractor, trolley, power tiller, combined harvester were used by the farmers. Progressive farmers had some of their own equipments and other farmers hired the implements. Combine harvester was mostly used on hire basis. On an average 81% of the farmers in different districts told that they purchased 100% of their seed requirement. Remaining farmers told that they used part (50%) of last years harvested seeds. The main source of irrigation was deep tube well. Majority of the farmers told that there was no scarcity of irrigation water. Majority (>90%) of the farmers contacted also told that inputs like fertilizers and pesticides were available and they were satisfied with their quality. The main advisors to the farmers were private dealers followed by officials from state department of Agriculture and University.

Table 9: Details of inputs used

Details	Districts			
	Kaithal	Kurukshetra	Karnal	Jind
Implements used	Implements like harrow, rotavator, tractor, trolley, power tiller, combined harvester were used by the farmers. Progressive farmers had some of their own equipments and other farmers hired the implements. Combine harvester was mostly used on hire basis			
Source of seeds	Majority of the farmers contacted (60% in Kaithal, 100% in Kurukshetra, 70% in Karnal and 50% in Jind) told that they purchased 100% of their seed requirement. Remaining farmers told that they purchased 50% of their seeds requirement and used another 50% of their seed requirement from previous year's seed.			
Source of irrigation	Deep tube well (100%)	Deep tube well (100%)	Deep tube well (100%)	Deep tube well (100%)
Scarcity of irrigation water	No (100%)	No (100%)	No (100%)	No (100%)
Availability of fertilizers/pesticides*	Yes (100%);	Yes (90%)	Yes (100%)	Yes (100%)
Quality of fertilizers/pesticides	Satisfied (100%)	Satisfied (60%)	Satisfied (70%)	Satisfied (100%)
Advisors to the farmers	Own decisions (60%); Dealers (80%); State dept (30%); Others (10%)	Own decisions (30%); Dealers (50%); State dept (50%); Univ (20%)	Own decisions (20%); Dealers (80%); State dept (30%); Univ. (20%)	Own decisions (50%); Dealers (100%); State dept (30%); Univ (20%)

* Sometime DAP availability was an issue

Table 9 contd..: Details of inputs used

Details	Districts			
	Yamunanagar	Ambala	Panipat	Sonepat
Implements used	Implements like harrow, rotavator, tractor, trolley, power tiller, combined harvester were used by the farmers. Progressive farmers had some of their own equipments and other farmers hired the implements. Combine harvester was mostly used on hire basis			
Source of seeds	Majority of the farmers contacted (100% each in Yamunanagar and Ambala, 80% in Panipat and 90% in Soneapt) told that they purchased 100% of their seed requirement. Remaining farmers told that they purchased 50% of their seeds requirement and used another 50% of their seed requirement from previous year's seed.			
Source of irrigation	Deep tube well (100%)	Deep tube well (100%)	Deep tube well (90%); Canal (10%)	Deep tube well (100%)
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 (100%)	Satisfied (100%)	Satisfied (100%)	Satisfied (100%)
Advisors to the farmers	Own decisions (50%); Dealers (70%); State dept (60%); Univ. (30%)	Own decisions (30%); Dealers (80%); State dept (40%); Univ (20%)	Own decisions (20%); Dealers (100%); State dept (30%); Univ. (40%)	Own decisions (30%); Dealers (80%); State dept (50%); Univ (40%)

* Sometime DAP availability was an issue

Table 10: Occurrence and severity of rice insect- pests recorded in different districts of Haryana during *Kharif*, 2024

District	Sheath blight	Leaf blast	Neck blast	Bakanae	False smut	Grain Discoloration	Bacterial leaf blight	Sheath rot
Kaithal (0 %) [C]	90 % L-M[b] PB 1401, PR 114, PR 126, PB 1509, Sava 7301, Sava 7501, KPH 7299, PB 1847, PB1718, Hyb 2222, CSR 30, PB 1121	60 % L-M[b] CSR 30, PB 1401, PB 1718, PB 1121	10 % Tr.-L[a] CSR 30, PB 1121	70 % L-M[a] CSR 30, PB 1509, PB 1401, PB 1718, PB 1847, PB 1121	10 % Tr.-L[a] Sava 7301	30 % Tr.-L[a] PB 1401, PB 1509, PR 114, Hyb. 2222	100 % L-M[b] PB 1509, PB 1401, CSR 30, PB 1692, KPH 7299, PB 1718, Hyb 2222, Sava 7301, PR 114, Sava 7501	50 % L-M[a] PB 1401, PR 126, Super 52, KPH 2222, PR 114, PR 131, Sava 7301
Kurukshetra (0 %)	80 % L-M[b] Sava 127, Sava 7501, KPH 7299, Hyb 2111, PR 126, CSR 30, PB 1121, PB 1509, PR 114, Sava 7301, PR 131, PB 1401	10 % Tr.-L[b] PB 1121, PB 1509, CSR 30	10 % Tr.-L[a] PB 1401	30 % Tr.-L[a] PB 1509, CSR 30, PB 1121	40 % Tr.-M[a] Sava 7501, PB 1401, PR 131, PR 126, Hyb 2111, PR 114	60 % L-M[a] Sava 127, Sava 7301, PR 114, Sava 7501, PR 126, PR 131, Hyb 2111	100 % L-M[b] Hyb 2111, Sava 7301, Sava 7501, PR 114, PR 126, CSR 30, PB 1509, PB 1121, PR 126, PR 131, PB 1401	50 % Tr.-L[a] Sava 7501, PR 114, PR 126, PR 131, Hyb 2111
Karnal (20 %)	80 % L-M[b] PB 1509, PB 1692, Sava 7301, PR 114, Super 52, PR 126, PB 1121	30 % L-M[b] PB 1509, CSR 30, PB 1121	20 % Tr.-L[a] PB 1509, CSR 30	80 % L-M[a] PB 1509, PB 1692, CSR 30, PB 1121	10 % Tr.-L[a] KPH 7299, Sava 7501	40 % L-M[a] Hyb 2111, Sava 7301, PR 114, PB 1509,PR 126	60 % L-M[b] PB 1509, Sava 7301. Super 52, PR 114, Sava 7501	10 % Tr.-L[a] Hyb 303, Hyb 2111
Jind (10 %)	70 % L-M[b] PB 1121, PB 1847, PB 1885, PB 1886, PB 1718, Hyb 2222, 468, PB 1509	80 % L-M[b] PB 1718, 1121, 1885, 1401, 1509	10 % Tr.-L[a] PB 1509	80 % L-M[a] PB 1718, 1509, 1121, 1847, 1401, 1885	10 % Tr.-L[a] Hyb 468	10 % Tr.-L[a] Hyb 468	60 % L-M[b] PB 1121, PB 1885, PB 1718, Hyb 468	10 % Tr.-L[a] Hyb 468
Yamuna-Nagar (0 %)	70 % L-M[b] Hyb 359, 6222, 2082, Sava 7301, 7501, CSR 30, PB 1121	30 % L-M[b] PB 1718, 1, CSR 30, 1121	-	30 % Tr.-L [a] PB 1718, PB 1, PB 1121	10 % Tr.-L[a] Hyb 468	20 % Tr.-L[a] Hyb 468, Sava 7301	60 % L-M[b] Sava 7301, Hyb 359, PB 1, Super 52, CSR 30	10 % Tr.-L[a] Hyb 359
Ambala (20 %)	80 % L-M[b] Hyb 7501, 7301, 282, 90M100, 127, 468, 2222, 28P67, 7299, PB 1509	10 % Tr.-L[b] PB 1509	-	10 % Tr.-L [a] PB 1	30 % Tr.-L[a] Hyb 2222, 28P67, Sava 7501, Sava 7301	50 % L-M[a] Hyb 468, 2222, 28P67, Sava 7501, Sava 7301	50 % L-M[b] Sava 7501, 7301, Hyb 282, 90M100, Sava 127, Hyb 468, 7299	20 % Tr.-L[a] Hyb 90M100, 2222
Panipat (20 %)	80 % L-M[b] PB 1121, PB 1509, PB 1401, PB 1718, Hyb 2222, PB 1885, PB 1692, PB 1847	80 % L-M[b] PB 1121, 1509, 1401, 1885, 1692, 1718	40 % Tr.-L[a] PB 1509, PB 1121, PB 1692	80 % L-M[a] PB 1121, PB 1509, PB 1401, PB 1718, PB 1692, PB 1885	-	20 % Tr.-L[a] PB 1121, PB 1509, PB 1692	70 % L-M[b] PB 1121, PB 1509, PB 1401, Hyb 2222, PB 1885, PB 1692, PB 1718	10 % Tr.-L[a] Super 1125
Sonepat (20 %)	80 % L-M[b] PB 1125, 1885, 1847, 1509, 1401, 1121	60 % L-M[b] PB 1401, PB 1509, PB 1121	40 % Tr.-L[a] PB 1401, 1509, 1885, 1121	80 % L-M[a] PB 1125, 1509, 1847, 1718, 1401, 1121	10 % Tr.-L[a] PB 1509	40 % Tr.-M[a] PB 1509, 1885, 1847, 1401, 1121	40 % Tr.-M[b] PB 1125, 1718, 1885, 1509, 1121	-

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

Table 11: Occurrence and severity of rice insect- pests recorded in different districts of Haryana during *Kharif*, 2024

District	Stem borer	Planthoppers (WBPH /BPH)	Leaf folder	Grass hopper	Insect-pests free locations (%)
Kaithal	100 % Tr.- L[b] (0.5-1 % dead heart/WE); PR114, 126, 131,CSR30 & Sava 7501, 7301, HYB2222,7299, PB 1718, 1692, 1401, 1885	80 % Tr- L[b]; 70 % Tr; (1-2 nymphs/hill); PR114, 126, 131,CSR30 & Sava 7501, 7301, HYB2222,7299, PB 1718, 1692, 1401, 1885	100 % Tr[b]; (0.5-5.0% damaged leaves); PR114, 126, 131,CSR30 & Sava 7501, 7301, HYB2222,7299, PB 1718, 1692, 1401, 1885	60 % Tr[b]; PR 114, SAVA 7501, 7301, 7299 & PB 1718,1692,CSR30	-
Kurukshetra	90 % Tr-M[b]; (0.5-1.0% dead heart/WE)[a]; ; PR 126 & 114, PB 1401, Sawa 7501, 7301, 127, HYB 2211, PB1121, CSR 30, PB 1509, 1886	50% Tr; (1-5 nymphs/hill)[a]; PR 126, 131 & 114, PB 1401, Sawa 7501, 7301, HYB 2211	100% L[b]-M; (0.5-5.0% damaged leaves)[a]; PR 126 & 114, PB 1401, Sawa 7501, 7301, 7299, 127, HYB 2211, PB1121, CSR 30, PB 1509, 1886	50 % Tr[b] PR 114, 126, PB 1121 & HYB 7299, Sava 7501	-
Karnal	60 % Tr- L[b]; (0.5 % dead heart/WE)[a]; PR 114, PR 126, CSR30, PB 1121, 1718, PB 1401, 1509, SAVA 7501	30 % L- M[b]; (1-10 nymphs/hill)[a] PR 114, PB 1121, 1718, PB 1401, 1509, HYB 7299 SAVA 7501, CSR30	100 % Tr-L[b]; (0.5-5.0 % damaged leaves)[a]; PR 114, PR 126, CSR30, PB 1121, 1718, PB 1401, 1509, SAVA 7501, 7301, super 52, hyb 303	30 % Tr[b] PR 126, CSR30, PB 1121, SAVA 7501, 7299, hyb 303	-
Jind	90 % Tr.- L[b] (0.5-2.5 % dead heart/WE)[a] PB 1885, PB 1121, PB 1886, PB 1401, 1847 & 1885, 1509	80 % Tr; (1-5 nymphs/hill)[a] PB 1885, 1886, PB 1121, 1718, 1847 & 1885, 1509, hyb468, hyb2222	100 % Tr-L[b]; (5 - 10 % damaged leaves)[a]; PB 1718, PB 1121, PB 1509, PB1847, 1886 & 1885, 27P22 CSR30, sava 7501, PR 1409, hyb 2222	90 % Tr[b] PB 1509, 1718, 1885, 1886 & PB1121, hyb2222, 468	-
Yamuna Nagar	80 % Tr-M[b]; (0.5-5.0 % dead heart/WE)[a]; Sawa 7301, Hyb 359, 468 2032 & 2222, PB 1, 1692, PB 1509, PB 1718, 1121 SAVA 127, super 52, CSR30	30 % Tr (1-5 nymphs/hill)[a] Sawa 7301, 7501, PB 1509	100 % Tr; (0.5-5.0 % damaged leaves)[a] Sawa 7301, Hyb 359, 468 2032 & 2222, PB 1, 1692, PB 1509, PB 1718, 1121 SAVA 127, super 52, CSR30, ARIZE 6222	-	-
Ambala	90 % Tr -L[b]; (0.5-1.0 % dead heart/WE)[a]; Sawa 7301, 7501 & Sava 127, 7299, 6444 PB1509, Kaveri 468, HYB 2222, HYB 372, 471	20 % Tr (1-5 nymphs/hill)[a] Sawa 7301, HYB7299	100 % Tr; (0.5-5.0 % damaged leaves)[a]; HYB28P67, Sawa 7301, 7501 & Sava 127, 7299, 6444 PB1509, Kaveri 468, HYB 2222, HYB 372, 471	-	-
Panipat	100 % L-M[b]; (0.5-2.5 % dead heart/WE)[a]; PB 1847, 1885, 1718,1121, PB1509,1692 1401, HYB 2222, SUPER 1125	100 % Tr; (1-5 nymphs/hill)[a] PB 1847, 1885, 1886, 1718, 1121, PB1509,1692 1401, HYB 2222, 1125 SUPER	90% Tr- L[b]; (1.0-5.0 % damaged leaves)[a] PB 1847, 1885, 1886, 1718, 1121, PB1509, 1692 1401, HYB 2222, 1125 SUPER	30 % Tr[b] (<0.5%) PB 1401, 1718, 1121,1509 & 1885 HYB 2222	-
Sonepat	100% Tr. -L[b] (1.0-5.0 % dead heart/WE)[a] PB 1121, PB 1718, PB 1692, PB1509, PB1885, PB1847, 1401	100 %Tr- L[b] (1.0- 10 nymphs/hill)[a] PB 1121, PB 1718, PB 1692, PB1509, PB1885, PB1847, 1401	90 % Tr-L[b] (1-5.0 % damaged leaves)[a] PB 1121, PB 1718, PB 1692, PB1509, PB1885, PB1847, 1401	40 % Tr[b] (<0.5%) PB 1121, PB 1692, PB1509, PB1885, PB1847	-

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

Stem borers: Traces: <1.0% dead heart/white ear, Low: 1.0-10.0% DH/WE, Moderate: 10.1-20.0% DH/WE, Severe: > 20.0 % DH/WE. **WBPH/ BPH**: Traces: <1.0 nymphs or adults/hill, Low: 1.0-5.0 nymphs or adults/hill, Moderate : 5.1- 15.0 nymphs or adults/hill ; Severe: >15.0 nymphs or adults/hill. **Leaf folder & whorl maggot**: Traces: < 1.0% damaged leaves, Low: 1.1-10.0% damaged leaves , Moderate: 10.1-20.0% damaged leaves; Severe : > 20.0% damaged leaves. **Termites** : Traces: <1.0 % infested plants; Low : 1.0 -5.0 infested plants; Moderate: 5.1-10.0% infested plants; Severe: >10% infested plants

Table 12: Details of pest management

Details	Districts			
	Kaithal	**Kurukshetra**	**Karnal**	**Jind**
% age farmers adopting plant protection	100% farmers adopted chemical plant protection measures			
Names of pesticides	**Insecticides**: **Ferterra** (4-4.5 kg/acre), **Cartap hydrochloride (Caldan/Padan)** (7.5 kg/acre), flubendiamide 20% WG (Takumi @ 40-100 g/acre), Coragen (60-100 ml/acre), Lamda cyhalothrin (300-400 ml/acre), emamectin benzoate (200 ml/acre), Incipio (isocycloseram 18.1% SC) (120 g/acre), Regent (fifronil) (7.5 kg/acre), cartap + emamectin (3 kg/acre), acephate, Gunther (novaluron 5.25% + Eemamectin benzoate 0.9 % SC), for leaf folder and stem borer; Chess (pymetrozine) (120 g/acre), Checkmate (dinotefuran + pymetrozine), thiomethoxam (100 g/acre) and Osheen (Dinitofuran) (80 gm/acre) for BPH/WBPH, chlorpyriphos (400 ml/acre) for termite and carbofuran (5 kg/acre) for nematodes **Fungicides**: Pulsor (thifluzamide 24% SC) (150 ml/acre), Azoxystrobin + tebuconazole (200 ml/acre), Nativo (80-100 g/acre), Amister top (200 ml/acre), Galileo Way (picoxystrobin 7.05% + propiconazole 11.71% SC) (400 ml/acre), Iglare (thifluzamide 24 Sc) (150 ml/acre), Konika (300 ml/acre), Tebuconazole (200 ml/acre), hexaconazole (400 ml/acre), Epic (hexaconazole 75% WG, tebuconazole + Captan (250 ml/acre), Lusture (Flusilazole 12.5% + Carbendazim 25% SE) @ 400 ml/acre and for sheath blight and false smut; isoprothiolane (Fuji One) (300-400 ml/acre), diathane Z 78 (500 g/acre), azoxystrobin + difenconazole (200 ml/acre), Beam (tricyclazole) @ 120 gm/acre, and carbendazim (1 g/l) for blast; Jatayu (chlorothalonil) (500 gm/acre for false smut; propiconazole (200 ml/acre), Diathane M 45 (500 g/acre) for sheath rot and grain discoloration; azoxystrobin + difenconazole (150 ml/acre), Amister top (150-200 ml/acre) for blast and sheath blight; copper oxychloride (400-500 g/acre) for false smut and bacterial blight; azoxystrobin + tebuconazole (200 ml/acre) for sheath blight and grain discoloration; plantomycin, copper hydroxychloride (400 ml/acre), Konika Super (200 ml/acre) and Kavach (400-500 g/acre) for bacterial blight of rice; thifluzamide + kasugamycin (300 ml/acre) for sheath blight and bacterial blight and azoxystrobin + lamba cyhalothrin for sheath blight and stem borer			
# of pesticide sprays	3-7	2-7	2-6	3-8
Mixing of pesticides before application	Yes (80%) 2-3 pesticides	Yes (30%) 2 pesticides	Yes (30%) 2 pesticides	Yes (40%) 2 pesticides
Zinc deficiency	Yes (30%)	Yes (80%)	Yes (30%)	Yes (40%)

G. Biotic stresses and their management: The details of different diseases and insect pests in different surveyed districts are presented in Table 10 and 11. Among the disease, sheath blight, leaf and neck blast, bakanae, false smut, grain discoloration, bacterial blight and sheath rot were wide spread in low to moderate form. Among the insect pests, stem borer, leaf folder and plant hoppers (BPH and WBPH) were wide spread in low to moderate intensity. All the farmers

contacted applied different pesticides for the management of different diseases and insect pests (Table 12). The number of pesticide application in different districts ranged from 2-7. On an average, 47% farmers contacted told that they mixed 2-3 different pesticides while application. On an average in about 40% fields surveyed, there were symptoms of zinc deficiency (Table 12).

Table 12 contd..: Details of pest management contd..

Details	**Districts**			
	Yamunanagar	**Ambala**	**Panipat**	**Sonepat**
% age farmers adopting plant protection	100% farmers adopted chemical plant protection measures			
Names of pesticides	**Insecticides**: Fertera (4 kg/acre), Coragen (100-150 ml/acre), Solomon (Beta Cyfluthrin + Imidacloprid 300 Od) (200 ml/acre), cartap hydrochloride (7.5 kg/acre), emamectin benzoate (200 ml/acre), Virtako (chlorantraniliprole 0.5% GR + thiamethoxam 1%), lamda cyalothrin (500 ml/acre), flubendiamide 20% WG (Takumi @ 50-100 g/acre), Incipio (isocycloseram 18.1% SC) (120 g/acre), Engage (spinetoram 5.66% and methoxyfenozide 28.3% SC), Regent (fipronil) (7.5 kg/acre), lamda cyhalothrin (200 ml/acre), Ampligo (chlorantraniliprole 10% + lambdacyhalothrin 5% ZC) and profenophos + cypermethrin (150-200 ml/acre) for stem borer and leaf folder; thiomethoxam (100 g/acre), pexalon (triflumezopyrim 10% SC) @ 100 ml/acre, Chess (pymetrozine) (120 g/acre), Osheen (Dinitofuran) (80 gm/acre), Ulala (flonicamid 50 WG) (60 g/acre) and Checkmate (dinotefuran + pymetrozine) and for BPH/WBPH and chlorpyriphos (500 ml/acre) for termite **Fungicides**: hexaconazole (300 ml/acre), Sheathmar (400 ml/acre), Nativo (80 g/acre), azoystrobin + tebuconazole (200 ml/acre), Iglare (thifluzamide 24 Sc) (150 ml/acre), Galileo Way (picoxystrobin 7.05% + propiconazole 11.71% SC) (400 ml/acre), azoxystrobin + difenoconazole (200 ml/acre), Lusture (flusilazole 12.5% + carbendazim 25% SE) (400 ml/acre), Amistar Top (200 ml/acre), Pulsor (thifluzamide) (150 ml/acre) and propiconazole (250 g/acre) for sheath blight and false smut; Amistar Top (200 ml/acre) and azoxystrobin + difenoconazole (200 ml/acre) for blast and sheath blight; Fuji One (300 ml/acre), Amister Top (200 ml/acre) and Beam (tricyclazole) @120 g/acre for blast; propiconazole (200 ml/acre), Nativo (80 gm/acre) and Indofil M-45 (500 g/acre) for sheath rot and grain discoloration; copper hydroxide (400 g/acre) and Kasu-B (400 ml/acre) for grain discoloration and bacterial blight; azoxystrobin + tebuconazole (200 ml/acre) and Amister Top (150-200 ml/acre) for sheath blight and blast. Few applied liquid potash and 19:19:19 fertilizer for better growth			
# of pesticide sprays	2-5	2-6	3-6	2-6
Mixing of pesticides before application	Yes (50%) 2 pesticides	Yes (30%) 2 pesticides	Yes (50%) 2 pesticides	Yes (70%) 2 pesticides
Zinc deficiency	Yes (20%)	Yes (10%)	Yes (40%)	Yes (70%)

Table 13: Researchable issues

Parameters/Issues	**Districts**			
	Kaithal	**Kurukshetra**	**Karnal**	**Jind**
Rice ecology in your area	Irrigated			
Rice cultivation only in Kharif or both Kharif and Rabi	Only Kharif season			
Number of years of experience in rice farming	Some less than 5-10 years; majority 10-20 years			
Main biotic constraints (diseases) in your area according to you	Sheath blight followed by leaf blast			
Extent of disease damage	Below 10%			
Main biotic constraints (Insect pests) in your area according to you	Leaf folder, BPH/WBPH and stem borer			
Extent of insect pest damage	Below 10%			
Main abiotic constrains in your area according to you	Flash flood and low light intensity	Flash flood and low light intensity	Flash flood and low light intensity	Flash flood, low light intensity and salinity
Production constraints in your area according to you	Scarcity of agricultural labours, lack of mechanization and unavailability of quality seeds and fertilizers and pesticides			
Irrigation facilities in your area	Yes, Available; Bore wells			
Normally how many years it takes to change the rice variety	Majority 5-10 years followed by 10-20 years			
Any other rice production issues in your area which the rice scientists need to address	NA	NA	NA	NA
What is urgently required in your area as far as rice varieties are concerned				
Duration	varieties suitable for DSR			
Biotic stress resistance	NA	NA	NA	NA
Abiotic stress resistance	NA	NA	NA	NA
Preferred grain quality	NA	NA	NA	NA
Nutritional quality	NA	NA	NA	NA

H. Researchable issues: Among the biotic stresses, major problems in the region are sheath blight followed by leaf and neck blast among the diseases and leaf folder, BPH/WBPH and stem borer among insect pests. Farmers want varieties suitable for DSR and varieties resistant/tolerant to above mentioned biotic constraints.

Table 13: Contd.. Researchable issues

Parameters/Issues	Districts			
	Kaithal	**Kurukshetra**	**Karnal**	**Jind**
Rice ecology in your area	Irrigated			
Rice cultivation only in Kharif or both Kharif and Rabi	Only Kharif season			
Number of years of experience in rice farming	Some less than 5 years; majority 5-10 years			
Main biotic constraints (diseases) in your area according to you	Sheath blight followed by leaf blast			
Extent of disease damage	Below 10%			
Main biotic constraints (Insect pests) in your area according to you	Leaf folder, BPH/WBPH and stem borer			
Extent of insect pest damage	Below 10%			
Main abiotic constrains in your area according to you	Flash flood and low light intensity	Flash flood and low light intensity	Flash flood and low light intensity	Flash flood, low light intensity and salinity
Production constraints in your area according to you	Scarcity of agricultural labours, lack of mechanization and unavailability of quality seeds and fertilizers and pesticides			
Irrigation facilities in your area	Yes, Available; Bore wells			
Normally how many years it takes to change the rice variety	5-10 years (majority), less than 5 years (some)			
Any other rice production issues in your area which the rice scientists need to address	NA	NA	NA	NA
What is urgently required in your area as far as rice varieties are concerned				
Duration		NA	NA	NA
Biotic stress resistance	NA	NA	NA	NA
Abiotic stress resistance	NA	NA	NA	NA
Preferred grain quality	NA	NA	NA	NA
Nutritional quality	NA	NA	NA	NA

Jammu & Kashmir-Chatha (2024-25)

Districts Surveyed: *Jammu, Rajouri and Poonch*

Table 1: Particulars of survey

District	Block	Villages (Latitude; Longitude)
Jammu	Bishnah, Marh, Suchetgarh, Phalian Mandyal, Satwari and R. S. Pura,	Pasgal, Gandoli, Deoli, Karloop, Mokhe, Suchetgarh, Top, Satai Camp, Fathuchak and Nandwal
Rajouri	Dongi, Manga Kote, Rajouri, Panjgran and Qila Darhal	Dehrian (32.183192; 74.142754), Gambhir Brahmna, Tandwal, Karain, Fatehpur (33.1813;74.16), Muradpur, Sangipur (34.193192; 72.1832), Kalar (33.37; 74.28) and Jhandi Dhara
Poonch	Haweli, Poonch, Janyal and Surankote	Chandak Mandi (33.449020; 74.105634), Gulpur (33.458045; 74.36378), Chankan da bagh, Chaktro Mandi (33.453062; 74.74.114761), Chandak (33.452872; 74.99458), Dingla (33.456869; 74.91768), Nangali Sahib (33.460769; 74.8041), Qazhi Mohra (33.460201; 74.70486) and Potha (33.39357; 74.151345)

Table 2: Widely Grown Varieties:

District	Prevalent Varities
Jammu	**Basmati/Scented**: Basmati 370, Pusa 1121, Sarbati, Jammu Basmati 129, Jammu Basmati 118; **Hybrids:** Arize6164 Gold and Arize 6444 Gold
Rajouri	**Improved/HYVs**: Giza 14, K 39, VL 88 and some unknown local paddy
Poonch	**Improved**: Chandak Basmati, Giza 14 and China

Table 3: Particulars of Rice Area

District	Total Geographical area	Total Cultivable area (ha)	Area Under Rice (ha)	Area under rice hybrids (ha)
Jammu	3097 sq. Km	105854	59056	3-5%
Rajouri	2630 sq Km	58196	4736	0
Poonch	1674 sq. KM	28216	3000	0

An extensive production oriented survey was conducted in *Kharif* 2024 in Jammu district and two hilly viz., Rajouri and Poonch districts of Jammu and Kashmir by a team of scientists from the SKUAST-Jammu and the respective KVK's. The details of survey are presented in Table 1 and Table 7. Particulars of rice area in the surveyed districts are presented in Table 3. All the districts experienced a normal weather with well distributed rains throughout the season except at the fag end of the crop when there was a long dry spell particularly in Rajouri without affecting much the yield parameters of rice. The details of different weather parameters are presented in Table 4. The details of rice varieties cultivated are presented in Table 2. Commonly cultivated rice varieties in

these districts are basmati varieties like Basmati 370, Pusa 1121, Sarbati, Jammu Basmati 129, Jammu Basmati 118 and traditional varieties like Giza 14, K 39, China and Chandak Basmati. Seed replacement rate remains negligible and the farmers still opt for the age- old traditional course varieties of Giza 14, K 39 and Chandak Basmati for their taste preferences. In Poonch district, local Chandak Basmati variety is very much popular. Very few cultivated hybrids like Arize 6444 Gold in Jammu district. Farmers still prefer these local varieties because of their taste and their suitability in the hilly region.

Table 4: Weather data for Jammu and Rajouri districts during *Kharif*' 2024

District/ Parameters	Months						
	Jun	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Jammu							
# RD	03	12	12	6	1	0	1
TR (mm)	45.0	459.6	412.2	261.4	22.4	0	31.6
MMT (^{0}C)	32.6	30.9	29.55	29.35	25.4	19.4	12.75
T. Max (^{0}C)	40.6	35.6	33.4	34.4	32.7	27.3	21.2
T. Min (^{0}C)	24.6	26.2	25.7	24.3	18.1	11.5	4.3
SH	6.9	5.0	8.2	7.6	7.1	4.0	4.4
Rajouri							
# RD	06	08	14	04	01	01	01
TR (mm)	47.0	204.2	251.6	64.6	4.0	6.8	14.8
MMT (^{0}C)	27.0	27.2	25.9	25.4	21.3	15.9	10.1
T. Max (^{0}C)	35.7	32.1	30.2	32.0	30.2	25.0	19.6
T. Min (^{0}C)	18.3	22.3	21.6	18.7	12.4	6.8	0.5
SH	7.3	5.6	4.4	7.5	8.2	6.9	5.3

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

Table 5: Variety wise area coverage (% area) in different districts of Jammu and Kashmir during *Kharif* 2024

Variety/hybrid	Districts		
	Jammu	**Rajouri**	**Poonch**
HYVs/Improved			
Basmati 370	45%		
Pusa Basmati 1121	10%		
Jammu Basmati 129	8%		
Jammu Basmati 118	4%		
Arize 6444 Gold	2-4%		
Giza-14		30%	20%
K-39		20%	
VL Dhan 88		10%	
Chandak Basmati			30%
China			30%

Table 6: General question on rice cultivation in district (to be filled by the cooperator in consultation with the officials from state department of agriculture)

Parameters	Jammu	Rajouri	Poonch
Total area under HYVs (ha)	80%	60%	20-30%
Most prevalent HYVs in the district	Basmati 370, Pusa Basmati 1121, Jammu Basmati 129	Giza-14, K-39, VL Dhan 88	Chandak Basmati, Giza-14, China
Total area under rice hybrids in the district	2-3%	-	-
Most prevalent rice hybrids in the district	Arize 6444, Arize 6444 Gold	-	-
Total area under basmati in the district	70%	-	-
Most prevalent basmati varieties in the district	Basmati 370, Pusa Basmati 1121, JB 129	-	-
Seed replacement rate	16-18%	10-12%	8-10%
Whether farmers are using any heavy equipments	Yes; Combine harvester	Nil	Nil
Mention water saving technologies being used by the farmers	Laser levelling in limited area	NA	NA
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Replacing the seeds every year, balance use of fertilizers and use of plant protection chemicals	Replacing the seeds every year, balance use of fertilizers and use of plant protection chemicals	Replacing the seeds every year and balance use of fertilizers
General problems in rice cultivation in the district?	Scarcity of labours and lodging of varieties like Basmati 370 and drainage problems	Restricted irrigation facilities, sudden fall in temperature resulting in spikelet sterility	Sudden fall in temperature resulting in spikelet sterility
Please provide any farmers association in the district	-	-	-
Whether availability of agricultural labours is sufficient?	No	No	No
Whether there is any marketing problem of the produce?	Yes; some times	Yes	Yes
Any major irrigation/ power generation project in the district	No	No	No
Any soil testing program undertaken?	Yes; by State department of Ag	Yes	Yes
Any farmers' training program was organized by the state department of Ag/ University	Yes	Yes (KVK)	Yes

A. Cropping sequences and yield: Land holding in the districts is generally less than one acre which impedes to go for the diversified farming. Maize and Rice are the only cereal crops grown widely in the Kharif season. Rice-oats (fodder) and rice-wheat were most predominant cropping sequences in these districts. Other crop rotation practices followed by the farmers were rice-vegetables (knol khol, cucurbits), rice-barseem, rice-potato, rice-mustard and others. Farmers used part of their land for other crops like maize, black gram, rajmash and cucurbits during Kharif season. The details of area covered by different rice varieties are presented in Table 5. The yield of different rice varieties as reported by the farmers are presented in Table 8. The rice yield among different basmati and improved rice varieties ranged from 2280-3300 kg/ha while among the local traditional varieties yield ranged from 1800-2650 kg/ha. In some of the fields, yield was significantly reduced due to lodging especially in Basmati 370, very less or nil application of potassium fertilizers, erratic climatic conditions, rainfed hill ecosystem, sudden fall in temperature in flowering stage resulting in spikelet sterility and poor irrigation

Table 7: General information

Parameters	**Districts**		
	Jammu	**Rajouri**	**Poonch**
# of talukas/blocks covered	7	5	4
# of villages surveyed	10	9	9
# of farmers interviewed	10	10	10
Field ecosystem	Irrigated (100%)	Hill ecosystem (100%)	Hill ecosystem (100%)
Weather conditions during cropping season	Normal; Favourable for rice cultivation	Normal (80%); in few places, there were long dry spell	Normal; Favourable for rice cultivation
Crop stage when survey was made	Milk to dough	Milk to dough	Dough to maturity
Crop rotations	Rice-oats (fodder) and rice-wheat were most predominant cropping sequences in these districts. Other crop rotation practices followed by the farmers were rice-vegetables (knol khol, cucurbits), rice-barseem, rice-potato, rice-mustard and others.		

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

Varieties	**Yield (kg/ha)**			**Remarks**
	Jammu	**Rajouri**	**Poonch**	
Basmati 370	2280-2870			In some of the fields, yield was significantly reduced due to lodging especially in Basmati 370, very less or nil application of potassium fertilizers, erratic climatic conditions, rainfed hill ecosystem, sudden fall in temperature in flowering stage resulting in spikelet sterility and poor irrigation
Pusa Basmati 1121	3200-3370			
Sarbati	3280-3450			
Jammu Basmati 118	3200			
SJR-129	3300			
Giza-14		1950-2250	1800-2280	
K-39		2080-2650		
VL Dhan 88		2650-3000		
China			1600-2480	
Chandak Basmati			2040-2650	

B. Rice consumption pattern: Survey was conducted on rice consumption pattern among the farmers in different districts of Jammu and Kashmir. Majority of the farmers (70-100%) contacted were in the medium income group. Average per capita consumption of rice per month was 8-12 kg rice (Table 9). All the farmers contacted told that their main meal consisted of both rice and wheat (chapatti) or maize and all of them told that they used polished rice. About 90% farmers in Jammu told that they preferred long grain basmati rice varieties. However, farmers from Rajouri and Poonch told that they consume both fine and coarse grain varieties. On an average about 40% of the farmers contacted told that they have included wheat, pearl millet and maize in their diet because of diabetic problems.

Table 9: Details of rice consumption pattern

Parameters	Districts		
	Jammu	**Rajouri**	**Poonch**
Status of farmers	Medium income (70%); Rich (30%)	Medium income (100%)	Medium income (90%); Poor (10%)
Per capita monthly rice consumption (kg)	8-12 kg	8-12 kg	10-12 kg
Composition of main meal	Rice + wheat (100%); Rice + maize (30%)	Rice + wheat and maize (100%)	Rice + wheat (80%); Rice + maize (100%)
Preferred rice types	Polished rice (100%)	Polished rice (100%)	Polished rice (100%)
Rice grain type preference	Long grain basmati (90%); Coarse grain (10%)	Fine grain (100%); coarse grain (90%) and long grain basmati (10%)	Fine grain (40%); coarse grain (100%)
Any changes in food habit in last 10 years	No (60%); Yes (40%)	No (40%); Yes (60%)	No (70%); Yes (30%)
Changes in food composition	Partly shifted to wheat, pearl millet and maize due to diabetic problem		

Table 10: Details of nursery management

Parameters	Districts		
	Jammu	**Rajouri**	**Poonch**
Planting time	1st week to 2nd week of July	1st week to 3rd week of July	2nd week of June to 2nd week of July
Seed rate	28-30 kg/ha (HYVs); 22-24 kg/ha (Basmati)	25-30 kg/ha	28-30 kg/ha
Seed treatment (% farmers adopted)	Yes (60%)	Yes (100%)	Yes (70%)
Chemicals used for seed treatment	Carbendazim (2 g/kg of seeds)	Carbendazim (1-2 g/kg of seeds)	Carbendazim (2 g/kg of seeds)
Organic manure in nursery (% farmers adopted)	Yes (60%); FYM	Yes (80%); FYM	Yes (60%); FYM
Inorganic manure in nursery (% farmers adopted)	Yes (100%); DAP (10-18 kg) + Urea (4-8 kg) per Kanal	Yes (100%); DAP (8-10 kg) + Urea (8-118 kg) per Kanal or only urea (10-12 kg/kanal)	Yes (100%); DAP (5-10 kg) + Urea (14-18 kg) per Kanal or only urea (10-16 kg/kanal)

1 kanal = 500 mt^2

C. Nursery and main field Management: Planting was done in 2nd week of June to 3rd week of July. Average seed rate was 25-30 kg/ha. Farmers followed random planting where plant population per unit area was not maintained. Quite often farmers transplant seedlings at a closer spacing which hinders the various cultural operations at critical stages of crop growth. On an average about 75% of the farmers contacted told that they adopted seed treatment with carbendazim (2 g/kg). About 60-80% of the farmers contacted told that they applied organic manure like FYM in the nursery. All the farmers contacted told that they applied chemical fertilizers like DAP and urea in the nursery beds (Table 10). In the main fields, fertilizers were applied @ 30-80 kg N/ha, 20-50 kg P_2O_5/ha and 30-40 kgK_2O/ha. Application potash was followed by less number of farmers (Table 11). About 20-30% of the farmers contacted applied zinc sulphate. Most of the farmers adopted random transplanting method where plant population per unit area was not maintained. All the farmers in Jammu and 60-70% farmers in Rajouri and Poonch applied FYM @ 40-80 quintals/ha depending on its availability. Few farmers (10%) in Jammu applied green manure and about 20% of the farmers contacted in Rajouri applied vermicompost

Table 11: Details of main field management

Details	Districts			Remarks
	Jammu	**Rajouri**	**Poonch**	
Planting method	Random transplanting (100%)	Random transplanting (100%)	Random transplanting (100%)	
Total N applied	**HYVs**:45-60 kg/ha; **Basmati**: 30-35 kg/ha (100% farmers applied)	40-80 g/ha (100% farmers applied)	30-70 kg/ha (100% farmers applied)	Urea, DAP
Total P_2O_5 applied	**HYVs**: 30-40 kg/ha ; **Basmati:** 20-60 kg/ha (100% farmers applied)	20-50 kg/ha (100% farmers applied)	15-40 kg/ha (100% farmers applied)	DAP
Total K_2O applied	**HYVs & Basmati:** 30-40 kg/ha (80% farmers applied)	30-40 kg/ha (50% farmers applied)	40 kg/ha (10% farmers applied)	MOP
$ZnSO_4$ applied	**HYVs & Basmati:**15-20 kg/ha (30% farmers applied)	15-20 kg/ha (30% farmers applied)	20 kg/ha (20% farmers applied)	Zinc sulphate
Organic fertilizers applied	Most of the farmers adopted random transplanting method where plant population per unit area was not maintained. All the farmers in Jammu and 60-70% farmers in Rajouri and Poonch applied FYM @ 40-80 quintals/ha depending on its availability. Few farmers (10%) in Jammu applied green manure and about 20% of the farmers contacted in Rajouri applied vermicompost			

D. 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 12. Weeds were common in most of the fields surveyed. Farmers followed hand weeding along with herbicide application. About 10-50% farmers in different districts practiced only hand weeding. Commonly used herbicide was butachlor. Some applied post-emergence herbicides like bispyribac sodium. In many fields (40% in Jammu, 60% in Rajouri and 100% in Poonch) a mixture of seeds and wild rice (*Oryza sativa* var. *spontanea*) was commonly observed which needs the replacement with pure seed.

Table 12: Weeds and weed management

Details	Districts			Remarks
	Jammu	Rajouri	Poonch	
Weed intensity	Low to medium			
Names of the weeds	*Echinochloa* spp., *Echinochloa frumentaces*, *Cynodon dactylon* (dub grass), *Cyperus rotandrus* (motha), *Cyeprus difformis* (small flower umbrella), *Eclipta alba* (Jalbhangra), *Euphorbia hirta* (Dudhi), Digitaria sanguinalis (crab grass) and others			Weeds were common in most of the fields surveyed. Farmers followed hand weeding along with herbicide application. About 10-50% farmers in different districts practiced only hand weeding.
Weedicides used	butachlor and bispyribac Sodium			
%age of farmers applied herbicides	Yes (90%)	Yes (80%)	Yes (50%)	
Wild/weedy rice incidence	In many fields (40% in Jammu, 60% in Rajouri and 100% in Poonch) a mixture of seeds and wild rice (*Oryza sativa* var. *spontanea*) was commonly observed which needs the replacement with pure seed			

Table 13: Details of inputs used

Details	Districts		
	Jammu	Rajouri	Poonch
Implements used	Tractor (own or hire), rotavator (own or hire), cultivator (own or hire), sprayer (own); combine harvester (hire)		
Seed replacement rate in 2024	12-18%	8-18%	6-16%
Source of seeds	Majority of the farmers contacted used their own (previous year harvested) seeds for major part of their land/sowing. About 40-80% of the farmers in different districts contacted told that they purchased part of their seed requirement. Farmers procured seed from Agriculture Department and University and KVK.		
Source of irrigation	Canal (60%); Shallow tube well (100%)	Shallow tube well (10%); Kool* (90%)	Shallow tube well (30%); Kool (70%)
Scarcity of irrigation water	No (100%)	Yes (80%)	Yes (60%)
Timely availability of fertilizers/ pesticides	No (50%)	No (50%)	No (70%)
Quality of fertilezers/ pesticides	Not happy (70%)	Not happy (60%)	Not happy (70%)
Advisors to the farmers	State dept (100%); University (100%)	State dept (60%); University (90%); Pvt Dealers (20%); KVK (20%)	State dept (60%); University (80%); Pvt Dealers (50%); KVK (20%)

* In Rajouri and Poonch districts, the irrigation source for the crop was mainly connected through irrigation channels derived from river water lifter basins locally called as **Kool.**

E. Common needs of the farmers: Some of the common needs of the farmers were timely supply of seeds, fertilizers, plant protection chemicals and other inputs, improvement in farm mechanization and availability of small equipments, improvement in irrigation facilities, availability of soil testing facility at block level, kisan credit card, creation of self-help group for collective farming and promoting marketing and improvement in drainage facilities.

F. Input use: Farmers used different equipments like Tractor (own or hire), rotavator (own or hire), cultivator (own or hire), sprayer (own); combine harvester (hire) (Table 13). Seed replacement rate was low (8-18%) in the surveyed districts and the farmers still opt for the old age traditional course varieties of Giza 14, K 39 and Chandak basmati for their taste preferences. Majority of the farmers contacted used their own (previous year harvested) seeds for major part of their land/sowing. About 40-80% of the farmers in different districts contacted told that they purchased part of their seed requirement. Farmers procured seed from Agriculture Department and University and KVK. Main sources of irrigation in Jammu district were canal and shallow tube wells. However, in Rajouri and Poonch districts, the irrigation source for the crop was mainly connected through irrigation channels derived from river water lifter basins locally called as **Kool.** About 60-80% of the farmers from Rajouri and Poonch expressed that irrigation water was scarce. On an average about 55% of the farmers contacted told that fertilizer and pesticides were not available in time and about 66% farmers told that they are not satisfied with their quality. In addition to their own decisions, farmers took advices from officials of state department of agriculture, university staffs and private dealers. Some common problems faced by the farmers wereScarcity of agricultural labours during peak season, non-availability of quality seeds, marketing problem and delay in marketing, fragmented land, drainage problem, scarcity of potassic fertilizers, lack of mechanization, problem of crop lodging especially in Basmati 370, sudden drop in temperature during flowering stage resulting in spikelet sterility, lack of proper irrigation facilities and lack of storage facilities (Table 15).

Table 14: Prevalence of diseases and insect pests in surveyed districts of Jammu and Kashmir during Kharif' 2024

District	Diseases					
	LBl	**BS**	**ShR**	**FS**	**GD**	**BB**
Jammu	L	M-S (18-28%)	L (4-5%)	M (10-23%)	M (16-23%)	M (10-26%)
Rajouri	M-S (10-30%)	L-M (5-20%)	-	-	M-S (10-35%)	M (10-24%)
Poonch	L-M (5-24%)	L-M (5-12%)			L	M-S (14-28%)

District	Insect Pests			
	SB	**RH**	**GLH**	**GH**
Jammu	L-M (5-18%)	M (16-18%)	-	L-M (5-20%)
Rajouri	M (10-20%)	M	L-M (5-14%)	L-M (5-18%)
Poonch	M (8-18%)	L	-	M (16-18%)

G. Biotic stress and their management: District wise prevalence of different diseases and insect pests are presented in Table 14. Leaf blast was recorded in moderate to severe (28-30% intensity) intensity in some parts of Rajouri on variety VL Dhan 88. Moderate to severe (up to 30% intensity) intensity of brown spot was recorded in some fields of Jammu on varieties like Sarbati and Basmati

370. Moderate to severe intensity of grain discoloration was recorded in some fields of Jammu and Rajouri on varieties like Giza-14, K-39 and other varieties. Bacterial blight was wide spread in most of the districts. Moderate to severe intensity of bacterial blight was recorded in some fields of Chandak Basmati, Giza-14 and China in Poonch (village Gulpur). Among the insect pests, stem borer was wide spread in low to moderate intensity in most of the places surveyed. Other insect pests recorded were rice hispa, grasshoppers and green leaf hoppers. On an average about 43% of the farmers contacted adopted plant protection measures. The details of different pesticides used by the farmers are presented in Table 15. In general, farmers adopted 1-2 pesticide application. Very few farmers in Jammu told that they mixed 2 different pesticides before application.

Table 15: Details of pest management

Details	**Districts**		
	Jammu	**Rajouri**	**Poonch**
% age farmers adopting plant protection	70%	30%	30%
Names of pesticides	**Insecticides**: imidacloprid (0.6-0.8 ml/l) for different insect pests **Fungicides**: propiconazole (1 ml/l), carbendazim (1 g/l) and mancozeb + carbendazim (2 g/l) for brown spot, grain discoloration, leaf blast and false smut and copper oxychloride (2.5 g/l) or mixture of copper oxychloride (2.5 g/l) and streptocycline (1 g/l) for bacterial blight of rice		
# of pesticide sprays	2	1-2	1-2
Mixing of pesticides before application	Yes (20%); 2 pesticides	Nil	Nil
Zinc deficiency	Nil	Nil	Yes (10% fields)
Iron deficiency	Nil	Nil	Nil
Problems faced by the farmers	Scarcity of agricultural labours during peak season, non-availability of quality seeds, marketing problem and delay in marketing, fragmented land, drainage problem, scarcity of potassic fertilizers, lack of mechanization, problem of crop lodging especially in Basmati 370, sudden drop in temperature during flowering stage resulting in spikelet sterility, lack of proper irrigation facilities and lack of storage facilities		

H. Researchable issues: Among the biotic stresses, major problems are leaf blast, brown spot, bacterial blight and stem borer and among abiotic stresses, drought, submergence and low light intensity are the major problems. Farmers want varieties suitable for DSR, varieties resistant/tolerant to above mentioned biotic and abiotic constraints, varieties with lodging resistance and biofortified varieties.

Table 16: Researchable issues

Parameters/Issues	Jammu	Rajouri	Poonch
Rice ecology in your area	Irrigated	Hill ecosystem	Hill ecosystem
Rice cultivation only in Kharif or both Kharif and Rabi	Kharif	Kharif	Kharif
Number of years of experience in rice farming	10-20 years	10-20 years	10-20 years
Main biotic constraints (diseases) in your area according to you	Brown spot, bacterial blight and false smut	Leaf blast, Brown spot and bacterial blight	Leaf blast, Brown spot and bacterial blight
Extent of disease damage	10-25%	10-25%	10-25%; >25%
Main biotic constraints (Insect pests) in your area according to you	Stem borer	Stem borer	Stem borer, rice hispa
Extent of insect pest damage	10-25%	10% or less	10% or less
Main abiotic constrains in your area according to you	Submergence and flash flood	Drought and low light intensity	Drought and low light intensity
Production constraints in your area according to you	Scarcity of agricultural labours, unavailability of quality seeds, lack of irrigation facilities and lack of mechanization		
Irrigation facilities in your area	Yes (100%); bore well, Canal	Yes (100%); River water lifting (Kool)	Yes (100%); open well and River water lifting (Kool)
Normally how many years it takes to change the rice variety	5-20 years	5-20 years	5-20 years
Any other rice production issues in your area which the rice scientists need to address	-	-	-
What is urgently required in your area as far as rice varieties are concerned			
Duration	Varieties suitable for DSR and medium duration varieties with lodging resistance		
Biotic stress resistance	BLB, blast, brown spot and stem borer resistant rice varieties		
Abiotic stress resistance	Varieties resistant to submergence, drought and low light intensity		
Preferred grain quality	Long grain basmati	MS grain rice varieties and aromatic short grain varieties	MS grain rice varieties
Nutritional quality	Rice varieties with high Zn, iron and protein and with low GI		

Karnataka-Mandya (2024-25)

Districts surveyed: *Mandya, Mysuru, Chamarajanagara, Hassan, Chikkamangalur, Kodagu, Davangere* and *Shivamogga*

Table 1: Particulars of survey

Districts	Taluks	Villages (Latitude; Longitude)
Mandya	Mandya, Pandavapura, Srirangapatna, Malavalli, K. R Pete, Belagala, Arekere and Maddur	Bukanakere (12.3437; 76.289), Gurudevarahalli (12.315; 77.256), Malapura (12.241; 76.440), Doddapalaya (12.23; 6.4527), Vittalapura (12.3448; 76.2848), Sundahalli (12.307; 76.5030), Gowdagere (12.3423; 76.4935/ 12.2147; 77.130), Belagala (12.25; 76.4527), Kottathi (12.3423; 76.4936), Talekere (12.2830; 76.3840), Hosakoppalu (12.2616; 76.3737/12.2617; 76.3737), Bukanakere (12.2952; 76.5251/12.2740; 77.540), Bevinahalli (12.294; 76.5242) and Mahadevapura (12.2254; 76.4650)
Mysuru	KR Nagara, Bannuru, HD Kote, T. Narsipura and Hunasur	Krishnapura (12.387116; 76.409311), Tippuru (12.2860; 76.2520), Singanahally (12.38709; 76.40928), Chamanahalli (12.215; 76.5251/ 12.214; 76.5252), Bannuru (12.1952; 76.5230), Arakere (12.410604; 76.393023), Degganapally (12.3036; 76.254) and Muguru (12.1343; 76.5457)
Chamarajanagara	Kollegala, Kasaba, Chamarajanagara and Hanuru	Harale (12.1018; 77.650), Kollegala (12.104; 77.649/12.105; 77.649), Siddaiahnapura (12.157629; 77.127441), Hosaanagahalli (12.165803; 77.115446), Harale (12.104; 77.649) and Agrahara (12.1050; 77.649)
Hassan	Hassan, Gunjevu, Mangalapura and Hole Narasipura	Shivapura (12.790969; 76.210708), Aluru (12.969063; 76.004295), Goruru (12.820894; 76.061011), Kandali (12.978593; 76.042597), Devaramuddanahalli (12.753226; 76.311543), Srimatada Kaval (12.777489; 76.319836), Nagalapura (12.793817; 76.210401), Chikkabyagatharalli (12.793817; 76.210401) and Kadavinahosahalli (12.790159; 76.259715)
Chikkamangalur	Mudigere, Neergandi and Chikmangaluru	Haratti (13.129063; 75.521852), Halike (13.126474; 75.595963), Badavanadinne (13.12214; 75.598936), Nidagodu (13.079791; 75.671095), Jannapura (13.084608; 75.694168), Chowlagere (12.963872; 75.994366), Goribidu (13.08241; 75.693177) and Kodaradinne (13.136847; 75.58867)
Kodagu	Shanivarasanthe, Madikere, Kushalnagara and Harangi	Kudumangaluru (12.2845; 75.5752), Kudige (12.2949; 75.564/ 12.2949; 75.566), Kudluru (12.2846; 75.57480/12.2846; 75.57490), Harangi (12.2957; 75.5449), Huluse (12.3119; 75.5825) and Dindagadu (12.5220073; 75.97372959)
Davangere	Channagiri, Harihara and Davangere	Ingalagondi (14.480455; 75.694008), Davanagere (14.590694; 75.840144), Harihara (14.5106; 75.78453), Nandigavi (14.469497; 75.71304), Bilasmuru (14.491524; 75.738511), Dulehole (14.469497; 75.71304), Nandigudi (14.401786; 75.648635), Sirigere (14.452276; 75.709824) and Haggigundi (14.432253; 75.779814)
Shivamogga	Shivamogga and Bhadravati	Anavatti (14.50005; 75.157872), Bhogi Road (14.337357; 75.306415), Kutrahalli (14.280988; 75.326116), Jambuvally

Districts	Taluks	Villages (Latitude; Longitude)
		(13.717975; 75.420135), Holahuru (14.032204; 25.677816), Shiralakoppa (14.387699; 75.247784), Shikaripura (14.259894; 75.35691) and Shantivana (14.289986; 75.292111)

Table 2: Widely prevalent rice varieties

Districts	Varieties
Mandya	HYVs: MTU 1001, Super Aman Gold, IR-64, NP-3056-Omkar, Jyothi, RNR-15049, Kaveri Prize, Amogh, Sun Madhu, Glory, PENNA SUPER, BR-2655, MTU1010, Sowbhagya, G K Chetana, Rajamudi, Thanu, Ankur, JAYA and others; Hybrids: VNR 2233, Meenakshi and others
Mysuru	HYVs: Sanna Madhu, Vasundara Samvruddi, Super Aman, Jyothi, Tualsi, Siri Suma, Akshay, Kaveri Prize, KMP-220, MSN-99 and others; Hybrids: VNR 2233, Meenakhsi and others
Chamarajanagara	HYVs: RNR15048, Jyothi, IR64, Superamman, Sampada, Super BPT and Kaveri Glory
Chikkamagaluru	HYVs: Tunga, BR 2655, KPR 1, Intan, JAYA, Jyothi, Sahyadri and Kempumukthi
Hassan	HYVs: IR-64, Tunga, Rajamudi, BR-2065, Jyothi, BR 2644, Super amman, Ashmitha, Kaveri RNR-15048 and Sanna Madhu
Kodagu	HYVs: RNR 15048, Tunga, BKB, Intan, Athira, Doddi, Sanna Madhu, Rajamudi and Chinnapuni
Davanagere	HYVs: Jyothi, MTU1001, Kaveri, Super amman, Sowbhagya, Sona and Jaishree Sona
Shivamogga	HYVs: Sona, MTU1001, RNR15048, Super amman, Padmavathi and Jytohi

Production oriented survey was conducted in eight districts of Karnataka *Viz*., Mandya, Mysuru, Chamarajanagara, Hassan, Chikmagaluru, Kodagu, Davangere and Shivamogga districts of Southern Karnataka during *Kharif* 2024. The particulars of survey are presented in Table 1. Rice is grown in the state under Canal irrigated, rainfed, borewell irrigated and tank fed conditions. The south west monsoon entered the Karnataka state during June and the onset of monsoon was timely and normal rainfall was recoded in all the districts surveyed. The rainfall received between May and June was less than normal thus all reservoirs Krishna Raja Sagar, Hemavathi, Tungabhadra and Bhadra project got partially filled and later rains allow all reservoirs to fill up to maximum level. The farmer started paddy sowing and transplanting were completed timely in all the districts surveyed. The climatic conditions were in general normal during Kharif 2024 and favourable for rice cultivation. However, there were dry spells during September at tillering stage in Mandya, Mysuru and Shivamogga districts. The particulars of weather conditions are presented in Table 4. The particulars of rice area in surveyed districts of Karnataka are presented in Table 3. The details of rice varieties cultivated in different surveyed districts are presented in Table 2. Commonly cultivated rice varieties were HYVs like MTU 1001, Super Aman Gold, IR-64, Omkar (NP-3056), Jyothi, RNR-15048, Kaveri Prize, Amogh, Sanna Madhu, Glory, Penna Super, BR-2655, MTU1010, Sowbhagya, G K Chetana, Rajamudi, Thanu, Ankur, Jaya, MTU 1001, Samruddi, Tulasi, Sirisuma, Akshay, KMP 220, Super BPT, Kaveri glory, Tunga, BR-20658, Vasundara, Ashmitha and others and hybrids like VNR 2233, Meenakshi, Kaveri hybrids and others. The area of different rice varieties in different districts are presented in Table 6.

