



IARI NEWS



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ICAR-Indian Agricultural Research Institute Foundation Day 2016

Though established in 1905, IARI celebrated its very first Foundation Day on April 1, 2016 with scintillating Foundation Day Lecture by Prof. M. S. Swaminathan, the chief guest of the Function. Prof. Swaminathan spoke on "IARI's Role in India's Agricultural Transformation", where he presented the glorious landmarks and achievements of IARI in attainment of food security and nation's prosperity. He emphasized upon inter-disciplinary collaboration and believed that this was one of the reasons why IARI had been successful. Wheat and rice breeding has been one of the most important activities of this institution. Development of wheat variety HD 2967, which now occupies most of the area under

irrigated wheat production, and some of the rice varieties like PB 1121, which have really created a *Basmati* revolution; amply exemplify the power of public good research. He further stressed upon synergy between technology and public policy. He raised his concern about malnutrition in society in spite of having attained food security. Efforts need to be directed towards nutritional security. He exhorted the scientists and other staff members towards pursuance of sustainable development goals through innovative research, education and extension. Speaking on the occasion, Dr Trilochan Mohapatra, Secretary, DARE and Director-General, ICAR highlighted that IARI had enough potential to redeem the pledge of



Prof. M. S. Swaminathan delivering the Foundation Day Lecture at Dr. B. P. Pal Auditorium

the nation for food and nutritional security and strive towards development of bio-fortified crops and transcending the productivity barriers through novel approaches. Prof. V. L. Chopra, former Member of Planning Commission was the chairman and Prof. R.B. Singh, former Director, IARI was Co-Chairman of the lecture session. At the outset of the event, Dr Ravinder Kaur, Director (Acting), IARI, extended warm welcome and felicitated the dignitaries. Six outstanding officials from technical, administrative and supporting categories were felicitated on this occasion with certificate and memento for their commendable performance during 2015. IARI convocation music, a video on climate change adaptation and few technical bulletins were released by the chief guest on this



ICAR-Indian Agricultural Research Institute celebrating its Foundation Day on April 1, 2016

occasion. Dr K.V. Prabhu, Joint Director (Research) proposed the vote of thanks and assured that IARI would continue to serve the nation with renewed vigour and dedication.

IARI Library Gets Its New Name as “Prof. M S Swaminathan Library”

IARI celebrated its foundation day on April 1, 2016. On this occasion, Dr. T. Mohapatra, Secretary DARE & Director-General, ICAR announced that the name of IARI Library may be changed to “Prof. M S Swaminathan Library” as an honour to our most eminent scientist “Prof. M. S. Swaminathan”. The idea was welcomed and accepted by all dignitaries and audience. Inaugural function was organized on April 29, 2016. Prof. M. S. Swaminathan, Dr. T. Mohapatra, Secretary DARE & Director-General, ICAR, Dr. Ravinder Kaur, Director (Acting), Dr. K V Prabhu, Joint Director (Research), Dr. R. K. Jain, Dean & Joint Director (Education) and other dignitaries were present on this occasion.



RESEARCH

Efficacy of Nano-emulsified Basil Essential Oil based Alginate Coating for Reducing Fungal Spoilage in Okra

Alginate coating based on nano-emulsified basil (*Ocimum basilicum* Linn.) essential oil was prepared using ultrasonic technique with an objective for use as antimicrobial coating on vegetables. The droplet size of prepared emulsions was measured using dynamic light scattering equipment and further confirmed through transmission electron microscope. Further, use of a chemical surfactant, tween 20 & a natural surfactant, *reethha* (*Sapindus mukorossi*) extract was compared for emulsification efficacy. The extract was further characterized using FTIR and NMR.

