



IARI NEWS



Vol. 34, No. 4

October-December, 2018

Foundation Stone Laying Ceremonies of International Student Hostel and *Krishi Haat*

Hon'ble Union Minister of Agriculture & Farmers Welfare, Shri Radha Mohan Singh laid the foundation stone of International Student Hostel in front of Shishir Hostel on December 6, 2018. The hostel will be spread across 2 hectares with a built up area of 14,480 sqm and will accommodate approximately 500 students. It will have 50 family suites with two rooms & kitchen, 50 single room sets with bath amenities and 400 single rooms. A food court catering to 600 students will also be constructed in this hostel along with a gymnasium of international standard, games and activity room, seating lodge; covered parking whose terrace will be used for organizing cultural events.



Hon'ble Union Minister of Agriculture & Farmers Welfare, Shri Radha Mohan Singh laying the Foundation Stone of International Student Hostel at ICAR-IARI, New Delhi

Hon'ble Union Minister of Agriculture & Farmers Welfare, Shri Radha Mohan Singh also laid the foundation stone of *Krishi Haat* in the premises of Agricultural Technology Information Centre (ATIC) on December 6, 2018. The *Krishi Haat* will be built across 2.5 acres in which 60 stalls measuring 3 m x 3 m will be created, in which farmers can sell their agricultural produce and value-added products. At the same time, the technology and value-added products developed by the institutions of the ICAR will be available here for the farmers and visitors. *Krishi Haat* will also have 'Technology Park', in which farmers can see live demonstrations of crop technologies. Facilities like food plaza, open-air theater with a seating capacity of 100 people, conference hall, technology museum, lab and lecture hall will be there. It will also have facility for agricultural advisory services, seeds and literature for farmers. Dr. Trilochan Mohapatra, Secretary, DARE & Director General, ICAR; Dr. A.K. Singh DDG, Horticulture & Crop Science, ICAR; Dr. A.K. Singh, DDG, Agricultural Extension, ICAR & Director, ICAR-IARI; Dr. J.P. Sharma, Joint Director (Extension & Research), IARI; CPWD Officials; Senior Officials of Staff and Students of ICAR-IARI also participated in these programmes.



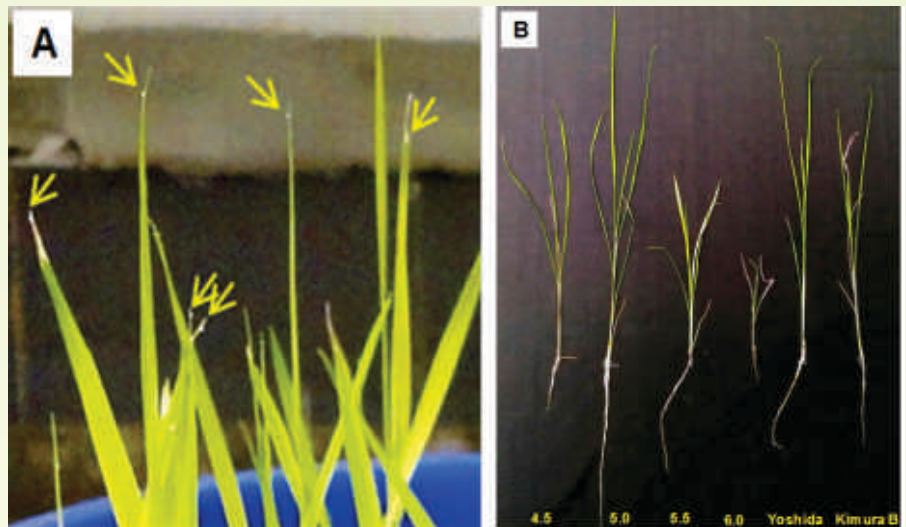
Hon'ble Union Minister of Agriculture & Farmers Welfare, Shri Radha Mohan Singh laying the Foundation Stone of *Krishi Haat* at IARI, New Delhi

Dr. Trilochan Mohapatra, Secretary, DARE & Director General, ICAR; Dr. A.K. Singh DDG, Horticulture & Crop Science, ICAR; Dr. A.K. Singh, DDG, Agricultural Extension, ICAR & Director, ICAR-IARI; Dr. J.P. Sharma, Joint Director (Extension & Research), IARI; CPWD Officials; Senior Officials of Staff and Students of ICAR-IARI also participated in these programmes.