Table 3: Particulars of Rice area in 2024

Districts	Total geographical area (ha)	Total cultivable area (ha)	Total cultivated area (ha)	Total irrigated area (ha)	Area under rice (ha)	Area DSR (ha)
Mandya	498244	309307	253118	140309	57804	225
Mysuru	676382	368528	154517	137569	91735	290
Chamarajanagara	569901	235691	219355	106317	10518	-
Hassan	662602	449313	255479	1,06,157	37998	225
Chikkamagaluru	722075	448087	270479	121288	12923	-
Kodagu	410775	332761	172711	2400	20854	--
Davanagere	454573	292492	243802	84442	64200	-
Shivamogga	847784	262267	248706	156666	68757	1500

Table 4: Weather data for different districts of Karnataka during *Kharif*' 2024

Weather parameters	June	July	August	Sept	Oct	Nov	Dec
Mandya							
Total Rainfall (mm)	96.0	55.7	48.2	75.7	64.1	48.0	81.4
Max. Temperature	31.7	29.4	31.3	31.6	30.2	29.9	29.3
Min. Temperature	22	22	22	21	22	19	18
Mysuru							
Total Rainfall (mm)	117.7	120.6	117.0	52.6	49.6	1.4	57.4
Max. Temperature	30.6	28.1	29.8	30.8	30.7	29.9	29.1
Min. Temperature	22	22	21	22	21	20	19
Chamarajanagara							
Total Rainfall (mm)	89.5	66.0	167.5	35.5	177.5	37.5	60.5
Max. Temperature	31.3	28.6	30.5	31.1	30.9	30.0	29.4
Min. Temperature	22	22	21	20	21	19	18
Hassan							
Total Rainfall (mm)	142.6	632.0	164.8	44.4	83.0	0.5	0.0
Max. Temperature	32.4	29.0	30.6	31.6	32.2	36.8	37.0
Min. Temperature	21	18	16	20	21	19	17
Chikmagalur							
Total Rainfall (mm)	137.0	340.0	223.0	29.0	170.1	24.0	28.0
Max. Temperature	26.8	24.2	24.8	26.6	26.1	27.2	26.4
Min. Temperature	17	16	16	17	16	15	12
Kodagu							
Total Rainfall (mm)	350.0	119.0	270.0	68.5	71.7	53.5	61.5
Max. Temperature	27.3	25.7	27.6	27.3	28.9	29.2	28.3
Min. Temperature	20	20	20	20	20	18	18
Davanagere							
Total Rainfall (mm)	171.4	156.0	187.2	114.2	325.6	1.2	30.2
Max. Temperature	30.0	27.2	29.0	29.3	29.4	29.5	29.1
Min. Temperature	21	20	20	20	20	17	17
Shivamogga							
Total Rainfall (mm)	176.4	334.6	430.6	97.7	307.6	10.0	12.0
Max. Temperature	29.9	27.0	28.4	29.2	30.4	30.1	29.6
Min. Temperature	22	21	21	21	21	19	18

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).

Parameters	Districts			
	Mandya	**Mysuru**	**Chamaraja-Nagara**	**Hassan**
Total area under rice HYV in the district	57804	91735	10518	37998
Most prevalent HYVs in the district	MTU-1001 SuperammanGold, RNR 15048, Sona, MSN-99, Jyothi and GK- Chethan, Akshay, Penna super, and Amogha	Sanna madhu, Vasundara Samruddi, Super Aman, Jyothi, Tualsi, Siri suma, Akshay, Kaveri price, KMP-220 and MSN-99	RNR15048, Jyoti, IR64, Superamman, Sampada, Super BPT and Kaveri glory	RNR- 15048 Tunga, Rajamudi, BR-2065, Jyothi, Super amman, Ashmitha, Kaveri Sanna madhu and IR-64
Total area under rice hybrids in the district (ha.)	2400	4223	1325	2100
Most prevalent rice hybrids in the district	PAC 837, VNR-2233 Plus, Meenakshi,	V.N.R 2233, Meenakhsi,	-	-
Whether farmers are using any heavy equipments like transplanter/combine harvester	Combine harvester	Combine harvester and baler	-	Combine harvester and baler
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	DSR and Alternate wetting and drying	Direct seeded Rice and alternate wetting and drying	-	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, Application of Zn, pest and disease control, crop insurance, SRI	Water saving technologies and plant protection measures	Water saving technologies and plant protection measures	Water saving technologies and plant protection measures
What are the general problems in rice cultivation in the district?	High Labour and fertilizer cost, MSP	Labour and marketing, less minimum support price	Labour, marketing and less minimum support price	Labour marketing, less minimum support price
Please provide any farmers' association in the district	-	Karnataka Farmers association	-	Karnataka Farmers association
Whether availability of agricultural labours is the sufficient?	No	No	No	No
Whether there is any marketing problem of the produce?	Yes	Yes	Yes	Yes
Any major irrigation/power generation project in the district	Krishna Raja Sagara	Krishna Raja sagara	KABINI	Hemavathi irrigation project
Any soil testing program undertaken?	Soil health card scheme	Soil health card scheme	Soil health card scheme	Soil health card scheme
Any farmers training program was organized by the state department of Ag/ University	KSDA under ATMA	KSDA under ATMA	KSDA under ATMA	KSDA under ATMA

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).

Parameters	Districts			
	Chikkamagaluru	**Kodagu**	**Davanagere**	**Shivamogga**
Total area under rice HYV in the district	12923	20854	64200	68757
Most prevalent HYVs in the district	Tunga BR 2655, KPR-1, Rajamudi, Superamman, Sannmadhu, Kaveri and Kempu mukti	,Sannmadhu, Rajmudi, Tunga, BKB and Chinnapuni	RNR15048 Jyothi, MTU 1001, MTU 1010 Kaveri, Super Amman, Sowbhagya,	MTU1001, RNR15048, Abhilash Sona, Super amman, and Jytohi
Total area under rice hybrids in the district (ha.)	2300	-	2564	6110
Most prevalent rice hybrids in the district	NA	NA	NA	NA
Whether farmers are using any heavy equipments like transplanter/combine harvester	Transplanter, harvester and baler	Combine harvester	Combine harvester	Combine harvester and Baler
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	Alternate drying and wetting method and Direct seeded Rice	-	Alternate drying and wetting method	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	Acidic soil measures, Water saving technologies and plant protection measures, crop insurance	Water saving technologies and plant protection measures Use of HYV, crop insurance	Water saving technologies and plant protection measures	Mechanized transplanting, Water saving technologies and Plant protection measures
What are the general problems in rice cultivation in the district?	Wild animal menase Iron toxicity Labour issues Marketing price	Labour problem and Wild animal menase	Labour, marketing problems and less minimum support price	Labour, marketing problems and less minimum support price
Please provide any farmers' association in the district	Karnataka Farmers association	-	Karnataka Farmers association	Karnataka Farmers association
Whether availability of agricultural labours is the sufficient?	No	No	No	No
Whether there is any marketing problem of the produce?	Yes	Yes	Yes	Yes
Any major irrigation/power generation project in the district	Hemavathi	Kaveri	Bhadra reservoir	Tunga Bhadra reservoir
Any soil testing program undertaken?	Soil health card scheme	Soil health card scheme	Soil health card scheme	Soil health card scheme
Any farmers training program was organized by the state department of Agriculture/University	KSDA under ATMA	KSDA under ATMA	KSDA under ATMA	KSDA under ATMA

Table 6: Variety/hybrid wise area coverage (ha) in different districts of Karnataka during 2024

Varieties/Hybrids	Districts			
	Mandya	**Mysuru**	**Chamarajanagara**	**Hassan**
MTU 1001	8338			
Super Aman Gold	8142	12560	1100	1256
IR-64	4426		1206	8600
Omkar (NP-3056)	3368			
Jyothi	2457	5525	1550	
RNR-15048	2200		2783	8050
Kaveri Prize	1870	2494		
Amogh	1802			
Sanna Madhu	1801	8574		968
Glory	931			
PENNA SUPER	918			
BR-2655	845			
MTU1010	768			
Sowbhagya	756			
G K Chetana	736			
Rajamudi	452			
Tanu	425			
Ankur	236			
JAYA	127			
MTU 1001		7560	850	
Samruddi		6553		
Tulasi		3558		
Sirisuma		3125		
Akshay		2566		
KMP 220		587		
Super BPT			785	
Kaveri glory			756	
Tunga				7132
BR-20658				3026
Rajamudi				4535
Vasundara		8956		
Ashmitha				856
VNR 2233	2272	15223		
Meenakshi	3127	5282		
Kaveri				2200
Others	11807	9172		1375
Other hybrids			1488	

Table 6 contdd..: Variety/hybrid wise area coverage (ha) in different districts of Karnataka during 2024

Varieties/hybrids	Districts			
	Chikkamagaluru	**Kodagu**	**Davanagere**	**Shivamogga**
Tunga	2710	4200		
BR 2655	2495			
KPR-1	2720			
Intan	1578			
Jaya	1175			
Jyothi	850		10560	9235
Kempumukthi	745			
Sannmadhu		5025		
Rajamudi		4586		
Chinnapuri		1235		
RNR15048		1110	11200	4900
Kaveri Sona			10525	
Jayashree			4950	
Sri ram sona			4800	
MTU 1001			4756	7300
MTU 1010			4563	5486
JGL 1798			3500	
Sona			2256	4456
Superamman			1250	1942
Abhilash				8240
Others	650	4698	5840	24348

A. General Information, cropping system and rice yield: The details of the number of villages surveyed and number of farmers contacted are presented in Table 7. Majority of the fields surveyed were under irrigated ecosystem and some were under rainfed lowland ecosystem (Table 7). The prevailing cropping pattern in the districts surveyed is Rice-rice followed by rice-sugarcane, rice-ragi, rice-maize, rice-pulses, green manure crops and rice-fallow. Farmers followed other cropping sequences like rice-finger millet, rice-vegetables, rice-potato, rice-dhaincha-rice, rice-sesamum, rice-cowpea, rice-black gram/green gram, rice-finger millet-black gram, rice-groundnut-cowpea and others (Table 7). Crop health was good at all the stages in some plots. Average rice yield in different high yielding rice varieties and hybrids in different districts ranged from 4500-7000 kg/ha. Yield in some of the fields were affected due to poor management of the fields, high pests and disease pressure, salinity, erratic rainfall, problematic soil, micronutrient deficiency and continuous monocropping.

Table 7: General information

Parameters	Districts			
	Mandya	**Mysuru**	**Chamaraja Nagara**	**Hassan**
# of talukas/blocks covered	8	5	4	4
# of villages surveyed	14	8	6	9
# of farmers interviewed	17	10	8	9
Field ecosystem	IR (100%)	IR (100%)	IR (100%)	IR (88.9%); RL (11.1%)
Weather conditions during cropping season	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)
Crop stage when survey was made	Tillering to dough	Milk to mature	Milk to matue	Tillering to dough
Crop rotations	Farmers followed diverse crop rotation practices like rice-rice, rice-sugarcane, rice-maize, rice-finger millet, rice-pulses, rice-vegetables, rice-potato, rice-dhaincha-rice, rice-sesamum, rice-cowpea, rice-black gram/green gram, rice-finger millet-black gram, rice-groundnut-cowpea and others			

Table 7 contd..: General information

Parameters	Districts			
	Chikkamagaluru	**Kodagu**	**Davanagere**	**Shivamogga**
# of talukas/blocks covered	3	4	3	2
# of villages surveyed	8	6	9	8
# of farmers interviewed	8	9	9	8
Field ecosystem	IR (62.5%); RL (37.5%)	IR (77.8%); RL (22.2%)	IR (55.5%); RL (45.5%)	IR (75%); RL (25%)
Weather conditions during cropping season	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)
Crop stage when survey was made	Dough to mature	Dough to mature	Dough to mature	Dough to mature
Crop rotations	Farmers followed diverse crop rotation practices like rice-pulses, rice-vegetables, rice-dhaincha, rice-finger millet, rice-rice, rice-pepper, rice-sorghum, rice-green gram/black gram/cowpea, rice-sunnhemp and others			

IR: Irrigated; RL: Rainfed lowland

B. Rice consumption pattern: Survey was conducted on consumption pattern of rice among the farmers in different surveyed districts of Karnataka (Table 9). On an average about 72% of the farmers contacted were in medium income group, about 14% were from low income group and rest were from high income group. Average per capita monthly consumption of rice per month was 6.5-9 kg rice. On an average about 66% of the farmers contacted told that they consumed both wheat and rice. In general, they preferred polished rice. Regarding grain quality, farmers consumed both fine and coarse grain rice. In general, there was no change in the food habit.

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

Variety/hybrids	Yield (kg/ha)			
	Mandya	**Mysuru**	**Chamaraja Nagara**	**Hassan**
HYVs				
Jyothi	6500-7000	5500-6200		
RNR 15048	5500			
Super Amman	5000-5500			5750
Rajamudi				5500-5700
BR 2644				6000
MTU 1001	6500	5750		
Sannmadhu		6000		5500-5750
Meenkashi	5000	5375-6000		
Sona	5000-5700			
Akshay	6500	5000		
Tulasi		5500		
Vasundara		7000		
Super BPT			4500-5000	
Sampada			5500-6000	
Kavery Glory			5700	
Tunga				5250
IR 64				5250-5500
Ashmitha				6000
Hybrids				
VNR2233	4500-5000			
Kaveri				5500

Table 8 contd..: Average yields of different rice varieties as reported by the cooperators/ farmers

Variety/hybrids	Yield (kg/ha)			
	Chikkamagaluru	**Kodagu**	**Davanagere**	**Shivamogga**
HYVs				
Jyothi				5750
RNR 15048				6250
Super Amman	5750		5750	5750-6000
Tunga	5750-6000	5500-5750		
IR 64	6500			
MTU 1001			5500-6000	6000
Rajamudi	5750-6250	5000		
Padmavathi				6000
Sannmadhu	5500	5000-6000		
Sona			5750-6000	5750-6500
Chinnapuni		4500-5500		
Sowbhagya			6000	
Hybrids				
Kaveri	6250		5250-5500	

Table 9: Details of rice consumption pattern in different districts of Karnataka in 2024

Parameters	Districts			
	Mandya	Mysuru	Chamaraja Nagara	Hassan
Status of farmers	Medium Income (88.2%); Poor (11.8%)	Medium Income (80%); Poor (10%); Rich (10%)	Medium Income (62.5%); Poor (12.5%); Rich (25%)	Medium Income (66.7%); Poor (22.2%); Rich (11.1%)
Per capita monthly rice consumption (kg)	8-9 kg	6.5-8.5 kg	7.5-9 kg	7.5-9 kg
Composition of main meal	Only rice (100%)	Only rice (10%); rice + wheat (90%)	Only rice (12.5%); rice + wheat (87.5%)	Only rice (22.2%); rice + wheat (77.8%)
Preferred rice types	Polished rice (100%)	Polished rice (90%); parboiled (10%)	Polished rice (50%); parboiled (50%)	Polished rice (75%); parboiled (25%)
Rice grain type preference	Fine grain (35.3%); Coarse grain (64.7%)	coarse grain (80%); Scented (20%)	coarse grain (75%); Scented (25%)	coarse grain (62.5%); Scented (12.5%); fine grain (25%)
Any changes in food habit in last 10 years	No (94.1%)	No (100%)	No (100%)	No (100%)

Table 9 contd..: Details of rice consumption pattern in different districts of Karnataka in 2024

Parameters	Districts			
	Chikkamagaluru	Kodagu	Davanagere	Shivamogga
Status of farmers	Medium Income (75%); Poor (12.5%); Rich (12.5%)	Medium Income (66.7%); Poor (22.2%); Rich (11.1%)	Medium Income (77.8%); Poor (11.1%); Rich (11.1%)	Medium Income (62.5%); Poor (12.5%); Rich (25%)
Per capita monthly rice consumption (kg)	7.5-9 kg	7.5-9 kg	7-8.5 kg	7.5-8.5 kg
Composition of main meal	rice + wheat (100%)	Only rice (62.5%); rice + wheat (37.5%)	rice + wheat (100%)	Only rice (62.5%); rice + wheat (37.5%)
Preferred rice types	Polished rice (37.5%); parboiled (62.5%)	Polished rice (88.9%); parboiled (11.1%)	Polished rice (88.9%); parboiled (11.1%)	Polished rice (75%); parboiled (25%)
Rice grain type preference	Fine grain (12.5%); Coarse grain (50%); Scented (37.5%)	Fine grain (22.2%); Coarse grain (66.7%); Scented (11.1%)	Coarse grain (88.9%); Scented (11.1%)	Fine grain (12.5%); Coarse grain (62.5%); Scented (12.5%)
Any changes in food habit in last 10 years	No (100%)	No (100%)	No (100%)	No (100%)

Table 10: Details of nursery management

Parameters	Districts			
	Mandya	**Mysuru**	**Chamaraja Nagara**	**Hassan**
Planting time	2nd of July to 1st week of August	2nd of July to 2nd week of August	2nd to 4th week of August	2nd week of August to 1st week of September
Seed rate	25-50 kg/ha	25-30 kg/ha	25-45 kg/ha	20-35 kg/ha
Seed treatment (% farmers adopted)	Yes (17.6%)	Yes (100%)	Yes (75%)	Nil
Chemicals used for seed treatment	Thiram (3 g/kg), carbendazim (1-2 g/kg)			
Organic manure in nursery (% farmers adopted)	Yes (88.2%) FYM, Green manure	Yes (70%) FYM, Vermicompost	Yes (62.5%) FYM, Vermicompost	Yes (44.4%) FYM, Vermicompost
Inorganic manure in nursery (% farmers adopted)	Yes (100%); Urea (100 kg/acre) and/or 20:20:0:13 (100 kg/acre); Some applied DAP and MOP	Yes (100%); Urea (50 kg/acre) and/or 20:20:0:13 (100 kg/acre); Some applied 10:26:26 (50 kg/acre) and MOP (30-50 kg/acre)	Yes (100%); Urea (50-100 kg/acre) and/or DAP (50 kg/acre); Some applied 20:20:0:13 (100 kg/acre), 20:20:20 (50 kg/acre), 19:19:19 (50 kg/acre) and MOP (50 kg/acre)	Yes (100%); Urea (100 kg/acre) and; Some applied 20:20:16 (50 kg/acre) 20:20:0:13 (100 kg/acre), 19:19:19 (50 kg/acre) and MOP (50 kg/acre)

Table 10 contd..: Details of nursery management

Parameters	Districts			
	Chikkamagaluru	**Kodagu**	**Davanagere**	**Shivamogga**
Planting time	3rd week of August to 1st week of Sept	3rd week of July to 4th week of August	1st to 4th week of August	2nd to 4th week of August
Seed rate	25-50 kg/ha	25-50 kg/ha	25-50 kg/ha	25-40 kg/ha
Seed treatment (% farmers adopted)	Yes (37.5%)	Nil	Nil	Yes (50%)
Chemicals used for seed treatment	Thiram (3 g/kg), carbendazim (1-2 g/kg)			
Organic manure in nursery (% farmers adopted)	Yes (75%) FYM, vermicompost	Yes (100%) FYM, vermicompost	Yes (66.7%) FYM	Yes (75%) FYM, vermicompost, Green manure
Inorganic manure in nursery (% farmers adopted)	Yes (100%); Urea (50-100 kg/acre) and/or 20:20:0:13 (50-100 kg/acre); Some applied DAP (50-100 kg/acre), 17:17:17 (50-100 kg/acre) and MOP	Yes (100%); Urea (50-100 kg/acre) and/or 20:20:0:13 (50-100 kg/acre); Some applied DAP (50-100 kg/acre), 10:26:26 (50-100 kg/acre) and MOP	Yes (100%); Urea (50-100 kg/acre) and/or DAP (50-100 kg/acre). Some applied 19:19:19 (50-100 kg/acre), 10:26:26 (50-100 kg/acre) and MOP	Yes (100%); Urea (50-100 kg/acre). Some applied DAP (50 kg/acre). Some applied 19:19:19 (100 kg/acre), 10:26:26 (50 kg/acre), 20:20:0:13 (50 kg/acre) and MOP

C. Nursery and main field Management: In general, planting was done from 2nd week of July to 1st week of September (Table 10). Average seed rate used by the farmers ranged from 25-50 kg/ha. On an average, about 35% of the farmers contacted adopted seed treatment with carbendazim or thiram. None of the farmers contacted from Hassan, Kodagu and Davanagere adopted seed treatment (Table 10). On an average, about 72% of the farmers contacted applied organic manures like FYM and vermicompost in the nursery. All the farmers contacted applied chemical fertilizers like urea, DAP, MOP and complex fertilizers like 20:20:0:13 (factomphos), 19:19:19, 10:26:26, 17:17:17 (Table 10). About 33-90% farmers in different districts adopted line planting and rest followed random planting (Table 11). Some farmers from Mandya adopted direct sowing. In recent years Cauvery command area farmers are adopting drum seeder method of direct sowing, machine transplanting, alternate drying and wetting method of irrigation in Mandya and Mysuru districts due to technology spread and it is helpful for tail end farmers paddy cultivation. The farmers have adopted DSR and machine transplanting mainly due to yield advantage and to save the water. Fertilizers were applied @ 22.5-140 kg N/ha, 21.25-115 kg P_2O_5/ha and 21.25-75 kg K_2O/ha. On an average about 31% of the farmers contacted applied zinc sulphate in the field (Table 11). On an average about 75% of the farmers contacted applied organic manure (mainly FYM followed by vermicompost and green manure) in the field. Nutrients were applied in the form of 20:20:0:13 (factomphos), 19:19:19, 10:26:26, 17:17:17, urea, DAP, SSP, MOP and zinc sulphate (Table 11).

Table 11: Details of main field management

Details	**Districts**			
	Mandya	**Mysuru**	**Chamaraja Nagara**	**Hassan**
Planting method	About 44-90% in different districts adopted line transplanting. Few farmers (~17%) in Mandya adopted direct sowing while rest of the farmers adopted random transplanting where plant population per unit area was not maintained.			
Total N applied	50-140 kg/ha	50-140 kg/ha	25-115 kg/ha	50-115 kg/ha
Total P_2O_5 applied	32.5-107.5 kg/ha (100% applied)	25-50 kg/ha (60% applied)	25-65 kg/ha (75% applied)	47.5-50 kg/ha (44.4% applied)
Total K_2O applied	32.5-75 kg/ha (76.5% applied)	32.5-75 kg/ha (46.7% applied)	47.5-65 kg/ha (50% applied)	47.5-75 kg/ha (66.7% applied)
$ZnSO_4$ applied (21% or 33%)	Yes (70.6%) @ 16-32 kg/ha	Yes (50%) @ 16-32 kg/ha	Yes (12.5%) @ 16 kg/ha	Yes (33.3%) @ 13-16 kg/ha
Organic fertilizers applied	Yes (100%); FYM (82%); Green manure (18%)	Yes (70%); FYM (mainly); vermicompost	Yes (50%); FYM (mainly); vermicompost	Yes (88.9%); FYM (mainly; vermicompost)
Remarks	Nutrients were applied in the form of 20:20:0:13 (factomphos), 19:19:19, 10:26:26, 17:17:17, urea, DAP, SSP, MOP and zinc sulphate.			

Table 11 contd..: Details of main field management

Details	Districts			
	Chikkamagaluru	**Kodagu**	**Davanagere**	**Shivamogga**
Planting method	About 33-87.5% in different districts adopted line transplanting while rest of the farmers adopted random transplanting where plant population per unit area was not maintained.			
Total N applied	22.5-115 kg/ha	25-115 kg/ha	25-115 kg/ha	22.5-115 kg/ha
Total P_2O_5 applied	21.25-57.5 kg/ha (62.5% applied)	25-115 kg/ha (88.9% applied)	23.75-115 kg/ha (55.5% applied)	25-57.5 kg/ha (62.5% applied)
Total K_2O applied	21.25-75 kg/ha (50% applied)	32.5-75 kg/ha (55.5% applied)	23.75-75 kg/ha (55.5% applied)	32-75 kg/ha (62.5% applied)
$ZnSO_4$ applied (21% or 33%)	Yes (37.5%) @ 20-40 kg/ha	Yes (33%) @ 16-32 kg/ha	Nil	Yes (12.5%) @ 16 kg/ha
Organic fertilizers applied	Yes (75%); FYM (50%); Green manure (25%)	Yes (77.8%); FYM (mainly); vermicompost	Yes (66.6%); FYM	Yes (75%); FYM (mainly); GM, vermicompost
Remarks	Nutrients were applied in the form of 20:20:0:13 (factomphos), 19:19:19, 10:26:26, 17:17:17, urea, DAP, SSP, MOP and zinc sulphate.			

D. 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 12. Usage of herbicides was in general less. On an average about 46% of the farmers contacted applied herbicides in the fields. Most of the farmers who applied herbicides, also adopted 1-2 hand weeding hand weeding at 30 and 60 days after planting. On an average about 54% farmers contacted in different districts told that they practice only hand weeding.

E. Specific needs of the farmers: Some of the common needs of the farmers were improvement in irrigation system, pest and disease resistant HYVs, improvement in marketing facility, timely availability of micronutrients, crop insurance, timely availability of quality seeds and other inputs like fertilizers and pesticides, subsidies on inputs from Government, soil testing facilities, mechanization in rice farming, drones for field sprays, warehouse facilities, proper supply of electricity and knowledge/ training on improved rice production technology.

F. Input use: Implements like rotavator, tractor, power tiller, JCB, cultivator, tiller, grass cutter and combined harvester were used by the farmers mostly on hire basis. Progressive farmers had some of their own equipment. Harvesting of rice crop and baling of straw by using combine harvesters slowly picking up in all the districts. Rice transplanting machines are being promoted from state department by providing subsidies in Davangere and Mandya and Mysore districts. Sree Kshetra Dharmastala Rural Development Programme (SKDRDP) and Private companies emerged to promote machine planting at cauvery command area. Drum seeding technology (wet direct) also picking up at Mandya district due to pre-emergent selective weedicides available in the market for weed management. Many farmers told that they purchased part of their seed requirement. State department of Agriculture, Universities and NGOs distributed the seeds to the farmers timely during the season. Canal was the main source of irrigation followed by deep tube well. Almost all the farmers contacted expressed that there was scarcity of irrigation water. Majority of the farmers expressed that fertilizers especially complex fertilizer (10:26:26) and zinc micronutrient were not

available in time. Major advisors to the farmers were private dealers followed by officials from state department of agriculture.

Table 12: Weeds and weed management

Details	Districts			
	Mandya	**Mysuru**	**Chamaraja Nagara**	**Hassan**
Weed intensity	Low to medium	Low to medium	Low to medium	Low to medium
Names of the weeds	*Cyperus procerus, C. difformis, C. iria, Fimbristylis miliaceae, Glinus oppositifolius, Eclipta alba, Scirpus* spp., *Spilanthus acmella, Echinochloa colona, Leptochloa chinensis, Panicum trypheron, Ludwigia Parviflora* and *Cuperus rotundus*			
Weedicides used	Not available			
Percentage of farmers applied herbicides	Only hand weeding (76.5%); Hand weeding + herbicide (24.5%)	Only hand weeding (40%); Hand weeding + herbicide (50%); only herbicide (10%)	Only hand weeding (50%); Hand weeding + herbicide (25%); only herbicide (25%)	Only hand weeding (55.5%); only herbicide (44.5%)
Wild/weedy rice incidence	Nil	Nil	Nil	Wild rice in few places
Only hand weeding	Weed were commonly recorded in and around rice fields. Hand weeding was common practice among the farmers. Majority of the farmers who applied herbicides also adopted hand weeding in most of the districts			

Table 12 contd..: Weeds and weed management

Details	Districts			
	Chikkamagaluru	**Kodagu**	**Davanagere**	**Shivamogga**
Weed intensity	Medium	Medium	Medium	Low to medium
Names of the weeds	*Cyperus procerus, C. difformis, C. iria, Fimbristylis miliaceae, Glinus oppositifolius, Marsilia quadrifolia, Eclipta alba, Scirpus* spp., *Spilanthus acmella, Echinochloa colona, Leptochloa chinensis, Panicum trypheron, Ludwigia Parviflora, Lindernia vernicaefolia* and *Cuperus rotundus*			
Weedicides used	Not available			
Percentage of farmers applied herbicides	Only hand weeding (12.5%); Hand weeding + herbicide (50%); only herbicide (37.5%)	Only hand weeding (88.9%); only herbicide (11.1%)	Only hand weeding (44.5%); Hand weeding + herbicide (33.3%); only herbicide (22.2%)	Only hand weeding (62.5%); Hand weeding+ herbicide (37.5%)
Wild/weedy rice incidence	Nil	Nil	Nil	Nil
Only hand weeding	Weed were commonly recorded in and around rice fields. Hand weeding was common practice among the farmers. Majority of the farmers who applied herbicides also adopted hand weeding in most of the districts			

Table 13: Details of inputs used

Details	Districts			
	Mandya	Mysuru	Chamaraja Nagara	Hassan
Implements used	Implements like rotavator, tractor, power tiller, JCB, cultivator, tiller, grass cutter and combined harvester were used by the farmers mostly on hire basis. Progressive farmers had some of their own equipment.			
Source of seeds	Many farmers (37.5-94%) told that they purchased part of their seed requirement from private or government sources			
Source of irrigation	Canal (100%)	Canal (100%)	Canal (100%)	Canal (100%)
Scarcity of irrigation water	Yes (88.2%)	Yes (100%)	Yes (100%)	Yes (100%)
Availability of fertilizers/pesticides	No (88.2%)	No (100%)	No (87.5%)	No (88.9%)
Quality of fertilizers/pesticides	Not Satisfied (88.2%)	Not Satisfied (100%)	Not Satisfied (100%)	Not Satisfied (100%)
Advisors to the farmers	Own (17.6%), Dealers (76.5%); State dept. (11.7%)	Dealers (90%); State dept. (10%)	Dealers (75%); State dept. (25%)	Dealers (88.9%); State dept. (11.1%)

Table 13 contd..: Details of inputs used

Details	Districts			
	Chikkamagaluru	Kodagu	Davanagere	Shivamogga
Implements used	Implements like rotavator, tractor, power tiller, cultivator, tiller, JCB, grass cutter and combined harvester were used by the farmers mostly on hire basis. Progressive farmers had some of their own equipment.			
Source of seeds	Many farmers (37.5-66.7%) told that they purchased part of their seed requirement from private or government sources			
Source of irrigation	Canal (100%)	Canal (88.9%); Deep tube well (11.1%)	Canal (100%)	Canal (62.5%); Deep tube well (37.5%)
Scarcity of irrigation water	Yes (100%)	Yes (100%)	Yes (100%)	Yes (100%)
Availability of fertilizers/pesticides	No (87.5%)	No (44.4%)	No (100%)	No (62.5%)
Quality of fertilizers/pesticides	Not Satisfied (87.5%)	Not Satisfied (55.5%)	Not Satisfied (100%)	Not Satisfied (50%)
Advisors to the farmers	Dealers (75%); State dept. (25%)	Dealers (88.9%); State dept. (11.1%)	Dealers (55.5%); State dept. (44.5%)	Dealers (75%); State dept. (25%)

G. Biotic stress and their management: District wise prevalence of different diseases and insect pests are presented in Table 14. Diseases like leaf and neck blast, brown spot, sheath blight, sheath rot, false smut and bacterial blight were recorded in low to moderate intensity indifferent surveyed districts (Table 14) due to less rain fall. Sporadic incidences of udbatta was also noticed in few fields in Mandya. However, sheath blight was noticed in patches with severity ranged from 25-37% on varieties like Jyothi, and MTU 1001 in few fields in few fields of Mandya and Mysuru. Insect pests like stem borer, leaf folder, brown plant hopper were commonly recorded. In the

districts of Mandya, Mysuru and Hassan, the brown plant hopper and stem borer infestation of 6-8% and 12-18% was recorded during tillering, dough and grain filling stage. Earhead bug infestation 5-7% was noticed at dough stage irrespective of the varieties. Brown plant hopper, yellow stem borer and earhead bug have been consistently recorded from past four years in Mandya, Mysuru and Hassan district. The details of different pesticides used for management of different diseases and insect pets are presented in Table 15. It was reported 100% of the farmers contacted adopted chemical plant protection measures. In general, the farmers adopted 1-2 sprayings and some farmers from Mandya, Kodagu and Shivamogga districts mixed 2 or more pesticides before spraying. During this year zinc and potassium deficiency was observed in many districts as the farmers could not apply the zinc due to non-availability and high cost.

Table 14. Prevalence of disease and pests in Southern Karnataka during *Kharif* 2024

Districts	Diseases							
	Bl	**NBl**	**BS**	**ShBl**	**ShR**	**FS**	**UDB**	**BLB**
Mandya	L-M (2-10%)	M	L (4%)	L-M (2-12%)	L-M	L (2%)	L (5%)	L
Mysuru	L-M (2-12%)	L	L (3%)	L-M (2-16%)	L-M	L (5-7%)	-	L
Chamarajnagara	L (2%)	L	L	L (2-6%)	L	L (2-6%)	-	-
Hassan	L (1-4%)	L-M	L (2%)	L (2-4%)	L-M	L-M (4-8%)	-	-
Chikmagaluru	L (2%)	M	L	M	L-M	L-M (3-8%)	-	-
Kodagu	L (1-3%)	L	L	M	M	L (3-5%)	-	-
Davangere	L (2%)	M	L-M	L-M	L	L-M (2-9%)	-	-
Shivamogga	L (2%)	M	M	M	L-M	L-M (2-10%)	-	L

Districts	Insect pests				
	SB	**LF**	**BPH**	**WBPH**	**Nematode**
Mandya	L (4-5%)	L-M (2-12%)	L-M (2-8%)	-	L-M (3-8%)
Mysuru	L (2-6%)	L-M (5-8%)	L-M (2-8%)	-	-
Chamarajnagara	L (1-3%)	L (2-3%)	M	-	-
Hassan	L (1-4%_	L	L (1-4%)	-	-
Chikmagaluru	L (2-4%	M	L (2%)	-	-
Kodagu	L (1-3%)	M	M	-	-
Davangere	M	L-M	M	-	-
Shivamogga	L (2-3%)	M	L	L (2%)	-

Table 15: Details of pest management

Details	Districts			
	Mandya	**Mysuru**	**Chamaraja Nagara**	**Hassan**
% age farmers adop-ting plant protection	100% farmers adopted chemical plant protection measures			
Names of pesticides	Insecticides: fipronil (1.5 ml/l), chlorpyriphos (2 ml/l), acephate (1 g/l), thiametoxam, imidacloprid (0.5 ml/l), Fame (Flubendiamide) (0.2 ml/l) and cypermethrin (1-2 ml/l) for stem borer, leaf folder and other pests; Fungicides: hexaconazole (2 ml/l), propiconazole (1 ml/l), carbendazim (1 g/l), Saaf (carbendazim + mancozeb) (2 g/l), tricyclazole (0.6 g/l), difenoconazole (1 ml/l) and Nativo (0.4 g/l) for different fungal diseases			
# of pesticide sprays	1-2	1	1	1-2
Mixing of pesticides before application	Yes (17.6%) 2 pesticides	Nil	Nil	Nil
Zinc deficiency	Yes (58.8%)	Yes (100%)	Yes (87.5%)	Yes (77.8%)

Table 15 contd..: Details of pest management

Details	Districts			
	Chikkamagaluru	**Kodagu**	**Davanagere**	**Shivamogga**
% age farmers adop-ting plant protection	100% farmers adopted chemical plant protection measures			
Names of pesticides	**Insecticides**: Ekalux (2 ml/l), fipronil (1.5 ml/l), imidacloprid (0.5 ml/l) and chlorpyriphos (2 ml/l) for stem borer, leaf folder and other pests; **Fungicides**: carbendazim (1 g/l), propiconazole (1 ml/l), Nativo (0.4 g/l), hexaconazole (2 ml/l), tricyclazole (0.6 g/l) and Saaf (carbendazim + mancozeb) (2 g/l) for different fungal diseases			
# of pesticide sprays	1	1-2	1	1-2
Mixing of pesticides before application	Nil	Yes (11.1%); 2	Nil	Yes (12.5%); 2
Zinc deficiency	Yes (75%)	Yes (88.9%)	Yes (77.8%)	Yes (75%)

H. Researchable issues: Among the biotic stresses, major problems in the region leaf and neck blast, sheath blight and false smut among the diseases and BPH, stem borer and leaf folder among the insects. Major abiotic constraint was salinity. Farmers want varieties suitable for DSR, HYVs with lodging resistance, short duration high yielding rice varieties, varieties resistant/tolerant to above mentioned biotic abiotic constraints and bio-fortified varieties with higher zinc and protein.

Table 16: Researchable issues

Parameters/Issues	**Districts**			
	Mandya	**Mysuru**	**Chamaraja Nagara**	**Hassan**
Rice ecology in your area	Irrigated; Rainfed lowland	Irrigated; Rainfed lowland	Irrigated; Rainfed lowland	Irrigated
Rice cultivation only in Kharif or both Kharif and Rabi	Kharif and Kharif + Rabi			
Number of years of experience in rice farming	5-20 years			
Main biotic constraints (diseases) in your area according to you	Leaf and neck blast, sheath blight and false smut			
Extent of disease damage	10-25%			
Main biotic constraints (Insect pests) in your area according to you	BPH, stem borer and leaf folder			
Extent of insect pest damage	10-25%			
Main abiotic constrains in your area according to you	Salinity; submergence			
Production constraints in your area according to you	Scarcity of agricultural labours, lack of mechanization, lack of irrigation facilities, unavailability of fertilizers and pesticides in time, micronutrient deficiency and unavailability of quality seeds of HYVs			
Irrigation facilities in your area	Available Canal, bore well	Available canal	Available Canal, bore well	Available canal
Normally how many years it takes to change the rice variety	10-20 Years/More than 20 years			
Any other rice production issues in your area which the rice scientists need to address				
What is urgently required in your area as far as rice varieties are concerned				
Duration	Not available			
Biotic stress resistance	Not available			
Abiotic stress resistance	Not available			
Preferred grain quality	Not available			
Nutritional quality	Not available			

Table 16 contd..: Researchable issues

Parameters/Issues	**Districts**			
	Chikkamagaluru	**Kodagu**	**Davanagere**	**Shivamogga**
Rice ecology in your area	Irrigated; rainfed lowland	Irrigated	Irrigated; rainfed lowland	Irrigated; rainfed lowland
Rice cultivation only in Kharif or both Kharif and Rabi	Kharif and Kharif + Rabi			
Number of years of experience in rice farming	5-10 years/ 10-20 years			
Main biotic constraints (diseases) in your area according to you	Leaf and neck blast, sheath blight and false smut			
Extent of disease damage	10-25%			
Main biotic constraints (Insect pests) in your area according to you	BPH, stem borer and leaf folder			
Extent of insect pest damage	10-25%			
Main abiotic constrains in your area according to you	Salinity, alkalinity and submergence (in few places)			
Production constraints in your area according to you	Scarcity of agricultural labours, lack of mechanization, lack of irrigation facilities, unavailability of fertilizers and pesticides in time, micronutrient deficiency and unavailability of quality seeds of HYVs			
Irrigation facilities in your area	Available Canal, Bore well	Available Canal, Bore well	Available Canal	Available Bore well
Normally how many years it takes to change the rice variety	10-20 Years or more			
Any other rice production issues in your area which the rice scientists need to address				
What is urgently required in your area as far as rice varieties are concerned				
Duration	Not available			
Biotic stress resistance	Not available			
Abiotic stress resistance	Not available			
Preferred grain quality	Not available			
Nutritional quality	Not available			

Kerala-1-Moncompu (2024-25)

Districts surveyed: *Alappuzha, Kottayam, Pathanamthitta, Thiruvananthapuram, Kollam* and *Ernakulam*

Particulars of survey

District	Blocks	Panchayats/Villages
Alappuzha	Ambalapuzha, Champakulam, Ramankari, Haripad and Cherthala	Ambalappuzha N, Purakkad, Takazhy, Ambalappuzha S, Edathwa, Champakulam, Nedumudy, Thalavady, Ramankary, Pulinkunnu, Kavalam, Neelamperoor, Veeyapuram, Harippad, Pallippad, Thaneermukkam, Kadakarappally and Kanjikkuzhy
Kottayam	Ettumanoor, Kottayam, Madappally and Vaikom	Aymanam, Kumarakom, Kumaranelloor, Puthupally, Nattakam, Vazhapally, Paippad Vaikom and Vechoor
Pathanamthitta	Thiruvalla	Niranan, Kadapra and Peringara
Thiruvananthapuram	Parasala, Pallichal, Nedumangadu, Vamanapuram, Kattakada, Kazhakkuttam, Attingal, Varkala, Pulimath, Aryankode and Neyyatthinkara	Parassala, Karode, Malayinkeezhu, Pallichal, Nedumangadu, Aruvikkara, Kallara, Manickal, Aryanad, vellanadu, Ulloor, Kazhakkuttam, Chirayinkeezhu, Anchuthengu, Varkala, Edava, Madavoor, Pallikkal, Kollayil, Aryankode, Neyyattinkara and Karumkulam
Kollam	Kottarakkara, Karunagappalli, Kunnathoor and Punaloor	Kottarakkara, Kareepra, Alappad, Oachira, Sooranad N., Mynagappally, Pattanapuram and Pattazhy S
Ernakulam	Narakkal, Paravoor, Aluva, Nedumbassery, Kalamassery, Vyttila, Perumbavoor, Angamaly, Keezhmad, Poothrikka, Moovattupuzha and Kothamangalam	Pallipuram, Njarakkal, Kottuvally, Chendamangalam, Karumalloor, Varappuzha, Chengamanad, Nedumbassery, Mulavukad, Kadamakudy, Kumbalangi, Thiruvangulam, Rayamangalam, Okkal, Ayyampuzha, Thuravoor, Choornikkara, Edathala, Mazhuvanoor, Kunnathunad, Avoly, Kothamangalam and Nellikuzhy

Widely prevalent rice varieties

District	Varieties
Alappuzha	Uma (MO-16), Pournami (MO 23), Jyothi, Manuratna and others
Kottayam	Uma (MO-16), Jyothi, Manuratna and others
Thiruvananthapuram	Uma (MO-16), Jyothi, Prathyasha and others
Kollam	Uma (MO-16), Jyothi, Prathyasha, Manuratna, Red Triveni, Sreyas, Cherady and others
Ernakulam	Pokkali, Choottu Pokkali, Chettivirippu, Cheruvirippu, Kuruka, Anakodan, Eravapandy, Bali, Orpandy and others

Production oriented survey was conducted during Kharif 2024 in 6 different districts of Kerala *viz*., Thiruvananthapuram, Alappuzha, Pathanamthitta, Kottayam, Ernakulam, and Kollam. A total of 83 village panchayats in 37 blocks were covered during the survey. Commonly cultivated rice varieties in the region were Uma (MO 16), Pournami (MO 23), Manurathna, Jyothi, Prathyasha,

Manuratna, Red Triveni, Sreyas and Cherady. Uma was the most predominant rice variety. In Ernakulum district, farmers cultivated Pokkali rice varieties. Weedy rice and weeds like *Eichinochloa* spp., *Fimbristylis* spp., *Monochoria vaginalis*, *Cyperus* spp., Nagapola (*Limnocharis flava*), *Salvinia* spp. (watermosses) and others were commonly observed in almost all padasekarams. Implements like tractor, tiller, drum seeder and combine harvester were used by the farmers mainly on hire basis. Labour shortage is the main issue in Kuttanad region. Among abiotic stresses, acidity was the major problem. Among diseases, blast, brown spot, sheath blight, bacterial blight and grain discoloration were observed in varying intensities. Among insect pests, stem borer, leaf folder, brown plant hopper, gall midge, case worm and thrips were recorded in different farmers' fields. Major problem faced by the farmers were shortage of agricultural labours and their high cost and increase in the cost of cultivation.

District wise details

Kuttanad (Alappuzha, Kottayam and Pathanamthitta): Production oriented survey was conducted in several villages of different blocks of these three districts in Kuttanad region. In Alappuzha district, out of the total cultivable area of 12977.9 ha, rice cultivation was practiced in 6111.06 ha area during Kharif season. The total irrigated area is 37990.89 ha. Rice cultivation was taken up in 154 padasekarams forming an area of 8823.58 ha. A very unique pre-sowing weed control method termed **"Stale seed bed preparation"** is practiced by the Kuttanad farmers. The technique involves providing ideal conditions for the germination of weed seeds on the soil surface of fields prepared to a 'ready to sow' condition by draining the fields. The fields are kept in this condition for 10-15 days for emergence of weeds. The emerged weeds are then submerged by flooding the fields to more than 1.0 m depth for a period of 2-3 weeks, which results in total decomposition of the weeds. All these weeds will be killed by this practice. The fields are again drained and germinated paddy seeds are sown in soil surface with minimum disturbance. The practice is most useful to control the grasses especially *Echinochloa spp*. The predominant varieties in this district were Uma (MO 16), Pournami (MO 23) and Manurathna. The ruling variety in this Kuttanad area is Uma. Many farmers practiced cultivation of Pournami and the cultivation was started by direct sowing, transplanting or drum seeding. The farmers belonging to the padasekarams of Kayal areas have practiced drum seeding. Low seed rate per acre (12 kg/acre) and less incidence of insect pest are the main benefits of using drum seeder. Implements like tractor, tiller, drum seeder and combine harvester were used by the farmers mainly on hire basis. Labour shortage is the main issue in Kuttanad region. The cost of cultivation in Kuttanad is Rs. 26,200/acre. The yield obtained from Kuttanad is 2250-3000 kg/acre. The paddy procurement price is Rs.28.30/kg. The Government based supplyco directly procure the paddy from the farmers in the above rate.

The occurrence of rice thrips and rice black bug was observed during the early phase of cultivation. The incidence of Brown plant hopper, case worm and leaf folder was also recorded. Among diseases BLB, sheath blight, leaf spot and blast were recorded. Among abiotic stresses, acidity was the major problem. Phytotoxicity of certain weedicides were also reported. The grain discolouration and brown spot diseases occurred in the soil acidity and high iron toxicity field. FLD on 'Popularization of KAU Sampoorana Multimix (Rice)' was conducted at Ambalappuzha block. The severe incidence of weedy rice was noticed in Alappuzha, Kottayam and Pathanamthitta District. Major weeds observed were *Cyperus difformis* and *Echinochloa crusgalli*

along with wild rice. FLD on 'Popularization of KAU weed wiper for the management of weedy rice' was conducted in Champakulam and Ramankary block of Alappuzha district. In this regard KAU weed wiper was distributed to 8 padasekarams each of Champakulam and Ramankary blocks. The sowing of seeds using drone was done for the first time in Kerala as a part of AICRP Agronomy trail on 'Evaluation of drone for spraying of agrochemicals (herbicides, insecticides and fungicides) in rice pest management at 'Chambadi Chakkamkari Padasekaram of Champakulam panchayat and Madambakka padasekaram of Pulinkunnu panchayat. Normally 50 kg of seeds are recommended for 1 acre as per KAU Package of Practices, but 30 kg of seed/25 minutes is enough for drone sowing in the experimental trial. Using drones for aerial seeding helps to conserve seeds, save times and labour charge. It is also used to apply biocontrol agent, fertilizer and micronutrients in Kuttanad.

In Kottayam District, nearly 6400 ha area was cultivated rice during *Kharif*' 2024. Rice variety Uma was widely cultivated by farmers. The rice variety, Pournami (MO 23) is getting popularized among the farmers. The soil acidity remains a major problem in the padasekarams of many parts of the district. The farmers used to apply Lime (250 kg/ acre) to reduce acidity. Insect pests namely, rice thrips, black bug, stem borer, leaf folder, BPH, case worm and gall midge were recorded in varying intensities during the season. Among this, the incidence of Stem borer (50 ha) and leaf folder (45 ha) were severe in some of the padasekarams. Among the diseases, sheath blight, BLB, brown spot and blast were observed in varying level. Bacterial leaf blight (50 ha) and sheath blight were observed in paddy fields (20 ha) where higher seed rate (>40 kg/ acre) was used. Weedy rice and weeds like *Eichinochloa* spp*., Fimbristylis* spp*., Monochoria vaginalis, Cyperus* spp. and otherrs were commonly observed in almost all padasekarams.

In Pathanamthitta District, only 8 ha area was cultivated during Virippu Season. Harvesting was done in 4.5 ha. Rest of the area was vitiated due to natural calamity. The upper Kuttanad areas of Pattanamthitta district has cultivation only in Puncha season. But other areas follow cultivation in two seasons per year. Stem borer, BPH and leaf roller were observed as major insects and sheath blight, BLB etc as major diseases.

Thiruvananthapuram: In this district, rice cultivation was practiced mainly in Parasala, Pallichal, Vamanapuram, Nedumangadu, Kattakada, Ka1zhakkuttam, Attingal, Varkala, Pulimath, Aryankode, Neyyatthinkara blocks in an area of 1319.351 ha. The cultivation was carried out in Virippu, Mundakan and Puncha seasons. The infestation of thrips, stem borer, leaf folder and brown plant hopper was recorded. Occurrence of wild rice, *Fimbristylis* sp., *Echinocloa* sp., *Echichornia crassipes, Salvinia molesta* etc. were severe in many areas under rice cultivation.

Kollam: In this district, total cropped area was recorded as 1579.5 ha of which 1278.72 is occupied by rice cultivation. Insect pests and diseases namely, leaf folder, rice bug, case worm, blast, BLB and leaf spot were reported in different intensities. Cultivation was practiced in Virippu, Mundakan and Puncha seasons by adopting direct sowing and transplanting. Rice varieties like Uma, Jyothi, Prathyasha, Manuratna, Red Triveni, Sreyas and Cherady were predominantly cultivated. Frontline Demonstration was done on 'Popularization of Pournami (MO 23) in Vaettikkavala and Nedumbana panchayats under the guidance of Krishi Vigyan Kendra, Kollam in an area of 1 acre. Wild rice infestations and weeds like *Echinocloa* spp., Nagapola (*Limnocharis flava*), *Salvinia*

spp. (watermosses) etc. were commonly observed in the farmers' fields. Farmers used weedicides for management of these weeds. Hand weeding was also practiced.

Ernakulam: In this district, rice cultivation was performed in Virippu, Mundakan and Puncha seasons. The rice cultivation was practiced in Narakkal, Paravoor, Aluva, Nedumbassery, Kalamassery, Vyttila, Perumbavoor, Angamaly, Keezhmad, Poothrikka, Moovattupuzha, Kothamangalam and Piravam blocks. Total cropped area of the district is 166827.54 ha of which 4600 ha was suitable for rice cultivation. Rice varieties namely, Uma, Jyothi and pokkali varieties were commonly cultivated in the region. Pokkali cultivation is mainly practiced in Narakkal, Paravoor, Vyttilla blocks. In addition to this, Aluva and Kalamassery block also practice the same.

Pokkali rice cultivation

A unique system of paddy cultivation is prevalent in this coastal belt is known as "Pokkali cultivation". The salient characteristics of this practice is that the rice can be cultivated only during the low saline phase / monsoon season which starts from June–July to mid of October. Rice cultivation starts strengthening of outer bunds in the month of April after setting up of sluices to control the level of water. The fields are then drained during low tide and the sluices are closed at high tide. When the soil becomes dry, it is heaped up to form mounds of about one-meter base and half a meter height and the mounds are then allowed to dry and weather. With the onset of monsoon during May-June, the salt is washed off from the mound soil and the water with the dissolved salts is drained off from the field. Tops of mounds become free from salts very soon and sprouted seeds are sown. These mounts act as elevated *in-situ* nursery and provide protection to seedlings from flash floods. In this cultivation system 'Pokkali' is the most popular variety used. Other varieties of the region are Choottu Pokkali, Chettivirippu, Cheruvirippu, Kuruka, Anakodan, Eravapandy, Bali, Orpandy etc.

