



# Reporter

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## From the DG's Desk

Dear Readers,

Engineering inputs to agriculture by way of mechanization have increased considerably during the recent years. Agricultural mechanization that started with sharpened stones, wooden and metallic tools has now moved to electric operated sophisticated machineries, all to meet the timeliness of farm operations, reducing drudgery, capacity enhancement and efficient utilization of inputs. As early as in 400 BC, *Krishi Parashara* provides details of farm mechanization, tools as well as practices, indicating the best possible real-time farm management solutions. It is only during the past four centuries that agricultural mechanization growth experienced steep upward trend as a result of industrial revolution. Introduction of internal combustion engines and tractors, as power source, provided immense possibilities of covering large agricultural areas in a short period. For example, a pair of bullocks would plough 1 ha area in about 120 hr, whereas a tractor operation would be over in just 5 hr.



Although agricultural mechanization transformed agriculture from subsistence to a commercial enterprise in the western world, the history in India is only about six decade-old.

Research and development on farm implements and machinery has facilitated production and adoption of different tools, implements and machines suitable to carry out farm operations manually, through draught animals, and through mechanical and electrical prime movers. Laser assisted land levellers, seed and fertilizer drills, paddy seeders, transplanters, rotavators, sprayers, weeders, irrigation pumps, micro-irrigation systems, reapers, combine-harvesters, sugarcane harvesters and threshers are some popular farm machineries in India. The Indian farm machinery industry constitutes 10% of the global market and is growing at about 5% per annum. Today, farm machinery and power industry accounts for over ₹ 50,000 crore of annual sales excluding farm implements and machinery manufactured/fabricated by the village craftsmen. Manufacturing of

agricultural equipments through 250 medium-to large-scale, 2,500 small-scale, and 15,000 tiny units is mainly concentrated in Punjab, Haryana, western Uttar Pradesh, Terai region of Uttarakhand, and Tamil Nadu. Impact analysis of some popular farm technologies showed that annual monetary benefit to the country through the use of these equipment/ technologies has reached the level of about ₹ 100,000 crore. About 87% of the total operational energy for agriculture is electro-mechanical. There are about 5 million tractors and other self-propelled machines and 19 million pumps on Indian farms. The power availability on Indian farms is about 1.7 kW/ha at present. There is a close correlation between degree of agricultural mechanization, energy use and agricultural production and productivity. Post-harvest management of agricultural produce do involve mechanization and equipment that still requires special attention and has economic bearing on the gross yield. The ICAR institutes, viz. Central Institute of Agricultural Engineering, Bhopal, and Central Institute of Post-Harvest Engineering Technology, Ludhiana, have been carrying out successful development of appropriate machinery in partnership with machinery manufacturers leading to elimination of gestation period in the development of machinery and its availability to stakeholders. Addressing gender issues in design of agricultural machines has been a major concern that is being inclusively addressed by the ICAR considering the ergonomics and energy efficiency. The state agricultural universities do develop commodity- and location-specific implements and machines to meet the farm mechanization needs. Realizing the productivity constraints, ICAR analyzed the gaps in availability and accessibility of existing farm equipments and machinery to correct regional imbalances. It is felt that the availability of farm machinery is greatly constrained due to inadequate manufacturing capability, which is mostly in unorganized sector and concentrated in a few pockets only. There is generally a large gestation period between the machinery development and its availability to the farmers, indicating the need for an enabling mechanism to reduce this gestation period.

To bridge the gaps identified in farm mechanization under different agro-climatic conditions, especially in the field of horticulture and fisheries a functional networking is being worked out by the ICAR to address the associated problems and evaluate the possible solutions. During XII Five-Year Plan, ICAR is focusing on-farm mechanization and energy in a consortia research mode. While the spread of agricultural mechanization has been spatially non-

uniform, the potential for intensive mechanization is still very high. Profitability and sustainability of Indian agriculture with inclusive growth requires well-distributed efforts in appropriate mechanization and energy management. As mechanization is a resource intensive venture, custom hiring of improved agricultural machinery could help the small- and marginal-farmers to reap the benefits of mechanization with little or no capital investment. Various models for promotion of custom hiring activities at village/village cluster level needs to be tried out, considering the existing socio-economic and infrastructural frame work available in various parts of the country. There is a need to establish Farm Machinery Resource Centres and Farm Machinery Bank and Display Centres at village/ village cluster level. Further, trainings for village artisans and entrepreneurs in machinery repair and maintenance is being encouraged. Industry-driven

farm equipment display centres need to be created in different regions for creating greater awareness among farmers and entrepreneurs.

Future farmers would be well informed and tech-savvy professionals who would access real time information on natural resources available including weather data to precisely plan the production activities utilizing the modern machinery. A significant portion of production activity whether crops, livestock or fishery would be in the form of protected production technology. However, there would still be other not-so-enabled farmers who would need considerable support for sustaining the farming activity. Although people would own their small farms, they would become a part of some sort of cooperative plan. Such people would generally be working in cities and maintaining their links with the cooperatives utilizing their farm holdings.

Future research and development efforts in smart-farm mechanization is steered not only to develop machinery for those operations for which no suitable machinery exists today, but also for efficient use of resources, combating extreme climatic conditions, conserving environment and working in special or difficult agro-climates. The ICAR is continuing its efforts to develop machineries that has multiple agricultural functions and test their feasibility for popularization amongst the farmers to enable them to achieve smart farming.

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# WORKSHOPS, MEETINGS, SEMINARS, CONFERENCES, SYMPOSIA

## V<sup>th</sup> Borlaug Global Rust Initiative, 2013

New Delhi, 23 August 2013. Hon'ble President of India, Shri Pranab Mukherjee, inaugurated the Fifth Borlaug Global Rust Initiative (BGRI), 2013, a four-day Technical Workshop, on 19 August 2013 at Vigyan Bhavan.



Dr S Ayyappan (Secretary, DARE and DG, ICAR) announced the establishment of a special National Professorial Chair in the name of Dr Borlaug and assured delegates that ICAR is taking steps to ensure that researchers do not face difficulties in transfer of biological material across borders for research purposes. This sentiment was reinforced by Prof. Ronnie Coffman (Vice-Chair, and Director of International Programme at Cornell University, USA), who announced that they would formulate an official communique to address the problems faced in the free flow of research material. He recognized the immense participation from the Indian agronomists and students and especially their poster submissions. Jeanie Borlaug said, "Do not let frustrations blind us to the opportunities before us and work to make your own contributions to Norman Borlaug's vision." Hans Braun of CIMMYT stressed the fundamental importance of a thorough knowledge of agronomy for wheat farmers. He also presented a curtain raiser for the BGRI Technical Workshop, 2014 in March at Obregon, Mexico.

### Minister of Agriculture Unveiled the Statue of Dr Borlaug

New Delhi, 19 August 2013. Union Minister of Agriculture and Food Processing Industries, Government of India, Shri Sharad Pawar, unveiled the



statue of Dr Norman E. Borlaug at NASC Complex. Shri Pawar said that Dr Borlaug always considered himself to be a teacher, as well as a scientist. Today, several thousand men and women agricultural scientists from more than 50 countries are proud to say that they were students of Norman E. Borlaug. We can think of no greater tribute to Dr Borlaug than to carry on the work to which he dedicated his life, applying agricultural science for humanitarian benefits. Shri Pawar also thanked CIMMYT for getting the statue of Dr Borlaug installed in the campus of ICAR, New Delhi.

Ms Jeanie Laube-Borlaug [Chairperson of Borlaug Global Rust Initiative (BGRI) and daughter of Dr Norman E. Borlaug] said that her father's heart and soul inhabit in Indian agriculture.

