



IARI NEWS



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RESEARCH

New Varieties Released

One variety each of bread wheat (Pusa Kiran), *Dicoccum* wheat (Nilgiri Khapli), and rice (Pusa 1592) were released by Central Sub-Committee on Crop Standards, Notification and Release of Varieties for Agricultural Crops. Two varieties of acid lime (Pusa Udit and Pusa Abhinav) and one variety each of rose (Pusa Mahak) and marigold (Pusa Deep) were also released at the Institute level.

Pusa Kiran (HS 542), a high yielding bread wheat variety with



A field view and grains of *Dicoccum* wheat Nilgiri Khapli



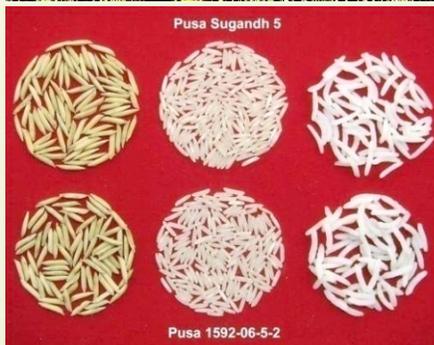
A field view and grains of bread wheat variety Pusa Kiran

an average yield of 3.29 t/ha and potential yield of 6.03 t/ha was released for early sown rainfed conditions of North Hills Zone. The variety is resistant to stripe and leaf rust and also possesses superior chapatti making quality.

Nilgiri Khapli (HW 1098), a high yielding, disease resistant, semi dwarf *dicoccum* wheat variety developed at Regional station, Wellington was released for timely sown irrigated conditions in all the *dicoccum* growing area of country. The average yield of the variety is 4.55 t/ha. It possesses high degree of

adult plant resistance to all the three rusts. It has high protein (16.5%), grain weight (46.5 g) and β -carotene (3.39 ppm) component.

Pusa 1592, an isogenic line of Pusa Sugandh 5, was developed through marker assisted selection for bacterial blight resistance genes *xa13* and *Xa21*. It has long slender grain and strong aroma. It has an average yield of 4.73 t/ha and matures in 120-125 days and has been released for the Basmati growing Region II (Punjab, Haryana, Delhi and Jammu & Kashmir).



A field view and grains of Pusa 1592

Acid lime variety Pusa Udit is a highly promising clonal selection having medium vigorous trees, dense foliage and attractive bright yellow round shaped fruits. It has round the year fruiting with peak harvesting twice during February-March and August-September. It is moderately tolerant to canker. It



Fruits of Pusa Udit

has medium sized fruit (34.38 g) with high juice content (42.80%) and acidity (7.01%). This selection is highly suitable for commercial cultivation under Indo-Gangetic and trans-Gangetic plain zones of India as well as for kitchen gardens.

Another acid lime variety Pusa Abhinav is a clonal selection having moderate vigour, thick foliage and attractive bright yellow round shaped fruits. It has round the year flowering with peak harvesting during March-April and August-September. It has moderate tolerance to citrus canker. Pusa Abhinav has medium sized fruit (38.10 g) with high juice content (58.86%) and acidity (8.71%). It is highly suitable for commercial cultivation under Indo-Gangetic and trans-Gangetic plain zones of India as well as for kitchen gardens.

Pusa Mahak is a Hybrid Tea variety of rose. The plants are tall and vigorous with a height of 100 - 120 cm. The Flowers are dark pinkish in colour and have outstanding fragrance. The flowering starts in 40-45 days after pruning. Flowers are large and



A Hybrid Tea variety of rose Pusa Mahak

semi-double with 22-23 petals. It is a recurrent flowering and floriferous variety and each plant produces on an average 50-60 flowering shoots in a season. The variety is ideal for garden display and the fragrant flowers can be used for floral arrangements.

Pusa Deep is an early flowering variety of French marigold, which flowers in 85-95 days after planting. The variety produces medium statured spreading plants having 55-65 cm plant height and 50-55 cm plant spread. It produces compact and medium sized flowers of maroon colour. The variety is very floriferous and produces on an average 80-90 flowers per plant resulting in high flower yield (18-20



A French marigold variety Pusa Deep

t/ha). In Northern plains it flowers during October-November. It is suitable for loose flower production and profitable as it flowers during festive season.

