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From the DG's Desk

Dear Readers,

The goal of the '2015-Paris Climate Conference', commonly referred to as Conferences of Parties (CoP 21), was to achieve a legally binding, international agreement to keep average global temperatures not more than 2°C above pre-industrial temperatures. After two weeks of negotiations, 190 nations of the world adopted an agreement to 'holding the increase in global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C'. To achieve it, the nationally determined contributions for emissions reduction are recognized by the text, and although not legally binding, the deal commits all countries' contributions to a review every 5 years with each successive contribution to be more ambitious than the last.

The international political response to climate change began at the Rio Earth Summit in 1992, where the 'Rio Convention' included the adoption of the United Nations Framework on 'Climate Change'. This convention set out a framework for action aimed at stabilizing atmospheric concentrations of greenhouse gases to avoid 'dangerous anthropogenic interference with the climate system.' The United Nations Framework on 'Climate Change' which entered into force on 21 March 1994 now has a near universal membership of 195 parties. The main objective of the annual CoP is to review the Convention's implementation. The first CoP took place in Berlin in 1995 and significant meetings since then have been included in CoP 3 where the Kyoto Protocol was adopted; CoP 11 where the Montreal Action Plan was produced; CoP 15 in Copenhagen where an agreement to success Kyoto Protocol was unfortunately not realized, and CoP 17 in Durban where the Green Climate Fund was created. CoP 21 held during 30 November to 11 December 2015 at Paris, France, was aimed at achieving a legally binding and universal agreement on climate, with the aim of keeping global warming below 2°C. France played a leading international role in hosting CoP 21 conference.

India is projected to become the most populated country by 2030 and would require to produce an additional 100 million tonne of food grains to feed the growing population in the face of climatic variability and change, growing constraints on water and land for crops and livestock. Ensuring food security lies within the core

objectives of the United Nations Framework on Convention on Climate Change.

The recently concluded Paris Agreement has recognized the fundamental priority of safeguarding food security and ending hunger, and the vulnerability of food production systems to the adverse impacts of climate change. Article 2 of Paris Agreement has been resolved to strengthen the global response to the threat of climate change by increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production.

Agriculture has become embedded in several strands under the United Nations Framework on Convention on Climate Change (UNFCCC) including Nationally Appropriate Mitigation Action, Intended Nationally Determined Contributions and activities of Subsidiary Body for Scientific and Technological Advice. A number of countries submitted Nationally Appropriate Mitigation Action (NAMAs) and at least 30 developing countries had expressed interest in implementing agricultural NAMAs. Agricultural practices considered for Nationally Appropriate Mitigation Actions have focused on improved agronomic practices, carbon storage, and reduced forest conversion on agricultural land. Improved economic performance, efficiency and often climate change adaptation are potential benefits from many of these practices. The role of agriculture in supporting a secure sustainable development pathway is evident from the Intended Nationally Determined Contributions (INDCs) submitted so far to the United Nations Framework on Convention on Climate Change. Agriculture is one of the largest sources of emissions in many developing countries and mitigation in the agricultural sector is also a focus of many INDCs, including some developing countries. India has envisaged reducing the emissions intensity of its GDP by 33 to 35 % by 2030 from 2005 level as part of the INDC and focus was on the adaptation aspects in agriculture. The INDCs submitted by several countries so far shows that majority has given priority to adaptation in agriculture. Notwithstanding these, REDD+ is a voluntary mechanism within the UNFCCC to provide incentives to reduce carbon emissions from deforestation and forest degradation in developing countries.

It is important to highlight India's adaptation efforts and achievement in climate resilient development of agriculture sector while discussing CoP 21. A side event 'Scaling up Adaptation Strategies for Climate Resilient Agriculture in India' was organized on the 5 December 2015 at the Indian Pavilion, coordinated by the Ministry of Environment, Forest and Climate Change, wherein, Director (CRIDA) gave an account of the available technologies for climate resilience in agriculture and briefed the audience about the climate resilient agriculture packages being implemented by the Government of India schemes. The National Council on Climate Change and Sustainable Development, through its two major presentations, one on weather advisories and other on Innovative Agricultural Extension Model in Gujarat discussed pathways for scaling up climate resilient agriculture models through nationally driven integrated development initiatives. The side event brought together India's policy makers, scientists and civil society organizations to share successful highlights of technology innovation and adoption, capacity building, knowledge dissemination, community driven approaches and enabling policy environment. In the discussions, India's strategy to achieve its national commitments for climate resilient development in the agriculture sector primarily through nationally driven programmes and policies was highlighted. While CoP 21 illustrated the potential of scientific solutions to climate change, challange of translating the scientific solutions to action at a scale where extension and advisory services have to play a major role is to be developed. I am convinced that the Extension and Advisory Services (EAS) have a major role in organizing farmers to adopt measures aimed at adaptation to climate change and communicating climate advisory to farmers. In fact, the whole adaptation at the ground level is fully dependent on extension and there is a need to enhance the capacities of extension personnel and of farmers in this area. At the same time, there is a need to learn from the successful experiences of different countries and different actors in implementing adaptation measures and this should feed into the training of extension staff. It is time that we seriously review and strengthen the capacity development efforts in the area of climate change adaptation, perhaps it needs focus on developing training modules for the purpose.

The Indian Council of Agricultural Research, and Union Ministry of Agriculture and Farmers Welfare are all set to move forward by strengthening research and development on climate resilient agriculture to minimize risks to farmers and reduce the impacts of year-to-year climate variability on food production at national level. The outputs of strategic research and technology demonstration components of the National Innovations in Climate Resilient Agriculture (NICRA) are being mainstreamed into the 'National Mission on Sustainable Agriculture' and converged with significant missions like water mission and other government programmes to contribute to the overall national goal of sustainable agriculture in the context of changing climate. Though major focus of agriculture sector is towards adaptation of agriculture systems to climate change and weather aberrations/extreme climatic events; benefits derived from various adaptation technologies implemented for food security will also contribute significantly in mitigating the greenhouse gas emissions (as win-win situations), thus agriculture sector is an important component in the overall goals set up by the Government of India in meeting the adaptation and mitigation targets.

Various programmes of the Ministry of Agriculture and Farmers Welfare, Government of India, are in tune with Article 2 of CoP 21 Agreement to strengthen the adaptive capacity of agriculture sector to weather aberrations and extreme climatic events in order to bring the resilience to agriculture with low greenhouse gas emissions and for country's food and nutritional security. Nonetheless, a constant and systematic review process is essential to ensure the ground level implementation of these programmes by regular interaction with state machinery, to ensure a science led development process to triumph.

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WORKSHOPS, MEETINGS, SEMINARS, CONFERENCES, SYMPOSIA

Annual conference of Vice-Chancellors of agricultural universities, and Directors of ICAR institutions

New Delhi, 24 January 2016. A three-day Annual Conference of Vice-Chancellors of Agricultural Universities, and Directors of ICAR Institutions was inaugurated on 22 January 2016 by the Union Minister of Agriculture and Farmers' Welfare, Shri Radha Mohan Singh. The dignitaries paid homage to the great leader, Netaji Subhash Chandra Bose by offering floral tributes on his 119th birth anniversary.

The Union Minister of Agriculture and Farmers' Welfare said that Netaji left us a legacy of ideas, ideals and dreams and the most precious item in that legacy is his generous and imaginative approach towards achieving unity by respecting difference. Shri Radha Mohan Singh emphasized the importance of distribution of soil-health cards to prevent excessive use of fertilizers and stated that progress of *'Mera Gaon, Mera Gaurav'* must be monitored to study its impact. The three universities viz. University of Agricultural Sciences, Dharwad, University of Agricultural Sciences, Bengaluru; Orissa University of Agriculture and Technology, Bhubaneshwar were awarded first, second and third positions, respectively, for achieving excellence in JRF examination conducted at All India Level. Among the category of large and small ICAR Institutes, the Best Annual Report Award 2014-15, was bestowed upon Central Marine Fisheries Research Institute, Kerala, and National Institute of Agricultural Economics and Policy Research, respectively. A progressive and innovative organic farmer, Shri Neelam Dutta from Biswanath Charali, Sonitpur, Asom, was awarded 'Haldhar Organic Farmer Award, 2014'.

