



IARI NEWS



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Dr. Trilochan Mohapatra Joins as Director, ICAR-IARI



Eminent geneticist, Dr. Trilochan Mohapatra joined as Director, ICAR-Indian Agricultural Research Institute (IARI), New Delhi on August 28, 2015. Born on April 20, 1962 at Kharibil village, Cuttack district, Odisha, India, Dr. Trilochan Mohapatra completed his B.Sc. (Agriculture) from OUAT, Bhubaneswar in 1985 and M.Sc. and Ph.D in Genetics from Indian Agricultural Research Institute, New Delhi in the year 1987 and 1992, respectively.

Dr. T. Mohapatra Before taking over the position of Director of this prestigious Institute, Dr. Mohapatra worked as the Director of ICAR-National Rice Research Institute (Formerly CRRI), Cuttack, Odisha since 2012 and as a researcher & teacher for about 20 years at the ICAR-National Research Centre on Plant Biotechnology, New Delhi.

Dr. Mohapatra has been working in the area of molecular genetics and genomics. He has over 145 research papers in national and international journals of repute and several book chapters. His research accomplishments 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. His contribution to science is reflected from high h-index and i10-index.

Dr. Mohapatra has the distinction of receiving several honours and awards in recognition of his excellent academic and research contributions including the INSA Young Scientist Award, Prof. LSS Kumar Memorial Award, NAAS-Tata Award, IARI BP Pal Award, DBT Bio-science Award and NASI-Reliance Industries Platinum Jubilee Award. He also got the Recognition Award of the National Academy of Agricultural Sciences for the biennium 2013-14 for significant contributions in Plant Improvement, and the Lifetime Achievement Award of the Indian Genetics Congress in recognition of outstanding contribution in the field of Plant Genetics. He is a Fellow of the National Academy of Agricultural Sciences, New Delhi, Indian National Science Academy, New Delhi, and National Academy of Sciences-India, Allahabad.



Dr. T. Mohapatra (right) taking over charge from Dr. Ravinder Kaur, Director (Acting), IARI

RESEARCH

Wheat Variety Identified

A wheat variety HS 562 was identified for release for timely sown rainfed and irrigated

conditions of Northern Hills Zone. HS 562 produced an average grain yield of 3.6 t/ha which was 6.2% higher than that of the best check HS 507 under rainfed conditions. It also performed well and gave on an

average grain yield of 5.27 t/ha under irrigated condition of Northern Hills Zone. It has shown good levels of field resistance to leaf and stripe rusts. It has good *chapati* and bread making qualities. This



A field view and grains of wheat variety HS 562

variety is expected to provide a high yielding variety option for the farmers of this region.

Identification of High Iron and Zinc Lines of Pearl Millet

Three breeding lines PPMI 903, PPMI 904 and PPMI 906 were found to possess stable high iron and zinc contents across different locations, namely, Coimbatore, Delhi, Durgapura, Gwalior, Hisar, Jamnagar, Ludhiana, Mandor and Tirupati in 2013 and in 2012-13 and 2013-14 at IARI, New Delhi in comparison to ICTP 8203 (Fe – 79 ppm; Zn – 61ppm) which is the check variety.



PPMI 903 PPMI 904 PPMI 906

Phenotypic Characterization of DWnt4 Mutants in Drosophila

Based on the observations made during knockdown of DWnt4 gene using different tissue specific drivers, we observed the mutant flies DWnt4^{AL7}, DWnt4^{RF2} and other five mutants of DWnt4 isolated in *Drosophila* lab of the Division of Genetics. DWnt4^{AL7} and DWnt4^{RF2} both of them showed reduction in

wing size, unequal wing size between pair of wings, Ectopic wing veins, one wing missing from pharate adults (unenclosed pupa) or adult fly, absence of bristles from abdomen, polarity defects in abdominal bristles, etc.

Low-phytate Soybean with Improved Mineral Bioavailability

An over expressing *Gmphy* cassette containing *phytase* gene under the control of a developmentally regulated (seed specific) promoter was transformed into soybean cv. DS 9712 using the *Agrobacterium* mediated cotyledonary node method. The presence of the transgene cassette in the resulting transgenic plants was confirmed by molecular analysis, indicating the stable integration of the transgene. The developing transgenic (T4) seeds revealed a 2.7 fold up-regulation in the *phytase* transcripts as well as a 2 fold up-regulation in the phytase activity which correlated to a significant (38-43%) reduction in phytate levels compared to the non-transgenic controls. The low-phytate soybean seeds showed



Transgenic plants of soybean for *phytase* overexpression under containment greenhouse conditions

improved mineral bioavailability with an increase of 21.2% in iron, 11.7% in zinc and 13.8% in calcium levels due to the decreased phytate content.

