ICAR Research Complex for Eastern Region, Patna

भारतीय कृषि अनुसंधान परिषद् का पूर्वी अनुसंधान परिसर, पटना

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"Our mandate is to undertake strategic and adaptive research for efficient integrated management of natural resources to enhance productivity of agricultural production systems in Eastern India"

ICAR Research Complex for Eastern Region is a multi-commodity and multidisciplinary institute catering to the eastern states of India. Eastern India is endowed with natural resources. However, in terms of agricultural productivity and livelihood status, it is still far away from the national average. The region has about 71% marginal farmers, small and fragmented landholdings, lack of mechanization, the lowest per capita income, the highest population density, poor infrastructure facilities for storage, processing and marketing, limit adoption of modern farming practices in the region.

Eastern region comprising of Chhattisgarh, Jharkhand, Assam, Bihar, Eastern Uttar Pradesh, Odisha and West Bengal accounts for nearly 82% of the total rice-fallow area (11.7 m ha) of the country. These areas are suitable for intensification with a short duration (≤3 months), low water-consuming grain legumes such as chickpea, lentils, blackgram, greengram, and oilseeds viz. linseed and safflower, to improve smallholder farmer's incomes and soil health. With appropriate planning and policy interventions combined with efficient crop production technologies, these fallow lands could be converted in to productive lands in a phased manner. Even if 50% (~ 5.0 m ha) of the rice fallows in eastern India with minimum of 0.5t/ha pulse productivity could be brought under pulses, an additional production of 2.5 m tones could be added in national pulse basket, besides improving the soil health. This additional pulse production will not only cut foreign exchange incurred on the import, but also provide nutritional security to weaker sections of the society.

B P Bhatt
Director

Research Highlights

Energy Balance in Conservation Agriculture

Conservation agriculture (CA) is getting importance among the farmers, researchers and policy makers due to its higher resource use efficiency. Energy remains a critical input in determining the feasibility of conservation agriculture practices at farm scale. Higher energy output to input ratio is an indicator of sustainability of the crop production. The energy budget analysis of the conservation agriculture trials in paddy conducted at the ICAR RCER, RC Ranchi revealed that the input energy under farmer practice, DSR and Zero-till transplanting (ZTT) was 9783.4, 8906.7 and 8526.5 MJ, respectively. The CA practices recorded 9 to 13 % saving in input energy as compared to farmers practice.

Conservation Agriculture in farmers' fields

The highest input-output energy ratio (15.6) was recorded in DSR. The energy conversion ratio for winter crops cultivated after rice had the highest output-input energy ratio. Mustard and greengram recorded the ratio of 2.2 and 1.9 as compared to farmer practice of 1.4 and 1.5, respectively. Higher output-input ratio under CA practices indicates the potential of this practice in improving the energy use efficiency in Indian agriculture.

(BK Jha, SK Naik and SS Mali)

Carbon Sequestration Potential of Mango Orchards

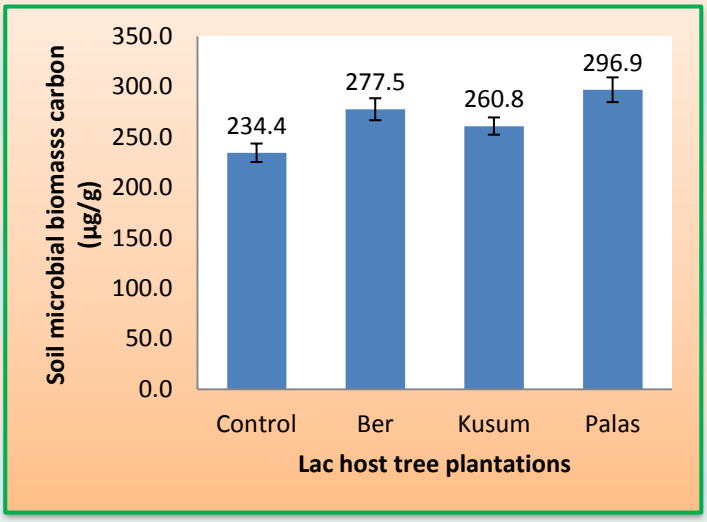
The mango orchards grown in eastern plateau and hill region of India help to meet the diverse needs of food, fodder, fuel wood and timber besides producing significant biomass. These orchards also make an important contribution towards C stock by atmospheric CO_2 sequestration. Results revealed that the carbon sequestration potential of mango orchards varied from 0.57 Mg ha^{-1} in 2 year to 11.04 Mg ha^{-1} of CO_2 in 10 year old orchard. Hence, the non-destructive estimation of biomass carbon with best fitted Gompertz model has the implications with respect to protect mango orchards from destroying the plant for C-estimation, thus limiting CO_2 emission and ultimately global warming. The component wise biomass models developed in the present investigation are likely to be useful to the farmers of mango growers for estimation of standing biomass productivity and biomass carbon stock at any stage of growth before harvesting, by simply measuring the collar diameter values.

