



ICAR RCER NEWS

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From the Director's Desk



Indian agriculture has been diversifying from cereals to high-value crops including fruits and vegetables, and livestock & fishery. The Eastern states supports 34% human and 31% livestock population of the country on 21.85% geographical area.

Agriculture in Eastern India have been facing the challenges of the new economic regime, besides the usual problems of rising population, unemployment and poverty; declining investment in agriculture and degradation of natural resources.

Crop diversification fulfills the basic needs of the farm households for cereals, pulses, oilseeds and vegetables and, helps in regulating farm income, withstanding weather aberrations, controlling price fluctuation, ensuring balanced food supply, conserving natural resources, reducing the chemical fertilizer and pesticide loads, ensuring environmental safety and creating employment opportunity. In the era of shrinking resource base of land, water and energy, resource use efficiency is an important aspect for considering the suitability of a cropping system. Hence, selection of component crops needs to be suitably planned to harvest the synergism among them towards efficient utilization resource base and to increase overall productivity.

Rice-Wheat is one of the major cropping systems of Eastern states. Continuous cultivation of rice for longer periods with low system productivity, and often with poor crop management practices, results in loss of soil fertility due to emergence of multiple nutrient deficiency and deterioration of soil physical properties, and decline in factor productivity and crop yields in high productivity areas. Diversification and intensification of rice-based cropping systems to increase productivity and profitability per unit resource is very pertinent. Because of high rainfall in the region (average annual rainfall 1526 mm) during rainy season (June-September), frequent flooding with runoff water from uplands, and beside, rice being the staple food of people can not be replaced with other crops during rainy season. Hence, the only option left is to identify suitable crops for post-rainy (November to February) and summer (March to May) seasons. However, still there are the areas in the Eastern region where rice faces severe drought at different growth stages due to insufficient and disproportionate rain fall. In those regions, millets being drought hardy crops will play an important role in food, feed and fodder security. Growing of crops such as vegetables, pulses and oilseeds in post-rainy season is an alternative approach for realizing higher productivity and profitability. Moreover, large area in the region remains fallow (rice-fallow) due to moisture stress. Therefore, there is need to evaluate the crops, varieties and management practices for higher productivity, resource use efficiency and sustainability.

Research Highlights

Diversification of Rice-Wheat System through Climate Resilient Crops

Millets can be grown successfully in hot and dry environments. With the threat of climate change looming large on crop productivity, millets being a drought hardy crop will play an important role in food, feed and fodder security of the eastern region. A long-term experiment involving 10 diversified cropping systems was evaluated during *kharif* 2016. Diversification of rice-wheat with maize cob-toria-mungbean provided the highest rice equivalent yield (20.58 t/ha) followed by sorghum fodder-mustard-urdbean (18.72 t/ha). However, sorghum fodder-mustard-urdbean (Rs.169395/ha) was the most profitable cropping system.



Promising Rice Genotypes Identified



IET 25667 (A near isogenic line of Swarna Sub-1 with submergence and drought tolerance) has been identified by the VIC. The average yield of this variety varies from 2.53 t/ha under submergence to 2.93 t/ha in drought stress and 6.35 t/ha under normal conditions,

which was 14.7, 59 and 11.4 % higher than that of Swarna Sub-1 under the respective

ecologies. Similarly, 3 entries viz., RCPR-16 (IET 24692) for Jharkhand and Gujarat, RCPR-19 (IET 24660) for Jharkhand, and RCPR-10 (IET 24306) for Bihar and Uttar Pradesh have been found promising.



In another experiment rice genotypes IR09L342, IR10F198, IR11F195 and IR10F365 were found to have submergence tolerance for 21 days.



Crop Diversification in Rice-Fallow System

In rice-fallows of Bihar, Jharkhand and Chhattisgarh, short duration rice varieties like Swarna Shreya, Latat and Naveen under DSR with proper weed management produced grain yields similar to that of transplanted rice. The



succeeding crops of lentil, chickpea, linseed and safflower were more promising when grown after DSR as compared to transplanted rice.