Selection of Potential Genomic Region to Differentiate *Chaetomium* species for DNA Barcoding

The ITS region which was confirmed as primary barcode for *Chaetomium* species identification as the ITS sequence, identification and is highly conserved between the species and the β -tubulin is selected as secondary barcode due to its high barcode gap, net group mean distances between the species, diversity in entire population and probability of correct identification for *Chaetomium* species after sequence multigene (Actin, β -tubulin, Calmodulin, ITS, rpb-2 and tef-1) analysis.

Web-based Crop Model InfoCrop-Wheat to Simulate the Growth and Yield of Wheat

Crop simulation models predicts the impacts on crop growth and yield without actually conducting the experiment, once the crop conditions are parameterized, calibrated and validated. Taking these things into consideration, a web based application of crop simulation model InfoCrop -Wheat was designed and developed. Web InfoCrop is a web based crop simulation model that simulates

the wheat crop growth on daily basis based on weather, soil, variety and management practices and facilitates the simulation of wheat crop growth and yield. Web InfoCrop-Wheat has been developed using Visual Studio Express, SQL Server, NET framework 4.0 and hosted at <http://InfoCrop.iari.res.in>. System has been designed using modular approach and has separate modules for input variable, management conditions and output – results. General users have the flexibility to run and simulate the growth of a wheat crop and get information on the crop fertilizer dynamics, environmental impact, crop growth and yield, pest damage, soil nitrogen dynamics, water balance and weather at a single day interval or as defined by the user while the registered users can insert and edit data. This can be accessed on mobile device and the results from the simulations are validated with the observed results. This was further developed to be Decision Support System for wheat crop management under moisture and temperature stress conditions. The user can access web InfoCrop Wheat crop model using the URL <http://InfoCrop.iari.res.in>

EDUCATION

Teachers' Day Lecture 2015

The Teachers' Day Lecture 2015 was organized on September 4, 2015 at the Dr. B.P. Pal Auditorium of the Institute to pay tributes to Dr. S. Radhakrishnan, the great philosopher, philanthropist and ex-



Prof. P.K. Gupta, Hon. Emeritus Professor, Chaudhary Charan Singh University, Meerut and INSA Senior Scientist delivering the Teachers' Day Lecture

President of India. Prof. P.K. Gupta, Hon. Emeritus Professor, Chaudhary Charan Singh University, Meerut and INSA Senior Scientist delivered the Teachers' Day Lecture on the topic "Deteriorating level of teaching: My experiences and thoughts as a teacher" where he shortlisted the factors responsible for the deterioration and the steps to overcome them. Prof. R. B. Singh, former Director, IARI and former Chairman, ASRB presided over the function.

Special Lecture

Padma Vibhushan Prof. M.S. Swaminathan delivered a talk on "65 Years of Adventure in Agricultural Research and



Padma Vibhushan Prof. M.S. Swaminathan delivering a talk on "65 Years of Adventure in Agricultural Research and Development"

Development" on September 28, 2015 at Dr. B.P. Pal Auditorium in IARI. He narrated his journey of science in the field of agriculture for the benefit of the faculty and students. Prof. V. L. Chopra, former DG, ICAR and former Secretary, DARE, presided over the programme and precisely summarized the lecture. The lecture brought to the forefront the deep seated love he has for farmers and IARI as well as his unparalleled service that brought 'Green Revolution' in the country.

Institute Research Council (IRC-1) Meetings

The Institute Research Council (IRC-I) meetings of IARI were held from July 28 to August 19, 2015 under the chairmanship of Dr. Ravinder Kaur, Director (Acting.), IARI and Co-chairmanship of Dr. K.V. Prabhu, Joint Director (Research), IARI. The IRC meetings were held in the school mode, wherein, individual scientist of each school made a brief presentation of his/her contributions with respect to the research, teaching and extension activities during the year 2014-15 across disciplines. The performance of the scientists was evaluated by the school coordinators and nominated experts.