Hon'ble Governor of the State of Iowa, USA, Mr Terry Branstad, laid a wreath at the statue of Dr Norman E. Borlaug at NASC Complex, New Delhi on 11 September 2013. He also underlined the contributions and services of Nobel Laureate Dr Norman E. Borlaug in enabling South Asian region self-sufficient in food production. Mr Branstad also informed that on the occasion of Dr Borlaug's centenary birth anniversary, Government of USA will set up two statue of Dr Borlaug in each state of Iowa and Washington (D.C.).

Shri Arvind R. Kaushal (Additional Secretary, DARE and Secretary, ICAR) highlighted the contributions of Dr Borlaug in Indian agriculture that played a significant role during Green Revolution.

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## Outscaling Farm Innovation

New Delhi, 5 September 2013. Shri Ashish Bahuguna (Secretary, Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India) inaugurated a 3-day National Workshop on 'Outscaling Farm Innovation', jointly organized by Trust for Advancement of Agricultural Sciences, Indian Council of Agricultural Research, and Asia-Pacific Association of Agricultural Research Institutions on 3



September 2013 at NASC Complex. He focused upon the farm innovation for better efficiency and effectiveness in agriculture, and said that the dissemination of technology and knowledge is the key to enhancement in agricultural production. Shri Bahuguna also applauded the Food Security Bill and pointed out the importance of farming community for success of this bill. Dr R.S. Paroda (Chairman, Trust for Advancement of Agricultural Sciences, and Haryana Kisan Ayog) stressed upon the targeted research for small-and marginal-farm for increase in agriculture production. He also appreciated ICAR for innovative initiatives like 'Farmers First', and 'Attracting and Retaining Youth in Agriculture' during XII Five-Year Plan. Dr S. Ayyappan (Secretary, DARE and Director General, ICAR) appreciated the farmer community and said that scientists do research in the laboratories but farmers are able to do innovations while addressing different situations right in their fields.

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## Enhancing Water Use Efficiency in Yamuna Basin

New Delhi, 30 August 2013. Dr S. Ayyappan (Secretary, DARE and DG, ICAR) inaugurated one-day sensitization workshop on 'Enhancing Water Use Efficiency in Yamuna basin' at NASC Complex, and emphasized upon the need of enhanced water use efficiency in the Yamuna basin. He added that sustainable use of water can be ensured with new technologies and institutional and policy interventions. Dr Ayyappan also stressed upon the adoption of climate resilient agriculture to conserve



the water resources in changing environmental conditions. Shri G. Mohan Kumar (Special Secretary, Ministry of Water Resource, Government of India) emphasized upon the development of irrigation infrastructure and dissemination of new technology for sensible use of water. Dr A.K. Sikka (DDG, NRM) and Shri Bibhas Kumar (Chairman, Central Water Commission, Government of India) also shared their vast research experience and gave valuable suggestions.

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## Sustainable Management of Marginal Dry Lands

Jodhpur, 19 July 2013. Dr O.P. Gill (Vice Chancellor, Maharana Pratap University of Agriculture and Technology, Udaipur) inaugurated a national workshop on 'Managing Resources for Optimizing Land Productivity in Thar Desert' at Central Arid Zone Research Institute under UNESCO-sponsored project on 'Sustainable Management of Marginal Dry Lands' (SUMAMD) - Phase II. He highlighted that existing human and animal resource density in the Indian Thar Desert are quite higher than rests of the world. He also pointed out that in the context of climate change situation, there is a need to evolve innovative cultivation practices. Considering the scarce rainfall situation and the limitations of soil resources in arid situation, there is also a need for optimum management of these resources. Dr M.M. Roy (Director, Central Arid Zone Research Institute) pointed out that management of natural resources in dry land is highly essential and the activities under the project carried out in the field will enhance the land productivity. He felt that for sustainable growth and development, integration of indigenous knowledge and the research technology is very important. Technical sessions were on rangeland management and agroforestry, arable arid farming, soil and water management, livestock management and energy management and socio-economic issues.

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## Scientists-Fish Farmers Interaction

Katihar, 3 July 2013. Union Minister of State for Agriculture and Food Processing Industries, Shri Tariq Anwar, inaugurated one-day awareness programme on inland fisheries and aquaculture at Katihar. Farmers - Scientists Interaction Meet was organized



by Central Institute of Fisheries Education, Mumbai in collaboration with Bihar Agricultural University and Department of Fisheries, Government of Bihar. He urged that the fish farmers and fishers of Katihar needed to be trained at CIFE centres to achieve higher productivity from the vast water resources available in the district. He stressed that Katihar fishermen and fish farmers should lead the entire Bihar. He also urged the Department of Fisheries, Government of Bihar to develop leaflets on programmes related to fisheries and aquaculture.

Dr M. L. Choudhary (Vice Chancellor, Bihar Agricultural University) emphasized that fisheries require a movement in the form of community mobilization to transfer the technologies in inland fisheries and aquaculture. Shri Nishat Ahmed (Director, Department of Fisheries, Bihar) explained different schemes of Centre and State. Dr A.K. Pal (Joint Director) appraised that 500 fish farmers from Katihar district will be trained at three centers of the Institute under the training programme funded by National Fisheries Development Board.

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## Workshop on Indian Mackerel Genetics Harmonization

Kochi, 27 August 2013. Dr Rudolf Hermes (Chief Technical Officer BOBLME) inaugurated a eight-day Workshop on 'Indian Mackerel Genetics Harmonization' at National Bureau of Fish Genetic Resources (Kochi Unit) on 20 August, 2013 at National Bureau of Fish Genetic Resources, Kochi unit.

Participants were taken to M/s Scigenom, the genome sequencing facility available at Kochi, to get first-



hand information about the next generation sequencing techniques. A total of 16 delegates from Bangladesh, India, Indonesia, Malaysia, Maldives, Myanmar, Sri Lanka and Thailand participated in the workshop. Dr B. Meenakumari (Deputy Director General, Fisheries) the Chief Guest of valedictory

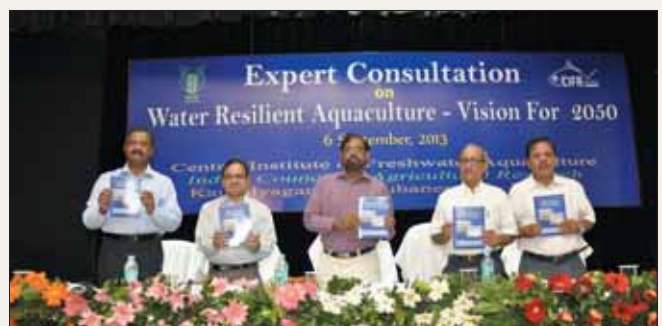


function of the workshop, gave away certificates to the participants on successful completion of the training programme. Participants received hands-on training on various aspects of genetic characterization and population genetic structure analysis of Indian Mackerel.

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## Water Resilient Aquaculture - Vision for 2050

Bhubaneswar, 6 September 2013. Dr K.K. Vass (Ex-Director, CIFRI, Barrackpore) inaugurated an Expert Consultation Meeting on 'Water Resilient Aquaculture - Vision for 2050', at the Central Institute of Freshwater Aquaculture (CIFA). Dr P. Jayasankar





(Director, CIFA) emphasized on efficient and productive utilization of water for aquaculture, and development of new strategies for water resilient fish culture. The distinguished experts from different disciplines expressed their views about freshwater availability at 2050 and opined that aquaculture should develop into a water-resilient practice since water is going to be the most important constraint in next 10 to 20 years.

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## Fish Genomics Research in India: A Way Forward

Lucknow, 2 August 2013. An Expert Consultation on 'Fish Genomics Research in India: A Way Forward' was organized by National Bureau of Fish Genetic Resources in collaboration with Asian Fisheries Society Indian Branch, Mangalore and Aquatic Biodiversity Conservation Society, Lucknow. Dr B. Venkatesh (Research Director, Institute of Molecular and Cell Biology, Singapore) was the Chief Guest of the Consultation. Dr Venkatesh emphasized the need to engage people who have passion in science. He delineated the development taken place globally in the area of genomics and emphasized on the necessity of greater thrust on a comprehensive subject like genomics in India.