Grafting Time in Litchi Standardized

An experiment was undertaken to standardize the optimum time of grafting in litchi under Jharkhand conditions. The branches were girdled (removing of 3 mm ring from branches of 40-50 mm girth) one month before the collection of scion sticks for grafting. Defoliation was performed 7 days before the collection of scion sticks. Wedge grafting was performed under shade net. The graft success rate and vegetative growth were markedly improved as a result of girdling and defoliation. More than 50% success rate was observed for the grafting performed during June, July and August. The highest graft success rate (70%) was recorded during July indicating that July was the most favourable month to undertake grafting in Litchi.



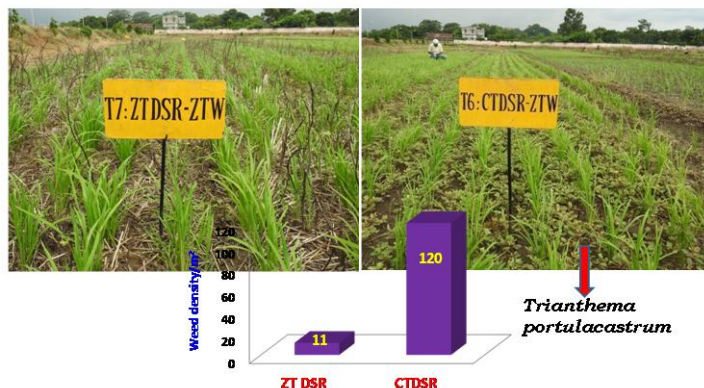
Different stages of wedge grafting in litchi cv. Shahi (a) Girdled branch in scion mother tree (b) Bud sprouting (c) Scion Union (d) Immature graft (e) Mature grafted plant (f) Grafted plant in the field

Management of Carpet weed (*Trianthema portulacastrum*) in Direct-Seeded Rice through Zero-Tillage

Horse Purslane (*Trianthema portulacastrum* L.), also known as Carpet weed, is becoming a major weed in direct-seeded rice (DSR) in eastern India. Studies of a long-term experiment on 'Crop establishment in rice-wheat-greengram cropping system' under ICAR-CSISA

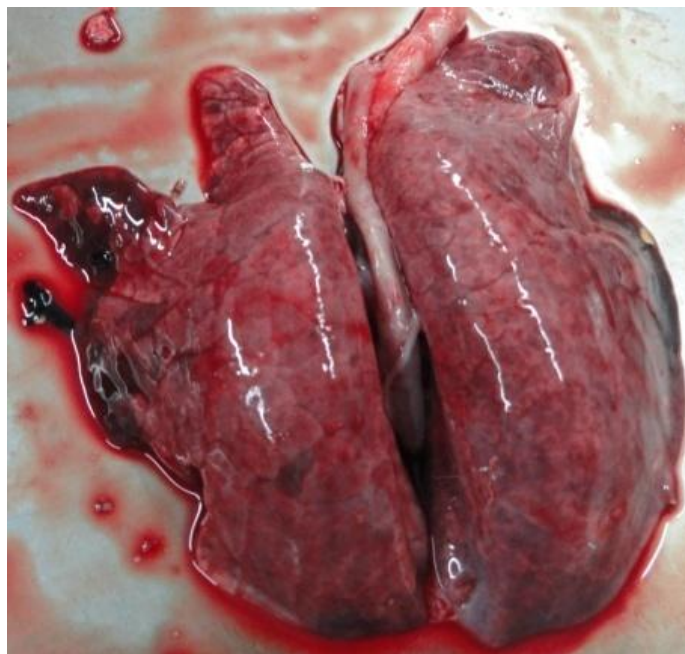
collaborative project at ICAR-Research Complex for Eastern Region, Patna revealed that after 2 years, the population of *T. portulacastrum* in ZT DSR-ZT wheat-ZT greengram (complete CA) system was drastically reduced to 11/m² as compared to 120/m² in conventional DSR.