RESEARCH

Genetic Diversity of Phytoplasmas Infecting Fruit Species in India

Three different groups of phytoplasma were identified and characterized in six fruit crops (litchi, guava, pomegranate, mango, grape and apricot) in Jammu, Pune and Delhi during 2016-17. '*Ca. Phytoplasma aurantifolia*' (16SrII-D) was found associated with litchi, (little leaf and yellowing), guava (leaf yellowing), pomegranate (leaf yellowing and declining) at Jammu; and phyllody associated with Mango at Delhi. '*Ca. P. asteris*' (16SrI) was found associated with leaf yellows in apricot at Jammu. However, grapevine varieties at Baramati, Pune and IARI, Delhi were found associated with '*Ca. P. cynodontis*' (16SrXI-B) group. Presence of phytoplasmas were confirmed in all the six fruit samples using polymerase chain reaction with phytoplasma specific primer pairs (P1/P7, R16F2n/R16R2n), pair wise sequence comparison, phylogenetic relationship and



(A) Rice (var. MTU1010) plants grown in commonly available hydroponics media (Yoshida) showing salt deposition on leaf tips (arrows) followed by necrosis; and (B) Optimization of pH for rice hydroponics media. Rice plants grown in 'PusaRich' with a pH at 5.0 shows optimum plant growth as compared to other medium

virtual RFLP analysis of 16S rRNA gene sequences. Except litchi, all the other reports of phytoplasma diseases are new to India, hence, further studies are planned on epidemiology and management of the disease in respective areas of their occurrence.

Optimized Medium for Growing Rice Seedlings in Hydroponics

Through concerted research efforts, we optimized the nutrient media for growing rice plants

taking into consideration the nutrient concentration, pH and ratio of NH_4^+ to NO_3^- nitrogen (N) and named it as '*Pusa Rice Hydroponics*' (PusaRich). PusaRich contains higher amounts of macronutrients, significantly lower B, Mn and Cl and higher amounts of Zn than two commonly used hydroponics media, 'Yoshida' and 'Kimura B'. The optimal ratio of NH_4^+ to NO_3^- -N in PusaRich medium was 0.5 mM NH_4^+ and 7.0 mM NO_3^- with a pH at 5.0. The PusaRich medium was validated by growing 100 diverse rice genotypes and it significantly outperformed the widely used 'Yoshida' and 'Kimura B'. Cluster analysis carried out on the squared Euclidean distance matrix of biomass and leaf area values of genotypes revealed four major clusters in all hydroponics medium. However, only PusaRich medium could identify in ten genotypes as good performers in comparison to other two widely cited media.



Field view of symptoms associated with Phytoplasma infection in different fruit crops, namely: (a) guava leaf yellowing; (b) grapevine leaf reddening; (c) apricot leaf yellowing; (d) mango phyllody; (e) litchi little leaf yellowing; and (f) pomegranate leaf yellowing

Therefore, the optimized PusaRicH medium can be used successfully to grow rice seedlings in hydroponic system, which will help in screening large number of genotypes in breeding and other physiological experiments.

