ICAR Research Complex for Eastern Region

भारतीय कृषि अनुसंधान परिषद का पूर्वी अनुसंधान परिसर, पटना

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Our Mandates

Strategic and adaptive research for efficient integrated management of natural resources to enhance the productivity of agricultural production systems in the Eastern Region

Transform low productivity-high potential eastern region into high productivity region for food, nutritional and livelihood security

Utilization of seasonally waterlogged and perennial water bodies for multiple uses of water

Promote network and consortia research in the Eastern Region

भाकृअनुप
ICAR

Agricultural production is highly risk-prone and fluctuating that results in low farm income and has detrimental effect on the interest in farming and farm investment. It has forced majority of farmers, particularly younger group, to leave farming. It is apparent that income earned by a farmer from agriculture is crucial to address agrarian distress and promote farmers welfare. Realizing the need to pay special attention to the plight of farmers, the Hon'ble Prime Minister urged to double the farmers income by 2022 to promote farmers welfare, reduce agrarian distress and bring parity between income of farmers and those working in non-agricultural profession. In spite of the natural resource endowments in terms of fertile soils, water resources and solar radiation, the productivity and per capita income of the farmers in the Eastern region is very low due to erratic climate variations, population explosion, land degradation, small and scattered land holdings, lack of quality seed and planting materials, poor extension mechanism, etc. However, the Eastern region of the country holds promise for a Second Green Revolution, which can be accomplished through holistic management of land, water, crops, biomass, horticultural, livestock, fishery and human resources. A large number of technologies related to agri-horti crops, vegetables, integrated farming, livestock, poultry and fisheries has been developed for this region. In order to enhance agricultural productivity and profitability, there is a need to make planned efforts for dissemination and adoption of these technologies in befitting manner so as to increase farmer's income to ensure sustainable food and livelihood security. It is imperative to strengthen the linkages with the development departments for wider up-scaling of the technologies developed by the Institute. Regular scientific & stakeholders' meetings, and interactive sessions can be organized to understand the prevailing issues and share the knowledge generated thereof for further research. Focus should be on the development and promotion of farmer empowerment models (SHGs, CIGs, FOs, FPCs, PPPs, etc.), large scale ICT applications through IT Platforms, social media, farmer and farm women knowledge groups, Apps for various value chain operations, etc for better price realization by the farming community.

Dr. Ujjwal Kumar
Director

RESEARCH HIGHLIGHTS

Identification of Traits, Genes, Physiological Mechanism to Develop Climate Smart Varieties for Unfavorable Environment

A field level screening was carried out for drought tolerance during *Kharif* 2019 at ICAR Research complex for Eastern region, Patna with aim to identify the rice genotypes with better stem reserve mobilization efficiency during drought period.

Fourteen rice genotypes (12 donor lines plus 2 check varieties) *viz.*, IR64, IR74371-70-1-1 (checks), Gul murali, Camponi sml, Wanni dahanala, EZI 124, Jabor sail, Tchampa, Dular, Santhi sufaid, Aus 257, DZ78, ARC10955 and Soloi were received from IRRI and evaluated under two sets of conditions i.e. stress (drought) and non-stress (irrigated). Under drought stress experimental field, the crop was provided normal irrigation for four weeks after transplanting and then no further irrigation was applied.

Agro-morphological (days taken to 50% flowering, anthesis, physiological maturity) and physiological data (RWC, chlorophyll, Pn rate) related to drought tolerance and stem reserve mobilization (%) were recorded. In order to access the mobilization potential of rice genotypes kernel weight reduction (%) was calculated and stem reserve potential of rice genotypes was estimated. Study showed that genotypes Dular (22.9%), ARC10955 (20.9%) and Camponi sml (21.2%) have lower kernel weight reduction percentage thus having better stem reserve mobilization efficiency, while kernel weight reduction were higher in EZI124 (39.3%) and in Gul Murali (36.9%) thus having poor stem reserve mobilization capacity.

Evaluation of Rice Genotypes for Tolerance to Multiple Stresses (Submergence and Drought)

Twenty one rice genotypes were evaluated under submergence, drought and combine stress (submergence + drought) conditions during Kharif 2019 (Fig. 1). The control trial was maintained by applying irrigation as and when required. Under the submergence experiment, after eleven days of transplanting the crop was completely submerged under 1.0 to 1.25 m water depth for eighteen days and thereafter water was drained out from the field. Due to natural heavy rainfall, the crop was again submerged (28 days after first de-submergence) for one week. Under drought stress experiment, crop faced stress at the reproductive stage. Sixty days old seedlings were subject to drought by withholding irrigation and withdrawing water from the field. Thereafter crop was left rainfed. Under combine stress crop faced 16 days submergence at vegetative stage and later drought at the reproductive stage. Results of the present study revealed that irrespective of the genotypes, there was a significant reduction in grain yield of rice under drought (26.3%), submergence (90.6%) and combine stress (87.9%) conditions as compared to control. Among rice genotypes, IR96321-558-563-B-2-1-1, IR 96321-315-294-B-1-1-1, IR96321-558-209-B-6-1-1, IR83383-B-B-129-4 (RCPR 10), IR 96321-1447-521-B-2-1-2, IR 96322-34-223-B-1- 1-1 and IR 96321-315-323-B-3-1-3 have been found promising for multiple stresses tolerance. Grain yield of different rice genotypes varied from 3.58-4.57 t/ha, 0.06-1.30 t/ha, 0.00-1.41 t/ha and 4.70-5.83 t/ha, under drought, submergence, combine stress and control conditions, respectively.