(SK Naik)

Soil microbial Biomass Carbon (SMBC) under Lac-host Tree Plantations

The soil microbial biomass carbon (C_{mic}), which normally constitutes about 1-5

% of the C_{tot}, can provide an early warning for a possible degrading and/or aggrading effect of different management practices on soil quality. The C_{mic} in surface soil varied significantly ($P \leq 0.05$) among the tree plantations (Fig. 1). The maximum and significant ($P \leq 0.05$) C_{mic} was 297 mg kg^{-1} recorded in Palas plantations followed by Ber plantations (277.5 mg kg^{-1}) and resulted in 26.6 % increase over control (No plantations). The lower value of C_{mic} in the control seemed to be related to its unfavorable environment arising out of depletion of nutrients following without any leaf litter, while a higher value in the tree plantations was due to its congenial environment for microbial growth for C enrichment through leaf litter addition.



Microbial biomass carbon in soils of different Lac host tree plantations in EPH region of India

Further, the higher C_{mic} in palas and ber plantations was attributed to the quantity and quality of litter with higher rate of decomposition, greater availability of nutrients due to the addition of higher plant quality.

(S K Naik and S Maurya)

Analysis of Farmers' Profitability under Pond System of Makhana Cultivation

Makhana (*Euryale ferox* salisb.) is a major aquatic cash crop largely grown in lowlands of North Bihar. Darbhanga, Madhubani, Purnea and Katihar are major makhana producing districts of Bihar. A survey of makhana growers was carried out in Darbhanga and Madhubani to study the cost of cultivation and analyze the profitability to farmers under pond system of makhana cultivation.

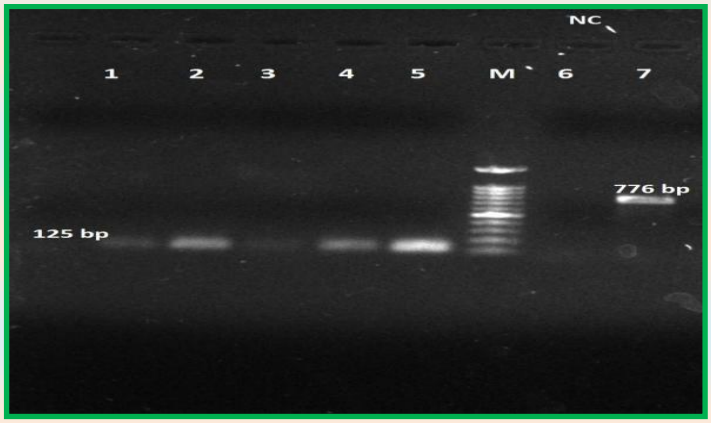
The average cost of makhana cultivation was estimated at □ 88, 300/ha. Collection of Makhana seed from the bottom of pond is a highly labour intensive process. Therefore, harvesting cost was highest which contributed nearly 40.9% of total cost followed by lease charges for pond (14.8%) and labour charges for cleaning, planting and weeding (10%). Makhana growers were not involved in processing of seed to popped lava. They sold makhana seed, locally known as *Gudi* at a price of Rs. 65,830/ton. The average yield of Makhana seed was found to be 1.96 ton/ha. The net profit earned by farmers was □ 40,727/ha under pond system of makhana cultivation.

(Dhiraj K Singh)

Report of *Theileria orientalis* from Crossbred Cattle of Bihar, India

In India tropical theileriosis is the most common form of bovine theileriosis caused by *Theileria annulata*. However, reports of bovine theileriosis due to *Theileria orientalis* which was previously considered as non-pathogenic or benign from states of Assam, Maharashtra, Andhra Pradesh, etc.

Interestingly, *T. annualta* and *T. orientalis* are transmitted by two different types of ticks. It is difficult to differentiate based on most commonly used Geimsa staining screening test. Molecular differentiation and identification can be made based on PCR using specific primers. In the present study, theileriosis in cross breed cattle of Danapur in Patna District, due to *T. orientalis* has been identified using major piroplasm surface protein (MPSP) gene of *T. orientalis* by PCR at 776 bp.