Forewarning of Rice Brown Planthopper

Brown planthopper (BPH) has become an important pest of rice in North India during last decade. The first major outbreak of this pest in North India occurred in 2008 and subsequently very high population levels of this pest have been witnessed during 2010, 2013, 2016, 2017 and 2018. Following 2008, 2010 and 2013 outbreaks, weather data from 1999-2013 were analyzed to determine likely causes of BPH outbreak. The analysis of 15-year weather 1999-2013 revealed that more frequent rains during June to September months (>30 rainy days) had a role in BPH outbreak. Out of 7 years with ≥ 30 rainy days, BPH outbreaks have occurred during 5 years. More number of rainy

days coupled with cloudy weather, lower sunshine hours and favourable temperature results in conducive conditions for BPH development. Consequently, the pest attains higher population levels. Rain forecast may thus provide a clue about likely BPH scenario, thereby helping in its timely management.

EDUCATION

ICAR-IARI Celebrated Agricultural Education Day

ICAR-IARI celebrated Agricultural Education Day on December 3, 2018 on the occasion of birth anniversary of Dr. Rajendra Prasad, First President of independent India. Dr. J.P. Sharma, Joint Director (Extension & Research) was the chief guest of the program. Dr. Man Singh, Project Director, Water Technology Centre highlighted the biography of Dr. Rajendra Prasad. Dr. J.P. Sharma said that the best way to offer the tribute to Dr. Rajendra Prasad is to follow his footsteps of simplicity and honesty to work for a better scenario of agriculture

in our country. Dr. A.K. Singh, Head, Division of Genetics advised that a collective effort should be made to include agriculture as a subject in school curriculum. Dr. K.M. Manjaiah, Associate Dean said that knowledge, education, morality and social commitments are the attributes of the human beings. Dr. T.K. Bahera, Professor, Division of Vegetable Science presented the formal vote of thanks.

Division of Agricultural Chemicals Celebrated its 52nd Foundation Day

The Division of Agricultural Chemicals celebrated its 52nd Foundation Day on November 16, 2018. Dr. N. Bhattacharya, Associate Director, C-DAC, Kolkata delivered a lecture on the topic "ICT in Agriculture" on this occasion. Professor R. B. Singh, former Chairman, ASRB, was the chief guest and Dr. J. P. Sharma, Joint Director (Extension), ICAR-IARI, New Delhi presided over the function.

ICAR-IARI Regional Station, Indore Celebrated its 67th Foundation Day

ICAR-IARI Regional Station, Indore celebrated its 67th Foundation Day on October 3, 2018. Dr. J.P. Sharma, Joint Director (Extension), ICAR-IARI, New Delhi presided over the function. Mr. Neeraj Bedhotiya, Principal, The Daly College, Indore was the chief guest and Dr. V.S. Bhatia, Director, ICAR-IISR was the guest of honor. On this occasion, Dr. J.P. Sharma delivered



Agricultural Education Day being celebrated at Dr. B P Pal Auditorium

Dr. M.V. Rao Memorial Lecture on “Strategies for Enhancing Income of Small Farm Holders”. After the lecture, a panel discussion on “Improved Wheat Varieties – Possibilities and Expectations” was organized in which scientists, seed producers, processing industries and farmers' presented their views.

Brain Storming Discussion

The Division of Biochemistry organized a panel discussion on October 12, 2018 on “Food and Nutritional Security: Challenges and Threats in the New Millennium” under Centre for Advanced Faculty Training (CAFT) Programme.

Symposium

The Division of Plant Pathology organized a symposium on “Microbes for Integrated Plant Disease Management and Bio-Prospecting” on December 14, 2018. Dr. C. L. Jandaik, former Head, Plant Pathology, Dr Y S Parmar University of Horticulture & Forestry was the Chief Guest at inaugural session.

EXTENSION

ICAR-IARI Celebrated World Soil Day

The Division of Soil Science and Agricultural Chemistry and Delhi Chapter of Indian Society of Soil Science jointly organized the World Soil Day on the theme “Be the Solution to Soil Pollution” on December 5, 2018. Students of four secondary schools, viz., Bal Bharti Public School, Ramjas School, DTEA Senior Secondary School and



World Soil Day celebrated at ICAR-IARI, New Delhi

Sarvodaya Kanya Vidyalaya were sensitized about geogenic and anthropogenic pollution as well as ways and means for checking soil pollution to possible extent. Dr. J.P. Sharma, Joint Director (Extension and Research) emphasized that the very survival of all living forms depend on soil and we must preserve this precious natural resources for prosperity and posterity. He also distributed the prizes, memento and certificates to the students.