Fig.1 Effect of Mg, Zn, Cu and B on test weight of makhana seeds

Performance of Promising Chickpea Genotypes in Irrigated and Rainfed Situations

Two station trials each comprising the same set of 12 treatments including 2 check varieties (released for north east plains) were conducted both under normal irrigated and rainfed conditions (during the 3rd week of November 2018). The test entry 'DBGC 1' (3.78 t/ha), with 100-seed wt. of 26.72 g and maturity period of 134 days showed an yield advantage over the best check 'Pusa 3043' (3.32 t/ha) by more than 13% under normal irrigated condition (Table 1). Another station trial comprising 6 entries including two checks was conducted under late sown condition (second fortnight of December 2018) at three locations, viz., KVK, Vaishali, KVK, Buxar and BAU, Sabour. Yield of both test entries and check varieties were reduced significantly compared to those under normal sown condition at Patna.

Table 1: Mean performance of promising chickpea genotypes under normal sown conditions at ICAR RCER, Patna

Genotypes	Irrigated condition			Rainfed condition		
	Yield (t/ha)	100-seed wt (g)	Maturity period (days)	Yield (t/ha)	100-seed wt (g)	Maturity period (days)
DBGC 1	3.78	26.72	134	2.66	24.89	130
DBGC 2	3.01	29.05	132	2.38	28.60	131
DBGC 3	3.06	24.19	134	2.27	25.26	131
DBGC 4	2.98	26.53	135	2.26	28.06	131
Pusa 372	2.84	14.22	133	2.16	15.68	130
Pusa 1103	3.09	23.82	134	2.11	24.20	131
Pusa 3042	3.32	21.87	132	2.44	22.21	129
LSD (P=0.05)	0.41	2.32	1.35	0.21	2.10	0.55

Nutritional profile studies in cool season pulses

In order to assess nutritional quality of cool season pulses, seed samples were sent to ICAR RCER Regional Centre, Ranchi for detailed analysis of protein and micronutrient content during 2019. It is evident that the chickpea variety 'Pusa 3043' (released in 2018) has significantly lower protein content than older varieties such as 'Pusa 256' and 'Pusa 372', indicating the necessity to pay due attention on quality attributes while assessing a prospective genotype for release and notification. A few advance breeding lines of chickpea (DBGC1, DBGC 2 and DBGC 3) and lentil (DBGL 135) bred at ICAR RCER, Patna have a balanced proportion of both protein and Zn content (Table 2).

Table 2: Nutritional profile of selected genotypes/varieties of chickpea and lentil

Chickpea				Lentil			
Genotype	N (%)	Protein (%)	Zn (ppm)	Genotype	N (%)	Protein (%)	Zn (ppm)
DBGC 1	3.21 ± 0.11	20.06	36.8±1.30	PL 8	3.73 ± 0.15	23.31	49.6
DBGC 2	3.46 ± 0.21	21.63	42.2±1.25	DPL 15	3.94 ± 0.16	24.62	50.6
DBGC 3	3.47± 0.16	21.69	37.8±1.90	HUL 57	4.00 ± 0.27	25.00	56.0
DBGC 4	2.55 ±0.12	15.94	34.8±1.45	DBGL 135	4.29 ± 0.20	26.81	53.5
Pusa 256	3.08 ± 0.13	19.13	42.2±1.80	DBGL 62	3.60 ± 0.13	22.50	55.5
Pusa 372	3.17± 0.18	19.81	38.3±1.60	DBGL 138	3.81 ± 0.10	23.81	53.1
Pusa 547	3.29 ± 0.25	20.56	36.8±1.85	Pusa Vaibhav	3.70 ± 0.15	23.12	49.1
Pusa 1103	3.32 ± 0.15	20.75	41.7±2.15	KLS 218	3.44 ± 0.13	21.50	57.0
Pusa 3043	2.49 ±0.13	15.56	44.7±1.75	IPL 220	4.07 ± 0.10	25.43	59.0
ICC 4958	2.95 ± 0.15	18.43	17.6±1.35	IG 4258	3.84 ± 0.16	24.00	58.0
JG 14	3.24 ± 0.21	20.25	45.2±1.90	DBGL 105	4.09 ± 0.22	25.56	50.1

Evaluation of jackfruit germplasm for vegetable purpose

During the year 2019, jackfruit germplasm were evaluated for their suitability as vegetables. The fruits were evaluated at tender stage (fruit weight varies from 0.5 to 1.0 kg) based on per cent edible portion, TSS, acidity and firmness of edible portion after boiling. The per cent edible portion varied from 44.29 % (ICARRCER JS 3/8) to 68.75 % (ICARRCER JS 7/4). The minimum firmness was recorded with ICARRCER JS 1/4 (1.73 lbs) whereas maximum firmness was recorded in the ICARRCER JS 7/4 (6.5lbs). Hence, based on per cent edible portion and firmness ICARRCER JS 1/4, 2/9, 8/9 and 10/3 were found promising for vegetable purpose (Fig. 2).