The pokkali varieties have early seedling vigour and they attain a height of 40-45cm in 30-35 days. At this stage, when field conditions become favourable, the mounds were cut into pieces with a few seedlings intact with a clod of earth, which was uniformly spread in the field and seedlings being tall enough to survive in the flooded field condition. The clods of earth attached to the clumps give anchorage to the seedlings. Manuring or plant protection operations are generally not done by the farmers. Management of water level in the field is the only operation to be attended after spreading the seedlings. Standing water minimizes lodging and helps to keep the tall plants erect and therefore water level is kept constant with the growth of plants. In 'pokkali' cultivation where no chemical fertilizers are added, tidal ingress anyhow, plays an important role in maintaining the nutrient status of the soil. After transplantation, no intercultural operations are adopted in *Pokkali* farming. Since the water management is very important to minimise the loss due to flash flood, water level is raised as per the growth of the plant through sluice gate.

The important weeds are *Echinochola crusgalli, Eliocaris fistula, Fimbristyllis milliaceae, Monochoria vaginalis, Valisnaria spiralis, Nymphea sp., Marsilea quadrifolia, Astiracantha longifolia, Lymonophytta heretophylla, Sphenoclea zeylanica, Cyperus difformis, Ludwigia octovalois* etc. In addition, floating migratory weeds like *Salvinia auriculata, Eichornia crassippes, Lemna minor* also create problems in cultivation. The weed management in *pokkali* fields is by raising water level and allowing free flow of water into and out of the field. With the ingression of salt water during high saline phase, the weeds along with flaura and fauna decompose and add to soil fertility. Generally, the pest and disease attack in pokkali fields is below the

threshold level. The prevalence of natural enemies and predators, varietal resistance, single cropped system etc. can be attributed to the low incidence of pests and diseases. But there were incidence of stem borer (*Scirpophaga incertulus*), leaf roller (*Cnaphalocrosis medinalis*) and rice bug (*Leptocorisa acuta*) in pokkali fields. The farmers adopt organic cultivation only in pokkali. Eco friendly management practices like use of trichocards @ 5 cc per hectare may be encouraged for the management of stem borers and leaf folders in rice. The farmers are reluctant to use pesticides with a view to cause toxicity to the fishes and prawns. There are some other non-insect pests, which are particular to Pokkali crop. They are fishes, tortoises, rats and birds (purple swamp hens, sparrows, doves and parrots). Fishes of the genera *Ambassis*, *Anabas*, *Channa* etc. feed on the sprouting seeds (radicle and plumule and damage the seedlings). Doves and sparrows cause damage at the time of sowing and after flowering of the crop. The crop matures in about 110-120 days. Average yield of rice is only 1500-2000 kg per hectare, when traditional varieties are grown.

In other areas of Ernakulam district, farmers mainly rely on canal irrigation system for rice farming. Rainfed cultivation is also practiced. Weedy rice, *Echinocloa* sp., *Cyperus* sp. etc. were commonly observed. Application of weedicides was practiced for the management of weeds and weedicides like 2, 4-D, Nomini Gold, Adora, Tarak and other were commonly used weedicides. Incidence of several diseases, namely, brown spot, sheath blight, blast and false smut was recorded during the survey. Infestation of stem borer, leaf roller, brown plant hopper was common during the season. Timely application pesticides were done to reduce the incidence of both insects and diseases. Avian pest like purple moorhen is a serious threat to paddy cultivation. The rodents also caused damage in some paddy fields.

Prevalence of diseases and insect pests in Kerala in 2024

Districts	Diseases				
	Bl	BS	ShBl	GD	BLB
Alappuzha	L	S	M	S	S
Kottayam	L	M	S	M	S
Pathanamthitta	L	M	S	M	S
Thiruvananthapuram	L	M	M	M	S
Kollam	L	M	M	M	M
Ernakulam	L	M	M	M	S

Districts	Insect pests						
	SB	LF	BPH	GM	CW	Thrips	Leaf Miner
Alappuzha	L	M	S	L	S	M	M
Kottayam	L	S	S	L	L	M	L
Pathanamthitta	M	M	S	L	M	L	-
Thiruvananthapuram	L	S	S	-	L	M	-
Kollam	M	S	M	-	L	L	L
Ernakulam	L	L	M	L	L	M	L

Kerala-2-Pattambi (2024-25)

Districts surveyed: *Palakkad, Thrissur* and *Malappuram*

Particulars of survey area

District	Block	Village Panchayats
Palakkad	Palakkad, Alathoor, Nenmara, Chitoor, Ottapalam, Kuzhalmannam, Pattambi, Thrithala, Perumbadapp and Sreekrishnapuram	Mannoor (10.803616; 76.4693), Puthukkode (10.63; 76.45/10.64; 76.54), Vellayanaipadam, Kariyankode, Melarkode (10.59; 76.60), Puthanthara, Nalleppilly (10.73; 76.7), Lakkidi Peroor 2 (10.76; 76.43), Kottayl (10.64; 76.54/ 10.77; 76.56), Peringotukurissi (10.75; 76.48/10.71; 76.6), Vilayoor (10.89; 76.18), Koppam (10.53; 76.11), Chalisseri (10.73; 76.08), Maranjeri (10.73; 75.97), Sreekrishnapuam (10.9; 76.4) and Pookotukavu (10.9; 76.4)
Thrissur	Chovanoor and Wadakkancherry	Kadavaloor (10.7175; 76.0661), Arthat (10.6348; 76.0599), Desamangalam (10.7469; 76.2334), Karumathra, Kanjirakode, Parlikad (10.7867; 76.653145), Varavoor and Kumarappanal
Malappuram	Perinthalmanna, Wadakancherry, Tirur, Perumpadappu and Angadippuram	Koottilangadi, Mankada, Angadippuram, Aripra, Padinjarepadam, Elamkulam, Desamangalam, Mangalam, Maranjeri, Alamkode and Angadippuram

Widely cultivated rice varieties

District	Varieties
Palakkad	**HYVs**: Uma, Jyothi, Bhadra, Akshaya, Supriya, Manuratna, TC-5, Kanchana, CR, Matta, Ponmani, and others
Thrissur	**HYVs**: Uma, Bhadra, Jyothi, and others
Malappuram	**HYVs**: Uma, Ponmani, Aiswarya, Karuna and others

Production-oriented survey was conducted in the Palakkad, Thrissur, and Malappuram districts of Kerala from August 2024 to January 2025. The survey was carried out from the tillering to maturity stage of the crop. The predominantly cultivated rice varieties in these areas were Uma, Jyothi, Ponmani, Aishwarya, Supriya, Akshaya, Karuna, Bhadra, and Manuratna. Reported yield ranged from 1 t/ha to 8 t/ha. Major cropping sequences followed by the farmers were rice-rice, rice-rice-dhaincha, rice-rice-cowpea, rice-rice-fallow and others. Farmers adopted a seed rate of 75–80 kg/ha. For nursery preparation, they preferred applying only farm yard manure (FYM) in the nursery. Fertilizer application ranged from 25 to 85 kg N/ha, 12.5 to 25 kg P_2O_5/ha, and 0 to 40 kg K_2O/ha. Application of organic manure is not common among farmers. Farmers who are applying organic manures either use FYM or poultry manure and only a few adopted green manuring or green leaf manuring. A few farmers of Malappuram district used IFFCO product Seaweed Extract Concentrate (28% w/w) as a plant growth promoter. Transplanting is the common method of crop establishment and a few adopted dry sowing. The common weed species observed were *Echinochloa* spp., *Cyperus* spp., *Fimbristylis miliacea*, *Chara* spp. (green algae), *Pistia* spp. (aquatic weed), *Monochoria vaginalis*, *Isachne miliacea*, *Eichornia* spp., *Marcelia quadrifolia*,

Tridax procumbens, *Sacciolepis interrupta* and others. *Oryza rufipogon* was a serious problem in some pockets. Farmers used hand weeding and chemical herbicides for weed management. The major diseases observed, were bacterial blight, brown spot, sheath blight, and false smut. Bacterial blight was very wide spread and was recorded in very high intensity in many places surveyed. Among insect pests, stem borer and leaf folder were widespread and were recorded in high intensity in many places. The primary constraints faced by farmers included wild boar attacks, non-availability of good-quality seeds, pest and disease incidence, labour shortage, and high labour costs.

The production-oriented survey conducted in three major rice-growing districts of Kerala *viz.,* Palakkad, Thrissur, and Malappuram, revealed that farmers are increasingly concerned about changing climatic conditions, such as erratic rainfall and high temperatures. They emphasized the need for high-yielding varieties resistant to bacterial leaf blight and stem borer. Some farmers suggested the development of medium to long duration lodging-resistant varieties. The demand for drought and submergence resistant varieties, as well as high-yielding varieties suitable for DSR, was also highlighted. Furthermore, most farmers expressed a preference for rice varieties with enriched protein and iron content. Farmers face several challenges, including wildlife conflicts particularly wild boar attacks, labour shortages, high labour costs, limited availability of quality seeds, and significant crop losses due to pest and disease incidences. The district wise details of the survey are given below.

Palakkad: Production oriented survey was conducted in 16 villages (in 10 blocks) in this district when the crops were in tillering, booting and maturity stage. The details of the villages surveyed are presented in the Table. A total of 59 farmers were contacted during the survey. Majority of the fields surveyed were under rainfed lowland ecosystem. In general, climatic conditions were normal during both seasons. Commonly cultivated rice varieties were Uma, Jyothi, Bhadra, Akshaya, Supriya, Manuratna, TC-5, Kanchana, CR, Matta, Ponmani, and others. The predominant varieties grown in the district during kharif season were Uma and Jyothi. In rabi, major varieties were Uma and Ponmani. Major cropping sequences followed by the farmers were rice-rice, rice-rice-dhaincha, rice-rice-cowpea, rice-rice-fallow and others. Average rice yield in the district ranged from 3.5-7.5 t/ha. In some fields, yield was severely affected due to high incidence of bacterial blight and stem borer. Majority of the farmers contacted were (81%) were from medium income group and about 15% were from low income group. Rest of the farmers were from higher income group. Average per capita rice consumption was about 10-20 kg/ha and surprisingly many farmers contacted told that they are also including wheat in their diet. Majority of the farmers contacted told they use parboiled rice and coarse grain rice. Average seed rate used by the farmers ranged from 70-80 kg/ha. About 54% of the farmers contacted told that they treated the seeds with *Pseudomonas fluorescens* and *Pseudomonas fluorescens* + cow dung slurry if *Pseudomonas fluorescens* provided from Krishi Bhavans. As an indigenous practice, some farmers were using cow dung slurry for seed treatment. In the nursery, in general, farmers did not apply chemical fertilizers. During nursery preparation, farmers were applying only organic manure like FYM and green manure.

In the main field, fertilizer application ranged from 30-90 kg N / ha, 12.5 to 25 P_2O_5 / ha and 0-40 kg K_2O / ha. Farmers used Factomophos (20:20:0:13; 40 parts ammonium phosphate and 60 parts ammonium sulfate) and urea as N source and MOP for potassium. Some farmers applied Rajphos (Rajphos is a natural, organic, and eco-friendly fertilizer made from ground rock phosphate).

Application of organic manure is inadequate to meet the recommended dose. Only a small percentage of farmers applied FYM or poultry manure. The quantity varied from 1 to 3 t/ha. Green leaf or green manuring is very meagre. Majority of farmers followed random transplanting and a few adopted dry sowing especially in the second crop season. Very few applied plant growth regulator like Boom and Paddy Booster. In general, intensity of weeds was low to medium. Commonly encountered weeds were *Echinochloa* spp., *Cyperus* spp., *Fimbristylis miliacea*, *Chara* spp. (green algae), *Pistia* spp. (aquatic weed), *Monochoria vaginalis*, *Isachne miliacea*, *Eichornia* spp., *Marcelia quadrifolia*, *Tridax procumbens*, *Sacciolepis interrupta* and others. Hand weeding is the common practice adopted by most of the farmers. Only a few of them applied herbicides, recommended by extension officers or pesticide agencies for weed management. Pre-emergent weedicides used by farmer were Pyrazo sulfuron ethyl (Saathi)+ pretilachlor (Rifit) (0. 2kg/ha+1l/ha), bensulfuron ethyl + pretilachlor (10kg/ha) (Londax Power). Weedy rice problem is observed in some pockets of the district. Some of the common needs of the farmers were HYVs having resistance to bacterial blight and other pests and diseases, crop insurance, good quality seeds, skilled labour for different agricultural operations, protection measures from wild boar and supply of quality fertilizers. Implements used by farmers are weed cutter, tractor, threshers, power sprayer and combined harvester. Most of the farm machineries used are being hired by padashekhara samithis on payment basis. Majority of the farmers contacted (~ 77%) told that they purchased new seeds for sowing. Seeds are mainly procured either from government agencies or government approved agencies. Only a few depend private agencies for getting seeds. Farm saved seeds are also used by a few percentage of farmers. Sources of irrigation varies depending on the location. Deep tube wells and canal irrigation are the main source. However, farmers complained about shortage of water during critical period of crop growth. Electricity is the main source of power and no shortage in power is faced by respondents. Farmers reported shortage of urea, factomphos and MOP. Farmers contacted department officials, scientists from university and private agencies for getting information on fertilizer and pesticide use. Some of them rely on social media and fellow farmers for this information.

The incidence of pests and diseases were moderate to high. The major disease observed was bacterial blight. Other diseases observed were leaf blast, sheath blight, brown spot, false smut and bacterial leaf streak in low to moderate intensity. False smut was observed in high intensity in some fields of Ponmani. Bacterial blight was very wide spread and in some fields its intensity was very high. Very high intensity of BLB (to the tune of 40-95%) was recorded on varieties like Uma, Bhadra and Jyothi in villages like Peringotukurissi, Pookotukavu, Lakkidi-2 and Chalisseri, Puthukkod. Rice variety Jyothi was worst affected. Farmers find it very difficult to manage BLB even though they adopted most of the recommended practices. Commonly used chemical against BLB is streptocycline (100g/ha). Among different insect pests, stem borer, leaf folder, case worm, gall midge and rice bugs were observed in moderate to high intensity. High intensity of stem borer (up to 50% intensity) was recorded on varieties like Uma and Ponmani in Maranjeri village. High intensity of leaf folder (up to 80%) on Uma and Ponmani in Marangeri village and high intensity of gall midge (up to 60%) on Ponmani and Supriya in Vilayoor village. Different pesticides like Quinalphos (500 ml/ha), cypermethrin (300 ml/ha), Karate (1 ml/l), chorantraniliprole (3 ml/10 l), Koranda/Gambhir (chlorpyrifos 50% and cypermethrin 5% EC) (1 ml/l), lamda cyhalothrin (2 ml/l), Virtako (chlorantraniliprole 0.5% GR + thiamethoxam 1%) (2.5 kg/acre), cartap hydrochloride (25 kg/ha), acephate (2 g/l), flubendamide (1 ml/l) and Coragen (2 ml/l) for leaf folder and stem borer; imidacloprid (350 ml/ha) and thiomethoxam (2.5 g/10 l) for BPH and rice

bugs; Vayego (tetraniliprole 18.18% W/W SC) for gall midge and case worm; propiconazole (1 ml/l) and Nativo (0.4 g/l) for sheath blight and streptocycline (100 g/ha) for bacterial blight were used by the farmers. Farmers responded that they had to apply pesticides two to three times during a cropping period. They sometimes mix pesticides for reducing labour cost. Iron toxicity is a major abiotic problem in most of the areas. Farmers apply liming material, only if provided from Krishi bhavans. Farmers complained about the non-availability of quality seeds in required quantity. Serious menace caused by wild boars forces many farmers to withdraw from rice cultivation. High labour charge and lack of skilled labourers are also serious problems faced by farmers. They demanded more crop insurance schemes and ready payment from agencies like Supplyco for procured rice.

Thrissur: Production oriented survey was conducted in 8 villages (in 2 blocks) in this district when the crops were in tillering to maturity stage. A total of 22 farmers were contacted during the survey. Majority of the fields were under rainfed lowland ecosystem while some were under irrigated ecosystem. In general, weather conditions were normal for rice cultivation except some instances of excess rainfall. Commonly cultivated rice varieties in the district were Uma, Bhadra, Jyothi, and others. Cropping sequences followed by the farmers were rice-rice, rice-rice-vegetables and others. Average rice yield in Uma ranged from3800-6000 kg/ha. All the farmers contacted were from medium income group and per capita monthly rice consumption was 15-20 kg. Majority of the farmers contacted were only rice eaters while some included wheat in their diet. The preferred rice is parboiled and coarse-grained. Seed rate followed varied from 70 to 85 kg/ha. About 63% of the farmers contacted told that they adopted seed treatment with *Pseudomonas fluorescens* @10g/kg. In nursery they applied organic matter like FYM, poultry manure, green manure and vermicompost. None of the farmers contacted applied chemical fertilizers in the nursery. In the main fields fertilizers were applied @ 30-70 kg N/ha, 12.5-25 kg P_2O_5/ha and 15-35 kg K_2O/ha. Different fertilizers like factomphos, urea, MOP and others were used by the farmers. In the main fields some farmers applied FYM and green manure. Few applied sampoorna and paddy booster. Planting was random where plant population per unit area was not maintained. Application of lime is done only when provided from Krishi Bhavans. But recommended quantity of 600kg/ ha could never be met. Eventhough, they know about the benefits of green manuring, they do not adopt the practice due to the unavailability of required quantity of green manure and due to high labour cost. Intensity of weeds was low to medium. Commonly encountered weeds were low to medium. Common weeds observed were *Sacciolepis interrupta, Echinochloa* spp., *Pontederia crassipes* (formerly *Eichhornia crassipes*) and others. Most of the farmers followed hand weeding along with herbicide application. Pre-emergent herbicides, Pyrasosulphuronethyl+ Pretilachlor (0. 2kg/ha+1l/ha), Bensulfuron ethyl + Pretilachlor (10kg/ha) were successfully used by farmers for weed management. Some of the common needs of the farmers were good quality seeds, crop insurance and varieties resistant to bacterial blight and submergence. Equipments like tractor, thresher, tiller, combined harvesters and others were used by the farmers. Farm machineries like tractor and combined harvester were hired on payment basis by padashekhara samithis. Seeds are usually purchased from government agencies /government approved agencies. A few farmers use farm saved seeds also. Tube well is the main source of irrigation. No scarcity of water and electricity is there. Shortage of fertilizers, especially urea and MOP is a problem faced by farmers. Pesticides are readily available from approved agencies. Farmers maintain a good rapport with department of Agriculture officials and scientists from university company

representatives for information regarding fertilizer and pesticide use. A few of them are depending on pesticide dealers also.

Major disease encountered is bacterial blight. Very high intensity of bacterial blight (up to 55%) was recorded on varieties like Uma in Arthat, Kadavaloor, Desamangalam and Kanjirakode village. Other diseases observed were blast, sheath blight, brown spot and false smut in low to moderate intensity. Among the insect pests, stem borer and leaf folder were observed in high intensity. Repeated application of bleaching powder, streptocycline (100g/ha) are being done by farmers. However, quantity of spray volume applied is very low, instead of 500 l/ha, most of the farmers use only 200 to 250 l/ha. False smut is another important disease noticed and famers used propiconazole (500ml/ha) for its management. Farmers used insecticides like chlorpyriphos+cypermethrin@1l//ha, lambda cyhalothrin @750 ml/ha, chlorantraniliprole @ 150ml/ha, flubendiamide@ 50 ml/ha, cartap hydrochloride @12.5 kg/ha. They used to apply pesticides three to four times per cropping season. Mixing of pesticides is a common practice adopted by the farmers. High labour charge, unavailability of skilled labourers, are the serious problems faced by them.

Malappuram: Production oriented survey was conducted in 11 villages (in 5 blocks) when the crops were in maturity stage. A total of 43 farmers were contacted during the survey. The most common rice ecosystem is irrigated lowland. In general, climatic conditions were normal for rice cultivation except some instances of excess rainfall. Commonly cultivated rice varieties in the district were Uma, Ponmani, Aiswarya, Karuna and others. There was a drastic shift in the varietal profile compared to the previous year. Earlier, farmers preferred the Uma rice variety, but due to heavy disease incidence and low yield, many of the farmers shifted to Ponmani. Yield in different varieties varied from 1-8 t/ha. Most farmers belong to the medium economic category. All the farmers contacted told that they consumed only rice. They preferred parboiled rice and both fine and coarse grain rice. Farmers used seed rate of 70-85 kg/ha and majority of them treated the seeds with *Pseudomonas fluorescens* @ 10 g/kg before sowing. During the initial stages of land preparation, most farmers apply FYM and green manures as soil amendments, while some use poultry manure also. Additionally, a few farmers applied Seaweed Extract Concentrate (28% w/w), a growth enhancer. Most of the farmers follow direct sowing, while a few adopt transplanting. In the main field fertilizer application ranged from 25 to 80 kg N/ha, 15 to 30 kg P_2O_5/ha, and 0 to 40 kg K_2O/ha**.** Urea and Factomphos were the primary sources of nitrogen and phosphorus, Potassium was supplied as muriate of potash (MOP). Some of the farmers applied bleaching powder (5 kg/ha) along with fertilizer for the control of bacterial leaf blight. Weed intensity in the surveyed areas ranged from low to medium. The major weed species observed were *Echinochloa colona, Echinochloa crusgalli, Cyperus* spp., *Ludwigia perennis*, alligator weed (*Alternanthera philoxeroides*), *Sacciolepis interrupta* and others. *Oryza rufipogon* was a serious problem in some pockets. Hand weeding was the main weed control measure practiced by farmers in these regions. Few applied herbicides like pyrazo sulfuron ethyl (Saathi), pretilachlor (Rifit), 2,4-D and others. Some of the common needs of the farmers were availability of quality seeds, improved method of management of diseases like bacterial blight and stem borer management, proper supply of labours and flood tolerant rice varieties.

Farm machineries commonly used were tractors, power sprayers and combined harvesters. Padashekhara samithis hired the implements on payment basis. One instance of use of drone was also recorded. Only a few farmers use farm saved seeds, while majority of them procured seeds from government agencies. Most depended on shallow tube wells, while a few relied on canal

irrigation. Farmers did not face any difficulty in accessing irrigation water. Electricity was the primary source of power, and no power shortages were reported by the respondents. Farmers received fertilizers and pesticides on time and in sufficient quantities, and they are satisfied with their quality. For information on fertilizers and pesticides, farmers consulted department officials, university staff, and pesticide dealers. The incidence of pests and diseases ranged from moderate to high. The major disease observed was bacterial blight, while low incidences of sheath blight, brown spot and false smut were also noted. Very severe incidence (up to 50%) of bacterial blight was recorded on varieties like Aiswarya, Ponmani and Uma in villages like Mangalam, Maranjeri, Angadipuram, Padinjarepadam, Aripra and Koottilangadi. Among insect pests, high infestation (up to 50%) of leaf folder and stem borer were observed on varieties like Aiswariya, Uma and Ponmani in villages like Mangalam, Maranjeri and Mankada. Mild incidence of gallmidge in nursery stage andmoderate infestation of rice bug in milk stage was there. Most of the farmers applied streptocycline (100g/ha) for the management of bacterial blight. The commonly used insecticides included Vayego (tetraniliprole) (300 ml/ha), chlorantraniliprole (150ml/ha), flubendiamide (50 ml/ha), cartap hydrochloride (12.5 kg/ha), cypermethrin (300 ml/ha), lambda-cyhalothrin (750 ml/ha), acephate, fipronil and thiamethoxam (125g/ha). Farmers applied these pesticides two to three times per cropping season**,** ensuring that they did not mix different pesticides together. However, some farmers did not use any insecticide sprays. No deficiency or toxicity symptoms were reported in these areas. However, most farmers faced serious challenges in disease and pest management. Additionally, in some regions, high labour costs, unavailability of good-quality seeds, and weed infestation were also significant concerns. Some of the common problems faced by the farmers were labour shortage and very high cost of labour, weed management, non-availability of good quality seeds of HYVs and pest and disease incidence in early stage of the crop.

Incidence of diseases and pests in Kerala in 2024

Districts	**Diseases**					
	Bl	**ShBl**	**BS**	**FS**	**BLB**	**BLS**
Palakkad	L-M	M (10-20%)	L-M (5-10%)	M-S (10-30%)	M-S (10-95%)	L-M (5-15%)
Thrissur	L-M	M (10-20%)	M (15-20%)	M (20-25%)	M-S (15-55%)	-
Malappuram	L-M	L-M (5-10%)	L-M	L-M	L-S (5-50%)	

There was low to moderate (5-15%) incidence of sheath rot in Thrissur

Districts	**Insect pests**						
	SB	**LF**	**BPH**	**CW**	**GM**	**RB**	**AW**
Palakkad	L-S (5-50%)	L-S (5-80%)	M (15-20%)	M-S (10-30%)	M-S (10-60%)	M-S (10-30%)	M (10-20%)
Thrissur	S	S		L	L	M	
Malappuram	L-S (5-50%)	L-S (5-50%)		L	L	M	

Maharashtra-Karjat (2024-25)

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

Table 1: Details of survey

Districts	Taluka/Block	Villages
Thane	Shahapur, Ambernath, Kalyan and Murbad	Talwade, Rodwal, Ranviheeri, Dhapivali, Eranjad, Ambeshiv BK, Vaholi, Aapti, Rayate, Devgaon, Nahane and Mhasa
Palghar	Wada, Vikramgad, Dahanu, Vasai and Palghar	Kanchad, Nehalpada, Kambrath, Sajan, Aapte, Vasuri, Vanai, Bhuvane, Sakhare, Kopar, Aadne, Jambhulpada, Chahade, Navaze and Loware
Raigad	Karjat, Mangaon, Murud, Alibag, Pen, Mahad, Uran and Panvel	Kalamb, Pohi, Ware, Salegaon, Kalamje, Koshimbale, Aadad, Wande, Murud, Shreegaon, Poynad (Ambepur), Chaukicha Pada, Sonkhar, Durshet, Kharsapoli, Jite, Dasgaon, Vahoor, Veer, Pandive, Mothijui, Chirner, Wakadi, Kewale and Harigram
Ratnagiri	Chiplun, Khed, Lanja, Ratnagiri and Sangmeshwar	Kalambaste, Kapsal, Kondmala, Kalambani, Udhale, Khavati, Kurne, Gavhane, Punas, Tike-Bhatrewadi, Manushtyewadi (Harcheri), Osi, Aravali, Ozarkhol, Kolambe and Manaskond
Sindhudurg	Vaibhavadi, Kankavali, Kudal, Vengurla and Sawantwadi	Napne, Kokisare, Nadhawade, Waghori (Damre), Osargaon, Wagade, Salgaon, Aakeri, Mangaon, Aadeli, Tulas, Hodawada, Kunkeri, Bhom and Kolgaon

Table 2: Widely prevalent rice varieties

Districts	Varieties
Thane	**HYVs**: Karjat-3, MTU 1010, Jaya, Rupali (Ankur), YSR, Spriha 911, Shubhangi, Daptari 1008, Daptari 100, Daptari 250, Om Sree Ram-125, Daptari 125, Devaki, Jordar, Shabri, Wada Kolam, Akshet, Shree-101, Asmita, Jyotika, Avni, RTN-8, Karjat-3, Kajart-8, Komal, Ratna and Gujrat-11; **Hybrida:** Arize 6444, Upaj, Arize 6129, NPH-30, Ankur-6077, Paturu 3434, VNR 2245, NP-125, Kaveri-9090, KPH-468, Loknath, Gorakhnath and others
Palghar	**HYVs**: Karjat-3, Karjat-6, Komal 101, Silk 277, Suma, Saguna, Sindhu, Suvarna, Gujrat-11, Zordar, Poonam, Punam Gold, Wada Kolam, Samrudhi, Sundar, YSR, MTU-1010, Mahsuri, Shree-101, Daptari, Motu, Khushi, Kranti, MPR-404, Pooja Gold, Rupali, Wada Zinia, Akshad, Sampada, Sonal, Jyotika, Durga, Mahuli, Swarna, VIP, Safari, Jaya, Shree-1008, Mohini, Gold-78, Kaveri Suprim Sona, Yarana, Shatayu and CO-51; **Hybrids:** Champion, Winer, NP-125, Ankur-7576, Ankur-7434, Rasi-336, Rasi-113, NPH-30, Arize 6444 and Raja
Raigad	**HYVs**: Jaya, Komal-101, Suvarna, Prassana, Jyotika, Karjat-7, Wada Kolam, MTU 1010, Karjat-3, Rupali, Trupti, Ruchika, Ajita, Wada Zinia, Shree 101, Sarthi, MTU-7029, Avani, YSR, Supersona, KP 264, Kaveri Sona, Zordhar, Shubhangi, Shivani, Om Shri Ram, Amani, Narsimha, Ratna, Karjat-5, Swabhagya, Janaki and Nathpoha; **Hybrids:** Gorakhnath-509, NP-125, Loknath-505 and others
Ratnagiri	**HYVs**: Karjat-2, Jaya, Sonan, Komal-101, Sarathi, Ratnagiri 8, Sadna, Rupali, Trupti, Poonam, Vaishnavi, NR-241, Pooja, Wada Kolam, Sairam, NR-9, Prasana, Suvarna, Mohini, Shree-101, Karjat 7, Karjat-3, Ratnagiri 6, Jaya, Sai Ram, Karjat- 6, Karjat -9,

	Ratnagiri 1, Ratnagiri 8, Ratna, Daptari, Puja, Mohini, Prasanya , Kasturi, Saguna, Poonam gold and Sadana; **Hybrids:** Arize 6444, Ankur 7576, Syn 5251, Loknath 505, TATA -748, Gorakhnath, NPH-30, Upaj Mahiko 5566, Ankur 6444 and Others
Sindhu-durg	**HYVs:** Komal, Om Shree Ram-125, YSR, Sonam, Sri 101, Wada Kolam, Prasanna, Poonam, Poonam Gold, Trupti, Avni, Shubhangi, Vaishnavi, Jaishriram Gold, Chintu, MTU-7029 and Gold-78; **Hybrids:** Gorakhnath, Arize 6444, Arize 6129, Kaveri-9090, NPH-30 and others

Table 3: Particulars of rice area in different districts of Konkan region of Maharashtra (*Kharif*' 2024)

District	Total Geographical Area (ha.)	Total Cultivable Area (ha.)	Total Cultivated Area (ha.)	Net Irrigated Area (ha)	Area sown Under Rice (ha.)
Thane	955800	90000	54923	25000	54923
Palghar	534400	176300	142200	14980	76644
Raigad	715200	328600	124000	9455.5	98919
Ratnagiri	816400	60,000	45000	5000	45000
Sindhudurg	520700	79000	78000	7500	78000

Production oriented survey was conducted in the Konkan region of Maharashtra which is predominant rice growing belt with an average productivity of 2.58 (3.63 rough rice) t/ha. The region comprises of five districts viz. Thane, Palghar, Raigad, Ratnagiri and Sindhudurg. In Kharif-2024 season 360990 ha area was sown under rice cultivation in the region with HYV. The farmers of this region cannot grow any crop other than rice in Kharif because of high rainfall and geographically low land. The Production Oriented Survey for rice was undertaken at dough to maturity stage of crop during the month of second week of October-to last week of October 2024. The details of the places surveyed are presented in Table 1. The particulars of rice area in different districts of Konkan region are presented in Table 3. The details of different weather variables during the cropping season of 2024 in the five surveyed district are presented in Table 4. Weather conditions were in general favourable for rice cultivation in the region. The onset of monsoon took place in the second week of June. Therefore, farmers have sown the seed in second week of June. However, there was delay rainfall during the month of June 2024 at least fifteen days in North Konkan Costal Zone of the region. Moderate to heavy rainfall was received in almost all districts of Konkan region in the month of July. The maximum rainy days and highest rainfall was occurred in Sindhudurg district i.e.130 days with 5212.8 mm total rainfall followed by Raigad, Ratnagiri, Thane and Palghar districts were 102,111, 101, and 82 days respectively with total rainfall 4630.3 ,4294.8, 3622 and 3499mm. The total rainfall and its distribution in Konkan region were not much satisfactory. During the month of October 2024, there was rainfall in all the Districts of the region. Where as in south Konkan there was continues rainfall in the month of November also. Overall weather conditions were good at different growth stages of crop but, there was heavy rainfall at the time of maturity and harvesting of crop in many places in the entire region resulting in crop lodging and delay in harvesting.

The details of the varieties cultivated by different farmers are given in Table 2. Commonly grown rice varieties were Karjat-3, Karjat-6, Karjat-7, Karjat-2, MTU 1010, Jaya, Rupali (Ankur), YSR, Spriha 911, Shubhangi, Daptari 1008, Daptari 100, Daptari 250, Om Sree Ram-125, Daptari 125, Devaki, Jordar, Shabri, Wada Kolam, Akshet, Shree-101, Asmita, Jyotika, Avani, Poonam,

Sunder, Suma, Sindhu, Akshad, Saguna, Khusi, Suvarna, Kranti, Samrudhi, Komal-101, Mahuli, Silk-277, Pooja Gold, Poonam Gold, Motu, Jyotika, Durga, RTN-5, RTN-8, Ratnagiri-6, Sampada, CO-51, Prasanna, Trupti, Ruchika, Ajita, Wada Zinia, Sarathi, Swarna, Super Sona, KP 264, Kaveri Sona, Karjat5, Sonam, Shivani, Amani, Narshimha, Ratna, Nath Poha, Janki, Swabhagya, Sadna, Vaishnavi NR-241, Sree Ram NR-9, Mohini, Jai Shree Ram Gold, Chintu and Gold-78. Commonly grown rice hybrids were Arize 6444, Gorakhnath-509, Loknath-505, Upaj Mahyco 5566, Arize-6129, NPH-30, VNR 2245, NP-125, Kaveri-9090, Ankur-7576, Ankur-6077, Ankur-6444, KPH-468, Champion, Winner, Syn-5251 and Tata-748

Table 4: Weather data for different districts of Mahararahtra during *Kharif*' 2024

District/ Parameters	Months					
	Jun	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**
Thane						
RD	13.00	31.0	24.00	21.00	12	0.0
TR (mm)	472.33	2100	479.5	460.95	109.45	0.0
MMT (^{0}C)	32.37	29.02	30.83	29.93	30.08	25.95
T. Max (^{0}C)	40.44	34.00	36.77	36.47	38.98	38.59
T. Min (^{0}C)	24.31	24.04	24.89	23.39	21.19	13.31
SH	2.1	1.3	2.2	3.4	4.8	6.9
Palghar						
RD	15	23	17	22	5	0
TR (mm)	697.0	1369.0	663.0	689.0	81.0	0.0
MMT (^{0}C)	27.45	27.35	27.6	26.9	28.9	26.65
T. Max (^{0}C)	30.8	30.1	30.1	29.6	32.5	31.5
T. Min (^{0}C)	24.1	24.6	25.1	24.2	25.3	21.8
SH	0.6	0.0	0.0	0.0	9.3	8.9
Raigad						
RD	14.00	30.0	24.00	22.00	12	0.0
TR (mm)	507.1	2227.8	995.2	682.5	217.7	0.0
MMT (^{0}C)	29.9	26.5	28.2	27.75	28.37	26.64
T. Max (^{0}C)	34.1	29.1	31.3	31.1	33.86	34.83
T. Min (^{0}C)	25.7	23.9	25.1	24.4	22.89	18.45
SH	3.3	0.2	2.1	3.0	6.29	6.37
Ratnagiri						
RD	22	31	24	21	11	2
TR (mm)	815.4	2162.8	617.0	543.4	132.2	24
MMT (^{0}C)	27.1	25.25	25.85	25.4	26.75	23.55
T. Max (^{0}C)	31.5	28.2	29.3	29.2	32.3	32.5
T. Min (^{0}C)	22.7	22.3	22.4	21.6	21.2	14.6
SH	3.3	0.2	1.5	3.0	5.4	7.8
Sindhudurg						
RD	27	31	23	24	20	5
TR (mm)	1067.7	2041.3	1071.2	565.0	365.2	102.4
MMT (^{0}C)	26.5	25.1	25.9	26.4	27.15	25.85
T. Max (^{0}C)	31.1	29.3	30.4	31.2	33.3	34.8
T. Min (^{0}C)	21.9	20.9	21.4	21.6	21.0	16.9
SH	2.5	0.3	2.2	3.8	4.9	7.0

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 co-operator in consultation with the officials from state department of agriculture)

Parameters	Thane	Palghar	Raigad
Total area under HYVs (ha)	54923 ha	75,700 ha	98919 ha
Most prevalent HYVs in the district	Karjat-3, MTU 1010, Jaya, Rupali (Ankur), YSR, Spriha 911, Shubhangi, Daptari 1008, Daptari 100, Daptari 250, Om Sree Ram-125, Daptari 125, Jordar, Shabri, Wada Kolam, Shree-101, Asmita, Jyotika, Avni, RTN-8, Karjat-3, Kajart-8, Komal, Ratna and Gujrat-11	Karjat-3, Karjat-6, Komal 101, Silk 277, Gujrat-11, Zordar, Poonam, Punam Gold, YSR, MTU-1010, Mahsuri, Shree-101, Daptari, Kranti, Pooja Gold, Rupali, Wada Zinia, Sampada, Swarna, VIP, Safari, Jaya, Shree-1008, Mohini, Gold-78, Kaveri Suprim Sona	Jaya, Komal 101, Suvarna, Prassana, Jyotika, Karjat-7, Wada Kolam, MTU 1010, Karjat-3, Rupali, Wada Zinia, Shree 101, MTU-7029, YSR, Supersona, Kaveri Sona, Zordhar, Shubhangi, Om Shri Ram, Amani, Narsimha, Ratna, Karjat-5.
Total area under rice (ha)	4516 ha	1000 ha	1068 ha
Most prevalent rice hybrids in the district	Arize 6444, Upaj, Arize 6129, NPH-30, Ankur-6077, Paturu 3434, VNR 2245, NP-125, Kaveri-9090, KPH-468, Loknath, Gorakhnath	Champion, Winer, NP-125, Ankur-7576, Ankur-7434, Rasi-336, Rasi-113, NPH-30, Arize 6444	Gorakhnath-509, NP-125, Loknath-505,
Total area under basmati in the district	Nil	Nil	Nil
Most prevalent basmati varieties in the district	Nil	Nil	Nil
Seed replacement rate	100 %	100%	100%
Whether farmers are using any heavy equipment like transplanter/combine harvester	No	Used Power tiller operated harvester, Small Thresher	Yes, use transplanter and power tiller operated harvester
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	Nil	Nil	No
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Yes, IPM, IDM and weed management, mechani-zation in rice cultivation.	Different methods of Rice cultivation, IPDM, INM and mechanization in rice cultivation.	Improved Rice production methods, INM, IPM 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 or storage irrigation facilities.	Due to small land holding, farmers needs low cost mechanization.	Non-availability quality seeds and higher wages of the labour
Please provide any farmers association in the district	Farmer's groups registered under ATMA and "Agricultural Tools Bank" Association.	Farmer's groups registered under ATMA as a vegetables grower and Marketing purpose.	Co-operative Rice Seed Production Society, Vadap, Karjat; Shetkari Vikas Sanstha, Mahad; Vegetables growers and marketing groups under ATMA
Whether availability of agricultural labours is sufficient?	No	No, Non-availability and High wages of the labour	No
Whether there is any marketing problem of the produce?	Yes	Lack of marketing facilities	Yes.
Any major irrigation/power generation project in the district	3 Major and 15 Small Irrigation projects.	Bhatsa, lendi, Surya, DTPS and Wandri major and 16 minor irrigation projects	Ravalaje, Patnus, Kal, Rajnala, Hetawane major and 28 minor irrigation projets.
Any soil testing program undertaken?	Yes. Soil Health Improvement Program	Yes. Soil Health Improvement Program	No.
Any farmers' training program was organized by the state department of Agriculture/University	Integrated Rice Improvement and pest and disease management Program	Rice Crop Protection t Program and demonstrations	Hybrid Rice Improvement Program and demonstration

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

Parameters	Ratnagiri	Sindhudurg
Total area under HYVs (ha)	97977 ha	62416 ha
Most prevalent HYVs in the district	Karjat-2, Jaya, Sonan, Komal-101, Sarathi, Ratnagiri 8, Sadna, Rupali, Trupti, Poonam, Vaishnavi, Wada Kolam, Sairam, Prasana, Suvarna, Shree-101, Karjat 7, Karjat-3, Ratnagiri 6, Jaya, Sai Ram, Karjat- 6, Karjat -9, Ratnagiri 1, Ratnagiri 8, Ratna	Komal, Om Shree Ram-125, YSR, Sonam, Sri 101, Wada Kolam, Prasanna, Poonam, Poonam Gold, Trupti, Avni, Shubhangi, Vaishnavi, Jaishriram Gold, Chintu, MTU-7029 and Gold-78
Total area under rice (ha)	1723 ha	346
Most prevalent rice hybrids in the district	Arize 6444, Ankur 7576, Syn 5251, Loknath 505, TATA -748, Gorakhnath, NPH-30, Upaj Mahiko 5566, Ankur 6444	Gorakhnath, Arize 6444, Arize 6129, Kaveri-9090, NPH-30
Total area under basmati in the district	Nil	Nil
Most prevalent basmati varieties in the district	Nil	Nil
Seed replacement rate	100%	100%
Whether farmers are using any heavy equipment like transplanter/combine harvester	Use power tiller operated transplanter and harvester, electric thresher	Use power tiller for land cultivation
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	Nil	Some farmers used DSR technique.
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 Mechanization	Mechanization in harvesting, threshing, drum seeding 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 higher 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; Labour shortage and high rate of wages.
Whether there is any marketing problem of the produce?	Yes	Yes.
Any major irrigation/power generation project in the district	Natu nagar Irrigation Project, Ratnagiri Power Company is Major and 38 minor small-scale projects	Talamba, Aruna Tilari, Sarmala and Mahmmad Wadi Irrigation projects and 28 other minor projects.
Any soil testing program undertaken?	Nil	Yes. Soil Health Improvement Program organized by State govt.
Any farmers' training program was organized by the state department of Agriculture/University	Integrated Hybrid Rice Improvement Program and field demonstrations, Sheti Shala etc	Integrated Rice crop protection Program

Table 6: Variety/hybrid wise area coverage (ha) in different districts of Maharashtra during 2024

Variety/hybrids	Districts/area (ha)				
	Thane	Palghar	Raigad	Ratnagiri	Sindhudurg
HYVs/Improved					
Karjat – 3	1049.57	7000	700	47.25	
MTU 1010	791.275	5654	512.5		
Jaya	1541.2	500	5720	839.25	
Rupali (Ankur)	1259.75	205	570	405.2	
YSR	2707.475		362.5		329.075
Spriha 911	718.625				

Variety/hybrids	Districts/area (ha)				
	Thane	**Palghar**	**Raigad**	**Ratnagiri**	**Sindhudurg**
Shubhangi	301.95		350		245.4
Daptari 1008	303.475				
Daptari 100	265.8				
Daptari 250	759.75				
Om Sree Ram-125	380.675		677.5		279.575
Daptari 125	812.85				
Devaki	385.275				
Jordar	494.05	1285	725		
Shabri	419.1				
Wada Kolam	812.625	1571	1530	208.25	1007.85
Akshet	512.875				
Shree-101	300.85		255	91.5	321.05
Asmita	375.675				
Jyotika	239.875				
Avani	235.575		450		98.8
Poonam		7571		110.22	95.375
Sunder		4285			
Suma		2914			
Sindhu		2400			
Akshad		571			
Karjat-6		1428			
Saguna		1571			
Khusi		814	2030		
Suvarna		242		407	
Kranti		371			
Samrudhi		1285			
Komal-101		1857	2525	589	289.125
Mahuli		714			
Silk-277		1000			
Pooja Gold		928		289	
Poonam Gold		1571			72.275
Motu		771			
Jyotika		529	1170		
Durga		314			
RTN-5		285			
RTN-8				558.5	
Ratnagiri-6				125	
Sampada		1000			
CO-51		285			
Prasanna			1200	194	87.45
Karjat-7			800	45.8	
Trupti			525	328.75	78.175
Ruchika			555		
Ajita			405		
Wada Zinia			370		
Sarathi			467.5	404.4	

Variety/hybrids	Districts/area (ha)				
	Thane	Palghar	Raigad	Ratnagiri	Sindhudurg
Swarna			277.5		114.725
Super Sona			705		
KP 264			785		
Kaveri Sona			325		
Karjat5			275		
Sonam				538	543.525
Shivani			520		
Amani			262.5		
Narshimha			280		
Ratna			625		
Nath Poha			76		
Janki			120		
Swabhagya			40		
Karjat-2				580	
Sadna				372.96	
Vaishnavi NR-241				300.05	98.125
Sree Ram NR-9				172.8	
Mohini				151.5	
Jai Shree Ram Gold					133.825
Chintu					119.65
Gold-78					132.7
Others	5959.45	3071	1476	2096	717.3
Hybrids					
Arize 6444	773.2			451.48	258.48
Gorakhnath-509	916.92		40	74.48	25.25
Loknath-505	252.56		352	123	
Upaj Mahyco 5566	450			49.52	
Arize-6129	112.24				25.56
NPH-30	134.72			107.2	11.12
VNR 2245	90.2				
NP-125	138.76		440		
Kaveri-9090	194.32				11.08
Ankur-7576				153.2	
Ankur-6077	294.12				
Ankur-6444				47.84	
KPH-468	130.04				
Champion		140			
Winner		120			
Syn-5251				141.2	
Tata-748				103.96	
Others	1029.6	740		194.52	14.28

A. General Information, cropping system and rice yield: The details of the number of villages surveyed and number of farmers contacted are presented in Table 7. Rice is grown as a rain-fed crop due to heavy rainfall in the region. The most common cropping pattern adopted by farmers in the region is rice-fallow, rice-pulses (chick pea, green gram, pigeon pea, black gram, horse

gram, dolichos bean), rice-vegetables, rice-pearl millet/finger millet, rice-water melon, rice-sesamum and rice-groundnut. Sometimes farmers grow flowers like marigold after rice. The farming systems of Konkan region also includes 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, Sindhudurg and Ratnagiri districts. Common vegetables cultivated by the farmers in the region were lady's finger, cucurbits, dolichos bean, chilli, tomato, turmeric etc. Area covered by different rice varieties in different districts is presented in Table 6. Rice yield in the region was low and ranged from 2000-5000 kg/ha (Table 8). Rice yield in some of the surveyed places in most of the districts was affected due to submergence especially during maturity time, flash flood, uneven rainfall, poor crop stand due to low/ sub-normal dose of fertilizers, high incidence of bacterial blight and cultivation of low yielding local rice varieties.

Table 7: General information

Parameters	Thane	Palghar	Raigad	Ratnagiri	Sindhudurg
# of talukas/blocks covered	4	5	8	5	5
# of villages surveyed	12	15	25	16	15
# of farmers interviewed	19	15	26	17	15
Field ecosystem	RL (100%)	RL (100%)	RL (100%)	RL (100%)	RL (100%)
Weather conditions during cropping season	Weather conditions were in general favourable for rice cultivation in the region. The onset of monsoon took place in the second week of June. Therefore, farmers have sown the seed in second week of June. However, overall rainfall in the month of June was less and some farmers in Palghar did re-sowing of seeds. Overall weather conditions were good at different growth stages of crop but, there was heavy rainfall at the time of maturity and harvesting of crop in many places in the entire region resulting in crop lodging and delay in harvesting.				
Crop stage when survey was made	Maturity	Maturity	Maturity	Maturity	Maturity
Crop rotations	Rice is grown as a rain-fed crop due to heavy rainfall in the region. The most common cropping pattern adopted by farmers in the region is rice-fallow, rice-pulses (chick pea, green gram, pigeon pea, black gram, horse gram, dolichos bean), rice-vegetables, rice-pearl millet/finger millet, rice-water melon, rice-sesamum and rice-groundnut. Sometimes farmers grow flowers like marigold after rice. The farming systems of Konkan region also includes 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, Sindhudurg and Ratnagiri districts.				

RL: Rainfed lowland

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

Varieties	Yield (kg/ha) in different districts of Maharashtra					Remarks
	Thane	Palghar	Raigad	Ratnagiri	Sindhudurg	
Ratna	2500-3500	3500			1000-2700	Rice yield in some of the surveyed places in most of the districts was affected due to submergence especially during maturity time, flash flood, uneven rainfall, poor crop stand due to low/ sub-normal dose of fertilizers, high incidence of bacterial blight and cultivation of low yielding local rice varieties.
RTN-8	3000			3300	3500-4000	
KJT-8	3000					
Karjat-3		2500-3500	4000			
Karjat-2				3000		
YSR	3000	2500	2500-4000			
Komal	2250	1100	1500-3500	2800-3200	1000-3500	
Gujarat-11	1100-2400					
Avani	2975		2700			
MTU-1010		3000		2000		
Suvarna		1800-3000	1500-4500	2800-3000	3000-3400	
Mohini		3500				
Mahsuri		1400				
Daptari		2000				
Shree-101			4000			
Wada Kolam			2500-3000	3500-3600	2222-3300	
Jaya			1500-5000	1333	1200-3000	
Sarthi			2500-3500	3050-3300		
Rupali			3500	1500		
Kolam			560			
Devki			4464			
Sonam				5000		
Vaishnavi				3200		
Trupti				3000		
Swati					2900	
Walai					1400	
Kranthi					2700	

B. Rice consumption pattern: Survey was conducted on consumption pattern of rice among the farmers in different districts of Konkan region of Maharashtra (Table 9). Majority (~74%) of the farmers contacted were in the medium income group and rest were in poor category. Average per capita consumption of rice per month was 3-6 kg rice. More than 80% of the farmers contacted told that their main meal consisted of both rice and wheat (chapatti). Few also told that they took finger millet along with rice. Almost all the farmers contacted in different districts told that they used polished rice. In addition, some farmers (26-28%) from Thane and Sindhudurg districts also took parboiled rice along with polished rice. Regarding grain quality, more than 96% farmers in different districts told that they preferred fine grain quality rice. However, some farmers (40-42%) farmers from Thane and Sindhudurg told that they also used coarse grain rice varieties for consumption. In general, there was no change in the food habit except that some farmers included finger millet in their diet.

Table 9: Details of rice consumption pattern

Parameters	Districts				
	Thane	**Palghar**	**Raigad**	**Ratnagiri**	**Sindhudurg**
Status of farmers	Medium income (42.9%); Poor (57.3%)	Medium income (46.7%); Poor (53.3%)	Medium income (92.3%); Poor (7.7%)	Medium income (88.2%); Poor (11.8%)	Medium income (100%)
Per capita monthly rice consumption (kg)	3-5 kg	4-5 kg	4-5 kg	3-5 kg	4-6 kg
Composition of main meal	Rice + Wheat (85.7%); Rice + Finger millet (14.3%)	Rice + Wheat (100%)	Rice + Wheat (100%); Rice + Finger millet (3.8%)	Rice + Wheat (100%)	Only rice (13.3%); Rice + Wheat (80%); Rice + Finger millet (6.7%)
Preferred rice types	Polished rice (100%); Parboiled (28.6%)	Polished rice (100%)	Polished rice (100%); Parboiled (3.8%)	Polished rice (100%)	Polished rice (100%); Parboiled (26.7%)
Rice grain type preference	Fine grain (100%); Coarse grain (42.9%)	Fine grain (100%)	Fine grain (96.1%); Coarse grain (11.5%)	Fine grain (100%)	Fine grain (100%); Coarse grain (40%)
Any changes in food habit in last 10 years	No (100%)	No (100%)	No (100%)	No (100%)	No (100%)

C. Nursery and main field Management: In general, planting was done during 2nd to 4th week of July (Table 10). Average seed rate used by the farmers ranged from 30-45 kg/ha for high yielding rice varieties and about 25 kg/ha in case of hybrids. On an average, about 23% of the farmers contacted told that they treated the seeds with thiram (2.5-3 g/kg seeds). On an average 80% of the farmers contacted told that they applied organic matter like FYM and poultry manure in the nursery. All the farmers contacted told that they applied chemical fertlizers like urea @ 0.2-2 kg/R or urea (0.5-1 kg/R) + suphala (15:15:15) @ 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'. In few cases farmers will manually remove the weeds. Farmers use 25 to 30 days old seedlings for transplanting. This year monsoon was in time in the month of June farmers did their sowing in time and completed their transplanting up to last week of July. Transplanting was random and average plant population was 30-35 hills/m2. In some part of Raigad district in saline soils farmers do not transplant the rice seedling but uprooted seedlings are uniformly scattered in the puddle fields locally called as 'Awatni'. Fertilizers were applied @ 23.23-262 kg N/ha, 3.75-75 kg P_2O_5/ha and 3.75-75 kg K_2O/ha (Table 11). None of the farmers contacted applied zinc sulphate. While most of the farmers applied nitrogenous fertilizers, about 42% of the farmers applied P and K fertilizers. Fertilizers like urea, 15:15:15, 18:18:10, Suphala (15:15:15), 18:18:18, 19:19:19 (Sampurna) and DAP (18:46:0) were

used by the farmers. Few farmers applied only urea. About 20% of the farmers contacted applied FYM (1-5 t/ha) depending on its availability (Table 11).