Participation in Exhibitions

The Institute participated in the following exhibitions:

- 'Agricultural Exhibition' held at Deen Dayal Upadhyay Dham, Mathura, UP from October 6 to 8, 2018.
- 'Organic Agriculture Conference & Exhibition' held at Jhijnholi, Sonipat, Haryana on October 23, 2018.
- 'AgroWorld 2018' held at ICAR-IARI, New Delhi from October 25 to 27 2018.
- 'Krishi Kumbh' held at ICAR-Indian Institute of Sugarcane

Research, Lucknow from October 26 to 28, 2018.

- 'Farmers' Fair & Agro-Industrial Exhibition' on Crop Residue Management held at ND University of Agriculture & Technology, Faizabad, UP from December 7 to 8, 2018. IARI received 1st prize in the exhibition.

- 'Kisan Mega Conference & Exhibition' held at Shaheed Vijay Singh Pathik Sports Complex, Greater Noida (UP) on December 15, 2018.

- 'Krishi Samridhhi Mela cum National Workshop on IFS' held at Ramakrishna Mission Ashrama, Sargachi, Murshidabad, West Bengal during December 28-31, 2018.

Awareness Camp-cum-Demonstrations

The Division of Agricultural Extension organized an awareness camp-cum-demonstrations of Pusa Mustard 30 variety under the project “Enhancing Nutritional Security and Gender Empowerment” at Bassi, Lehchora, Suhenhda and

Rattol villages of Baghpat district on October 4, 2018 and Ghadiwala village of Sonipat, Haryana on October 5, 2018. This programme gave awareness to the farmers about the nutritional and health quality of Pusa Mustard (PM 30) variety and the benefits of low erucic acid mustard oil usage in their daily diet.

Activities Organized by KVK, Shikohpur

- **Field Day on Pigeon Pea:** Two field days on pigeon pea were organized on October 14 and November 6, 2018 in Tajnagar and Tikali villages of Gurugram district, respectively. In these field days, 53 and 47 farmers and farm women participated.

- **Mahila Kisan Diwas:** *Mahila Kisan Diwas* was organized on October 15, 2018 at KVK campus, in which 40 farm women participated.

- **World Food Day:** The World Food Day was organized on October 16, 2018 in Chandu village, in which 40 women participated.

- **Krishi Shiksha Diwas:** *Krishi Shiksha Diwas* was organized on December 3, 2018 at KVK, Shikohpur. In this programme, 65 students of class 10th & 11th standard of Government Senior Secondary School, Shikohpur participated.

- **World Soil Day:** A World Soil Day was organized on December 5, 2018 at its campus. In this programme, 153 farmers/farm women participated and 102 soil cards were distributed to the farmers.

- **Kisan Diwas:** *Kisan Diwas* was organized on December 23, 2018 on the occasion of birth anniversary of Late Chaudhary Charan Singh, former Prime Minister of India. A total of 150 farmers and farm women from districts Gurugram and Mewat participated. During the programme, Dr. Pankaj, Head, KVK, Shikohpur, Dr. B. S. Tomar, Head, Division of Vegetable Science, Dr. R. K. Sharma, Head and Dr. Kirti Sharma, Principal Scientist, Division of Entomology, Dr. Nafees Ahmed, Incharge, CATAT, and Dr. S. L. Meena, Principal Scientist, Division of Agronomy provided information about latest technology available in agriculture and motivated farmers to adopt Integrated Farming System.

CAPACITY BUILDING

Trainings

The Division of Agricultural Extension organized a training on “Enhancing Personal Effectiveness at Workplace” for technical officers of ICAR Institutes from October 8 to 13, 2018. A total of 21 technical officers including 18 male and 3 female candidates from 3 ICAR institutes, namely, ICAR-IARI, ICAR-NBPGR, New Delhi and ICAR-VPKAS, Almorah Uttarakhand participated in this training programme.