Dr B Meenakumari conveyed about the supportive role of ICAR for genomics research in all sector of agriculture, including fish in coming years through platform projects. She emphasized on the necessity of generation of structural and functional genomic resources for different commercially important fish and shellfish species, besides whole genome sequences for prioritized ones. She added that many of the genomic data will hopefully lead to a better understanding of fish production and health management systems.

Dr J K Jena (Director, NBFGR) conveyed about the initiation of a Department of Biotechnology-funded programme on 'Whole Genome Sequencing of *Labeo rohita* and *Clarias batrachus*' by NBFGR in collaboration with Central Institute of Freshwater Aquaculture, Anand Agriculture University, and Indian

Agricultural Statistics Research Institute, and proposals on envisaged genomics programme by different fisheries Institutes under ICAR Genomics Platform during XII Plan period. The consultation is basically intended to develop a road map/ blue print for at least a coming decade on the areas of fish genomics, species to be undertaken for genome sequencing and functional genomics, utilization of genomic resources in production systems, traits to be selected for upgradation, manpower development, networking/ linkages, infra-structure development and sources of funding for such research and development programmes. Over 50 participants from ICAR Institutes, cutting across the disciplines, State Agricultural Universities and Experts from all over the country deliberated on the subject during the consultation, which helped in chalking out the future strategies on fish genomics research in the country.

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## Water Management and Ground-water Utilization

Navsari, 1 August 2013. Shri Govindbhai Patel (Minister of State for Agriculture, Food and Civil Supply, Consumers Affairs, Forest and Environment, Government of Gujarat) inaugurated a four-day Biennial Workshop of All India Coordinated Research Project on 'Water Management and Groundwater Utilization' on 29 July, 2013 at Navsari Agricultural University (NAU). Shri Patel emphasized upon efficient utilization of available water resources through micro-irrigation and enhancing awareness among the farmers regarding importance of water to overcome the problems of water scarcity in the state. He also stressed upon the importance and need for soil-health cards for maintaining soil fertility.

Dr A. K. Sikka (DDG, NRM) expressed concern over declining groundwater level in some parts of the country, water-energy nexus, regulatory mechanism for groundwater, and emphasized upon the convergence of different water management programmes/schemes. Dr A. R. Pathak (Vice-Chancellor, NAU) accentuated upon the judicious use of water and lauded the work done under this project and cited many examples where farmers of Gujarat have replicated the technologies generated by the AICRP centre at Navsari.

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## Group Meeting on Contingent Planning for Agriculture in Uttarakhand

Dehra Dun, 2 August 2013. A two-day Group Meeting on 'Contingent Planning in Agriculture and Allied Sectors due to Extreme Rainfall Events in Uttarakhand' was started on 1 August 2013 at Central Soil and Water Conservation Research and Training



Institute to evolve work plan for agriculture and allied sectors in the Uttarakhand.

Dr S. Ayyappan (Secretary, DARE and DG, ICAR) highlighted the control of silts and sediments, planning for *rabi* crops to compensate the losses incurred in the on-going *khari*, promotion of location-specific horticultural and vegetable crops, and supply of necessary feeds, fodder and health care interventions for livestock and fisheries sectors, preferably adopting a community approach. Dr A.K. Sikka (DDG, NRM) emphasized upon the doable and location-specific action plans of agriculture and allied sectors for rehabilitation and restoration of the affected areas. Discussions were held on natural resource management, crops, horticulture and vegetables, livestock, poultry and fisheries by subject experts from different institutions for drawing action points.

Dr S. Ayyappan (Secretary, DARE and DG, ICAR) appraised Shri Vijay Bahuguna (Chief Minister, Uttarakhand) about the action points that emerged during the meeting so as to enable the State Government to provide relief to the affected people in agriculture and allied sectors.

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## Consultation Meeting on Contingency Planning for North-Eastern Region

Barapani, 2 September 2013. A one-day consultation meeting on Contingency Planning in North-Eastern Region was organized at ICAR Research Complex for North- Eastern Hills Region, Umiam. Dr A. K. Sikka (DDG, NRM) emphasized upon the development of contingency plan in the event of climatic variabilities. He also urged to evaluate different contingency measures for its effectiveness.

Dr B. Venkateswarlu (Director, CRIDA) briefed the background for contingency plan for suggesting appropriate measures to be taken in drought affected and rainfall deficit areas while Dr J. S. Sandhu



(Agriculture Commissioner, Government of India) suggested timely action and contingency planning is needed to mitigate the drought. He also stated that timely availability of the resources would be a part of this contingency plan.

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## Scientist-Farmer Interface on Plantation Crops

Kasaragod, 27 August 2013. Shri Ramanatha Rai, Minister for Forest and Environment, Government of Karnataka, inaugurated a Scientist-Farmer interface programme on 'Coconut and arecanut' organized by Central Plantation Crops Research Institute. He said that most of the farmers in the region are plantation crops growers. They are small-land holders and follow traditional method of cultivation. He emphasized that adoption of scientific method of cultivation is the only long-term solution to address the problems faced by arecanut growers in the region. He further stressed that the profitability of the produce can be enhanced through product diversification and value addition. He suggested the farmers to adopt the technologies developed by the CPCRI to make farming profitable.

Shri Pramod Madhwaraj, Udipi (MLA) urged the farmers to adopt innovative technologies like virgin coconut oil, coconut chips, coconut neera, sugar etc. to improve their livelihood. He also appealed to the farmers to make best use of these interface programme to get the advance scientific technologies in coconut and areca nut production from the scientists.

Dr George V. Thomas (Director, CPCRI, Kasaragod) focused on various crop improvement, production, protection, processing and value addition technologies developed by the CPCRI which can be adopted to improve the productivity as well as profitability in coconut, arecanut and cocoa.

An exhibition of technologies was also arranged to make farmers aware of the technologies.

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## International Linkages

### Tropical Roots and Tubers for Sustainable Livelihood

Thiruvanthapuram, 9 July 2013. Chief Minister of Kerala, Shri Oommen Chandy inaugurated the International Conference on 'Tropical roots and tubers for sustainable livelihood' under changing agro-climate and the culmination of Golden Jubilee celebration of Central Tuber Crops Research Institute (CTCRI). He said that CTCRI would soon set up a technology incubation centre to produce value added products with the financial assistance from Small Farmers Agribusiness Consortium, Government of Kerala. Dr Shashi Tharoor (Union Minister of State for Human Resources Development, Government of India) lauded the achievements of CTCRI in production of high-yielding varieties, biopesticides, value addition etc.

Dr S. Ayyappan (Secretary, DARE and Director General, ICAR) presided over the function. A special postal cover commemorating the Golden Jubilee of



CTCRI was released during the function by Smt Sumathi Ravichandran (Director, Postal Services, Kerala Circle).

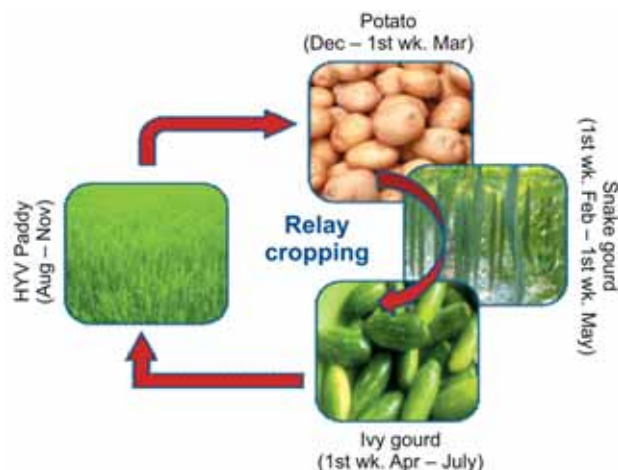
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## Success Stories

### Four-fold Cropping Intensity by using Relay Cropping

Sunderbans. In medium to uplands of Sunderbans, most of the farmers used to grow only 2 crops per year i.e., *kharif* paddy followed by green gram in rainfed situation or *kharif* paddy followed by a single vegetable under irrigated situation. After a significant improvement in the irrigation facility, this cropping pattern was changed to introduce a third or fourth vegetable as relay cropping which reduced the duration of land preparation between two successive vegetables.