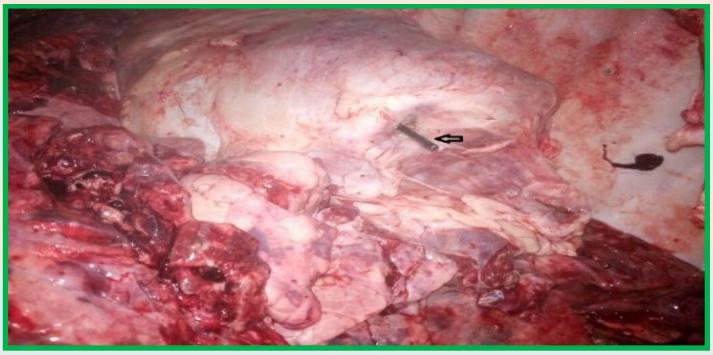
Lane 1 to 5 positive for T. anulata at 125 bp fragment using 18S rRNA gene and Lane M as marker (100 bp ladder), lane 6 as negative control (NC) and lane 8 positive for T. orientalis using MSPS gene

It signifies that theileriosis prevalent in bovine of Bihar is not only due to *T. annulata* but also may be due to *T. orientalis*. Further study in the direction is underway.

(Pankaj Kumar)

Traumatic Reticulo-pericarditis with Vena Caval syndrome: An Unusual Case in Water Buffalo (*Bubalis bubalis*)

An unusual case of vena caval syndrome also known as vena caval thrombosis caused due to traumatic reticulo-pericarditis is presented. An adult buffalo of about seven years age had symptoms of respiratory distress. It was followed with loss of body condition, coughing, occasional pyrexia, tachypnoea, and jugular pulse. The animal died suddenly with signs of hemoptysis and hematemesis. Post-mortem finding was indicative of Vena Caval Syndrome with characteristic findings of metastatic pneumonia with multifocal pulmonary abscesses, blood clots from ruptured blood vessels. Grossly the heart was enlarged.



Gross picture of Heart showing blunt object (Arrow) lodged in pericardial sac in hardware disease

The pericardium was thickened and pus filled cavity had formed between epicardium and pericardium. A cylindrical blunt object was recovered from pericardial sac confirming the hardware disease. The generalized distribution of these lesions in lungs indicated possible hematogenous spread of the infection.

(Pradeep K Ray)

Rice Genotypes for Drought Stress Tolerance

Forty eight rice genotypes comprises of advanced breeding lines and check varieties were evaluated during *Kharif* season 2018

under stress (drought at reproductive stage) and non-stress (irrigated) condition.

Screening of rice genotypes under drought stress and control condition

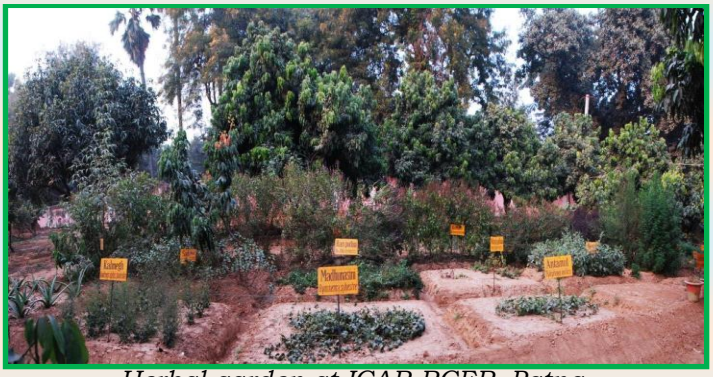
Results revealed that eight rice genotypes viz., IR 90257-B-577-1-1–B (4.05 t ha^{-1}), IR 95817-5-1-1-2 (4.02 t ha^{-1}), IR 107891-B-B-447-3-1 (3.75 t ha^{-1}), IR14L157 (3.51t ha^{-1}), IR 107891-B-B-1284-2-1 (3.49 t ha^{-1}), IR14L362 (3.44t ha^{-1}), IR 106312-50-1-1-1 (3.33t ha^{-1}) and IR14L613(3.32t ha^{-1}) showed significantly (p=0.05) better drought tolerance at reproductive stage as compared to checks MTU 1010 (2.61t ha^{-1}), IR64 (2.37 t ha^{-1}), Swarna Shreya (3.12 t ha^{-1}) and Sahbhagi Dhan (3.03 t ha^{-1}).

(Santosh Kumar and SK Dwivedi)

Collection and Conservation of Germplasms of Medicinal and Aromatic Plant

Thirty six medicinal and aromatic plant species were collected from various part of the country. Among them twenty nine plant species were collected from Directorate of Medicinal Aromatic Plants Research, Anand, Gujarat. Rest five and three plant species were collected from Patna, Bihar and Howrah, West Bengal, respectively. They are being maintained under a home garden situated at ICAR-RCER, Patna.