Table 10: Details of nursery management

Parameters	Districts				
	Thane	**Palghar**	**Raigad**	**Ratnagiri**	**Sindhudurg**
Planting time	2nd-4th Week of July	2nd-4th Week of July	2nd-4th Week of July	2nd-4th Week of July	2nd-4th Week of July
Seed rate	30-40 kg/ha	35-45 kg/ha	30-35kg/ha	30-40 kg/ha	30-35kg/ha for HYVs; 25 kg/ha for hybrids
Seed treatment (% farmers adopted)	Yes (33.3%)	Yes (6.7%)	Yes (7.7%)	Yes (35.3%)	Yes (33.3%)
Chemicals used for seed treatment	Thiram (3 g/kg seeds)	Thiram (2.5 g/kg seeds)	Thiram (2.5 g/kg seeds)	Thiram (3 g/kg seeds)	Thiram (2.5-3 g/kg seeds)
Organic manure in nursery (% farmers adopted)	Yes (81.8% only); FYM	Yes (86.7% only); FYM, poultry manure	Yes (61.5% only); FYM	Yes (88.2% only); FYM	Yes (84.6% only); FYM
Inorganic manure in nursery (% farmers adopted)	Yes (100% farmers); Urea @ 0.5-1.5 kg/R or urea (0.5-1 kg/R) + suphala (15:15:15) @ 0.5-1 kg/R*	Yes (100% farmers); Urea @ 0.2-2 kg/R or urea (0.5-1 kg/R) + suphala (15:15:15) @ 0.5-1 kg/R*	Yes (100% farmers); Urea @ 0.5-1.5 kg/R or urea (0.5-1 kg/R) + suphala (15:15:15) @ 0.5-1.5 kg/R*	Yes (100% farmers); Urea @ 0.5-2 kg/R or urea (0.5-1 kg/R) + suphala (15:15:15) @ 0.5-1 kg/R*	Yes (100% farmers); Urea @ 0.5-1.5 kg/R or urea (0.5-1 kg/R) + suphala (15:15:15) @ 0.2-1.5 kg/R*
Weed management in nursery	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'. In few cases farmers will manually remove the weeds				

1R=1000 sq. ft

Table 11: Details of main field management

Details	Districts					Remarks
	Thane	**Palghar**	**Raigad**	**Ratnagiri**	**Sindhudurg**	
Planting method	Farmers use 25 to 30 days old seedlings for transplanting. This year monsoon was in time in the month of June farmers did their sowing in time and completed their transplanting up to last week of July. Transplanting was random and average plant population was 30-35 hills/m2. In some part of Raigad district in saline soils farmers do not transplant the rice seedling but uprooted seedlings are uniformly scattered in the puddle fields locally called as 'Awatni'.					Fertilizers like urea, 15:15:15 18:18:10, Suphala (15:15:15), 18:18:18, 19:19:19 (Sampurna) and DAP (18:46:0) were used by the farmers; Few farmers applied only urea. FYM app-lication by progressive farmers
Total N applied	23.23-142 kg/ha (100 % farmers applied)	46-152.5 kg/ha (100 % farmers applied)	28.75-262 kg/ha (100 % farmers applied)	46-130 kg/ha (100 % farmers applied)	30.66-115 kg/ha (100 % farmers applied)	
Total P_2O_5 applied	7.5-18.75 kg/ha (35.7 % farmers applied)	7.5-37.5 kg/ha (46.7 % farmers applied)	3.75-18 kg/ha (30.8 % farmers applied)	11.25-75 kg/ha (58.8 % farmers applied)	3.75-7.5 kg/ha (40 % farmers applied)	
Total K_2O applied	7.5-18.75 kg/ha (35.7 % farmers applied)	7.5-37.5 kg/ha (46.7 % farmers applied)	3.75-18 kg/ha (30.8 % farmers applied)	11.25-75 kg/ha (58.8 % farmers applied)	3.75-7.5 kg/ha (40 % farmers applied)	
$ZnSO_4$ applied	Nil	Nil	Nil	Nil	Nil	
Organic fertilizer applied	Yes (21.4%) FYM (2 t/ha)	Yes (33.3%) FYM (1-5 t/ha)	Yes (11.5 %) FYM (2 t/ha)	Yes (29.4%) FYM (2 t/ha); GM (100 kg/ha)	Yes (13.3%) FYM (4-5 t/ha)	

D. Weeds and their Management: Overall, intensity of weeds was low. The details of different weeds recorded in different districts are presented in Table 12. 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.

E. 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 financial support to purchase farm inputs for crop management.
- Farmers need low cost mechanization suitable for Konkan region to overcome labour problem.
- Farmers need quality and availability of seed and fertilizers in time.

Table 12: Weeds and weed management

Details	Districts					Remarks
	Thane	Palghar	Raigad	Ratnagiri	Sindhudurg	
Weed intensity	Low					
Names of the weeds	*Isachne globosa, Cyperus dufformis, Cyperus rotundus, Cyperus iria, Echinochloa colona, Echinochloa crusgalli, Eleusine indica, Convolvulus arvensis, Celosia argentea, Ludwigia octovalvis, Ischaemum rugosum, Alternanthera triandra, Amaranthus spinosus, Leptochloa chinensis, Saccharum spontaneum, Cassia occidentalis, Ficus virens, Digitaria* spp. *Cynodon dactylon*, *Chenopodium album*, and *Mimosa pudica*					Weeds were common in most of the fields surveyed
Weedicides used	Nil; Out of 92 farmers contacted, none used weedicide for the management of weeds. All the farmers contacted practiced only hand weeding (1-2)					
% of farmers applied herbicides	Nil	Nil	Nil	Nil	Nil	
Wild/weedy rice incidence	Nil	Nil	Nil	Nil	Nil	

F. 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. None of the farmer has harvester or thresher. In Thane and Palghar districts farmer has formed some "Farmers Agricultural Machinery and Tool Bank" to overcome labours problem in the district with support of Zilla-parishad. Exact information on seed replacement ratio in the region during Kharif 2024 is not available. Most of the farmers in Konkan region are having small land holding. Our cooperator reported that most of the farmers contacted purchased 90-100% of their seed requirement. Seeds of improved varieties are supplied by Government agencies viz. Panchayat Samittee, Zilla Parishad, Agricultural Department, Agricultural University, Research Stations etc. Krishi Udyog Kendras. Most of the farmers purchase seed every season, from private agro service centers and private seed companies as well as Agril. Research Stations. Shallow and deep tube well, canal (few), river water and natural rain water were the main sources of irrigation. On an average 68% of the farmers contacted told that there was scarcity of irrigation water. More than 70% of the farmers contacted except Thane district told that inputs like fertilizers and pesticides were not available in time and on an average 84% farmers told that they were not satisfied with their quality. In addition to their own decisions, farmers got advices from private dealers and officials of state department of agriculture and university.

Table 13: Details of inputs used

Details	Districts				
	Thane	Palghar	Raigad	Ratnagiri	Sindhudurg
Implements used	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. None of the farmer has harvester or thresher. In Thane and Palghar				

Details	Districts				
	Thane	Palghar	Raigad	Ratnagiri	Sindhudurg
	districts farmer has formed some "Farmers Agricultural Machinery and Tool Bank" to overcome labours problem in the district with support of Zilla-parishad.				
Seed replacement rate in 2022	Exact information on seed replacement ratio in the region during Kharif 2024 is not available.				
Source of seeds	Most of the farmers in Konkan region are having small land holding. Our cooperator reported that most of the farmers contacted purchased 90-100% of their seed requirement. Seeds of improved varieties are supplied by Government agencies viz. Panchayat Samittee, Zilla Parishad, Agricultural Department, Agricultural University, Research Stations etc. Krishi Udyog Kendras. Most of the farmers purchase seed every season, from private agro service centers and private seed companies as well as Agril.Research Stations.				
Source of irrigation	Deep tube well, Bore well, river and Rain water	Shallow tube well, Bore well and Rain water	Bore well, river and Rain water	Deep tube well, Bore well and Rain water	Canal and Rain water
Scarcity of irrigation water	Yes (64.3% farmers)	Yes (66.7% farmers)	Yes (65.4% farmers)	Yes (58.8% farmers)	Yes (86.7% farmers)
Availability of fertilizers/pesticides	Available (100%)	Not Available (86.7%)	Not Available (100%)	Not Available (70.5%)	Not Available (100%)
Quality of fertile-zers/pesticides	Not Happy (64.3%)	Not Happy (86.7%)	Not Happy (100%)	Not Happy (70.5%)	Not Happy (100%)
Advisors to the farmers	Own decisions (78.5%) Dealers (28.6%)	Own decisions (93.3%); Dealers (6.7%)	Own decisions (100%); Deal-ers (42.3%); State dept (11.5%); Univ (11.5%)	Own decisions (88.2%); Dealers (29.4%); Univ (5.8%)	Own decisions (100%);Dealers (26.7%); State dept (6.7%); Univ (6.7%)

G. Biotic stress and their management: District wise prevalence of different diseases and insect pests are presented in Table 14. During 2024, intensity of most of the diseases and insect pests were recorded in low to moderate except bacterial blight was high in different fields in Thane, Palghar, Raigad and Ratnagiri. The incidence of bacterial leaf blight disease was found medium to severe particularly in lowland areas where crop submerged with water during heavy rainfall in Raigad, Thane and Palghar districts of Konkan region. Most of the fields were observed infected with bacterial leaf blight disease in Raigad, Palghar and Thane districts, particularly on varieties like Komal, Wada Kolam, Suvarna, Sarthi, Trupti, Karat-2, Kranti, Jaya, Zordar and Modak, to the tune of 2-30 per cent. Severity of false smut was found less in but was high in variety Komal in Konkan region. Sheath rot incidence was in low to moderate range in all the districts of Konkan, but on Komal it was severe above 30 percent at RARS, at farmers' field in Raigad. Leaf blast and sheath blight incidence was observed moderate in some paddy fields at Kudal, and Sawantwadi tehsil. There was low to medium incidence of stem borer noticed on varieties Sarthi, Karjat-3, Karat- 5, Komal, Zordar, Wada Kolam and Jaya during survey in most of the fields in all the districts. In Alibagh taluka incidence of caseworm was noticed on variety Jyotika upto 10 % as well as Armyworm at Panvel taluka. In some fields of Palghar district, gundibug incidence was noticed in variety Sunder and Karat-3 in low intensity. Crabs and Rat incidence was low in every field in the region. The attack of leaf folder was also noticed in the some of the entries in the district

but incidence was very low. Pesticides use by the farmers in the region was very low (Table 15). Very few farmers (5-7%) from Thane, Raigad and Ratnagiri applied pesticides like phorate and cypermethrin for management of stem borer and lamda cyhalothrin 5%EC (2 ml/l) for case worm (Table 15).

Table 14: Prevalence of diseases and insect pests in Konkan region of Maharashtra during *Kharif'* 2024

District	Bl	ShBl	FS	ShR	BLB
Thane	L-M (5-10%)	-	VL	L-M	M -S
Palghar	-	-	T (1-2%)	L-M (2-10%)	M-S
Raigad	L	L	L (1-5%)	M-S	M –S (5-30%)
Ratnagiri	M	L-M (5-10%)	L (2-5%)	L-M (5-10%)	M-S
Sindhudurg	L-M (5-10%)	-	L-M (5-10%)	L-M (5-10%)	L (4-5%)

District	SB	LF	GB	AW	CW	CRB/ Rat
Thane	L-M (2-10%)	L	-	-	-	L
Palghar	L (1-5%)	-	L-M (1-12%)	-	-	L
Raigad	L-M (2-10%)	L	-	L (1-5%)	L-M (1-10%)	L
Ratnagiri	L-M (2-10%)	L	L (2-5%)	L-M (2-10%)	L (2-5%)	L
Sindhudurg	L-M (2-10%)	L	-	L (2-5%)	L	L

Table 15: Details of pest management

Details	Districts				
	Thane	Palghar	Raigad	Ratnagiri	Sindhudurg
% age farmers adopting plant protection	6.7%	Nil	7.7%	5.9%	Nil
Names of pesticides	Phorate for management of stem borer	NA	Phorate for stem borer and lamda cyhalothrin 5%EC (2 ml/l) for case worm	Cypermethrin (1 ml/l) for stem boer	NA
# of pesticide sprays	1	NA	1	1	NA
Mixing of pesticides before application	Nil	Nil	Nil	Nil	Nil
Zinc deficiency	Nil	Nil	Nil	Nil	Nil
Iron deficiency	Nil	Nil	Nil	Nil	Nil

Table 16: Researchable issues

Parameters/Issues	Thane	Palghar	Raigad	Ratnagiri	Sindhudurg
Rice ecology in your area	Rainfed lowland				
Rice cultivation only in Kharif or both Kharif and Rabi	Kharif				
Number of years of experience in rice farming	>20 years in all the districts except about 23-35% farmers in Thane and Ratnagiri have 10-20 years of experience				
Main biotic constraints (diseases) in your area according to you	Leaf blast, bacterial blight, sheath Rot	bacterial blight, sheath Rot and false smut	Bacterial blight and sheath rot	Sheath rot, Blast, bacterial blight and sheath blight	Leaf blast and sheath rot
Extent of disease damage	<10%	<10%	<10%	<10%	<10%
Main biotic constraints (Insect pests) in your area according to you	Stem borer	Stem borer and gundhi bug	Stem borer	Stem borer	Stem borer,
Extent of insect pest damage	Below 10%				
Main abiotic constrains in your area according to you	Submergence/flash flood				
Production constraints in your area according to you	Scarcity of agricultural labours, lack of irrigation facilities and lack of mechanization				
Irrigation facilities in your area	Lacking	Lacking	Lacking	lacking	Lacking in some areas
Normally how many years it takes to change the rice variety	5-10 years	5-10 years	5-10 years	5-20 years	5-20 years
Any other rice production issues in your area which the rice scientists need to address	-				
What is urgently required in your area as far as rice varieties are concerned					
Duration	HYVs suitable for DSR and HYVs having lodging resistance				
Biotic stress resistance	Varieties having resistance to BLB, blast, sheath rot, stem borer and false smut				
Abiotic stress resistance	Varieties tolerant to submergence and drought				
Preferred grain quality	MS grain rice varieties and aromatic short grain				
Nutritional quality	Varieties with high Zn and iron and low GI				

H. Researchable issues: Among the biotic stresses, major problems in the region are bacterial blight, blast, false smut, sheath rot, sheath blight and stem borer and among abiotic stresses, submergence and flash flood are the major problems (Table 16). Farmers want varieties suitable for DSR, medium duration varieties with lodging resistance, varieties resistant/tolerant to above mentioned biotic constraints and bio-fortified varieties with higher zinc, high iron and low GI.

Puducherry-Karaikal (2024-25)

District surveyed: *Karaikal*

Particulars of Survey

District	Villages
Karaikal	Neravy, Surakudi, Devamapuram, Vadathamangalam, Ambagarathur, Agaramangudi, Kezhaponbethi, Melakasakudi, Kurumbagaram, Nedungadu, Annavasal, Kottucherry, Kezhaveli and T.R. Pattinam

Widely cultivated varieties

District	Varieties
Karaikal	**Samba Season**: ADT 37, ADT 38, ADT 39, ADT 45, ADT 46, ADT 51, BPT 5204, Improved White Ponni (IWP), CO 43, CO 50, CO 51, CR 1009 (Ponmani), CR 1009 Sub1, TKM 13, NLR, KKL (R) 2, TRY 3, Karuppu Kavuni, Seeraga Samba and Thanga Samba; **Kuruvai Season**: IR 20 and CO 51

During 2024-25, the Kuruvai crop (June-July) was cultivated across 802.72 hectares, producing 2,755.770 metric tons with a productivity of 3.433 metric tons per hectare. The Samba crop (August-January) covered 3,686.15 hectares, while Thalady (September-October) and Navarai (December-January) were grown on 768.17 hectares and 31.59 hectares, respectively, bringing the total cultivated area to 5,288.63 hectares. Farmers relied on canal water, bore wells and farm ponds for irrigation. A comprehensive production-oriented survey was conducted in 15 villages across the district. The survey was carried out across five communes *viz.,* Neravy, Thirunallar, Nedungadu, Kottucherry, and Thirumalairayan Pattinam encompassing fourteen villages including Neravy, Surakudi, Devamapuram, Vadathamangalam, Ambagarathur, Agaramangudi, Kezhaponbethi, Melakasakudi, Kurumbagaram, Nedungadu, Annavasal, Kottucherry, Kezhaveli and T.R. Pattinam in the Karaikal district. During the survey, a total of 51 farmers representing different farming categories, including small, marginal and large-scale farmers were interviewed between December 2024 and February 2025 to have a comprehensive understanding of various aspects of rice cultivation, such as cropping patterns, irrigation practices, varieties preferred, challenges faced and other cultivation strategies adopted during rice cultivation. The survey provided first-hand insights into practical realities of rice farming, highlighting opportunities to improve productivity and sustainability in this region.

Varieties and cropping system: Short-duration rice varieties such as IR 20 and CO 51 were cultivated during the Kuruvai season. In the Samba season, a diverse range of varieties, including ADT 37, ADT 38, ADT 39, ADT 45, ADT 46, ADT 51, BPT 5204 Improved White Ponni (IWP), CO 43, CO 50, CO 51, CR 1009 (Ponmani), CR 1009 Sub1, TKM 13, NLR, KKL (R) 2, TRY 3 were cultivated primarily utilizing Cauvery water. Among these varieties, BPT 5204 (Samba Masuri) is highly preferred by the farmers in this region for its high market demand, better selling price and better profitability. On the other hand, traditional rice varieties**,** such as Karuppu Kavuni, Seeraga Samba, and Thanga Samba**,** are cultivated by few farmers for self-consumption rather than commercial purposes. Karaikal district, situated in the Union Territory of Puducherry, is primarily an agricultural region with a rice-centric cropping pattern**.** The predominant cropping sequences include rice-pulse and rice-rice-pulse**,** while in areas with assured borewell irrigation, farmers also practice the rice-cotton system. Rice is the primary crop of Karaikal region grown during Kuruvai

(June to September) and Samba season (August to January). Pulses such as green gram or black gram was cultivated in the Rabi season (October to March) by utilizing the residual moisture in the field. The survey revealed that paddy cultivation in Karaikal district primarily relied on canal irrigation from the Cauvery River, farm ponds and groundwater resources like bore wells.

Rice consumption pattern: Survey was conducted on consumption pattern of rice among the farmers in different surveyed districts of Karaikal Puducherry. Majority (>90%) of the farmers contacted were from medium income group. Average per capita monthly consumption of rice per month was 5-15 kg rice. On an average about 70% of the farmers contacted told that they consumed both wheat and rice and rest told that they preferred only rice. In general, they preferred parboiled rice. Regarding grain quality, majority of the farmers contacted told that they preferred fine grain rice. About 23% of the farmers contacted told that they have started using millets and traditional rice varieties like red rice, Karuppu Kavuni etc in their food habit.

Nursery and main field management: Majority of farmers obtained seeds from local Agro Service Centres and suppliers in neighbouring districts of Tamil Nadu. Few farmers used their own saved seeds, especially traditional varieties. Additionally, some farmers obtained seeds from Pandit Jawaharlal Nehru College of Agriculture and Research Institute (PAJANCOA & RI), Karaikal. Rice is cultivated using two primary methods such as direct sowing and transplanting**.** Due to labour shortages during peak cultivation periods**,** such as transplanting and harvesting and the need to reduce cultivation cost, many farmers prefer direct sowing**,** as it requires less labour and eliminates the need for nursery preparation and transplantation**.** The seed rate for direct sowing ranges from 50 to 75 kg per hectare**,** while for transplanting, it is 40 to 50 kg per hectare**.** Majority of the farmers contacted applied fertilizers like DAP (15-22 kg/ha) and urea (10-25 kg/ha) in the nursery. In the main fields (both in case of transplanted rice and in case of direct sowing), fertilizers were applied @ 100-150 kg N/ha, 30-50 kg P_2O_5/ha and 30-50 kg K_2O/ha. Organic manures such as FYM @ 12.5 t/ha, goat manure 2000-3000 kg/ ha and neem cake @ 12.5 t/ha were being applied by the farmers.

Weeds and their management: Weeds, including grasses, sedges, and broad-leaved species, were commonly observed in rice fields. Sedges and Grasses were the dominant weed types in this region. Key grassy weeds identified in the fields included *Leptochloa chinensis, Echinochloa colona*, *Echinochloa crusgalli*, and various *Digitaria* species. Among the sedges, *Cyperus rotundus*, *Cyperus iria*, *Cyperus deformis*, and *Fimbristylis miliacea* were prevalent. Broad-leaved weeds such as *Marsilia quadrifoliate, Eclipta alba*, *Ludwigia parviflora* and *Ludwigia abyssinica* were found to be significant competitors for the rice crop in most surveyed areas. Farmers in the Karaikal region employ both mechanical and chemical methods to manage weed growth. They typically perform hand weeding twice, on the 25-30 and 45-50 days after transplanting, by hiring 6-7 labourers per acre. Additionally, some farmers used herbicides such as Bispyribac Sodium (10% SC), available under the trade names Nominee Gold or Adora, at a rate of 80-200 ml per acre, as well as Butachlor at 2.5 l per hectare, Rice star (Fenoxaprop-p-ethyl 6.9 EC) at 400 – 500 ml/acre, Council active (Triafamone 20% + Ethoxysulfuron 10% WG) at 90 g per acre and Londax power (Bensulfuron methyl 0.6 + pretilachlor 6 gr) 4-5 kg / ac. The details of different weedicides used by the farmers in Kariakal and their target weeds are presented in the Table below

Commonly used herbicides by the farmers of Karaikal in 2024

Chemical name of the herbicide	Trade name	Dosage (Commercial product)	Target weeds
Pre-emergence herbicides (0-6 DAS)			
Pretilachlor 6.0% + pyrazosulfuron ethyl 0.15% GR	Craze	3.5 – 4.5 kg/ac	Grasses, sedges and broad-leaved weeds
Bensulfuron methyl 0.6 + pretilachlor 6 gr	Londax power	3.5 – 4.5 kg/ac	Grasses, sedges and broad-leaved weeds
Penoxsulam 0.97% + butachlor 38.8% SE	Corean	800 -1000 ml /ac	Grasses and broad-leaved weeds
Post-emergence herbicides			
Triafamone 20% + ethoxysulfuron 10% WG	Council active	40-50g/ac	Grasses and broad-leaved weeds
Bispyribac sodium 10% SC	Nominee gold/ Adora	80-100 ml/ac	Grasses, Sedges & broad-leaved weeds
2, 4-D amine salt	Green D	400 – 600 ml /ac	Broad leaved weeds

Biotic stresses and their management: Major pests observed during the survey were yellow stem borer, leaf folder, gall midge, brown planthopper and rice mite at various locations. However, not all insect pests were prevalent at all locations and seasons. The incidence of leaf folder and brown planthopper was predominant in Kuruvai. The highest incidence of leaf folder was observed in the traditional rice variety Karuppu Kavuni (20 %) and ADT 38 (15 %). In the Samba season, pest incidence was observed across all varieties. Moderate incidence of ear head bug and mite were observed in varieties such as BPT 5204, CR1009 and IR 20. It was also observed that, the incidence of rodent was severe in BPT5204 and CR1009. The farmers of Karaikal district usually taking up 2-4 rounds of insecticides spray in Kuruvai season and 1 -2 rounds of spray in Samba season. Few organic farmers of Surakudi village were spraying botanical extracts viz., *Calotropis gigantea*, *Vitex negundo*, *Azadirachta indica*, *Capsicum annuum* and *Allium sativum* @ 5 per cent for the management of leaf folder, brown planthopper and rice mite. Among the diseases, Leaf Blast, Brown Spot, Sheath Rot, Grain Discoloration, False Smut and Bacterial Leaf Blight were the diseases observed during the survey in Karaikal district of Puducherry. Among the recorded diseases, Bacterial Leaf Blight showed the highest severity of 37.2%, followed by Sheath Rot (32.5%), Brown Spot (22.7%), Grain Discoloration (15.3%), Leaf Blast 15.1% and False Smut (8.0%). BPT 5204 recorded the highest severity of Sheath Rot (62.7%) in villages like Kezhaveli and Kottucherry, followed by Bacterial Leaf Blight (60.4%) in Kottucherry village and Brown Spot (32.1%). The variety ADT 46 showed the highest severity of Leaf Blast (50.6%), followed by Brown Spot (20.1%). Similarly, ADT 37 recorded the highest severity of Brown Spot (41.6%). Leaf Blast was observed in almost all the surveyed varieties, while Brown Spot was recorded in all varieties except IR 20. Among the different varieties, BPT 5204 recorded the highest mean occurrence of all diseases (35.7%), followed by ADT 46 (26.2%), ADT 37 (18.6%), ADT 45 (15.3%), Co 51 (15.1%), CR 1009 (10.5%) and IR 20 (9.6%). Farmers used different pesticides for the management of different pests and diseases. The details of different pesticides used are presented in the Table below

Details of pesticides used by the farmers of Karaikal in 2024

Target Pest	Name of the pesticide	Dosage
Leaf folder and stem borer	Flubendiamide 20 WG	50g/ ac
	Cartap hydrochloride 15SP	400g/ ac
	Fipronil 5 SC	400 ml/ ac
	Chlorantraniliprole 18.5 SC	60 ml/ac
Gall midge	Thiamethoxam 25 WG	40 g/ ac
Rice mite	Propargite 57 EC	400 ml/ ac
	Fenpyroximare 5 EC	240 ml/ ac
Leaf blast	Azoxystrobin 23%SC (Amistar)	250 ml/ha
	Tricyclazole 75 WP	500 g/ha
	Pseudomonas fluorescens as foliar spray	2.5 kg or 500 ml/ha
Brown spot	Mancozeb 75% WP (Dithane M-45)	500 g/ha
Sheath rot	Carbendazim 50% WP (Bavistin)	500 g/ ha
Grain discoloration	Carbendazim 50% WP (Bavistin)	500 g/ ha
False smut	Hexaconazole 5% SC (Contaf Plus) Propiconazole 25% EC (Tilt)	250 ml/ha 250 ml/ha
BLB	Copper Hydroxide 46.1% (Kocide)	1250g/ha

Problems faced by the farmers

- ✓ **Water scarcity:** Karaikal district is heavily dependent on Cauvery River for cultivation of crops particularly for water-intensive crops like rice. This district receives north east monsoon rainfall in the month of October, November and December. To tackle irrigation water scarcity during kharif, some farmers used water from borewells installed by the Government of Puducherry at ₹5 per hour, while others bought water from neighbouring borewells at ₹50 per hour during Kuruvai (June to September)
- ✓ **Labour scarcity:** During the peak rice growing season, there is shortage of labours due to the migration of workers to cities for better employment opportunities along with Mahatma Gandhi National Rural Employment Guarantee Scheme (Mahatma Gandhi NREGS), especially during transplanting or harvesting period. Due to labour shortage, farmers have transitioned to direct sowing. Although many farmers are transitioning to organic farming, labour shortages are driving them to rely on herbicides for weed management in their fields.
- ✓ **Unpredictable rainfall due to climate change**: Climate change has led to unpredictable excessive rainfall leading to flooding, which affect overall efficiency of farming and crop yield.
- ✓ **Need for local markets for procurement of produce:** Farmers lack direct market access, forcing reliance on middlemen who offer lower prices. Establishing fair local markets can ensure better profits.
- ✓ **Timely availability of harvesting equipment:** The unavailability or delay in accessing harvesting equipment leads to significant field losses due to grain shattering and bird consumption. Ensuring timely access to combine harvesters is essential for preventing post-harvest losses.
- ✓ **Maintenance of irrigation channels:** Many irrigation channels suffer from poor maintenance or are blocked due to encroachment by land acquisition. This disrupts the proper flow of water,

reducing the availability of irrigation for rice fields. Regular cleaning and maintenance of these channels are necessary to ensure an uninterrupted water supply.

- ✓ **Crop damage from grazing animals:** Rats, cows, buffaloes and peacocks damage crops by feeding, trampling or uprooting plants. Effective fencing and pest control are essential to minimize losses.
- ✓ **Malfunctioning of borewells:** Around 20% of borewells are non-functional, leading to water shortages during critical growth stages of rice cultivation.
- ✓ **Crop submergence due to heavy rainfall:** Excessive rainfall causes submergence of rice crops leading to reduced yields. Improved drainage and flood-tolerant varieties can help mitigate losses.
- ✓ **Power shortages**: Frequent power cuts disrupt irrigation, affecting rice cultivation.
- ✓ **Need for government borewells**: In many regions, farmers lack access to adequate water resources and government supported borewells are needed to supplement irrigation. Installing more borewells through public schemes can help farmers to cultivate crops more efficiently.
- ✓ **Need for crop insurance**: Unpredictable weather causes financial struggles for farmers due to unexpected losses from natural calamities. Implementing crop insurance schemes can provide financial security to overcome economic hardships.

Needs of the farmers

- ✓ Ensure adequate and timely release of Cauvery water to address irrigation needs.
- ✓ Increase government-supported borewell installations to improve water access.
- ✓ Supply of sufficient quantity of quality farm inputs from state department at subsidized rates.
- ✓ Provision of farm equipment especially mechanical harvester-cum-threshers through government agencies on rent at subsidized rates,
- ✓ Provision of small harvesting machinery especially for famers of small holdings.
- ✓ Provision of government supported drones for pesticide spraying.
- ✓ Implementation of minimum support price (MSP) for agricultural produce.
- ✓ Strengthening local market facilities and marketing channels to ensure fair pricing.
- ✓ Offering financial support and subsidies for farming, equipment and fencing installation.
- ✓ Developing and distribution of flood and herbicide-tolerant rice varieties.
- ✓ Promoting natural farming and high-yielding traditional local varieties.
- ✓ Implementing crop insurance schemes to protect farmers from financial losses.
- ✓ Installation of proper fencing to prevent crop damage from grazing animals.
- ✓ Provide technical guidance on pesticide application and sustainable farming practices.

Highlights of the survey

- Short duration varieties like IR 20, CO 51 were cultivated during the Kuruvai season, while in the Samba season, BPT 5204 (Samba Mahsuri), ADT 37, ADT 38, ADT 39, ADT 45, ADT 46, ADT 51, Improved White Ponni (IWP), CO 43, CO 50, CO 51, CR 1009 (Ponmani), CR 1009 Sub1, TKM 13, NLR, KKL (R) 2, TRY 3 and traditional varieties like Karuppu Kavuni, Seeraga Samba, Thanga Samba and Mappilai samba were cultivated primarily utilizing Cauvery water.
- Most of the farmers shifted from transplanting to direct sowing due to labour shortages and the need to reduce cultivation costs.
- Sedges and Grasses were the dominant weed types in this region. Grassy weeds such as Leptochloa *chinensis, Echinochloa colona*, *E. crus-galli* and *Digitaria* spp. and sedges such as *Cyperus rotundus*, *C. iria*, *C. deformis* and *Fimbristylis miliacea* were prevalent in rice fields. Broad-leaved weeds such as *Marsilia quadrifoliate, Eclipta alba*, *Ludwigia parviflora* and *Ludwigia abyssinica* were the significant competitors for rice crop in most surveyed areas.
- Farmers employ both mechanical and chemical methods to manage weed growth. Hand weeding is done twice on 25 -30 and 45 – 50 DAT by hiring 6-7 labourers per acre. Herbicides like bispyribac Sodium (10% SC), Butachlor, Fenoxaprop-p-ethyl 6.9 EC, Triafamone 20% + Ethoxysulfuron 10% WG, Bensulfuron methyl 0.6 + pretilachlor were mostly used for control weeds.
- Leaf folder, Brown planthopper and Rice mite were the major insect pest observed in most of the farmer's field and are managed by spraying Flubendiamide, Cartap hydrochloride, Thiamethoxam and Propargite respectively.
- Leaf Blast, Brown Spot, Sheath Rot, Grain Discoloration, False Smut and Bacterial Leaf Blight were the diseases observed during samba season. Azoxystrobin, Tricyclazole, Mancozeb, Carbendazim, Hexaconazole, Propiconazole and Copper Hydroxide were used by the farmers for managing the diseases. The BPT 5204 recorded maximum occurrence of all diseases.
- ✓ Organic manures such as FYM @ 12.5 t/ha, goat manure 2000 – 3000 kg/ ha and neem cake @ 12.5 t/ha are being applied by the farmers.
- ✓ Mechanical harvesting by harvester cum thresher is adopted by the farmers due to acute shortage of labours.

Punjab-Ludhiana (2024-25)

Districts surveyed: *Ludhiana, Jallandhar, Bathinda, Mansa, Muktsar, Fazilka, SBS Nagar, Roopnagar, Mohali, Moga, Barnala, Ferozepur, Faridkot, Amritsar* and *Tarn Taran*

Table 1: Particulars of Survey

District	Blocks	Villages (Lat; Long)
Ludhiana	Samrala and Jagraon	Balala (30.81; 76.111), Balion (30.86; 76.18), Baghour (30.40; 76.11), Adhiana (30.746; 75.098), Ajlaud (30.78; 76.15) and Porain (30.92; 75.62)
Jallandhar	Adampur, Nurmahal and Shahkot	Ghurial (31.44; 75.79), Cheema Kalan (31.07; 75.52), Ajtani (31.05; 75.52), Aidalpur (31.04; 75.31), Kalra (31.39; 75.77) and Kapurpind (31.37; 75.67)
Bathinda	Bathinda	Akalian Kalan (30.1448; 74.8185), Bahi Yatri (30.12; 74.57), Nathana (30.31; 75.09); Bhucho Mandi (30.22; 75.10), Virk Kalan (30.30; 74.82), Ghudda (30.12; 74.78), Bir Behman (30.19; 74.86) and Chak Bakhtu (30.21; 75.11)
Mansa	Mansa and Budhlada	Nangal Kalan (29.92; 75.40), Borawal (29.59; 75.32), Chotian (29.72; 75.33), Akkanwali (29.86; 75.42), Kahangar (30.13; 74.98) and Malakpur (30.93; 75.73)
Muktsar	Muktsar	Kotli Sangar (34.48; 74.61), Jhabel Wali (30.51; 74.60), Chibbran Wali (30.23; 74.24), Chak Dohak (30.60; 74.62), Akalgarh (30.75; 75.65), Baja Madahar (30.25; 75.24) and Badhai (30.28; 75.60)
Fazilka	Fazilka	Ahal Bodla (30.46; 74.13), Abohar (30.14; 74.20) and Awa Urf Waryam Pura (30.40; 74.02)
SBS Nagar		Chahal Khur (31.07; 76.01), Chahal Kalan (31.05; 75.54), Ghataron (31.10; 75.99), Niamatpur (31.00; 76.12), Nangal Jattan (31.03; 75.94),
Rupnagar	Rupnagar, Morinda	Badarpur (30.96; 76.52), Laudi Majra (31.02; 76.54), Chitawala/ Chhutewal (30.58; 76.48), Dugri (30.88; 76.48), Chalaki (30.76; 76.47), Chaklan (30.82; 76.44), Kalawal Mohalla (30.97; 76.52),
Mohali		Kurali (30.83; 76.58), Bakarpur (30.65; 76.82)
Moga	Moga, Baghapurana	Daroli Bhai (30.81; 75.04), Chamb (31.01; 75.30), Kot Ise Khan (30.9; 75.14), Kishanpur Kalan (30.93; 75.35), Chugawan (30.82; 75.26), Ajitwal (30.81; 75.33), Charik (30.72; 75.16), Nihal Singh Wala (30.59; 75.28), Karahe Wala (32.8; 73.5), Chuhan Chak (30.78; 75.36), Smalsar (30.64; 74.99),
Barnala		Balari (30.22; 75.33), Tapa Mandi (30.17; 75.22)
Ferozepur	Ferizepur and Zira	Arif Ke, Lehra Bet (31.08; 75.02), Malwal (30.91; 74.68), Piareana (30.88; 74.72), Ghall Khurd (30.85; 74.81) and Makhu (31.10; 74.97)

Faridkot	Kot Kapura	Aulakh (30.40; 75.23), Baggiana (30.40; 74.90), Deviwala (30.62; 74.87) and Dhulkot (30.38; 74.70)
Amritsar	Majitha, Amritsar 1 and Daba Bakala	Nag Kalan (31.73; 74.94), Chhapa Ram Singh (31.63; 74.98), Saido Lehal (31.65; 75.09) and Dharar (31.53; 75.05)
Tarn Taran	Khadur Sahib and Tarn Taran	Vainpoin (31.40; 75.05), Uoman (31.36; 74.97) and Marhana (31.20; 74.96)

Table 2: Widely prevalent rice varieties

District	Varieties
Ludhiana	**HYVs:** PR 126, PR 131, Pusa 44, PR 129 and others; **Basmati:** Pusa Basmati 1121, Pusa Basmati 1509 and others
Jallandhar	**HYVs:** PR 126 and others; **Hybrids**: Sava 7301; **Basmati**: Pusa Basmati 1121, Pusa Basmati 1509 and others
Bathinda	**HYVs:** PR 121, PR 126, PR 128, PR 129, PR 131, Pusa 44 and others; **Basmati**: Pusa Basmati 1121, Pusa Basmati 1509, Pusa Basmati 1637, Pusa Basmati 1401 and others
Mansa	**HYVs:** PR 126, PR 131 and others; **Basmati**: Pusa Basmati 1401, Pusa Basmati 1121 and others
Muktsar	**HYVs:** PR 131, PR 114, PR 126, PR 130 and others; **Basmati:** Pusa Basmati 1121, Pusa Basmati 1401, Pusa Basmati 1509 and others
Fazilka	**HYVs**: PR 126, PR 130 and others; **Basmati**: Pusa Basmati 1121, Pusa Basmati 1401, Pusa Basmati 1509 and others
SBS Nagar	**HYVs**: PR 121, PR 129, PR 130 and others; **Basmati**: Pusa Basmati 1121 and others
Rupnagar	**HYVs**: PR 126, PR 128, PR 131 and others; **Hybrids**: Sava 134 and Supreme 110; **Basmati**: Pusa Basmati 1121, Pusa Basmati 1509 and others
Mohali	**HYVs**: PR 131,
Moga	**HYVs**: PR 126, PR 131, Pusa 44 and others; **Basmati**: Pusa Basmati 1121, Pusa Basmati 1509 and others
Barnala	**HYVs**: PR 131, PR 130 and others; **Basmati**: Pusa Basmati 1509 and others
Ferozepur	**HYVs**: PR 114, PR 126, PR 122 and others; **Basmati**: Pusa Basmati 1401, Pusa Basmati 1121, Pusa Basmati 1509 and others
Faridkot	**HYVs**: PR 126, PR 114 and others; **Basmati**: Pusa Basmati 1121 and others
Amritsar	**HYVs/Hybrids**: Sava 7301 and others; **Basmati**: Pusa Basmati 1509 and others
Tarn Taran	**HYVs**: PR 131 and others; **Hybrids**: Sava 7301; **Basmati**: Pusa Basmati 1718, Pusa Basmati 1121 and others

Production oriented survey was conducted in 15 districts of Punjab viz., Ludhiana, Jallandhar, Bathinda, Mansa, Muktsar, Fazilka, SBS Nagar, Roopnagar, Mohali, Moga, Barnala, Ferozepur, Faridkot, Amritsar and Tarn Taran during Kharif season of 2024. Survey was conducted when the crops were in booting to heading stage. The details of villages surveyed are presented in Table 1. The fields surveyed were under irrigated ecosystem. The climatic conditions were in general favourable for rice cultivation (Table 3). During *Kharif*-2024 in Punjab state, paddy was cultivated on an area of around 31 lakh hectares of which 80 percent area was under non-basmati rice and 20

percent area was under Basmati rice. Among non-basmati rice, PR126 was most popular variety occupying 43 per cent area followed by PR 131. Other non-basmati varieties cultivated in the state were PR 128, PR 121, PR 114, PR 130, Supreme and Pusa 44 and hybrids like Sava 7301. Among basmati varieties commonly cultivated varieties were Pusa Basmati 1121, Pusa Basmati 1509 Pusa Basmati 1718, Pusa Basmati 1401 and Pusa Basmati 1847. The details of different rice varieties cultivated in different districts are presented in Table 2.

Table 3: General informations

Parameters	**Districts**			
	Ludhiana and Jallandhar	**Bathinda and Mansa**	**Muktsar and Fazilka**	**SBS Nagar, Rupnagar and Mohali**
# of villages surveyed	12 (6 + 6)	14 (8 + 6)	10 (7 + 3)	14 (5 + 7 + 2)
# of farmers interviewed	12 (6 + 6)	14 (8 + 6)	11 (7 + 4)	14 (5 + 7 + 2)
Field ecosystem	Irrigated	Irrigated	Irrigated	Irrigated
Weather conditions during cropping season	Normal	Normal	Normal	Normal
Crop stage when survey was made	Booting to heading	Booting to heading	Booting to milk	Booting to heading
Main Crop rotations	Rice-wheat (main) followed by rice-wheat-potato, rice-wheat-cotton, rice-wheat-vegetables, rice-vegetables, rice-wheat-maize			

Table 3: General informations

Parameters	**Districts**		
	Moga and Barnala	**Ferozepur and Faridkot**	**Amritsar and Tarn Taran**
# of villages surveyed	13 (11 + 2)	10 (6 + 4)	7 (4 + 3)
# of farmers interviewed	13 (11 + 2)	13 (9 + 4)	7 (4 + 3)
Field ecosystem	Irrigated	Irrigated	Irrigated
Weather conditions during cropping season	Normal	Normal	Normal
Crop stage when survey was made	Booting to heading	Heading	Booting to Heading
Main Crop rotations	Rice-wheat (main) followed by rice-potato, rice-wheat-garlic, rice-wheat-vegetables		

A. Cropping system and rice yield: The fields surveyed were under irrigated ecosystem. During 2024, the predominant crop rotation remained the rice-wheat system followed by rice-potato, rice-wheat-garlic, rice-wheat-vegetables (Table 3). Average rice yield among the HYVs and hybrids ranged from 7460-8250 kg/ha while in case of basmati varieties, the yield ranged from 4280-4880 kg/ha.

Table 4: Average yields of different rice varieties as reported by the cooperators/farmers

Parameters	Districts			
	Ludhiana and Jallandhar	Bathinda and Mansa	Muktsar and Fazilka	SBS Nagar, Rupnagar and Mohali
HYVs				
PR 126	7880-8250	7940-8250	7530-7870	7710-7880
PR 131	8250-8270	8250-8350	7500-850	7850-8250
Pusa 44	8250	8250		
PR 129	7950	7750		7550
PR 128		7840		7830
PR 121		7850-8210		7950
PR 114			7460	
PR 130			7580-8030	7830
Hybrids				
Sava-7301	7750			
Sava 134				7830
Basmati				
Pusa Basmati 1121	4710-4730	4650-4750	4280-4860	4750
Pusa Basmati 1509	4530-4550	4850	4550-4880	4870
Pusa Basmati 1637		4775		
Pusa Basmati 1401		4575-4775	4660-4860	

Table 4: contd..

Parameters	Districts		
	Moga and Barnala	Ferozepur and Faridkot	Amritsar and Tarn Taran
PR 126	7940-8050	7550-8370	
PR 131	7980-8270		7940
Pusa 44	8250-8270		
PR 114		7400-7550	
PR 130	7550		
PR 122		7830	
Hybrids			
Sava-7301			7450-7650
Basmati			
Pusa Basmati 1121	4850	4530-5060	4750
Pusa Basmati 1509	4770	4750	4540-4850
Pusa Basmati 1401		4730	
Pusa Basmati 1718			4860

Table 5: Details of nursery management

Parameters	Districts			
	Ludhiana and Jallandhar	**Bathinda and Mansa**	**Muktsar and Fazilka**	**SBS Nagar, Rupnagar and Mohali**
Planting time	An area of about 1.0 lakh ha was under direct seeded rice (DSR), whereas rest was under puddled transplanted rice (PTR). Majority of farmers did direct seeding between May 25 to June 15. Rice crop was transplanted between June 11 to July 20 and Basmati was transplanted during first week of July to 3rd week of July at farmer's field.			
Seed rate	14-20 kg/ha	12-18 kg/ha	12-25 kg/ha	12-17 kg/ha
Seed treatment (% farmers adopted)	Yes (41.6%)	Yes (50%)	Yes (81.8%)	Yes (42.8%)
Chemicals used for seed treatment	Sprint (3 g/kg); carbendazim (2 g/kg)	Sprint (3 g/kg); carbendazim (2 g/kg)	Sprint (3 g/kg); thiram (2 g/kg), carbendazim (2 g/kg)	Sprint (3 g/kg); carbendazim (2 g/kg)
Organic manure in nursery (% farmers adopted)	Yes (100%); FYM	Yes (100%); FYM	Yes (100%); FYM (mainly); few poultry manure	Yes (100%); FYM
Inorganic manure in nursery (% farmers adopted)	Yes (100%); urea (52-72 kg/ha) + DAP (22-30 kg/ha); Many (75%) applied ZnSO4 @ 10-15 kg/ha	Yes (100%); urea (50-80 kg/ha) + DAP (20-30 kg/ha); Many (71.4%) applied ZnSO4 @ 10-15 kg/ha	Yes (100%); urea (52-76 kg/ha) + DAP (10-27 kg/ha); Many (45.4%) applied ZnSO4 @ 8-15 kg/ha	Yes (100%); urea (52-71 kg/ha) + DAP (20-30 kg/ha); Many (%) applied ZnSO4 @ 10-15 kg/ha

B. Nursery and main field Management: Most of the farmers used 12-20 kg/ha of seed rate for nursery sowing but for direct seeding they used 15-25 kg seed per ha. The seed treatments practices were applied by majority of the farmers. On an average about 22% of the farmers contacted adopted seed treatment mostly with Sprint (mancozeb 50% + marbendazim 25% WP) @ 3 g/kg or carbendazim (2 g/kg) or thiram (2 g/kg) (Table 5). Almost all the farmers contacted told that they applied FYM in the nursery. Few applied poultry manure in the nursery. All the farmers contacted in different districts told that they applied chemical fertilizers like urea and DAP in the nursery (Table 5). Many farmers also applied zinc sulphate in the nursery. An area of about 1.0 lakh ha was under direct seeded rice (DSR), whereas rest was under puddled transplanted rice (PTR). Majority of farmers did direct seeding between May 25 to June 15. Rice crop was transplanted between June 11 to July 20 and Basmati was transplanted during first week of July to 3rd week of July at farmer's field. Mostly, farmers transplanted 30-35 days old nursery. In most of the cases, planting density was inadequate and it varied from 18-23 plants/m^2 as against recommended density of 33 plants/m^2. Most of the surveyed farmers used overdose of nitrogen but some farmers skipped the application of phosphorus (P_2O_5) or applied less quantity of phosphorus due to higher status of it in their soils. Comparatively less number of farmers applied potash (K_2O) in paddy

crop. Application of Zinc sulphate (either 21 or 33%) was practiced by about 61-83% farmers but they used under dose of Zinc. Most of the farmers contacted told that they applied green manure in the field (Table 6).

Table 5: contd..

Parameters	Districts		
	Moga and Barnala	**Ferozepur and Faridkot**	**Amritsar and Tarn Taran**
Planting time	An area of about 1.0 lakh ha was under direct seeded rice (DSR), whereas rest was under puddled transplanted rice (PTR). Majority of farmers did direct seeding between May 25 to June 15. Rice crop was transplanted between June 11 to July 20 and Basmati was transplanted during first week of July to 3rd week of July at farmer's field.		
Seed rate	12-20 kg/ha	15-20 kg/ha	15-16 kg/ha
Seed treatment (% farmers adopted)	Yes (85.7%)	Yes (61.5%)	Yes (71.4%)
Chemicals used for seed treatment	Sprint (3 g/kg); carbendazim (2 g/kg)	Sprint (3 g/kg); thiram (2 g/kg); carbendazim (2 g/kg)	Sprint (3 g/kg); carbendazim (2 g/kg)
Organic manure in nursery (% farmers adopted)	Yes (100%); FYM	Yes (100%); FYM (Mainly); Poultry manure	Yes (100%); FYM
Inorganic manure in nursery (% farmers adopted)	Yes (100%); urea (52-70 kg/acre) + DAP (27-30 kg/ha); Many (84.6%) applied ZnSO4 @ 10-15 kg/acre	Yes (100%); urea (52-75 kg/acre) + DAP (20-30 kg/ha); Many (53.8%) applied ZnSO4 @ 10-15 kg/acre	Yes (100%); urea (52-70 kg/acre) + DAP (20-30 kg/ha); Many (71.4%) applied ZnSO4 @ 10-15 kg/acre

Table 6: Details of main field management

Details	Districts				Remarks
	Ludhiana and Jallandhar	**Bathinda and Mansa**	**Muktsar & Fazilka**	**SBS Nagar, Rupnagar and Mohali**	
Planting method	About 35.7-72.7% farmers contacted in different districts adopted direct sowing. Mostly, farmers transplanted 30-35 days old nursery. In most of the cases, planting density was inadequate and it varied from 18-23 plants/m^2 as against recommended density of 33 plants/m^2.				
Total N applied (Kg/ha)	HYVs: 100-125 kg/ha & Basmati: 79-90 kg/ha (100% farmers)	HYVs: 100-120 kg/ha & Basmati: 76-90 kg/ha (100% farmers)	HYVs: 70-130 kg/ha & Basmati: 70-110 kg/ha (100% farmers)	HYVs: 90-120 kg/ha & Basmati: 60-100 kg/ha (100% farmers)	Urea, DAP

Details	Districts				Remarks
	Ludhiana and Jallandhar	**Bathinda and Mansa**	**Muktsar & Fazilka**	**SBS Nagar, Rupnagar and Mohali**	
Total P_2O_5 applied (Kg/ha)	15-30 kg/ha (66.6% farmers)	10-40 kg/ha (78.6% farmers)	15-60 kg/ha (91)% farmers)	22-35 kg/ha (71.4% farmers)	DAP
Total K_2O applied (Kg/ha)	5-15 kg/ha (8.3% farmers)	10-15 kg/ha (14.3% farmers)	10-40 kg/ha (72.7% farmers)	10-20 kg/ha (35.7% farmers)	MOP
$ZnSO_4$ applied (Kg/ha)	5-15 kg /ha (83.3 % farmers)	8-15 kg /ha (71.4 % farmers)	7-20 kg /ha (81.8 % farmers)	8-10 kg /ha (71.4 % farmers)	Zinc sulphate (either 21 or 33%)
Organic fertilizers applied	Green manure (100% farmers)	Green manure (100% farmers)	Green manure (100% farmers)	Green manure (100% farmers)	

Table 6: Contd..

Details	Districts			Remarks
	Moga and Barnala	**Ferozepur and Faridkot**	**Amritsar and Tarn Taran**	
Planting method	About 46.15-71.4% farmers contacted in different districts adopted direct sowing. Mostly, farmers transplanted 30-35 days old nursery. In most of the cases, planting density was inadequate and it varied from 18-23 plants/m^2 as against recommended density of 33 plants/m^2.			
Total N applied (Kg/ha)	HYVs: 100-120 kg/ha & Basmati: 75-90 kg/ha (100% farmers)	HYVs: 100-120 kg/ha & Basmati: 60-100 kg/ha (100% farmers)	HYVs: 52-120 kg/ha & Basmati: 80-90 kg/ha (100% farmers)	Urea, DAP
Total P_2O_5 applied (Kg/ha)	25-30 kg/ha (76.9% farmers)	26-70 kg/ha (100% farmers)	20-30 kg/ha (100% farmers)	DAP
Total K_2O applied (Kg/ha)	10 kg/ha (7.7% farmers)	15-40 kg/ha (53.8% farmers)	10-15 kg/ha (28.6% farmers)	MOP
$ZnSO_4$ applied (Kg/ha)	8-15 kg /ha (61.5 % farmers)	5-20 kg /ha (76.9 % farmers)	5-15 kg /ha (71.4 % farmers)	Zinc sulphate (either 21 or 33%)
Organic fertilizers applied	Green manure (100% farmers)	Green manure (92.3% farmers)	Green manure (100% farmers)	

Table 7: Weeds and weed management

Details	Districts				Remarks
	Ludhiana & Jallandhar	**Bathinda and Mansa**	**Muktsar & Fazilka**	**SBS Nagar, Rupnagar and Mohali**	
Weed intensity	Low	Low	Low to medium	Low	71-91% farmers in different districts also followed hand weeding along with herbicide appliecation. Even, some farmers did not use any weedicide in transplanted crop but they adopted cultural method of weed control i.e. ponding of water for the first 15 days of crop cycle.
Names of the weeds	Predominant weeds observed during the survey were *Leptochloa chinensis, Cyperus rotundus* and *Echnochloa crusgalli* etc, in puddled transplanted rice. Weeds like *Eragrostis* spp. *Leptochloa chinensis*, *Echinichloa colona*, *Ammania* sp. were reported in case of direct seeded rice (DSR).				
Weedicides used	Most of the farmers used pretilachlor, butachlor and some farmers also used bispyribac sodium as a post-emergence herbicide for weed control in transplanted rice crop but in DSR pendimethlin alone or pendimethalin+ pyrazosulfuron Ethyl was commonly used as pre-emergence herbicides. Although bispyribac sodium was widely adopted post emergence herbicide but many other post emergence herbicides such as fenoxaprop, Clincher, Vivaya, Council Activ etc. were also used by some farmers.				
%age of farmers applied herbicides	Yes (100%)	Yes (100%)	Yes (100%)	Yes (100%)	
Wild rice incidence	Nil	Nil	Nil	Nil	

C. Weeds and their Management: Overall intensity of weeds was low throughout the state. Predominant weeds observed during the survey were *Leptochloa chinensis, Cyperus rotundus* and *Echnochloa crusgalli* etc, in puddled transplanted rice. Weeds like *Eragrostis* spp. *Leptochloa chinensis*, *Echinichloa colona*, *Ammania* sp. were reported in case of direct seeded rice (DSR). Most of the farmers used pretilachlor, butachlor and some farmers also used bispyribac sodium as a post-emergence herbicide for weed control in transplanted rice crop but in DSR pendimethlin alone or pendimethalin+ pyrazosulfuron Ethyl was commonly used as pre-emergence herbicides. Although bispyribac sodium was widely adopted post emergence herbicide but many other post emergence herbicides such as fenoxaprop, Clincher (cyhalofop-butyl), Vivaya (Penoxsulam 1.02% and Cyhalofop-Butyl 5.1% OD), Council Activ (triafamone 20% and ethoxysulfuron 10%) etc. were also used by some farmers. Some farmers did not use any weedicide in transplanted crop but they adopted cultural method of weed control i.e. ponding of water for the first 15 days of crop cycle (Table 7). Majority of the farmers (71-100%) in different districts who applied herbicides also followed hand weeding for weed management (Table 7).

D. Common needs: Some of the common needs of the farmers were higher MSP for HYVs, improved irrigation water availability, improved rice production and protection technologies and timely availability of seeds of HYVs.

Table 7: Contd..