Potato is planted in first week of December after harvest of paddy in November. During first week of February, when potato reaches 60 days of crop age, snake-gourd seeds are sown at 1.8 m x 1.8 m spacing. By the next one month, when potato reaches maturity, the snake-gourd vines are trailed over bamboo- iron wire made structure (locally called "*macha*"). Potato is harvested during first week of March. Snake-gourd starts fruiting from first week of April and continues up to first week of May. Ivy-gourd stem cuttings are then planted in-between snake gourd plants, at 1.35 m x 1.35 m spacing, in first week of April. By the time snake-gourd harvesting is completed (first week of May), ivy-gourd vines start climbing the same "*macha*". Ivy-gourd starts fruiting after 60 days and the harvesting is allowed up to the end of July. In medium-land situation where there is chance of water stagnation due to summer rain, ivy-gourd is not cultivated. In such cases snake-gourd



vines are allowed to grow till the end of May. Some farmers even planted cow pea or bitter-gourd along with snake-gourd, at the periphery. Presently 148 farmers (Self-Help Group and UG members) are following this intensive vegetable cultivation through relay cropping after taking loan from the watershed revolving fund.

Mrs Manasi Mondal, member of Star SHG of Paschim Kultali, earned a net profit of ₹ 31,160 from her 0.13 ha of land in 2012. For further information contact: Ramakrishna Ashram Krishi Vigyan Kendra, Nimpith Ashram, South 24 Parganas (West Bengal) 743 338.

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## Elite Karan-Kirti Buffalo reborn through Cloning

Karnal. The scientists of NDRI have produced a cloned calf 'Purnima' from a buffalo namely Karan-Kirti at this Institute's farm.



Dr A. K. Srivastava (Director, NDRI) informed that the Purnima was produced through the new and advanced hand-guided Cloning Technique. It is different from the earlier cloned calves because, in this case, the used donor cell was taken from the ear of an adult outstanding buffalo. He informed that the donor

Karan-Kirti yielded 4,425 kg of milk in its first lactation in 427 days of lactation and had a yield of 3,812 kg in 305 days. He added that the peak yield of the buffalo was 25.1 kg that was recorded highest so far in the history of the Institute.

He emphasized that this technology could go a long way in helping multiply the number of best milch buffaloes in India. He said that although the world's largest population of buffaloes is in India and that they contribute about 55% of the total milk production in the country, but the percentage of elite buffaloes is very less and there is an urgent need to enhance the population of these elite buffaloes.

Dr S. Ayyappan (Secretary DARE and DG, ICAR ) said that this new advancement in the technology of cloning of buffaloes will facilitate faster multiplication of elite germplasm and help us face the challenges of increasing demands of milk due to the ever growing human population.

Dr K.M.L Pathak (DDG, Animal Sciences, ICAR) also congratulated the working team.

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## Plateena: A New Weave in Indian Fish Industry

Cochin. The strongest fibre, ever made is being introduced into the Indian fishing industry through a collaborative initiative of the Central Institute of Fisheries Technology (ICAR), Cochin; Garware Wall Ropes Ltd, (GWRL) Pune; and DSM India Ltd., Mumbai under Public Private Partnership mode. This material developed by DSM, Netherlands, christened Dyneema and patented by the Garware Wall Ropes Ltd under the trade name Plateena, is set to make new waves in the Indian fishing industry, choked by the rising fuel prices.



UHMWPE webbing



UHMWPE rope

With one-third the diameter of nylon and one-fourth its weight this wonder fibre renders 30-40% fuel savings and has 4- to 5- fold more life and reduces carbon footprint considerably. The fishing gears made out of this new material promises conservation of aquatic biodiversity and fuel saving through efficient water filtering.

Ultra high molecular weight polyethylene fibre, popularly known as Dyneema/Spectra, is a type of polyolefin synthesized from monomer of ethylene. The fibre made by gel spinning has a high degree of molecular orientation resulting in very high tensile strength and has extremely long chains of

polyethylene, which attain a parallel orientation greater than 95% with a level of crystallinity up to 85%. Netting of single knot, double knot and knotless viz., raschel can be made with ultra-high molecular weight polyethylene fibres. The material is 15-fold stronger than steel on a weight-to-weight basis. The material has high strength, low density, no water absorption, low elongation at break, high abrasion resistance, high resistance to ultra violet radiation and high resistance to degradation by micro-organisms and to most chemicals except oxidizing acids. Dyneema is considered as the strongest fibre in the world.

The work is being carried out under the project on "Green Fishing Systems for Tropical Seas" under the National Fund for Basic, Strategic and Frontier Application Research in Agriculture (NFBSFARA) and designs of plateena trawls and purse seines have already been made for testing. This significant innovative work was done by Saly N. Thomas, Leela Edwin (Central Institute of Fisheries Technology) and B. Meenakumari (DDG,Fy,ICAR).

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## Directorate of Onion and Garlic Research signs MoU

Rajgurunagar, 27 August 2013. A Memorandum of Understanding (MoU) was signed by the Director (DOGR) with Director (Jindal Crop Sciences Pvt. Ltd., an ISO 9001:2008 certified company, located at Jalna, India) at Directorate of Onion and Garlic Research.

According to MoU, Directorate of Onion and Garlic Research extended a non-exclusive license to Jindal Crop Sciences Pvt. Ltd for seed production and distribution of Bhima Super onion that is a red onion variety and can also be grown in late *kharif*. It has been recommended for *kharif* in Chhattisgarh, Delhi, Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan and Tamil Nadu.

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## NAIP

### Empowering Rice Farmers through Capacity Building Programme

Barapani, 12 September 2013. Shri S. Pradhan, (Secretary, Food Security and Agricultural Development and Horticultural and Cash Crop Development Department, Government of Sikkim) inaugurated the a 3-day farmers' capacity building programme on 10 September 2013 at ICAR Research Complex for NEH Region, Sikkim Centre, Tadong, Gangtok under the aegis of NAIP-I project 'Development and Maintenance of Rice Knowledge Management Portal' ([www.rkmp.co.in](http://www.rkmp.co.in)).

He said that there is immense variability among rice cultivars in the North- Eastern Region due to selection



made unknowingly by various ethnic groups inhabiting at different altitudes and climatic situations, practising different forms of cultivation which might have also contributed to the diversity of rice crop in this region and this information needs to be documented in the RKMP portal.

Dr R. K. Avasthe (Joint Director, ICAR Research Complex, Sikkim Centre, Tadong) highlighted that Indian rice research and its rice development programmes led India to be self-sufficient in food-grain production where rice shares about 43% of total national foodgrain production of more than 260 million tonnes per annum. Dr Mohanty justified the information sharing mechanisms of RKMP developed under NAIP-I in harnessing the rice knowledge among the rice stakeholders for enhancing the rice production to meet the Vision 2020 envisaged target of 121 million tonnes.

Dr R. P. Medhi (Director, NRC for Orchids, Pakyong) stated that his past experience of working with SRI technology enhanced the productivity to the tune of 30-40% in Andaman Islands and advocated the farmers to make best use of the first ever Rice portal [www.rkmp.co.in](http://www.rkmp.co.in).

### Business Planning and Development Unit Inaugurated

Bhopal, 6 August 2013. Dr D Rama Rao (National Director, NAIP) inaugurated the Business Planning and Development (BPD) Unit at Central Institute of Agricultural Engineering. He explained that the concept of BPD is basically to provide new developments and service to the farmers through entrepreneurs.