Their performance is being studied under fruit orchard as lower storied crop. The well performing plant species are Manducaparni (Scientific name: *Centella asiatica*, use: Brain tonic for improving memory and for overcoming mental confusion, stress etc.), Brahmi (Scientific name: *Bacopa monnieri*, use: Improves intellect, epilepsy, insanity, nervous diseases, ulcers, indigestion etc.), Satavari (Scientific name: *Asparagus racemosus*, Use: dysentery, tumours, inflammations, biliousness) and Ghrit Kumari (Scientific name: *Aloe vera*, use: purgative, emmenagogue; topically emollient, anti-inflammatory, antimicrobial etc.).



Herbal garden at ICAR-RCER, Patna

(Tanmay K Koley, Nongmaithem R Singh)

An Alternate Way of Increasing Productivity of a Water-logged Area

About 4.5 ha area of the Research Farm of ICAR-RCER, Patna is allocated for growing cultivated fodder which is affected by runoff water generated from the adjacent catchment area (about 10 ha with runoff coefficient of 0.5) of Jay Prakash Narayan Airport, Patna. The annual rainfall of Patna

is about 1200 mm and high-intensity rainfall (greater than 100 mm per day) is common in this area during monsoon (June–September). This causes generation of runoff water from the catchment area and its subsequent accumulation in the farm area which is the prime reason for crop failure during *Kharif*. The maximum expected runoff that would be generated from a heavy storm was worked out which could be accommodated by the drainage management plan. Drainage management plan comprised of surface drain, two pasture based land units namely Raised and Sunken Fodder Production Unit (RSFPU) and Goat-Fish Pasture Integration Unit (GFPIU). Surface drain (0.45 ha) diverted water into RSFPU (0.67 ha) and subsequently to GFPIU (0.33 ha). Finally, the excess water from the GFPIU was diverted to the fish pond (0.09 ha).

This whole system (total area allocated 1.54 ha) could accommodate a runoff volume of 13770 m^3 which is equivalent to the occurrence of 355 mm rainfall in the catchment area. Fodder water productivity in RSFPU and GFPIU were calculated to be 20.28 and 29.29 kg/m^3, respectively whereas fish water productivity in GFPIU and fish pond were 0.33 and 0.18 kg/m^3, respectively.

(Akram Ahmed)

Makhana and Water Chestnut Germplasm Evaluated

Ten germplasm were evaluated based on yield and morphological characters. The number of fruits per plant varied from 7.22 (Manipur-9) to 13.20 (Superior Selection-1) and flowering period was about 42 days. The number of seed/plant varied from 82.4 in Manipur-2 to 102 in Selection-27 and Superior Selection-1. Superior Selection-1 registered the maximum harvestable yield of 4.9 t/ha, where as Manipur-9 recorded the lowest yield (1.8 t/ha) Superior Selection-1 was early maturing (3.92 months) promising high yielding makhana cultivar for the wet land ecosystem of North Bihar.

Superior Selection -1: Big size fruit, Seed no/fruit> 100/fruit

In case of water chestnut germplasm, Green Spineless variety of water chestnut produced large quality nut (24.42 g) and recorded maximum yield of 12.24 t/ha.

Green colour spineless water chestnut

The Spineless Red variety exhibited the maximum TSS of 9.70B followed by Green Spineless which had TSS of 9.20B, was found resistant to water chestnut beetle (*Galerucella birmanica* Jacoby) and aphid.

(BR Jana and IS Singh)

Water, Nutrient and Weed Management Practices Effects on Rice under SRI

Results revealed that soil moisture saturation throughout crop duration and application of soil test based nutrients + 5t/ha FYM + Green Manure + Bio fertilizer + weed management through cono weeder 3 times recorded the maximum grain yield of rice (6.01 t/ha) under SRI.

(SK Singh, Ajay Kumar and Bikas Sarkar)

EVENTS ORGANIZED

Training Programme on "Recent Advances in Integrated Fish Farming"

The ICAR-Research Complex for Eastern Region (ICAR-RCER), Patna organised a 10-days farmers' training programme on "*Recent Advances in Integrated Fish Farming*" during 04-13 July 2018 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 25 trainees from Buxar district (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.

Another programme was organized during 22-31 August, 2018 in which 25 trainees from Rohtas district (Bihar) participated.