The Institute's Centre of Agricultural Technology Assessment and Transfer (CATAT) organized eight training programmes each for 25 extension staffs and farmers on: i) “Production Technology of

Onion, Garlic and its Medical Value” on October 9, 2018; ii) “Diversification on Agriculture Due to Climate Change” on October 23, 2018; iii) “Preservation of Fruits and Vegetables” on October 26, 2018; iv) “Safe and Judicious Use of Pesticides for Food Safety and Quality with Reference to Food Standards of Other Countries” on October 30, 2018; v) “Rabi Crops” during November 13-14, 2018; vi) “Nutrient, Pest and Disease Management and Judicious Use of Insecticides in Cropping System” on November 20, 2018; vii) “Use and Benefit of Sprinkler & Drip Irrigation System and Use of Net and Green House in Agri-horticulture” on November 27, 2018; and viii) “Maize, Baby Corn and Sweet Corn Farming” on November 30, 2018.

The Institute's *Krishi Vigyan Kendra* (KVK) at Shikohpur organized four vocational training programmes on: i) “Production Technology of Mushroom” from October 10 to 30, 2018 (15 rural youths participated); ii) “Dress Designing and Tailoring” from October 12 to December 11, 2018 (20 rural women actively participated); iii) “Food Processing, Preservation and Value Addition” from November 17 to December 7, 2018 (9 rural women participated); and iv) “Organic Farming and Production Technology of Vermicompost” from November 28 to December 18, 2018 (17 rural youths participated). The KVK also organized two in-service training programmes on: i)

“Integrated Plant Nutrient Management in *Rabi* Crops” on November 20, 2018 in which 18 Agriculture Officers and Extension Personnel participated; and ii) “Integrated Pest Management (IPM) in *Rabi* Crops” on December 14, 2018 in which 25 ADOs participated.

The Division of Agricultural Engineering and Centre for Protected Cultivation Technology organized a training course on “Hydroponics” for subject matter specialists (SMS) of different KVKs of NEH region from November 15 to 17, 2018. Eleven participants from KVKs of NEH region (Nagaland, Mizoram and Tripura states) participated in the training.

The Centre for Conservation and Utilization of Blue Green Algae, Division of Microbiology and ZTM & BPD Unit jointly organized a training on “*Spirulina* Cultivation and Processing for Advancement of Skills Amongst Entrepreneurs” from November 26 to 30, 2018. During the training program, fifteen researchers, entrepreneurs and others were acquainted with the practical, technical and scientific knowledge regarding the *Spirulina* cultivation and its processing at large scale.

MISCELLANEOUS

Externally Funded Projects Sanctioned

- “Morphological, molecular and association mapping based approach to identify the resistance /tolerance to anthracnose disease of chilli in the North East India” funded by DBT. Amount: ₹ 25.42 lakhs for

three years. Principal Investigator: Dr. Partha Saha, Scientist, Division of Vegetable Science.

- “Integrated production of advanced biofuels and biocommodities” funded by DBT. Amount: ₹ 63.27 lakhs for three years. Principal Investigator: Dr. Sunil Pabbi, Principal Scientist, Division of Microbiology.

- “Integrative taxonomy of insect pests of rice and their natural enemies of North-East India” funded by DBT. Amount: ₹ 20.92 lakhs for three years. Principal Investigator: Dr. Debjani Dey, Principal Scientist, Division of Entomology.

- “Identification and molecular characterization of sweat bees (Hymenoptera: Halictidae) of North-East India” funded by DBT. Amount: ₹ 20.52 lakhs for three years. Principal Investigator: Dr. Debjani Dey, Principal Scientist, Division of Entomology.