Details	Districts			Remarks
	Moga and Barnala	**Ferozepur and Faridkot**	**Amritsar and Tarn Taran**	
Weed intensity	Low	Low	Low	71-100% of the farmers contacted in different districts followed hand weeding along with herbicide application. Few (14-15%) farmers in Ferozepur, Faridkot, Amritsar and Tarn Taran followed on hand weeding. Some followed ponding of water for the first 15 days of crop cycle for weed management
Names of the weeds	Predominant weeds observed during the survey were *Leptochloa chinensis, Cyperus rotundus* and *Echnochloa crusgalli* etc, in puddled transplanted rice. Weeds like *Eragrostis* spp. *Leptochloa chinensis*, *Echinichloa colona*, *Ammania* sp. were reported in case of direct seeded rice (DSR).			
Weedicides used	Most of the farmers used Pretilachlor, Butachlor and some farmers also used Bispyribac Sodium as a post-emergence herbicide for weed control in transplanted rice crop but in DSR Pendimethlin alone or Pendimethalin+ Pyrazosulfuron Ethyl was commonly used as pre-emergence herbicides. Although Bispyribac Sodium was widely adopted post emergence herbicide but many other post emergence herbicides such as Fenoxaprop, Clincher, Vivaya, Concil Active etc. were also used by some farmers.			
%age of farmers applied herbicides	Yes (100%)	Yes (84.6%)	Yes (85.7%)	
Wild rice incidence	Nil	Nil	Nil	

Table 8: Details of inputs used

Details	Districts			
	Ludhiana & Jallandhar	**Bathinda and Mansa**	**Muktsar & Fazilka**	**SBS Nagar, Rupnagar and Mohali**
Implements used	Most of the farmers contacted were progressive and have knowledge on improved rice production technologies. Implements like tractor, disc plough, cultivator, harrow, planker, laser leveller, combined harvester and others were used by the farmers. Many farmers possessed many of these implements. Most of the farmers used combine harvester on hire basis.			
Seed replacement rate	Not available. However, about 66-81% of the farmers contacted in these districts told that they purchased the seeds and used for sowing			
Source of irrigation	Canal (50%); Deep Tube well (100%)	Canal (42.8%); Deep Tube well (92.8%)	Canal (45.4%); Deep Tube well (100%)	Canal (57.1%); Deep Tube well (92.8%); Shallow tube well (7.1%)
Scarcity of irrigation water	No (100%)	No (100%)	No (91%)	No (92.8%)
Availability of fertilizers/ pesticides	Yes (91.7%)	Yes (100%)	Yes (91%)	Yes (100%)

Details	Districts			
	Ludhiana & Jallandhar	**Bathinda and Mansa**	**Muktsar & Fazilka**	**SBS Nagar, Rupnagar and Mohali**
Quality of fertilizers/ pesticides	Satisfied (100%)	Satisfied (100%)	Satisfied (100%)	Satisfied (100%)
Advisors to the farmers	Own Decision (100%), State Dept (100%); Dealers (100%); Univ. (100%)	Own Decision (100%), State Dept (100%); Dealers (100%); Univ. (100%)	Own Decision (100%), State Dept (100%); Dealers (100%); Univ. (100%)	Own Decision (100%), State Dept (100%); Dealers (100%); Univ. (100%)

E. Input use: Most of the farmers contacted were progressive and have knowledge on improved rice production technologies. Implements like tractor, disc plough, cultivator, harrow, planker, laser leveller, combined harvester and others were used by the farmers (Table 8). Many farmers possessed many of these implements. Most of the farmers used combine harvester on hire basis. Exact seed replacement rate data are not available. But 66-100% farmers contacted in different districts told that they purchased the seeds and used for sowing. Canal and deep tube wells were the main sources of irrigation (Table 8). Majority (>90%) of the farmers expressed that there no scarcity of irrigation water. Farmers also expressed that fertilizers and pesticides were available in time and they were satisfied with their quality. In addition to their own decisions, farmers received advices from officials of state department of agriculture, university and private dealers (Table 8).

Table 8: Contd..

Details	Districts		
	Moga and Barnala	**Ferozepur and Faridkot**	**Amritsar and Tarn Taran**
Implements used	Most of the farmers contacted were progressive and have knowledge on improved rice production technologies. Implements like tractor, disc plough, cultivator, harrow, planker, laser leveller, combined harvester and others were used by the farmers. Many farmers possessed many of these implements. Most of the farmers used combine harvester on hire basis.		
Seed replacement rate	Not available. However, about 84.6-100% of the farmers contacted in these districts told that they purchased the seeds and used for sowing		
Source of irrigation	Canal (23.1%); Deep Tube well (100%)	Canal (15.4%); Deep Tube well (100%)	Canal (28.5%); Deep Tube well (100%)
Scarcity of irrigation water	No (92.3%)	No (100%)	No (100%)
Availability of fertilizers/ pesticides	Yes (100%)	Yes (100%)	Yes (100%)
Quality of fertilizers/ pesticides	Satisfied (100%)	Satisfied (100%)	Satisfied (100%)
Advisors to the farmers	Own Decision (100%), State Dept (100%); Dealers (100%); Univ. (100%)	Own Decision (100%), State Dept (100%); Dealers (100%); Univ. (100%)	Own Decision (100%), State Dept (100%); Dealers (100%); Univ. (100%)

Table 9: Prevalence of different diseases and insect pests in surveyed districts of Punjab in 2024

Districts	Diseases							
	Bl	**NBl**	**ShBl**	**BS**	**ShR**	**FS**	**Bak**	**BB**
Ludhiana & Jallandhar	L (2-3%)		L-M (2-10%)	L-M (2-10%)		T-M (1-10%)	L-M (2-10%)	
Bathinda and Mansa	T-L (1-7%)	L-M (2-10%)	L-M (2-20%)	L (2-7%)		L (2-7%)	L-M (2-12%)	
Muktsar & Fazilka	L-M (5-15%)	L-M (5-15%)	L-M (2-12%)	L-M (2-15%)	T	L (2-7%)	L-M (3-12%)	
SBS Nagar, Rupnagar and Mohali		T	L-M (2-20%)	L-M (5-12%)	T	L-M (2-18%)	L (2-7%)	
Moga and Barnala			L-M (2-12%)	L-M (3-15%)		T-M (1-8%)	M (8-12%)	
Ferozepur and Faridkot	T		L-M (5-12%)	L-M (5-10%)	T	L-M (3-15%)	L (2-5%)	
Amritsar and Tarn Taran				L (6-7%)		L-M (4-25%)	M (15-20%)	L-M (5-10%)

There was minor incidence (2%) of grain discolouration in SBS Nagar, Rupnagar and Mohali. Southern Rice Black Streak Dwarf Virus (SRBSDV) disease was reported in few fields of Rupnagar District on Rice Hybrid 7301 and PR 131 in traces.

Districts	Insect pests				
	SB	**LF**	**BPH**	**WBPH**	**GLH**
Ludhiana & Jallandhar	T-L (1-2%)	T-L (1-2%)	T-L (1-3%)	T-L (1-2%)	
Bathinda and Mansa	T-L (1-2%)	T-L (1-2%)	T-L (1-2%)	T-L (1-2%)	
Muktsar & Fazilka	T-L (1-7%)	T-L (1-3%)	T-L (1-3%)	T-L (1-2%)	
SBS Nagar, Rupnagar and Mohali	T-L (1-2%)	T-L (1-2%)	T-L (1-4%)	L (2-4%)	
Moga and Barnala	T-L (1-2%)	T-L (1-2%)	T-L (1-2%)	T-L (1-3%)	
Ferozepur and Faridkot	T-L (1-3%)	T-L (1-3%)	T-L (1-4%)	L (2-4%)	
Amritsar and Tarn Taran	T-L (1-2%)	T-L (1-4%)	T-L (1-3%)	L (4%)	T-L (1-3%)

F. Biotic stresses and their management: Overall incidence of rice diseases was low to moderate during the *Kharif*-2024. The details of incidences of different rice diseases are presented in Table 9. Low incidence of leaf blast was recorded in Abohar, Sangrur, Ferozepur, Malerkotla and Fazilka districts on varieties Pusa basmati 1401 and Pusa basmati 1121. Low to moderate incidence ofn neck blast was recorded from Malerkotla, Sangrur, Muktsar, Sangrur, Abohar, Tarn Taran and Amritsar districts on varieties Pusa Basmati 1401, Pusa Basmati 1121. Low to moderate level of sheath blight was recorded on different rice varieties viz., PR 121, PR 122, PR 126, PR 128, PR 129, PR 130, PR 131, Pusa 44, Pusa Basmati 1121, Pusa Basmati 1509 and Pusa Basmati1401 and hybrid Sava 134 in the districts of Faridkot, Fatehgarh Sahib, Ferozepur, Malerkotla, Moga, Patiala, Hoshiarpur, Ludhiana, Pathankot, Gurdaspur, Sangrur, Jalandhar, Roopnagar, SAS Nagar, Amritsar and Barnala. Higher incidence of false smut was observed on variety PR126 in some

fields of Sangrur and Ludhiana districts. Low to moderate incidence of the disease was observed on rice varieties viz., PR126, PR 128, PR 131, Pusa 44 and Pusa Basmati 1509 in the districts of Faridkot, Patiala, Fatehgarh Sahib, Pathankot, Gurdaspur, Moga, Barnala and Jalandhar. Low to moderate incidence of the brown spot was recorded on varieties PR 121, PR 126, PR 128, PR 130, PR 131, in the districts of Faridkot, Fatehgarh Sahib, Ferozepur, Patiala, Hoshiarpur, Pathankot, Sangrur, Gurdaspur, Moga, Barnala, Roopnagar, Tarn Taran, Jalandhar and Ludhiana. Low to moderate incidence of bakanae was recorded from Patiala, SAS Nagar, Pathankot, Gurdaspur, Sangrur, Taran Tarn, Amritsar, Barnala, Moga, Fatehgarh Sahib, Ferozepur, Malerkotla, Jalandhar and Roopnagar districts on varieties Pusa Basmati 1121, Pusa Basmati 1509 and Pusa Basmati 1401. Low incidence of grain discoloration was recorded on varieties PR 114, PR 121, PR 126, Pusa 44 and Pusa Basmati 1121 from Ludhiana, Gurdaspur, Patiala, Taran Tarn, Barnala, Ferozepur, Faridkot, Bathinda and Malerkotla districts. Low incidence of sheath rot was recorded on variety PR 114 from few fields in the districts of Ferozepur, Moga and Faridkot. Southern Rice Black Streak Dwarf Virus (SRBSDV) disease was reported in few fields of Rupnagar District on Rice Hybrid 7301 and PR 131 in traces.

During *Kharif* 2024, insect-pests namely, stemborers, leaf folder and plant hoppers (WBPH + BPH) were recorded in low level in general. The damage by leaf folder rice under shade in the form of small patches was observed in village Vein Poin (Tarn Taran district). Similarly, hopper burn by brown planthopper was observed in some parts during grain maturity crop growth stage. Some farmers are using cartap hydrochloride as prophylactic treatment, dinotefuran15% + Pymetrozine45% for the management of planthoppers and Coragen (chlorantraniliprole 18.5% w/w) and Fame (flubendiamide 480SC) for lepidopteran insect pests.

Table 10: Researchable issues

Parameters/Issues	**Districts**			
	Ludhiana & Jallandhar	**Bathinda and Mansa**	**Muktsar & Fazilka**	**SBS Nagar, Rupnagar and Mohali**
Rice ecology in your area	Irrigated	Irrigated	Irrigated	Irrigated
Rice cultivation only in Kharif or both Kharif and Rabi	Kharif	Kharif	Kharif	Kharif
Number of years of experience in rice farming	10-20 years	10-20 years	10-20 years	10-20 years
Main biotic constraints (diseases) in your area according to you	Sheath blight, false smut	Sheath blight, neck blast, false smut	Sheath blight, neck blast, false smut	Sheath blight, neck blast, brown spot, false smut
Extent of disease damage	10-25%	10-25%	10-25%	10-25%
Main biotic constraints (Insect pests) in your area according to you	Stem borer, leaf folder and BPH/WBPH	Stem borer, leaf folder and BPH/WBPH	Stem borer, leaf folder and BPH/WBPH	Stem borer, leaf folder and BPH/WBPH

Parameters/Issues	Districts			
	Ludhiana & Jallandhar	**Bathinda and Mansa**	**Muktsar & Fazilka**	**SBS Nagar, Rupnagar and Mohali**
Extent of insect pest damage	<10%	<10%	<10%	<10%
Main abiotic constrains in your area according to you	Salinity and high temperature	Salinity and high temperature	Salinity and high temperature	Salinity, alkalinity and high temperature
Production constraints in your area according to you	Scarcity of agricultural labours			
Irrigation facilities in your area	Yes (100%); Canal; bore well	Yes (100%); Canal; bore well	Yes (100%); Canal; bore well	Yes (100%); Canal; bore well
Normally how many years it takes to change the rice variety	> 10 years	> 10 years	5-10 years	10-20 years
Any other rice production issues in your area which the rice scientists need to address	-	-	-	-
What is urgently required in your area as far as rice varieties are concerned				
Duration	Varieties suitable for DSR, short duration rice varieties			
Biotic stress resistance	Varieties tolerant to stem borer, BPH, sheath blight and false smut			
Abiotic stress resistance	Varieties resistant to high temperature, drought, salinity			
Preferred grain quality	MS grain quality rice varieties and aromatic short grain, Basmati varieties and hybrid			
Nutritional quality	Rice varieties with high Zn, iron and high protein			

G. Researchable issues: Among the biotic stresses, major problems in the region are sheath blight, false smut, brown spot and neck blast among the diseases and BPH/WBPH, stem borer and leaf folder among insect pests. Among the abiotic problems, drought /high temperature and salinity were the main problem in certain areas. Major problems faced by the farmers were scarcity of agricultural labours, micronutrient deficiency and non-availability of quality seeds in some areas. Farmers want varieties suitable for DSR and short duration rice varieties, varieties having tolerance to sheath blight, brown spot, neck blast, false smut, BPH/WBPH, leaf folder and stem borer. Farmers also expressed the need of high yielding fine grain varieties, aromatic short grain rice varieties and basmati varieties and varieties with high zinc, high iron and high protein.

Table 10: Contd..

Parameters/Issues	**Districts**		
	Moga and Barnala	**Ferozepur and Faridkot**	**Amritsar and Tarn Taran**
Rice ecology in your area	Irrigated	Irrigated	Irrigated
Rice cultivation only in Kharif or both Kharif and Rabi	Kharif	Kharif	Kharif
Number of years of experience in rice farming	10-20 years	5-20 years	10-20 years
Main biotic constraints (diseases) in your area according to you	Sheath blight, false smut		
Extent of disease damage	10-25%		
Main biotic constraints (Insect pests) in your area according to you	leaf folder		
Extent of insect pest damage	<10%		
Main abiotic constrains in your area according to you	Salinity		
Production constraints in your area according to you	Scarcity of agricultural labours		
Irrigation facilities in your area	Yes (100%); Canal; bore well	Yes (100%); Canal; bore well	Yes (100%); Canal; bore well
Normally how many years it takes to change the rice variety	5-10 years		
Any other rice production issues in your area which the rice scientists need to address			
What is urgently required in your area as far as rice varieties are concerned			
Duration	Varieties suitable for DSR, short duration rice varieties		
Biotic stress resistance	Varieties tolerant to sheath blight		
Abiotic stress resistance	Varieties resistant to high temperature, drought, salinity		
Preferred grain quality	MS grain quality rice varieties and aromatic short grain, Basmati varieties and hybrid		
Nutritional quality	Rice varieties with high Zn, iron and high protein		

Tamil Nadu-1-Aduthurai (2024-25)

Districts surveyed: *Ariyalur, Thanjavur, Nagappattinam, Mayiladuthurai, Thiruvarur, Tiruchirappalli, Perambalur, Pudukkottai, Villupuram, Thiruvannamalai, Kancheepuram, Thiruvallur, Cuddalore* and *Vellore*

Particulars of survey

District	Villages surveyed
Ariyalur	Gangaikondachozhapuram, Vilangudi, Manakudi, Sendurai, Chozhamadevi, T.Palur, Udayarpalayam, Karaikurichi, Naduvasam and Adhichanur
Thanjavur	Iluppakorai, Ganapathy Agraharam, Swamimalai, Thingalur, Saliyamangalam, Satanur, Maharajapuram, Thugili, Vilangudi, Pavanamangalam, Poondi and Patteeswaram
Nagapattinam	Thanikottagam, Adanur, Thakattur, Karuppanpulam, Vaimedu, Poodevankadu, Marthur, Ayakaranpulam, Sembodai, Thamaraipulam, Kallimedu and Vellapallam
Mayiladuthurai	Pandur, Thirunandriyur, Aathugudi, Needur, Madhanam, Semmangudi, Thirunindriyur, Tharangambadi, Manalmedu, Kuttalam, Kurumanakudi and Sirkali
Thiruvarur	Needamangalam, Valangaiman, Thiruvalanchuli, amani, Kunnur, Kachanam, Manali, Narthangudi, Nunakkadu and Thiruthuraipoondi
Tiruchirappalli	Pullampadi, Idhayapuram, Thirucherai, Vayalur, Manamedu, Musuri, Kulumani, Karuppur, Valadi, Musiri, Pettaivaithalai, Ramanathanallur and Alavanthanallur
Perambalur	Siruvachur, Sendurai, Veppankuzhi, Manjamedu, Veppanthattai, Thirumalapadi, Thirumanoor and Vetriyar
Pudukkottai	Valavampatti, Gandharvakottai, Semmanampottal, Sadayamangalam, Avudayarkovil, Manmelgudi, Avanam, Alangudi, Solagampatti and Thirumayam
Villupuram	Azhiyur, Melur, Sorappur, Vanur, Sengadu, Semmankuppam, Koonimadu, Gingee, Kallakurichi, Siruvathur and Kolianur
Thiruvannamalai	Radhapuram, Ariyur, Muthanoor, Adhamangalam, Arugavoor, Panappadi, Perunkattur and Kilaiyur
Kancheepuram	Madavakkam, Kanathur, Nanchipuram, Kallur, Nelveli, Agaram, Nandhivaram, Keelappattu, Sithapuram, Arumpuliyur and Ellappakkam
Thiruvallur	Thirurkkuppam, Periyapalayam, Ayalur, Ponneri, Jayapuram, Ayathur, Egattur, Eraiyur, Pallipattu, Villivakkam, Govindamedu and Ikkadu
Cuddalore	Renganathapuram, Kudikadu, Venkitankuppam, Gunamangalam, Ayankudi, Vanamadevi, Semmankuppam, Nallathur, Vadakuthu, Maruvai, Kurungudi and Reddiyur
Vellore	Athipattu, Udayamuthur, Virinjipuram, Thakkankulam, Arkadu, Kavanoor, Pichanoor, Chettikuppam, Pasumathoor and Poondi

Widely grown rice varieties

District	Varieties
Ariyalur	**HYVs:** BPT 5204, Amman Ponni, I. W. P. CO 52, TPS 5, CR 1009 Sub 1, ADT 45 & ADT 54
Thanjavur	**HYVs:** ADT 36, ADT 37, ADT 39, ADT 42, ADT 43, ADT 45, ADT 46, ADT 51, ADT 52, ADT 54, CR 1009, CR 1009 Sub 1, BPT 5204, CO 50, CO 56, CO 52, NLR 34449, MTU 7029, IR 20, Swarna Sub 1, TRY 3, TPS 3, VGD 1, DR Dhan, TKM 13, Uma and Ankur Sadhana
Nagappattinam	**HYVs:** BPT 5204, IR 20, TPS 5, TRY 3, CR 1009, CR 1009 Sub 1, ADT 36, ADT 47, ADT 38, ADT 39, ADT 42, ADT 45, ADT 46, ADT 51, ADT 53, ADT 54, ADT 57 and MTU 7029
Mayiladuthurai	**HYVs:** ADT 46, ADT 51, BPT 5204, Swarna Sub 1, ADT 38, CO 56 and ADT 54
Thiruvarur	**HYVs:** ADT 39, ADT 46, ADT 45, ADT 42, ADT 51, CR 1009, CR 1009 Sub 1, IR 20, MTU 7029, BPT 5204, ADT 54, CO (R) 50, CO 51 and Swarna Sub 1
Tiruchirappalli	**HYVs:** ADT 36, NLR-34449, CR 1009, CO 50, TKM 13, CO 52, CO 54, TRY 3 and BPT 5204
Perambalur	**HYVs:** ADT 54, CO (R) 50, BPT 5204, I.W. Ponni, RNR 15048 and Anna Ponni
Pudukkottai	**HYVs:** ADT 39, ADT 51, CR 1009 Sub 1, BPT 5204, JGL 1786, NLR 34449, ASD 16 and TPS 5
Villupuram	**HYVs:** I.W.Ponni, CR 1009 Sub 1, BPT 5204, ADT 39, ADT 54, NLR 34449, RNR 15048 and Mahindra 606
Thiruvannamalai	**HYVs:** CO 51, RNR, I.W.P., ADT 37, ADT 39, ADT 45, CO 55, BPT 5204, Amman and Mahindra 606
Kancheepuram	**HYVs:** CO 51, NLR 34449, BPT 5204, I.W. Ponni, RNR 15048, MTU 1010, Mahindra-606 and ADT 37
Thiruvallur	**HYVs:** CO 55, MTU 1010, BPT 5204, CR 1009 Sub 1, ADT 39 and I.W. Ponni
Cuddalore	**HYVs:** BPT 5204, I. W. Ponni, TKM 13, CO 50, ADT 51, ADT 54, Ankur Sadhana, RNR 5048, NLR 34449, CR 1009 Sub 1 and ADT 38
Vellore	**HYVs:** CO 51, RNR 15068, Narmada and others

Particulars of rice area surveyed (*Samba / Thaladi*) 2024-25

District	Normal rice area (ha)	Area planted (ha)	%age of area covered against normal area
Ariyalur	22000	21986	99
Thanjavur	135000	130197	96
Nagappattinam	65000	64416	99
Mayiladuthurai	66000	68880	104
Thiruvarur	145000	143935	99
Tiruchirappalli	44977	54492	121
Perambalur	4723	3643	77
Pudukkottai	85109	81035	95

District	Normal rice area (ha)	Area planted (ha)	%age of area covered against normal area
Villupuram	55914	70242	125
Thiruvannamalai	67945	64137	94
Kancheepuram	14427	13270	91
Thiruvallur	51993	49945	96
Cuddalore	90000	92960	103
Vellore	1870	2828	151
Total	**849958**	**861966**	--

Production oriented survey was conducted in fourteen districts of Cauvery delta zone in Tamil Nadu viz., Ariyalur, Thanjavur, Nagappattinam, Mayiladuthurai, Thiruvarur, Tiruchirappalli, Perambalur, Pudukkottai, Villupuram, Thiruvannamalai, Kancheepuram, Thiruvallur, Cuddalore and Vellore. Area under rice was marginally increased. Short duration rice varieties ADT 36, ADT 43, ADT (R) 45, TKM 13 and medium / long duration varieties CR 1009 Sub 1, ADT 38, ADT 39, ADT (R) 46, ADT (R) 49, ADT 51, Annapoorani, Jaiganesh, Amman, Mahindra-404, CO 43, CO 51, NLR 34449, CO 51, Improved White Ponni, CR 1009 and BPT 5204 were predominantly grown. Common crop rotations followed by the farmers were rice-rice-pulses/gingelly, rice-pulses, rice-rice-rice, rice-sugarcane-rice and rice-onion. Overall incidences of different pests and diseases in different surveyed districts was low. Among the insect pests, leaf folder, stem borer, BPH and gall midge were recorded. Mild incidence of bacterial leaf blight, false smut, blast, sheath blight, sheath rot and brown spot diseases were recorded. Labour scarcity was the major constraint to the farmers.

District-wise observations

Ariyalur: Ten villages were covered for production oriented survey in this district. Rice crop was grown in 18088 ha in *Samba / Thaladi* season as against a normal area of 20500 ha. Canal, tanks and open wells were the major sources of irrigation. Direct seeding was practiced in the district due to drought. Rice-pulses-gingelly/cotton cropping systems being followed in this district. Short duration rice varieties like BPT 5204, Amman Ponni, I. White Ponni, CO 52, TPS 5, CR 1009 Sub 1, ADT 45 and ADT 54 were prominently grown in *Rabi* season. The average yield was about 4.0-4.5 t/ha. Farmers generally used higher seed rate of 90 kg/ha. Few farmers only applied the recommended level of fertilizer @ 150:60:60 kg NPK/ha for *Rabi* season. Hand weeding was commonly followed. Inputs like water, power and seeds were not adequately available to the farmers. Proper facilities for drying and storage were not available in many villages. No pest and diseases were noticed.

Thanjavur: Production oriented survey was conducted in twelve villages of this district. Rice crop was grown in 130197 ha as against the normal area of 135000 ha in Samba/Thaladi season. Rice-rice-pulses/gingelly, rice-pulses and rice-rice-rice were the major cropping systems followed. Varieties like ADT 36, ADT 37, ADT 39, ADT 42, ADT 43, ADT 45, ADT 46, ADT 51, ADT 52, ADT 54, CR 1009, CR 1009 Sub 1, BPT 5204, CO 50, CO 56, CO 52, NLR 34449, MTU 7029, IR 20, Swarna sub 1, TRY 3, TPS 3, VGD 1, DR Dhan, TKM 13, Uma and Ankur Sadhana were predominantly grown by the farmers. Herbicide, butachlor @ 2.5 lit/ha at 3 DAT was used for the control of common wetland weeds. Nitrogenous fertilizers at recommended level (150

kg/ha), phosphorus and potash fertilizers at lower level (30 kg/ha) were applied by the farmers. Insect pests like gall midge, leaf folder, brown plant hopper and stem borer and diseases like false smut, brown spot and BLB were noticed at below ETL in BPT 5204, ADT 52, ADT 51, CO (R) 50 and CO 56.

Nagappattinam: Production oriented survey was conducted in twelve villages of this district. Rice crop was grown in 64416 ha in *Samba/Thaladi* season as against a normal area of 65000 ha. It is located in the tail end of Cauvery river basin. Because of non-availability of canal water, direct sowing was followed in some places where bore wells are not available. Most of the farmers purchased new seeds every year for cultivation. Sufficient quantity of fertilizers and pesticides were available on time both in co-operative societies and in private shops. The varieties like BPT 5204, IR 20, TPS 5, TRY 3, CR 1009, CR 1009 Sub 1, ADT 36, ADT 47, ADT 38, ADT 39, ADT 42, ADT 45, ADT 46, ADT 51, ADT 53, ADT 54, ADT 57, MTU 7029 are predominantly grown in this district. Rice-pulses and rice-rice-pulses were the major cropping systems followed. Insect pests like brown plant hopper, leaf folder, stem borer, yellow stem borer and thrips were observed under ETL. In case of diseases false smut and blast were observed at low level.

Mayiladuthurai: Production oriented survey was conducted in twelve villages of this district. Rice crop was grown in 68880 ha in *Samba/Thaladi* season as against a normal area of 66000 ha. It is located in the tail end of Cauvery river basin. Because of non-availability of canal water direct sowing was followed in some places where bore wells are not available. Most of the farmers purchased new seeds every year for cultivation. Sufficient quantity of fertilizers and pesticides were available on time both in co-operative societies and in private shops. The varieties like ADT 46, ADT 51, BPT 5204, Swarna Sub 1, ADT 38, CO 56, ADT 54 are predominantly grown in this district. Rice-pulses and rice-rice-pulses were the major cropping systems followed. Insect pests like brown plant hopper, leaf folder, stem borer were observed at low level.

Thiruvarur: Production Oriented Survey was conducted in ten villages of this district. Rice crop was grown in 143935 ha in *Samba/Thaladi* season as against a normal area of 145000 ha. Normally rice crop was cultivated with Cauvery river irrigation and bore wells. This year both canal water and bore well water was available for irrigation. The varieties like ADT 39, ADT 46, ADT 45, ADT 42, ADT 51, CR 1009, CR 1009 Sub 1, IR 20, MTU 7029, BPT 5204, ADT 54, CO (R) 50, CO 51 and Swarna Sub 1 were predominantly grown in *Samba/Thaladi* season. Rice-rice-pulses, rice-rice and rice-rice-rice were the cropping sequences followed. The average yield of the district in *Kharif* season was about 5.5 - 6.0 t/ha. Direct seeding was also practiced in some areas. Few farmers applied zinc sulphate (0.5%) + urea (1.0%) as foliar spray to correct zinc deficiency in *Rabi* crop. Combined harvesters were widely used. Pest and diseases like false smut, BPH and leaf folder were observed in some places below ETL.

Tiruchirappalli: The survey was conducted in thirteen villages of this district. Rice crop was grown in 54492 ha as against a normal area of 44977 ha. Canal irrigation and bore wells were the major sources of irrigation. Rice-rice, rice-rice-pulses/gingelly and rice-pulses were the predominant cropping systems followed. Rice varieties like ADT 36, NLR 34449, CR 1009, CO 50, TKM 13, CO 52, CO 54, TRY 3 and BPT 5204 were grown in larger areas. Farmers applied higher level of nitrogenous fertilizer and lower level of phosphorus and potash fertilizers as against the blanket recommendation of 150:50:50 kg NPK/ha. Bacterial leaf blight was noticed with low

level of incidence. In case of insect pest, stem borer and gall midge incidence were recorded in low level. Combined harvesters, thrashers, transplanters and cono weeders were used by the farmers.

Perambalur: The survey was conducted in eight villages of this district. Direct seeding of rice was practiced in larger areas in Perambalur district. Rice crop was grown in 3643 ha in Samba season as against a normal area of 4723 ha. Area was drastically reduced because of drought. Canals and bore wells were the major sources of irrigation. Tanks were the supplemental source of irrigation. Rice-rice, rice-rice-pulses/gingelly, rice-sugarcane-rice and rice-onion were the cropping systems followed. Farmers used higher seed rate of 90-120 kg/ha. Government agencies contributed 20%, Private agencies 20% and farmers used their own seeds to the extent of 60, Varieties like ADT 54, CO (R) 50, BPT 5204, I.W. Ponni, RNR 15048, Anna Ponni were largely grown in this district. Lower doses of NPK fertilizers were applied by the farmers. Resources like water, power, quality seeds and machineries were not adequately available. No pest and diseases were noticed.

Pudukkottai: The survey was conducted in ten villages of this district. Rice crop was grown in a total area of 81035 ha in Samba season as against normal area of 85109 ha. Canal, tanks and open wells were the major sources of irrigation. ADT 39, ADT 51, CR 1009 Sub 1, BPT 5204, JGL 1786, NLR 34449, ASD 16, TPS 5 were the prominent rice varieties grown. Farmers used a higher seed rate of 80-90 kg/ha and adopted random method of planting with 40-50 hills/sq. m. Farmers used new seeds every time for cultivation. Seed treatment was not practiced. Quality fertilizers and pesticides were available in private shops. Combined harvesters and thrashers were widely used. Low incidence gall midge, brown plant hopper and stem borer were noticed below ETL. In case of diseases, blast and BLB were noticed below ETL.

Villupuram: Production oriented survey was conducted in eleven villages of this district. Rice crop was grown in 70242 ha as against a normal area of 55914 ha in *Samba*. The varieties like I. W. Ponni, CR 1009 Sub 1, BPT 5204, ADT 39, ADT 54, NLR 34449, RNR 15048 and Mahindra 606 were predominantly grown. Tanks and open wells were the major sources of irrigation. Rice-pulses/onion/maize was the major cropping system adopted. Direct sowing was practiced by the farmers. Conventional method of cultivation with random planting was followed in many places. Hand weeding was commonly practiced by the farmers. The insect pests and diseases like leaf folder, stem borer, thrips, bacterial blight and brown spot were noticed in 1515 ha in BPT 5204, RNR 15048, I. W. P. and Mahindra 606.

Thiruvannamalai: During *Rabi* season, the survey was conducted in eight villages of this district. Rice crop was grown in 64137 ha as against normal area of 67945 ha in Samba. Rice-rice-rice, rice-rice and rice-rice-groundnut were the major cropping sequences followed. Rice varieties like CO 51, RNR 15048, I. W. Ponni, ADT 37, ADT 39, ADT 45, CO 55, BPT 5204, Amman and Mahindra 606 were prominently grown in Rabi season. The average rice yield was 5.0-5.5 t/ha in Kharif and 4.5-5.0 t/ha in Rabi season. Most of the farmers did not apply any fertilizers for nursery. Weed infestation was medium in rice fields with weeds *like Echinocloa crusgalli, Cyperus rotandus* and *Marsilia quadrifolia*. Combine harvesters were used by 80 - 90% of farmers of this district. Inputs such as power, water and seeds were inadequate to the farmers. Power sprayers

were widely used for spraying of insecticides and fungicides. Occurrence of leaf folder, stem borer and leaf spot were noticed in Amman, Mahindra 606 and CO 55 varieties below ETL.

Kancheepuram: The survey was conducted in eleven villages of this district. Rice crop was grown in a total area of 13270 ha in *Kuruvai* season as against normal area of 14427 ha. Canal, tanks and open wells were the major sources of irrigation. CO 51, NLR 34449, BPT 5204, I.W. Ponni, RNR 15048, MTU 1010, Mahindra-606, ADT 37 were the prominent rice varieties grown. Farmers used a higher seed rate of 80-90 kg/ha and adopted random method of planting with 40-50 hills/sq. m. Farmers used new seeds every time for cultivation. Seed treatment was not practiced. Quality fertilizers and pesticides were available in private shops. Combined harvesters and thrashers were widely used. Low incidence of blast, sheath blight, BLB and false smut and leaf folder was recorded below ETL in CO 51, NLR 34449, BPT 5204, I.W. Ponni, MTU 1010 and ADT 37 in 2786 ha.

Thiruvallur: Production oriented survey was conducted in twelve villages of this district. Rice crop was grown in 49945 ha as against a normal area of 51993 ha in *Samba/thaladi*. CO 55, MTU 1010, BPT 5204, CR 1009 Sub 1, ADT 39 and I.W. Ponni were mostly grown. Bore wells and tanks were the main sources of irrigation. Rice-rice and rice-rice-rice were the important cropping sequences followed. Optimum population of 40-50 hills/sq. m. was maintained. Harvester cum Thresher was widely used by farmers on hire basis. Water, electricity, seeds, storage and drying facilities were inadequate. Leaf folder, leaf blast, grain discolouration and algal growth were noticed in below ETL.

Cuddalore: Twelve villages were covered for production oriented survey in this district. Rice crop was grown in 92960 ha in *Samba/Thaladi* as against a normal area of 90000 ha. Direct seeding was practiced in the district due to drought. In this district, 55% of rice area was cultivated with Cauvery river irrigation and the remaining area was grown with bore wells. Rice-rice-rice, rice-rice-pulses, rice-sugarcane and rice-rice-groundnut is the normal cropping systems being followed in this district. Rice varieties like BPT 5204, I. W. Ponni, TKM 13, CO 50, ADT 51, ADT 54, Anthur Sadhana, RNR 5048, NLR 34449, CR 1009 Sub 1, ADT 38 were prominently grown in *Rabi* season. The average yield was about 4.0-4.5 t/ha and 4.5 - 5.0 t/ha in *Kharif* and *Rabi* seasons, respectively. Few farmers only applied the recommended level of fertilizer application @ 150:60:60 kg NPK/ha for *Rabi* season. Hand weeding was commonly followed for management of weeds. Inputs like water, power and seeds were not adequately available to the farmers. Proper facilities for drying and storage were not available in many villages. The insect pest like leaf folder, stem border and leaf foliator were noticed below ETL. Diseases like blast and BLB were noticed at low level in CR 1009 Sub 1, BPT 5204 and Improved White Ponni.

Vellore: Production oriented survey was conducted in ten villages of this district. Rice crop was grown in 2828 ha as against normal area of 1870 ha in Samba season. RNR 15068, CO 51 and Narmada were the rice varieties predominantly grown in the district. Tanks and open wells were the major sources of irrigation. Zinc sulphate was applied as basal application at the rate of 25 kg/ha or 0.5% foliar spray in many villages. Few farmers used bio fertilizers like *Azospirillum* and *Phosphobacteria* for rice cultivation as seed treatment and soil application. Water, electricity and quality seeds were inadequate. Leaf folder incidence was noticed in all varieties grown in the districts at low level.

Prevalence of diseases and insect pests in Tamil Nadu-1

Districts	Diseases						
	Bl	**ShBl**	**BS**	**FS**	**GD**	**BLB**	**GA**
Ariyalur	-	-	-	-	-	-	-
Thanjavur	-	-	L	L	-	L	-
Nagappattinam	L	-	-	L	-	-	-
Mayiladuthurai	-	-	-	-	-	-	-
Thiruvarur	-	-	-	L	-	-	-
Tiruchirappalli	-	-	-	-	-	L	-
Perambalur	-	-	-	-	-	-	-
Pudukkottai	L	-	-	-	-	L	-
Villupuram	-	-	L	-	-	L	-
Thiruvannamalai	-	-	L	-	-	-	-
Kancheepuram	L	L	-	L	-	L	-
Thiruvallur	L	-	-	-	L	-	L
Cuddalore	L	-	-	-	-	L	-
Vellore	-	-	-	-	-	-	-

GA: Green algae

Districts	Insect pests				
	LF	**SB**	**BPH**	**RT**	**GM**
Ariyalur	-	-	-	-	-
Thanjavur	L	L	L	-	L
Nagappattinam	L	L	L	L	-
Mayiladuthurai	L	L	L	-	-
Thiruvarur	L	-	L	-	-
Tiruchirappalli	-	L	-	-	L
Perambalur	-	-	-	-	-
Pudukkottai	-	L	L	-	L
Villupuram	L	L	-	L	-
Thiruvannamalai	L	L	-	-	-
Kancheepuram	L	-	-	-	-
Thiruvallur	L	-	-	-	-
Cuddalore	L	L	-	-	-
Vellore	L	-	-	-	-

Tamil Nadu-2-Coimbatore (2024-25)

Districts surveyed: *Thiruvanamalai, Salem, Dharmapuri, Erode, Coimbatore, Krishnagiri, Kallakurichi, Namakkal, Kanyakumari* and *Tirunelveli*

Particulars of survey

Districts	Villages
Thiruvanamalai	Sathuvanthangal, Vettavalam, Kilpennandhur, Anakavur and Mukkur
Salem	Thevoor, Poolampatti and Belur
Dharmapuri	Mailampatti and Govindapuram
Erode	Kothamangalam, Arakkankottai, Jambai, Vellankoil and Tiruvachi
Coimbatore	Narasipuram, Devarayapuram and Anamalai
Krishnagiri	Paiyur and Pannandhur
Kallakurichi	Namasivayapuram, Mangalam, Malaikothalam and Siruvallur
Namakkal	Vediyarasampalayam, Kokkarayanpettai and Eriyamangalam
Kanyakumari	Thamaraikulam, Thovalai and Vallavilai
Tirunelveli	Ayyansingampatti, Arasankulam, Karisal patti and Malayankulam

Widely prevalent rice varieties

Districts	Varieties
Thiruvanamalai	ADT 53, ADT 55, ADT 38, Amman and Co 51
Salem	ADT 53, ADT 38, CO 51, Sadana and Amman
Dharmapuri	ADT 53, ADT 55, Amman, IR 20 and Dhanuska
Erode	Amman, BPT5204, ADT 53, ADT 43, Bharani and Sadana
Coimbatore	Co 51, ASD 16 and BPT 5204
Krishnagiri	ADT 53, ADT 43, ADT 38, Amman and BPT 5204
Kallakurichi	Amman, ADT 37, ADT 55, CO 51 and BPT 5204
Namakkal	BPT 5204, RNR 15048, ADT 45,IWP, Archana and Amman
Kanyakumari	TPS 5, ASD 16, Bharathi and BPT 5204
Tirunelveli	ASD 16, ASD 19 and TPS 5

Table 3: Particulars of rice areas in the surveyed districts of Tamil Nadu during 2024

District	Total geographical area (ha)	Total cultivable area (ha)	Total cultivated area (ha)	Total irrigated area (ha)	Area under paddy (ha)	Area under DSR (ha)
Thiruvanamalai	631205	209384	198415	76629	68243	13570
Salem	520530	313492	213297	118948	13897	1200
Dharmapuri	449777	250373	164975	57512	22421	4450
Erode	572264	176699	158878	117758	24067	3270
Coimbatore	472322	175068	165117	118948	1365	420
Krishnagiri	514326	241182	166072	70670	29118	2640
Kallakurichi	330705	276346	114733	54175	41193	13764
Namakkal	336719	189508	149322	72892	5555	865
Kanyakumari	167200	78349	72670	24367	11218	1875
Tirunelveli	387606	84268	69925	47905	34390	6731

Table 4: Details of weather data in the surveyed districts of Tamil Nadu in 2024

Weather parameters	Months							
	Jun	**Jul**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**	**Jan**
Thiruvanamalai								
Total rainfall (mm)	23.6	31.2	67.0	62.8	117.6	144.7	120.3	71.6
Salem								
Total rainfall (mm)	57.6	43.1	168.4	141.7	118.0	73.7	139.2	31.4
Dharmapuri								
Total rainfall (mm)	16.4	21.9	44.6	48.1	93.2	115.4	61.0	23.6
Erode								
Total rainfall (mm)	38.3	84.9	126.2	181.5	130.5	65.7	61.3	48.0
Coimbatore								
# of Rainy days	2	8	3	1	14	5	5	-
Total rainfall (mm)	175.8	27	89.3	31.8	11.2	369.4	43.4	39.1
Maximum temp (^{O}C)	32.1	30.6	31.8	32.9	30.8	29.8	29.8	26.3
Minimum temp (^{O}C)	24.3	23.6	23.9	23.7	22.7	22	21	22.4
Krishnagiri								
Total rainfall (mm)	10.2	27.3	118.1	129.0	145.2	106.7	73.4	148.6
Kallakurichi								
Total rainfall (mm)	18.1	45.8	106.9	84.7	137.5	96.0	123.4	81.9
Namakkal								
Total rainfall (mm)	97.94	19.42	146.79	25.52	207.57	73.73	154.04	10.07
Kanyakumari								
Total rainfall (mm)	74.3	248.5	122.7	284.1	255.3	156.8	239.6	41.4
Tirunelveli								
Total rainfall (mm)	10.3	26.8	70.1	32.6	74.5	162.4	149.1	198.3

Table 6: Variety wise area coverage (ha) in different districts of Tamil Nadu in *Kharif* 2024

Variety/hybrid	Districts				
	Thiruvanamalai	**Salem**	**Dharmapuri**	**Erode**	**Coimbatore**
Amman	5350	1400	3600	2300	
ADT 53	14000	1200	4400	2100	85
ADT 38	5600	850			
CO 51	2760	800		1400	240
Sadana		550		1250	80
ADT 55	6500		3600		
IR 20			750		
BPT 5204					320
ASD 16					80
ADT 43				2100	
Bhavani				1100	

Variety/hybrid	Districts				
	Krishnagiri	**Kallakurichi**	**Namakkal**	**Kanyakumari**	**Tirunelveli**
BPT 5204	2000	6450	3100	1150	
RNR 15048			280		
ADT 55		6450			
CO 55			85		
IR 20			255		
Wayanadu 2			580		
ADT 45	2000		620		
Amman		6200			
Co 51		3135			
ADT 43	6235				
ADT 53	2070				
ADT 38	1300				
ASD 19					7540
ASD 16				2735	11305
TPS-5				3460	3870
Bharathi				1300	

Table 5: General Question of Rice Cultivation In District (To Be Filled By The Cooperator In With The Officials From State Department of Agriculture

Parameters	Districts				
	Thiruvanamalai	**Salem**	**Dharmapuri**	**Erode**	**Coimbatore**
Total Area under HYVs in the district (ha)	67140	13725	22173	24000	1250
Most prevalent HYVs in the District	ADT 53	Amman	ADT 53	Amman	BPT 5204
Total area under rice hybrids in the district (ha.	Nil	Nil	Nil	Nil	Nil
Most prevalent rice hybrids in the district	NA	NA	NA	NA	NA
Total area under ~~basmati~~/scented in the district	Nil	Nil	Nil	Nil	Nil
Most prevalent basmati varieties in the district	NA	NA	NA	NA	NA
Seed replacement rate	Not available	100%	100%	100%	100%
Whether farmers are using any heavy equipments like transplanted/combine harvester	Combine harvester	Combine harvester	Combine harvester	Combine harvester	Combine harvester
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	SRI	SRI (5%)	SRI and DSR (10%)	SRI (10%)	SRI
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	-	Biological seed treatment, SRI	Biological seed treatment	False smut disease management	-
What are the general problems in rice cultivation in the district?	Labour shortage especially during planting	Labour shortage	Labour shortage	Labour shortage, false smut	Labour shortage
Please provide any farmers association in the district	-	-	-	Keelbhabani farmers welfare association	-
Whether availability of labors is sufficient?	No	No	No	No	No
Whether there is any marketing problem of the produce?	Inadequate infrastructure for public procurement	Inadequate infrastructure at state marketing centres	Inadequate infrastructure at marketing centres	No	No
Any major irrigation/power generation project in the district	Stanley dam	Stanley reservoir	-	Lower Bhabani project	Aliyar Dam
Any soil testing program undertaken?	Yes	Yes	Yes	Yes	Yes
Any farmers' training program was organized by the state department of Agriculture/ University	Yes	Yes	Yes	Yes	Yes

Table 5 contd..: General Question of Rice Cultivation In District (To Be Filled By The Cooperator In With The Officials From State Department of Agriculture

Parameters	Districts				
	Krishnagiri	**Kallakurichi**	**Namakkal**	**Kanyakumari**	**Tirunelveli**
Total Area under HYVs in the district (ha)	28720	40570	10364	11218	33625
Most prevalent HYVs in the District	ADt 43	ADT 55	IWP, BPT 5204, IR 20	TPS 5	ASD 19, ASD 16
Total area under rice hybrids in the district (ha.	Nil	Nil	Nil	Nil	Nil
Most prevalent rice hybrids in the district	NA	NA	NA	NA	NA
Total area under ~~basmati~~/scented in the district	Nil	Nil	Nil	Nil	Nil
Most prevalent basmati varieties in the district	NA	NA	NA	NA	NA
Seed replacement rate	100%	100%	100%	100%	-
Whether farmers are using any heavy equipments like transplanted/combine harvester	Combine harvester	Combine harvester	Combine harvester	Combine harvester	Combine harvester
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	SRI and DSR (10%)	SRI	SRI	SRI / DSR	DSR
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Biological seed treatment, DSR	Adoption of SRI and DSR	-	Biological seed treatment	SRI adoption
What are the general problems in rice cultivation in the district?	Labour shortage, less price of the produce	Labour shortage for planting	Labour shortage	Labour shortage; less price of the produce	Labour shortage
Please provide any farmers association in the district	Podhigi farmers welfare association	Sankarapuram farmers association	-	-	Ambai Farmers Welfare Association
Whether availability of labors is sufficient?	No	No	No	Yes	No
Whether there is any marketing problem of the produce?	-	Inadequate in-	No	No	No
Any major irrigation/power generation project in the district	Krishnagiri reservoir	Gomuchi, Manimuktha Dam	Metur dam, Stanley reservoir	Pechiparai dam and Perunchari dam	Papanasam, Manimutharu irrigation project
Any soil testing program undertaken?	Yes	Yes	Yes	Yes	Yes
Any farmers' training program was organized by the state department of Agriculture/ University	Yes	Yes	Yes	Yes	Yes

In the Production Oriented Survey (POS) program during the year 2024-25, ten districts were surveyed covering south and western parts of Tamil Nadu. These included Thiruvanamalai, Salem, Dharmapuri, Erode, Coimbatore, Krishnagiri, Kallakurichi, Namakkal, Kanyakumari and Tirunelveli. This year was a normal year for rice production without major outbreak of pest and diseases. Farmers solely depended on canal irrigation and were able to cultivate rice during *Kuruvai* season. Varieties chosen by the farmers in each district were mentioned above. Nearly half of the area surveyed was cultivated with two season rice crop in the current year. As in the past, short and medium duration varieties were generally chosen by the farmers for cultivation. Varieties like ADT 55, ADT 53, Amman and BPT 5204 were grown predominantly apart from CO 51, ASD 16, Sadana, IR 20 and IWP. Farmers are gradually shifting to DSR due to acute labour scarcity across the state. Mechanical transplanter suitable for small holdings was most sought-after machinery by the farmers. Crop insurance covering village level damages and better infrastructure at civil supplies corporation were also emphasized by some farmers. Herbicides butachlor (pre-emergence) was used along with one or two hand weeding for the control of weeds. Conoweeder was practiced by the farmers adopting SRI method of rice cultivation. NPK was applied by the farmers along with DAP as basal fertilizers. Urea and potash along with neem cake 50 kg/ha was also applied as top dressing in some of the rice growing areas. Many farmers have complained about huge increase in fertilizer prices. Zinc deficiency was noticed in some pockets and awareness about application of Zinc sulphate is very high among different group of farmers. Seed rate used by the farmers were varied from 40 to 60 kg per hectare and the seeds were purchased by the farmers every year from the local retailers and Agricultural Department. Seed rate of 10-12 kg/ha was adopted by farmers wherever the SRI method of cultivation was practiced. In the surveyed districts major sources of irrigation were canals and deep tube well.

Labour scarcity was very high for rice cultivation. Random transplanting was the most widely adopted method. Line transplanting, SRI, and direct sowing were also adopted by some farmers. In the mechanized cultivation, farmers are using the agricultural implements *viz*., power tiller, tractor and machine harvester. Most of the places farmers were advised by the pesticide dealers for the usage of fertilizers, pesticides and seed. Harvesting is done by combine harvester in most places and the use of combine harvester is gaining momentum among the various categories of farmers and farmers were getting an average yield of 4400-5300kg/ha. Diseases like blast, neck blast, brown spot, sheath blight, sheath rot, false smut and bacterial blight and insect pests like stem borer, leaf folder, case worm and leaf mite were recorded in low intensities in most of the places surveyed. However, in some areas, stem borer, blast and BLB emerged as major biotic problems during this year. Many farmers have used two sprays of plant protection chemicals as prophylactic spray along with micronutrients. Insecticides *viz.,* imidachloprid, thiomethaxim, acephate, profenophos, melathion, and chlorpyriphos were used for the control of BPH, leaf folder and stem borer. In general, higher doses of chemicals were used for the control of stem borer and leaf folder. Farmers used prophylactic sprays by mixing the insecticides with fungicides before application. Fungicides like tricyclazole, tebuconazole, propiconazole, azoxystrobin and carbendazim were used by the farmers for disease control. Seed treatment with *Bacillus subtilis* @ 10 gm/kg was practiced by several farmers across the state. Most of the farmers were not aware about the name of pesticides they are using and also not able to distinguish many pest and diseases except major ones like neck blast, stem borer, false smut and leaf folder. There was no major outbreak of any pest or disease during this year.

District wise observations

Thiruvanamalai: In Thiruvannamalai district, survey was conducted in Sathuvanthangal, Vettavalam, Kilpennandhur, Anakavur and Mukkur villages when the crops were in heading to mild stage. A total of 10 farmers were contacted during the survey. The fields surveyed were under irrigated ecosystem and in general, the climatic conditions were normal and favourable for rice cultivation. Rice varieties, ADT 53, ADT 55, Co 51, NLR 3449, ADT 38 and Amman were the preferred varieties by the rice growers of this district. Common cropping sequences followed by the farmers were rice-sugarcane, rice-pulses, rice-groundnut, rice-groundnut-sorghum, rice-pulses-onion and others. Average yield ranged from 4100 to 5000 Kg/ha. A seed rate of 40-60 kg/ha was used by the farmers. Some farmers treated the seeds with carbendazim (2 g/kg). Application of organic manure in the nursery was not common among the farmers. However, most of the farmers applied chemical fertilizers like urea and DAP in the nursery. N, P and K fertilizers were applied at the rate of 125-150Kg/ha, 40-50kg/ha, 40-50Kg/ha respectively through urea, DAP and MOP. Complex fertilizers were also used in some places. Many farmers applied FYM in the main fields (2-5 t/ha). Intensity of weeds like *Cyperus* spp., *Echinochloa* spp., *cynodon dactylon*, *Digitaria* spp. and others in the field was less. Hand weeding was most common method of weed control. Only few farmers applied herbicides like butachlor. Some of the common needs of the farmers were desilting of tanks, small machine for planking and leveling, better price support, enhancement of insurance coverage at village level, improvement in mechanization and remunerative price. Implements like power sprayer, tractor, power tiller, cono weeder, combine harvesters and others were used by the farmers. Most of the farmers contacted told that they purchased seeds for sowing. Canal and shallow tube wells were the main sources of irrigation. Most of the farmers contacted told that fertilizers and pesticides were available in time and they were happy with their quality. In addition to their own decision, farmers got advices from local dealers. Leaf blast and false smut infection and stem borer infestation was the most common thus, application of monocrotophos, azoxystrobin and profenofos was widely practiced. Many farmers applied two rounds of pesticide during the crop season.

Salem: During the survey crop was in tillering stage. Fields were surveyed in villages such as Poolampatti, Thevoor, Tiruvandipatti and Belur. Rice varieties CO 51, BPT5204, ADT 38, ADT 53, Sadana and Amman were the most commonly used varieties of rice among the farmers during the crop season. The average seed rate used was 50-60 Kg/ha. Fertilizers, 150 Kg/ha N, 50 Kg/ha P and 50 Kg/ha K nutrients were applied through Urea, DAP and complex fertilizers. Farmers used tractor, power tiller, sprayer and machine harvester for field operations. The source of irrigation is deep tube well and canal. Pest and disease incidence was noticed at low intensity. Many farmers applied two rounds of pesticide during the crop season.

Dharmapuri: The villages *viz.*, Maiylampatti and Govindapuram were covered during the survey. Crops from seedling to grain filling stages were surveyed. Rice varieties *viz*., ADT 53, ADt 55, Amman, and IR 20 were the most commonly used rice varieties among the farmers. Complex fertilizers, Urea, SSP, DAP, MOP were used. Intensity of weeds in the field was low. Average yield obtained by the farmers during the season was around 5000 Kg/ha. Leaf blast and false smut infection and stem borer infestation was most common. Farmers applied imidachloprid and monocrotophos to protect the crop from pest. Diseases were low in most of the fields and carbendazim, propiconazole and copper hrdroxide were used to manage diseases.

Erode: Survey was conducted in villages like Kothamangalam, Arakkankottai, Jambai, Vellankoil and Tiruvachi. In Erode district, ADT 53 ADT 43, Sadana, CO 51, BPT 5204, IR 20 and white ponni were commonly cultivated varieties of rice among the farmers. Crops with just transplanted to panicle initiation stages were surveyed. NPK fertilizers were applied in terms of Urea, DAP and MOP. During the survey crops with tillering stage were sprayed with combination fungicides (carbendazim 12% + mancozeb 63 % WP) or tricyclazole as a prophylactic measure against blast and brown leaf spot diseases. Blast, BLB, stem borer and leaf folder were observed below ETL in most of the places. Many farmers applied two rounds of pesticide during the crop season. Majority of the farmers have expressed concern over huge price increase of potassium fertilizers.