Web Telecast of Prime Minister Interaction Programme with Self Help Groups

Krishi Vigyan Kendra, Buxar arranged the Web telecast of Prime Minister Interaction programme with farmers on 12th July 2018. Total 53 farmers and farm women

participated in the programme. Farmers were benefitted by the interaction of Prime Minister with different SHGs of different parts of the country and also made aware about how the SHGs were adopting innovative new technologies and practices in agriculture and doubling their incomes.

Webcast of hon'ble prime minister before farmers

A similar programme was also organized at Gargali village, Mandu block, Ramgarh, from which more than 100 SHG members and women farmers were benefitted.

Awareness Programme on Fish Disease Surveillance and Management in Bihar

An awareness programme on fish disease surveillance and management in Bihar was organized on 25.08.2018 at village Dighara Rampur under Mushahri block, district, Muzaffarpur, Bihar by ICAR Research Complex for Eastern Region, Patna in collaboration with department of fisheries, District Muzaffarpur under the "National Surveillance Programme for Aquatic Animal Diseases" project.

Farmers' Hostel at KVK, Ramgarh inaugurated

Farmers' hostel was inaugurated by Dr. Trilochan Mohapatra, DG (ICAR) & Secretory (DARE) on 25th August 2018 at ICAR-RCER, KVK, Ramgarh. Dr. B P Bhatt, Director, ICAR-RCER, Patna welcomed chief guest, other dignitaries and farmers. He apprised about the achievements of KVK in the last year. On this occasion farmer-scientist goshti was also organized. Hon'ble Chief Guest suggested that there is an urgent need to address the climate change effects and decreasing water table. He gave emphasis to work with all the line departments in convergence mode for effective implementation of schemes.

Model Training Course on Conservation Agriculture: Mitigating Climate Change Effects & Doubling Farmers Income

Model training course on "*Conservation Agriculture: Mitigating Climate Change Effects & Doubling Farmers Income*" was successfully organized at ICAR Research Complex for Eastern Region, Patna during 11-18th September 2018. Twenty three participants from different States participated in the programme.

Several experts working on Conservation Agriculture and Climate Change sector interacted with participants and shared their ideas for profitable farming and linking it with sustainable agricultural production system. Visit to long term CA field of BISA, Pusa, IARI RS Pusa and ICAR-Main research fields were also organized.

Training Programme on Tools and Implements for Weed Management

Three days training program on "*Tools and implements for weed management*" was conducted under CRP on Farm Machinery and Precision Farming at KVK, Ramgarh, Jharkhand from 24-26 September 2018. Total 48 farmers took part in this training programme. Farmers also visited Semina Agro Pvt. Ltd. Ranchi, a manufacturer of small tools used in agriculture. A similar programme was also conducted at KVK, Buxar, Bihar from 27-29 September 2018. Twenty five farmers took part in this training programme.

Exposure visit of farmers to small tools and implements manufacturer at Ranchi

150th Birth Anniversary of Mahatma Gandhi Celebrated

On the Occasion of Mahatma Gandhi's 150th Birth Anniversary, Shri Radha Mohan Singh, Hon'ble Union Minister of Agriculture & Farmers Welfare unveiled a large statue of Mahatma Gandhi for general public and laid the foundation stone of Farmer's Hostel and Training Hall of Mahatma Gandhi Integrated Farming Research Institute, Motihari on 2nd October, 2018 at the institute campus in Piprakothi (Motihari). Honb'le Minister also inaugurated a Farmers-Scientist interaction programme during this occasion.

In his inaugural address, Hon'ble Chief Guest, Shri Radha Mohan Singh narrated many inspiring quotes of Mahatma Gandhi and his vision about the farmers' welfare and sanitation. He urged farmers to take advantage of agricultural development schemes launched by the Government, like Pradhan Mantri Fasal Beema Yojna, Rashtirya Krishi Vikash Yojana, Gokul Mission, Integrated Farming System, Irrigation schemes etc. A Swachchhata Pledge was also taken by all the participants facilitated by the Chief Guest. Shri Pramod Kumar, Hon'ble Minister of Tourism, Govt. of Bihar graced the occasion as the Guest of Honour. Dr. B.P. Bhatt, Director, ICAR-RCER, Patna and OSD, Mahatma Gandhi Integrated Farming Research Institute, Motihari welcomed the Chief Guest and other dignitaries. Public representatives of East Champaran district; Mr Akhilesh Prasad, non-official member of Governing Body, ICAR, New Delhi; Dr S Bhaskar, ADG (AAF & CC) ICAR, Dr. Vishal Nath, Director, NRC Litchi, Muzaffarpur; Dr. Anjani Kumar, Director, ATARI, Patna and Dr B. Singh, Director, IIVR, Varanasi, Officials of Central and State Government and Scientists of ICAR institutes and more than 6000 of farmers participated in this event.