- “Identification of lentil and mungbean genotypes for microgreens technology for L-Sector and elucidation of underlying genetic / environmental factors for their differential nutritional profiles” funded by LSRB, DRDO. Amount: ₹ 29.84 lakhs for three years. Principal Investigator: Dr. Gyan Prakash Mishra, Senior Scientist, Division of Genetics.

- “Genomics-led improvement of biotic and abiotic stress tolerance in mustard rape for economic and environmental sustainability” funded by DBT. Amount: ₹ 39.00 lakhs for three years. Principal Investigator: Dr.

Lakshman Prasad, Principal Scientist, Division of Plant Pathology.

- “Enhancing the productivity of phycobiliproteins (C-PCs) and cyanocobalamin (Vitamin B12) in selected cyanobacteria for valorization and development of financial foods” funded by DBT. Amount: ₹ 34.42 lakhs for three years. Principal Investigator : Dr. O. N. Tiwari, Senior Scientist, Division of Microbiology.

- “Molecular mapping and construction of linkage maps for improving aluminium tolerance and phosphorus acquisition efficiency in lentil for cultivation in acidic soils of North East Hill States” funded by DBT. Amount: ₹ 27.54 lakhs for three years. Principal Investigator: Dr. Dharmendra Singh, Principal Scientist, Division of Genetics.

- “Skill building in nutrition sensitive agriculture (NSA) for empowerment of rural women” funded by DBT. Amount: ₹ 54.61 lakhs for three years. Principal Investigator: Dr. V. Sangeetha, Scientist, Division of Agricultural Extension.

- “Association mapping of seed iron, zinc concentration and antinutritional factors in lentil (*Lens culinaris* Medik)” funded by DST, SERB. Amount: ₹ 33.49 lakhs for three years. Principal Investigator: Dr. Muraleedhar Aski, Scientist, Division of Genetics.

- “Improving stability and ensuring targeted delivery of anthocyanin through biopolymer based customized triggered-release formulation” funded by DST, SERB. Amount: ₹ 25.02

lakhs for three years. Principal Investigator: Dr. Anirban Dutta, Scientist, Division Agricultural Chemicals.

- “Biological and molecular typing of diverse *Papaya ringspot virus* (PRSV) population in relation to their host specificity, aphid transmissibility and geoecology” funded by DST- SERB. Amount: ₹ 26.10 lakhs for three years. Principal Investigator: Dr. Basavaraj, Scientist, Division of Plant Pathology.

- “Identification, characterization and validation of miRNAs and target mRNAs associated with nitrogen use efficiency in cultivated and progenitors based synthetic hexaploid wheat” funded by DST-SERB. Amount: 30.30 lakhs for three years. Principal Investigator: Dr. Lekshmy S., Scientist, Division of Plant Physiology.

- “ICT based extension strategies for nutrition sensitive agriculture in the states of UP and Odisha” funded by NASF, ICAR. Amount: ₹ 53.35 lakhs for three years. Principal Investigator: Dr. Premlata Singh, Head, Division of Agricultural Extension.

- “Long term conservation agriculture impact on microbiome and soil health indicators for resource efficiency and resilience in maize systems” funded by NASF, ICAR. Amount: ₹ 47.13 lakhs for three years. Principal Investigator: Dr. A. Kumar, Principal Scientist, Division of Plant Pathology.

- “National Knowledge Management Centre for Agricultural Education and

Research” funded by ICAR. Amount: ₹ 164.16 lakhs for four years. Principal Investigator: Dr. Amrender Kumar, Principal Scientist, AKMU.

- “Characterization of heat-linked QTLs and enzymes associated with starch biosynthesis pathway in wheat” funded by ICAR. Amount: ₹ 92.17 lakhs for three years. Principal Investigator: Dr. P. K. Singh, Principal Scientist, Division of Genetics.

- “Off-grid, clean energy cooling for affordable storage of perishables for BOP farmers” funded by PEER, US-National Academies of Sciences. Amount:US\$ 198,915.30 for two years. Principal Investigator: Dr. Sangeeta Chopra, Principal Scientist, Division of Agricultural Engineering.