EXTENSION

Kisan Sammelan Organized

Krishi Vigyan Kendra, Shikohpur (Gurgaon) organized a *kisan sammelan* on September 26, 2015 at its campus in the gracious presence of Dr. Trilochan



The farmers from different blocks of Gurgaon district participating in the kisan sammelan at KVK, Gurgaon

Mohapatra, Director, IARI. During *sammelan*, the Director interacted with the farmers and asked about the problems faced by them. He suggested the farmers to unite in the form of farmer groups/associations and get their groups registered first. These groups need to be linked to the processor to reduce the number of middlemen in between so as to increase the benefit of the both. He also emphasized on women empowerment and suggested to link the women Self Help Groups to market to boost up their business. He also showed concern over the problem of scarce water in Gurgaon district that should be addressed by the use of drip/sprinkler irrigation system by the farmers.

During the *sammelan*, Dr. J.P. Sharma, Joint Director (Extension) encouraged the farmers to go for value addition of crops in order to multiply their income from farming. During this event, an agro-exhibition was also organized in which IARI technologies and

products prepared by KVK trained SHGs and entrepreneurs were displayed. In this *sammelan*, more than 200 farmers/farm women from different blocks of Gurgaon district participated.

Participation

A presentation on the 'Wheat Production Technologies' was made by Dr. S.V. Sai Prasad, Head, IARI-Regional Station, Indore at the XXII Zonal Workshop of the KVKs under Zone VII (Madhya Pradesh, Chhattisgarh and Odisha) organized by the ICAR-Agricultural Technology Application Research Institute, Jabalpur at KVK, Ujjain from September 9-11, 2015.

"Madhya Bharat Wheat News" Launched

A biannual electronic newsletter entitled "Madhya Bharat Wheat News" was launched by IARI Regional Station, Indore on July 1, 2015. It was mailed to >250 wheat workers of different wheat

growing zones in various ICAR-Institutes and SAUs. The newsletter covered the station's salient research findings and important events. It is proposed to include in future contributions from different collaborating centres under AICW&BIP in the Central Zone as well regarding their achievements and happenings.

Field Days

The Institute's *Krishi Vigyan Kendra* (KVK) at Shikohpur organized three field days on: i) "Moong" in the Khanpur village of Gurgaon district on July 4, 2015 (22 farmers and 03 farm women participated); ii) "Rainy Season Vegetables" in the Langra village of Gurgaon district on September 8, 2015 (24 farmers and 02 farm women participated); and "Pearl Millet" (under AICRP scheme) in Langra village of Gurgaon district on September 15, 2015 (66 farmers and 10 farm women participated).

Campaign on Production Technology of Kharif Crops

A campaign on "Production Technology of *Kharif* Crops" was



A campaign on "Production Technology of *Kharif* Crops"

organized by KVK in six villages of Gurgaon district. During the programme, field training was imparted to the farmers by Subject Matter Specialists of KVK on various aspects of production technology for different *Kharif* crops, viz., *Bajra, Till, Guar, Paddy, Arhar, Jowar* and vegetables. Through this campaign more than 250 farmers/farm women of the area benefitted.

Pusa Mango Day Organized

The Institute organized Pusa Mango Day on July 15, 2015 at Dr. B. P. Pal Auditorium, IARI to popularise mango hybrids released from the institute among mango growers, researchers and academicians. On this occasion, publications on “Calendar of Operations for Mango Cultivation” and descriptions of new mango varieties have been released.



'Pusa Mango Day' inaugurated by Dr. Gurbachan Singh, Chairman, ASRB, ICAR in the presence of Dr. K. L. Chadha, former DDG (Hort.) and Dr. N. K. Krishna Kumar, DDG (Hort.), ICAR

CAPACITY BUILDING

Trainings

The Institute's Krishi Vigyan Kendra (KVK) at Shikohpur organized five vocational training courses on: i) "Preparation of Soybean for Entrepreneurship Development" at KVK campus from July 8 to 10, 2015 (08 rural youth participated); ii) "Establishment of Nutri-Farm" from July 27 to 31, 2015 at Langra village of Gurgaon district (15 farm women participated); iii) "Plant Protection and Pest Control Services" from August 6 to 18, 2015 at Bhora Kalan village of Gurgaon district (15 rural youth participated); iv) "Dairy Farming" from September 1 to 11, 2015 at KVK campus (40 rural youth from Gurgaon district participated); and v) "Protective Cultivation of Vegetable Crops" from September

21 to 28, 2015 in Langra village of Gurgaon district (15 farmers/rural youth were participated). The KVK also organized two in-service training programmes on: i) "Formulation of Low Cost Recipes" for pre-school children at Manesar (Gurgaon) on August 18, 2015 in which 15 Anganwari workers participated; and ii) "Integrated Pest Management (IPM) in Rabi Crops" on September 11, 2015 at Gurgaon in which 29 ADOs of Haryana Agriculture Department participated.