Weed shift in rice (3rd Yr) due to crop establishment methods



Epidemiological Respiratory Viral Diseases in Calves

Nasal swab samples were collected from calves showing signs such as nasal discharge, coughing and respiratory distress. Post mortem was conducted for nine dead bovine calves with signs of the respiratory disease and samples of lungs, trachea and intestines were collected. The predominant gross findings in such cases were edema and congestion of lungs, frothy fluid in trachea and bronchial tree, mild fibrin deposition on pleural surface and discrete areas of consolidation in lungs particularly in apical and middle lobes and in few cases suppurative pneumonia was found. Bronchial lymph nodes were enlarged in few cases. Histologically, the most prominent signs were present in lungs characterized by congestion of blood vessels, peribronchial infiltration of neutrophils and lymphocytes, bronchioles were plugged with neutrophilic and lymphocytic exudate, alveolar oedema, necrosis of lung parenchyma and infiltration of lymphocytes, fibrosis and oedema of septa. In bronchial lymph node congestion of capsular blood vessels, presence of few macrophages and mild lymphoid depletion was seen.



Lungs, H &E, 10 X: bronchiole plugged with neutrophilic exudate, peribronchial infiltration of lymphoid tissue, congestion of peribronchial vessels and alveolar edema

Stable Pigeonpea “Cleisto” Lines Identified



Field view of an NDT cleisto line ‘DBGA 5’ at full bloom stage

The natural out crossing is a major source of varietal contamination, posing problems in the maintenance of varietal purity in pigeonpea. In station trials conducted during

2015-16 and 2016-17, three “cleisto” lines (DBGA 1, DBGA 5 and DBGA 11) derived from advanced generation back cross population (IPA 203 × ICPL 87154) showed no natural out crossing (100% selfing). In addition to this, two lines ‘DBGA 5’ (non-determinate) and ‘DBGA 11’ (determinate) yielded consistently (1917 kg/ha & 1659 kg/ha and 1213 kg/ha & 1063 kg/ha, respectively) during both the years. These “cleisto” lines hold great promise as genetic purity of such lines is likely to be naturally sustained year after year.

Events Organized

Hon'ble Union Minister of State Visits the Institute

Shri S. S. Ahluwalia, Union Minister of State for Agriculture & Farmers' Welfare and Parliamentary Affairs, Govt. of India visited ICAR Research Complex for Eastern Region, Patna on 2nd January, 2017. Hon'ble Minister, in his address, urged the scientists of ICAR to initiate target oriented work strictly adhering to time frame. He lauded the integrated farming system models developed by the institute and emphasized that these types of models are need of the hour for all eastern states where farmers are facing natural calamities.



National Productivity Week

National productivity week with a theme 'from waste to profits through reduce, recycle and reuse' was celebrated from 12-18th February, 2017 at ICAR RCER, Patna. The meeting started



with a brief introduction of national productivity week and its objective by Dr. Amitav Dey, Director Incharge followed by a presentation on

'Parthenium: from waste to wealth' by Dr. J. S. Mishra, Head, DCR, ICAR RCER, Patna. The meeting was attended by the Heads and Scientists of the institute.

Institute Foundation Day

The 17th foundation day of the institute was celebrated at its Regional Centre, Ranchi on 22nd February, 2017. Her Excellency Hon'ble Governor of Jharkhand, Smt. Draupadi Murmu graced this occasion as Chief Guest. In her inaugural address, she suggested that more



emphasis should be given on scientific farming rather than traditional farming in order to generate more employment and to increase food security of the region. She urged educated rural youths to undertake agriculture as a profession to create more employment opportunity through farming. Progressive farmers, representatives from press and media and employees of the institute were felicitated for their outstanding work in the respective areas. An exhibition to demonstrate the latest technologies in



agriculture was also organized. Foundation Day Lecture was also delivered by Dr Parvinder Kaushal, Hon'ble Vice Chancellor, Birsa Agricultural University, Ranchi. He emphasized on strong research linkage between ICAR institutes and SAUs to address the problems of the region. Around 300 participants including 70 progressive farmers from seven eastern states (Assam, Bihar, Chhattisgarh, Jharkhand, Odisha, Eastern Uttar Pradesh and West Bengal) participated in the programme.