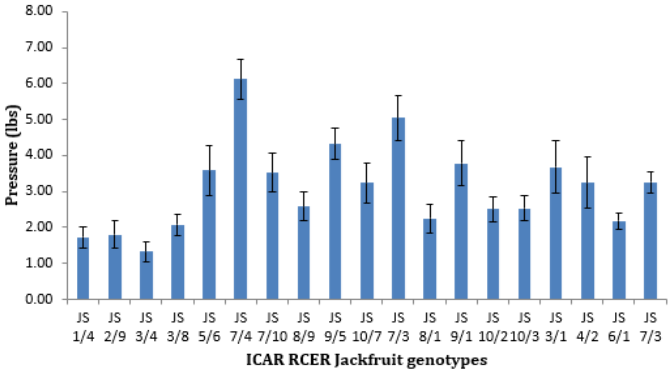


Fig. 2 Firmness of edible part after boiling of different jackfruit genotypes

Evaluation of bacterial wilt resistant (BWR) germplasm

Eleven promising genotypes/ ABLs/ varieties viz., HAB-915, HAB-917, IC-545901 (Fig. 3), HAB-792, IC-545901-1, HABR-6, Swarna Avilamb, IC-261786, HAB-905, HAB-906 and HAB-901 were evaluated for fruit yield and wilt resistance (Table 3). HAB-915 (RCBR-22) was submitted under round varietal trial of IET AICRP (VC), 2019. Individual plant selection of F7 generation of Swarna Shyamali x Swarna Pratibha was carried out for wilt resistance and non spiny fruits.

Table 3: Promising lines for wilt resistance

Genotype	Yield (t/ha)	Fruit weight (g)	Fruit length (g)	Days to 50% flowering	Fruit
IC 545901	20.63	119.33	14.73	51.00	Long purple, green calyx
IC 545901-1	32.76	110.67	9.85	51.33	Long dark purple
IC 261786	22.91	119.67	15.00	47.00	Long preen, green calyx
HAB-915	19.74	164.00	9.17	48.33	Round green stripes, green calyx
Swarna Shyamali x Swarna Pratibha-15-24 F_7	27.66	148.00	9.3	47.67	Round green stripes, green non spiny calyx

Evaluation of BWR F1s

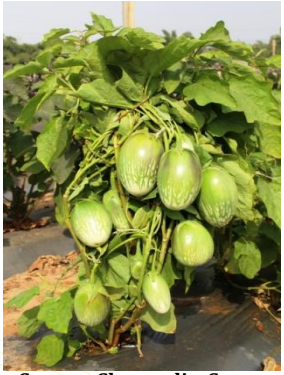
Best performing twelve F1 hybrids i.e., HAB-792 x IC-545901, HABR-6 x IC-545901, Swarna Avilamb x IC-545901, Swarna Avilamb x HAB-901, HABR-6 x HAB-901, HAB-905 x IC-545901, HAB-906 x IC-545901, IC-261786 x IC-545901, HAB-917 x HAB-906, HAB-917 x HAB-901, HAB-917 x IC-545901 and HAB-917 x IC 261786 selected from previous experiments were evaluated for yield, fruit characters and bacterial wilt resistance in field conditions. Five hybrids have been selected for further evaluation (Table 4). HABR-6 x IC-545901 (RCBRH-18/ Round hybrid) and Swarna Avilamb x IC-545901 (RCBLH-20/ Long hybrid) were submitted under IET AICRP (VC) 2019 for multi-location testing.

Table 4: Promising F1 hybrids

Genotype	Yield (t/ha)	Fruit weight (g)	Fruit length (cm)	Days to 50% flowering	Fruit
Swarna Avilamb x IC 545901	36.52	143.67	20.60	44.3	Long purple, green calyx
IC 261786 x IC 545901	26.10	127.67	15.10	49.0	Long purple, green calyx
HAB-906 x IC 545901	36.95	139.00	19.63	48.0	Long purple, green calyx
HABR-905 x IC 545901	30.46	95.67	15.83	40.0	Long dark purple
HABR-6 x IC 545901	38.46	135.67	12.83	46.0	Oblong purple

HAB-915

IC-545901



Swarna Shyamali x Swarna Pratibha-15-24 F_7

Swarna Avilamb x IC-545901

Fig. 3 Promising Genotypes of Brinjal

Collection, Identification and Conservation of Wild Edible Mushroom from Forest and Local Market

Rugda (Scleroderma sp.) and Tecnus (Termitomyces sp.) mushroom were consistently recorded in the local market of Ranchi, Ramgarh, Chibasa, Gumla, Chatra and Hazaribag of Jharkhand as well as in local forest nearby the research centre (Fig. 4). It's now well established that wild edible mushrooms play an important role in ensuring livelihood security of the tribal people residing in the forest. Among the edible mushroom, Rugda is collected from the forest of Saal in rainy season from July to August and sold at a premium price @ Rs. 300-400/kg in the local market while Tecnus (Termitomyces species) is widely collected by mushroom collector during the rainy season from August to October and sold at a premium price @ 400-600/kg.