Coimbatore: In Coimbatore district rice varieties *viz*., ASD 16, CO 51 and BPT 5204 were cultivated. Villages *viz*., Narasipuram, Devarayapuram and Anamalai were surveyed. Crops from just transplanted to panicle initiation stage were surveyed. Crop rotation of either sugarcane or banana was observed among of the farmers. Application of NPK fertilizers (Urea, SSP and MOP) along with 20 kg/acre of $ZnSO_4$ was used. Other amendments like FYM @ 12.5 tonnes/ha were used by some farmers. Intensity of weeds in the field was low. Farmers used butachlor (1.25 a.i kg/ha) in some areas. Pest and disease incidences were less in this district. Leaf blast and brown spot was most common in the field where minor occurrence of false smut was also observed. Stem borer and brown plant hopper infestation were noticed in few fields.

Krishnagiri: Production oriented survey was conducted in villages in Krishnagiri district *viz*., Paiyur, Pannandhur and Thavanipattu when the crops were in milk to dough stage. Most the fields surveyed were under irrigated ecosystem and in general, climatic conditions were favourable for rice cultivation. Rice varieties ADT 43, ADT 53, Amman and BPT 5204 were the most commonly used varieties of rice among the farmers. Crop rotation with varied crops like, black gram, fodder crops, sugarcane, finger millet and small millets were practiced by the farmers. Average yield obtained during Kharif season was around 4000 Kg/ha, whereas it was around 4300 Kg/ha during Rabi season. Farmers used a seed rate of 45-50 kg/ha while in case of SRI, seed rate was 10-15 kg/ha. Many farmers told that they treated the seeds with carbendazim or with Azospirillum. Application of organic manure in the nursery was not common. However, most of the farmers applied chemical fertilizers like DAP and urea in the nursery. In the main fields, fertilizers were applied @ 125-150 kg N/ha, 50-60 kg P_2O_5/ha and 40-60 kg K_2O/ha. Some applied zinc sulphate (10 kg/ha). Fertilizers like Urea, SSP and MOP and $ZnSO_4$ were used by the farmers. In the main fields, most of the farmers applied organic manure like FYM and green manure. Some farmers adopted SRI method. Intensity of weeds like *Cyperus* spp., *Echinochloa* spp., *Digitaria* spp. and others in the field was less. Hand weeding was most common method of weed control. Only few farmers applied herbicides like butachlor. Some of the common needs of the farmers were reduction in prices of implements, improvement in mechanization, better crop insurance scheme and better price system from government. Implements like tractor, power sprayer, combined harvesters and others were used by the farmers. Most of the farmers told that they purchased the seeds for sowing. Canal was the main source of irrigation. Most of the farmers contacted told that fertilizers and pesticides were available in time and they were happy with their quality. In addition to their own decision, farmers got advices from local dealers and officials from state department of agriculture. Brown spot and blast infection followed by stem borer and leaf folder infestation were the most common, thus, application of imidacloprid, quinalphos, tebuconazole and

azoxystrobin was followed to protect the crop. Many farmers applied two rounds of pesticide during the crop season.

Kallakurichi: Survey was conducted in villages viz., Namasivayapuram, Mangalam, Malaikothalam and Siruvallur when the crops were in milk to maturity stage. Most the fields surveyed were under irrigated ecosystem and in general, climatic conditions were favourable for rice cultivation. During the survey rice varieties ADT 55, Amman,, ADT 45, CO(R) 51and BPT 5204 were the most commonly used varieties of rice among the farmers during Kharif/Rabi season. Common crop rotation practices followed by the farmers were rice-vegetables, rice-pulses and rice-sugarcane. Average yield obtained during the year was around 5400 Kg/ha. Average seed rate was 40-60 kg/ha and about 50% of the farmers contacted told that they treated the seeds with carbendazim or with biocontrol agents like *Azospirillum* spp + *Bacillus* spp. Application of organic manure in the nursery was not common. Only few applied poultry manure. Most of the farmers applied DAP in the nursery. In the main fields, fertilizers were applied @ 150-175 kg N/ha, 50-70 kg P_2O_5/ha and 50-70 kg K_2O/ha. Some applied zinc sulphate (12 kg/ha). Fertilizers like Urea, SSP and MOP and $ZnSO_4$ were used by the farmers. Most of the farmers applied FYM or green manure in the field. Intensity of weeds like *Cyperus* spp., *Echinochloa* spp., *cynodon dactylon*, *Digitaria* spp., *Paspalum* spp. and others in the field was low to moderate. Hand weeding was most common method of weed control. Only few farmers applied herbicides like butachlor. Some of the common needs of the farmers were government support for organic cultivation, protection of the crop from peacock and wild boars, credit facilities, improvement in mechanization, better crop insurance and better marketing. Implements like power sprayer, tractor, power tiller, combine harvesters and others were used by the farmers. Most of the farmers contacted told that they purchased seeds for sowing. Canal and shallow tube wells were the main sources of irrigation. Most of the farmers contacted told that fertilizers and pesticides were available in time and they were happy with their quality. In addition to their own decision, farmers got advices from local dealers. Leaf blast infection and stem borer damage were observed. To control these damages famers applied fungicides like tricyclazole, propiconazole and mancozeb and insecticides like thiamethaxam, dimethoate, monocrotophos, neem oil, imidacloprid and acephate to protect the crop.

Namakkal: In Namakkal district, Vediyarasampalayam, Kokkarayanpettai and Eriyamangalam villages were surveyed. Rice varieties like RNR 15048, ADT 45, CO 55, Sadana and BPT 5204 were cultivated by the farmers. Crop stages from just transplanted to harvest stages were surveyed. Average yield of these varieties were 4800 Kg/ha. NPK fertilizers were applied through Urea, DAP and MOP, which were applied at the rate of 120:60:40 along with $ZnSO_4$ 20 Kg/ha. Intensity of weeds (*Cyperus sp.*) in the field was medium. Pest and disease incidence were less. Majority of the farmers have complained about huge increase in fertilizer prices.

Kanyakumari: Villages like Thamaraikulam, Thovalai and Vallavillai were surveyed in this district. TPS 5, ASD 16 and Bharathi were commonly cultivated varieties of rice by the farmers. Crops with just transplanted to panicle initiation stages were surveyed. NPK fertilizers were applied in terms of Urea, DAP and MOP. During the survey crops with tillering stage were sprayed with combination fungicides (carbendazim 12% + mancozeb 63%WP) or tricyclazole as a prophylactic measure against blast and brown leaf spot diseases. Blast, BLB, stem borer and leaf folder were observed below ETL in most of the places. Many farmers applied two rounds of

pesticide during the crop season. Majority of the farmers have expressed concern over huge price increase of potassium fertilizers.

Tirunelveli: Survey was conducted in Ayyansingampatti, Arasankulam, Karisalpatti and Malayankulam villages in this district. Rice varieties, ASD 16, ASD 19 and TPS 5 were the preferred varieties by the rice growers of this district. N, P and K fertilizers were applied at the rate of 120-150 Kg/ha, 40-50 kg/ha, 40-50 Kg/ha respectively, through urea, DAP and MOP. Complex fertilizers were also used in some places. Intensity of weeds in the field was less. Crop stages from planting to harvest were surveyed. Leaf blast and false smut infection and stem borer infestation was the most common. Application of monocrotophos, azoxystrobin and profenofos was widely practiced. Many farmers applied two rounds of pesticide during the crop season. Average yield ranged from 4000 to 5000 Kg/ha. Power tiller, tractor, and combined machine harvesters were used by the farmers.

Pest and disease scenario in Tamil Nadu in 2024

Districts	**Diseases**						
	Bl	**NBl**	**BS**	**ShBl**	**ShR**	**FS**	**BLB**
Thiruvanamalai	L	M	L	-	L	L	L
Krishnangiri	L	L	L	L	-	L	L
Dharmapuri	L	L	-	-	-	L	L
Erode	L	L	L	-	L	L	L
Coimbatore	L	L	L	L	L	L	-
Namakkal	L	L	L	-	L	L	L
Kallakurichi	L	M	L	-	-	M	L
Salem	L	L	L	-	L	L	L
Tirunelveli	L	L	-	-	-	L	L
Kanyakumari	L	L	L	-	L	L	-

Districts	**Insect pests**			
	LF (%)	**SB (%)**	**CW**	**Leaf mite**
Thiruvanamalai	L	L	-	-
Krishnangiri	L	L	-	L
Dharmapuri	L	L	L	-
Erode	L	M	-	-
Coimbatore	L	L	-	-
Namakkal	L	L	-	-
Kallakurichi	L	L	L	L
Salem	L	L	-	-
Tirunelveli	L	L	-	-
Kanyakumari	L	L	-	-

Telangana-Rajendranagar (2024-25)

Districts surveyed: *Ranga Reddy, Kamareddy, Nizamabad, Khammam, Yadadri Bhuvanagiri, Medchal–Malkajgiri, Sangareddy, Medak, Vikarabad, Hanomkonda, Karimnagar, Wanaparthi, Nagarkurnool, Jagtial, Janagoan* and *Jogulamba Gadwal*

Table 1: Particulars of surveyin Telangana state in 2024-2025

District	Mandal	Villages
Ranga Reddy	Shameerpet, Shabad, Chevella, Ibrahimpatnam, Manchala, Yacharam and Thallapalliguda	Shameerpet, Etlaerravalli, Gundala, Kummera, Khanapur, Aagapalle, Gungal Cross Road, Gaddamallaiah Gudem, Nandivardhanparthi, Mogullavampur, Yacharam and Thallapalliguda (**12**)
Kamareddy	Nizamsagar and Banswada	Nizamsagar, Maagi and Desaipet (**3**)
Nizamabad	Rudrur, Chandur and Bodhan	Tegelepally, Chandur, Pentakurd, Kotagiri and Seshadri Farm (**5**)
Khammam	Chintakani and Wyra	Lacchagudem, Chintakani, Poddutur, Thutikuntla, Nagiligonda, Gannavaram, Gollapudi and Nagiligonda (**8**)
Yadadri Bhuvanagiri	Rajapet, Aler, Rajapet and Yadagiri Gutta	Kurraram, Kolanpaka, Lacchakkapally and Vangapally (**4**)
Medchal - Malkajgiri	Ghatkesar, Dundigal and Medchal	Ankushapur, Dundigal and Gowdavelli (**3**)
Sangareddy	Sangareddy, Chowtikur and Andole	Fasalwadi, Chowtikur, Chandampet, Chintakunta and Mansanpally (**5**)
Medak	Chilipichedu and Chilipichedu	Chitukula and Chandur (**2**)
Vikarabad	Yalal, Basheerabad and Kodangal	Vishwanathapur, Kasimpur, Chennaram and Kodangal (**4**)
Hanomkonda	Hasanparthy and Elkathurthy	Madipally, Ananthasagar, Seethampet Cross Road, Gunturpally, Seethampet and Thimmapur (**6**)
Karimnagar	Shankarapatham and Veenavanka	Chintapally, Lingapur, Mamidalapally and Yelubaka (**4**)
Wanaparthi	Atmakur, Kothakota, Srirangapur, Peddaman-daddi, Pebbair and Madanapuram	Veeraghavapuram, Pamapur, Venkatapur, Pamireddypally, Pebbair, Palem and Ramanpady (**7**)
Nagarkurnool	Bijenepally	Palem, Vattem and Peddadevulapally (**3**)
Jagtial	Korutla and Metpally	Ilapur, Dharmaram, Sangem and Metpally (**4**)
Janagoan	Zafargarh	Raghunathapally and Konaichalam (**2**)
Jogulamba Gadwal	Rajoli, Vaddepalli and Alampur	Patcherl, Konkal and Alampur (**3**)
Total: 16	**Total: 46**	**Total: 71**

Production oriented survey (POS) is conducted every year on different aspects of rice cultivation in different rice growing districts of Telangana during *vanakalam* and *yasangi* seasons. The farmer fields were surveyed randomly at 20-25 km distance and it is conducted twice in a crop season; once during tillering to maximum tillering stage and again during grain filling to maturity stage. The Production Oriented Survey, 2024-25 (POS) was conducted in collaboration with KVKs,

DAATTCs and Department of Agriculture in major rice growing districts of Telangana state. A total of **16** districts *viz.*, Rangareddy, Medchal–Malkajgiri, Vikarabad, Nagarkurnool, Wanaparthy, Jogulambha Gadwal, Yadadri Bhuvanagiri of Southern Telangana Zone, Nizamabad, Kamareddy, Karimnagar and Jagtial of Northern Telangana Zone, Warangal, Janagoan, Medak, Sangareddy and Khammam of Central Telangana Zone covering **71** villages were visited under POS during *vanakalam*, 2024 and *yasangi*, 2024-25. The information on various aspects of rice cultivation *viz*., seasonal conditions, crop area coverage and item wise package of practices, cost of cultivation, abiotic/ biotic constraints and their management were discussed with farmer during the interaction. The information on the aforesaid aspects were collected from the progressive farmers, seed producers, AEOs, MAOs, ADAs, DAOs and Input dealers of the respective villages / mandal / district through interaction and participatory approach.

A. General information

A.1: Seasonal Conditions

The rainfall received from South West monsoon and North East monsoon during the period from June, 2024 to February, 2025 along with district wise rainfall situation.

South West Monsoon-2024: During the South-west monsoon period, a total of 948.2 mm rainfall received in Telangana as against normal rainfall of 738.6 mm from 01.06.2024 to 27.09.2024 showing deviation +32% with over all status is being excess.

North-East Monsoon: Normally, in Telangana State, the average normal rainfall of North-East Monsoon is 113.20 mm and actual rainfall received is 86.60 mm showing the deviation of -23.50% with over all status is being deficit during NE monsoon.

Overall, the average rainfall received in Telangana state from 01.06.2024 to 05.02.2025 is 1049.2 mm as against the normal rainfall of 859.3 mm with deviation of 22.10 per cent.

Table. 2. Month wise rainfall received in Telangana from 01.6.2024 up to 05.02.2025

Month	Normal (mm)	Actual rainfall (mm)		% deviation to normal	Status
		2023-24	2024-25		
June, 2024	129.3	74.7	159.0	23.26	Excess
July, 2024	229.1	503.9	29.8	29	Excess
August, 2024	217.4	82.10	209.9	-3.45	Normal
September, 2024	162.7	179.4	284.5	101	Large Excess
S W Monsoon	**738.6**	**840.1**	**948.2**	**32**	**Excess**
October, 2024	89.2	6.6	64.9	-27	Deficit
November, 2024	19.90	20.60	5.90	-70	Large Deficit
December, 2024	4.10	25.70	15.50	285	Large Excess
N E Monsoon	**113.2**	**52.90**	**86.60**	**-23.50**	**Deficit**
January, 2025	7.10	0.00	0.0	-100.0	Large Deficit
February, 2025 (5.2.2025)	0.40	0.00	0.0	-100.0	Large Deficit
Cumulative Total (01.06.2024 to 05.2.2025)	**859.30**	**913.90**	**1049.20**	**22.10**	**Excess**

Table 3. Status and deviation of Rainfall during the period from 01.06.2024 to 05.02.2025

S. No.	Districts	No. of districts	Status and Deviation
1.	Nil	0	Large excess
2.	Nirmal, Nizambad, Rajanna Sircilla, Medak, Siddipet and Jayashanker Bhupalapally	6	Exess
3.	Adilabad, Komarambheem, Mancherial, Peddapally, Jagtial, Mulugu , Karimnagar, Mahabubabad, Kamareddy, Bhadradri Kothagudem,Khammam, Warangal, Hanmakonda, Jangoan, Sangareddy, Rangareddy, Medchal, Vikarabad Mahabubnagar, Narayanpet, Wanaparthy, Yadadri Suryapet and Hyderabad	24	Normal
4.	Nagarkurnool Jogulamba Gadwal and Nalgonda	3	Deficit
5.	Nil	0	Lege Deficit

A.2: Crop coverage

In Telangana, rice is mostly cultivated under wells, tanks and canals in an area of around 65.49 lakh acres against normal area of 56.64 lakh acres during *kharif*, 2024, whereas 48.94lakh acres against normal area of 47.27 lakh acres during *rabi*, 2024-25 (www.agri.telangana.gov.in). Among the districts, Nalgonda is the the major rice grown area during *kharif*, 2024 (5.12 lakh acres) and *rabi*, 2023-24 (4.72 lakh acres).

Table 4. District wise normal and actual rice area covered during *kharif,* 2024 and *rabi*, 2024-25 (Area in acres)

S. No.	DISTRICT	*Kharif, 2024*			*Rabi,* 2024-25		
		Normal Area	Actual Area	% Cov. over NA	Normal Area	Actual Area	% Cov. over NA
Southern Telangana Zone							
1	Rangareddy	100608	128780	28.00	71775	25187	-64.90
2	Medchal-Malkajgiri	16651	17636	5.91	11241	10134	-9.84
3	Vikarabad	99549	130000	30.58	61628	55005	-10.74
4	Mahabubnagar	139565	187784	34.54	98691	100500	1.83
5	Nagarkurnool	109344	141274	29.20	111359	53800	-51.68
6	Wanaparthy	175824	180417	2.61	115333	96432	-16.38
7	Gadwal (Jogulamba)	82925	90347	8.95	51791	52331	1.04
8	Narayanpet	127486	165092	29.49	96028	112850	17.51
9	Nalgonda	437047	512555	17.27	447678	472250	5.48
10	Suryapet	421202	472929	12.28	421511	458934	8.87
11	Yadadri Bhuvanagiri	243524	287332	17.98	234179	275316	17.56
	Total	**1953725**	**2314146**	**-**	**1721214**	**1712739**	**-**
Northern Telangana Zone							
12	Nizamabad	395731	429796	8.60	371412	419328	12.90
13	Kamareddy	271387	315457	16.23	217903	280530	28.74

S. No.	DISTRICT	*Kharif, 2024*			*Rabi*, 2024-25		
		Normal Area	Actual Area	% Cov. over NA	Normal Area	Actual Area	% Cov. over NA
14	Karimnagar	253817	275421	8.51	247461	238741	-3.52
15	Jagtiyal	283970	316382	11.41	268490	252670	-5.89
16	Peddapalli	205481	209562	1.98	191351	195712	2.27
17	RajannaSiricilla	156346	180677	15.56	153022	169675	10.88
18	Adilabad	1788	1963	9.78	362	200	-44.75
19	Mancherial	160605	156809	-2.36	95343	99365	4.21
20	Nirmal	116597	130606	12.01	95098	95358	0.27
21	Asifabad (K. Bheem)	57073	56856	-0.38	14478	10280	-28.99
	Total	**1902795**	**2073529**	**-**	**1654920**	**1761859**	**-**
Central Telangana Zone							
22	Medak	232971	298031	27.92	190540	211531	11.01
23	Sangareddy	108104	149370	38.17	68286	81699	19.64
24	Siddipet	282269	368173	30.43	276135	327534	18.61
25	Warangal (Rural)	118820	131120	10.35	89003	86544	-2.76
26	Warangal (Urban)	130043	146000	12.27	113516	111870	-1.45
27	JayashankarBhupalpalli	102106	108650	6.40	72210	65750	-8.94
28	Janagoan	169724	209377	23.36	158091	159450	0.85
29	Mehabubabad	183209	210983	15.15	127192	113934	-10.42
30	Mulugu	99286	96103	-3.20	42060	31320	-25.53
31	Khammam	275143	282014	2.49	168251	178880	6.31
32	Bhadradri Kothagudem	106332	161731	52.100	45582	51230	12.39
	Total	**1808007**	**2161552**	**-**	**1350866**	**1419742**	**-**
	Grand Total	**5664527**	**6549227**	**-**	**4727000**	**4894340**	**-**

A.3: Crop stage at the time of survey

The roving survey was conducted in **16** major rice growing districts of Telangana State covering **71** villages in different districts, when the crop was between maximum tillering to maturity stage during *kharif*, 2024 whereas tillering stage to PI stage during *rabi*, 2024-25.

A.4: Crop rotation practiced

Among various cropping systems, rice followed by rice was the most dominant practice across all surveyed districts. Other cropping systems observed included rice-fallow, green manure-rice-rice, rice-pulses, rice-zero tillage sunflower, and rice-rice-vegetables, depending on water availability and other influencing factors.

A.5: Varietal Scenario in Telangana state

As per the Department of Agriculture, Govt. of Telangana, the major varieties grown by the farmers are BPT 5204 (13.8 lakh acres), MTU 1010 (19.6 lakh acres), RNR 15048 – Telangana Sona (9.8 lakh acres), MTU 1224 (2.8 lakh acres), private variety *i.e.* Cintoo (2.27 lakh acres), JSR type (1.68 lakh acres), KNM 118 (1.67 lakh acres), IR – 64 (1.26 lakh acres), JGL 24423 (1.18 lakh acres) and KNM 1638 (1.05 lakh acres) and MTU 1061 (31000 acres) during *kharif*, 2024. In Jai Sreeram grain type (Pooja, Sriram gold, Ankur Sona, Super Aman, Sowbhaya, Aman gold), besides HMT Sona, RNR 21278, MTU 1271, Ganga Kaveri (local) and other fine varieties (Mahindra Sowbhagya) are widely popular among the farming community. Several coarse rice varieties cultivated in the state include Kunaram Sannalu, MTU 1010, Jagtial Rice-1, IR 64,

Tellahamsa, Bathukamma, MTU 1061, MTU 1153, MTU 1156, 7029, and MTU 1001. Additionally, the local variety in the name of Ganga Kaveri variety, known for both fine and coarse grain types, is widely grown in Nizamabad and Kamareddy districts during both *Kharif* and *Rabi* seasons.

During the *rabi* season, farmers in Warangal, Karimanagar, Vikarabad, Yadadri Bhuvanagiri (Pochampally), the Musi belt of Ranga Reddy, and Nalgonda districts are predominantly cultivating the private hybrid rice varieties. Some of the commonly grown hybrids include Kaveri 272, Kaveri 175, Kaveri 468, VNR 22258, Rasi 113, Mahindra 303, , 27P31, RX 100, and Bio 799. Further, hybrid seed production activity is predominantly grown in Manakondur and Huzurabad division of Karimnagar, Husnabad division of Siddipet and Warangal district during *rabi* season.

B. Crop Management

B.1: Seed rate and source of seed:
Direct Seeded Rice (DSR), both wet and dry, has been widely adopted in Khammam, Mahabubabad, Suryapet, and Nalgonda districts and is now gaining popularity across Telangana. For dry direct sowing, farmers will sow 15 kg per acre for fine-grain varieties and 20 kg per acre for coarse grain varieties. In the transplanting method, the seed rate ranging from 20-25 kg per acre.

For dry-to-wet converted rice, the seed rate varies between 10-18 kg per acre for fine varieties and 12-25 kg per acre for coarse grains during the *Yasangi* season. Farmers have observed that seed rate significantly influences weed population in DSR fields. Most farmers procure seeds from sources like TSSDC, NSC, PJTSAU Research Stations, DCMS, or private input dealers. The seed rate for research paddy or hybrids is ranging from 6-8 kg per acre.

B.2: Seed treatment
Across the surveyed villages, approximately <5.0% of farmers are practicing wet seed treatment. They soak seeds for 24 hours in a solution containing either Carbendazim (1.0 g per kg of seed per liter of water) or a combination of Mancozeb and Carbendazim (2.5 g per kg of seed per liter of water) to enhance seed protection. The question was posed to farmers in each surveyed village, revealing that, lack of awareness regarding the benefits of seed treatment. Many farmers were unfamiliar with its role in preventing seedborne diseases and improving crop establishment.

B.3: Sowing and Planting
The nurseries of long-duration varieties were sown between the last week of May and June, with planting completed by the first FN June, 2024, particularly in Nizamabad, Kamareddy, and Rajanna Siricilla districts. However, sowing was delayed in the NSP canal areas, including Khammam, Nalgonda, and Suryapet districts. During the *Rabi* 2023-24 season, paddy transplanting was delayed due to cold injury, stunted growth and zinc deficiency at the nursery stage.

B.4: Organic manures and inorganic fertilizers applied
The 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 form of DAP or 20-20-0-13 or other complex fertilizers. It was observed that, application of sheep manure or poultry manure @ 600-850 kg per 3-4 cents of nursery area

especially during *rabi* season. The growth of nurseries was affected during *rabi* season due to cold injury, sulphide injury and salinity.

B.5: Fertilizer application

The majority of the farmers in the surveyed districtsts are applying NPK in the form of complex fertilizers *viz.,* 12-32-16, 20-20-0-13, DAP, 10-26-26, 16-20-0-13, 17-17-17, 19-19-19, 28-28-0 ranging from 1 to 3 bags per acre as a basal dose. Majority of the farmers are applying the complex fertilizers (50-150 kg/acre) as basal followed by top dressing of Urea (150-200 kg/acre) in 2-3 split doses at tillering stage, booting and just before panicle initiation depending on duration of the varieties.

B.6: Methods of planting

The cost of transplanting ranged from Rs. 4,200 to Rs. 6,500. A major challenge observed during the visit was the unavailability of labor for transplanting. Migrant laborers from Uttar Pradesh, Bihar, Odisha, Jharkhand, and Chhattisgarh primarily undertake paddy transplanting across Telangana using the Bengal planting method. The cost of transplanting with this method is approximately Rs. 4,500–5,500 per acre. These laborers, mainly from UP, Bihar, and Jharkhand, work in teams of 12 members, achieving a labor efficiency of 1.5 2.0 hectares per day (6:00 AM to 6:00 PM).

In Telangana, direct seeded rice such as drum seeding, dry DSR and wet-DSR under puddled conditions are becoming increasingly popular among farmers during both *Kharif* and *Rabi* seasons. Especially, wet DSR in puddled condition is most widely practiced by the farmers during *rabi* season. Additionally, direct seeding using a seed-cum-fertilizer drill is a common practice in the Wyra and Sattupally division of Khammam district during *Kharif*. In transplanting, most of the farmer fields had a plant population of 15–24 hills per square meter, regardless of variety or planting time. However, dry-converted wet rice fields exhibited a higher plant population, ranging from 40 to 60 hills per square meter.

Drone Seeding:

The patent granted on 30.01.2024 for drone seed dispensing device on “Method and system for dispensing multi-varied seeds through multi nozzle aerial seed dispensing device” which was jointly developed by PJTSAU, Rajendranagar and Marutdrone Tech. Pvt. Ltd, Hyderabad under NABARD-PJTSAU-DRONE-DSR Project. Further, improving the protype as well as on farm testing in farmers’ fields in progress during 2024-25. The drone seeding is targeted to achieve the 6 – 8 kgs for fine grain varieties and 10 -12 kgs for coarse grain varieites to complete the sowing within 10 minutes per acre.

In Telangana, farmers use various rice planting methods depending on factors like water availability, labor costs, and soil conditions. The ranking of methods of planting as follows:

1. Normal transplanting is still hold goods where sufficient labour force is available.
2. Dry converted wet rice – Broadcasting of sprouted seed
3. Drum seeding
4. DSR using seed cum ferti drill
5. Machine planting

B.7: Intensity of weeds

The predominant weed flora includes *Echinocloa colanum, E. crusgalli, Cyandon dactylon, Cyprus rotundus, Leersia hexandra, Panicum ripens, Leptochloa* spp. *Euphorbia spp. and Parthenium spp*. In DSR either in drum seeding or wet direct seeding, the weeds *Ischaemum regosum* (Tonagi in local language) and Jungle rice are the major weeds observed in the farmer fields.

B.8: Weed management

Majority of the farmers in the surveyed districts were applied the pre and post emergence herbicides in rice during *kharif* and *rabi* seasons. Very few farmers are adopting the manulal weeding in rice due to severe scarcity of labourers. The most commonly used herbicide molecule for mixing with other weedicide is Bispyribac sodium 10% SC (Nomnee gold) @ 100 ml/acre as post- emergence herbicide. Further, some the farmers in the surveyed districts are mixing the Bispyribac sodium 10% SC along with newly released herbicides. Mixing of Bispyribac sodium 10% SC @ 30 to 50 ml per acre along with other herbicide is common practice was observed across the districts. The usage of herbicides both pre and post emergence herbicide is common among the surveyed districts. Most commonly used herbicides in rice by the farmers are as follows:

- Penoxsulam 2.67%OD @ 400 ml per acre
- Penoxsulam 1.02% + Cyhafolop-butyl 5.1% OD @ 900 ml per acre
- Triafamone 20% and Ethoxysulfuron 10% WG @ 90 g per acre
- Beflubutamid 2.5% GR @ 4 kg per acre
- Pretilachor @ 600 ml per acre
- Fenoxaprop-p-ethyl 6.9 EC (6.7% w/w) @ 350 ml per acre
- Bentazone 48% SL @ 350 ml per acre
- Pyrazosulfuron Ethyl 10% WP @ 60 g per acre
- Pendimethalin @ 1000 ml per acre
- Penoxsulam 0.97%+ butachlor 38.8% SE @ 900 ml per acre

C. Insect-Pests & Diseases scenario observed during rice POS

During the rice POS, the pest scenario in rice has been assessed during *kharif,* 2024 and *rabi*, 2024-25 in response to adoption of new varieties, package of practices, pest managaement practices and cost of cultivation. The significant achievements of the POS, 2024-25 as detailed below.

- The Production-Oriented Survey (POS) for the year 2024-25 was conducted in collaboration with Krishi Vigyan Kendras (KVKs), District Agricultural Advisory and Transfer of Technology Centres (DAATTCs) and the Department of Agriculture across major rice-growing districts of Telangana. The survey encompassed 16 districts, including Rangareddy, Medchal–Malkajgiri, Vikarabad, Nagarkurnool, Wanaparthy, Jogulamba Gadwal and Yadadri Bhuvanagiri in the Southern Telangana Zone; Nizamabad, Kamareddy, Karimnagar and Jagtial in the Northern Telangana Zone; and Hanmakonda (Warangal), Jangaon, Medak, Sangareddy, and Khammam in the Central Telangana Zone. A total of 72 villages were surveyed during *Vanakalam,* 2024 and *Yasangi*, 2024-25.
- The data on the incidence of various diseases revealed that the epidemic incidence of BLB was noticed in Nizamabad district (Bodhan division), Ankushapur village of Medchal mandal, Mahabubabad and RARS, Warangal.

- Bacterial Leaf Blight (BLB) was highest in RARS, Warangal (5-40%), Medchal-Malkajgiri (20–30%), followed by Nizamabad (5–25%), Kamareddy (1–10%) and Rangareddy (1–5%). The grain discoloration (GD) peaked in Medchal-Malkajgiri (5–25%), Rangareddy (1–20%) and Jagtial, Khammam and Hanamkonda (5–15%). Brown spot incidence was confined to Karimnagar (1–20%) and Wanaparthy (5–10%). False smut (FS) was most prevalent in Wanaparthy and Jagtial (1–15%), with lower occurrences in Karimnagar and Medak (1–5%).
- The pest scenario revealed that, yellow stemborer (dead hearts) incidence was reported in four districts, ranging from 1–5% in Jangaon, Yadadri Bhuvanagiri and Rangareddy, and 1–10% in Sangareddy. Whiteears were observed in eight districts, with Medak, Rangareddy, Wanaparthy and Nizamabad showing 1–5%, Kamareddy and Medchal-Malkajgiri 5–10%, Jagtial 1–15% and the highest severity (5–30%) in Karimnagar district during *rabi* season. Leaf folder infestation varied between 1–20%, with 5% in Nizamabad and Kamareddy, 1–5% in Khammam, Yadadri Bhuvanagiri and Sangareddy and 1–20% in Wanaparthy and Rangareddy.
- The perusal of data revealed that, yellow stem borer (dead hearts and white ear stage) during *kharif*, 2024 and *rabi*, 2024-25 and bacterial leaf blight during *kharif*, 2024 are major problems were identified during rice production oriented survey, 2024-25. Overall, the crop condition is good except in sporadic incidence of insect-pess and diseases in isolated patches and realized good yields during *kharif*, 2024. Whereas, incidence of stem borer (WE stage) caused damage in *rabi*, 2024-25 besides abiotic stresses (algal blume, salinity, cold and sulphide injury).

Table 5: Occurrence of insect-pests in surveyed districts during *Kharif*, 2024 & *Rabi*, 2024-25

District	YSB (DH)	YSB (WE)	GM	LF	WM	BPH	LM	PM	CW	PSB	RHC
Nizamabad	-	<5	-	<5	-	-	-	-	-	-	-
Kamareddy	-	5-10	-	<5	-	-	-	-	-	-	-
Warangal & Hanmakonda	-	5-10	5- 50	5-15	-	-	-	1-10	-	-	-
Karimnagar	-	5-30	5-10	-	-	1-5	-	-	-	-	-
Jagtial	-	1-15	-	-	-	-	-	-	-	-	-
Sangareddy	1-10	-	-	1-20	1-5	-	-	-	1-5	<1	1-5
Medak	-	1-5	1-5	-	-	-	-	-	-	-	-
Khammam	-	-	-	1-5	-	-	>5	-	-	-	-
Janagoan	1-5	-	-	-	-	-	-	-	-	-	-
Yadadri Bhuvanagiri	1-5	-	-	1-5	-	1-5	1-10	-	-	-	-
Medchal Malkajgiri	-	5-10	-	-	-	-	-	-	-	-	-
Rangareddy	1-5	1-5	-	1-10	-	-	-	-	-	-	-
Vikarabad	-	-	-	-	-	-	-	-	-	-	-
Nagarkurnool	-	-	-	1-5	-	-	-	-	-	-	-
Wanaparthy	-	1-5	5-15	1-20	-	-	-	1-10	-	-	-
Jogulamba Gadwal	-	-	-	-	-	-	-	-	-	-	-

Source: The data presented in the table is incidence of insect-pests and diseases in the surveyed farmer fields (isolated patches). The incidence of pests and diseases may vary from village to village in the respective districts also. The information also collected from concerned district ADAs, MAOs, AEOs and farmers interaction.

***Note:** YSB: Yellow Stem Borer (DH: Dead hearts; WE: White ears); GM: Gall midge; LF: Leaf folder; WM: Whorl maggot; BPH: Brown planthopper; LM: Leaf mite; PM: Panicle mite; CW: Cut worms; PSB: Pink stem borer; RHC: Rice horned caterpillar*

Table 6: Incidence of rice diseases in the surveyed districts during *Kharif*, 2024 & *Rabi*, 2024-25

District	BLB	NBl	ShBl	GD	BS	FS	ShR
Nizamabad	5-25	-	-	-	-	-	-
Kamareddy	1-10	-	-	-	-	-	-
Warangal & Hanmakonda	5-40	-	-	-	-	-	-
Karimnagar	-	1-5	-	1-15	1-20	1-5	-
Jagtial	-	-	-	5-15	-	1-15	-
Sangareddy	-	-	1-5	-	-	-	-
Medak	-	-	1-5	-	-	1-5	-
Khammam	-	-	-	5-15	-	-	-
Janagoan	-	-	-	1-15	-	-	-
Yadadri Bhuvanagiri	-	-	-	1-5	-	-	-
Medchal Malkajgiri	20-30	-	-	5-25	-	-	5-20
Rangareddy	1-5	-	-	1-20	-	-	-
Vikarabad	-	-	-	-	-	-	-
Nagarkurnool	-	-	-	1-5	-	-	-
Wanaparthy	-	-	-	1-15	5-10	1-15	-
Jogulamba Gadwal	-	-	-	-	-	-	-

Source: The data presented in the table is incidence of insect-pests and diseases in the surveyed farmer fields (isolated patches). The incidence of pests and diseases may vary from village to village in the respective districts also. The information also collected from concerned district ADAs, MAOs, AEOs and farmers interaction.

***Note:** BLB: Bacterial Leaf Blight; NB: Neck Blast; ShB: Sheath Blight; GD: Grain discolouration; BS: Brown spot; FS: False smut; SR: Sheath rot*

C.1: Pesticide application equipment

The most commonly used plant protection equipements for spraying of pesticides are as follows

- Battery operated knapsack sprayer
- Taiwan sprayer
- Tractor mounted sprayer
- Drones (UAVs)

Farmers across all surveyed districts are increasingly using drones for pesticide spraying on an outsourcing basis, primarily due to labor shortages. The cost of drone spraying ranges from Rs. 400 to 500 per acre, with 10-20 liters of spray fluid used per acre. Additionally, tractor-mounted sprayers are widely used in Medak, Sangareddy, Nalgonda, and Suryapet districts, offering a more cost-effective option at Rs. 300 per acre. However, tractor-mounted sprayers pose a higher risk of pesticide exposure to operators, time consuming and also involved for labourers.

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

In the surveyed villages, 70-75% of farmers did not conduct a single pesticide spraying during *Kharif,* 2024. Overall, pesticide usage remained less across surveyed districts, except in Kamareddy, Nalgonda and Nizamabad districts, where applications were comparatively higher. However, the application of granules (3G, 4G, or 0.4G) at the tillering stage (10-12 DAP) is a common practice adopted by farmers in the majority of the surveyed districts. But, majority of the farmers are mixing the granules with urea, which is quite common practice observed across the surveyed districts.

Table 7: List of insecticides and fungicides used by the farmers

S. No.	Insect-pests /diseases	Chemicals used
1.	Gall midge	Fipronil 0.3 G and 0.6G, Carbofuran 3G, Carbosulfan 25% EC
2.	Stem borer, Hispa, whorl maggot and leaf folder	**Nursery to Tillering stage:** Carbofuran 3G, Cartap Hydro Chloride 4G, Chlorantraniliprole 0.4G, Fipronil 0.3%G, Flubendiamide 0.7%G Chlorpyriphos 50%EC + Sand **PI to Booting stage:** Chlorantraniliprole Tablet application (Resonex) @ 500 per acre 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), Tetraniliprole (Vayego), Isocycloseram 18.1% W/W SC (Insipio)
3.	Leaf/panicle mite	Dicofol, Propargite and Spiromesfin
4.	Blast (Leaf and Neck blast)	Tricyclazole 18% + Mancozeb 64%WP (Merger/Trozole), Isoprothiolane 40%EC, Kasugamycin 3%L, Kresoxim methyl 44.3%SC, Picoxystrobin 6.78% + Tricyclozole 20.33% SC (Galileo Sensa/Salsa/Fanton/Kronos), 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 (Azotrix).
5.	Sheath Blight	Hexaconazole 5%EC, Propiconazole 25%EC, Validamycin 3%L, Tebuconazole + Trifloxystrobin (Nativo). Azoxystrobin + Tebuconazole (Custodia), Picoxystrobin 7% + Propiconazole 12%SC (Galileo Way), Thifluzamide 24%SC (Pulsor), Propiconazole 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
6.	BLB	Copper oxy chloride + Plantamycin or Paushamycin or Crocin or Agrimycin; Kasugamycin 5% + Copper Oxychloride 45% (Conika) Copper Sulphate 47.15% + Mancozeb 30% WDG (Devona)
7.	Stem rot	Hexaconazole Validamycin 3%L, Propiconazole 25%EC, Hexaconazole 5%EC, Iprobenphos 48%EC, Carbendazim 25% + Mancozeb 50% WS (Sprint), Copper Sulphate 47.15% + Mancozeb 30% WDG (Cuprofix).
8.	Sheath rot and GD	Propiconozole 25%EC, Carbendazim 12% + Mancozeb 63% WP (Saaf),

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

The majority of farmers in the surveyed districts were routinely mixing at least one insecticide and fungicide, while others were using cocktail mixtures of various molecules in different proportions without knowing their compatibility. It was observed that both farmers and input dealers were aware that Tricyclazole is incompatible with many insecticides. They are seeking

advice from university scientists regarding pesticide compatibility. The following are the common cocktail mixtures of insecticides and fungicides used by farmers:

- Cartap hydrochloride + Saff or Sprint or trifloxystrobin + tebuconazole or isoprothiolane
- Tricyclazole + chlorantraniliprole
- Tricyclazole + thiamethoxam
- Tricyclazole + lambda-cyhalothrin
- Propiconazole + fipronil
- Hexaconazole + chlorpyrifos
- Acephate + imidacloprid + (propiconazole)
- Tebuconazole + buprofezin
- Validamycin + diafenthiuron
- Triflumezopyrim + Sprint or Saff or Nativo or isoprothiolane or Gelelio Sensa

D. Cost of cultivation

The cost of cultivation of paddy in all the surveyed districts ranging from 22,000 to 35,000/-. During the POS, 2024-25, the highest cost of cultivation was recorded in Nizamabad district whereas lowest was recorded in Vikarabad district. Overall, the crop condition is good across the state except few locations, where severe incidence of insect-pests and diseases was noticed. Majority of the farmers in the surveyed districts were sold the produce at IKP centers of their respective village or AEOs cluster. The major cost of cultivation is incurring on labour cost for transplanting followed by harvesting. In this connection, university and department of agriculture is promoting direct seeded rice by conducting the demonstrations and awareness programmes. It was observed that, expenditure incurred on pesticides was drastically reduced due to less number of sprays during *kharif*, 2024.

E. Harvesting

The cost of harvesting per acre was ranging from 2800 TO 3300 per acre depending on the crop condition and area / location. The cost of bale for paddy straw bale is Rs. 40/-. Overall, it was observed that, very good paddy yields were realized during *kharif*, 2024. Majority of the farmers in the surveyed districts were satisfied with yields obtained due to cost of paddy during *kharif*, 2024.

F. Farmers outreach programmes

In order to forecast the incidence of pests and diseases in rice and alert the farmers on epidemic occurrence of major problem in field, Principal Scientist (Rice), PJTSAU, Institute of rice research, Rajendranagar, has given need based **alert messages (3 Nos.) and YouTube modules (8 Nos. - PJTSAU YouTube channel) / TV programmes** in vernacular language (TELUGU) to farmers, Commissionerate, Dept. of Agriculture, DAATTCs, KVKs, NGOs and wide publicity was given through print and electronic media.

Assessm-ent year	Name of Knowledge material / publication	Title of content	Publisher / Producer	Publication No / Volume No
2024	Alert Message	Vanakalam varilo bacterial endaku tegulu mariyu Sudidoma Yajamanyam	PS (Rice) and Head	*Vanakalam* rice / 2024-25 / 01
2024	Alert Message	Prasthutam Vanakalam Varilo Samasyalu – Yajamanya Cheryalu	PS (Rice) and Head	*Vanakalam* rice / 2024-25 / 02
2024	Alert Message	Yasangi Varilo Udtruthamavuthunna Kandam Toliche Purugu mariyu Oolli Kodu – Nivarana	PS (Rice) and Head	*Yasangi* Rice / 2024-25 / 01

G. Researchable issues

1. Development of varieties suitable for direct seeding.
2. Development of nutrient rich varieties having high Zn, Iron or Protein.
3. Development of high yielding varieties resistant to cold/salinity and high HRR through genome editing approach in collaboration with IIRR, Rajendranagar.
4. Development of technologies suitable for climate smart Dry direct seeding and wed direct seeding.
5. Management of algal assemblage through application of suitable chemicals in rice.
6. Studies on weed shifts in different establishment methods and Management of herbicide resistance weeds in Rice
7. Mechanized Rice Residue management and development of profitable cropping systems
8. Isolation characterization and blend optimization of rice gall midge pheromones.
9. Characterization and virulence profiling of *M. grisea* and *Xanthomonas oryzae* pv. *oryzae* in Telangana.
10. Deploying the data driven and innovative AI tools for prediction and early fore-warning for insect-pests and diseases of rice using the existing rice production oriented survey data.
11. Exploring novel plant protection methodologies for managing major insect-pests and diseases of rice.
12. Investigation on insect-pests and diseases dynamics across different rice establishment methods.

Uttar Pradesh-Masodha (2024-25)

Districts surveyed: *Ayodhya, Ambedkar Nagar, Amethi, Sultanpur* and *Barabanki*

Table 1: Particulars of survey

Districts	Block/Taluka	Villages
Ayodhya	Mawai, Sohawal, Milkipur and Bikapur	Gulalpur, Alipur Khajuri, Sivanthpur, Jerua, Rampur and Badagaon
Ambedkar Nagar	Tanda, Akbarpur and Katehri	Paikaulia, Raipur Katariya, Samokhpur, Beluwa Bariyarpur and Pakhanpur
Amethi	Musafirkhana, Jagdishpur and Shukul Bazaar	Kamkupur, Bhartha Ka Purwa Rasulpur, Nujaman, Sarai Alam and Kanjas Pura Jophan
Sultanpur	Baldirai, Dhanpatganj and Karaundi Kala	Pipargaon, Jarai Kalan, Haliyapur, Magarsand Kala and Tikar
Barabanki	Trivediganj, Haidergarh and Ramnagar	Pure Ladai, Shahpur and Budanpur

Table 2: Widely prevalent rice varieties

Districts	Varieties
Ayodhya	**HYVs:** NDR-2065, NDR 97, NDR-359, NDR-2064, Sambha Mahsuri, Swarna, Sambha Mahsuri-Sub 1, Narendra Lalmati, Sarjoo 52, Komal Mahsuri, Shahbhagi, Pusa Basmati 1, Damini, Dilkhush and others; **Hybrids:** Arize 6444 and Hyb. 27p37
Ambedkar Nagar	**HYVs:** NDR 359, Sarjoo 52, NDR 2065, Sambha Mahsuri, Narendra Lalmati, Sambha Mahsuri-Sub 1, Pan Mahsuri, Swarna Sub-1, CRS Dhan 4, NDR-97, NDR 2064, Damini, MTU 7029 and Dilkhush; **Hybrids:** Hyb. 27p31, Hyb. 27p67, Arize 6444 Gold, Gorakhnath 509
Amethi	**HYVs:** NDR 359, NDR 3112-1, NDR 2064, NDR 2065, NDR 97, Narendra Lalmati, Sambha Mahsuri, Damini, Moti Gold, and Lal Mahsuri; **Hybrids:** Hyb. 27p37, Hyb. 27p63, Arize 6444 Gold, Gorakhnath 509 and others
Sultanpur	**HYVs:** Sarjoo 52, NDR 97, NDR 2064, NDR 359, NDR 3112-1, NDR 2065, Narendra Lalmati, Sambha Mahsuri, Swarna Sub 1, Damini Gold and Moti Gold; **Hybrids:** Arize 6444 Gold, Kaveri Gold, Hyb. 27p37, Hyb. 27p63 and others
Barabanki	**HYVs:** NDR-97, NDR 359, Sarjoo 52, NDR 2064, NDR 2065, Sabha Mahsuri, Swarna, Dilpasand, Narendra Lalmati, Moti Gold, Bajrangi 40, Pan 804-Jamuna and others; **Hybrids:** Arize 6444 Gold, Hyb. 27p63, Pusa RH 10, Hyb. 27p33, Hyb. 27p38 and others

Production oriented survey of rice growing areas was conducted in five districts of eastern Uttar Pradesh viz., Ayodhya, Ambedkar Nagar, Amethi, Sultanpur and Barabanki when the crops were in tillering to heading stage in *Kharif* 2024. The details of survey are presented in Table 1. Though overall, climatic conditions were normal for rice cultivation, there were dryness and less rainfall in the region except Barabanki (Table 4). The details of different varieties and hybrids cultivated in different surveyed districts are presented in Table 2. Rice varieties like NDR 2064, NDR 3112-

1, NDR 2065, Sarjoo 52, Sambha Mahsuri-Sub 1, BPT 5204, NDR 97, Shahbhagi, NDR 359, Pusa Basmati 1, MTU 7029, Pan Mahsuri, Swarna Sub-1, Narendra Lalmati, Swarna-Sub-1, Damini and hybrids Arize 6444 Gold, Hyb. 27p63, Hyb. 27p38, Dilkhush, Gorakhnath-509, Pusa RH 10 and others were found very popular among the farmers of Eastern U.P. The details of rice area occupied by different class of rice varieties are presented in Table 3.

Table 3: Area under rice cultivation of surveyed districts during *Kharif*, 2024

Districts	Area (ha) under rice cultivation			
	Scented/ Basmati	Hybrid	Other	Total
Ayodhya	2500	43000	55879	101379
Ambedkar Nagar	1501	55000	58547	115048
Amethi	4000	28000	88722	120722
Sultanpur	1800	53000	35028	89828
Barabanki	2701	59006	126405	188112

Table 4: Rainfall distribution in surveyed districts during *Kharif,* 2024

Districts	Rainfall (mm)							
	June		July		August		September	
	Normal	Actual	Normal	Actual	Normal	Actual	Normal	Actual
Ayodhya	106.5	138	306.1	178	282.0	142.53	196.7	283
Ambedkar Nagar	106.5	107	237	304	282.0	575.4	196.7	849.9
Amethi	93.6	16	299.2	98	283.4	236	189.5	97.6
Sultanpur	87.3	99	307.1	108	289.5	216	202.8	312.4
Barabanki	98.4	67	299.7	109	281.6	264.7	203.6	856.8

A. General information, cropping system and rice yield: The details of number of villages and number of blocks surveyed are presented in Table 6. A total of 29 farmers were contacted during the survey. The rice fields surveyed were under irrigated ecosystem. Major crop rotations followed by the farmers were rice-wheat (main), rice-mustard, rice-wheat-black gram/green gram/lentil, rice-wheat-mentha, rice-pea, rice-chick pea, rice-pea-green gram, rice-wheat-vegetables, rice-mustard-green gram, rice-wheat-sorghum and rice-pulses. Average rice yield among different HYVs ranged from 3800-4400 kg/ha while in case of hybrid varities the yield ranged from 3600-6000 kg/ha (Table 7).

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)

Parameters	Districts		
	Ayodhya	**Ambedkar Nagar**	**Amethi**
Total area under HYVs (ha)	55879 ha	58547 ha	88722 ha
Most prevalent HYVs in the district	NDR 2064, NDR 2065, BPT 5204, Sarjoo 52, NDR 97, NDR 359, Damini	NDR 2064, BPT 5204, Sarjoo 52, NDR 97, MTU 7029, Damini	NDR 2064, NDR 2065, BPT 5204, Sarjoo 52, Damini
Total area under rice hybrids	43000 ha	55000 ha	28000 ha
Most prevalent rice hybrids in the district	Arize 6444 Gold, Hyb. 27p37, Goraknath 509,	Arize 6444 Gold, Hyb. 27p38, Goraknath 509,	Arize 6444 Gold, Hyb. 27p37, Goraknath 509,
Total area under basmati/scented in the district	2500 ha	1501 ha	4000 ha
Most prevalent basmati	Narendra Lalmati, Pusa Basmati 4	Narendra Lalmati, Basmati variety, NDR 6093	Narendra Lalmati, Basmati variety, NDR 6093
Seed replacement rate	80%	75%	80%
Whether farmers are using any heavy equipments like transplanter/combine harvester	Combine harvester	Combine harvester, Happy seeder	Combine harvester, Happy seeder
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	limited	Nil	limited DSR
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Use of plant protection measures	Use of plant protection measures	Use of HYVs and weedicides in rice cultivation
What are the general problems in rice cultivation in the district?	shortage of agricultural labours	shortage of agricultural labours	shortage of agricultural labours
Please provide any farmers association in the district	Kisan Club, FPOs	Kisan Club, FPOs	NA
Whether availability of agricultural labours is sufficient?	No	No	No
Whether there is any marketing problem of the produce?	No	No	No
Any major irrigation/power generation project in the district	Sarda Sahayak Canal Irrigation project	NTPC and Canal Irrigation project	Canal Irrigation
Any soil testing program undertaken?	Yes	Yes	Yes
Any farmers' training program was organized by the state department of Agriculture/University	Yes, regular training program by Dept. of Agriculture, KVKs and University	Yes, regular training program by Dept. of Agriculture, KVKs and University	Yes, regular training program by Dept. of Agriculture, KVKs and University

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)

Parameters	**Districts**	
	Sultanpur	**Barabanki**
Total area under HYVs (ha)	35028 ha	126405 ha
Most prevalent HYVs in the district	NDR 2064, NDR 2065, BPT 5204, MTU 7029	NDR 2064, BPT 5204, Sarjoo 52, NDR 359, Damini
Total area under rice hybrids	53000 ha	59006 ha
Most prevalent rice hybrids in the district	Arize 6444 Gold, Hyb. 27p63, Goraknath 509	Arize 6444 Gold, Hyb. 27p63, Goraknath 509,
Total area under basmati/scented in the district	1800 ha	2701 ha
Most prevalent basmati	Narendra Lalmati, Basmati variety, NDR 6093	Narendra Lalmati, Basmati variety, NDR 6093
Seed replacement rate	75%	80%
Whether farmers are using any heavy equipments like transplanter/combine harvester	Combine harvester	Combine harvester, Happy seeder
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	limited	Limited
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Use of plant protection measures and weedicides	Use of plant protection measures and weed control
What are the general problems in rice cultivation in the district?	shortage of agricultural labours and their high wages	shortage of agricultural labours
Please provide any farmers association in the district	Kisan Club	Kisan Club, FPOs
Whether availability of agricultural labours is sufficient?	No	No
Whether there is any marketing problem of the produce?	No	No
Any major irrigation/power generation project in the district	Sarda Sahayak Irrigation project	Sharda Sahayak Canal
Any soil testing program undertaken?	Yes	Yes
Any farmers' training program was organized by the state department of Agriculture/University	Yes, regular training program by Dept. of Agriculture, KVKs and University	Yes, regular training program by Dept. of Agriculture, KVKs and University

Table 6: General information

Parameters	Districts				
	Ayodhya	**Ambedkar Nagar**	**Amethi**	**Sultanpur**	**Barabanki**
# of talukas/ blocks covered	4	3	3	3	3
# of villages surveyed	6	5	5	5	3
# of farmers interviewed	6	7	5	5	6
Field ecosystem	IR (100%)	IR (100%)	IR (100%)	IR (100%)	IR (100%)
Weather conditions during cropping season	Normal	Normal	Normal	Normal	Normal
Crop stage when survey was made	Booting to heading	Booting to heading	Booting to heading	Booting to heading	Tillering to heading
Crop rotations	Rice-wheat, rice-mustard, rice-wheat-black gram/green gram/lentil, rice-wheat-mentha, rice-pea, rice-chick pea, rice-pea-green gram, rice-wheat-vegetables, rice-mustard-green gram, rice-wheat-sorghum and rice-pulses				

IR: Irrigated

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

Variety/hybrids	Yield (kg/ha)				
	Ayodhya	**Ambedkar Nagar**	**Amethi**	**Sultanpur**	**Barabanki**
Samba Mahsuri	3800-3900	4000-4400	4000-4400	3900-4400	3800
Sarjoo 52	4000-4800		4000	4500	4200
Swarna					
N. Lalmati					
NDR 2064	3900-4400	3900-4400		4200	
NDR 359					
NDR 97				2300	
Damini		3700-4200	3900		
PAN Mahsuri		3300			
Dilkhush			4100		
Arize 6444 Gold	3700		3600-3900		5800-6000
Goraknath 509		4200	3600		
Hyb. 27p37			3900		5500

B. Rice consumption pattern: Survey was conducted on consumption pattern of rice among the farmers in different surveyed districts of this part of eastern Uttar Pradesh (Table 8). All the farmers contacted were from medium income group. Average per capita consumption of rice per month was 3-5 kg rice and 100% of the farmers contacted told that their main meal consisted of both rice and wheat. All the farmers contacted told that they preferred polished rice over parboiled rice and all of them told that they preferred fine grain rice. In general, there was no change in the food habit.