Dr S. Ayyappan (the then DG, ICAR) informed that during the Year of Soils- 2015, soil-health cards were distributed by the Krishi Vigyan Kendras; *Kissan* Channel was launched; and 93 climate resilient varieties were developed by the National Agricultural Research and Education System. Dr Ayyappan said that during 2015-16 guidelines pertaining to implementation of various activities have been firmed up as CCEA note has approved the XII Plan initiatives. The new initiatives like Student 'READY' for insuring employability and to developed entrepreneurship and Course Curricula of undergraduate programme developed by Fifth Dean's Committee was discussed. The house was also informed about the new initiative, National Talent Scholarship for Postgraduate Students to attract talent and check inbreeding in agricultural education system.

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Innovations in coastal agriculture: current status and potentials...

Bhubaneshwar, 17 January 2016. A four-day XI National Symposium on 'Innovations in Coastal Agriculture: Current Status and Potentials under Changing Environment' was inaugurated by Prof. Manoranjan Kar (Vice Chancellor, Orissa University of Agriculture and Technology, Bhubaneshwar) on 14 January 2016 at Indian Institute of Water Management.

The symposium had five themes including a theme on 'Disaster management in agriculture with special reference to Odisha'; 152 abstracts in both Oral as well as in Poster Sessions; session on presentation by

Young Scientists for 'Early Career Research Scientist Award'; and an exhibition of activities of CARI (Bareily), CIBA (Chennai), DCFR (Bhim Tal), CTCRI (Thiruvananthpuram), NRRI (Cuttack), CIFA (Bhubaneshwar) and IIWM (Bhubaneshwar) who displayed their technologies in their exhibition stalls. The scientists from respective institutes explained the technologies developed by their institutes to the visiting dignitaries and attending delegates. There was a special session of NABARD (Bhubaneshwar) explaining their activities for improvement of farming communities in coastal areas.

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Challenges in Indian agriculture, future strategies for sustainability

Jabalpur, 14 February 2016. The Union Agriculture and Farmers' Welfare Minister, Shri Radha Mohan Singh addressed the National Convention on 'Challenges in Indian agriculture, Future Strategies for Sustainability', organized by *Vidyarthi Kalyan Nyas* at Jawaharlal Nehru Krishi Vishwa Vidyalaya from 13 to 14 February 2016.

Shri Radha Mohan Singh said that Indian Agriculture has come a long way since the independence, overcoming an era of acute food shortages and import dependence to the present level of being self-reliant in food security. During 2015, our institutions initiated new programmes like *'Mera Gaon, Mera Gaurav'* and 'Farmers FIRST', to improve scientist-farmer interaction for an effective technology dissemination, new initiatives such as 'Attracting and Retaining Youth in Agriculture', 'Consortia Research Platform', 'Extra Mural Funding', 'National Agricultural Science Fund', 'National Agricultural Education Project', and Agricultural Education in schools. Shri Singh also focused on sustainable agriculture in the country and said that Agriculture and Farmers' Welfare Ministry of the present Government has initiated 'Pradhan Mantri Crop Insurance Scheme', 'Revision of standards for relief in event of natural calamity', 'Deen Dayal Grameen Jyoti Yojna', and Kisan TV channel. The Deen Dayal Upadhyaya Grameen Koushalya Yojana is a placement-linked skill development scheme for poor rural youth. A total of 51,956 candidates have been skilled under this Yojana, of which 28,995 have been placed till November during 2014-15, the Union Agriculture Minister added.

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Boost shrimp farming through EHP management

Chennai, 19 January 2016. Dr (Mrs.) Beela Rajesh inaugurated the National Consultation on 'Management of the emerging *Enterocytozoon hepato penaei* (EHP) pathogen and related issues with Indian shrimp

aquaculture sector'. Dr Rajesh said that EHP is an important pathogen as it causes slow growth and reduced production. She advocated to investigate the zoonotic importance of the pathogen and also emphasized the need to transfer the scientific information in the vernacular language for the benefit of the farming community.

Dr K.K. Vijayan (Director, CIBA) expressed that this was a unique consultation, wherein, all the stakeholders joined us to address the issue. Dr Vijayan said that resolving such issues like management of the emerging problem of EHP, RMS would be easy when all the stakeholders work together for the future of aquaculture sector in the country.

Mr Elias Sait (Secretary General, SEAI) said that Central Institute of Brakishwater Aquaculture, and Coastal Aquaculture Authority along with other institutes would overcome the emerging problem of EHP.

Dr P. Ravichandran (Member Secretary, Coastal Aquaculture Authority) stressed that shrimp farmers must adopt biosecurity measures and better management practices to avoid diseases like EHP and RMS.

Mr Santhana Krishnan (CEO, Maritech representing SAP) appraised that this consultation was a timely intervention as farmers were going to stock their ponds soon and the outcome of the consultation as advisory would help farmers to manage the disease. In the technical session presentations were on (*i*) basic biology of microsporidia, and (*ii*) the status of EHP in farmed shrimp in India, followed by group discussion to exchange the views to manage EHP in shrimp farming. It was agreed upon to publish an advisory on EHP prepared by CIBA and follow up by Coastal Aquaculture Authority.

Presently, there is no drug or therapeutic options available for the control of EHP infection in shrimp. Hence, adoption of better management practices and proper biosecurity measures along with stocking of EHP free shrimp seeds is the only way to keep the pathogen away from shrimp farming system.

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Off-season spawning in carps towards year round availability of seeds

Bhubaneshwar, 9 March 2016. Prof. R. C. Patra (Dean, College of Veterinary Science and Animal Husbandry, OUAT) inaugurated one-day National Consultation on 'Off-season spawning in carps towards year round availability of seeds' , organized by the Central Institute of Freshwater Aquaculture. Dr Patra highlighted on the importance of such attempts and called for a road map with the help of scientists, entrepreneurs and officers from the line department. During technical session scientists outlined the role of nutrition in brood rearing as well as seed production during off-season months of the year. They suggested that one of the options to meet the increasing demand of carp seed of the country is through off-season gonadal maturation and spawning, which would potentially ensure round the year seed availability. The talks were on the relevance of melatonin in regulation of reproduction; quality seed production; nutrition for broodstock rearing; and photoperiod modulated gonadal maturation to prolong the breeding season. Aquaculture entrepreneurs pointed out the demand of fish seed in Karnataka, Kerala and Tamil Nadu where winter is less severe, and the off-season seed produced could be transported there. The consultation has inferred that the seasonality for carp seed production differs in different states across the country. It is high time to corroborate the seasonality, multiple breeding and off-season breeding to produce the carp seed round the year. However, technology transfer through farmer-friendly approach is the need of the day.

Dr P. Jayasankar (Director, CIFA) opined that the photothermal manipulation technology of the institute would be suitable for adoption in entrepreneurship mode.

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XV Annual convention on veterinary pharmacology

Karnal,16 January 2016. Hon'ble Governor of Haryana, Professor Kaptan Singh Solanki, inaugurated three-day

convention on 'Veterinary Pharmacology' on 14 January 2016 at NDRI on 'Nutritional Pharmalogy and Toxicology beyond calonies'. Dr Gurbachan Singh (Chairman, ASRB) presided over the function. This was the XV Annual Convention of Indian Society of Veterinary Pharmacology and Toxicology. The main theme of the convention was 'Many infectious diseases of livestock could be managed by nutritional intervention'. It was concluded that there is need to study long-term effect of nutraceuticals, minerals and vitamin on human health. Further, it was realized that 'nutritional pharmacology and toxicology' is important in the present context as new nutraceuticals are emerging.

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Protected cultivation technologies

Bhopal, 17 January 2016. The Minister for Horticulture and Food Processing (Government of Madhya Pradesh) Smt Sushri Kusum Singh Mahadele, inaugurated National Seminar on 'Protected Cultivation Technologies', jointly organized by Central Institute of Agricultural Enginnering, and Madhya Pradesh State Horticulture and Food Processing Department on 16 January 2016. Smt Mahadele focused on importance of protected cultivation in the state and urged the scientists to develop farm strategies for minimizing post-harvest losses of perishable horticultural produce.

Dr K.K. Singh (Director, CIAE) emphasized the role of engineering interventions for timely field operations. Shri M.S. Dhakad (Mission Director, SHM and Horticultural Commissioner, M.P.) explained initiatives of Madhya Pradesh State Government in promoting protected cultivation technologies. During technical sessions, experts from various fields deliberated on protected cultivation technologies, viz. selection of appropriate protected cultivation technology, vegetable and flower cultivation practices in protected structures, quality seedlings production, drip irrigation practices under protected structures, machinery for raising seedlings, critical issues during polyhouse construction etc.

Some of the participating farmers shared experiences of protected cultivation technologies adopted by them.On the second day, field visits were organized in which machineries such as vegetable transplanter, hydraulic platform for orchard management, orchard sprayer, plastic mulch laying machine, tractor operated soil auger and automatic seedling unit were demonstrated and explained to the participants.