Scientific Advisory Committee Meeting

The 7th Scientific Advisory Committee Meeting of KVK Buxar was held on 27th February, 2017 at Training Hall of KVK, Buxar under the Chairmanship of the Director of ICAR-Research Complex for Eastern Region, Patna. Sh. R.P. Singh, Member of Governing Body, ICAR, New Delhi was the Chief Guest of the meeting. The meeting was also attended by Deputy Development Commissioner, Project Director, ATMA, Mobile Van Veterinary Officer, DDM, NABARD of the region, Scientists from CIMMYT, ICAR RCER, Patna, VKSAU, Dumraon, officials from State Agriculture Department /other department, SMS/Staffs of KVK Buxar and progressive farmers/member of this meeting.



National Science Day

'National Science Day' was organized with the theme 'Science and technology for specially abled persons' on 28th February, 2017 at ICAR

Research Complex for Eastern Region, Patna. An interactive session between school students and the scientists of the institute was organized in which more than hundred students from different schools of the region actively participated. The interaction was centred on the importance of agriculture science in daily life and opportunities for the students in future agriculture. The students also visited different laboratories and experimental farms of the institute and participated in scientific talks in various disciplines and science quiz. Enthusiastic participation of the students in the interaction and laboratory visits shows that research on agriculture could sustain to the next generation with yet to bloom buds.



Hon'ble Union Minister of State Visits the Centre

Shri Sudarshan Bhagat, Hon'ble Minister of State, Agriculture & Farmers' Welfare, Govt. of India visited Research Centre, Ranchi of ICAR Research Complex for Eastern Region on 2nd March, 2017. He appreciated the research work being carried out and the technologies developed by the Centre and stressed upon the need for strong linkage between scientists and



farmers for dissemination of latest agricultural technologies and exploration of the opportunities in floriculture in Jharkhand as well as cultivation of tuber crops to increase the nutrition and income for the farming communities of Jharkhand.

Dr. R. S. Paroda, Chairman, TAAS, New Delhi, Visits the Institute

Dr. R.S. Paroda, Former Secretary, DARE & DG, ICAR and Chairman, TAAS (Trust for Advancement of Agricultural Science), New Delhi visited ICAR RCER, Patna on 2nd March, 2017 along with Dr. N.N. Singh, Ex-VC, BAU, Ranchi, Dr. R.K. Malik and Dr. M.L. Jat, Senior



Agronomists, CIMMYT, India. They visited the experimental farms of the institute and also had an interaction with the scientists of the institute. Addressing the scientists, Dr. Paroda stressed that for ensuring second green revolution issues such as gender balance, climate change, landscape pattern, post harvest handling and value addition are important. He emphasized that research should be planned for small and marginal farmers as majority of small and marginal land holders exist in Eastern region.



Bihar State Coordination Committee Meeting for Doubling Farmers' Income by 2022

Bihar State Coordination Committee Meeting for Doubling Farmers' Income by 2022 was organized on 23rd March, 2017 at ICAR Research Complex for Eastern Region, Patna under the chairmanship of Dr. A. K Singh, Vice Chancellor, BAU, Sabour. Systematic discussions related to agriculture and allied



sectors *i.e.* crop, horticulture, animal husbandry, fisheries, agroforestry, value addition, food processing, marketing etc. were held and the experts gave their inputs in their respective areas. The meeting was attended by the Vice Chancellor, Dr. RP CAU, Pusa, Principal of Bihar Veterinary College, Patna, officials from State Department of Agriculture, Fisheries, National Horticulture Board, Ministry of Food Processing Industries, Kaushlya Foundation, representative form CIMMYT, scientists from SAUs and ICAR institutes were present.