Table 8: Details of rice consumption pattern in different districts of Uttar Pradesh

Parameters	Districts				
	Ayodhya	Ambedkar Nagar	Amethi	Sultanpur	Barabanki
Status of farmers	Medium income (100%)	Medium income (100%)	Medium income (100%)	Medium income (100%)	Medium income (100%)
Per capita monthly rice consumption (kg)	3-4 kg	3-4 kg	3-4 kg	4-5 kg	3.5-4.5 kg
Composition of main meal	Rice + Wheat (100%)	Rice + Wheat (100%)	Rice + Wheat (100%)	Rice + Wheat (100%)	Rice + Wheat (100%)
Preferred rice types	Polished rice (100%)	Polished rice (100%)	Polished rice (100%)	Polished rice (100%)	Polished rice (100%)
Rice grain type preference	Fine grain (100%)	Fine grain (100%)	Fine grain (100%)	Fine grain (100%)	Fine grain (100%)
Any changes in food habit in last 10 years	No (100%)	No (100%)	No (100%)	No (100%)	No (100%)

Table 9: Details of nursery management

Parameters	Districts				
	Ayodhya	Ambedkar Nagar	Amethi	Sultanpur	Barabanki
Planting time	1st to 2nd week of July	1st to 3rd week of July	4th week of June to 3rd week of July	1st to 2nd week of July	3rd to 4th week of June
Seed rate	30 kg/ha (HYVs); 15 kg/ha (hybrids	30 kg/ha (HYVs); 15 kg/ha (hybrids	30 kg/ha (HYVs); 15 kg/ha (hybrids	30 kg/ha (HYVs); 15 kg/ha (hybrids	30 kg/ha (HYVs); 15 kg/ha (hybrids
Seed treatment (% farmers adopted)	Yes (66.7%)	Yes (42.8%)	Yes (40%)	Yes (40%)	Yes (16.7%)
Chemicals used for seed treatment	carbendazim (2 g/kg seed); *Trichoderma* (10 g/kg seed)				
Organic manure in nursery (% farmers adopted)	Yes (33.3%); FYM	Yes (28.6%); FYM	Yes (40%); FYM	Yes (40%); FYM	Yes (100%); FYM
Inorganic manure in nursery (% farmers adopted)	Yes (100%); urea (1-2 kg/100 m^2)	Yes (100%); urea (1-2 kg/100 m^2)	Yes (100%); urea (1-2 kg/100 m^2)	Yes (100%); urea (1-2 kg/100 m^2)	Yes (100%); urea (2-2.5 kg/100 m^2)

C. Nursery and main field Management: Average seed rate used by the farmers ranged from 30-35 kg/ha for HYVs while in case of hybrids it was 15 kg/ha. On an average about 41% of the farmers contacted treated the seeds before sowing with carbendazim (2 g/kg seeds). Some farmers treated the seeds with *Trichoderma* biocontrol formulation @ 10 g/kg seeds (Table 9). On an average 48% of the farmers contacted from different districts told that they applied organic manure like FYM in the nursery (Table 9). All the farmers contacted told that they applied urea (1-2 kg/100 m^2 nursery area). Planting was done from 3rd week of June to 4th week of July. All the farmers contacted in surveyed districts adopted random transplanting where plant population per unit area was not maintained. In the main fields, fertilizers were applied @ 100-120 kg N/ha, 50-60 kg P_2O_5/ha and 50-60 kg K_2O/ha (Table 10). All the farmers contacted told that they applied zinc sulphate (20-25

kg/ha) in the main field (Table 10). Micronutrient like Zinc and Sulphur deficiency were observed in surveyed areas. To supply essential nutrient to the crop farmers were using inorganic fertilizers viz. Urea, NPK, DAP, SSP, MOP, and Zinc sulphate. On an average about 93% of the farmers contacted applied organic matter in the main fields (Table 10). Majority of the farmers contacted applied FYM (10-16 t/ha). Some of the farmers contacted applied Dhaincha green manure in the fields. Some farmers also added other green manures like urd bean and moong bean in the fields to improve the soil health and yield potential of the crop. Plant growth promoters *viz.,* Zyme (8-10 kg/acre), Biozyme and Microzyme are being used by some progressive farmers.

Table 10: Details of main field management

Details	**Districts**				
	Ayodhya	**Ambedkar Nagar**	**Amethi**	**Sultanpur**	**Barabanki**
Planting method	All the farmers contacted in surveyed districts adopted random transplanting where plant population per unit area was not maintained				
Total N applied	120 kg/ha (100% applied)	120 kg/ha (100% applied)	120 kg/ha (100% applied)	120 kg/ha (100% applied)	100-120 kg/ha (100% applied)
Total P_2O_5 applied	60 kg/ha (100% applied)	60 kg/ha (100% applied)	60 kg/ha (100% applied)	60 kg/ha (100% applied)	50-60 kg/ha (100% applied)
Total K_2O applied	60 kg/ha (100% applied)	60 kg/ha (100% applied)	60 kg/ha (100% applied)	60 kg/ha (100% applied)	50-60 kg/ha (100% applied)
$ZnSO_4$ applied (21% or 33%)	24-25 kg/ha (100% applied)	20-25 kg/ha (100% applied)	20-24 kg/ha (100% applied)	20-25 kg/ha (100% applied)	20 kg/ha (100% applied)
Organic fertilizers applied	Yes (100%); FYM (10-15 t/ha); Dhaincha green manure	Yes (100%); FYM (10-16 t/ha); Dhaincha green manure	Yes (100%); FYM (10-15 t/ha); Dhaincha green manure	Yes (100%); FYM (10-15 t/ha); Dhaincha green manure	Yes (66.7%); FYM (10-15 t/ha); Dhaincha green manure
Remarks	Nutrients were applied in the form of urea, DAP, SSP, MOP and zinc sulphate. About 33.3% of the farmers contacted in Barabanki applied growth regulator 'Zyme' (8-10 kg/acre).				

Table 11: Weeds and weed management

Details	**Districts**				
	Ayodhya	**Ambedkar Nagar**	**Amethi**	**Sultanpur**	**Barabanki**
Weed intensity	Medium	Medium	Medium	Medium	Low to medium
Names of the weeds	Commonly recorded weeds were *Echinochloa colona, E. crusgalli, Cynodon dactylon, Eclipta alba, Cyperus iria, Cyperus rotundus, Digitaria sanguinalis* and *Fimbristylis dichotoma*				
Weedicides used	Butachlor (1.5-2.5 l/ha), pretilachlor (1.5 l/ha), Nominee Gold (200 ml/ha) and others				
%age of farmers applied herbicides	All the farmers contacted adopted herbicide application. In addition to herbicide application, all of them also adopted hand weeding for the management of weeds.				
Wild/weedy rice incidence	Nil	Nil	Nil	Nil	Nil

D. Weeds and their Management: Overall intensity of weeds was medium. Commonly recorded weeds were *Echinochloa colona, E. crusgalli, Cynodon dactylon, Eclipta alba, Cyperus iria, Cyperus rotundus, Digitaria sanguinalis* and *Fimbristylis dichotoma*. All the farmers contacted adopted herbicide application. All the farmers contacted told that they applied different herbicides for weed management (Table 11). In addition to herbicide application, all of them also adopted hand weeding for the management of weeds. Commonly used herbicides were butachlor (1.5-2.5 l/ha), pretilachlor (1.5 l/ha), Nominee Gold (200 ml/ha) and others

Table 12: Details of inputs used

Details	**Districts**				
	Ayodhya	**Ambedkar Nagar**	**Amethi**	**Sultanpur**	**Barabanki**
Implements used	Implements like sprayer, cultivator, tractor, paddy thresher, rotavator and combine harvester were used by the farmers. Progressive farmers had some of their own equipment and other farmers hired the implements. Use of combine harvester and paddy thresher was common practice among the rice farming community of the Eastern Uttar Pradesh.				
Source of seeds	About 80-100% of the farmers contacted in different districts told that they purchased 70-85% of their seed requirement				
Source of irrigation	Deep tube well (100%)	Deep tube well (100%)	Deep tube well (100%)	Deep tube well (100%)	Canal (83.3%); Deep tube well (66.7%); Shallow tube well (33.3%)
Scarcity of irrigation water	No (100%)	No (100%)	No (100%)	No (100%)	No (100%)
Availability of fertilizers/pesticides	No (100%)	No (100%)	No (100%)	No (60%)	Yes (100%)
Quality of fertilizers/pesticides	Not Satisfied (100%)	Not Satisfied (100%)	Not Satisfied (100%)	Not Satisfied (60%)	Satisfied (100%)
Advisors to the farmers	Own decisions (100%); State dept. (100%); Univ (100%)	Own decisions (100%); State dept. (100%); Univ (100%)	Own decisions (80%); State dept. (100%); Dealers (100%); Univ (60%)	Own decisions (80%); State dept. (100%); Univ (100%)	Own decisions (100%); State dept. (100%); Univ (100%)

E. Common needs of the farmers: Some of the common needs of the farmers were timely availability of quality seeds HYVs, high yielding varieties with medium slender grain, timely availability of fertilizers and plant protection chemicals, availability of labours, marketing facility, disease and pest tolerant rice varieties and farm machineries including solar pumps. The survey team reported that subsidized seeds, agro-chemicals, plant protection inputs and farm machineries including solar pumps were provided to the farmers by Govt. agencies.

F. Input use: Implements like sprayer, cultivator, tractor, paddy thresher, rotavator and combine harvester were used by the farmers. Progressive farmers had some of their own equipment and other farmers hired the implements. Use of combine harvester and paddy thresher was common practice among the rice farming community of the Eastern Uttar Pradesh. About 80-100% of the farmers contacted in different districts told that they purchased 70-85% of their seed requirement. Majority of the farmers have small holding size and using farm machinery on hired basis in the surveyed districts. Soil testing programme is promoting by the govt. agencies and providing Soil Health Card to farmers. Few farmers are doing organic rice cultivations in small areas. Deep tube wells, canal and shallow tube wells were the main sources of irrigation (Table 12). Majority of the farmers contacted expressed that fertilizers and pesticides were not available in time and they were not happy with their quality (Table 12). To promote new varieties/technologies, to minimize the cost of cultivation and to enhance the overall income of the rice growing farmers, regular training programmes, Kisan Mela and Kisan Gosthies were organized by KVKs of Agriculture University and Department of Agriculture, Govt. of Uttar Pradesh. The main source of farmers finance are own resources, Kisan Credit Card, P.M. Kisan Samman Nidhi and cooperative societies. In addition to their own decisions, farmers received advices from officials of state department of agriculture, university and private dealers. Availability of farm labourers coupled with higher labour wages are the major constraint in rice production in the surveyed districts.

Table 13: Prevalence of diseases and Insects in Eastern Uttar Pradesh during *Kharif' 2024*

Districts	Diseases			
	BS	ShBl	FS	BLB
Ayodhya	L-M	L-M (5-10%)	L-M (5-10%)	L
Ambedkar Nagar	L-M	L-M (5-10%)	L-M (5-10%)	L-M
Amethi	L-M	L-M (5-10%)	L-M (5-10%)	L
Sultanpur	L-M	L-M (5-10%)	L-M (5-10%)	L
Barabanki	L-M (5-10%)	M (10-15%)	L-M (5-10%)	L-M (5-10%)

Districts	Insects				
	SB	LF	BPH	GLH	GB
Ayodhya	L-M (5-10%)	L (<5%)	S (200-400 insects/hill)	L	L-M
Ambedkar Nagar	L-M (5-10%)	L-M (5-10%)	S (200-400 insects/hill)	L	L
Amethi	L-M (5-10%)	L (<5%)	S (200-350 insects/hill)	L	L
Sultanpur	L-M (5-10%)	L-M (5-10%)	S (200-600 insects/hill)	L	L
Barabanki	L-M	L-M	M-S (10-50 insects/hill)	L	L

G. Biotic stresses and their management: The details of occurrence of different diseases and insect pests are presented in Table 13. Overall, the incidences of different diseases like brown spot, sheath blight, false smut and bacterial blight were low to moderate. Among the insect pests, stem borer, leaf folder, gundhi bug, green leaf hoppers and termites were observed in low to moderate intensities. However, brown plant hopper damage was severe in most of the villages of most of the surveyed districts. In many villages, BPH population was very high (200-600 insects per hill) (Table 13). Varieties like Samba Mahsuri, Komal Mahsuri, PanN Mahsuri, PAN 804, Lal Mahsuri, Moti Gold and others were severely affected. All the farmers contacted adopted plant protection

measures. The details of different insecticides and fungicides used by the farmers are presented in Table 14. Farmers adopted 1-2 spraying and very few of the farmers contacted mixed 2 or more pesticides before spraying. In many places, deficiency symptoms of zinc were observed. Some of the common problems were shortage of labours and their high wages, damage by stray animals, unavailability of fertilizers and quality seeds in time and micronutrient deficiency

Table 14: Details of pest management

Details	Districts				
	Ayodhya	**Ambedkar Nagar**	**Amethi**	**Sultanpur**	**Barabanki**
% age farmers adopting plant protection	100%	100%	100%	100%	100%
Names of pesticides	**Insecticides**: cartap hydrochloride (400-500 ml/ha) and chlorpyriphos 20 EC (1000-1250 ml/ha) for stem borer and leaf folder and imidacloprid (100 ml/acre) for BPH **Fungicides**: propiconazole (500 ml/ha), azoxystrobin + difenoconazole (400-500 ml/ha), hexaconazole (1 l/ha), Nativo (tebuconazole + trifloxystrobin) (200-300 g/ha) and carbendazim (500 gm/ha) for sheath blight and false smut				
# of pesticide sprays	2	2	2	1-2	1-2
Mixing of pesticides before application	Yes (16.7%); 2	Yes (14.3%); 2	Nil	Yes (20%); 2	Yes (16.7%); 2
Zinc deficiency	Nil	Nil	Nil	Nil	Yes (83.3%)

H. Researchable issues: Among the biotic stresses, major problems in the region are sheath blight, bacterial blight and false smut among the diseases and brown plant hopper, stem borer and leaf folder among the insect pests (Table 15). Among the abiotic problems, Submergence/ drought (early drought), flash flood and salinity were the main problem. Scarcity of agricultural labours, unavailability of quality seeds and other inputs, lack of mechanization and micronutrient deficiency were different production constraints faced by the farmers. Farmers expressed the need for varieties suitable for DSR and varieties with lodging resistance, varieties having resistance to sheath blight, false smut, bacterial blight, BPH and stem borer. Farmers also expressed the need for varieties having tolerance to submergence, drought and salinity. Farmers also expressed the need of high yielding varieties with medium slender grain and bio-fortified rice varieties.

Table 15: Researchable issues

Details	Districts				
	Ayodhya	**Ambedkar Nagar**	**Amethi**	**Sultanpur**	**Barabanki**
Rice ecology in your area	Irrigated	Irrigated	Irrigated	Irrigated	Irrigated
Rice cultivation only in Kharif or both Kharif and Rabi	Kharif	Kharif	Kharif	Kharif	Kharif
Number of years of experience in rice farming	5-10 years	5-10 years	5-10 years	5-10 years	5-10 years
Main biotic constraints (diseases) in your area according to you	Sheath blight, bacterial blight and false smut				
Extent of disease damage	<10%	<10%	<10%	<10%	10-25%
Main biotic constraints (Insect pests) in your area according to you	Brown plant hopper, stem borer and leaf folder				
Extent of insect pest damage	<10%	<10%	<10%	10-25%	10-25%
Main abiotic constrains in your area according to you	Drought; flash flood	Drought	Drought	Drought; Salinity	Drought; Salinity
Production constraints in your area according to you	Scarcity of agricultural labours, micronutrient deficiency, unavailability of quality seeds				
Irrigation facilities in your area	Available; Bore well, river	Available; Bore well	Available; Bore well	Available; Bore well, canal	Available; Bore well, canal
Normally how many years it takes to change the rice variety	5-10 years	5-10 years	5-10 years	5-10 years	5-10 years
Any other rice production issues in your area which the rice scientists need to address					
What is urgently required in your area as far as rice varieties are concerned					
Duration	Varieties suitable for DSR and varieties with lodging resistance				
Biotic stress resistance	Varieties tolerant to bacterial blight, sheath blight, false smut, BPH and stem borer				
Abiotic stress resistance	Varieties with tolerance to drought and salinity				
Preferred grain quality	High yielding rice varieties with medium slender grain				
Nutritional quality	Varieties with high iron, zinc and high protein				

Uttarakhand-Pantnagar (2024-25)

Districts surveyed: *Udham Singh Nagar*

Table 1: Particulars of Survey

District	Blocks	Villages (latitude; longitude)
Udham Singh Nagar	Gadarpur, Nanak Matta, Jaspur, Khatima, Kashipur, Sitarganj, Bazpur and Rudrapur	Panchananpur (29.047274; 79.36497), Neta Nagar-Buk Saura (29.046348; 79.358404), Sankhera (28.93274; 79.83755), Babarkhera (29.2178; 78.89587), Jarashu-Pratappur (28.9215; 79.85224), Shivrajpur (29.2535; 78.88565), Shyamnagar (29.22424; 78.87752), Mohammadpur (29.87796; 79.86193), Missarwala (29.23132; 78.92386), Sarwarkhera (29.21195; 78.9249); Khempur, Kalyanpur (28.9397; 79.8115), Banskhera (29.14577; 79.23014), Bara (8.86796; 79.6035), Gangapur (29.13424; 79.2252), Sitargamj (28.89547; 79.68897), Bhuriya Tharu (28.96715; 79.94043), Puravgarh (28.9334; 79.79938), Peheniya (28.94497; 79.93281), Jhankat (28.9407; 79.9015) and another 52 villages

Table 2: Widely prevalent rice varieties

District	Prevalent varieties
Udham Singh Nagar	PR 113, PR 121, PR 126, PR 130, PR 131, HKR 47, Pant Dhan 23, Pusa Basmati 1509, Pusa Basmati 1121, Pusa Basmati 1692, Pant Sugandh Dhan 27, Noori (farmer's local selection), Pusa Basmati 1847, Pant Basmati 2 and others

Table 3: Particulars of rice area

District	Total Geographical Area (ha.)	Total Cultivable Area (ha.)	Total Cultivated Area (ha.)	Total Irrigated Area (ha.)	Area sown Under Rice (ha.)	Production (tonnes)	Productivity (q/ha)
US Nagar	254200	150892	144008	138010	107700	335120	31.12

Table 4: Weather conditions during Kharif 2024 at Pantnagar (Udham Singh Nagar)

Weather Data					Months			
	May	June	July	Aug	Sep	Oct	Nov	Dec
Rainy Days (No.)	0	3	17	15	8	0	0	1
Total Rain Fall (mm)	0.80	20.60	623.60	433.00	323.20	0.00	0.00	6.00
Max Temperature (°C)	38.50	39.20	33.00	31.90	32.10	32.10	27.80	23.20
Min Temperature (°C)	23.80	26.50	26.20	25.80	25.00	20.20	13.40	7.20
Relative Humidity								
Morning	55.00	62.70	87.90	89.10	90.00	86.40	91.40	91.70
Evening	30.00	39.30	74.00	75.30	72.00	54.40	50.10	44.60
Sunshine Hours	NA	7.80	5.00	5.20	5.50	7.20	4.40	6.50

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	**Udham Singh Nagar**
Total area under HYVs in the district	50-55%
Most prevalent HYVs in the district	PR 131, PR 130, HKR 47, PR 113, PR 121, PR 126, Pant Dhan 23.
Total area under rice hybrids in the district	NA
Most prevalent rice hybrids in the district	NA
Total area under basmati in the district	Less than 1%
Most prevalent basmati varieties in the district	Pusa Basmati 1509, Pusa Basmati 1121, Pusa Basmati 1692, Pant Sugandh Dhan 27, Noori (farmer's local selection), Pant Basmati 2, Pusa Basmati 1847.
Whether farmers are using any heavy equipments like transplanter /combine harvester	Yes
Mention water saving technologies like SRI/laser levelling/DSR being used by the farmers	Yes (DSR only on small scale)
Whether survey team gave any advice to the farmers during survey? If yes, then what are those?	Farmers were advised to apply only the recommended doses of pesticides and fertilizers in consultation with the experts/scientists and not to cultivate rice during summer.
What are the general problems in rice cultivation in the district?	High labour wages
Please provide any farmers association in the district	Not known
Whether availability of agricultural labours is sufficient?	No
Whether there is any marketing problem of the produce?	Insufficient rice counters where farmers can sell their produce
Any major irrigation/power generation project in the district	Nanaksagar Irrigation project, Nanakmatta, Khatima, Khatima hydro power Station, Lohiahead, Khatima
Any soil testing program undertaken	Yes
Any farmers training program was organized by the state department of agriculture/university	Trainings by State Agriculture department and university KVKs

Production oriented survey was conducted in Udham Singh Nagar district of Uttarakhand which is a predominant rice growing area. The details of the survey are presented in Table 1 & 6. The particulars of rice area, production and productivity are given in Table 3. The details of different weather parameters recorded in the district are presented in Table 4. Production oriented survey was conducted in 72 villages of 7 blocks of district Udham Singh Nagar during heading to dough stage of the rice. The district Udham Singh Nagar falls under tarai belt of the state. Weather conditions for rice cultivation in general were normal. Most of the farmers in the district 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 the areas surveyed. Predominant rice varieties in the district were HYVs like PR 113, PR 121, PR 126, PR 130, PR 131 and HKR 47 and basmati rice varieties like Pusa Basmati 1509, Pusa Basmati 1121, Pusa Basmati 1692, Pusa Basmati 1847 and Pant Sugandh Dhan 27 were the major varieties predominantly grown in this district.

Table 6: General information

Parameters	District: Udham Singh Nagar
# of talukas/blocks covered	8
# of villages surveyed	72
# of farmers interviewed	20
Field ecosystem	Irrigated
Weather conditions during cropping season	In general weather conditions were normal and favourable for rice cultivation
Crop stage when survey was made	Booting to dough stage
Crop rotations	Rice-wheat was the predominant cropping sequence. Other crops rotations followed by the farmers were rice-pea, rice-pea-potato, rice-wheat-mustard, rice-sugarcane, rice-mustard, rice-mustard-potato, rice-cole crops-mustard, rice-mustard-pea and others

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

Varieties	Yield (kg/ha) in Udham Singh Nagar district	Remarks
HKR-47	5500-5600	Due to favourable weather conditions, there was nice crop stand, in almost all the areas surveyed.
PR-113	5600-5700	
PR-121	5500	
PR-126	5700-5800	

A. Cropping system and rice yield: Rice-wheat was the predominant cropping sequence. Other crops rotations followed by the farmers were rice-pea, rice-pea-potato, rice-wheat-mustard, rice-sugarcane, rice-mustard, rice-mustard-potato, rice-cole crops-mustard, rice-mustard-pea and others (Table 6). Average rice yield among the high yielding varieties in plain area ranged from 5500-5800 kg/ha (Table 7).

Table 8: Details of rice consumption pattern

Parameters	District: Udham Singh Nagar
Status of farmers	Medium income (90%); Rich (10%)
Per capita monthly rice consumption (kg)	6-10 kg
Composition of main meal	Rice + Wheat (100%)
Preferred rice types	Polished rice (50%); Parboiled (50%)
Rice grain type preference	Fine grain (100%)
Any changes in food habit in last 10 years	No (100%)

B. Rice consumption pattern: Survey was conducted on consumption pattern of rice among the farmers in Udham Singh Nagar district of Uttarakhand. Majority (90%) of the farmers contacted were in the medium income group. Average per capita consumption of rice per month was 6-10 kg rice (Table 8). All the farmers contacted told that their main meal consisted of both rice and wheat and about 50% of the farmers told that they used polished rice. All the farmers contacted told that they preferred fine grain rice varieties. In general, there was no change in the food habit.

Table 9: Details of nursery management

Parameters	**District: Udham Singh Nagar**
Planting time	1st to 4th week of July
Seed rate	20-25 kg/ha
Seed treatment (% farmers adopted)	Yes (65%); Rest purchased treated seeds
Chemicals used for seed treatment	Carbendazim 50% WP (2 g/kg seeds)
Organic manure in nursery (% farmers adopted)	No (100 %)
Inorganic manure in nursery (% farmers adopted)	Yes (100% farmers); DAP or NPK (3-7 kg) plus urea (2-3 kg) per 1000 m^2 or only urea (3 kg/1000 m^2 or only DAP (5 kg/1000 m^2) or only NPK (5 kg/1000 m^2)

Table 10: Details of main field management

Details	District: Udham Singh Nagar
Planting method	Random planting (100%); Plant population per unit area was not maintained
Total N applied	120 kg/ha (100% farmers applied)
Total P_2O_5 applied	60 kg/ha (100% farmers applied)
Total K_2O applied	40 kg/ha (100% farmers applied)
$ZnSO_4$ applied	25 kg/ha (100% farmers applied)
Organic fertilizers applied	Very less (only 10%) applied FYM @ 2 q/ha
Remarks	Fertilizers like DAP, urea, MOP, Zinc sulphate and NPK (19:19:19) were commonly used by the farmers. Zn deficiency is a common problem in the district. Farmers in the district unanimously applied zinc sulphate @ 25 kg/ha or sprayed the crop with 5 kg zinc sulphate + 20 kg urea/ha to manage Zinc deficiency/Khaira disease. Few farmers also applied chelated zinc @ 0.5% and bio-fertilizer named biozyme.

C. Nursery and main field Management: Entire area under the district is irrigated and most of the farmers followed recommended agronomic package of practices. Planting was done between 1st week to 4th week of July. Average seed rate was 20-25 kg/ha and farmers adopted random planting where plant population per unit area was not maintained. About 65% farmers contacted told that they adopted seed treatment with carbendazim (2 g/kg of seeds) before sowing and remaining farmers told that they purchased treated seeds. None of the farmers contacted applied organic manure in the nursery beds. However, all of them applied chemical fertilizers like DAP or NPK (3-7 kg) plus urea (2-3 kg) per 1000 m^2 or only urea (3 kg/1000 m^2 or only DAP (5 kg/1000 m^2) or only NPK (5 kg/1000 m^2) in the nursery (table 9). In the main fields, farmers applied fertilizers @ 120 kg N/ha, 60 kg P_2O_5/ha and 40 kg K_2O/ha. Almost all the farmers contacted told

that they applied zinc sulphate @ 25 kg/ha. Fertilizers like DAP, urea, MOP, Zinc sulphate and NPK (19:19:19) were commonly used by the farmers. Zn deficiency is a common problem in the district. Farmers in the district unanimously applied zinc sulphate @ 25 kg/ha or sprayed the crop with 5 kg zinc sulphate + 20 kg urea/ha to manage Zinc deficiency/Khaira disease. Few farmers also applied chelated zinc @ 0.5% and bio-fertilizer named biozyme. Application of organic manures like FYM in the fields is not common among the farmers.

Table 11: Weeds and weed management

Details	District: Udham Singh Nagar	Remarks
Weed intensity	Low	Most of the farmers adopted hand weeding along with herbicide application
Names of the weeds	*Echinochloa colona, Echinochloa crusgalli, Cynodon dactylon, Ischaemum rugosum, Eclipta prostrata, Cyperus* spp. and others	
Weedicides used	Pre-emergence: pretilachlor 50% EC and butachlor 50% EC Post-emergence: bispyribac Sodium 10% SC	
Percentage of farmers applied herbicides	Applied (100%) along with hand weeding	
Wild/weedy rice incidence	Nil	

D. Weeds and their Management: Overall, intensity of weeds was low. The details of different weeds recorded in different districts are presented in Table 11. The details of different weedicides used by the farmers are presented in Table 11. Almost all the farmers contacted applied different pre-emergence and post emergence herbicides (Table 11). Most of the farmers practiced hand weeding along with herbicide application.

Table 12: Details of inputs used

Details	District: Udham Singh Nagar
Implements used	Implements like tractor, harrow, bund-maker, cultivator and combine harvester were used by the farmers. Combine harvested was hired by majority of the farmers in both districts. About 40% farmers possessed their own implements like tractor, harrow and cultivator.
Seed replacement rate in 2024	Seed replacement rate is not available. However, 100% farmers contacted in the district purchased 100% of their seed requirement
Source of irrigation	Shallow tube wells (100%)
Scarcity of irrigation water	No (100%)
Availability of fertilizers/pesticides	Available (100%)
Quality of fertilizers /pesticides	Happy with the quality (100%)
Advisors to the farmers	Own decisions (20%); State department (85%); Dealers (10%); University (100%)

E. Input use: Implements like tractor, harrow, bund-maker, cultivator and combine harvester were used by the farmers. Combine harvested was hired by majority of the farmers. About 40% farmers possessed their own implements like tractor, harrow and cultivator. Seed replacement rate is not available. However, 100% farmers contacted in the district purchased 100% of their seed requirement. Shallow wells are the main sources of irrigation in the district. Besides, Nanaksagar dam, and Khatima hydro power station, situated in Khatima and Haripura Dam, Gularbhoj in Gadarpur were also a source of irrigation for farmers in that area. Most of the farmers contacted expressed that there was no scarcity of irrigation water. Majority of the farmers contacted told that fertilizers and pesticides are available in time and they were happy with their quality. In addition to their own decisions, farmers took advices from officials of state department of agriculture and university staffs. Some of the common problems expressed by the farmers were scarcity of labours and improvement in marketing facility (more number of counters/points where the farmers can sell their produce). Majority of the farmers reported the problem of zinc deficiency.

Table 13. Prevalence of major diseases in Udham Singh Nagar district in 2024

Districts	Diseases								
	Bl	ShBl	BS	FS	ShR	GD	Kh	Bak	BLB
US Nagar		T-M (1-10%)	L	L-M	T (<2%)	L	T (<2%)	L	L-S

Districts	Insect Pests						
	SB	LF	BPH	WBPH	GB	RH	WM
US Nagar	L-M (5-20%)	L-S (2-30%)	L-M (2-15%)	L	L	L	T-M (1-20%)

F. Biotic stress and their management: Prevalence of different diseases and insect pests in Udham Singh Nagar district are presented in Table 13. Among the diseases, sheath blight and bacterial blight were widespread. Sheath blight was recorded in low to moderate intensity and bacterial blight was recorded in low to severe intensity. Other diseases recorded were brown spot, false smut, grain discoloration, bakanae and khaira in low intensity. Among the insect pests, brown plant hopper, leaf folder and stem borer were widespread in low to moderate intensity. Severe incidence (25-30% leaf damage) of leaf folder was recorded in some fields of Shyamnagar village of UDham Singh Nagar district on rice variety HKR 47. Other insect pests recorded were WBPH, gundhi bug, rice hispa and rice whorl maggot. All the farmers contacted told that they applied different pesticides and fungicides for management of different insect pests and diseases. The details of different pesticides used by the farmers are presented in Table 14. In general, farmers adopted 2-5 pesticide application. About 50% of the farmers contacted told that they mixed 2-3 pesticides before application. Zinc deficiency was commonly observed in most of the surveyed areas.

Table 14: Details of pest management

Details	District: Udham Singh Nagar
% age farmers adopting plant protection	Adopted (100%)
Names of pesticides	Insecticides: chlorantraniliprole 18.5 SC (150 ml/ha), acephate 75% WP (1000 g/ha), deltamethrin + triazophos (1000 ml/ha), cartap hydrochloride + imidacloprid (1000 ml + 150 ml per ha), cypermethrin + profenophos, lamda cyhalothrin, chlorpyriphos 50% + cypermethrin 5% EC (500 ml/ha), cartap hydrochloride 50% SP (1000 g/ha), chlorantraniliprole 0.4% GR (10 kg/ha), fipronil 5% SC (1000 ml/ha) and cartap hydrochloride 4% GR (19 kg/ha), chlorpyriphos imidacloprid (1000 g + 150 gm per ha) for leaf folder and stem borer; dinitofuron 20% SG (150 g/ha), dinitrofuron 15% + pymetrozine 45% WG (400 g/ha), buprofezin 25% SC (1000 ml/ha), pymetrozine 50% (300 g/ha) and acephate 75% WP (600 g/ha) for plant hoppers and cartap hydrochloride 50% SP + buprofezin 10% WP (800 g/ha) for all insect pests; Fungicides: propiconazole 5% EC (1 ml/l) for sheath blight and false smut and copper oxychloride + streptomycin (500 g+ 15 g per ha) for bacterial blight
# of pesticide sprays	2-5
Mixing of pesticides before application	Yes (50%); mixed 2-3 pesticides
Zinc deficiency	Yes (90%)

G. Researchable issues: Among the biotic stresses, major problems are sheath blight, bacterial blight, false smut and brown spot and BPH, stem borer and leaf folder among insect pests. Among abiotic stresses, micronutrient deficiency was the major problem. Farmers want varieties suitable for DSR, rice varieties resistant/tolerant to above mentioned biotic constraints, varieties with lodging resistance and bio-fortified varieties with high zinc.

Table 15: Researchable issues

Parameters/Issues	District: Udham Singh Nagar
Rice ecology in your area	Irrigated (100%)
Rice cultivation only in Kharif or both Kharif and Rabi	Kharif (100%)
Number of years of experience in rice farming	5-10 Years (50%); 10-20 Years (50%)
Main biotic constraints (diseases) in your area according to you	Sheath blight, bacterial blight, false smut and brown spot
Extent of disease damage	10-25%
Main biotic constraints (Insect pests) in your area according to you	BPH, stem borer and leaf folder
Extent of insect pest damage	10-25%
Main abiotic constrains in your area according to you	Zinc deficiency
Production constraints in your area according to you	Micronutrient deficiency especially Zinc and scarcity of agricultural labours
Irrigation facilities in your area	No
Normally how many years it takes to change the rice variety	Less than 5 years (40%); 5-10 years (60%)
Any other rice production issues in your area which the rice scientists need to address	-
What is urgently required in your area as far as rice varieties are concerned	
Duration	HYVs suitable for DSR and HYVs with lodging resistance
Biotic stress resistance	HYVs with resistance to BLB, false smut, sheath blight, BPH and stem borer
Abiotic stress resistance	HYVs tolerant to zinc deficiency
Preferred grain quality	Aromatic short grain
Nutritional quality	HYVs with high zinc

West Bengal-1-Bankura (2024-25)

Districts surveyed: *South 24-Parganas, Jhargram, Purulia* and *Bankura*

Table 1: Particulars of survey

District	Blocks	Villages (Latitude; Longitude)
South 24-Parganas	Bishnupur-I, Bishnupur-II,	Khagramuri (22.3349; 88.3662), Raypur (22.4325; 88.2248), Chandrahati (22.4337; 88.2253), Rashkhali (22.3349; 88.3662), Bharu Ram Krishnapur (22.3365; 88.3895)
Jhargram	Jhargram	Shalboni (22.38; 87.02), Shirshi (22.41; 87.12), Khalsheuli (22.40; 87.21), Benedi (22.33; 87.16)
Purulia	Santuri	Salberia (23.51953; 86.84605),
Bankura	Sarenga	Sarulia (22.17; 87.04), Chiltore (22.46; 87.01)

Table 2: Widely prevalent varieties

District	Varieties
South 24-Parganas	**HYVs/Improved:** Dudheswar, Ajit, MTU 1010, Banskathi, Gitanjali, MTU-1001, Patnai, Gobindobhog, Gontra Bidhan 1/2/3 and Santoshi; **Hybrids:** Mali-4, Pan-802, GMS 2264, GMS-26081, Arize 6129 and Arize 6444 Gold; **Locals:** Kalma, Dadsal and Kanakchur
Jhargram	**HYVs/Improved:** Swarna, Sindhu, Gaurav, MTU-1001, Gobindobhog, Bullet and others
Purulia	**HYVs/Improved:** BB-11, Swarna, Pooja, Dhiren, Dhruba, Ajit, MTU 1153, MTU-1001, Super Shyamali, Lalat and IR 64
Bankura	**HYVs/Improved:** MTU 1010, Gobindobhog, Swarna, GB1, Lalat, IR 64, Badshabhog, MTU 1153, MTU 1156, Shatabdi, BB-11 and IR 36

Table 3: Particulars of rice areas in the surveyed districts of West Bengal during 2024

District	Total geographical area (ha)	Total cultivable area (ha)	Total cultivated area (ha)	Total irrigated area (ha)	Area under paddy (ha)	Area under DSR (ha)
S 24-Parganas	948710	663863	360300	156895	330750 (K)	500
Jhargram	302439	207375	168448	61224	166000	430
Purulia	625276	431485	379187	87816	328582	NA
Bankura	688000	394523	363778	210000	345769	350

Production oriented survey was conducted in four rice growing districts of this part of West Bengal viz., South 24-Parganas, Jhargram, Purulia and Bankura. Most of the crops were in maturity stage at the time of survey. Some fields when the crops were in dough to maturity stage. Some fields in Jhargram were in booting to grain filling stage. A total of 63 farmers from 13 different villages were contacted during the survey. The details of the places covered during survey are presented in Table 1. The particulars of rice area in different surveyed districts are presented in Table 3. Most of the fields surveyed were under rainfed ecosystem. The gist of survey is presented in Table 7. In general, weather conditions were not very favourable for rice cultivation except South 24-parganas. There was long dry spell in many places visited in Jhargram and Bankura. In South 24-

Parganas, there were reports of excess rainfall or water inundation in few places visited. The details of different weather parameters are presented in Table 4. The details of different rice varieties cultivated in different surveyed districts are presented in Table 2. Commonly cultivated rice varieties in these districts were HYVs or improved varieties like Dudheswar, Ajit, MTU 1010, Banskathi, Gitanjali, MTU-1001, Patnai, Gobindobhog, Gontra Bidhan 1/2/3, Mali-4, Santoshi, Swarna, GB1, Sabhagidhan, Lalat, IR 64, Parijat Amara, Badshabhog, MTU 1153, MTU 1156, Shatabdi, BB-11 and IR 36 and hybrids like PAN-802, GMS 2264, GMS-26081, Arize 6129 and Arize 6444 Gold. Some farmers cultivated local varieties like Kalma, Dadsal, Kanakchur. The details of area covered by different rice varieties (as reported by the co-operator) is presented in Table 6. In Purulia, some of the farmers also cultivated millet is part of their land during Kharif season.

Table 4: Details of weather data in the surveyed districts of West Bengal in 2024

Weather parameters	**Months**							
	Jun	**Jul**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**	**Jan**
S 24-Parganas								
# of Rainy days	14	30	30	23	20	1	3	0
Total rainfall (mm)	103.42	316.92	590.27	374.90	275.23	2.94	7.47	0
Jhargram								
# of Rainy days	12	22	18	18	8	2	4	0
Total rainfall (mm)	102.8	234.6	573.75	527.2	215.4	8.3	13.5	0
Purulia								
# of Rainy days	4	20	25	14	10	0	1	0
Total rainfall (mm)	30.2	268.4	415.8	456.7	63.6	0	6.2	0
MMT (^{O}C)	33.3	29.4	28.6	28.5	28.3	22.8	18.9	18.4
Maximum temp (^{O}C)	39	32.8	32.1	32.0	32.1	29.4	26.6	26.2
Minimum temp (^{O}C)	27.5	26.0	25.0	25.0	24.4	16.2	11.2	10.5
Bankura								
# of Rainy days	10	25	22	15	13	0	0	NA
Total rainfall (mm)	83	284.6	438.9	403.8	212.3	0	0	NA

MMT: Monthly mean temperature; NA-Not available; h-hours; m-minutes

Table 5: General Question of Rice Cultivation In District (To Be Filled By The Cooperator In With The Officials From State Department of Agriculture

Parameters	**Districts**			
	S 24-Parganas	**Jhargram**	**Purulia**	**Bankura**
Total Area under HYVs (ha)	175000-200000	128090	316892	340500
Most prevalent HYVs in the District	Ajit, MTU-1010, MTU-1001, Dhiren	Swarna	Lalat, Swarana, Sabhagi Dhan, BB 11, MTU # 1010, 1153, 1156, 1001	Swarna
Total area under rice hybrids in the district (ha)	65000-70000	Boro (62 ha), Kharif (2175 ha)	11600 ha	175
Most prevalent rice hybrids in the district	Mali-4, PAN-802, GMS-2264, Arize hybrids	KRH 2	KB-468, VNR 2355, Arize 6444 Gold, PAC - 837	NA
Total area under ~~basmati~~/scented	Negligible	Nil	90	Nil

Parameters	Districts			
	S 24-Parganas	**Jhargram**	**Purulia**	**Bankura**
Most prevalent basmati varieties in the district	NA	Nil	Badshabhog, Gobindobhog,	Nil
Seed replacement rate	45-50% (Kharif); 90-95% (Boro)	NA	40-50%	90%
Whether farmers are using any heavy equipment like transplanted/combine harvester	Yes	Yes; Combine harvester	Very few	Yes
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	NA	SRI	SRI	SRI 7 DSR (few)
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Yes; New improved varieties, nutrient & pest management, timely sowing	-	Improved weed management methods	Line transplanting, seed treatment before sowing, application of organic manure
What are the general problems in rice cultivation in the district?	Water logging, salinity, drainage	Inadequate rainfall and lack of irrigation	Water stress	Erratic rainfall, high weed and pest and disease problem
Please provide any farmers association in the district	Co-operatives, FPO/FPC, kisan Gosthi	-	EPO (13 Nos)	FPC Chetana (Chetana Agro-Producers Corporation), Harit-dhan Farmer Producer Company, Taldangra
Whether availability of labors is sufficient?	Yes	Yes	Yes	No
Whether there is any marketing problem of the produce?	No	Yes; in some interior area	No	Yes, particularly for aromatic rice
Any major irrigation/power generation project in the district	No	No	Ayodhya Hills, Bandu dam, Hanumata dam, Kumari dam, Barabhum dam, Saharajore dam, Turga dam and others	Solar irrigation
Any soil testing program undertaken?	Yes	Yes	Yes	Yea
Any farmers' training program was organized by the state department of Agriculture/ University	Yes	Yes	Yes, farmers training by dept. of Agriculture	Yes

A. Cropping pattern and Yield: Farmers followed diverse crop rotation practices. Rice-boro rice was major crop rotation in South 24-Parganas. Other common crop rotation practices were rice-vegetables, rice-sesame, rice lathyrus, rice-mustard, rice pulses, rice-potato-sesame, rice-mustard-sesame, rice-maize-sesame, rice-mustard-millet, rice-vegetables-sesame, rice-mustard-vegetables, rice-vegetables-sesame and others. The details of rice yield of different varieties in different rice growing districts of West Bengal are presented in Table 8. Average yield in farmers' field ranged from 4000-6372 kg/ha in case of HYVs and about 2700-3900 kg/ha in case of aromatic short grain varieties. In some fields in South 24-Parganas, yield was reduced due to low land ecosystem, excess rainfall and flood like situation, crop lodging and poor fertilizer application.

Table 6: Variety wise area coverage (ha) in different districts of West Bengal during *Kharif* 2024 (as reported by the cooperator)

Variety/hybrid	Districts			
	S 24-Parganas	Jhargram	Purulia	Bankura
HYVs/Improved				
Dudheswar	5000-9000			
Ajit	35000-40000			
MTU 1010	25000-30000	16900 (Approx)	30160	1000
Banskathi	20000-25000			
Gitanjali	15000-20000			
MTU-1001	10000-12000		17306	
Patnai	10000-12000			
Gobindobhog	8000-10000		32	15726
Gontra Bidhan 1/2/3	5000-7000			
Mali-4	40000-45000			
Santoshi	5000-6000			
Swarna		125500 (approx.)	35542	232825
GS-1		18600 (Approx)		
GB1			8300	200
Sabhagidhan			20250	
Lalat			42290	15000
IR 64				300
Parijat Amara				
Badshabhog			41	22630
Kaveri			14600	
MTU 1153			15400	2000
MTU 1156			22806	1000
Shatabdi				5000
BB-11			10340	30000
IR 36				500
Pratiksha			5100	
GB-3			15900	
Rajendra Mahsuri			8300	
Dhiren			7326	
Super Shyamali			33130	
Pooja			15400	
Sabita			12460	
MTU 1140			2300	
Hybrids				
PAN-802	28000-30000			
Kaveri 468			3020	
GMS 2264	25000-30000			
GMS-26081	10000-12000			
Arize 6129	5000-6000			
Arize 6444 Gold	3000-4000		2800	
VNR 2355			4600	
PAC 837			1180	
Others				

Variety/hybrid	Districts			
	S 24-Parganas	Jhargram	Purulia	Bankura
Local (Kalma, Dadsal Kanakchur etc)	10000-12000			

Table 7: General informations

Parameters	Districts			
	S-24-Parganas	Jhargram	Purulia	Bankura
# of talukas/blocks covered	2	1	1	1
# of villages surveyed	6	4	1	2
# of farmers interviewed	18	15	15	15
Field ecosystem	RL (100%)	UP (93.3%); IR (6.7%);	Raifed (100%)	UP (100%)
Weather conditions during cropping season	In general, weather conditions were not very favourable for rice cultivation except South 24-parganas. There was long dry spell in many places visited in Jhargram and Bankura. In South 24-Parganas, there were reports of excess rainfall or water inundation in few places visited			
Crop stage when survey was made	Maturity	Booting to maturity	Maturity	Maturity
Crop rotations	Farmers followed diverse crop rotation practices. Rice-boro rice was major crop rotation in South 24-Parganas. Other common crop rotation practices were rice-vegetables, rice-sesame, rice lathyrus, rice-mustard, rice pulses, rice-potato-sesame, rice-mustard-sesame, rice-maize-sesame, rice-mustard-millet, rice-vegetables-sesame, rice-mustard-vegetables, rice-vegetables-sesame and others			

IR: Irrigated; RL: Rainfed lowland; UP: Upland

Table 8: Average yields of different rice varieties as reported by the co-operators/ farmers

Varieties	Yield (kg/ha)				Remarks
	S-24-Parganas	Jhargram	Purulia	Bankura	
Mali-4	5350-5500				In some fields in South 24-Parganas, yield was reduced due to low land ecosystem, excess rainfall and flood like situation, crop lodging and poor fertilizer application.
Lathisail	3300-4500				
Gobindobhog	2700-3100				
Pratiksha	5100-5450				
Balam	4900-5100				
Patnai	3000-5800				
Laxmichur	3300-3900				
Swarna	5700-5900	4000-5500	4700-5570	5000-5500	
Jhingasal	3500-4300				
Jamainadu	3500-3700				
Santhoshi	5500	4500			
Dudhesar	2700-3900				
Gaurav		4000-4500			
Sindhu		4000-4500		3500-4200	
Bullet		4000		4000-4500	
BB-11			5916-6200		

Varieties	Yield (kg/ha)				Remarks
	S-24-Parganas	Jhargram	Purulia	Bankura	
Pooja			5400-6372		
Dhiren			5902-6341		
Ajit			5200-5400		
Lalat			5058-5832		
IR 64			5617		
Dhruba			6020		
MTU 1153			5150		
Super Shyamali				5000-5500	
MTU-1010				4500-5000	
MTU-1001				4000-4500	
MTU-1017				4500	

B. Rice consumption pattern: Survey was conducted on consumption pattern of rice among the farmers in different districts of West Bengal. On an average about 77% farmers contacted belonged to low income group and rest were from medium income group. Average per capita consumption of rice per month was 4-12 kg rice (Table 9). All the farmers from south 24-Parganas, Jhargram and Bankura and about 26% farmers from Purulia told that their food consisted of both rice and wheat. Farmers from all the district except south 24-Parganas told that they preferred parboiled rice for consumption and mainly they used coarse grain rice (Table 9). In general, there was no change in the food habit except some farmers from Purulia told that they have included millet in their diet.

Table 9: Details of rice consumption pattern

Parameters	Districts			
	S-24-Parganas	Jhargram	Purulia	Bankura
Status of farmers	Medium income (44.4%); Poor (55.6%)	Poor (100%)	Medium income (40%); Poor (60%)	Medium Income (6.7%); Poor (93.3%)
Per capita monthly rice consumption (kg)	8-12 kg	7-10 kg	4-8 kg	5-9 kg
Composition of main meal	Rice + wheat (100%)	Rice + wheat (100%)	Only rice (73.3%); rice+wheat (26.7%)	Rice + wheat (100%)
Preferred rice types	Polished rice (100%)	Parboiled rice (100%)	Parboiled rice (100%)	Parboiled rice (100%)
Rice grain type preference	Both fine and coarse grain	Coarse grain (100%)	Coarse grain (100%)	Coarse grain (100%)
Any changes in food habit in last 10 years	No (100%)	No (100%)	Yes (20%); included millet in the diet	No (100%)

C. Nursery and main field Management: In general, planting was done from middle of July to last week of August. Average seed rate ranged from 40-50 kg/ha. None of the farmers from Jhargram and Bankura adopted seed treatment before sowing. About 60-65% farmers contacted from South 24-Parganas and Purulia treated the seeds with carbendazim (2 g/kg) and mancozeb (2-2.5 g/kg) or mixture of carbendazim + mancozeb (2 g/kg seed); some treated the seeds with *Trichoderma harzianum* (5g/kg). On an average about 85% of the farmers contacted told that they applied organic manure like FYM or cow dung in the nursery. About 97% farmers contacted told that they applied chemical fertilizers like urea, DAP and 10:26:26 in the nursery (Table 10). Planting was random where proper plant population per unit area was not maintained. However, some farmers from Jhargram adopted line planting. In the main fields, fertilizers were applied @ 40-125 kg N/ha, 10-65 kg P_2O_5/ha and 10-60 kg K_2O/ha. Most of the farmers applied N, P and K fertilizers (Table 11). About 51% of the farmers contacted applied zinc sulphate. Most of the farmers (94-100%) in different districts applied organic manure like FYM (0.5-4 t/ha) in the main field. Few farmers from South 24-Parganas also applied vermicompost in the main field (Table 11).

Table 10: Details of nursery management

Parameters	**Districts**			
	S-24-Parganas	**Jhargram**	**Purulia**	**Bankura**
Planting time	Mid July to July end	NA	Mid July to August end	NA
Seed rate	HYVs: 52-67 kg/ha Local: 60-75 kg/ha	40-50 kg/ha	35-50 kg/ha	40-50 kg/ha
Seed treatment (% farmers adopted)	Yes (61.1% only)	Nil	Yes (66.6%)	Nil
Chemicals used for seed treatment	Carbendazim (2 g/kg) and mancozeb (2-2.5 g/kg) or mixture of carbendazim + mancozeb (2 g/kg seed); some treated the seeds with *Trichoderma harzianum* (5g/kg)			
Organic manure in nursery (% farmers adopted)	Yes (40%) FYM	Yes (100%); Cowdung/FYM	Yes (100%); FYM	Yes (100%); Cowdung/FYM
Inorganic manure in nursery (% farmers adopted)	Applied (88.2%); Urea (0.5-1 kg/Katah) or 10:26:26 (1.5-2 kg/Katah) or DAP (1-1.5 kg/Katah)	Applied (100%); DAP (0.2-0.3 kg/Katah)	Applied (100%); Urea (0.75-3.25 kg/Katah) or DAP (0.75 kg/Katah) or 10:26:26 (0.85-1 kg/Katah); Some applid zinc sulphate	Applied (100%); DAP (0.2-0.3 kg/Katah)

1 Katah=66.7 m^2

Table 11: Details of main field management

Details	Districts				Remarks
	S-24-Parganas	Jhargram	Purulia	Bankura	
Planting method	Random transplanting; Very few in Jhargram adopted line transplanting				Fertilizers like Urea, DAP, 10:26:26, SSP, MOP, zinc sulphate were applied; Very few farmers in South 24-Parganas applied zinc sulphate
Total N applied	40-80 kg/ha (100% applied)	80-100 kg/ha (100% applied)	120-125 kg/ha (100% applied)	50-100 kg/ha (100% applied)	
Total P_2O_5 applied	10-60 kg/ha (94% applied)	40-50 kg/ha (100% applied)	60-65 kg/ha (100% applied)	40-60 kg/ha (100% applied)	
Total K_2O applied	10-50 kg/ha (94% applied)	40-50 kg/ha (100% applied)	40 kg/ha (100% applied)	40-60 kg/ha (100% applied)	
$ZnSO_4$ applied	1 kg/ha (only 5.5% applied)	2-5 kg/ha (86% applied)	20-25 kg/ha (46.7% applied)	3-10 kg/ha (66.7% applied)	
Organic fertilizers applied	Yes (94%); FYM (0.75-2 t/ha); Few 11%) applied vermi-compost (2-2.5 q/acre)	Yes (100%); FYM (2-4 t/ha)	Yes (100%); FYM (0.5-3 t/ha)	Yes (100%); FYM (1-3 t/ha)	

D. Weeds and their Management: Overall, intensity of weeds was high in most of the places surveyed except South 24-Parganas where weed intensity was recorded low. The details of different weeds recorded in different districts are presented in Table 12. Weeds were common in most of the fields surveyed. The farmers followed either hand weeding or hand weeding and herbicide application. The details of different weedicides used by the farmers are presented in Table 12. In S-24-Parganas, weedicide application was not common. Few farmers applied paraquat for general weed cleaning. On an average, about 57% farmers adopted weedicide application in addition to manual weeding.