Fig. 4 Livelihood security though mushroom farming

Effect of Secondary and Micronutrients on Seed Quality of Makhana

An experiment was conducted to find out the effect of secondary and micronutrients on seed quality of makhana in field condition. Results indicated significant improvement in seed quality (seed weight) by application of micronutrients along with NPK. Test weight (100-seed weight) of makhana seeds improved by 21% over control due to recommended NPK application. A further improvement of 8-27% over NPK application was recorded consequent to Mg and micronutrients (Zn, Cu, B) application, with the most profound influence was observed in treatments involving Cu spray (0.1% CuSO4), Fig. 5.

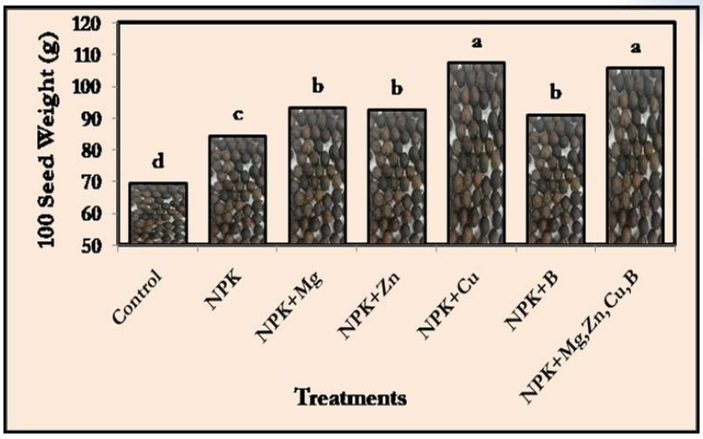


Fig. 5 Effect of Mg, Zn, Cu and B on test weight of makhana seeds

The seed quality improvement by Mg and micronutrients application was further recognized by grading of makhana seeds in 8 different diameter groups. While 74% of the seeds obtained from control fell in >1cm diameter grade, the percentage rose near to 80% or over in the treatments involving secondary and micronutrients. Particularly noticeable improvement was observed with Cu spray treatments. The observations from the first year of experiments established Mg, Zn Cu and B as the potential booster of makhana yield and quality, a line of makhana research which was hitherto unattended. Potential benefit of Cu spray on makhana seed quality deserves particular attention (Fig. 6).

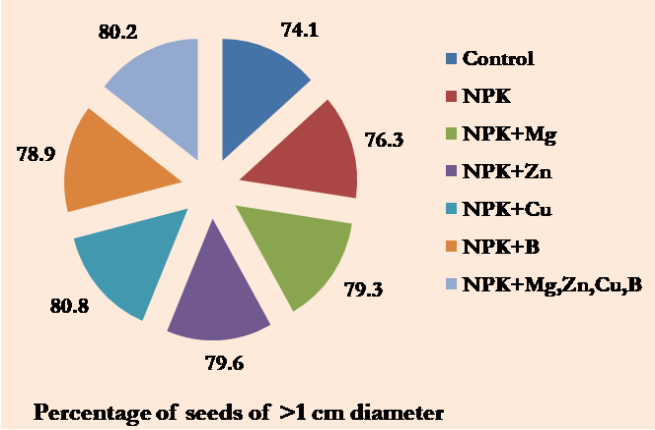


Fig. 6 Effect of Mg, Zn, Cu and B on makhana seed size

Screening of medicinal plants for the higher content of bioactive compounds

To study bioactive compounds, initially thirteen plant species were studied for their phenolics and antioxidant potentiality. Phenolic content ranged from 225.62 to 1215.2 GAE/100g, whereas flavonoid content ranged from 62.1 to 865.8 mg CE/100g. Antioxidant activity (FRAP) ranged from 3.6 to 64.9 µMol TE/g. A significant higher antioxidant activity was observed for CUPRAC methods. Plant with higher antioxidants activities were helencha, black tulsi, jangli tulsi, ban tulsi and artemisia. Among these plants, helencha was used for profiling of the phenolic compounds using ultra-performance liquid chromatography with quadrupole time of flight mass spectrometry. A total of 25 compounds, including 6 flavonols, 4 phenolic acids, 3 lignans, 3 flavone, 1 flavanol, flavanone, dihydro flavonol, tetramethoxy flavone, isoflavonoids and methylated flavonols, and 3 other phenolic compounds were putatively identified. Flavonols were the most abundant type of phenolics exhibiting 26.76% of the total phenolics in helencha leaves. Tetramethyl scutellarein was single predominant compounds in helencha, exhibiting 26.46% of the total phenolic. In the antimicrobial assay, significant antimicrobial activity of the methanolic extract of helencha was found against Shigella flexneri, Salmonella paratyphi A and Pseudomonas aeruginosa against standard antibiotics like ampicillin and ciprofloxacin. Further, the in silico interaction studies of 21 compounds with LasR protein of P. aeruginosa showed Demethyloleuropein to be the best candidate compound.