Dr N. S. Rathore (DDG, Agricultural Engineering) urged that through this BPD Unit we should support the innovations of entrepreneurs by extending them support and guidance.

Dr P. S. Pandey (National Coordinator, NAIP) shared the success of various initiatives under NAIP. Er. Rajeev Choudhary (Director, Directorate of Agricultural Engineering, Government of Madhya Pradesh) highlighted the contribution of agricultural engineering technologies in growth of agriculture in Madhya Pradesh. The technology of multi-grain biscuits, developed by Dr Dipika A Murugkar (National Fellow at CIAE) was licensed to M/s SSD Enterprises, Bhopal for its production and marketing. The BPD Unit will serve as nurturing unit for agri-business aspirants intending to start their enterprise/business based on agricultural engineering technologies such as manufacturing of agricultural machinery, agro-produce processing and value addition, biomass-based energy generation and covered cultivation of horticultural crops.

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## Improved Gill Nets Distributed to the Fishermen



Kollengode, 22 July 2013. Shri K. Babu, Minister of Fisheries and Excise, Government of Kerala, inaugurated a programme on 'Distribution of improved gill nets suitable for reservoir fisheries in seven dams of Palakkad district'. It was organized by the Central Institute of Fisheries Technology (CIFT), Cochin. under the NAIP sub-project, RHSSP. Shri K. Babu distributed the gill nets to the fishermen of Meenkara and Chulliyar dams of the 132 fishermen from various dams in Palakkad, namely Valayar, Mangalam, Pothundi, Kanjirapuzha, Meenkara and Chulliyar were benefited from the programme.

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## NAIP's Experience with Business Planning and Development Units

New Delhi. With an objective to promote technology commercialization through incubation, promoting agri-preneurs and enhancing sector competitiveness, 10 Business Planning and Development Units (BPDUs) have been set up under NAIP (5 in ICAR institutions and 5 in State Agricultural Universities) with one hand-holding consortia (ICRISAT).

The key learning that are emerging from NAIP's experience in setting up of these agri-business incubators are:

- (i) professional and dynamic Principal Investigator (PI) at host institute needs to be appointed on fulltime basis and the assessment of PI would be linked to the performance of the BPDUS;

- (ii) setting up of an advisory board with representation from industry and trade at each BPDUS;
- (iii) bpdu business manager must be qualified professionals from industry with market linked salary structures and additional incentives linked to the performance of BPDUS and with longer tenure (3 years); and
- (iv) a single window system of commercialization through BPDUS to be made mandatory for all BPDUS including those in state agricultural universities.

### Way forward for sustainability of business planning development unit

The Business Planning Development Units established under NAIP needs special attention for their sustainability during post NAIP period.

Following points were being submitted for discussion:

1. All BPD Units should be coordinated at National level with sufficient authority and responsibility to promote, facilitate BPDS through guideline and support.
2. BPD Units established under NAIP may be supported under ICAR. However, the composition of BPD team may be re-assessed and these BPD Units may be supported with RAs/SRFs and consultants as per need.
3. The BPD Network may be supported by a handholding agency on incubation, technology commercialization etc.
4. Managers must be professionals from industry and recruited on nominal salary with performance based incentives. Such incentives should be provided only in case of the revenue crossed the limit set for the BPD. This applies only when the BPD Unit is capable to sustain its expenditure from revenue generated.
5. It is desirable to align the existing BPD Units under the umbrella of Agri-Innovate India Ltd.
6. The Principal Investigator must have recognition of credit for working in BPD Unit in terms of appraisal and incentive based on physical and financial performance.

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### ICAR Vichar Manch

New Delhi, 21 August 2013. Shri K. Vijay Kumar (Senior Security Advisor to the Home Minister on Naxal Management) did celebrations on 'Countering Maoist Insurgency—some nuances' at NASC Complex. He spoke on the policing responses and also on the new policing ones while placing the Maoist problems in the overall context of Internal Security.

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### Homestead Farming Fetch More Revenue

Mogpuskarini, Tripura. Considering the limited resources of the villagers, shrinking average land holdings and also the requirement of *in situ* conservation of bio-resources, eight field demonstrations were conducted by Krishi Vigyan Kendra, South Tripura for scaling up of existing homestead farms under Rural Innovation Programme of NABARD. Participating farmers were trained on practices of homestead farming through tailor made training modules. Focus was more on building their capacities to adopt the technology in existing farm conditions.



Sri Narayan Shukla Das, Mogpuskarini (South Tripura), was at the lowest point of his life 2 years ago. His income as a rickshaw puller was irregular and insufficient. Narayan got training in homestead garden from KVK.

He established his village model farm at the household. Initially, KVK provided seeds of vegetables, planting materials of spices, tuber and fruit crops; 15 dual purpose poultry and 2 goats to rear; and one vermi-compost and a *jalkund* unit for production of on-farm compost and water harvesting. Sri Narayan worked in his garden side-by-side with household tasks and marketing of farm produce. Sri Narayan now earns more with a minimum of ₹ 5,000/month, through selling vegetables, mushroom, eggs, poultry and other farm produces from his homestead garden.

Sri Narayan is one of the successful farmers in Homestead Food Production Programme, who helps farmers to establish homestead gardens. Farmers from distant villages are visiting his farm and learning the system.

Impact of project work showed that farmers could harvest 1,400 eggs, 28 kg of poultry meat, 6 goat kids, 140 kg of mushroom, 1,700 kgs of vegetable, 448 kg of tuber and spices crops per unit of homestead farm. Adding various components to a

homestead farm and integrating them has helped small farmers to reap rich harvests. Farmers have continued to realize consistently improved yields and could earn up to ₹ 67,705/year from 0.16 ha land area.

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### Beekeeping Improves Livelihood

Morena. Beekeeping requires less investment and technical skill and provides good income due to increasing demand of good quality honey in domestic and international market. Owing to increase in honey production, marketing of honey was facilitated by Krishi Vigyan Kendra (KVK) by formation of self-help groups (SHGs) for increasing income from beekeeping. Presently 12 SHGs of beekeepers are working with the Krishi Vigyan Kendra. About 6,500 rural youths are directly and indirectly associated with beekeeping, marketing of bee-products and bee-equipments. The centre has also established honey processing (one at the center and three in the district), storage and quality testing laboratory at the center to strengthen marketing of quality honey for consumers. The moisture content, F/G ratios, acidity, identification of adulteration are tested in the lab. This intervention has increased the number of beekeepers and production of honey in the district.

Bee wax is costlier than honey, therefore, training on improved method of wax extraction and purification was also conducted to promote its marketing. Seeing the progress and awareness on beekeeping farmers, NGOs and extension workers from Madhya Pradesh, Uttar Pradesh, Chhattisgarh, Bihar and Rajasthan showed their interest and were also educated during exposure visits to beekeeping unit at centre on importance of beekeeping for crop productivity enhancement and benefits of honey.

#### Steps for promotion of bee keeping

- Selection of unemployed rural youth and training.
- Promoting bee management and multiplication of *Apis mellifera* bee colonies.
- Helping in providing loan and financial support through banks other and institutions.
- Intensive cropping for increasing flora round the year and crop production of the farmers.
- Technical guidance and interactions with local beekeepers and migratory beekeepers from Uttar Pradesh, Bihar and Rajasthan to support each other during migration.
- Establishment of honey quality testing, cold storage and processing unit for safe storage and marketing of quality honey.

- Organic honey production by beekeeping in pigeon pea, rapeseed-mustard and barseem crops.
- Development of Raj Vijay SHGs for various activities including marketing.
- Development of entrepreneurship for production of wooden boxes, wax sheets, honey extract etc. in the district.