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Interface meeting between public representatives and scientists to enhance technology adoption

Jodhpur, 21 January 2016. An interface meeting between public representatives and scientists was organized at the Central Arid Zone Research Institute (CAZRI) to enhance technology adoption. A group of 20 prominent public representatives including Members of Parliament, Members of Legislative Assembly of Rajasthan, and various functionaries of Panchayat Raj had an interactive session with scientists of the institute on various technologies developed in horticultural science, agricultural engineering, agro-techniques, and protected cultivation. These technologies were displayed in solar yard, animal feed unit, technology park, *ber* orchard and polyhouse.

Shri Narayan Panchariya (Member of Parliament, Rajya Sabha) appreciated the varieties of *ber*, developed by the CAZRI during last few years, and stressed on

development of better varieties that can tolerate intense drought prevalent in the north-western India. Shri Gajendra Singh Shekhawat (Member of Parliament, Lok Sabha) mentioned that climate change, decreasing availability of water, reduced land holdings and disinterest in farming by younger generation have become major challenges in agriculture and a holistic approach between technologies and policies is needed to further increase the profitability of farming.

Dr O.P. Yadav (Director, CAZRI) said that now the time has come to have frequent interface of scientists with public representatives to apprise them of latest developments in the research and farming technologies so as to reduce the time gap between technology development and adoption.

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Annual review meeting of AICRP on farm implements and machinery

Ludhiana, 30 January 2016. A three-day Annual Review Meeting of All India Coordinated Research Project (AICRP), which aims to provide a platform for interaction amongst researchers, tractor and farm-machinery manufacturers and policy makers was started at Punjab Agricultural University on 28 January 2016. Dr K. Alagusundaram (DDG, Agric. Engg.) advised that machinery using latest technologies must be developed and popularized for making agriculture cost effective, more profitable and environment friendly. Dr Alagusundaram also stressed on the role of agricultural engineers towards automation in agriculture.

Dr B.S. Dhillon (VC, PAU) said highly labour intensive operations like rice transplanting, sugarcane and cotton harvesting can be performed by using machines operated on custom hiring basis. Dr Dhillon suggested need to take urgent steps to promote agro-service providers through farmers cooperatives, custom hiring centres, machinery banks so that benefits of farm mechanization can reach marginal farmers.

Dr C.R. Mehta (Project Coordinator of AICRP on FIM) focused on the achievements of 25 centres during the last two years. The technical bulletin on *Zero till seed-cum-fertilizer drill for growing pea in RRF land in Asom* was released during the session. The scientists focused on mechanization of diversified crops like sugarcane, cotton, maize, oilseeds and pulses the need to pay attention towards standardisation of machinery parts, quality control and reliability of agricultural machinery. The progress under research and development, prototype production, prototype feasibility testing, frontline demonstration were discussed. The special emphasis was given on sugarcane and cotton mechanization in association with the related industry.

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Fourth interface meet of ICAR institutes-SAU-state departments

Bhubaneshwar, 28 January, 2016. Sri Manoj Ahuja, (Principal Secretary of Agriculture, Government of Odisha) inaugurated the Fourth Interface Meet of ICAR Institutes-SAU-State Departments on 27 January 2016, and emphasized on the generation, assimilation and transfer of the new knowledge among the farming community for overall development of agriculture in Odisha. Dr Ahuja asserted that the Krishi Vigyan Kendras need to play a major role in dissemination of new technologies, and the technology should be developed on the basis of farmers' conditions, ecosystems and available market situations. Shri Ahuja also highlighted about the special provisions of the Odisha government for rapid sectoral growth in the form of a separate agricultural budget.

Prof. Manoranjan Kar (Vice-Chancellor, OUAT), said that ICAR Institutes-SAU-State line Departments are complementary to each other and should work hand-in-hand in a coordinated manner to address the problems of the farming communities and transfer technologies more efficiently. At this juncture, the line departments of the State Government should take pro-active role in dissemination of technologies and increase public awareness.

Dr Amaresh Kumar Nayak (Director, NRRI) drew attention to seed production by the farmers themselves at their doorstep for self-sufficiency, proper government policy for production and promotion of low-cost small and drudgery reducing farm machineries available with research institutes, developing irrigation infrastructure in the state, creation of awareness for long-slender grain, high value aromatic and hybrid rice among the farmers, food processing and value addition.

Major concerns and issues of farming communities emerged during the deliberations, and interactions, were on timely supply of good quality seeds and planting materials especially the seed production in potato, onion, pulses like green gram and black gram etc., creation of sufficient infrastructures for storage, irrigation, processing, value addition and marketing, robust procurement mechanism, promoting farm mechanization and integrated farming system, promotion of rice varieties like 'CR-1014' improved 'Pooja' (tolerant to false smut), hybrid and aromatic 'Puja Basanti' rice-easing and accelerating agricultural loan processing, popularization of polyhouse and protected cultivation, post-harvest processing of fruits and vegetables, and scope of promotion of fish, milk and poultry production of the state.

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District agricultural contingency plans in A & N Islands meet

Port Blair, 20 January 2016. With the aim to prepare district agricultural contingency plans for 3 districts i.e North and Middle Andaman, South Andaman and Nicobar Islands, a meeting was jointly organized by Central Research Institute of Dryland Agriculture (CRIDA) and Central Islands Agricultural Research Institute (CIARI).

Dr S. Dam Roy (Director, CIARI) emphasized the need for separate contingency plans for all 3 districts considering the important sectors in these districts. Dr Roy added that sea water intrusion is one of the major problems in these islands impacting low-land rice ecosystems, and continued efforts are being made to reclaim Tsunami impacted lands for cultivation. A brief presentation on district contingency plans was made by Dr K.V. Rao (Agriculture Contingency Cell, CRIDA) explaining the initiatives of ICAR, planning

and development process, interface meeting with state governments etc. Dr B. Gangaiah (Head, NRM Division, CIARI) made a presentation on the agricultural scenario, climate setting etc., for 3 mentioned districts of Andaman and Nicobar Islands. The geographical setting, agricultural profile, climate is varying among these 3 districts significantly. The South and North Andaman are having higher annual rainfall of about 3,400 mm compared to 2,600 mm to Nicobar Islands. The undulating terrain in south and north Andaman with large area under agriculture and plantations often suffer from moisture stress during post-monsoon period in spite of high rainfall. The Nicobar islands due to flat terrain close to sea level is prone to inundation due to intense storms. It has been agreed upon to complete the development of Plans before March 2016.

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Brainstorm meeting on IPM in major crops

New Delhi, 17 February 2016. Dr S. Ayyappan [the then Secretary (DARE) and DG (ICAR)] inaugurated two-day Brainstorm meeting on IPM in major crops, organized by the National Centre of Integrated Pest Management (NCIPM). Dr Ayyappan emphasized on IPM development and implementation through coordinated efforts of all stakeholders of plant-protection in the country with emphasis on crop health management considering

health of soil, plant, animal and man. Dr Ayyappan also stressed upon further innovations and improvements in IPM with necessary policy support. The Deputy Director General (Crop Science), Dr Jeet Singh Sandhu, pointed out the need for harmonizing IPM packages to suit the changing agro-ecologies. The role of Krishi Vigyan Kendras for validation and the Department of Agriculture for demonstration was highlighted for wider area coverage under IPM. Besides delebrations were on IPM packages in field and horticultural crops.

Recommendations

The recommendations included harmonization of IPM packages of different crops in coordination with other crop based ICAR institutes, State Agricultural Universities, Department of Agriculture, Cooperation and Farmers' Welfare and State Department of Agriculture; nation-wide e-pest surveillance and integration of honeybees and other pollinators as important components in IPM technological packages.

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Consultation meet on Energy saving in fishing

Cochin, 5 March 2016. Dr K. Gopakumar (Ex DDG, Fisheries) inaugurated Consultation Meet on 'Energy Saving in Fishing' at Central Institute of Fisheries Technology. The Consultation Meet was conducted under the project 'Green Fishing Systems for Tropical Seas' funded by the National Agricultural Science Fund.

Dr K. Gopakumar observed that it is the excessive use of energy in fisheries that led to crisis in the fishing industry. The Consultation Meet was presided over by Dr C.N. Ravishankar (Director, CIFT). Presentations were made on 'Transition to green fishing: considerations and barriers', 'Fuel saving engines for fishing vessels', 'Energy efficient new generation fishing gears', and 'Fuel efficient combination fishing vessel' etc.