Rehabilitation of Coal Mine Affected Areas through Agroforestry Interventions

A model of Agri-horti-silvi-pastural system was developed (Fig. 7) in the year 2015 at coal mine affected area of Phusri village, Near Charhi, Mandu, Ramgarh, Jharkhand. In this model, agroforestry species viz., Aegle marmelos, Artocarpus heterophyllus, Citrus limon, Dalbergia latifolia, Mangifera indica, Melia azedarach, Pongamia pinnata, Psidium guajava, Punica granatum, Swietenia mahogany and Tectona grandis have been planted. After four years of plantation, the maximum plant height (4.05 m) and trunk diameter (18.82 mm) was recorded in Pongamia pinnata compared to other MPTs. Among the fruit crops, maximum plant height (2.91 m) and plant spread were recorded in the Aegle marmelos. Among the fruit trees, the maximum average yield was recorded in pomegranate (6.25 kg/plant) followed by guava (5.24 kg/plant) and mango (4.85 kg/plant). A total of 846 kg green fodder was harvested from perennial grasses, Melia azedarach and Tephrosia candida. Apart from this, the farmer could obtain returns of approximately of Rs. 8200/- by growing intercrops like tomato, chilli and lentil during the rainy season and selling the surplus produce in the market after fulfilling the requirement of a family of 4 members.

Fig. 7 Agri-horti-silvi-pastural in coal mine affected area

Improving Rice–Vegetable Pea-Summer Maize System Productivity through Efficient Water Management Practices

An experiment was initiated at ICAR RCER Patna during 2018 to improve the productivity of rice-vegetable pea-summer maize system through efficient water management. Three varieties of each crop were evaluated under 4 levels of water management (W1 IW: CPE=0.4, W2 IW: CPE=0.6), W3 IW: CPE=0.8) and W4 IW: CPE=1.0) in a split-plot design.

During summer 2019, three maize genotypes namely S-999 (V1), Vishal (V2) and S-585 (V3) were evaluated under 04 water regimes based on IW:CPE ratios 0.4 (W1), 0.8 (W2), 1.0 (W3) and 1.2 (W4) (Fig. 8). Results revealed that genotype Vishal produced the highest green cob yield (16.75 t/ha). In case of water management treatment, the highest green cob yield (19.06t/ha) was recorded with W4 (IW: CPE=1.2) Maximum irrigation water productivity (4.79kg/m^3) was recorded by genotype Vishal and irrigation at IW: CPE=0.4 (Table 5).

Fig. 8 Evaluation of maize genotype under different water regimes

Table 5: Green cob yield (t/ha) of maize as influenced by water management and genotypes

Treatments	Green cob yield (t/ha)	WP (kg/m^3)
W1 (IW: CPE=0.4)	11.61	5.81
W2 (IW: CPE=0.8)	15.22	4.76
W3 (IW: CPE=1.0)	18.33	4.58
W4 (IW: CPE=1.2)	19.06	3.97
CD (P=0.05)	**1.31**	**0.21**
V1=S-999	15.25	4.36
V2=Visal	16.75	4.79
V3= S-585	16.17	4.62
CD (P=0.05)	**0.76**	**0.17**

In subsequent Kharif 2019, three varieties of rice, namely CR Dhan 40 (V1), Rajendra Shweta (V2) and Swarna Shreya (V3) were evaluated along with 04 levels water management. Results revealed that genotype Swarna Shreya produced significantly higher rice (3.98 t/ha) as compared to other tested rice genotypes (Table 6). In case of water management practices, W4 produced higher grain yield (4.05 t/ha) than others.

Table 6: Performance of rice as influenced by water management and genotypes

Treatments	Grain yield (t/ha)	Biological yield (t/ha)	Harvest index	IWP (kg/m^3)
W1 = (IW: CPE=0.4)	3.58	10.23	0.35	1.79
W2 = (IW: CPE=0.6)	3.78	11.12	0.34	1.51
W3 = (IW: CPE=0.8)	3.95	11.62	0.34	1.32
W4 = (IW: CPE=1.0)	4.05	12.26	0.33	1.16
LSD (P=0.05)	0.11	0.34	NS	0.28
V1 - CR Dhan 40	3.81	11.12	0.34	1.39
V2 - Rajendra Shweta	3.73	10.96	0.34	1.36
V3 - Swarna Shreya	3.98	11.70	0.34	1.45
LSD (P=0.05)	0.82	2.47	NS	0.22

Effects of long-term tillage, termination of zero-till and cropping system on productivity, energetic and economics

Long-term experiments have been undertaken under the CSISA project on conservation agriculture in rice-based cropping systems at ICAR RCER Patna since 2009-10. After 7th year, ZT DSR in CA-based rice- mustard-maize cropping system faced a severe problem of rice mealy bug (Brevennia rehi), and hence, divided into 4 plots (ZT DSR, CT DSR, Puddle transplant and Unpuddle transplant). After two years of tillage, these plots were again converted to ZT DSR. Results after 9th year revealed that the maximum system productivity in terms of rice-equivalent yield (21.37 t/ha), system water productivity (1.01 kg rice equivalent grain/m3) and net returns (Rs. 2,43,022/-) was recorded in puddle transplanted rice-ZT mustard-ZT maize cropping system and minimum (12.95 t/ha, 0.61 kg rice equivalent grain/m3 and Rs. 1,74,746/-) with farmers

practice of puddle random transplanting rice-conventional till wheat system (Table 7). During the 10th year (2019), maximum rice grain yield 6.78 t/ha) was recorded with ZT DSR in CA-based rice-wheat and green gram system.