ZTM & BPD Unit of the Institute organized a three weeks training on "Intellectual Property



Training on "Intellectual Property Rights in Agriculture" inaugurated by Dr. Rita Sharma, former Secretary, Ministry of Rural Development, Govt. of India in the presence of Mr. S. R. Samuel, IPS Joint Development Commissioner, Ministry of MSME, Govt. of India

Rights in Agriculture" at ICAR-IARI, with the financial support from Ministry of Micro, Small and Medium Enterprises (MSME) from August 12 to September 1, 2015. Thirty two participants from nine states including academicians, representatives from Industries, KVKs and NGOs from across the agricultural organizations and Institutes participated for getting an in-depth knowledge of the state of art IP-systems, and to build an overall IP-awareness during their professional tenure.

The Division of Plant Pathology conducted a training on “Bio-pesticide Testing” from August 24 to 28, 2015 for the officials of plant protection, quarantine and storage. The objective of the training course was to upgrade the knowledge of the participants on parameters of bio-pesticides testing, antagonistic capabilities, suspensibility, contaminants and *in-vitro* entomogenous tests.

Innovative Farmer Meet

The Institute organized a one day ‘Innovative Farmer Meet’ on September 24, 2015. Dr. A. K. Singh, DDG (Extension), ICAR was the chief guest of the function, and it was presided over by Dr. T. Mohapatra, Director, IARI. In his opening remarks, Dr. Mohapatra stressed the need for developing a closer network of all innovative farmers among themselves and also with the researchers. The Chief Guest applauded IARI for the relevant theme and need to use innovator farmers as IARI ambassadors for technology transfer. Eighty five innovative

farmers representing 13 states of India, scientists, research managers, farmer innovators and lead marketing agencies participated in the meet. This initiative was intended to enhance awareness about the innovative capacities of the farmers and to share the experiences of farmers-led innovations in the field of agriculture and allied sector.

It was decided that under the programme “*Mera Gaon Mera Gaurav*”, besides a team of four scientists (interdisciplinary), one innovative farmer may be included as an expert/farmer scientist. Every innovative farmer should also adopt at least ten farmers for mentoring and effective transfer of relevant technologies.

MISCELLANEOUS

New Externally Funded Projects Sanctioned

- ❖ “Marker assisted pyramiding of genes for resistance to diseases in Indian cauliflower” funded by DST. Principal

Investigator: Dr. Partha Saha, Division of Vegetable Science.

- ❖ “Ensuring sustainable agricultural development and livelihood security in lower Shiwalik range of Uttarakhand” funded by DST. Principal Investigator: Dr. R.R. Burman, Division of Agril. Extension.
- ❖ “Demonstration of nematode management technologies and farmers training under rice-wheat cropping system” funded by DST. Principal Investigator: Dr. Pankaj, Division of Nematology.
- ❖ “Translation of plant resistance to nematodes to commercial practice” (Indo-Australia collaborative project) funded by DBT. Principal Investigator: Dr. Uma Rao, Division of Nematology.
- ❖ “Network project of Improvement of pigeon pea for plant type, pod borer resistance and moisture stress tolerance” funded by DBT. Principal Investigator: Dr. Uma Rao, Division of Nematology.
- ❖ “Development of low linolenic acid genetic stocks of soybean and validation of molecular markers” funded by BRNS (DAE). Principal Investigator: Dr. S.K. Lal, Division of Genetics.
- ❖ “Virus-vector relationships in dissemination of chirke and foorkey diseases of large cardamom by aphids in the sub-Himalayan Mountains”



‘Innovative Farmer Meet’ held at IARI, New Delhi

funded by IIHR, Bangalore. Principal Investigator: Dr. Amalendu Ghosh, Scientist, IARI Regional Station, Kalimpong.

- ❖ “Front line demonstration on pearl millet – AICRP under National Food Security Mission (NFSM)”. Programme Coordinator: Dr. Anjani Kumar, KVK Shikohpur, Gurgaon.
- ❖ “Network project on transgenics in crops – pigeonpea component” funded by NPTC (NRCPB). Principal Investigator: Dr. R.S. Raje, Division of Genetics.

Patents/PCT Applications Filed

- ❖ Pusa Bio-Pellet - a bio-formulation of *Trichoderma harzianum* (IARI P-4) for soil application
- ❖ Plant transformation vector for suppressing MIPS gene expression and method for culturing low phytate soybean
- ❖ A novel plant growth promoting rhizobacteria formulation and its preparation
- ❖ Nanofabrication process involving clay minerals as receptacles for manufacturing advanced nonmaterial's including novel fertilizers
- ❖ Nanofabrication of phosphorus on kaolin mineral receptacles
- ❖ Beneficiation of phosphate rock for the segregation of phosphorus containing heavy metal free minerals.