Experts concluded that by investing in fishery management initiatives, the fishing costs can be reduced substantially and the earnings will increase commensurately.

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Meet on Farm innovators day

Udhagamandalam, 27 February 2016. Mr C. Badrasami (District Forest Officer, the Nilgiris) inaugurated Sixth Annual Meet of 'Farm Innovators Day' which was

organized by the Research Centre of Indian Institute of Soil and Water Conservation at Kadasholai village, a tribal region of the Nilgiri district.

Dr O.P.S. Khosla (Head, IISWC-RC) focused on capacity building, water resources created for irrigation and drinking micro-irrigation, fruit tree plantation etc. Dr Khosla reiterated that tribal farmers should accept only the programmes which are beneficial to them. Dr P. Subramaniam (Director, Tribal Research Centre, Uhdagmandalam) stressed the need of sustaining the traditional knowledge while adopting new technologies for soil resilience. Dr Subramaniam released the leaflet on *Natural Resource Interventions for Tribal Development* by IISWC, Udhagamandalam.

Dr N. Mani (Joint Director of Horticulture) explained the various government schemes for the farmers from the state horticultural department including National Horticultural Mission, subsidy for pepper nursery and bee-keeping. Dr Mani also urged the tribal farmers for registering in various free training programme' offered by their department under Agricultural Technology Management Agency. Dr Mani also distributed farm implements to the tribal farmers provided by the IISWC under Tribal Sub-Plan, and inaugurated the exhibition.

Mr C. Badrasamy (District Forest Officer, Udhagamandalam) inaugurated the water resource facilities for the tribal communities developed by the Indian Institute Soil and Water Conservation (IISWC), Udhagamandalam. Shri Badrasamy informed the tribals that land title for the tribes are ready in the Nilgiris, for which tribal people should form the forest right groups. Mr Badrasamy felicitated the innovative tribal farmers with citation and mementos for their effective adoptation of IISWC technologies for sustainable agricultural farming.

The farmers-scientist interactive meeting was held in which subject expert from various organizations participated, and discussed various livelihood development schemes for the tribals, the various higher education schemes available for tribal communities, the various child rights and urged the tribes to call the child help line in case of any child abuse. Mr George Samuel (Assistant Director, Tea Board, Kotagiri) described various subsidy schemes including planting, pruning and irrigations tools available with tea board and stressed the need for having smart card for availing these facilities.

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Interface meet on development of farmer-centric cotton technologies

Mumbai, 17 March 2016. The Union Minister of State for Agriculture and Farmers' welfare, Dr Sanjeev Kumar Balyan, had an interface meet with the expert members and the scientist of the Central Institute for Research on Cotton Technology on the recent developments in the cotton sector. Dr Balyan urged the scientists to give more emphasis on development of farmer-centric technologies. Besides to make cotton cultivation more remunerative, development of cutting edge technologies for the industry must be accelerated to have better coordination with industries and commercialization of technologies.

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Antibiotic residue analysis in aquatic environment

Cochin, 12 February 2016. The first operational two days workshop of the All India Network Project on Fish Health was launched on 11 February 2016 at Central Institute of Fisheries Technology.

Dr C.N. Ravishankar (Director, CIFT) emphasized the importance of operating in network mode for getting maximum benefit for the institutes and said that the project is highly relevant to the current situation as the use of antibiotics in aquaculture is increasing day-by-day and for CIFT, being an accredited institute as per ISO/IEC 17025:2005, it will be a wonderful opportunity for utilizing the facility for the benefit of the project.

Dr K.K. Vijayan (Director, CIBA) pointed out the lack of credible data on antibiotic usage in aquaculture and mentioned the importance of networking and sharing of data among the institutes. Dr Vijayan mentioned that the project is significant in this context and through good networking and combined efforts a complete database on antibiotic usage in aquaculture in India can be developed which could be used as a benchmark on antibiotic usage. On the second day, an exposure training on the extraction of antibiotic residues from aquatic samples as per standard procedure optimized in CIFT was carried out for the benefit of scientists and research scholars. The analysis of extracted sample by LC-MS/MS was demonstrated by Dr K. Ashok Kumar.

Dr T. V. Sankar (Principal Scientist, CIFT) focused on

Antibiotic Residue Analysis in Aquatic Environment. The other scientists discussed the working principle and method development for the detection of antibiotics in aquatic samples by LC- MS/MS.

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Fisheries and aquaculture response in emergencies in Sundarban region

Kakdwip, 27 February 2016. With the aim to enhance the quality and accountability of preparedness and response to emergencies affecting the fisheries and aquaculture sector in Sundarban region, a three-day workshop on Fisheries and Aquaculture was organized by Central Institute of Fisheries Education at Kakdwip Research Centre of Central Institute of Brakishwater Aquaculture.

The learning objectives of the workshop were to understand the relationship among fisheries, aquaculture, emergency, food security and livelihoods, assess post-disaster needs in the fisheries and aquaculture sector using the FAO Guidelines for the Fisheries and Aquaculture sector on Damage and needs assessments in emergencies, and identify appropriate best practice responses and standards in emergency interventions in fisheries and aquaculture.

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Make in India: dairying in India by 2030

Karnal, 20 February 2016. The 44th Dairy Industry Conference was organized by Indian Dairy Association (North Zone) on Dairying in India by 2030 under Prime Minister's programme 'Make in India'.

Dr Gurbachan Singh (Chairman, ASRB) said that in the coming years, dairying in country will face the challenge of providing green fodder to the milch animals as the chances of increase in arable land which at present is 142 million ha or less. Dr Singh suggested that utilization of about 120 million ha of wasteland

available in the country for fodder tree production. Dr Singh also stressed on the utilization of animal excreta for the organic dairy farming.

Dr Nico van Belzen (DG, International Dairy Federation, Belgium) explained the activities of International Dairy Federation and expressed the concern in recession in world market for milk and milk prices. Dr Betzen said that world over dairy sector is facing the challenge of increasing milk production in imminent climate change. India is at advantageous position mainly because of heat resilient Indian cattle and buffalo breeds as well as availability of huge genetic diversity in milk animals, Dr Betzen added.

Dr A.K. Srivastava (Director, NDRI) said that global dairy industry is expected to reach US$ 505 billion by 2017, at CAGR of 5%. With the launch and implementation of programmes for increasing productivity of milk animals, production is expected to grow at higher rate. Milk, cheese, yoghurt and dried milks are the major segments of the global dairy market and will remain so. Dr Srivastava added that with the growing demand of functional foods and nutraceuticals, new dairy products are also expected to grow.

Dr N.R. Bhasin (President, Indian Dairy Association) informed that dairying contributed 30% in agricultural GDP and 4.5% in total GDP; and added that with value addition, product diversification, adoption of advanced scientific intervention and modern technological processing techniques, we can perfect indigenous technologies to cater the needs to the local population and also improve export prospects.

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Kissan gosthi at NRC on Camel

Laxmipura, 29 January 2016. A team of scientists and technical personnel of National Research Centre on Camel organized *Kissan Gosthi* in Laxmipura village, tehsil Khedbrahma, Gujarat under Tribal Sub-Plan. During *Kissan Gosthi*, discussions were held on qualities of camel milk, its collection and marketing in the surrounding areas. The scientists elaborated information on medicinal properties of camel milk

which will boost trade of camel milk and fetch more price. Dr N.V. Patil, Director, NRC on Camel, focused on various health problems of livestock and preventive and curative measures to prevent them. The scientists highlighted as to how farmers can gain more profits from livestock farming.

Under Tribal Sub-Plan milk recording was done during milking at the 'farmers door step' for assessment of production and enthusiasm of the farmers engaged in the trade of milk at village Telpur, tehsil Pindwara, district Sirohi (Rajasthan).

During the Camel health camp, 320 camels belonging to 23 camel herders participated. Scientists of NRC on Camel examined and treated them for prevention of mange, trypanosomiasis and other ailments.

To encourage tribal livestock farmers, best male camel and female camel, and milking competitions were organized to judge superior germplasm available with camel herders which got overwhelming response from farmers.

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International Linkages

Implementation of climate change, agriculture and food securuity programme

Modipuram, 6 March 2016. A brainstorming meeting between the scientists of CIMMYT and Indian Institute of Farming System Research (IIFSR) was held under the chairmanship of Dr A.S. Panwar (Director, IIFSR) to chalk out the mutual role of both the collaborating organizations for implementation of the Climate Change, Agriculture and Food Security (CCAFS), the flagship programme of International Maize and Wheat Improvement Centre (CIMMYT) and the Indian Institute of Farming Systems Research.