Anti-microbial coating of basil nano-emulsion for extending post-harvest life of okra. The antimicrobial coating suspension was found effective against spoilage causing microorganisms *Penicillium chrysogenum* and *Aspergillus flavus*. The effectiveness of nano-emulsified basil oil against spoilage causing microorganisms was higher by 23% compared to micro-emulsified basil oil formulation based on *in vitro* trials using poisoned food method. Besides emulsification, *Sapindus* extract was also found to enhance the antimicrobial activity of basil oil against *Aspergillus flavus* by ~31%. Effective concentration for 50% inhibition of the pathogens, determined using probit analysis, was also lower for *reethha*

containing formulations. The developed nano-formulation at EC 50 level of basil essential oil was mixed with sodium alginate solution & coated upon okra. The *in vivo* trials on okra against *Penicillium chrysogenum*, *Aspergillus flavus* spores (10^5 spores/ mL) yielded promising results. Thus alginate coating based on basil oil nano-emulsified with *reethha* extract can emerge as a promising non-chemical approach towards extension of post-harvest shelf life of okra.

Improved Method for Rapid Isolation and Quantification of *Rhizoctonia solani* from Mungbean Rhizospheric Soil

Rhizoctonia solani causes web blight/wet root rot disease of mungbean and is also the major constraint to mungbean crop production in India. The Institute developed an improved procedure for quantitative estimation of propagules of *Rhizoctonia solani* in soil. Maximum number of colonies were observed in Ko and Hora medium following serial dilution after sieving through 0.150 mm sieve. The highly positive correlation ($r = 0.96$) was observed between disease incidence (%) and number of cfu/g of soil. In the q-PCR analysis for quantification and monitoring of *R. solani* isolates, the

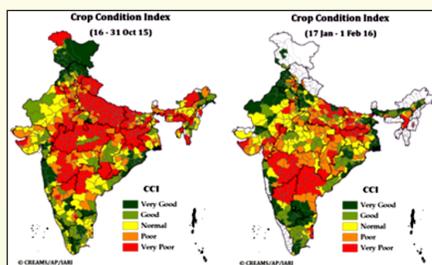


Rhizoctonia solani colony isolated through improved technique

maximum level of inoculum was observed in the rhizospheric soil of mungbean genotype Pusa Vishal at 21 days after sowing. The method can be utilized for monitoring of soil borne population of *R. solani* under glass house and field conditions.

District Scale Crop Monitoring System

A web enabled Decision Support System (DSS) for near real time crop growth monitoring at district level based on multi-temporal satellite remote sensing data was implemented. Satellite derived weekly Land Surface Temperature (LST), Normalized Difference Vegetation Index (NDVI) and Daily Rainfall products were generated for crop pixels and averaged in each district for 2015-2016 *kharif* and *rabi* seasons. Based on these parameters, regular anomaly indicators of Standardized Precipitation index (SPI), Temperature Condition Index (TCI day and night) and Crop Condition Index (CCI) were generated for each of the 579 districts of country. The historical and real-time basic parameters and anomaly indices were archived in a database for each district and made accessible through a public web portal <http://creams.iari.res.in> to all stakeholders for their own decision making. The indices could capture the developing the meteorological drought in Maharashtra, Telangana, Karnataka and Uttar Pradesh. The CCI showed poor crop condition in Maharashtra, Madhya Pradesh, Gujarat, Telangana, Karnataka and Uttar



The Crop Condition Index maps of *Kharif* and *Rabi* seasons of 2015-16

Pradesh during *kharif*. During *rabi* season, CCI by February beginning showed the very poor crop condition in Maharashtra, Telanagna, north Karnataka, Bundelkhand region, south Bihar and northern Jharkhand. The TCI also showed very hot to hot conditions prevailing especially in Marathwada, Bundelkhand and Telangana.

EDUCATION

Dr. B.P. Pal Memorial Lecture

The 23rd Dr. B.P. Pal Memorial Lecture was delivered by Prof. Ramesh Chandra, Member, NITI Aayog, New Delhi on May 26, 2016 on the topic "Addressing Agrarian

Distress: Sops Versus Development" at Dr. B P Pal Auditorium. Dr. R.S. Paroda, Chairperson, TAAS, New Delhi presided over the function and Dr. T. Mohapatra, Secretary, DARE & Director-General, ICAR was the Guest of Honour. Dr. Ravinder Kaur, Director (Acting), IARI welcomed the Chairman, Speaker and the audience present on this occasion. Dr. R.K. Jain, Dean and Joint Director (Education) introduced the Speaker and the lecture series. Dr. Vinod, Professor, Genetics presented the vote of thanks.