Table 7:Effects of long-term tillage, termination of zero-till and cropping system on system productivity, net returns and energetic

Treatment	System productivity (REY t/ha)	Water productivity (kg grain/m³)	Net returns (Rs/ha)	Energy output: input ratio (MJ)
Rice-wheat (conventional row transplanting)	13.47	0.64	1,81,883	8.76
Rice-wheat (conventional random transplanting)	12.95	0.61	1,74,746	8.62
Rice (MTR)-ZT wheat-ZT greengram	18.49	0.82	2,26,515	7.04
ZT DSR-ZT wheat-ZT greengram	16.83	0.71	2,12,341	7.54
ZT DSR-ZT mustard-ZT maize	19.06	0.75	2,20,417	5.93
CT DSR-ZT mustard-ZT maize	19.69	0.85	2,24,425	5.87
PTR-ZT mustard-ZT maize	21.37	1.01	2,43,022	6.07
UPTR-ZT mustard-ZT maize	20.13	0.82	2,24,435	6.06
LSD (P=0.05)	2.13	0.09	39,014	0.78

[PTR-Puddled transplanted rice, UPTR-Unpuddled transplanted rice, *ZT DSR Zero till Direct Seeded Rice]

EVENTS ORGANIZED

Training Programme on Selection and Operation of Farm Implements for Improving Crop Productivity

A three-day training programme on selection and operation of farm implements for improving crop productivity was organized at ICAR-Research Complex for Eastern Region, Patna under Consortia Research Platform on Farm Mechanization and Precision Farming during 21-23 August, 2019. A total of 31 farmers from Nalanda district of Bihar participated in the training programme. Participants were briefed about setting up of custom hiring centres and its benefits for the farming community in the region. They were also trained in calibration of seed cum fertilizer drill.

Recent Innovations in Climate Smart Technologies in Agriculture and its upscaling strategies

A five-day training course on "Recent innovations in climate smart technologies in agriculture and its up-scaling strategies" sponsored by MANAGE, Hyderabad was organized by ICAR-RCER, Patna during 18-22 September, 2019. The training was inaugurated on 18 September, 2019 by the Chief Guest, Dr Jitendra Prasad, Director, Bihar Agricultural Management & Extension Training Institute (BAMETI), Patna. Dr Shailendra, Deputy Director (Behavioural Sciences), MANAGE, Hyderabad was also present along with other

faculties of the institute. All the dignitaries interacted with participants on climate related issues and adaptation and mitigation strategies for climate smart agriculture. A total 17 numbers of field level extension functionaries from Bihar and Uttar Pradesh attended the training.

Short Course on Conservation Agriculture for Climate Resilient Farming & Doubling Farmers Income

A ten-day short course on "Conservation Agriculture for Climate Resilient Farming & Doubling Farmers Income" sponsored by ICAR, New Delhi was organized at ICAR-Research Complex for Eastern Region, Patna during 14-23 October, 2019. Dr R.C. Agrawal, DDG (Education), ICAR-New Delhi and Registrar General, PPV & FRA was the Chief Guest of the function. Dr S.S. Singh, Director, ATARI-Kolkata and Dr V.K. Singh, Head, Division of Agronomy, Indian Agricultural Research Institute, New Delhi were the Guests of honour. Dr B.P. Bhatt, Director, ICAR-RCER Patna highlighted that the Institute is involved in developing, refining and popularizing the RCTs for climate resilience and increasing farmers' income in eastern IGP since its inception. Dr R.C. Agrawal, the Chief Guest of the function, in his inaugural address emphasised on the importance and need of such training programmes for the scientists of SAUs and ICAR institutions. He further emphasised on the importance of resource conservation as well as conservation of genetic resources for development of stress tolerant crop varieties. He also shared his experiences of working in PPV& FRA related to conservation of genetic stock/materials/cultivars. This training was attended by 17 participants from the different states like Tamil Nadu, Karnataka, Rajasthan, Jharkhand, Uttar Pradesh and Bihar.

Policy Dialogue on Role of Livestock and Fisheries in Doubling Farmers' Income in Eastern India

A policy dialogue on "Role of Livestock and Fisheries in Doubling Farmers' Income in Eastern India" was organized at ICAR-Research Complex for Eastern Region, Patna on 24th October, 2019. Sh. Giriraj Singh, Hon'ble Minister for Fisheries, Animal Husbandry and Dairying, Govt. of India was the chief Guest of this programme. Sh. Giriraj Singh, in his address stressed upon production and use of earthworms as feed supplement for low input poultry production. He also urged to research institutions to adopt low input livestock production system and add value to the manure, cow urine and crop-by product through technological intervention. During his interaction with all the scientists, he shared his experiences on production of earthworms using cow dung and use of whey- water and moringa leaves for increasing milk yield if fed to cattle and buffaloes. He reiterated that moringa leaves can be utilized as organic fertilizer as it contains sufficient amount of nitrogen. On this occasion a training manual on "Conservation Agriculture for Climate Resilient Farming & Doubling Farmers Income" was also released by Hon'ble Minister. Earlier,

Sh. Giriraj Singh monitored the field experiments being conducted at ICAR-RCER, Patna and appreciated the efforts made by the scientists. He suggested for large scale plantation of moringa tree in the campus and experimentation of fresh water prawn culture. Among various fish species, he stressed on popularization of indigenous fish, especially Mangur in eastern part of India.