Variety Identified

A MAS derived blast resistant *basmati* rice variety Pusa Basmati 1609 (Pusa 1609-09-9-4; IET 22778), having genes *Piz5* and *Pi54* with seed to seed maturity of only 120 days and average yield of 4.6 t/ha was identified for release in the *basmati* growing regions of the Uttar Pradesh, National Capital Region of Delhi, Uttarakhand and Punjab. It has semi-dwarf stature and non-lodging habit, reduced duration, higher yield and superior grain and cooking quality traits.



A field view and grains of Pusa Basmati 1609

Biofortification in Pearl Millet

Development of pearl millet cultivars with elevated levels of micronutrients is one of the approaches to provide sustainable solution to various health problems associated with micronutrients

malnutrition, especially in India. Efforts have been initiated at IARI, to develop high iron and zinc parental lines, and thus to develop biofortified hybrids to achieve this goal. Three breeding lines PPMI 903, PPMI 904 and PPMI 906 were found to possess stable high iron and high zinc content across different locations namely-Coimbatore, Delhi, Durgapura, Gwalior, Hisar, Jamnagar, Ludhiana, Mandor and Tirupati in 2013 and in different years (2012-13 and 2013-14) at IARI, New Delhi in comparison to ICTP 8203 (Fe – 79 ppm; Zn – 61ppm) which is the check variety.



Hybrid 76-1: A Promising Grape Hybrid for Subtropical Climate

It is a cross between 'Hur' x 'Cardinal' made in 1976. The hybrid has been tested under field trials as 'Hybrid-76-1'. It is well adapted to sub-tropical conditions. It is a unique early maturing grape hybrid having uniform ripening, large berry, round golden yellow colour with firm pulp. Average bunch size is 409 g and bunch length is 20 cm. The optimum ripe fruits have 20-22 °Brix with 0.35 - 0.45% total acidity. This hybrid has good traits for table purpose, juice making and *Munnakka* (seeded raisin) preparation. It has moderate tolerance to anthracnose and powdery mildew diseases and termite attack.



Bunch of grape fruits of Hybrid 76-1

Genetic Analysis of Resistance to Bakanae Disease of Rice

The genetic analysis of resistance to Bakanae disease of rice caused by *Fusarium fujikuroi* was carried out in the cross between the highly susceptible variety Pusa Basmati 1121 and resistant genotype Pusa 1342 showed that the resistance to Bakanae is governed by a single recessive gene.

miR430: The Master Regulator for Heat Stress Tolerance Identified from Wheat

The identified miR430 was validated in contrasting wheat cvs. HD 2985 and HD 2329 through real-time PCR (qRT-PCR). A significant variation in the expression of miR430 was observed in different tissues of wheat like root, stem and spike under control and HS conditions. The miR430 was amplified and cloned from wheat cv. HD 2985; Sanger's di-deoxy sequencing showed the pre-

miRNA to be 150 bp long. psRNA Target analysis showed the family of small heat shock proteins (HSP17, HSP26, etc.) and signalling molecules (CDPK, MAPK, etc.) as their target genes. Scatter plot analysis established the negative correlation between the expression of miR430 and their respective targets in different tissues of wheat under HS. The identified miR430 can be characterised and functionally validated in order to use it for the development of climate smart wheat crop.

Bacterial Panicle Blight in Rice

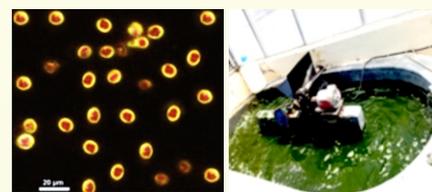
Bacterial panicle blight (BPB) in rice, caused by *Burkholderia glumae*, has recently emerged as a potential threat. BPB is destructive on emerging panicles and leaf sheaths of *basmati* and *non-basmati* rice varieties. The diseased panicle bears light to dark brown partially or fully discolored glumes. Under severe conditions, grain filling in the diseased panicles is affected resulting in chaffy grains. 16S rRNA gene sequence of three

Indian strains (Acc No. KP689100, KP689101, KP689102) shared 99%-nucleotide sequence identity with *Burkholderia glumae* (Acc No. NR102846).

Pathogenicity was confirmed at panicle initiation or boot leaf stage by infiltrating bacterial suspensions into the sheath, leaf and flag leaf (boot leaf) of susceptible basmati rice (cv. Pusa Basmati 1) in glasshouse.