Dr M.L. Jat gave a brief introduction about the Climate Change, Agriculture and Food Security programme, its work plan by adoption of climate smart agriculture Practices in a climate smart villages concept.

Dr Santiago Lopez-Ridaura (from CIMMYT) focused on the important role of farming system typologies in scaling the climate smart agriculture practices in small-holder farming systems with examples from India. Dr Lopez-Ridaura emphasized on integration of biophysical and socio-economical aspects of farming systems and its analysis through multivariate analysis. Dr Lopez-Ridaura also informed the house regarding the potential role of Farm Design Model developed by Wageningen University and Fuzzy logistic maps in livelihood analysis for understanding the diversity of farming system for better targeting of climate smart agricultural practices. Dr A.S. Panwar (Director, IIFSR) focused on the research in IIFSR along with its network partners (AICRP-IFS and NPOF) for the upliftment of the farming community.

Activity milestones for the project were identified and it was decided to identify a suitable team of scientists for the implementation of climate change, agriculture, and food security with IIFSR.

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Microbiome in health and disease

Bengaluru, 25 February 2016. A three-day International symposium on 'Microbiome in Health and Disease' was launched by the National Institute of Animal Nutrition and Physiology on 23 February 2016. The symposium focused on the importance of animal and human associated microbiome in maintaining animal and human health and performance. Dr Kalidas Shetty (Associate Vice President for International Partnerships and Collaborations) described how fermented food systems with enriched diversity for beneficial microbiome can offer unique processing and nutritional solutions to addressing global food and nutritional security challenges. Dr Srini V Kaveri (Director, Immunopathology and Therapeutic Immuno-intervention, *Centre de Recherche des Cordeliers*, France) emphasized the need of investigating the interaction of gut microbes and the host immune system to understand the molecular and cellular basis of the pathogenesis of autoimmune diseases and design novel therapeutic strategies. The scientists described the latest technological developments for characterizing microbiome, role of microbiome in performance and health with a special emphasis on rumen metabolism and possible strategies to use manipulate microbiome for our benefits.

Recommendations

- Disrupted host associated microbial ecosystems can have serious implications on mammalian immune system, auto-immune diseases, pre-disposition to metabolic disorders etc. Detailed understanding for correcting dysbiosis warrants intensive research.
- The next generation 'Sequencing Technology' holds bright application in microbiome analysis though metagenome characterization. Microbiome-based diagnostics through MWAS (Metagenome Wide Association Studies) are the next generation powerful tools for identification of markers associated with specific physiological condition and disease in animal and human beings.

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Genomics in Aquaculture

Bhubaneshwar, 30 January 2016. A Second International Symposium on 'Genomics in Aquaculture' was inaugurated on 28 January 2016 at CIFA. It was organized by the institute in association with Association of Aquaculturists, Bhubaneshwar and Asian Fisheries Society, Indian Branch, Mangalore. Dr J.K. Jena (DDG, Fisheries) emphasized on providing a platform for fruitful scientific deliberation and interaction among the scientific community and stakeholders and to come out with appropriate recommendations for planning and execution of aquaculture genomics research in the country.

Dr P. Jayasankar (Director, CIFA) said that CIFA was engaged in research towards producing selectively bred fish and generating genomic resources such as mapping populations, DNA markers, linkage and QTL maps, whole genome sequence etc. Draft whole genome sequences of rohu and magur are almost ready.

Recommendations

- Prioritization of objective, trait and species before starting whole genome sequencing project.
- The classical selective breeding programme should be supported by genetic markers to increase the accuracy of selection and emphasis on 'Phenomics to assist genomic selection'.
- Need to enhance the pool of bio-informaticians, and advance training programme on bioinformatics should be conducted in institute.
- Infrastructure development for computational biology work and validation of *in-silico* work before publication.
- Best early career researcher competition for the innovative and novel ideas on Genomics in the symposium.
- Development of on farm assay (BIOCHEMICAL) system for identification of improved varieties from non-improved one.
- Working with zebra fish as model fish along with farm food fish simultaneously to solve the research problem.
- Development of designer fish for production of drug or vitamin through transgenesis in collaboration with industry on Public, Private, Partnership mode.
- Networking with international and national institutes to develop core group in the area of genomics.
- Basic research and technology development for end users (farmers/stakeholders/industry) should be done simultaneously.
- IPR in the genomic era need to be strengthened in India.

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MoUs

IISR signs MoUs with private firms

Kozhikode, 23 January 2016. Dr M. Anandaraj (Director, IISR) signed a Memorandum of Understanding with private firms from Kozhikode, Kerala for 'Utilization of Spice Processing Unit' at Indian Institue of Spices Research Experimental Farm, Peruvannamuzhi. Dr Anamdray, IISR, also signed non-exclusive licenses with private firms for commercialization of:

- *Trichoderma harzianum*, a biocontrol agent against against *Phytophthora* footrot.
- Designer micro-nutrient formulations for black pepper and cardamom.
- Turmeric variety, 'IISR Prathibha'.
- Nutmeg variety, 'IISR Keralashree'.
- Innovation and Entrepreneurship Development.
- Encapsulated delivery of agriculturally important microorganisms.

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Success stories

'IISR Varada' ginger fetches 27-fold production and handsome revenue

Chempanoda. Four years ago, Mrs Omana Kaithakkulath (from Chempanoda village of Perambra block, Calicut district, Kerala) stepped into the field with the support of Krishi Vigyan Kendra, Peruvannamuzhi in Calicut district. The plots used for ginger cultivation is a patch of land, spreading over 2.5 cents, which would have been neglected as wasteland but now it holds several sacs with sprouting ginger propagules. By using the methods of organic agriculture, Mrs Omana cultivated ginger in gunny bags. According to Mrs Omana, pro-tray (filled with coir-pith, dry cowdung and *Trichoderma*) raised seedlings by using cut rhizomes of 5 g weight with one sprout is a good seed material to start her innovation. Plentiful availability of sunlight, irrigation water and timely application of manures are the prime reasons for the better growth of ginger.

Impact of technology

During 2015-16, the ginger was planted in 300 sacs during the second week of May 2015, and harvested in the last week of January 2016. Mrs Omana says that she could harvest 108 kg fresh ginger from 4 kg planting materials during this season. Each seed had a weight of 20 g. She is cultivating the ginger variety 'IISR Varada', which was the centre of attraction in agricultural fest 'Technology Week', organized by KVK, Peruvannamuzhi. During her sharing of experience, she reported that she got ginger of 2 kg/bag from polybag of 15 cm × 30 cm size. To her, field level training, periodic visits, quality planting materials, and marketing support of scientists from KVK helped in successful harvest of ginger. Mrs Omana usually takes classes on ginger cultivation. The KVK and Centre for Overall Development (an NGO) provided many opportunities for the same. Besides ginger, she is cultivating black pepper, various intercrops, fruit trees etc. Also, she is maintaining and culturing ornamental fishes, earthworms and series of birds in cages as per guidance and suggestion of KVK, Calicut Subject matter specialists. In case of value addition, her 'Nutmeg rind candy', 'Garcinia rind paste', and 'dry ginger' are innovative and successful methods for processing and value addition of spice products. Mrs Omana followed KVK's Front-Line Demonstrations and implemented it immediately in her farm with a seal of innovation.

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Weed management in organically grown tomato

Jabalpur. In present day agriculture, indiscriminate use of pesticides in general and vegetables in particular are the major cause of concern for degrading the quality of produce. Weeds are a serious problem in tomato crop, reducing fruit yield by up to 70%. It is essential to control weeds through non-chemical weed management methods like mulching to produce organically grown good quality tomatoes without any harmful residues of pesticides. To enhance production of tomato and overcome this problem, prepare the field thoroughly so that soil clods, crop residues are not present. On a leveled field, make small pits at 60 cm × 40 cm spacing and mix the vermicompost @ 5 tonne/ha in those pits. On this field, spread black polythene sheet in which round holes of 15 cm dia at 60 cm × 40 cm spacing have been made. Transplant about 20-day-old tomato seedlings in the middle of the holes in black polythene sheet and water the plants regularly as per the need. Due to polythene sheet cover, weeds will not germinate at all. Few weeds may come up in the vicinity of tomato plants which can be manually removed with very less labour. Follow other plant-protection practices applicable in organic cultivation as per the need. Take care, not to damage the polythene sheet by stray animals walking over it. After the last picking of tomato, carefully remove the polythene sheet, wash it thoroughly in running water and store it properly for future use. Never leave any pieces of polythene sheet lying in the field. This technology should be practised on the same field for more than 3 years to achieve the maximum benefits.