Table 12: Weeds and weed management

Details	Districts				Remarks
	S-24-Parganas	Jhargram	Purulia	Bankura	
Weed intensity	Low	High	Low-high	high	In S-24-Parganas, weedicide application was not common. Few farmers applied paraquat for general weed cleaning. The farmers followed either hand weeding or hand weeding and herbicide application
Names of the weeds	*Echinochloa crusgalli, Ludwigia* spp., *Cyperus rotundus* (Mutha) ,*Cyperus difformis, Cyperus iria, Marsilea quadrifolia* (Shooshni), *Eclipta alba*, *Solanum* spp*., Digitaria sanguinalis, Commelina benghalensis, Amnesia* spp*., Fimbristylis miliacea, Euphorbia hirta, Cynodon dactylon*, and some unidentified grassy and broad leaved weeds				
Weedicides used	Paraquat (non-selective), pretilachlor (2-3 ml/l), propaquizafop 10% EC (1 ml/l), 2,4-D (2-3 ml/l), butachlor, pendimethalin, cyhalofop butyl (1-2 ml/l)bispyribac Sodium (0.2 ml/l), fenoxaprop-p-ethyl and others were used by the farmers.				
% age of farmers applied herbicides	16.7%	33.3%	80%	100%	
Wild rice incidence	Nil	Nil	Nil	Nil	

Table 13: Details of inputs used

Details	Districts			
	S-24-Parganas	**Jhargram**	**Purulia**	**Bankura**
Implements used	Implements like tractor, power tiller, thresher, sprayers, pumpset, weeder and harvesters were commonly used by the farmers. Most of the farmers contacted used these implements on hire basis. Few farmers in Purulia tried transplanter			
Source of seeds	Most of the farmers except Purulia used their previous year's harvested seeds for sowing. Majority of the farmers from Purulia purchased part of their seed requirement.			
Source of irrigation	Shallow and deep tube well	Canal	Canal	Canal
Scarcity of irrigation water	No (100%)	Yes; Scarce (100%)	Yes; Scarce (100%)	Yes; Scarce (100%)
Availability of fertilizers/pesticides	Available (100%)	Not available (46.7%)	Available (100%)	Not available (86.7%)
Quality of fertilizers/pesticides	Satisfied (100%)	Satisfied (100%)	Satisfied (100%)	Satisfied (100%)
Advisors to the farmers	Own decisions (66.7%); State dept (100%); Dealers (50%)	Own decisions; State dept (100%);	Own decisions (100%)	Own decisions; State dept (100%)

E. Needs of the farmers: Some of the common needs of the farmers were HYVs with tolerance to submergence, lodging and salinity, short duration high yielding rice varieties, training/information on improved rice cultivation, good market price, improvement in drainage facilities, disease and pest resistant rice varieties, improvement in irrigation facilities, timely availability of seeds and other inputs, availability of implements on hire basis and subsidy on inputs.

F. Input use: Implements like tractor, power tiller, thresher, sprayers, pumpset, weeder and harvesters were commonly used by the farmers. Most of the farmers contacted used these implements on hire basis (Table 13). Few farmers in Purulia tried transplanter. Most of the farmers except Purulia used their previous year's harvested seeds for sowing. Majority of the farmers from Purulia purchased part of their seed requirement. Shallow and deep tube wells in South 24-Parganas and canal in other districts were the main sources of irrigation. Most of the farmers depended on rain for raising the crop. Almost all the farmers contacted from Jhargram, Purulia and Bankura expressed irrigation water scarcity. On an average about 66% farmers contacted from Jhargram and Bankura expressed that inputs like fertilizers and pesticides were not available in time. In addition to their own decisions, farmers took advices from officials of state department of agriculture and private dealers.

G. Biotic stress and their management: District wise prevalence of different diseases and insect pests are presented in Table 14. Among the diseases, blast was widespread in most of the districts in low to moderate intensity. Brown spot was widespread in south 24-Parganas and Purulia. In South 24-Parganas, brown spot intensity upto 30% was recorded in some fields Pratiksha, Mali-4 and other varieties. High sheath rot (up to 45% incidence) was recorded in some fields of rice variety Swarna and other varieties in South 24-Parganas (Table 14). Bacterial blight was also widespread in South 24-Parganas and Purulia and in some fields in South 24-Parganas its intensity was as high as 40%. Among the insect pests, stem borer and brown plant hopper was widespread

in most of the districts. Leaf folder was widespread in low to moderate form in south 24-Parganas and Purulia. On an average about 83% of the farmers contacted adopted plant protection measures (Table 15). The details of different pesticides used are presented in Table 15. The number of pesticide application ranged from 1-3 and none of the farmers contacted mixed different pesticides before application. Zinc deficiency was reported from most of the places in Jhargram and Bankura.

Table 14: Prevalence of diseases and insect pests in West Bengal during *Kharif*' 2023

Districts	Diseases						
	Bl	**NBl**	**BS**	**ShBl**	**ShR**	**GD**	**BB**
South 24-Parganas	L (2-5%)		L-S (5-30%)	L-S (5-35%)	L-S (2-45%)	L-M (2-15%)	L-S (3-40%)
Jhargram	L		L	L-M			
Purulia	L-M (2-15%)	L-M (5-10%)	L-M (4-15%)	L-M (5-18%)	L (5%)	L-M (4-15%)	L-M (4-17%)
Bankura	L-M			L-M			

Minor incidence of Rice tungro disease in some fields of South 24-Parganas

Districts	Insect pests							
	SB	**LF**	**BPH**	**WBPH**	**GLH**	**GH**	**GB**	**Rats**
South 24-Parganas	L-M (2-15%)	L-M (5-10%)	L-M (2-10%)					
Jhargram	L-M		L-M					
Purulia	L-M (7-20%)	L (3-5%)	L-M (3-12%)	L (3-6%)	L-M (2-10%)	L (2-6%)	L	L-M (9-18%)
Bankura	L-M		L-M					

Table 15: Details of pest Management

Details	Districts			
	S-24-Parganas	**Jhargram**	**Purulia**	**Bankura**
% age farmers adopting plant protection	38.9%	100%	93.3%	100%
Names of pesticides	**Insecticides**: Carbofuran 3G (9 kg/acre) and chlorpyriphos 50% (20-25 ml/15 litre of water) for stem borer and leaf folder; imidacloprid (0.5 ml/l) for brown plant hopper; cypermethrin 5% EC for rice bug and Hamla (chlorpyriphos 50% + cypermethrin 5% EC) and neem (1000 ppm) (1 ml/l) for all insect pests **Fungicides**: Kasugamycin (1.5 g/l) and kasugamycin + copper oxychloride (1.5 g/l)for blast; azoxystrobin (1 ml/l) and azoxystrobin + difenoconazole (1 ml/l) for sheath blight, brown spot and blast; Tilt (propiconazole) (1 ml/l), Nativo (trifloxystrobin + tebuconazole) (0.4 g/l) and hexaconazole (1.5 ml/l) for all disease and *Trichoderma* (1 kg/acre) at the time of planting for all diseases			
# of pesticide sprays	2-3	2	1	2
Mixing of pesticides before application	Nil	Nil	Nil	Nil
Zinc deficiency	Yes (38.9%)	Yes (100%)	Nil	Yes (86.7%)
Iron deficiency	Nil	Nil	Nil	Nil

H. Abiotic stress and other general problems: Zinc deficiency was reported from most of the places in Jhargram and Bankura. Some of the common problems expressed by the farmers were unavailability of good quality seeds in time, scarcity of labours, unavailability of FYM and other organic matter, high price of inputs especially fertilizers and pesticides, lack of proper training and advisory, lack of good market and high weed and pest intensity

I. Researchable issues: Among the different biotic and abiotic stresses, major problems are brown spot, bacterial blight, sheath blight, leaf blast among the diseases, BPH and stem borer among the insect pests and drought, submergence/flash flood among abiotic stresses. Farmers want varieties suitable for DSR, short duration varieties, varieties resistant to lodging, varieties resistant/tolerant to above mentioned biotic constraints and bio-fortified varieties (Table 16).

Table 16: Researchable issues

Parameters/Issues	S-24-Parganas	Jhargram	Purulia	Bankura
Rice ecology in your area	Rainfed lowland	Rainfed upland	Rainfed	Rainfed upland
Rice cultivation only in Kharif or both Kharif and Rabi	Kharif + Rabi	Kharif	Kharif + Rabi	Kharif
Number of years of experience in rice farming	>20 years	5-10 years	5-10 years	5-10 Years
Main biotic constraints (diseases) in your area according to you	Sheath blight, Bacterial blight and brown spot	Leaf blast	Leaf blast, sheath blight, false smut, bacterial blight and brown spot	Leaf blast
Extent of disease damage	10-25%	<10%	10-25%	10-25%
Main biotic constraints (Insect pests) in your area according to you	BPH and stem borer	BPH	BPH, stem borer, leaf folder	BPH
Extent of insect pest damage	<10%	<10%	<10%	10-25%
Main abiotic constrains in your area according to you	Submergence/ drought; flash flood	Drought	Drought, high temperature	Drought
Production constraints in your area according to you	Unavailability of good quality seeds, micronutrient deficiency, lack of irrigation facility and scarcity of agricultural labours			
Irrigation facilities in your area	Yes (100%); Bore well	No (93%)	No (100%)	No (93%)
Normally how many years it takes to change the rice variety	5-10 years; > 10 years	5-10 years	5-10 Years	10-20 years
Any other rice production issues in your area which the rice scientists need to address	-			
What is urgently required in your area as far as rice varieties are concerned				
Duration	HYVs suitable for DSR and varieties having lodging resistance			
Biotic stress resistance	Varieties with tolerance to **blast, bacterial blight**, **sheath blight** and **stem borer**			
Abiotic stress resistance	Varieties tolerant to drought, high temperature, submergence, salinity			
Preferred grain quality	**MS grain quality rice varieties** and aromatic short grain varieites			
Nutritional quality	Rice varieties with high Zn and iron and low GI			

West Bengal-2-Chinsurah (2024-25)

Districts surveyed: *Nadia, Howrah, Hooghly, Purba Bardhaman, Purba Madinipur, North 24 Parganas* and *South 24 Parganas*

Table 1: Particulars of survey

Districts	Blocks	Villages
Nadia	Hanskhali	Ber Hanskhali
Howrah	Bally Jagacha	Madhyajaipurbir and Uttar Jaipurbir
Hooghly	Chinsurah-Mogra	Uttar Simla
Purba Bardhaman	Galsi-I	Paraj and Khuraj
Purba Madinipur	Ramnagar-I	Khadalgobra
North 24-Parganas	Baduria	Jadurhati, Salua, Hungle and Narkelberia
South 24-Parganas	Basanti and Gosaba	Jotispur, Manmathanagr, Janagheri, Santigachhi, Satjalia, Mollakhali, Badamtala, Sonagaon, Gosaba, Uttar Paschim Para and Bally

Table 2: Widely prevalent rice varieties

Districts	Varieties
Nadia	**HYVs**: Pratisksha, Lalat, Swarna, Swarna Sub-1, IET 4786 (Shatabdi) and others; **Hybrid**: PAN 802 and others
Howrah	**HYVs/Improved**: Gobindobhog, IET 4094 (Ksitish), Sabita, Pratiksha, Swarna, CR-800, Super Shyamali, Ratna, Lalat, Nilanjana and Ranjit and others; **Hybrid**: Arize 6444 Gold, KRH 2 and others
Hooghly	**HYVs/Improved**: Yamuna, Pratiksha, Swarna, Ksitish, Gontra Bidhan, MTU 1010, MTU 1156, Gobindobhog, IET 4786 (Shatabdi) and others
Purba Bardhaman	**HYVs/Improved**: Swarna, MTU 1153, MTU 1156, MTU 1010, IET 4786 (Shatabdi), Khas Dhan, Mitali, Ranjit, Gobindobhog, Badshabhog, IET 4094 (Ksitish), IR 36, IR 64 and others
Purba Madinipur	**HYVs/Improved**: Super Shyamali, Yamuna, MTU 1010, MTU 1156, Swarna, IET 4786 (Shatabdi), Gontra Bidhan 3, Gobindobhog and others
North 24-Parganas	**HYVs/Improved**: Swarna, Pratiksha, IET 4786 (Shatabdi), Swarna Sub-1, GB-1, Santoshi, Rajendra Mahsuri, Gontra Bidhan-3, Gobindobhog and others
South 24-Parganas	**HYVs/Improved**: Pratiksha, Jira Kathi, Jamuna, CR 1017, Bangabandhu, Jatayu, Dudheswar, BM-20, Santoshi, Shreya, Ajit, CR-1018, Banskathi, Gitanjali, MTU 1001, Patnai, Gobindobhog, Gontra Bidhan 1/2/3 and others; **Hybrid**: Mali-4, PAN 802, GMS 2264, GMS 2608, Arize 6129 Gold, Arize 6444 Gold and others; **Locals:** Kalma, Dadsal, Kanakchur and others

Table 3: Particulars of rice areas in the surveyed districts of West Bengal during 2024

District	Total geographical area (ha)	Total cultivable area (ha)	Total cultivated area (ha)	Total irrigated area (ha)	Area under paddy (ha)	Area under DSR (ha)
Nadia	392700	272135	229465	89%	86603 (Aman); 63775 (Boro)	-
Howrah	138676	83776	80200	56748	59020	-
Hooghly	314900	212089	210946	120890	2260 (Aus); 182926 (Aman); 59481 (Boro)	220
Purba Bardhaman	522427	400037	391080	344510	373785	05
Purba Medinipur	430140	324800	318076	179025	311105	-
N 24-Parganas	409400			17050	224770	100
S 24-Parganas	948710	663863	360300	156895	330750 (Kharif)	500

Table 4: Details of weather data in the surveyed districts of West Bengal in 2024

Weather parameters	Months							
	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan
Nadia								
# of Rainy days	09	17	12	13	06	0	02	0
Total rainfall (mm)	177.3	212.4	173.9	125.1	119.9	0	82.6	0
MMT (^{O}C)	30.7	29.7	29.3	29.3	27.0	23.1	19.1	16.9
Maximum temp (^{O}C)	40.1	35.6	36.8	37.4	35.2	33.2	28.6	29.6
Minimum temp (^{O}C)	22.4	23.6	23.8	25.0	17.8	13.2	9.0	5.4
Howrah								
# of Rainy days	17	28	19	21	5	3	0	1
Total rainfall (mm)	87.08	189.32	343.71	32.71	251.72	4.12	0	1.2
Maximum temp (^{O}C)	35.2	34.8	31.2	35.2	35.2	31.7	22.7	25.1
Minimum temp (^{O}C)	27.7	25.4	27.2	30.8	27.8	18.9	12.1	10.1
Sunshine hours	4.5	3.8	4.1	4.2	5.9	6.9	6.2	6.1
Hooghly								
# of Rainy days	04	16	15	13	10	0	01	NA
Total rainfall (mm)	45.40	185.00	445.80	348.60	243.80	1.60	2.90	NA
Maximum temp (^{O}C)	36.8	34.84	33.26	33.77	32.45	29.23	26.0	NA
Minimum temp (^{O}C)	28.40	27.10	26.84	26.68	24.97	17.77	12.19	NA
Purba Bardhaman								
# of Rainy days	15	29	30	24	18	01	03	NA
Total rainfall (mm)	61.9	212.9	493.8	340	212.3	0.1	1.3	NA
Maximum temp (^{O}C)	36.0	33.8	32.6	33.1	32.3	30.0	27.3	NA
Minimum temp (^{O}C)	27.4	27.2	26.7	26.7	25.4	19	14.3	NA
Purba Medinipur								
Total rainfall (mm)	229.3	289.1	279.4	221.3	123.6	36.2	7.9	11.0
Maximum temp (^{O}C)	33.3	32.3	31.9	32.7	31.7	29.5	27.5	25.8
Minimum temp (^{O}C)	26.8	27.1	26.6	26.8	23.7	16.5	13.8	14.4
N 24-Parganas								
# of Rainy days	19	21	22	24	12	02	02	0
Total rainfall (mm)	300.15	180.2	274.2	254.1	220.1	180.2	2.24	0
S 24-Parganas								
# of Rainy days	14	30	30	23	20	1	3	0
Total rainfall (mm)	103.42	316.92	590.27	374.90	275.23	2.94	7.47	0

MMT: Monthly mean temperature; NA-Not available

Table 5: General Question of Rice Cultivation In District (To Be Filled By The Cooperator In With The Officials From State Department of Agriculture

Parameters	Districts			
	Nadia	**Howrah**	**Hooghly**	**Purba Bardhaman**
Total Area under HYVs in the district (ha)	83655 ha	58865 ha	162070 ha	327780 ha
Most prevalent HYVs in the District	IET 4786, Pratiksha	Swarna, IET 4786	Swarna	Swarna
Total area under rice hybrids in the district (ha.	75 ha	255 ha	60 ha	25 ha
Most prevalent rice hybrids in the district	PAN 802	KRH 2, Arize 6444 Gold	NA	NA
Total area under ~~basmati~~/scented in the district	Nil	Nil	18500 ha	46000 ha
Most prevalent basmati varieties in the district	NA	NA	Gobindobhog	Gobindobhog
Seed replacement rate	35%	9%	NA	80%
Whether farmers are using any heavy equipments like transplanted/combine harvester	very little use of combined harvester	Yes	Yes	Yes
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	limited area under SRI and DSR	SRI (limited)	SRI, DSR (limited)	SRI, Zero tillage (limited)
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Yes; seed replacement and use of organic manure	-	Yes	Yes
What are the general problems in rice cultivation in the district?	Scattered cultivation, sheath blight and nematode problem	-	Pests and diseases	Pests and diseases and natural calamities
Please provide any farmers association in the district	-	-	Many FPC and FPOs	Kamarhati FPC, Mukundaram FPC
Whether availability of labors is sufficient?	Optimum	Yes	No	Insufficient during peak period; dependence on migratory labours
Whether there is any marketing problem of the produce?	Low price of agricultural product	No	No	Yes; Sometimes
Any major irrigation/power generation project in the district	NA	No	DVC Canal	DVC
Any soil testing program undertaken?	Soil health card distribution camp	Yes	Yes	Yes
Any farmers' training program was organized by the state department of Agriculture/ University	Yes	Yes	Yes	Yes

Table 5 Contd..: General Question of Rice Cultivation In District (To Be Filled By The Cooperator In With The Officials From State Department of Agriculture

Parameters	Districts		
	P. Medinipur	**N 24-Parganas**	**S 24-Parganas**
Total Area under HYVs in the district (ha)	182700 ha	90% area	175000-200000 ha
Most prevalent HYVs in the District	Super Shyamoli	Pratiksha, Swarna, Swarna Sub-1	Ajit, MTU 1010, MTU 1001, Dhiren
Total area under rice hybrids in the district (ha)	150 ha	<5% area	65000-70000 ha
Most prevalent rice hybrids in the district	NA	PAC 802	Mali-4, PAN 802, GMS 2264, Arize hybrids
Total area under basmati/scented in the district	10735 ha	Nil	Negligible
Most prevalent basmati varieties in the district	Gobindobhog	NA	NA
Seed replacement rate	NA	Low	90-95% in Boro; 45-50% in Kharif
Whether farmers are using any heavy equipments like transplanted/combine harvester	Yes	Yes	Yes
Mention water saving technologies like SRI/laser leveling/DSR being used by the farmers	SRI, DSR (limited)	DSR (limited)	Negligible
Whether survey team gave any advice to the farmers during survey? If yes, then what are those	Yes	Yes; farm mechanization and adoption of new HYVs and hybrids	Yes; new varieties cultivation, timely sowing, plant protection measures
What are the general problems in rice cultivation in the district?	Pests and diseases	Natural calamities and drainage problems	Water logging, salinity and drainage problems
Please provide any farmers association in the district	Many FPC and FPOs	Yes; FPOs	Co-operatives; FPOs/ FPCs, Kisan Gosthis
Whether availability of labors is sufficient?	No	Yes	More or less sufficient
Whether there is any marketing problem of the produce?	No	No	No
Any major irrigation/power generation project in the district	Kelegahi canal	Yes	No
Any soil testing program undertaken?	Yes	Yes	Yes
Any farmers' training program was organized by the state department of Agriculture/ University	Yes	Yes	Yes

Production oriented survey was conducted in seven districts of this part of West Bengal viz. Nadia, Howrah, Hooghly, Purba Bardhaman, Purba Medinipur, North 24-Parganas and South 24-Parganas when the most of the crops were in maturity stage. The details of the places surveyed are presented in Table 1. A total of 59 farmers from 21 villages in 7 districts were contacted during survey (Table 7). The fields surveyed were either under irrigated or rainfed lowland ecosystem

(Table 7). Majority of the fields surveyed in Hooghly and Purba Medinipur were under rainfed lowland ecosystem. In general, weather conditions were normal for rice cultivation. However, in Nadia, there were reports of prolonged dryness or drought like situation in about 60% places surveyed. On the other hand, there were reports of excess rainfall or flood like situation in many places in Howrah, Hooghly, Purba Medinipur and South 24-Parganas (Table 7). The details of different weather parameters in different districts are presented in Table 4. The particulars of rice area during 2024 in the surveyed districts are presented in Table 3. The details of different varieties cultivated in different districts are presented in Table 2. Commonly cultivated rice varieties were HYVs/improved varieties like Swarna, IET 4786 (Shatabdi), Swarna Sub-1, Super Shyamali, Yamuna, MTU 1010, MTU 1156, IET 4094 (Ksitish), IR 36, Sabita,IR 64 MTU 1153, Pratiksha, Jira Kathi, Jamuna, CR-800, CR 1017, Bangabandhu, Khas Dhan, Ratna, Lalat, Nilanjana Mitali, Ranjit, Jatayu, Rajendra Mahsuri, Dudheswar, BM-20, Santoshi, Shreya, Ajit, CR-1018, Banskathi, Gitanjali, MTU 1001, Patnai, Gobindobhog, Badshabhog Gontra Bidhan 1/2/3 and others and hybrids like Mali-4, PAN 802, GMS 2264, GMS 2608, krh 2, Arize 6129 Gold, Arize 6444 Gold and others. Few farmers also cultivated local traditional varieties like Kalma, Dadsal, Kanakchur and others. Variety wise area of selected rice varieties in different surveyed districts are presented in Table 6.

Table 6: Variety wise area coverage (ha) in different districts of West Bengal during *Kharif* 2024

Variety/hybrid	Districts			
	Nadia	**Howrah**	**Hooghly**	**P. Bardhaman**
IET 4786	43284	17510	20000	7150
Swarna		21270	162790	318800
Pratiksha	42019			
Lalat		2960		
Swarna Mahsuri		2730		
Nilanjana		2070		
Ranjit		3805		200
Sabita		3120		
Ksitish			700	
Gontra Bidhan			800	
IR 36				100
MTU-1010			35000	1400
MTU 1156			200	
IR 64				70
Gobindobhog			18000	45950
Badshabhog				55
IET 4094		5300		60
PAN 802	75			
KRH-2		200		
Arize 6444 Gold		55		

Table 6-Contd..: Variety wise area coverage (ha) in different districts of West Bengal during *Kharif* 2024

Variety/hybrid	Districts		
	P. Medinipur	N 24-Parganas	S 24-Parganas
HYVs			
IET 4786	101560	10% area	
Swarna	1008	10% area	
Pratiksha		35% area	
Swarna Sub-1		25% area	
Nilanjana			
Super Shyamoli	182700		
Gontra Bidhan-1/2/3	500		5000-7000
Jamuna	11200		
Dudheswar			85000-90000
Ajit			35000-40000
CR 1008			25000-30000
Banskathi			2000-25000
Gitanjali			15000-20000
MTU-1010	1002		
MTU 1156	1200		
MTU 1001			10000-12000
Patnai			10000-12000
Gobindobhog	10735		8000-10000
Santoshi			5000-6000
Roopanjan	800		
Rajendra Mahsuri		10% area	
Mali-4			40000-45000
Hybrids			
PAN 802			28000-30000
Arize 6444 Gold			3000-4000
GMS-2264			25000-30000
GMS-2608			10000-12000
Arize 6129			5000-6000
Others		10% area	
Locals (Kalma, Dadsal Kanakchur etc)			10000-12000

A. Cropping system and rice yield: Farmers adopted different cropping systems. Common crop rotation practices followed by the farmers in different districts were rice-rice, rice-mustard, rice-mustard-rice, rice-vegetables, rice-lentil, rice-lentil-rice, rice-fallow-jute, rice-vegetables-green gram, rice-potato-jute, rice-sugarcane, rice-mustard-vegetables, rice-vegetables-vegetables, rice-pulses-vegetables, rice-vegetables-sesame, rice-mustard-sesame, rice-pulses, and others (Table 7). Average rice yield among different HYVs ranged from 3600-6000 kg/ha while in case of aromatic short grains the yield was 2250-3200 kg/ha (Table 8).

Table 7: General information

Parameters	Districts			
	Nadia	**Howrah**	**Hooghly**	**P. Bardhaman**
# of talukas/blocks covered	1	1	1	1
# of villages surveyed	1	2	1	2
# of farmers interviewed	10	9	5	10
Field ecosystem	IR (50%); RL (50%)	IR (44.4%); UL (22.2%); RL (33.33%)	RL (100%)	IR (100%)
Weather conditions during cropping season	Abnormal (60%); drought or prolonged dryness	Abnormal (33%); excess rainfall or flood	Abnormal (100%); excess rainfall	Normal (100%)
Crop stage when survey was made	Maturity	Maturity	Heading	Maturity
Crop rotations	Rice-rice, rice-mustard, rice-mustard-rice, rice-vegetables, rice-lentil, rice-lentil-rice, rice-fallow-jute, rice-vegetables-green gram, rice-potato-jute, rice-sugarcane, rice-mustard-vegetables, rice-vegetables-vegetables, rice-pulses-vegetables, rice-mustard-sesame, rice-pulses and others			

Table 7 Contdd..

Parameters	Districts		
	P. Medinipur	**N 24-Parganas**	**S 24-Parganas**
# of talukas/blocks covered	1	1	2
# of villages surveyed	1	4	10
# of farmers interviewed	5	10	10
Field ecosystem	IR (20%); RL (80%)	IR (100%)	IR (100%)
Weather conditions during cropping season	Abnormal (80%); Excess rainfall	Normal (100%)	Abnormal (100%); excess rainfall/flood
Crop stage when survey was made	Heading to maturity	Maturity	Maturity
Crop rotations	Rice-rice, rice-rice-black gram/green gram, rice-pulses-green gram/black gram, rice-mustard-vegetables, rice-vegetables-sesame, rice-mustard-rice, rice-potato/vegetables and others		

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

Varieteis	Nadia	Howrah	Hooghly	P. Bardha-man	P. Medi-nipur	N 24-Parganas	S 24-Parganas
Pratikshya	4800-5300	4600-5625	5200			4875	3600
Lalat	4800-5000						
Shatabdi	5200-5300			5500		4500	4500-4950
Swarna		4000-4500	5100	5000-5500		4500-4800	
MTU-1153				5500-6000			
MTU 1156				5500-5600			
MTU 1010				5250-6000			
Ksitish		4500-4600					
GB-1						4950	
CR 800		4800					
CR-1017							4125-4950
Bangabandhu							
Santoshi						4950	
Super Shyamali					5500-6000		
Sabita		4000-4500					
IET 4094		4200-4600					
Gobindobhog		3200					
Jamuna			4500-5500		5300-5800		4950
Bangobandhu							4500-4875
Khasdhan				3000-4000			
Dudheswar							2250
Mitali				5000-5500			
Jeerakathi							2625-3000
BM-20							4875
Shreya							4875

B. Rice consumption pattern: Survey was conducted on consumption pattern of rice among the farmers in different surveyed districts of this part of West Bengal. On an average about 87% of the farmers contacted were from medium income group and about 11% were from low income group and rest were from higher income group (Table 9). Average per capita consumption of rice per month was 6-15 kg rice. Most of the farmers from Hooghly, Purba Bardhaman, Purba Medinipur and north and south 24-Parganas told that they only consumed rice. Most of the farmers from Howrah and about 50% of the farmers from Nadia told that their main meal consisted of both rice and wheat (Table 9). Most of the farmers from all the districts except Hooghly and Purba Medinipur told that they preferred parboiled rice. Most of the farmers contacted from Hooghly, Purba Medinipur and south and north 24 Parganas consumed coarse grain rice. In general, there was no change in food habit.

Table 9: Details of rice consumption pattern

Parameters	Districts			
	Nadia	Howrah	Hooghly	P. Bardhaman
Status of farmers	Medium income (90%); Poor (10%)	Medium income (77.8%); Poor (11.1%); rich (11.1%)	Medium income (100%)	Medium income (50%); Poor (50%)
Per capita monthly rice consumption (kg)	10-15 kg	10-12 kg	6-7 kg	8-10 kg
Composition of main meal	only rice (50%); Rice + Wheat (50%)	Rice + Wheat (100%)	Only rice (100%)	Only rice (100%)
Preferred rice types	Parboiled rice (76.9%)	Parboiled rice (100%)	Polished rice (100%)	Parboiled rice (100%)
Rice grain type preference	Fine grain (100%)	Fine grain (55.5%); coarse (45.5%)	Coarse grain (100%)	Fine grain (100%)
Any changes in food habit in last 10 years	No (100%)	Yes (77.7%); included wheat	No (100%)	No (100%)

Table 9-contd..: Details of rice consumption pattern

Parameters	Districts		
	P. Medinipur	N 24-Parganas	S 24-Parganas
Status of farmers	Medium income (100%)	Medium income (100%)	Medium income (90%); poor (10%)
Per capita monthly rice consumption (kg)	NA	7-10 kg	7-12.5 kg
Composition of main meal	Only rice (100%)	Only rice (100%)	Only rice (100%)
Preferred rice types	Polished rice (100%)	Parboiled rice (100%)	Parboiled rice (100%)
Rice grain type preference	Coarse grain (100%)	Coarse grain (100%)	Coarse grain (100%)
Any changes in food habit in last 10 years	No (100%)	No (100%)	No (100%)

C. Nursery and main field Management: Average seed rate used by the farmers ranged from 30-50 kg/ha. On an average about 58% of the farmers contacted told that they adopted seed treatment with carbendazim (2 g/kg seeds) or SAAF (mancozeb + carbendazim) (2-2.5 g/kg) or thiram (2.5 g/kg). On an average 45% of the farmers contacted applied organic matter like FYM, oilseed cake, cow dung manure and poultry manure in the nursery (Table 10). Very few (~10%) farmers from Purba Bardhaman and South 24-Parganas applied FYM in the nursery. On an average about 93% of the farmers contacted applied chemical fertilizers like urea, DAP, SSP, MOP and different complex fertilizers like 10:26:26, and 14:35:14 (Table 10). Planting was done in between middle of July to middle of August. Many farmers from Nadia, Howran, Hooghly and Purba Bardhaman adopted line planting. In the main fields, fertilizers were applied @ 60-113 kg N/ha, 22.5-69 kg P_2O_5/ha and 15-60 kg K_2O/ha (Table 11). Some farmers from Howrah, Hooghly and Purba Bardhman applied zinc sulphate in the main field (Table 11). Fertilizers like urea, DAP, SSP,

MOP. 10:26:26, 10:35:14 were applied by the farmers. On an average 71% farmers applied organic manure like FYM (0.5-2 t/ha) in the main field.

Table 10: Details of nursery management

Parameters	Districts			
	Nadia	**Howrah**	**Hooghly**	**P. Bardhaman**
Planting time	3rd week of July to 1st week of August	June-July	July	1st to 3rd week of July
Seed rate	30-50 kg/ha	25-70 kg/ha	50 kg/ha	37.5-52.5 kg/ha
Seed treatment (% farmers adopted)	Yes (100%)	Yes (88.9%)	Yes (80%)	Yes (30%)
Chemicals used for seed treatment	carbendazim (2 g/kg of seeds)	carbendazim (2 g/kg of seeds) or Saaf (mancozeb +carbendazim)	carbendazim (2 g/kg of seeds), thiram (2.5 kg/kg)	carbendazim (2 g/kg of seeds)
Organic manure in nursery (% farmers adopted)	Yes (60%); oil cake, Poultry manure	Yes (77.8%) FYM, neem cake, mustard cake	Yes (60%); FYM	Yes (10%) FYM
Inorganic manure in nursery (% farmers adopted)	100% applied; Urea (20-80 kg/ha) + SSP (40-50 kg/ ha); Few appl-ied MOP (8-10 kg/ha)	55.5% applied; Urea (1 kg/K); some applied SSP, MOP along with urea. Some applied DAP	100% applied; Urea (5-10 kg) + SSP (5 kg) + MOP (5 kg) per 1000 m^2	100% applied; Urea (0.5-1 kg/K) + 10:26:26 (1 kg /K) or only 10:26:26 (1-2 kg/K)

1K=1 Katha =66.67 m^2 area

Table 10-contd..: Details of nursery management

Parameters	Districts		
	P. Medinipur	**N 24-Parganas**	**S 24-Parganas**
Planting time	NA	End of July to 2nd week of August	End of July to 2nd week of August
Seed rate	50-55 kg/ha	30-37.5 kg/ha	30-37.5 kg/ha
Seed treatment (% farmers adopted)	Yes (100%)	Nil	Yes (10%)
Chemicals used for seed treatment	carbendazim (2 g/kg of seeds)	-	NA
Organic manure in nursery (% farmers adopted)	Yes (100%); FYM	-	Yes (10%); Cow dung
Inorganic manure in nursery (% farmers adopted)	100% applied; Urea (0.5 kg/K)+ SSP (0.25 kg/K) + MOP (0.25 kg/K)	100% applied; Urea (0.25 kg/K)+ 10:26:26 (0.25-0.5 kg/K) + MOP (0.15-0.25 kg/K)	100% applied; Urea (0.15-05 kg/K) and or 10:26:26 (0.15-0.3 kg/K) and/or DAP (0.5 kg/K) or 14:35;35 (0.2-0.25 kg/K). Few applied MOP

Table 11: Details of main field management

Details	Districts			
	Nadia	**Howrah**	**Hooghly**	**P. Bardhaman**
Planting method	Random planting (50%); Line planting (50%)	Random planting (33.3%); Line planting (66.7%)	Random planting (20%); line planting (80%)	Random planting (50%); Line planting (50%)
Total N applied	60-80 kg/ha (100% applied)	80-100 kg/ha (100% applied)	80 kg/ha (100% applied)	87-113 kg/ha (100% applied)
Total P_2O_5 applied	35-40 kg/ha; (100% applied)	22.5-45 kg/ha; (77% applied)	40 kg/ha; (100% applied)	48-69 kg/ha; (100% applied)
Total K_2O applied	35-60 kg/ha; (100% applied)	15-60 kg/ha; (66% applied)	40 kg/ha; (100% applied)	45-60 kg/ha; (100% applied)
$ZnSO_4$ applied	-	12-37.5 kg/ha; (44% applied)	25 kg/ha; (20% applied)	20-25 kg/ha; (20% applied)
Organic fertilizers applied	40% applied FYM (1-2 t/ha)	NA	60% applied FYM (0.5-2 t/ha)	30% applied FYM (05-2 t/ha)
Fertilizers applied	Fertilizers like urea, DAP, SSP, MOP. 10:26:26, 10:35:14 were applied by the farmers			

NA: Not available

Table 11-contd..: Details of main field management

Details	Districts		
	P. Medinipur	**N 24-Parganas**	**S 24-Parganas**
Planting method	Random planting (100%)	NA	NA
Total N applied	80 kg/ha (100% applied)	NA	NA
Total P_2O_5 applied	40 kg/ha; (100% applied)	NA	NA
Total K_2O applied	40 kg/ha; (100% applied)	NA	NA
$ZnSO_4$ applied	-	NA	NA
Organic fertilizers applied	100% applied FYM (1-2 t/ha)	100% applied FYM	100% applied FYM
Fertilizers applied	Fertilizers like urea, DAP, SSP, MOP. 10:26:26, 10:35:14 were applied by the farmers		

D. Weeds and their Management: Overall intensity of weeds was medium except in Nadia and Howrah where weed intensity was recorded high in some places. Common weeds observed in and around rice fields were *Echinochloa colona, Echinochloa crusgalli*, *Cyperus rotundus*, *Cynodon dactylon, Cyperus difformis, Marsilia quadrifolia, Chenopodium album*, *Ipomoea* spp. (Kalmi), *Ammannia baccifera, Sphenoclea zeylanica*, *Monochoria vaginalis* and some unidentified grasses and sedges (Table 12). Due to scarcity labours, use of herbicides has increased significantly. On an average, about 75% of the farmers contacted in Nadia, Howrah, Hooghly, Purba Bardhaman and Purba Medinipur applied different herbicides along with hand weeding (Table 12). Most of the farmers from north and south 24 Parganas told that they managed the weeds only by hand weeding. Different herbicides used by the farmers are presented in Table 12.

Table 12: Weeds and weed management

Details	Districts				Remarks
	Nadia	**Howrah**	**Hooghly**	**P. Bardhaman**	
Weed intensity	Medium to high	Medium to high	Medium	Low to medium	Weed intensity was high in many fields surveyed. About 30-40% farmers in Nadia, Howrah and Hooghly adopted only hand weeding. Most of the farmers who applied herbicides also adopted hand weeding
Names of the weeds	*Echinochloa colona, Echinochloa crusgalli*, *Cyperus rotundus*, *Cynodon dactylon, Cyperus difformis, Marsilia quadrifolia, Chenopodium album*, *Ipomoea* spp. (Kalmi), *Ammannia baccifera, Sphenoclea zeylanica*, *Monochoria vaginalis* and some unidentified grasses and sedges				
Weedicides used	pretilachlor @ 750 ml/ha, Fighter (2, 4-D Ethyl Ester 20% W.P.) (5 ml/10 l), Round Up 9Glyphosate 41% SC) (7 ml/15 l), Saathi (pyrazosulfuron Ethyl 10% WP) (200 g/ha) and others				
Percentage of farmers applied herbicides	60%	66.7%	60%	90%	
Wild rice incidence	Nil	Nil	Nil	Nil	

Table 12-Contd..: Weeds and weed management

Details	District			Remarks
	P. Medinipur	**N 24-Parganas**	**S 24-Parganas**	Weed intensity was high in many fields surveyed. Almost all the farmers contacted in Purba Medinipur told that they adopted hand weeding along with herbicide application
Weed intensity	Medium	Medium	Medium	
Names of the weeds	*Echinochloa colona, Echinochloa crusgalli*, *Cyperus rotundus*, *Cynodon dactylon, Cyperus difformis, Marsilia quadrifolia, Chenopodium album*, *Ipomoea* spp. (Kalmi), *Ammannia baccifera, Sphenoclea zeylanica*, *Monochoria vaginalis* and some unidentified grasses and sedges			
Weedicides used	Not available			
Percentage of farmers applied herbicides	100%	Only hand weeding	only hand weeding	
Wild rice incidence	Nil	Nil	Nil	

E. Specific needs of farmers: Some of the common needs of the farmers were HYV with pest and disease resistance, improvement in marketing facility, availability of seeds and agricultural machineries, reduction in fertilizer cost, availability of agricultural labours, improvement in irrigation facilities, subsidy on inputs like fertilizers, seeds, pesticides and herbicides, suitable varieties for submergence, availability of organic manure, increase in minimum support price and technical support for improved rice cultivation.

Table 13: Details of inputs used

Details	Districts			
	Nadia	**Howrah**	**Hooghly**	**P. Bardhaman**
Implements used	Implements like tractor, leveller, pump, power tiller, rotavator, thresher, power sprayer, sprayer and combine harvester were used by the farmers. Progressive farmers owned these instruments and others used these implements on hire basis. Combined harvester was used on hire basis			
Source of seeds	Farmers (60% in Nadia, 44.4% in Howrah, 100% in Hooghly and 40% in Purba Bardhaman) told that they purchased part of their seed requirement from private or Government sources			
Source of irrigation	Shallow tube well (10%); Canal (50%); RLI (40%)	Canal (78%); RLI (11%); Deep tube well (11%)	Shallow tube well (80%); Deep tube well (20%)	Canal (100%)
Scarcity of irrigation water	No (100%)	No (55.5%)	No (100%)	No (100%)
Availability of fertilizers/pesticides	Available (100%)	Available (88.9%)	Available (100%)	Available (100%)
Quality of fertilizers/pesticides	Yes (100%)	Yes (88.9%)	Yes (80%)	Yes (100%)
Advisors to the farmers	State dept (80%); Dealers (30%); Univ. (10%)	own (33.3%); State dept (33.3%); Others (11%)	State dept (100%)	Own (80%); State dept (100%)

RLI: River lift irrigation

Table 13-cond..: Details of inputs used

Details	Districts		
	P. Medinipur	**N 24-Parganas**	**S 24-Parganas**
Implements used	Implements like tractor, leveller, pump, power tiller, thresher, power sprayer, sprayer and combine harvester were used by the farmers. Progressive farmers owned these instruments and others used these implements on hire basis. Combined harvester was used on hire basis		
Source of seeds	Some farmers told that they purchased part of their seed requirement from private or Government sources		
Source of irrigation	Shallow tube well (100%)	NA	NA
Scarcity of irrigation water	No (100%)	NA	NA
Availability of fertilizers/pesticides	Available (100%)	Available (100%)	Available (100%)
Quality of fertilizers/pesticides	Yes (100%)	Yes (100%)	Yes (100%)
Advisors to the farmers	State dept (100%)	Dealers (100%)	Dealers (100%)

F. Input use: Implements like tractor, leveller, pump, power tiller, rotavator, thresher, power sprayer, sprayer and combine harvester were used by the farmers. Progressive farmers owned these instruments and others used these implements on hire basis. Combined harvester was used on hire basis. On an average about 61% of the farmers from Nadia, Howrah, Hooghly and Purba Bardhaman told that they purchased part of their seed requirement from private or government sources (Table 13). Shallow tube wells and canal were the major sources of irrigation (Table 13). Some farmers Howrah and Hooghly also used mini deep or deep tube wells (Table 13). Some farmers from Howrah told that there was scarcity of irrigation water. Most of the farmers contacted told that inputs like fertilizers and pesticides were available in time and overall they were happy with their quality. In addition to their own decisions, farmers received advices from officials of state department of agriculture and private dealers.

Table 14: Prevalence of diseases and insect pests in West Bengal during *Kharif*' 2024

Districts	Diseases						
	Bl	**NBl**	**ShBl**	**BS**	**ShR**	**FS**	**BLB**
Nadia		L (3-7%)	L-M (5-10%)	L-M (5-15%)	M (10-15%)	L-M (5-10%)	
Howrah			L-M (2-12%)	L-M (5-10%)	L-M (5-10%)	L (2-5%)	L-M (5-10%)
Hooghly			M (10-20%)		M (10-15%)		L-M (5-10%)
P. Bardhaman	L-M (5-10%)		M (15-25%)	L-M (5-15%)	L-M (5-10%)		M (10-20%)
P. Medinipur			M (8-17%)	M (10-17%)		L-M (5-10%)	L-M (5-10%)
N 24-Parganas			M (20%)		M (15%)		
S 24-Parganas			M-S (15-30%)		M (12-15%)		

There was minor incidence (2%) in some fields in Hooghly

Districts	Insect pests					
	SB	**LF**	**BPH**	**RB**	**GLH**	**Rats**
Nadia	M (10-15%)		M (10-15%)			
Howrah	L-M (2-20%)	L (2-5%)	L (5%)	L-M (4-8%)		
Hooghly	M (8-15%)	M (8-10%)			L (5-8%)	L (2%)
P. Bardhaman	L-M (5-10%)		M-S (20-40%)			L-M (5-10%)
P. Medinipur	L-M (5-10%)	L-M (5-12%)				L
N 24-Parganas	M (8-20%)		M (10-25%)			
S 24-Parganas	M (15-25%)		M-S (25-30%)			

G. Biotic stresses and their management: The details of occurrence of different diseases and insect pests are presented in Table 14. The diseases like sheath blight, brown spot, sheath rot, false smut and bacterial blight were widespread and were commonly observed in farmers, fields. In

general, the intensity of different diseases was low to moderate (Table 14). However, High intensity of sheath blight was recorded in some fields in Bally village in South 24 Parganas on CR 1017. Among the insect pests, stem borer, BPH and leaf folder were widespread. In general, intensity of different insect pests was in low to moderate intensity. However, BPH was severe in some fields of Paraj village in Purba Bardhaman district on rice variety Swarna and Santigachhi, Satjalia and Mollakhali of South 24 Parganas on rice variety CR 1017. Majority (77-100%) of the farmers contacted told that they applied different pesticides to manage the biotic stresses. Different pesticides used by the farmers in different surveyed districts are presented in Table 15. The number of spraying/pesticide application ranged from 1-4 and some farmers contacted from Nadia and Purba Bardhaman district mixed 2 different pesticides before application.

Table 15: Details of pest Management

Details	Districts			
	Nadia	**Howrah**	**Hooghly**	**P. Bardhaman**
% age farmers adopting plant protection	100%	77.7%	100%	100%
Names of pesticides	**Insecticides**: Kritap (cartap hydrochloride 50 SP) (1-2 g/l), cartap hydrochloride 4G (6 kg/acre), acephate 75% WP (375 g/acre), chlorantraniliprole 18.5 SL (0.3 ml/l), fipronil (1 ml/l), quinalphos (2 ml/l), lamda cyhalothrin and Lancer Gold (acephate 50% + imidacloprid 1.8% SP) for stem borer and leaf folder; pymetrozine (135 g/acre) and imidacloprid (0.3 ml/l) for BPH and chlorpyriphos (2 ml/l) for rice bug **Fungicides**: validamycin (1 ml/l), propiconazole (1 ml/l), hexaconazole (2 ml/l), Amistar Top (azoxystrobin and difenoconazole) (1.5 ml/l) and Spectrum (azoxystrobin 11% + tebuconazole 18.3% w/w SC) (2 ml/l) for sheath blight and sheath rot; tricyclazole (0.6 g/l) for blast and neck blast; carbendazim (1 g/l) and carbendazim + mancozed (1.5 g/l) for brown spot and Tagmycin (streptomycin sulphate + tetracycline hydrochloride (90:10) SP (0.1%) for bacterial blight of rice			
# of pesticide sprays	2	1-3	2-3	3-4
Mixing of pesticides before application	Yes (50%); 2 pesticides	Nil	Nil	Yes (50%); 2 pesticides
Zinc deficiency	Yes (50%)	Nil	Yes (100%)	Nil

Table 15-contd..: Details of pest Management

Details	Districts		
	P. Medinipur	**N 24-Parganas**	**S 24-Parganas**
% age farmers adopting plant protection	Nil	100%	100%
Names of pesticides	**Insecticides**: Hamla chlorpyriphos 50% + cypermethrin 5% EC) (400 ml/acre, cartap hydrochloride (400 g/acre), Takumi (flubendiamide 20% WDG) (250 ml/acre) and chlorpyriphos 40% (1000 ml/acre) for stem borer and leaf folder		

Details	Districts		
	P. Medinipur	N 24-Parganas	S 24-Parganas
	Fungicides: Tilt (propiconazole) (1 ml/l), Contaf Plus (hexaconazole 5% Sc) (200-300 ml/acre) and V3 (validamycin) (600 ml/acre) for sheath blight, sheath rot and false smut		
# of pesticide sprays	NA	2-3	2-3
Mixing of pesticides before application	NA	Nil	Nil
Zinc deficiency	Nil	Nil	Nil

Table 16: Researchable issues

Parameters/Issues	Districts			
	Nadia	Howrah	Hooghly	P. Bardhaman
Rice ecology in your area	IR (50%); RL (50%)	Rainfed	Irrigated and rainfed lowland	Irrigated
Rice cultivation only in Kharif or both Kharif and Rabi	Kharif and Kharif + Rabi	Kharif	Kharif and Kharif + rabi	Kharif + Rabi
Number of years of experience in rice farming	5-20 years	5-20 Years	more than 20 years	10-20 Years
Main biotic constraints (diseases) in your area according to you	Neck blast, sheath blight and Brown spot	Sheath blight, brown spot and false smut	Sheath blight and bacterial blight	Bacterial blight and sheath blight
Extent of disease damage	10-25%	10-25%	10-25%	10-25%
Main biotic constraints (Insect pests) in your area according to you	Stem borer BPH	Stem borer BPH	Stem borer	BPH
Extent of insect pest damage	10-25%	10-25%	10-25%	10-25%
Main abiotic constrains in your area according to you	Submergence; flash flood	Submergence; flash flood	Submergence; flash flood	Submergence; flash flood
Production constraints in your area according to you	Scarcity of agricultural labours, lack of mechanization, lack of irrigation facilities, micronutrient deficiency, unavailability of quality seeds, high cost of cultivation, lack of electricity for agricultural operations			
Irrigation facilities in your area	Available; Canal	Available; canal, River	Available; Bore well	Available; Canal
Normally how many years it takes to change the rice variety	5-20 years	10-20 years	5-10 Years	
Any other rice production issues in your area which the rice scientists need to address	Management of crop damage by wild animals, integrated nutrient management, lack of knowledge on new improved rice varieties and awareness program on improved rice production technology			
What is urgently required in your area as far as rice varieties are concerned				
Duration	Medium to long duration varieties with lodging resistance,			
Biotic stress resistance	HYVs resistant to biotic stresses like blast, bacterial blight, sheath blight, BPH and stem borer			
Abiotic stress resistance	HYVs with tolerance to submergence, drought			
Preferred grain quality	HYVs with medium slender grain quality and aromatic short grain			
Nutritional quality	Varieties with high zinc, iron and protein and low GI			

H. Researchable issues: Among the biotic stresses, major problems in the region are sheath blight followed by bacterial blight, neck blast, brown spot and false smut among the diseases and stem borer and BPH among the insect pests. Among the abiotic problems, salinity and Submergence/ drought/flash flood was the main problem. Major problems faced by the farmers were scarcity of agricultural labours, lack of mechanization, lack of irrigation facilities, unavailability of fertilizers and pesticides, micronutrient deficiency, unavailability of quality seeds and lack of electricity for agricultural operations. Farmers want medium to long duration varieties with lodging resistance, varieties having tolerance to sheath blight, neck blast, bacterial blight, false smut, stem borer and BPH, varieties having tolerance to salinity, submergence and drought, MS grain varieties and varieties with high iron and protein and low GI (Table 16).

Table 16 contd..: Researchable issues

Parameters/Issues	**Districts**		
	P. Medinipur	**N 24-Parganas**	**S 24-Parganas**
Rice ecology in your area	Irrigated and Rainfed	Irrigated	Irrigated
Rice cultivation only in Kharif or both Kharif and Rabi	Kharif and Kharif + Rabi	Kharif	Kharif
Number of years of experience in rice farming	10-20 years	> 20 years	> 20 years (100%)
Main biotic constraints (diseases) in your area according to you	NA	Sheath blight	Sheath blight
Extent of disease damage	NA	10-25%	10-25%
Main biotic constraints (Insect pests) in your area according to you	Stem borer	BPH	BPH
Extent of insect pest damage	<10%	10-25%	10-25%
Main abiotic constrains in your area according to you	Submergence	Flash flood, salinity	Salinity, Flash flood
Production constraints in your area according to you	Lack of irrigation facilities, scarcity of agricultural labours, lack of mechanization		
Irrigation facilities in your area	Available; Bore well	Available; Bore wells, Reservoir	Yes; reservoirs
Normally how many years it takes to change the rice variety	NA	5-10 Years	5-10 Year (100%)
Any other rice production issues in your area which the rice scientists need to address			
What is urgently required in your area as far as rice varieties are concerned			
Duration	Medium to long duration rice varieties with lodging resistance		
Biotic stress resistance	HYVs resistant to blast, bacterial blight, sheath blight, BPH, stem borer		
Abiotic stress resistance	HYVs with tolerance to submergence and salinity		
Preferred grain quality	HYVs with medium slender grain		
Nutritional quality	Varieties with high zinc and iron, high protein and HYVs with low GI		

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, SRBSDV-Southern rice black-streaked dwarf virus

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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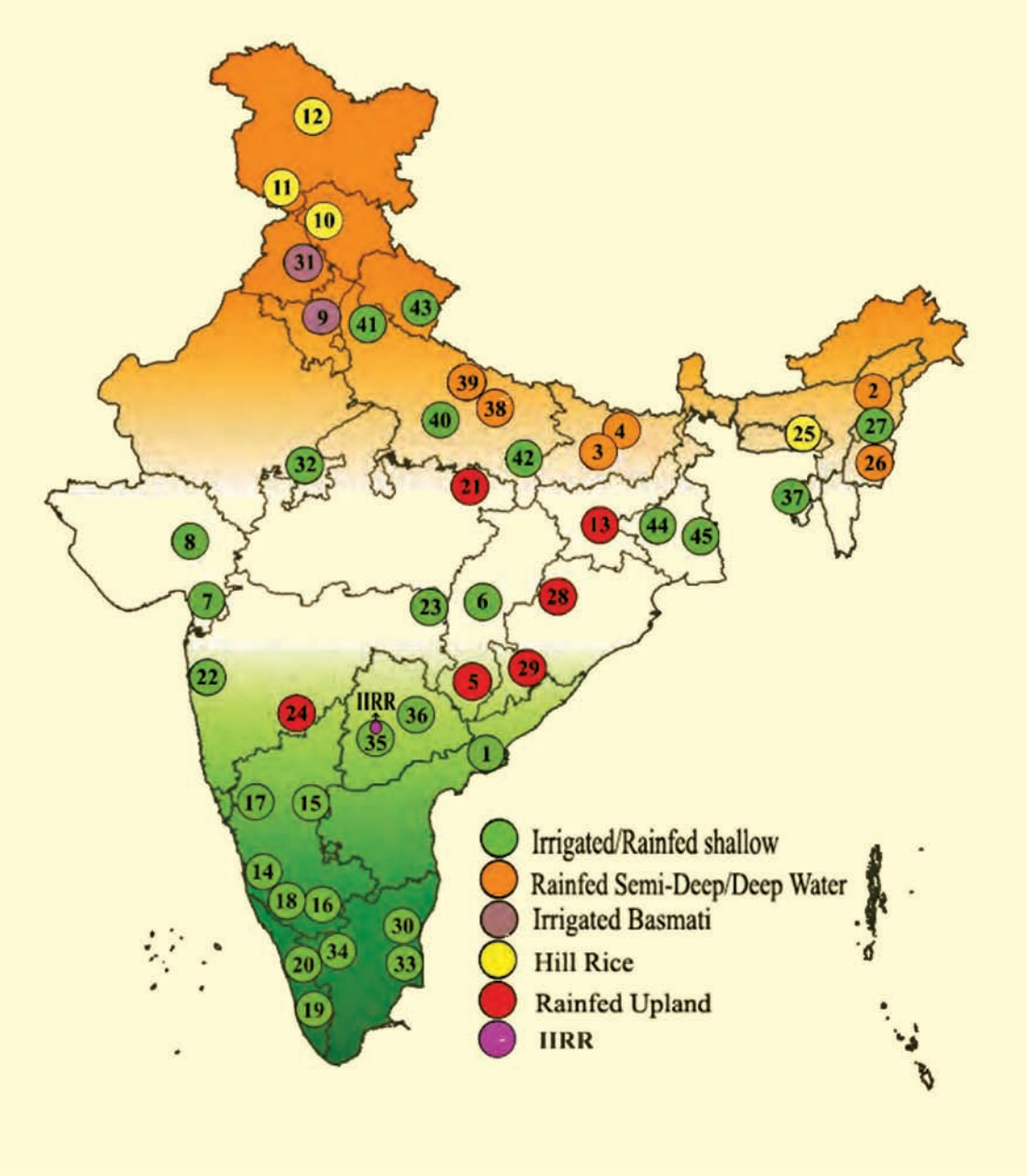

भाकृअनुप-भारतीय चावल अनुसंधान संस्थान

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