#### Beekeeping for sustainable livelihood

- Provide self-employment for rural youth and landless people.
- The farmers are also doing beekeeping as a part time with agriculture.
- Honey production up to 80 kg/year/apiary and 2.5-fold higher honey production can be obtained from migratory bee keeping.
- Extra income generation by increased crop productivity and marketing of other bee products (wax, pollen, bee venom, royaljelly, propolis) and bee boxes.
- Beekeepers having 10 to 1,200 bee colonies can get an annual income of ₹ 0.40 to 30 lakh.
- Cold storage, processing and quality testing facility to improve quality and shelf-life of honey.

At present, 6,500 bee keepers of Krishi Vigyan Kendra, having 50,300 colonies (*Apis mellifera*) are extracting 3,060 tonne of honey and earning ₹ 260 million/year income.

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## Hand-operated Winnower Enhances Income and Rice Quality

Rai-Bhoi. Mr Dwan Khream, a small farmer of the Rai-Bhoi district in Meghalaya, mainly grows rice among other vegetable crops, on his 1.5 acre of land. Despite good yield from paddy, he did not make profit as impurities mixed with rice due to traditional winnowing method had reduced the price of the paddy. Then, on advice of scientists, he used 'Hand-operated winnower', which made winnowing easier and resulted in better income.



In the conventional method five to six labours are required to start paddy cleaning – rice crop is beaten by two or three persons on wooden logs; collected in big baskets; these are raised above the head by a person to clean husk and impurities; and sometimes, he has to stand long to wait for a gust of wind. Since this method is wind dependent, arrival of monsoon, or untimely rains, also spoiled the rice crop permanently. Other than this, many farmers use *Dao* (chopper), spade, hoes, sickles, country plough, bamboo made leveler, and transporting baskets for different farm jobs. Following the age-old threshing technique, rice quality deteriorates, resulting into poor market price.



Agriculture Engineering Division of ICAR-Research Complex for North-Eastern Hills Region, Barapani demonstrated 'Hand-operated winnower' to few farmers in Meghalaya, so that they could clean paddy crop timely. Weighing around 29 kg, the hand-operated winnower is provided with a fan-guard to prevent any accident.

Mr Dwan purchased the machine at ₹3,000 from the ICAR institute. He got better quality rice that fetched better market price. Results encouraged his close friends to use the machine. The news that hand-operated winnower increased income, brought a large group of fellow rice farmers to him. Mr Dwan decided to rent the winnower out to fellow farmers at ₹ 100 per user in the local area which brought him ₹ 3,000 to 5,000 in one-year duration. "If small-and marginal-farmers go for it, rice crop alone can give them extra money, and a suitable job also," he said to fellow farmers during a recent training programme at ICAR-RC-Barapani. There is considerable scope for this technology, since rice covers about 3.5 million ha (10% of the total rice growing area of the country) in North-Eastern Hills Region. On an average, output of the winnower, taken by the local farmers, was recorded to be as 2.5 to 3.5 q/ha.

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# Celebrations

## Krishak Mela on Climate Resilient Agriculture

Cuttack, 5 July 2013. Shri Debi Prasad Mishra (Minister of Agriculture, Animal Husbandry, Fisheries, Housing and Urban Development, Government of Odisha) inaugurated a *Krishak Mela-cum-Agrani Krishak Sammelan*, jointly organized by KVK Cuttack, NICRA, CRRI and ATMA Cuttack, at village Sagar, Narasinghpur. He highlighted the performance of Central Rice Research Institute (CRRI) rice varieties for rainfed upland ecology and advised farmers to consult the KVK and CRRI scientists for rice seed production and experts of line departments for integrated farming.

There were three sessions: (i) Rice production strategy in relation to climate change and drought, (ii) Production technology of quality rice seed, and (iii) Scientists/Experts-Farmers Interaction. Demonstration of 'Power operated drum seeder and manual drum seeder' of CRRI was conducted by the scientists of the Institute. Two technical bulletins in Odia, *Parabartita Jalabayure Barsarita Dhipa Jamire Marudi Prapidita Anchala Pain Dhana Chasa* and *Unnata Manara Dhana Bihana Utpadana Padhati*, were released.

The rice seeds of drought-tolerant variety 'Sahabhazi dhan' were distributed among the farmers to help them increase productivity especially in drought prone upland.

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## Foundation Day of CPRI

Shimla, 22 August 2013. Eminent agriculture scientist Dr P.L. Gautam presided over the 64<sup>th</sup> Foundation Day of Central Potato Research Institute. He focused on potato varieties and production technologies. Thakur Sukhvinder Singh, (President, Himachal Pradesh State Congress Committee), was the Chief Guest of the foundation day celebration. Two publications and a CPRI Technology Kit related to potato cultivation in plateau area and management of potato disease and pests were released on this occasion.

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## National Fish Farmers' Day

- Mumbai, 10 July 2013. Padma Bhushan Prof. R. B. Singh, (President, NAAS) inaugurated National Fish Farmers' Day at CIFE. He stressed on the importance of entrepreneurship for addressing



employment issues of the country and highlighted the need to bridge the gap between acquired and required knowledge for generating qualified human resource.

Prof. Hiralal Chaudhuri Fish Farmer Award and Prof. Hiralal Chaudhuri Young Scientist Award were conferred upon six farmers/entrepreneurs, and young scientists were also awarded with Awards for their significant contributions to research in fisheries.

Dr W.S. Lakra (Director, CIFE) emphasized on the need for a culture of innovations and quality research and teaching with a focus on newer skills. The award winners narrated their success stories and urged the students to become the employment generators rather than job seekers.

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- Barrackpore, 10 July 2013. The Central Inland Fisheries Research Institute celebrated National Fish Farmers' Day. Sri Subesh Das (Additional Chief Secretary, Department of Fisheries, Aquaculture, Aquatic Resources and Fishing Harbour, Government of West Bengal) emphasized on sustainability of fish production. He highlighted various problems like ownership, market linkage, and suggested that development of unutilized water-bodies should be given priority through culture-based fisheries. Prof. A. P. Sharma, assured





the farming community to extend all possible support for scientific fisheries management.

A pamphlet in Bengali language on 'Importance of Small Indigenous in Livelihood and Nutritional Security' was released by CIFRI on this occasion.

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- Bhim Tal, 10 July 2013. The National Fish Farmers' Day was celebrated at village Tharu Teeshna in Udhan Singh Nagar, Uttarakhand. Dr Ashok Taru (Director, DCFR, Bhimtal) presided over the function. He highlighted the importance of rural aquaculture for income generation and for livelihood security particularly for the poor farmers with smaller-land holdings. Dr Barat advised local fish farmers to be in touch with scientists and also visit Bhimtal/Champawat centre for better utilization of available farming technologies. Dr Barat along with scientists and farmers released fish seed in farmer's pond. Dr M. S. Akhtar (Scientist) delivered an interactive lecture to the farmers for enhancing productivity



through integrated aquaculture and addressed the aquaculture related queries of the farmers.

Dr Patiyal gave on-farm demonstrations to the farmers for pond management. The seeds of improved Hungarian common carp strain, rohu, catla, mrigal, silver and grass carp were given to four adopted farmers under tribal sub-plans along with fish nets, plankton nets, hand nets, thermometer etc.

## Capacity Building

### Silver Jubilee Block Inaugurated

Hyderabad, 20 July 2013. Dr S. Ayyappan, (Secretary, DARE and DG, ICAR) inaugurated the newly built Silver Jubilee Block at Project Directorate on Poultry, Rajendranagar. He emphasized that Project Directorate on Poultry is one of the few institutes of ICAR that have excelled in supplying improved germplasm to farmers of the country. Dr Ayyappan suggested strengthening research in consortia mode employing multi-disciplinary approach involving local State Agricultural Universities, ICAR institutes and other line departments. He appreciated the architect of the building and congratulated the institute for establishing such a well-planned facility. The two storeys Silver Jubilee Block constructed for expanding the laboratory space at the Project Directorate on Poultry has floor space of 12,000 sq. ft. The building has been built with state-of-the-art design for providing good ventilation, light and space utility.