Impact of technology

The cost of black polythene sheet for 1 ha field would be from ₹ 25,000 to 30,000. This can be reduced by reusing it 3-4 times, if proper care is taken. There is complete control of weeds, better conservation of soil moisture so that less number of irrigation is required, less infestation of pest and diseases. The tomato fruit yield would be about 40-50 % higher than farmers' practice. Organic tomatoes may fetch 30 to 40 % higher price in the market. The benefit: cost (B:C) ratio obtained in a field study was 3.69 compared to 2.99 with farmers' practice.

Precautions

The field should be clean, well prepared and levelled before spreading the black polythene. There should not be any source of pesticide contamination from other fields, water sources etc. It is required to handle the polythene sheet with care for future use in succeding crops. After use, even small pieces of polythene sheet should be removed from the field and disposed appropriately.

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Union Minister of Agriculture and Farmers' Welfare inaugurates inter-state Agri-horti fair

Bargarh, 22 February 2016. The Union Minister of Agriculture and Farmers' Welfare, Shri Radha Mohan Singh, inaugurated a three-day 'Inter-state Agri-Horti Fair,' jointly organized by the Indian Council of Agriculture Research, and the National Horticulture Board at Bargarh, Odisha on 20 February 2016. Shri Singh urged the farmers to diversify their farming and take up cash crops and horticultural crops along with traditional crops, pisciculture and organic farming for getting more profit from unit investment. Shri Singh focused on National Food Security Mission, Pradhan Mantri Fasal Bima Yojana, Pradhan Mantri Sichhai Yojana, and distribution of Soil-Health Cards to all farmers of the country. The Union Minister of Tribal Affairs, Shri Jual Oram, and Union Minister of State for Petroleum and Natural Gas, Shri Dharmendra Pradhan also addressed the gathering on various issues concerning farmers and farm-activities.

Thousands of farmers and farm-women from various districts of the state visited the stalls, and a farmers-scientists interaction was organized. Scientists from participating institutions delivered lectures on thematic areas: (*i*) Field crops including rice, (*ii*) Horticultural crops, (*iii*) Natural Resource Management, (*iv*) Animal Husbandry, Dairy and Poultry, and (*v*) Pisciculture, which were followed by question-answer sessions.

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XVI Foundation day of ICAR-RCER

Patna, 22 February 2016. The Union Agriculture and Farmers' Welfare Minister, Shri Radha Mohan Singh, inaugurated the Farmers' Hostel of the ICAR Research Complex for Eastern Region and the exhibition. The Union Minister of Agriculture said that the government has taken up massive drive to improve soil fertility and irrigation facilities to increase productivity of crops. Dr A.K. Sikka (DDG, NRM) stated that the institute has done remarkable work in the field of Integrated Farming System, Resource Conservation Technologies and Wet Land Rehabilitation at its research stations and also in farmers' fields. Dr Sikka further reiterated that the institute is not only doing praiseworthy work on the production of rice, wheat, pulses, oilseeds but also on the other fronts of agriculture sector like diversification of crops, livestock development, fish management, water management, horticulture, forestry and soil management.

Dr B.P. Bhatt (Director, ICAR-RCER) informed that the institute has developed new *Makhana* variety 'Swarna Vaidehi'; rice variety 'Swarna Shreya' for drought condition, 11 new varieties of different vegetables and three varieties of faba bean. Mineral mixture costing around ₹ 40/kg has also been developed for increasing milk productivity in cattle.

The Union Minister of Agriculture and Farmers' Welfare honored 10 progressive farmers from Asom, Bihar, Chhattisgarh, Jharkhand, West Bengal, Odisha and Eastern Uttar Pradesh besides best worker award to 8 staff of ICAR-RCER, press and media personnel. '*Dutya Harit Kranti Ki Oar Rashtra Ke Badhte Kadam*' compiled by Dr B.P. Bhatt (Director, RCEOIC) was also released by the Union Minister of Agriculture and Farmers' Welfare.

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Second foundation day of NRC on Plant Biotechnology

New Delhi, 15 January 2016. The Padma Bhushan Prof. G. Padmanaban (former Director, Indian Institute of Sciences) delivered Foundation Day Lecture on 'Biotechnology in Health and Agriculture Sectors – Relevance for India' on the occassion of Second Foundation Day of Plant Biotecnology at National Research Centre on Plant Biotechnology.

Prof. Padmanaban emphasized on the future prospect of biotechnology in agricultural and medical research in Indian perspective, deliberated on importance of transgenic technology and marker assisted breeding in agricultural research to achieve the much needed enhancement of productivity in major crops. Project Director, Dr T.R. Sharma, gave deliberations on achievements of Institute.

During the function, publications viz. *NRCPB Newsletter* (both English and Hindi version), *NRCPB*

Video Film (both English and Hindi) and *NRCPB Compendium of Product and Technologies* were released.

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69th Foundation day of CMFRI

Kochi, 3 February 2016. As part of the 69th Foundation Day celebrations, the Central Marine Fisheries Research Institute organized an open house discussion on marine life, products, fishing gear, socio-economics, fish biology, marine biotechnology, mariculture and fishery environment related research and development, and technology to the public.

Different thematic divisions showcased the projects taken up to increase the Nation's marine fish wealth, make fishing easier and beneficial to fisherfolk and self-help groups. A stall showcased the life of squids and mussels, and the methods and techniques employed to capture them- the squid jigging and gill-netting techniques. In the exhibition of major commercial fishes at the Biology laboratory, pelagic, demersal, molluscan and crustacean resources were displayed. Experiments with micro-algae, rich in proteins and carotenoids showed how they can be dried

and used for topping *salads* and drinks. Marine nutraceuticals and products also attracted the younger generation. The stalls and exhibitions of Agricultural Technology Management Centre and its stall selling various products generated interest and created awareness on organic farming practices promoted by the KVK of CMFRI. More than 2,500 species of marine life especially corals and pearls were displayed.

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Kissan mela-cum-technology demonstration

Asom, 19 January 2016. The Deputy Commissioner of Districts (Jorhat), Shri Vishal Vasant Solanki inaugurated *Kissan Mela*-cum Technology Demonstration, organized by Indian Veterinary Research Institute along with its Eastern Regional Station, Kolkata, and an NGO at Majuli. Shri Solanki emphasized the importance of animal husbandry in upliftment of socio-economic strata of the farmers.

About 500 farmers and farm-women from Majuli and its surrounding villages participated in the *Kissan Mela*. Dr A.K. Garg (Joint Director, IVRI) narrated the technological advancement made by IVRI in the development of vaccines, diagnostics and other animal health and production aspects. In a special interaction session college students of different colleges of Majuli were educated about the role of agriculture and animal science in career development, and role of various zoonotic diseases and their prevention and control. Twenty progressive farmers from each field i.e. Animal Husbandry, Agriculture, Fisheries and Sericulture were honoured and awarded at this occasion. An interface meet of the scientist and farmers was organized during the *Mela* wherein various issues of farmers were deliberated by scientists and experts.

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Annual *kisan mela*-cum-exhibition 2016 at IINRG

Ranchi, 10 February 2016. The Agriculture Minister, Government of Jharkhand, Shri Randhir Kumar Singh inaugurated the Annual *Kisan Mela*-cum-Exhibition

2016 at Indian Institute of Natural Resins and Gums (IINRG). Shri Singh briefed about the government strategies to strengthen the farming community. Shri Singh said that Government's efforts are directed to benefit the lac growers, and promised to draw the attention of Jharkhand state government to issues related to lac sector. Shri Singh suggested that planning at grassroot level will be helpful for dairy, piggery, goatry, fisheries development and to promote organic farming in the state. The Jharkhand MoA announced that a mega scheme related to vegetable processing will be inaugurated shortly in the state to boost the employment opportunities and minimize the post-harvest losses. Lac production is important in terms of livelihood security for the lac growers. The Minister of Agriculture, Jharkhand asserted that the efforts taken by IINRG to generate awareness among the farmers for undertaking scientific cultivation of lac is yielding significant results. Shri Singh appreciated the contribution of the Institute and stated that the State Government will render all support to the Institute in its endeavour.

Shri Ram Tahal Choudhary (MP, Ranchi) opined that small-scale industry may be more useful to boost the rural economy and all the rural community should participate actively in *Yojna Banao Abhiyan* (*Gram Panchyat* Development Planning) for need based infrastructure development.