Up-scaling and Production of High Quality Biodiesel from Micro-algae

Micro-algae are increasingly explored as sources of lipids/fatty acids useful as biodiesel source, which necessitates the development of large scale technologies from available laboratory scale experiments. Analyses of biomass, lipid yields and fatty acid profiles were undertaken in *Chlorella sorokiniana*, *Botryococcus* sp. and *Chlorella* sp. grown in different cultivation systems. Significant enhancement of biomass and two-fold higher amounts of fatty acid methyl esters



Cultivation of lipid rich microalga *Chlorella sorokiniana*

were observed in the raceway ponds. Harvesting of biomass and pretreatment for enhanced lipid extraction were also optimized. The total lipid content ranged from 41–45% (w/w), 33–41% (w/w) and 27–30% (w/w) in the three microalgal strains.

The major fatty acid methyl esters (FAMES) contained in the biodiesel generated from *C. sorokiniana*, *Botryococcus* sp. and *Chlorella* sp. were esters of palmitic acid (C16:0), oleic acid (C18:1) and methyl linoleate (C18:2), with methyl palmitate and methyl oleate representing 69%, 63% and 71% of the total FAMES; these results are in accordance with the standards of biodiesel quality. This study highlighted the promise of microalgae and the suitability of the raceway system of mass cultivation, as an economically feasible and viable option for biodiesel production.

Colour Shade Nets for Crop Protection under Changing Climate

An experiment was conducted to know micro-environment under different colour shade nets and its influence on biophysical parameters of spinach. The crop was raised under white, black, red, green colour shade nets and control (without shade net). Results showed that the



Typical symptom of panicle blight on panicle (A), leaf blade (B), glumes and grains (C)

micro-environment was changed under different colour shade nets. The air temperature, wind speed, soil temperature, canopy temperature, light intensity, radiation and different accumulated heat indices such as GDD, PTU, HTU, PTI was found to be lower under different colour shade as compared to the corresponding value under control. However, the relative humidity and soil moisture had higher value under colour shade nets than corresponding value in control. The percentage reflectance as well as value of NDVI and VI was found to be more in green followed by red, black, control and white. The heat use efficiency had higher value under green shade nets followed by red, white, black and control. Biomass, leaf area, chlorophyll content, yield as well as radiation use efficiency and water use efficiency was found to be higher in the colour shade net as compared to corresponding value in the control. The yield was found highest under green as well as red followed by white, black and control. From the above studies it can be concluded that colour shade nets provide a new, multi-benefit tool for crop

protection. It changes the light intensity and radiation, which influence microenvironment under shade nets and hence the crop production. Among the different colour shade used in present study green as well as red shade nets were found better followed by black and white.

EDUCATION

53rd Convocation of Post Graduate School

The 53rd Convocation of the Post Graduate School of the Indian Agricultural Research Institute (IARI) was held on February 20, 2015. Dr. R. Chidambaram, Principal Scientific Advisor, Government of India and Chairman of the Scientific Advisory Committee to the Cabinet was the Chief Guest. Dr. S. Ayyappan, Secretary, DARE and Director-General, ICAR presided over the function. In his convocation address, Dr. Chidambaram emphasized that Science and technology-driven growth is essential for India to become a 'developed' country. To

achieve this goal, global leadership in science was required.

Dr. Ravinder Kaur, Director (Acting) presented her report on the significant research achievements of the Institute during 2014. Dr. R.K. Jain, Dean & Joint Director (Education), highlighted the significant achievements in the field of education and training activities of the Institute.

During the Convocation, 181 students (108 M.Sc., 07 M.Tech. and 66 Ph.D.) including 11 international students were awarded degrees. Shri Mukesh Choudhary of Genetics and Dr. Susheel Kumar of Plant Pathology were awarded the Best Student of the Year Awards for M.Sc. and Ph.D., respectively. Five students each in M.Sc. and Ph.D. received IARI Merit Medals. Five faculty members of the Institute, namely, Dr. Ram Asrey (Post Harvest Technology), Dr. (Ms.) Archana Sachdev (Biochemistry), Dr. A.D. Sarangi (Agricultural Engineering), Dr. T.J. Purkayastha (Soil Science and Agricultural Chemistry) and Dr. B.S. Tomer (Seed Science and Technology) received the Best Teacher Award - 2014 for their achievements in academics. Dr. H.S. Gupta, Director-General, BISA received 5th Rao Bahadur B. Viswanath Award; Dr. R.S. Gandhi, Assistant Director-General, ICAR, received XV Harikrishna Shastri Memorial Award, 2014; and Dr. T.K. Das, Principal Scientist, IARI received XXIII Hooker Award for the biennium 2012-2013. The Chief Guest released 13 varieties of different crops including Wheat (2);



Dr. R. Chidambaram, Principal Scientific Advisor, Government of India (Chief Guest) and Director-General, ICAR with other distinguished delegates at the beginning of the 53rd convocation's ceremonial procession

rice (2); chickpea (1); soybean (1); cauliflower (1); garden Pea (1); ash gourd (1); acid lime (2); marigold (1); and rose (1). The PG School Annual Report (2013-14) was also released during the convocation.