The new block has 6 labs, 12 sitting rooms, a seminar room, besides common facilities and room for Central Instrumentation Facility. Dr Ayyappan also visited the hatchery, farm and the recently acquired site from SVVU for creating Germplasm Supply Unit. Prof K.M.L.Pathak, DDG (AS) expressed satisfaction on the work progress of the institute.

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### 'Shining barb', CIFABROOD™, and 'Quality Pangas Seeds' Technologies Released

New Delhi, 29 August 2013. Dr S. Ayyappan (Secretary, DARE and DG, ICAR) released three technologies namely Shining barb, and CIFABROOD™, and Quality Pangas seeds, at NASC Complex. The inventors of these technologies are: Dr S.K. Swain, Shining barb, Dr S. Nandi, CIFABROOD™; and Dr B.S. Giri, quality pangas seeds. Dr Ayyappan handed over the released technologies to the respective progressive farmers at the occasion. The Memoranda of Understandings were signed between Director (CIFA) and the entrepreneurs Mr Avijan Ghosh (M/s Aishrya Aquaculture Pvt. Ltd., Naihati, West Bengal), and Dr Atul Kumar Jain (Director, M/s Tropical Aquaculture & Farming Systems, Udaipur, Rajasthan) for transfer of CIFABROOD™ and Shining barb technologies, respectively. Mr S. Suparna (M/s Sairam Hatchery Pvt. Ltd., West Godavari, Andhra Pradesh) received seeds of pangas.

Dr P. Jayasankar (Director, CIFA) gave a brief introductory address on the technologies, and

inventor scientists appraised the house on the new technologies. CIFABROOD™ is a brood stock feed for Indian major carps for an early maturation, improved breeding performances as well as quality seed production. 'Shining barb', a new variety of Rosy barb has been developed over a period of 8 years of selective breeding. The CIFA technology had led to first time successful breeding of pangas in Andhra Pradesh.

The success of seed production and breeding technology, popularized among the farmers will increase the availability of seed in the region as well reduce the seed cost.

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## IVRI Technologies Commercialized

Izatnagar, July 2013. The Indian Veterinary Research Institute (IVRI) has commercialized technologies to different entrepreneurs of Tamil Nadu, Kerala, Madhya Pradesh and Uttar Pradesh. On this occasion, seven Memoranda of Understandings were signed between Director, IVRI and the entrepreneurs:

- 'Ready to Cook Milk Chips' and 'Chicken Meat Chips' Technologies were commercialized to M/s Royal Food Corporation, Meerut on 4 July 2013 at Indian Veterinary Research Institute, Izatnagar.
- 'Low Cost Multiplication Technology of Salt Tolerant Bio-Growth Enhancers for Increasing Productivity of Agri-Horti Crops in Normal and Sodic Soils' Technology commercialized to M/s Krishicare Bioinputs, Tamil Nadu M/s Allwin Industries, Pithampur, District Dhar, Madhya Pradesh on 12 and 18 July 2013 respectively at NASC Complex, New Delhi.
- 'Non-Structural Protein 3ABC Based Diagnostic Assay (ELISA) for Foot-and-Mouth Disease to Differentiate Infected from Vaccinated Animals' and 'A Rapid Test for Detection of Non-Structural

Protein (NSP) 3ABC Antibodies from Foot-and-Mouth Disease Virus Infected Animals' Technologies have been commercialized to M/s Ubio Biotechnology Systems Pvt. Ltd., Cochin, Kerala on 17 July, 2013 at NASC Complex, New Delhi.

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## Shri Sharad Pawar unveiled portrait of Mahatma Jyotiba Phule

New Delhi, 5 August 2013. The Union Minister of Agriculture and Food Processing Industries, Government of India, Shri Sharad Pawar, unveiled the portrait of Mahatma Jyotiba Phule at Krishi Bhawan.



Shri Pawar informed that Mahatma Jyotirao Govindrao Phule was born in a farmer family at Satara, Maharashtra in 1827 and contributed towards reforming education, caste system, agriculture, and espoused the cause of women and widow upliftment.

Dr S. Ayyappan (Secretary, DARE and DG (ICAR) briefed the gathering about the contribution of Mahatma Jyotiba Phule in the field of Agricultural Reforms. Shri Shishir Shinde, Artist of the portrait made a presentation of paintings on the occasion.

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## Visits

### Union Minister of State for Agriculture visits ICAR Research Complex for Eastern Region

Patna, 3 August 2013. Shri Tariq Anwar (Union Minister of State for Agriculture and Food Processing Industries, Government of India) visited ICAR Research Complex for Eastern Region, Patna, Bihar. He urged the scientists to work for the betterment of small-and marginal-farmers in respect of food security, profitability and sustainability and asked them to join hands with the state department in dissemination of technologies developed by the institutes.



Shri Tariq Anwar also released a book, *Status of Agriculture Development in Eastern India*.

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## DG, ICAR visits

- Nadia, 25 July 2013. Dr S. Ayyappan (Secretary, DARE and DG, ICAR) visited Krishi Vigyan Kendra (KVK, Nadia), Bidhan Chandra Krishi Viswa-vidyalaya, Mohanpur. He took a round of KVK farm, training hostel and administrative building. Dr Ayyappan while expressing satisfaction about overall performance of the KVK, advised the staff to concentrate more on development of weaker section of the farming community. Dr Ayyappan also visited Arapanch Farm at Narendrapur, South 24 Parganas district, where additional KVK has



been approved. The Director General requested the Director, SAMETI, West Bengal to prepare and send a site development plan of Arapanch Farm indicating all the components of KVK establishment to the Zonal Project Directorate. Dr A.K. Singh (Director, Zonal Project Directorate) appraised (DG, ICAR) about more number of upcoming KVKs in the state of West Bengal.

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- Patna, 17 August 2013. Dr S. Ayyappan (Secretary, DARE and Director General, ICAR) visited ICAR Research Complex for Eastern Region. In the meeting, he stressed upon the development of location specific integrated farming system models in different agro-ecological conditions. He advised scientists to make a comprehensive contingency

plan for Bihar keeping in view the severe drought like situation prevailing in the state for last four years. Dr Ayyappan also met Agriculture Production Commissioner, Government of Bihar and discussed the Contingent Plan keeping in view the deficit rainfall in 30 districts of Bihar.

Dr R. K. Mittal (Vice Chancellor, Birsa Agriculture University) emphasized upon the need for collaborative research programme for the betterment of farming community.

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- Tripura, 2 July 2013. Dr S. Ayyappan (Secretary, DARE and DG, ICAR) visited ICAR Research Complex for North-Eastern Hills Region, Tripura Centre and inaugurated Mushroom House. It has a capacity to produce 15,000 spawn/annum for distribution among the farmers.



The DG, ICAR also inaugurated Central Laboratory. Several instruments for use in Soil Science, Plant Breeding, Plant Pathology and Fisheries were present in the laboratory. Mushroom spawn and fish fingerlings were also distributed by the dignitaries to the farmers.

The DG, ICAR visited the exhibition room of Tripura Centre depicting the number of crop varieties developed by the scientists at Tripura.

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## Trainings

- Izatnagar, 29 July 2013. A two-week National training on 'advances in stem cell therapy in livestock and pets and its business potential' funded by ICAR, New Delhi under National Agriculture Innovation Project (NAIP) and organized by the Centre of Advanced Faculty Training (CAFT) was held from 16 to 29 July 2013 at the Division of Physiology and Climatology, Indian Veterinary Research Institute.
- Kakdip, 27 July 2013. A training course on Culture

of shrimp *Litopenaeus vanname* was conducted at Kakdip Research Centre (KRC) of Central Institute of Brackishwater Aquaculture from 22 to 27 July 2013 as a capacity building measure in farming the new shrimp species in the coastal areas of West Bengal.