Training Programme on Land & Water Management, Climate Change and its Impact on Agriculture

Five days training programmes on "*Land and Water Management, Climate Change and its Impact on Agriculture*" were organized during 03-07 September 2018 and 03-07 October 2018 at ICAR-RCER Patna. The training programme was sponsored by ATMA, Purnea. Thirty farmers from Purnea district, Bihar participated in this training programme. Farmers were apprised about various technologies of water management and informed about the

effect of climate change on crops, heat and drought stress occurring due to climate change.

Rooftop Solar Energy Harnessing Unit Inaugurated

Shri Chhabilendra Roul, IAS, Special Secretary DARE & Secretary, ICAR, New Delhi inaugurated 100 kWp Rooftop Solar Energy Harnessing Unit installed at the rooftop of main office cum laboratory building of ICAR Research Complex for Eastern Region, Patna on 12th September, 2018. Sri Roul emphasized on the use solar energy and advised to install rooftop systems in other government buildings to meet out their energy requirements. This 100 kWp solar unit is capable of generating 8000 – 15000 units of electricity per month which is sufficient to meet out the energy requirement of the entire campus of ICAR-RCER. Excess energy produced from the system will automatically be transferred to the local power grid. This system is installed under RESCO mode. Dr B P Bhatt, Director, ICAR RCER, Patna explained about the functioning of installed rooftop solar energy system.

Solar roof top power plant at ICAR Research Complex for Eastern Region, Patna

Hindi Chetna Maas

ICAR-RCER, Patna observed '*Hindi Chetna Maas*' on the occasion of '*Hindi Diwas*' 2018 from 14th September to 13th October, 2018. Prof.(Dr.) Bijay Kumar Singh, Director, Birla Institute of Technology, Patna inaugurated the '*Hindi Chetna Maas*' on 14th September, 2018. During the one-month programme, various competitions in Hindi, such as Essay writing, Hindi Typing, Hindi Grammar, Calligraphy, Antakshari, Hindi debate, Word meaning test and various other programmes including a three-day-Hindi workshop were held under the

supervision of Hindi committee members. The closing ceremony of 'Chetna Maas' was held on 12th Oct, 2018. Prof. Raman Trivedi, Director, Students welfare of Bihar Animals Science University, Patna (BASU) was the chief guest of the function. He discussed the importance of Hindi in our day to day life, and also stressed for working in Hindi as much as possible.

Valedictory function of Hindi Chetna Maas 2018

Training Programme on Operation, Repair and Maintenance of Motors and Pumps for Farm Operation

A three days training programme on "*Operation, Repair and maintenance of motors and pumps for farm operation*" was conducted from 09-11 October 2018 at ICAR RCER, Patna. Twenty farmers took part in the training programme. They were apprised about the common troubleshooting of pumps and motors commonly used in agriculture.

Active participation of farmers in training programme on Operation, Repair and Maintenance of motors and pumps

Farmers-Scientist Interaction and Animal Health Camp

Four animal health camps were organized by KVK, Ramgarh at Arakata village, Mandu, Ramgarh on 10th October 2018. During the programme 100 animals (cattle and buffalo) was treated and vaccinated (FMD) and detail information about animal health issues were provided. Medicines for animals were also distributed during the programme.

Rastriya Mahila Kisan Diwas

KVK, Mandu, Ramgarh (Jharkhand) celebrated Rastriya Mahila Kisan Diwas on 15th November 2018 at Nawadih Panchayat Bhawan of Mandu block. Women farmers were explained about their roles and activities in agriculture and allied sector like mushroom cultivation, livestock, poultry and fish production.

Training Programme on Selection, Operation and Maintenance of Harvesting and Threshing Equipment

A 3-days training program on "*Selection, operation and maintenance of harvesting and threshing equipment*" was conducted under CRP on Farm Machinery and Precision Farming at KVK, Ramgarh, Jharkhand from 19-21 November 2018. Forty farmers from Jharkhand participated in the training programme.

Farmers were also apprised about various tools/implements used in agriculture during exposure visit to Department of Agricultural Engineering, Birsa Agriculture University, Ranchi.