As a part of the convocation programme the 45th Lal Bahadur Shastri Memorial Lecture was delivered by Prof. Sudhir K. Sopory, Vice-Chancellor, Jawaharlal Nehru University on February 19, 2015 on the topic 'Glyoxalase Pathway: Role in Stress Adaptation in Plants'. Dr. (Ms.) Manju Sharma, former Secretary, Department of Biotechnology, Govt. of India presided over the function, which was graced by Professor Deepak Pental, former Vice-Chancellor, University of Delhi.



Prof. Sudhir K. Sopory, Vice-Chancellor, Jawaharlal Nehru University delivering the 45th Lal Bahadur Shastri Memorial Lecture

EXTENSION ACTIVITIES

IARI *Krishi Vigyan Mela-2015*

The institute organized its annual *Krishi Vigyan Mela* on the theme "IARI Technologies for Inclusive Growth" from March 10



Shri Siraj Hussain, Secretary, Department of Agriculture & Cooperation, Ministry of Agriculture, Govt. of India lighting the lamp at the inauguration of IARI *Krishi Vigyan Mela-2015*

to 12, 2015. The *mela* was inaugurated by Shri Siraj Hussain, Secretary, Department of Agriculture & Cooperation, Ministry of Agriculture, Govt. of India. Dr. J.S. Sandhu, DDG (Crop Science) and Dr. A.K. Singh, DDG (Extension), ICAR were the Guests of Honors on this occasion.

During the *mela*, a total of 285 exhibitors participated and displayed their technologies. Farm technologies developed by the Institute for inclusive growth were displayed in the 48 stalls of different divisions of the Institute and 6 stalls of IARI regional stations. Besides, 30 ICAR Institutes, 15 SAUs, 4 KVKs, 5 CGIAR, 77 private companies, and 5 media agencies, 25 NGOs and 29 public sector undertakings also participated in the *mela* to demonstrate their technologies/

products for display or sale. In addition to this, fifty progressive farmers from extension operational areas of the Institute also put-up their stalls for display and sale of their farm produce. Farmers were provided free of cost agricultural consultancy services at the *mela* site by various agricultural experts.

Four technical sessions were organized for farmers-Scientist-industry interface on different themes. An 'Innovative Farmer's Meet' was held on March 12, 2015 under the chairmanship Dr. S.A. Patil, former Director, IARI. Twenty eight progressive farmers from different states of the country participated and shared their experiences about their innovations in agricultural production during this event.



Hon'ble Minister of State for Agriculture and Food Processing Industries, Dr. Sanjeev Kumar Balyan honouring an innovative farmer during the *mela*

The *mela* ended with valedictory function wherein Hon'ble Minister of State for Agriculture and Food Processing Industries, Dr. Sanjeev Kumar Balyan was the Chief Guest, and Dr. S. Ayyappan, Secretary, DARE and DG, ICAR presided over the function. Twenty eight progressive farmers from different states of the country were honoured for their innovations in the field of agriculture. The Chief Guest addressed the farmers and gave away the prizes and certificates to various participating organizations and farmers. On this occasion the publications, namely, *Mela Souvenir*, *Prasar Doot*, *Champion Kisan ka Sankshipt Parichaya*, *Shakiya Beej Utpadan Dwara Krishi Udhaymiyo Ka Vikas*, *Samekit Keet Prabandhan*, *Agronomic Inter-ventions for Sustainability of Major Cropping Systems of India*, *Sasya Vigyan Sambhag Ki Naveentam Sasya*

Prodyogikiyan and Integrated Farming Systems: A Key Driver for Farmers' Prosperity were released. In recognition of the outstanding contribution in technology development and dissemination in partnership with IARI, three farmers were bestowed with 'IARI Fellow' award.