- Bengaluru, 28 August 2013. A 10-day training programme on 'Advances in Livestock Disease Informatics and Biostatistics' was organized at Project Directorate on Animal Disease Monitoring and Surveillance, Bengaluru from 19 to 28 August, 2013.



## CRIJAF organized National Training on Improved Jute Retting Technology



Barrackpore, 12 August 2013. A national level training to train the state agricultural officers as master trainers was organized by CRIJAF, Barrackpore which was sponsored by the Directorate of Extension Education, Ministry of Agriculture, Government of India for 8 days ie from 5 to 12 August 2013. Twenty three agriculture officers from West Bengal, Bihar, Asom, Odisha and Andhra Pradesh participated in this training.

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## Clean and hygienic meat production

Izatnagar. A one-day training programme on 'Clean and hygienic meat production' for meat workers and butchers of Bareilly, Uttar Pradesh was inaugurated on 27 August 2013 at the Indian Veterinary Research Institute, Izatnagar.

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## Technology Transfer Programmes

Cochin Dr S. Balasubramaniam coordinated the following training programmes at the Central Institute of Fisheries Technology. A training on 'Fabrication of improved fishing nets and responsible fishing' was conducted on 27 and 28 August 2013.

A training on Post-harvest handling, processing, value addition and packaging was conducted from 29 to 31 August 2013 at Kokrajhar. About 140 trainees attended both training programmes.

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## Use of Modern Tools in Water Management for Evaluating Water Use Efficiency and Crop Yield



Karnal, 23 August 2013. Dr Rameshwar Singh (Project Director, DKMA) inaugurated a five-day training programme for Officers from Command Area Development Authority, Haryana on 'Use of Modern Tools in Water Management for Evaluating Water Use Efficiency and Crop Yield' at Central Soil Salinity Research Institute, Karnal on 19 August 2013. He

highlighted the importance of water resources and its efficient use for irrigation in enhancing crop production in view of reduction of canal water to agriculture and looming climate change.

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## ICAR's New Arrivals

- *Handbook of Animal Husbandry* (4<sup>th</sup> revised and enlarged edition)
- *Handbook of Agricultural Engineering*
- *Textbook of Field Crops Production – Foodgrain Crops Vol I*
- *Textbook of Field Crops Production – Commercial Crops Vol II*

*For order; please contact*

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# Nutrient Requirement Standards

## For Farm Animals, Birds, Mithun, Yak, Pet And Lab Animals

India is rich in livestock wealth, and a large genetic diversity exists of different animals in the form of breeds and strains, which are well adapted to different agro-ecological conditions and economic functions. The country has world's best dairy buffaloes, draft cattle, carpet-wool sheep and prolific goat breeds. But their genetic potential has not been fully exploited mainly due to various physical, environmental, nutritional and health constraints. Feed requirements of animals vary from species to species and from one geographic zone to other depending on the animal potential and plant-soil- animal relationship.

Several of the institutes of the Indian Council of Agricultural Research are and have been working on the crucial aspects of animal nutrition. Realizing the fact that compilation of the scattered valuable information on the nutrient composition of various feeds and fodders is a must, a National Committee on Nutrient Requirements of Animals was constituted by the ICAR. The Committee has brought out a series of ten publications on *Nutrient Requirements of Animals*. Nutrient Requirements of Animals developed by the National Research Council (NRC) of the USA and Agricultural Research Council (ARC) of the UK were

also referred, and wherever needed, data have been used.

**Nutrient Requirements of not only domestic animals and birds, but also of mithun, yak, pet and lab animals, fish and shell fish and wild life have been compiled as individual booklets.** For appropriate standardization of the nutrient requirements, the Committee took all care; the draft manuscripts were circulated to wide range of specialists including experts from feed industries also so that their critical inputs could also be considered and incorporated before finalization for printing. Computer models, considered to be most effective means of taking animal variations with varied needs of nutrients, have also been used. Equations developed in calculating nutrient requirements were taken into consideration and made effective use of. A barrage of models and equations has been introduced to edifice scientific modules leading to mathematical calculations of the nutrient requirements. The publications will serve as a radar to signal pathways for all those involved in animal science sector, researchers, teachers, students, feed industries, large and small livestock farmers, policy- planners and all other stakeholders in many countries placed in the similar situation.



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# Personnel

## Protocol Visits

- Dr B. Mohan Kumar (Assistant Director General, Agroforestry and AF, ICAR) visited Baghdad, Iraq as part of the delegation led by Shri M.P. Moily, Minister of Petroleum and Natural Gas from 7 to 8 July 2013 to attend the 17<sup>th</sup> India-Iraq joint commission meeting.
- Dr Kuldeep Singh Jodan (Scientist, Plant Pathology, Directorate of Groundnut Research) visited North Carolina State University, USA from 1 September to 23 November 2013 for the Norman Borlaug International Agricultural Science and Technology Fellowship Programme 2013 of USDA-FAS for conducting research on Integrated plant health management (pests and diseases) and development of biological control system for groundnut.
- Dr S. K. Nanda (Project Coordinator & Principal Scientist, CIPHET, Ludhiana) visited Thailand from 27 to 28 August 2013 to participate in High Level Multi Stakeholders Consultation meeting on 'Food Losses and Food Waste in Asia and Pacific Region'.
- Dr N.K. Krishna Kumar (Deputy Director General, Horticulture, ICAR) visited Michigan State University, Michigan, USA from 2 to 7 September 2013.
- Dr Manish Das (Principal Scientist, Division of Horticulture, ICAR) and Shri V.K. Singh (Under Secretary, DARE) visited Netherland from 9 to 13 September to attend a meeting on Potato Europe under Work Plan of ICAR and Directorate General of Agriculture of the Ministry of Economic Affairs and Innovation (DG, AGRO), Netherlands.
- Dr R. K. Gupta (Principal Scientist, CIPHET, Ludhiana) visited Singapore from 9 to 11 September 2013 for attending the XIII ASEAN Food Conference at Singapore, under ASEAN India Cooperation in Food Science and Technology.
- Dr Bishnu Prasad Mishra (Head Animal Biotechnology, IVRI, Izatnagar) visited Livestock Research Center, Oman from 14 to 20 September 2013 as an expert in the field of Animal Biotechnology under the Work Plan finalized between the two sides.

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Editor

## Appointments

Name	joined Council as	on
Dr Narendra Singh Rathore	DDG (Agricultural Engineering), ICAR (Hq), New Delhi	11 July 2013 (A.N.)
Dr Jitendra Singh Chauhan	A.D.G. (Seeds), ICAR (Hq), New Delhi	10 July 2013
Dr (Mrs) Neelam Grewal	Director, Directorate of Research on Women in Agric. Bhubaneshwar	15 July 2013
Dr Ravikant Avasthe	Joint Director ICAR Research Complex for NEH Region, Sikkim Centre, Tadong	4 July 2013
Dr A Gopalakrishnan	Director CMFRI, Cochin	31 July 2013
Dr Rudra Nath	Project Director PDP, Hyderabad	12 Sept 2013

## Superannuations

Name	Retired as	Date
Dr G. Syda Rao	Director, CMFRI, Cochin	31 July 2013
Dr N.P.S. Sirohi	A.D.G. (Agril Engg.) ICAR (Hq), New Delhi	31 July 2013
Dr T.P. Rajendran	ADG (PP), ICAR Hqrs New Delhi	31 July 2013
Dr A.M. Narula	Zonal Project Director (Zone-I), PAU Campus Ludhiana	31 July 2013
Dr V.J. Shivankar	Director NRC for Citrus, Nagpur	31 Aug 2013
Dr R.P. Sharma	Incharge, EEU, DKMA, ICAR (Hq) New Delhi	31 Aug 2013
Dr B.K. Joshi	Director NBAGR, Karnal	30 Sept 2013

## Editorial Board

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