Graduation Ceremony of M.Sc. Students from ANASTU

Indian Agricultural Research Institute imparted the teaching and research guidance to the first batch of 21 students from Afghanistan National Agricultural Sciences & Technology University (ANASTU), Kandahar, Afghanistan in collaboration with the Ministry of External Affairs, Government of India. All the students conducted their research work at the research



Prof. Ramesh Chandra, Member, NITI Aayog delivering the 23rd Dr. B.P. Pal Memorial Lecture



Graduation Ceremony of M.Sc. Students from ANASTU

farm of the ANASTU, Kandahar. The Graduation Ceremony of the first batch of M.Sc. Students from ANASTU, Kandahar was organized on June 6, 2016. On this occasion Shri Amar Sinha, Secretary (ER), Ministry of External Affairs, Government of India, New Delhi was the Chief Guest and awarded hard earned 'Transcripts' to the students. HE Mir Amanuddin Haidari, Deputy Minister for Technical Affairs, Afghan Ministry of Agriculture, Irrigation and Livestock; Mr. Abdul Rashid Hakimi, Vice-Chancellor, ANASTU; Mr. Abdul Ali Shamsi, Deputy Governor of Kandahar; Dr. Trilochan Mohapatra, Secretary, DARE & Director-General, ICAR; Dr Ravinder Kaur, Director (Acting), IARI; and Dr. R.K. Jain, Dean & Joint Director (Education), IARI also graced the occasion.

EXTENSION

Participation in Exhibition

The Centre for Agricultural Technology Assessment and

Transfer (CATAT) participated in the following exhibitions:

- ❖ "Farmer Field School" organized by ICAR-Indian Institute of Farming Systems Research, Modipuram, Meerut, UP on May 7, 2016 at Navala village in Muzaffarnagar District, Uttar Pradesh.
- ❖ "Farmers Fair and Farm Field School" organized by ICAR-Indian Institute of Farming Systems Research, Modipuram, Meerut, UP on May 25, 2016 at Mirapur Dalpat village in Muzaffarnagar District, Uttar Pradesh.

Distribution of Soil Health Cards

CATAT and Division of Soil Science and Agricultural Chemistry of the Institute organized a *Kisan Gosthi* and Soil Health Card distribution function in Rajpur village, Khair block, Aligarh (UP) on May 10, 2016. Soil Health Cards prepared by the Division of Soil Science and

Agricultural Chemistry for 250 farmers of village Rajpur were distributed among the farmers in the first phase of the Soil Health Card Scheme-a flagship programme of the Govt. of India. Dr. Balkar Singh, District Magistrate, Aligarh was the Chief Guest and Dr. Ravinder Kaur, Director (Acting), IARI, presided over the function. The programme was also attended by CDO, SSP and ADM of Aligarh, SDM, Khair and other officials of line departments like Agriculture and Horticulture, etc. Director, IARI advised the farmers about efficient use and conservation of water. The Chief Guest elaborated about the different development schemes being undertaken in the village. The mega event witnessed the participation of approximately 2000 farmers from the village and nearby vicinity.

Mera Gaon Mera Gaurav

Scientists from the Regional Station, Karnal visited the adopted villages Chakdha, Nerukheri, Raipur Jatan in May and Amopura, Chirao, Malikpur Khalsa in June, 2016, and interacted with the farmers to improve their productivity by adopting latest scientific interventions. The farmers were provided one page write-up in local language of important agricultural activities to be taken care for different crops during these months.

Field days

- ❖ A field day on wheat on April 7, 2016 in Khanpur village of Gurgaon district (19 farmers

and nine farm women participated).

- ❖ Two field days on summer *moong* in Khanpur and Bhodakana villages on June 8 and 15, 2016 (58 and 59 farmers and farm women participated, respectively).