Pusa Sabzi Vigyan Mela 2015

The Institute's Division of Vegetable Science organised *Pusa Sabzi Vigyan Mela* on January 29, 2015 in its sprawling research-cum-demonstration farm showcasing its technologies with the theme of "Nutrition, Health, Environment and Livelihood Security". The *mela* was inaugurated by Dr. K. L. Chaddha, former DDG (Hort. Sci.), ICAR in gracious presence of guests of honour, Dr. Brahma Singh, former Director, Life Science, DRDO and Dr. Ravinder Kaur, Director, IARI. Various technologies including wide range of varieties/hybrids, exotic vegetables and production systems (low cost protected cultivation, water saving, off-season cultivation) developed by the division were demonstrated in field. Farmers from Delhi and neighbouring states like U.P, H.P, Uttarakhand, Haryana, Punjab and Rajasthan participated in large number in the *mela*.



A view of Pusa Sabzi Vigyan Mela 2015

Pusa Horticulture Show 2015

The Institute organized Pusa Horticulture Show in collaboration with Delhi Agri-Horticultural Society from February 28 to March 1, 2015 at the lawns of the Division of Genetics. The Show was inaugurated by Dr. H.P. Singh, former Deputy Director General (Horticulture), ICAR (Chief Guest), & Dr. S.K. Malhotra, Horticulture Commissioner, Govt. of India (Guest of Honour) in the presence of Dr. Ravinder Kaur, Director, IARI, New Delhi. Dr. J.S Sandhu, Deputy Director General (Crop Sciences), ICAR along with Dr. A.K Singh, Managing Director, NHB, Ministry of Agriculture, Govt. of India gave away prizes to the winners. The large number of exhibitors, farmers and amateurs participated & visited this important event to know the latest techniques and products in the field of horticulture.

Field days: Three field days under FLD on “Carrot”, “Garden pea”

and “Mustard” in the adopted villages (Chandu Budhera & Lohatki of Gurgaon district) of KVK in which 80 farmers and farm women participated and one field day under OFT programme on “Cultivation of Summer Squash in Plastic Low Tunnel” on February 24, 2015 at Kumbhawas village of Gurgaon district in which 30 farmers and farm women were participated. A mustard field day was also organized on March 4, 2015 at Division of Genetics in which 27 industry partners including companies like Metahelix Life Sciences, Advanta India Ltd., Rasi seeds, Tata Chemicals Ltd., Bayer Bio Sciences Ltd., Mahyco and Panacea Crop Sciences participated.

Honey Day: A honey day-cum-training programme was organized on February 20, 2015 in the Teekli village of Gurgaon district in which 38 rural youth were participated.

Beej Bikri Diwas: A *Beej Bikri Diwas* was organized on March 12, 2015 at

ICAR-IARI, Regional Station, Karnal. *Pusa Beej* of popular varieties of *basmati* paddy, viz., PB 1509, PB 1121 and non-*basmati* variety Pusa 44 of worth Rs. 33,54,600/- was sold to thousands of farmers from Haryana, Punjab and Western Uttar Pradesh.

Participation in Extension Activities

The Institute participated in the following extension activities for display /sale of IARI technologies, products, services and publications:

- ❖ 7th Vibrant Gujarat Summit held from January 11 to 13, 2015 at Mahatma Mandir, Gandhinagar, Gujarat.
- ❖ ASC India Expo during 12th Agricultural Science Congress 2015 on the theme “Sustainable Livelihood Security for Small Holder Farmers” held from February 3 to 6, 2015 at NDRI, Karnal.
- ❖ Exhibition during Inter-session meeting of consultative committee of the Ministry of Agriculture on 17th February at KVK, Shikohpur, Gurgaon.
- ❖ Exhibition on the occasion of Annual General Meeting on February 18 at NASC, New Delhi.
- ❖ Kisan Agri show from February 26 to 28, 2015 at Pragati Maidan, New Delhi.
- ❖ Kisan Mela organized by YFA at Rakhra, Patiala on March 14, 2015.



A view of Pusa Horticulture Show

❖ Regional agriculture fair for the Northern Zone from March 17 to 20, 2015 organized by ICAR-Indian Veterinary Research Institute at the Izatnagar main campus.