Dr George John (VC, BAU) emphasized on need for alternate host plants for the lac insects. Dr John opined that market support both forward and backward, is an essential activity to encourage the lac growers. Primary level processing adds value to the produce and helps the farmers in getting better returns.

Dr K.K. Sharma (Director, IINRG) deliberated three major issues related to procurement of stick lac at minimum support price, consideration of lac as an agricultural produce, and establishment of lac specific commodity board to promote the lac at domestic as well as overseas area. The farmers were apprised of the various lac production technologies, new lac-host plants introduced for lac cultivation and pest management techniques at the Institute research farm and museum.

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Capacity Building

Scientist-farmer interaction on soil-test and target field approach for increased crop productivity programme

Nadia, 27 February 2016. Under Tribal Sub-Plan of AICRP on Soil Test Crop Response a scientist-farmer interaction was held on 'Field Day' to popularize the importance of soil-test based fertilizer application for improved crop productivity among tribal farmers under the theme of 'Soil-test and target yield approach for Increased crop productivity' at Dakshin Brahmapur village of Haringhata block, Nadia district, West Bengal on 26 February 2016. Fifty Tribal farmers including sixteen women-farmers from five villages, namely Panchkahania, Digha and Dakshin Brahmpur of Nadia district, and Dadpur of Amdanga block, Anoka and Barikpara of Naihati block of North 24-Parganas district participated. Besides, different facets of soil-testing and soil-health, the farmers were provided hands-on-training on collection of soil samples.

Dr A.R. Saha (Project Director, CRIJAF) stressed on the importance of soil-testing and soil testing crop response (STCR) based nutrient management. Dr Pradip Dey (Project Coordinator, STCR) explained the Soil-Health Card Scheme and targeted yield approach for improving crop productivity and maintaining soil health. The scientists (CRIJAF) emphasized on the use of organics and biofertilizers as a part of IPNS based STCR approach; and gave a practical demonstration on collection of soil samples. The motive of the programme was to imbibe scientific knowledge among the farmers and the practical demonstration. The application of manure and sowing methods were also demonstrated to the farmers.

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Conservation of small indigenous fish

Vaishali, 10 February 2016. Dr S.C. Rai (Dean), College of Fisheries, Dholi chaired an awareness-cum-capacity building programme on 'Conservation and culture of small indigenous fishes for livelihood and nutritional security' that was conducted in Gandak River Basin at Mataiya, Anchal Patepur, Vaishali in collaboration with ICAR Research Complex for Eastern Region, Patna; Department of Fisheries, Bihar, and Glory Vision, Patna. There was interaction between scientists and

fish farmers in nature to promote extention process. An exhibition with relevant literature and exhibits was arranged by the Central Inland Fisheries Research Institute.

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Soil moisture indicator launched at Sugarcane Breeding Institute

Coimbatore. Dr Bakshi Ram (Director, Sugarcane Breeding Institute) launched the 'Soil Moisture Indicator' at the Sugarcane Breeding Institute premises. Dr B.Ram said that depletion of water resources in agriculture has been a serious cause of concern. In most of the farmers' fields, particularly in sugarcane fields, efficient irrigation management practices such as irrigation-scheduling, based on soil moisture status is rarely in practice. In an effort to save water and to facilitate irrigation-scheduling,

Sugarcane Breeding Institute has developed a handy and user-friendly electronic moisture-indicating device, namely 'Soil Moisture Indicator'. This device helps the farmers in deciding when to irrigate their fields and as a result there would be considerable saving of irrigation water.Expressing gratitude to those involved in the design and development of the device, Dr Bakshi Ram added that the Soil Moisture Indicator technology was evolved with the active participation of farmers and sugar factory personnel across three agro-climatic zones of Tamil Nadu through the Farmers' Participatory Action Research Project.

Explaining the mode of operation, Director (SBI) said that the sensor rods of Soil Moisture indicator need to be inserted into the soil to a required depth to assess the soil moisture, which is indicated by glowing LEDs. Dr Bakshi Ram added that the device is suitable for use in agricultural farms as well as in potted plants. The Institute has registered four designs of Soil Moisture Indicator, while a product patent is pending. A private Bengaluru-based firm that has entered into a license agreement with Sugarcane Breeding Institute has started marketing this device by pricing it at ₹ 1,200.00.

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Tribal Sub-Plan programmes on Field day-cum-capacity building

Nadia, 27 February 2016. To popularize the importance of soil-test based fertilizer application for improved crop productivity among tribal farmers, a field day-cum-capacity building programme under the theme of 'Soil-test and target yield approach for Increased crop productivity' was organized under Tribal Sub-Plan of AICRP on Soil Test Crop Response at Dakshin Brahmapur village of Haringhata block, Nadia district,

West Bengal. Fifty tribal farmers including sixteen women farmers from five villages, namely Panchkahania, Digha and Dakshin Brahmpur of Nadia district and Dadpur of Amdanga block, Anoka and Barikpara of Naihati block of North 24-Parganas district participated in the event. Besides, different facets of soil-testing and soil health, the farmers were provided hands on training on collection of soil samples. Dr A.R. Saha (CRIJAF) stressed on the

importance of soil-testing and soil testing crop response (STCR) based nutrient management. Dr Pradip Dey (Project Coordinator, STCR) explained the Soil Health Card Scheme and targeted yield approach for improving crop productivity and maintaining soil-health. The scientists (CRIJAF) emphasized on the use of organics and biofertilizers as a part of IPNS based STCR approach; and gave a practical demonstration on collection of soil samples. The motive of the programme was to imbibe scientific knowledge among the farmers and the practical demonstration gave hands on training to the farmers. The application of manure and sowing methods were also demonstrated to the farmers. A scientist-farmer interaction was the major highlight of the 'Field Day' launched on 26 February 2016, an exhibition of better quality jute fibres was also conducted by progressive farmers.

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Office-cum-laboratory building inaugurated at RRS of CISH

Malda, 28 February 2016. Shri Krishnendu Narayan Chowdhury (Minister In-charge Department of FPI & Horticulture, Government of West Bengal) inaugurated an Office-cum-Laboratory building of Regional Research Station of Central Institute of Sub-tropical Horticulture (CISH) at Food Park. Shri Chowdhury emphasized the need of technology dissemination in the field of Horticulture particularly mango and litchi for the overall development of the farmers of the region. Dr N. K. Krishna Kumar (DDG, Horticultural Science) informed that the Institute proposes to establish an elite nursery and commence the research on vegetables, floriculture and medicinal and aromatic plants, besides mango, guava and litchi. Shri Krishna Kumar also emphasized on the need for creating export infrastructure for fruits as well as processed products and creating awareness on international standards.

Dr Shailendra Rajan (Director, CISH) stressed on the conservation of mango and other fruit varieties at the farmers' fields through community efforts. The Director (CISH) assured that the nursery programme will get the desired impetus for producing elite planting material and emphasized the need for efficient training of the farmers towards technology dissemination.

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Visits

Union Minister for Agriculture and Farmers Welfare visits NRC on Pig

Guwahati, 30 January 2016. The Union Minister for Agriculture and Farmers Welfare, Shri Radha Mohan Singh, visited at National Research Centre on Pig, Rani. Shri Singh was keen to know impact of research in nearby villages through the activities like artificial insemination and by the use of pig breeds developed for enhancing pork production. Shri Singh focused on the programmes launched by the Prime Minister of India, especially on issuing Soil-Health Cards to Farmers, Sansad Adarsh Gram Yojna to increase agricultural production of the country and promote farmers welfare. Shri Singh added that the technologies developed by the scientists must reach farmers and every effort should be taken to ensure that the required technologies are useful to farmers.

The Union Minister of Agriculture and Farmers Welfare suggested to establish a pork and pork products sale counter for easy accessibility and to bring more visibility about the technologies of the NRC on Pig.

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Practices for sustaining soil carbon is need of hour

Bhopal, 24 February 2016. Dr Trilochan Mohapatra (Secretary, DARE and Director General, ICAR) emphasized that declining total factor productivity and deteriorating soil health is a major concern. There is

need to play a pivotal role in sustaining productivity without deteriorating soil-health in the long run, he added. Dr Mohapatra stressed the importance of best management practices to sustain the soil organic carbon for major soil types, and focused on the preparation soil fertility maps, developing Integrated Nutrients Management Packages and on-field soil-testing mini-lab *Mridaparishak* at Indian Institute of Soil Science.