At the outset, Dr BP Bhatt, Director, ICARRCER, Patna welcomed the Chief Guest, Sh. Giriraj Singh and made a brief presentation on activities and achievements of Institute focusing on livestock and fisheries sector. Nearly 50 Scientists from ICAR-RCER, Patna and Bihar Animal Sciences University, Patna participated in this programme.

Field Day-cum-Training Program

Field day-cum-training programs on "धान का पुआल प्रबंधन" was organized by ICAR Research Complex for Eastern Region (ICAR-RCER), Patna under the project "Scaling up Climate Smart Agriculture (CSA) through Mainstreaming Climate-Smart Villages (CSVs) in Bihar" on 25th October 2019 at two villages namely Lodipur (Nagarnausa cluster) and Dasturpar (Chandi cluster) of Nalanda district. More than 50 farmers participated in each villages. Farmers were apprised about the management practices followed in growing direct-seeded rice. The youth facilitators, as well as farmers, were also apprised about the grave situation of stubble burning, paddy straw management, use of happy seeder and zero tillage machines. Addressing the farmers, Dr. J.S. Mishra, Head, Division of Crop Research, ICAR RCER, discussed the benefits of DSR and its agronomic management. Dr. Abhay Kumar, Principal Scientist, ICAR RCER, gave detailed information about the management of paddy straw and advised farmers to shun from burning the paddy stubble. Sh. Tarkeshwar Ram, Block Agriculture officer, Nagarnausa was also present and informed farmers about the subsidies and other benefits provided by state Government to farmers. Dr. Prem K Sundaram, Dr. Anirban Mukherjee, and Dr. N. Raju Singh, were also present and discussed farmers on various issues. Participating farmers shared their experiences and provided valuable feedbacks also.

Training Programme on Zero Tillage in Wheat

Four days training programme on 'Zero Tillage in Wheat' was organized during 18-21 November, 2019 for farmers of four blocks of Patna and Nalanda districts at ICAR-Research Complex for Eastern Region, Patna under Consortia Research Platform on Farm Mechanization and Precision Farming (CRP on FM & PF) and Scaling up Climate Smart Agriculture through Mainstreaming Climate Smart Village in Bihar. Total of 88 farmers: 26 from Fatuha block and 23 farmers from Daniyawan block of Patna district; 21 farmers of Nagarnausa block and 18 from Noorsarai block of Nalanda district actively participated in the training programme. The programme was inaugurated by Dr. J. S. Mishra, Head, Division of

Crop Research. He appraised the farmers about the conservation agriculture and crop residue management in wheat. Dr. P.K. Sundaram emphasized about the importance of ZT concept and its importance in rice-wheat cropping system. Farmers were imparted training on calibration, operation, maintenance of zero tillage machine and benefits of zero tillage in wheat.

Field day on Zero-till Wheat

Three field days were organized on 'Zero-till Wheat' at villages Kopwaon and Mungaon Dumraon block) and Hukahan (Sondhiya block) in Buxar district during 25-27 November 2019 under CRP on FM & PF project funded by ICAR. Scientists from ICAR RCER Patna, KVK, Buxar and state officials briefed the farmers about the benefits of using ZT in wheat. Dr. P.K. Sundaram, Scientist from ICAR RCER, Patna appraised the farmers about the operation, maintenance and calibration of ZT seed drill. Live demonstration of the ZT seed- cum fertilizer drill was also conducted at farmers' field. Also, extension folders published under the project on zero seed cum fertilizer drill were distributed among farmers. Sh. K.M. Chaudhary (BAO), Sh. S.D. Yadav (AC), Dr. Ramkewal (SMS) and Dr. Deokaran (SMS) from KVK, Buxar also interacted with the farmers. They motivated the farmers to use this machinery for the sowing of wheat in larger area. Total of 105 farmers participated in the training program/field day.

Model Training Course on Advances in Marketing and Supply Chain Management of Agricultural Produce

ICAR Research Complex for Eastern Region, Patna organised an eight-days Model Training Course during 10-17 December, 2019 for officials of development departments from different states. The training was sponsored by Directorate of Extension, Ministry of Agriculture and Farmers Welfare, Govt. of India. Seventeen agricultural and horticultural officers from Bihar, Gujrat, Haryana, Ladakh, Punjab and Sikkim participated in this training programme. The training was inaugurated on 10th December 2019 by Chief Guest, Prof Hemnath Rao H, Senior Professor and Director, Development Management Institute. Professor Rao appreciate effort of the institute for the organizing Events Organised such national level event with limited resources. He emphasized on development of techno-managerial approach.