Intersession Meeting of Consultative Committee of Ministry of Agriculture

An Intersession Meeting of Consultative Committee of Ministry of Agriculture was held on February 17, 2015 at Krishi Vigyan Kendra, Shikohpur under the Chairmanship of Hon'ble Union Minister of Agriculture. Two Agriculture Ministers, 16 Members of Parliament (MPs), DG (ICAR), Secretary, ICAR, Joint Secretary (DAC), DDG (Extension), Zonal Project Directors (ICAR), Director, Joint Director (Research), Joint Director (Extension), heads of divisions of IARI and other higher authorities of ICAR visited the various demonstration units at

KVK and exhibition stalls displayed by different KVKs from different corners of India on various themes followed by the Meeting.

CAPACITY BUILDING Trainings

The Institute's *Krishi Vigyan Kendra* at Shikohpur organized four vocational training courses on: "Dairy Farming" from January 15 to 27, 2015 (76 rural youth from, Gurgaon, Rewari, Mewat, Palwal and Bhiwani districts participated); "Production Technology of Vermicompost" from January 19 to 30, 2015 (16 rural youth participated); "Preservation of Seasonal Fruits & Vegetables" from February 23 to 28, 2015 (10 rural youth participated); and "Plant Protection and Pest Control Services" from February 23 to March 4, 2015 (14 rural youth participated). The *Krishi Vigyan*



A training on "Preservation of Seasonal Fruits & Vegetables"

Kendra, Shikohpur also organized an in-service training programme on "Disease Management in Animals" on February 27, 2015 in which 10 VLDAs of Animal Husbandry Department of Gurgaon (Haryana) participated.

The Division of Vegetable Science organized a model training course on "Promotion and Organization of Scientific Nutrition Gardening for Household Health Security and Tackling of Malnutrition" from January 17 to 24, 2015 for the Agri-Horticulture officers of various states of India.

Two trainings were organized at ICAR-IARI Regional Station, Karnal on "Seed Production Technology in Important Field Crops" from January 21 to 23, 2015 (25 farmers from Karnal, Kaithal and Kurukshetra districts of Haryana and Sangrur, Ludhiana and Amritsar districts of Punjab participated), and "Maintenance Breeding" from March 3 to 4, 2015, (25 scientists and researchers from Kerala, Karnataka, Andhra Pradesh, Maharashtra, Bihar, West Bengal, Assam, Mizoram, Madhya Pradesh, Uttar Pradesh, Uttarakhand, Punjab and Haryana participated).



Exhibition stall being visited by Shri Radha Mohan Singh, Hon'ble Union Minister of Agriculture at KVK, Shikohpur



A training on "Project Formulation, Risk Assessment, Scientific Report Writing and Presentation"

The Institute also organized a model training course (MTC) on "Management of Production Problems of Horticultural Crops for Enhancing Productivity and Quality" from January 27 to February 3, 2015 at the Division of Fruits and Horticultural Technology.

Two training programmes on "Project Formulation, Risk Assessment, Scientific Report Writing and Presentation" were organized from February 17 to 21, and 24 to 28, 2015 at the Division of Agricultural Engineering. The training programme was attended by 48 participants from all over the Tamil Nadu state. The valedictory function was graced by Dr. A.P. Srivastava, National Director, NAIP, ICAR.

The Division of Seed Science and Technology organized a training programme on "Seed Production and Quality Evalu-

ation" for the officials of African-Asian Rural Development Organization (AARDO) member countries from February 18 to 28, 2015.

The Division of Agricultural Extension organized a one-day training programmes on "Improved Production Technologies of Wheat and Mustard" at Krishi Vigyan Kendra, Sheopur, M.P. on February 25, 2015. Total 100 farmers and postal staff participated in the training. The farmers came from Galmanya, Lalitpura, Radep, Kalarna, Baroda and Wardha Bujurg villages.

The Institute' Centre for Agricultural Technology Assessment and Transfer organized on-campus training programmes on "Seed Production and Improved Crop Production Technology" from March 17 to 23, 2015 (16 progressive farmers and farm women participated); and "Seed Production

Technology" from March 24 to 27, 2015 (20 VO's/SAUs partners participated).

MISCELLANEOUS ACTIVITIES

New External Funded Projects Sanctioned

- ❖ "Risk Management in Agriculture: An Analysis of Rainfed Farming System in India" funded by DAC. Principal Investigator: Dr. Suresh A., Sr. Scientist, Division of Agricultural Economics, IARI.
- ❖ "Network Project on Transgenic Crops Wheat Quality Component" funded by NPTC.CCPI: Dr. Anju M. Singh, Principal Scientist, Division of Genetics, IARI.