Model Training Course on Advanced Technological Interventions for Livelihood Improvement of Resource Poor

A Model Training Course on "*Advanced Technological Interventions for Livelihood Improvement of Resource Poor*" was conducted during 22-29 November, 2018. The course was sponsored by Directorate of Extension, Ministry of Agriculture and Farmers Welfare, Govt. of India. Altogether 21 participants from State Development Departments, ICAR Institutes, SAUs, and KVKs participated in this training program. A total of 31 theory classes and 04 field visits were organized during the course.

Training focused on various advanced technologies in agriculture and allied sector capable of increasing the productivity, profitability and livelihood improvement of resource poor farmers.

Awareness program on "Brucellosis and other Zoonatic disease"

Awareness programme on "*Brucellosis and other zoonatic disease*" was organized at Rampur-kala, Phulwaria Block, Gopalganj on 5.12.2018. Many farmers from nearby areas participated and interacted with scientist.

World Soil Day

World Soil Day was celebrated at ICAR RCER, Patna on 5th December, 2018. More than 40 farmers attended the program out of which 30 farmers were provided with Soil Health Cards. Shri Sanjeev Chaurasia, Member of legislative Assembly was chief guest at the occasion.

Distribution of Soil health card at ICAR RCER, Patna

World Soil Day *cum* pre-*Rabi Kisan Mela* was also organised by KVK Ramgarh on 5th December 2018 jointly with Development Commissioner Ramgarh at collectorate office auditorium. A short film was displayed and soil health card and pamphlet was distributed during the celebration of programme. Soil health Cards were also distributed on the occasion. During the program DDC, DAO, Project Director, ATMA and Soil Conservation officer, District Dairy development Officer and District Animal Husbandry Officer were also present.

Word Soil Day organised by KVK, Ramgarh

Krishi Vigyan Kendra, Buxar also celebrated World Soil Day by organising one day training cum awareness programme on "*Soil health management*" on 5th December 2018. DAO and PD, ATMA distributed soil health cards to 55 farmers.

Field Day on Pigeonpea

Field day was organized at Bhudhakhap, Mandu block, Ramgarh on 07.12.2018. It was organised near the field of cluster of

pigeon pea crop. The KVK staff, NGO members (Srijan foundation, Ramgarh) and more than 200 farmers were present. The farmers were apprised about use of barren land for pulse crop, plant protection, role of Self Help Group in agriculture and use of undulated, barren and upland for agroforestry and fruit plantation. Srijan foundation, Ramgarh (NGO) also interacted with farmers and gave suggestion for linkage of KVK with other department for better cooperation and farmer's welfare.

Field Day on Horsegram

A field day was organized under Cluster Front Line Demonstration on Horse gram crop on 22nd December 2018 at Rakua village, Gola block, Ramgarh. KVK, Ramgarh staff and other line departments ATMA and PRADAN representatives were also present during the field day. Farmers were apprised about the technological intervention and technical gap in growing horsegram. It was suggested to adopt the latest technology for horse gram crop and increase area of fellow land with pulse crop. Farmer were provoked to cultivate the kharif pulse crops like horse gram, green gram, black gram and pigeon pea with technological intervention and soil testing. A farmers Scientist interaction was also held during the program for creating awareness about technology intervention given by Krishi Vigyan Kendra.

Pashu Arogya Mela cum Farmers–Scientists Interaction

A 3-days "*Pashu Arogya Mela -cum-Farmers-scientists interaction*" was inaugurated by Shri Radha Mohan Singh, Hon'ble Union Minister of Agriculture & Farmers Welfare at KVK, Piprakothi, Motihari on 23rd December, 2018. Free animal health camp was organized during 23-25 December, 2018. More than 40 organizations including

ICAR-IVRI, ICAR-NDRI, ICAR-IGFRI, DRRPCAU, Pusa, KVKs, COMFED etc, depicted their technologies for the farmers and other stakeholders. Farmers-scientists interactions were also organized during three days.

Krishi Kalyan Abhiyan at KVK, Ramgarh

Working in close coordination with line departments viz. D.A.O, ATMA, Animal Husbandry, Dairy, Soil conservation, Horticulture and NABAD, KVK, Ramgarh achieved 1st rank in Jharkhand and 2nd rank in country under "KKA-II (*Krishi Kalyan Abhiyan-II*) and 5th rank in Jharkhand 20th rank in country is under KKA-I (*Krishi Kalyan Abhiyan*-I). KVK, Ramgarh was the nodal agency for coordination and monitoring the activity of line department.

Swachh Bharat Abhiyan

Swachchhta Hi Seva activity by ICAR-RCER, Patna was organised during 15th September to 2nd October 2018. During the programme various types of activities related to swachchhta was organised at different places including ICAR RCER main campus, Patna and Baadipur village, Patna.