Rabi Kisan Gosthi sah Kisan Mela

Two days *Rabi Kisan Gosthi sah Kisan Mela* was celebrated and organized on 25–26 March, 2017 at KVK Buxar. Hon'ble Member of Parliament, Shri Ashwani Kumar Chaubey inaugurated the programme. The programme was attended by 750 progressive farmers, Block Agriculture Officer, Agriculture Coordinator, Kisan Salahkar and other line department officers. Hon'ble MP addressed the issue of increasing population, decreasing land availability and challenges to feed the large population in current scenario of

climate change. He stressed to use balance fertilizer along with organic manures like vermicomposting to maintain the soil health.



Awareness Programme on “Fish Disease Surveillance and Management”

An awareness programme on “Fish disease surveillance and management” was organised on 22nd March, 2017 at village Simra under Naubatpur block, Patna by ICAR Research Complex for Eastern Region, Patna under the “National Surveillance Programme for Aquatic Animal Diseases” project. The main objective of the programme was to sensitize fish farmers about the fish diseases and its management strategies. Demonstration of different fish culture, discussion related to the reasons for disease occurrence in fish ponds and its management, management of water quality,



maintenance of stocking density, importance of feed and feeding, was carried out. In the

programme, about 78 farmers from Simra and Masurhi block were present.

Policy Dialogue Workshop on Flood Index Insurance and Drought Management for Agricultural Development in Bihar

One day Policy Dialogue Workshop on ‘Flood Index Insurance and Drought Management for Agricultural Development in Bihar’ was organized by the International Institute of Water Management (IWMI), New Delhi and ICAR-Research Complex for Eastern Region (RCER), Patna at ICAR - RCER on 7th June, 2017. Professor Chandrashekhar, Hon’ble Minister for Disaster Management, Government of Bihar, graced the workshop as Chief Guest, Sri Alok Kumar Mehta, Hon’ble Minister for Co-operative, Government of Bihar



was the Guest of Honour. The purpose of workshop was to present the results of Index Based Flood Insurance (IBFI) product development and evaluation in Bihar, discuss strategies for implementation in 2017 monsoon season and develop and recommend protocol for drought monitoring and mitigation with inbuilt contingency measures including capacity development. The Chief Guest and Guest of Honour stated that Bihar is facing consequences of climate change due to global warming and it is very difficult to assess the losses caused by flood and drought. In this scenario, satellite based technology flood index insurance will be very useful for assessing damage and helping sufferer. He urged that all stakeholders should join hands and work together for this noble cause. Research report on “Mapping multiple climate-related hazards in

South Asia” was released by the dignitaries on this occasion. About 50 dignitaries from International Water Management Institute, New Delhi, ICAR-RCER, Patna, ICAR-Central Research Institute for Dryland Agriculture, Hyderabad, ICAR-IWMI, Bhubaneswar, ICAR-IARI, New Delhi, representatives of Panchayati Raj Institutions, NGOs, Agriculture Insurance Companies, State officials from Department of Agriculture and Disaster Management Department, etc. participated in the workshop.



International Yoga Divas

International Yoga Day was celebrated on 21st June, 2017 at ICAR Research Complex for Eastern Region, Patna, its Regional Centers and KVKs. To mark the occasion, all the scientists and staff of the institute performed Yoga from 8:00 AM to 11:00 AM under the instruction of Dr J.J. Gupta, Principal Scientist, ICAR RCER, Patna followed by the programme of Rural Development Wing of Rajyoga Education and



Research Foundation, Patna which offered all round development strategies on social,

behavioural, moral and cultural characters through spiritual revolution.

Honours and Awards

Dr. Ujjwal Kumar, Head, Division of Socioeconomic and Extension Division, received **ISEE Fellow Award** in recognition of outstanding contributions in the fields of Extension Education.



Dr. JS Mishra, Head, Division of Crop Research received the **ISWS Gold Medal** from the Indian Society of Weed Science in recognition of his outstanding contribution in weed science.



Dr. B.P. Bhatt, Director received **MS Swaminathan National Award** by ICAR Research Complex for NEH Region, Meghalaya for outstanding contribution in Hill Agriculture. He also received the prestigious **Dr. Rajendra Prasad Puraskar** for technical book writing on

“द्वितीय हरितक्रांति की ओर राष्ट्र के बढ़ते कदम” by ICAR, New Delhi.