Patents Filed

- ❖ Nanofabrication process involving clay mineral as receptacles for manufacturing advanced nanomaterials 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

- ❖ Wheat: HD 3043 (Pusa Chaitanya)
- ❖ Wheat: HD 3086 (Pusa Goutami)

Technologies Commercialized

IARI Technologies including rice variety Pusa 1612, STFR Meter, Bio fertilizer technologies, i.e., NPK Liquid Bio-Fertilizer Technology, BGA, Azotobacter Carrier Based Biofertilizer and Rhizobium Carrier based Biofertilizer have been licensed to 12 different Industry Partners and generated the revenue of ₹ 15.0 lakhs.



MoA signing ceremony with M/S Punjab Crop Seed Farm, Punjab for rice variety Pusa 1612

Corporate Membership

In this quarter, 22 new members were registered raising the membership to a total of 610 as on March 31, 2015.

Awards

- ❖ ZTM& BPD unit, IARI received the Gold in Flame Award, 2014 under the Fifth category of Agriculture/ Dairy Initiative of the Year for the campaign “Translating Research into Prosperity” from Rural Marketing Association of India on March 20, 2015.
- ❖ Dr. Rashmi Aggarwal, Head, Division of Plant Pathology received K.C. Mehta and Manoranjan Mitra Award 2014

from Indian Phytopathological Society.

- ❖ Dr. K. Annapurna, Head, Division of Microbiology received Woman Leadership Award from ASEAN Plant Growth Promoting Rhizobacteria Society.
- ❖ Dr. A.K. Sexena, then Head, Division of Microbiology received “The Distinction of Fellow” Award of the Indian Academy of Microbiological Sciences of India and Distinguished Scientist Award from ASEAN Plant Growth Promoting Rhizobacteria Society.
- ❖ Dr. Pratibha Sharma, Professor, Division of Plant Pathology received Dr. Sharda Lele Award from Indian Phytopathological Society.
- ❖ Dr. Man Singh, Professor, and Dr. Manoj Khanna, Principal Scientist, Water Technology Centre received the Team Award-2014 for Modernization of the Research Farm of the Institute with better irrigation and infrastructure facilities by the Indian Society of Agricultural Engineers, New Delhi.
- ❖ Dr. Suresh Kumar, Principal Scientist, Division of Biochemistry received “Excellence in Research Award” in the 3rd Academic Brilliance Awards-2015 by Education Expo TV (EET CRS), India.
- ❖ Dr. Archana Singh, Senior Scientist, Division of Biochemistry received “Special Mention-Excellence in Research Award” in the 3rd Academic Brilliance Awards-2015 by Education Expo TV (EET CRS), India.
- ❖ Ms. Veda Krishnan, Scientist, Division of Biochemistry



Dr. Neeru Bhooshan, Incharge, ZTM & BPD receiving the Gold Flame Award, 2014

received “Certificate of Excellence” in young faculty category in the 3rd Academic Brilliance Awards-2015 by Education Expo TV (EET CRS), India.

- ❖ Drs. VS Lather, Ashwani Kumar, SS Atwal, NK Chopra, Rakesh Seth, RN Yadav and VK

Pandita received the best poster award on “Prospects of Herbal Hydrogel (Tragacanth/Katira gum) for Seed Priming-cum-coating for Alleviation of Suboptimal Moisture”, and Drs. Ashwani Kumar, Anuja Gupta, SS Atwal, VK Maheshwari and CB Singh received the best poster award on

“Management of Karnal bunt, a quarantine disease, in wheat through mechanical processing” at the XII Agricultural Science Congress.

- ❖ ICAR-IARI, Regional Station, Karnal was awarded first prize for best display of technologies in National Dairy Mela-2015.

Visitors from Abroad

During the period, January-March 2015, eight delegations– two from USA and one each from France, Fiji, CIMMYT, Lebanon, Morocco and Nepal visited the Institute. The Fijian delegation was led by H.E. I. Batikoto Seruiratu, Minister of Agriculture and Maritime Development and National Disaster Management; and Lebanese delegation was led by H.E. Akram Chehayeb, Minister of Agriculture. Dr. Rezazadeh, Pro Vice-Chancellor and Dr. Nikzad, International Relation Officer, Orumieh University, Iran also visited the Institute.



A delegation of Wyoming Leadership Education & Development Programme, USA with IARI team

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