Different activities viz. Toilet pit-digging exercise, other toilet construction activities, cleaning of streets, drains and back alleys through awareness drives, organize waste collection drives in households and common or shared spaces, conduct door-to-door meetings to drive behaviour change organize awareness campaigns around better sanitation practices like using a toilet, hand washing, health and hygiene awareness etc. Students of Radiant International School were apprised about the importance of cleanness in our life.

At ICAR RCER, RC Ranchi, *Swachchhata Pakhwada* was observed from 16-31 December 2018. The centre carried out series cleanliness awareness campaigns in nearby villages, market places, tourist spots and in the villages adopted under *Mera Gaon Mera Gaurav* scheme. Other activities like experts' lectures, essay

writing, painting and quiz competitions were held for the staff and school students. The main aim of these activities was to create awareness about importance of cleanliness and hygiene among the residents of villages and school children. An awareness rally was carried out in collaboration with the students of Immaculate Heart of Merry School, Namkum Ranchi.

A similar programme was also organized by KVK, Ramgarh during 15/09/18 to 2/10/2018.

ACHIEVEMENTS/AWRDS

- Dr AK Singh, Head, RC Ranchi was awarded with the Fellowship of the prestigious National Academy of Agricultural Sciences for 2019.
- Dr. JS Mishra, Head (CR), ICAR RCER Patna was awarded with 'ISA Gold Medal' by the Indian Society of Agronomy.

During the 2nd *National Conference on Doubling Farmers Income for Sustainable and Harmonious Agriculture* (DISHA-2018), held at Ranchi during 11-12 August, 2018, following scientists received the various awards as:

- ❖ Dr AK Singh, Head, RC Ranchi- *Distinguished Scientist Award*
- ❖ Dr Bikas Das, Principal Scientist - *Outstanding Achievement Award*
- ❖ Dr Bikas Sarkar, Principal Scientist- *Distinguished scientist award*
- ❖ Dr Jaipal Singh Choudhary, Scientist (Entomology)- *Young Scientist award* and *Best Oral Presentation award.*
- ❖ Dr Mahesh Dhakar Scientist -*Best Oral Presentation Award*
- ❖ Dr Santosh Kumar, Scientist (Plant Breeding)- *Scientist of the year Award*
- ❖ Dr Santosh S Mali, Scientist (SWCE)- *Best Oral Presentation Award*

- Dr. Manibhushan, Senior Scientist- *Best research paper presentation award* in 8th International Conference on Agriculture,

Horticulture and Food Science held at New Delhi from December 29-30, 2018.

- Mrs. Prabha Kumari won Gold Medal in Javelin Throw (Women) in the ICAR Zonal Sports Tournament-2018 organized by ICAR - IINRG, Ranchi during 5-8th October, 2018.

Our new colleagues

- Er. Akram Ahmed joined as Scientist (Soil & Water Conservation Engg.) w.e.f. 06.07.2018 after getting transferred from ICAR-IGFRI, Jhansi.
- Dr. Anirban Mukherjee joined as Scientist (Agril. Extn.) w.e.f. 16.07.2018 after getting transferred from ICAR-VPKAS, Almora.
- Dr. Kumari Subha joined as Scientist (Vegetable Sc.) w.e.f. 16.07.2018 after getting transferred from ICAR-NBPGR, New Delhi.
- Mr. Umesh Kumar Mishra joined as T-3 (Hindi Translator) w.e.f. 06.08.2018.
- Mr. Abhishek Kumar joined as T-1 (Lab Technician) w.e.f. 13.12.2018.
- Mr. Alok Kumar joined as T-1 (Field/Farm) w.e.f. 13.12.2018.
- Miss Usha Kiran joined as T-1 (Field/Farm) w.e.f. 14.12.2018.
- Mr. Anand Ranu joined as T-1 (Field/Farm) w.e.f. 17.12.2018.
- Mr. Alok Raj joined as LDC w.e.f. 16.11.2018
- Mr. Rajnish Kumar joined as LDC w.e.f. 12.11.2018
- Mr. H. N. Prasad joined as LDC w.e.f. 12.11.2018

Transfers

- Dr. Rajbir Sharma, Head RCM, Darbhanga transferred to IARI, New Delhi w.e.f. 15.09.2018.
- Dr. Manoj Kumar, Scientist transferred from ICAR RCER, Patna to RCM, Darbhanga w.e.f. 13.12.2018.

EDITORIAL COMMITTEE

J S Mishra, Prem K Sundaram, Pankaj Kumar, Shivani, Bikash Das and VK Yadav

ICAR Research Complex for Eastern Region

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