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DG, ICAR visits at NBPGR

New Delhi on 31 March, 2016. The Secretary (DARE) and Director General (ICAR), Dr Trilochan Mohapatra, visited National Bureau of Plant Genetic Resources (NBPGR) and advised that Plant Quarantine may be given new dimensions to work on diagnostics for identification of new pest intercepts, to monitor dynamics of pest variants in plant populations and management of exotic pests. Dr Mohapatra stressed on the need to follow established, scientifically and legally valid practices in DNA fingerprinting and cultivar identification. Dr Mohapatra underlined the need to further strengthen the existing set up at NBPGR by establishing a referral and service facility for DNA fingerprinting with full funding support at the national level so that this serves the need of the nation and the region.

Dr Mohapatra released the work, *Utilization of* ex situ *collections and climate analogues for enhancing adaptive capacity to climate change,* done under a CCAFS funded project implemented by NBPGR during 2011-2015.

The project geo-referenced more than 60 thousand accessions belonging to ten crop species. A total of 2,293 accessions were designated as pre-adapted to changing climate and 9,701 locations were identified as vulnerable. Explorations to the predicted areas resulted in collection of 56 germplasm accessions from 42 villages.

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Secretary (ICAR) visits ICAR institutes

- Bhubaneshwar, 26 February 2016. Shri C. Roul (Additional Secretary, DARE and Secretary, ICAR)

visited CIFA to review the research progress of the institute along with other ICAR institutes like IIWM, CIWA and CHES, Bhubaneshwar. Shri C. Roul suggested that work programme should be relooked for better benefit of farming communities without diluting the focus. Adopt the technology, if it is available elsewhere rather reinventing the wheel. Variety, breed and technology must have social impact study and it must be communicated to all Institutes in terms of publication.

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- Anand, 1 February 2016. Shri C. Roul (Additional Secretary, DARE, and Secretary, ICAR) visited experimental fields of the Directorate of Medicinal and Aromatic Plant Research, and inquired about the implementation and progress of programmes such as ARYA, Tribal Sub-Plan, *Mera Gaon, Mera Gaurav* etc. Shri Roul categorically expressed the need of variety release of medicinal and aromatic plants for the benefit of stakeholders and formation of guidelines for minimum support price for discussed plants as well as marketing. Shri Roul also planted a sapling of Ashoka.

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Personnel

Trainings

- Bhubaneshwar, 16 January 2016. Dr P. Jayasankar, (Director, CIFA) inaugurated a four-day capacity building programme on 'Freshwater aquaculture as a livelihood option for tribal youth of Asom' at Central Institute of Freshwater Aquaculture on 13 January 2016.

e mail: cifri@org.nic.in

- Dehra Dun, 19 January 2016. A seven days skill development training on 'Soil and Water Conservation Measures' for 13 forest range officers (West Bengal) was organized at Indian Institute of Soil and Water Conservation from 13 to 19 January 2016.

e mail: directorsoilcons@gmail.com

- Mau, 20 January 2016. An International certificate course on 'Requisites of Seed Production, Processing and Quality Assurance' was conducted at Directorate of Seed Research.

e mail: pd_dsr2005@yahoo.co.in

- Modipuram, 23 January 2016. The Indian Institute of Farming System Research started five days, orientation training on 19 January 2016. Soil-testing and fertilizer recommendation for 20 soil chemists working in various soil-testing laboratories for Soil-health Card Scheme.

e mail: directoriifsr@yahoo.com

- North Sikkim, 5 February 2016. The ICAR Sikkim Centre organized 3-day training programme on 'Organic Crop Production' from 3 to 5 February 2016 at *Gram Prashashan Kendra*, Hee-Gyathang, Dzongu, Sikkim.

e mail: jdsikkim.icar@gmail.com

- Dehra Dun, 7 February 2016. The Indian Institute of Soil and Water Conservation organized a four months Certificate Course on 'Soil and Water Conservation, and Watershed Management' from 8 October 2015 to 7 February 2016.

e mail: directorsoilcons@gmail.com

- Udhagamandalam,12 February 2016. The Indian Institute of Soil and Water Conservation, Regional Centre organized 12-day-capacity building programme on 'Field Engineering Training on Forest Watershed Management' for the Assistant Conservator of Forests from 1 to 12 February 2016 at IISWC Regional Centre.

e mail: opskhosla@gmail.com

- Jodhpur, 19 February 2016. A seed day-cum-farmers-scientists interaction was organized at Central Arid Zone Research Institute.The programme included

training of farmers in seed production which also included guided tour of farmers to seed production plots of wheat, cumin and mustard.

e mail: director.cazri@icar.gov.in

- Lucknow, 20 February 2016. The Peninsular and Marine Fish Genetic Resources Centre (Kochi) National Bureau of Fish Genetic Resources (Lucknow) organized a six-day training programme on 'Fish Taxonomy', from 15 to 20 February 2016. The training programme was on various aspects of taxonomy of freshwater and marine fish species.

e mail: director@nbfgr.res.in

- Gangtok, 25 February 2016. The valedictory function of NICRA sponsored 10-day-training programme on 'Diversification of Hill Agriculture: An Approach for Climate Change Adaptation and Mitigation' was held between 16 and 25 February 2016 at ICAR Research Complex for NEH Region, Sikkim Centre, Tadong.

e mail: jdsikkim.icar@gmail.com

Appointments

Dr Trilochan Mohapatra joins as Secretary (DARE) and DG (ICAR)

New Delhi, 22 February 2016. Dr Trilochan Mohapatra, a scientist of global repute working in the area of molecular genetics and genomics, has taken over the charge of Secretary (DARE) and Director General (ICAR) from out-going Secretary (DARE) and DG (ICAR), Dr S. Ayyappan in the afternoon. The significant research accomplishments of Dr Trilochan Mohapatra include development of the first high-yielding 'Basmati rice' variety resistant to bacterial leaf blight through molecular marker assisted selection, and physical mapping and genome sequencing of rice and tomato. Dr Mohapatra has served the nation in different positions such as Director, IARI, New Delhi; Director, National Rice Research Institute, Cuttack; and Head,National Research Centre on Plant Biotechnology, IARI, New Delhi, as a researcher and teacher for about two decades.

e mail : icarreporter@rediffmail.com

Name	Designation and address	Date of appointment
Dr Sudhir Raizada	ADG (IF), ICAR Hqrs.	1 January 2016
Dr JoykrushnaJena	DDG (Fy. Sci.), ICAR Hqrs.	8 January 2016 (AN)
Dr R.R.B. Singh	Jt.Director, (Academic) NDRI, Karnal	15 January 2016
Dr S.K. Chakrabarti	Director, CPRI, Shimla	27 January 2016 (AN)
Dr Azad Singh Panwar	Director IIFSR, Modipuram	30 January 2016
Dr S.K. Singh	Director ATARI, Jodhpur	3 February 2016
Dr Ram Kewal Singh	ADG (CC), ICAR Hqrs.	4 February 2016
Dr Vishal Nath	Director, NRC for Litchi, Muzaffarpur	8 February 2016
Dr Sanjeev Saxena	ADG (IPTM&PME), ICAR Hqrs.	10 February 2016
Dr Vilas A. Tonapi	Director, IIMR, Hyderabad	10 February 2016
Dr M.R. Dinesh	Director, IIHR, Bengaluru	10 February 2016
Dr Anil Kumar Saxena	Director NBAIM, Mau	12 February 2016
Dr B.C. Deka	Director ATARI, Barapani	16 February 2016
Dr Jatinder Kishtwaria	Director DWA, Bubaneshwar	16 February 2016
Dr S. Bhaskar	ADG (AAF&CC), ICAR Hqrs.	17 February 2016
Dr Pankaj Kaushal	Joint Director (Research) NIBSM, Raipur	22 February 2016
Dr P.G. Patil	Director, CIRCOT, Mumbai	21 March 2016

Dr S. Ayyapan demits the office of Secretary (DARE) and DG (ICAR)

Dr S. Ayyappan demitted the office of the Secretary (DARE) and DG (ICAR) in the afternoon of 22 February 2016. Dr Ayyappan met the challenges and did his broad based approach to enhance agricultural productivity during his tennure. He was succeeded by new Secretary (DARE) and DG (ICAR), Dr Trilochan Mohapatra, who is a renowned scientist in the field of Plant Biotechnology.

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Superannuations

Name	Designation and Address	Date of superannuation
Dr R. Ramani	Director IINRG, Ranchi	31 January 2016
Dr (Mrs.) Indu Sharma	Director DWR, Karnal	31 January 2016 (Relieved)
Dr M. Anand Raj	Director IISR, Calicut	31 March 2016
Dr S.K. Sharma	Director CIAH, Bikaner	31 March 2016 (Relieved)

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