PPV&FRA Applications Filed

- ❖ *Triticum aestivum* L. (Wheat) HD 3059 [Pusa Pachheti]
- ❖ *Triticum aestivum* L. (Wheat) HD 3090 [Pusa Amulya].

Incubation Report

ZTM & BPD unit has signed Incubation agreement with new incubatees under the project entitled “Enterprising Integrated Nutrient Management (INM) & Integrated Pest Management (IPM)”. Four more incubatees were selected for MSME grant to boost the start up entrepreneur. Each incubatee will receive ₹ 6.25 lakhs from MSME.

Technologies Commercialized

Wheat variety HD 3086 has been licensed to forty three different seed companies from Punjab, Haryana, Rajasthan and Uttar Pradesh. Three other IARI technologies i.e., Bitter Gourd Gynoecious lines, Pusa Vita and STFR Meter were commercialized



Exchange of MoA for wheat variety HD 3086 with Industry Partners on 'Industry Partnership Day' at ZTM & BPD Unit, IARI

to Namdhari Seeds Pvt. Ltd., Karnataka, KAD Bioresources and Transchem Agritech Pvt. Ltd., Gujarat, respectively. During this quarter, a total revenue of ₹ 34,45,493 (Rupees thirty four lakh forty five thousand four hundred ninety three only) has been generated through commercialization activity.

New Website Launched

ZTM & BPD Unit has launched its dynamic website keeping in mind the facilitation of the farmers, industry partners, researchers, scientists and all the stake holders by offering them a common platform boosting the 'Make in India' initiative of Government of India.

Corporate Membership

In this quarter, 18 new members were registered and 5 corporate memberships were renewed generating a revenue of ₹ 1,04,500/- (Rupees one lakh four thousand and five hundred only).

Hindi Awareness Programme

The Institute celebrated *Hindi Chetna Maas* from September 1 to 30, 2015. The function was inaugurated by Dr. K.V. Prabhu, Joint Director (Research) on September 1, 2015 at Virology Auditorium. On this occasion a debate competition on '*Prajatantra Mein Jan -Pratinidhiyon Ki Bhoomika Sakaratmak Hai*' was organised. A large number of scientific, technical and administrative staff participated in this competition. During the *Hindi Chetna Maas* various other Hindi competitions like essay writing, noting & drafting, quiz, poem recitation, dictation, general knowledge, computer typing were also organized for all categories of the staff.

IARI Regional Station, Karnal celebrated "*Hindi Pakhwara*" from September 1-15, 2015. During the occasion, a training was imparted to 30 members of *Krishi Vistar Avum Mahila Utthan Samiti*, Karnal. During this, the guidance regarding rice cultural practices was given to the farmers. A poem recitation competition on '*Jalvayoo Parivartan*' was held, which was participated by the staff of the regional station. The winners were awarded prizes. A technical bulletin entitled "*Uttam Beej Ke Uplabdhta Ko Badhana-Beej Gram Karyakram*" was also released in the *pakhwara*.

During the *Hindi Chetna Maas* several divisions/regional stations of IARI also organised *Hindi Diwas/Saptah/Pakhwara*.

Awards/Honours

❖ Dr. P. Krishnan, Head, Division of Agricultural Physics and Dr. Anupma Singh, Principal Scientist, Division of Agricultural Chemicals received "Panjabrao Deshmukh Outstanding Woman Scientist

Award – 2014" of the Indian Council of Agricultural Research, New Delhi

❖ Dr. A.K. Dubey, Principal Scientist, Division of Fruits and Horticultural Technology received Rajiv Gandhi *Rashtriya Gyan Vigyan Maulik Pustak Lekhan Puruskar-2013* for his book "*Adhunik Phal Utpadan*" (as Co-author) by *Rajbhasha Vibhag Grih Mantralay, Govt. of India*.

Visitors from Abroad

During the period, July-September 2015, two delegations one each from African countries (Kenya, Liberia and Malawi) and Afghanistan (ICARDA) visited the Institute. Others who visited the Institute include Agricultural Counselors of Foreign Diplomatic Missions based in New Delhi; Ambassadors/High Commissioners of African Countries; and ICRISAT's Governing Board Members.



Dr. T. Mohapatra, Director, IARI interacting with ICRISAT's Governing Board members

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