Model Training Course on Recent Advances in Horticulture and Post-harvest Technologies for Livelihood Security

An eight-day Model Training Course on "Recent advances in horticulture and post-harvest technologies for livelihood security" was organized by the ICAR-Research Complex for Eastern Region, Patna from 19-26 December 2019. The programme sponsored by the Directorate of Extension, Ministry of Agriculture & Farmers Welfare, Government of India. Nineteen officials from the Agriculture/Horticulture Departments of Gujarat, Bihar, Punjab, Uttar Pradesh, Dadar Nagar Haveli and Laddakh participated in the course. Mr. Sunil Kumar Pankaj, Joint Director, Horticulture, Patna (Bihar) and Chief Guest, inaugurated the programme on 19 December 2019. Mr. Pankaj highlighted the importance of horticulture in Eastern India and also stressed the current rate of adoption of recent technology by farmers. Chief Guest also released a training manual based on the training course. During training programme, in addition to conventional topic various new techniques such as, vertical farming, microgreens, use of solar energy in horticulture, technologies for the cold arid zone, vegetable grafting, etc has been discussed. This training also included field visits of commercial strawberry cultivation in Nagarnausa, Nalanda and exposure to centre of excellence on Horticulture at Chandi, Nalanda, Bihar.

Training programme on Recent Advances in Integrated Fish Farming

ICAR-Research Complex for Eastern Region (ICAR-RCER), Patna organised two 5-days farmers' training programme on "Recent Advances in Integrated Fish Farming" during 2-6 Aug 2019 and 03-07 September 2019 sponsored by Directorate of Fisheries, Govt. of Bihar. The main purpose of the training was to develop the skills and to make aware the farmers about integrated fish farming practices. A total of 60 trainees from Bunka and Lakhisarai districts (Bihar) participated in the training programme. The trainees were provided hands-on training on designing of fish farm, seed rearing, fish seed stocking, pond management, water quality management, management of livestock and different aspects of integrated fish farming.

Awareness Programme on Fish Disease Surveillance and Management in Bihar

Two awareness programmes on 'Fish Disease surveillance and Management in Bihar' were organized at village Baghat, Manigachhi block, District Darbhanga and Mutlupur village, Muzaffarpur, on 29 March, 2019 and 04 August, 2019, respectively, in collaboration with department of fisheries, District Darbhanga and Muzaffarpur under the "National Surveillance Program for Aquatic Animal Diseases" project. The main objective of the program was to sensitize fish farmers about the fish diseases and its management strategies. A total of 96 participants attended the programme.

New Joining

Scientist

Dr. Jyoti Kumar, Scientist (Vet. Microbiology) w.e.f. 25.11.2019
Dr. Rachana Dubey, Scientist (Environmental Science) w.e.f. 02.12.2019
Dr. Rohan Kumar Raman, Scientist (Agril. Statistics) w.e.f. 02.12.2019

Administration

Mr. Nagendra Kumar, Assistant w.e.f. 01.10.2019
Mr. Keshav Kumar, Assistant w.e.f. 14.10.2019

Promotion

Scientist

Dr. Manibhushan, Scientist (Computer Application) promoted to Scientist (Level-13A) w.e.f. 30.12.2013
Dr. Pankaj Kumar, Sr. Scientist (Vet. Med.) promoted to Sr. Scientist (Level- 13A) w.e.f. 08.01.2019
Dr. S.J. Pandian, Scientist (Vet. Med.) promoted to Scientist (Level-12) w.e.f. 08.01.2017
Dr. S.S. Mali, Scientist (SWCE) promoted to Sr. Scientist (Level- 12) w.e.f. 12.06.2017.
Dr. P. Bhavana, Scientist (Plant Breeding) promoted to Sr. Scientist (Level- 12) w.e.f. 21.04.2018.
Dr. Santosh Kumar, Scientist (Plant Breeding) promoted to Sr. Scientist (Level- 12) w.e.f. 23.06.2018
Dr. P.K. Sundaram, Scientist (FMP) promoted to Scientist (Level- 11) w.e.f. 15.12.2014

Technical

Mr. Abhishek Kumar, Sr. Technical Officer promoted to Assistant Chief Technical Officer w.e.f. 05.04.2016
Late Sunil Rajak, Sr. Technical Assistant promoted to Technical Officer w.e.f. 15.09.2017

Transfers

Dr. Tania Seth, Scientist (Vegetable Science) transferred to ICAR-CIBA, Bhubaneshwar w.e.f. 16.11.2019
Dr. V. Dwivedi, Sr. Scientist & PC, KVK, Buxar transferred to KVK, Bhadoi w.e.f. 10.12.2019
Dr. S. Maurya, Scientist (Plant Pathology) transferred to ICAR-IVRI, Varanasi w.e.f. 13.12.2019.

Retirements

Dr. J.J. Gupta, Pr. Scientist. (Animal Nutrition) upto 31.10.2019
Dr. S.K. Singh, Pr. Scientist (Agronomy) upto 31.12.2019
Mr. B. P. Mishra, Senior Technical Officer (Farm) upto 30.11.2019
Mrs. Bigni Kachhap, SSS w.e.f. 31.07.2019
Ms. Sumi Lakra, SSS w.e.f. 31.08.2019
Mrs. Ratni Toppo, SSS w.e.f 31.12.2019

Editorial Committee

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