Arise Business Incubation Programme

Under the ZTM&BPD Unit's Agribusiness Incubation Program, the following two startups signed MoA were enrolled for incubation support at the Unit.

- Innosapien Agro Technologies Pvt. Ltd.

- Padmavati & Vari Agro Services Pvt. Ltd.

Marketing & Networking Platforms

ZTM&BPD unit provided the platform to its eleven (11) incubates to showcase their technologies, products, services and varieties which were of benefit to the agricultural community and stakeholders in

the Agri-Startup and Entrepreneurship Conclave at NASC Complex, New Delhi from October 16-18, 2018. The exhibition was inaugurated by Honorable Union Minister of Agriculture & Farmers Welfare, Shri Radha Mohan Singh. Large number of budding entrepreneurs, Startups, Krishi Vigyan Kendras, and ICAR Institutes visited the conclave.

Corporate Membership

In this quarter, 91 industry partners were registered through corporate memberships. Out of which, 46 new members were enrolled and 45 existing members renewed their membership, generating a revenue of ₹ 4,55,000/-.

Annual Hindi Prize Distribution Function

The Institute celebrated its annual Hindi prize distribution function on December 19, 2018 at Dr. B.P. Pal Auditorium. Prof. R.B. Singh, former Director, ICAR-IARI was the Chief Guest. Dr. A.K. Singh, Deputy Director General (Agricultural Extension), ICAR and Director, ICAR-IARI (additional charge) presided over the function. Shri Keshav Dev, Deputy Director (Official Language) presented the Institute's Official Language Progress Report. On this occasion, the prizes were given away to the winners of different competitions organized during the year. A *kavi sammelan* and *nukkad natak* were also organized on this occasion. The annual rajbhasha magazine of the institute 'Pusa Surbhi' was also released on this day.

Awards/Recognitions

- Dr. B.S. Dwivedi, Head, Division of Soil Science and Agricultural Chemistry received the Platinum Jubilee Commemoration Award of the Indian Society of Soil Science for “Lifetime research and teaching contributions in the area of improving soil health and nutrient use efficiency”.
- Dr. Shelly Praveen, Head, Division of Biochemistry received Vasvik Award in the area of Agricultural Science & Technology.
- Dr. M.K. Dhillon, Principal Scientist, Division of Entomology received Prof. T.N. Ananthkrishnan Special Senior

Scientist Award for the biennium 2016-2017 from T.N. Ananthkrishnan Foundation, Chennai, Tamil Nadu.

- Dr Basavaraj, Scientist, Division of Plant Pathology was conferred with Young Scientist Award by the Indian Virological Society at the 27th International Conference of Virology "INTERVIROCON-2018".
- The Pesticide Referral Laboratory, ICAR-IARI, New Delhi received NABL accreditation certificate from NABL up to September 25, 2020.
- Dr. Ranjeet Ranjan Kumar, Senior Scientist, Division of Biochemistry received R. H. Dastur Gold Medal from Indian

Society of Plant Physiology.

- Mrs. Veda Krishnan, Scientist, Division of Biochemistry received Young Scientist Award from Indian Society of Plant Physiology.
- Shri K.S. Aditya, Scientist, Division of Agricultural Economics received Dr. N. A. Muzumdar Prize Award for the best paper presented on the topic “Willingness to Pay for Participation in Community-based Programme: A Case of Seed Self-help Group in Uttar Pradesh” under the auspices of Institute of Economic Growth, Delhi.

Visitors from Abroad

During the period October - December 2018, three delegations one each from USA, Tanzania and Chile visited the Institute.



Chile-delegation interacting with ICAR-IARI team

Published quarterly by the Publication Unit on behalf of the Director, Indian Agricultural Research Institute (IARI), New Delhi-11 0012, and printed at M. S. Printers, C-108/1 Back Side, Naraina Industrial Area, Phase-1, New Delhi-110024, Tel.: 011-45104606

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