Selections/Promotions/Transfers / Retirements

Our new colleagues

- Dr. V.K. Yadav, Pr. Scientist *w.e.f.* 31.03.2017
- Dr. Tanmay Kumar Koley, Scientist *w.e.f.* 31.03.2017
- Dr. Tania Seth, Scientist *w.e.f.* 31.03.2017
- Dr. Manoj Kumar Tripathi, Scientist *w.e.f.* 21.03.2017
- Dr. Dhiraj Kumar Singh, Scientist *w.e.f.* 30.06.2017

Transfer

- Dr. Abhay Kumar Thakur, Pr. Scientist transferred to NIRJAFT, Kolkata *w.e.f.* 21.03.2017
- Dr. Jegaveera S Pandian, Scientist transferred to CSWRI, Avikanagar *w.e.f.* 27.06.2017
- Dr. Sridhar Gutam, Sr. Scientist, transferred to IIHR, Bangalore *w.e.f.* 10.03.2017

Promotions

Scientists

- Dr. P.C. Chandran, promoted from Scientist to Scientist (SS) *w.e.f.* 08.01.2012
- Dr. S.S. Mali, promoted from Scientist to Scientist (SS) *w.e.f.* 12.06.2012
- Dr. P.K. Ray, promoted from Scientist to Scientist (SS) *w.e.f.* 31.12.2013
- Dr. U.R. Sangle, promoted to Sr. Scientist (8000 to 9000)
- Dr. Rajni Kumari, promoted from Scientist to Scientist (SS) *w.e.f.* 23.06.2014
- Dr. I.S. Singh, promoted from Sr. Scientist (8000 to 9000) *w.e.f.* 09.08.2014
- Dr. Jaipal Singh Choudhary, promoted from Scientist to Scientist (SS) *w.e.f.* 01.09.2014
- Dr. Pankaj Kumar, promoted from Scientist to Sr. Scientist *w.e.f.* 08.01.2016
- Dr. J. Pandian S, promoted from Scientist to Scientist (SS) *w.e.f.* 08.01.2016

Technical

- Sh. Ramesh Kumar, promoted from Technical Assistant to Sr. Technical Assistant *w.e.f.* 28.08.2013
- Sh. Gokul Baraik, promoted from Technical Officer to Sr. Technical Officer *w.e.f.* 01.01.2015
- Sh. Dev Charan Kujur, promoted from Sr. Technical Assistant to Technical Officer *w.e.f.* 01.01.2015
- Sh. H.P. Kashi, promoted from Technical Assistant to Sr. Technical Assistant *w.e.f.* 26.06.2016
- Sh. Sanjay Lal Srivastava, promoted from Technician to Sr. Technician *w.e.f.* 03.10.2016

Administration

- Sh. S.R. Rajak, promoted from Asstt. Admn. Officer (MACP) *w.e.f.* 01.01.2013
- Sh. Sh. Firoz Akhtar, promoted from Assistant (MACP) *w.e.f.* 30.07.2016
- Smt. Sangeeta Chakraborty, promoted from Assistant (MACP) *w.e.f.* 23.09.2016
- Sh. Lakshmi Prasad, promoted from LDC to UDC *w.e.f.* 01.02.2017

Retirement

- Sh. Chandra Kant Mahto, UDC *w.e.f.* 31.01.2017
- Sh. Birendra Prasad, Technical Officer *w.e.f.* 31.01.2017
- Sh. A.K. Khan, Chief Technical Officer *w.e.f.* 31.01.2017
- Sh. Gokul Baraik, Assistant Chief Technical Officer *w.e.f.* 28.02.2017
- Dr. R.C. Verma, SMS *w.e.f.* 28.02.2017
- Sh. Hari Shankar, Assistant Chief Technical Officer *w.e.f.* 31.03.2017

Editorial Committee

**Dr. J. S. Mishra and Dr. (Ms.) Tshering
Lhamu Bhutia**

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