Kisan Sammelans

The Institute's *Krishi Vigyan Kendra* (KVK) at Shikohpur organized a *kisan Sammelan* on "Pradhan Mantri Fasal Bima Yojana" on April 5, 2016 at its campus. During the *Sammelan* the Scientists of IARI gave the detail procedure of *Fasal Bima Yojna* being introduced from *Kharif* 2016. Shri Abhai Singh Yadav, Ex Chairman, Jila Parisad, who was the chief guest, called upon the gathering of 500 farmers to get their crops insured so that they could get compensation of damaged crops due to natural calamities. Dr. J.P. Sharma, Joint Director (Extension) asked the farmers to remain in touch with the KVK to take benefits of different schemes launched by the Central/State Government.

The KVK also organized a *Kisan Sammelan* on "Save the Environment by not Burning the Crop residue" in Daboda village of Farukhnagar block of Gurgaon district on April 27, 2016 in which the Smt. Bimla Chaudhary, Hon'ble Member of Legislative Assembly, Haryana was the Chief Guest. The members of Panchayat/block samiti were also present in the *Sammelan*. The scientists from IARI/ KVK explained the losses occurred due to burning of crop residue like loss in fertility of soil, death of beneficial

insects and pollution of the environment.

Kharif Kisan Goshthi

ICAR-Indian Agricultural Research Institute, New Delhi organized *Kharif Kisan Goshthi* at Kutbi village of Muzaffarnagar district of Uttar Pradesh on June 27, 2016. A multi-disciplinary team of Scientists from IARI participated in the *Kisan Goshthi* and addressed the farmers. The topics discussed were: management of pests, agronomic practices and disease management in paddy, orchard management, protected cultivation, *sabjee phaslon ki kheti*, and care of dairy animals during monsoon season. Shri Ram Jatan Mishra, District Agricultural Officer, Muzaffarnagar informed the farmers about Central and State Govt. Schemes. More than 400 farmers of Kutbi and nearby villages participated in the programme.

CAPACITY BUILDING

Trainings

CATAT organized a 3-day training on "Good Agricultural Practices and Post Harvest Processing" for the partners from ICAR Institutes, SAUs, VOs and progressive farmers from April 25 to 27, 2016. CATAT also organized a 2-day pre-seasonal training on "Kharif Crops" for 20 Extension Officials of Development Department of NCR from May 21 to 22, 2016.

The Institute's *Krishi Vigyan Kendra* (KVK) at Shikohpur organized a vocational training course on "Dairy Farming" from

May 2 to 12, 2016 at KVK campus. During this programme, 40 rural youth from Gurgaon district participated. It covered the topics related to different breeds of cattle and buffalo, scientific management, balance feeding, disease management, cattle insurance, different welfare schemes of the Government, and loan facilities of banks.

The Division of Food Science and Postharvest Technology organized a training on "Career Prospects in Food Science and Technology" on May 13, 2016 in collaboration with Association of Food Scientists and Technologists Delhi chapter.

International Training Programme

A short-term three weeks international training programme was organized under the MEA sponsored Indo-Myanmar: Advanced Center for Agricultural Research & Education (IM-ACARE) from May 31 to June 20, 2016 for 15 faculty members of Yezin Agriculture University (YAU), Myanmar on "Agricultural Knowledge Management through Innovative Communication Intervention"; "Advances in Molecular Breeding of Crop Plants"; and "Post-harvest Management and Value Addition of Agri-produce".

Brainstorming Session

The Division of Plant Pathology organized a brainstorming session on "Wheat Blast Disease: Threat in Asia & Our Preparedness" on June 27, 2016. This brainstorming session was organized to discuss the global status of this emerging disease and the challenges, which

we may face in case it comes to India. The session was chaired by Dr. S. Nagarajan, Ex-Director, IARI & Ex- chairman, PPV& FR, and presided over by Dr. Ravinder Kaur, Director (Acting), IARI. A selected group of leading wheat and rice scientists including scientists from CIMMYT Global Wheat Programme in South Asia participated in the deliberations.

Faculty Training for ANASTU, Kandahar, Afghanistan

Three months hands-on training in the field of “Usage and Installation of Laboratory Equipments” for chemical analysis of plant and soil samples for the faculty of ANASTU was organized. The valedictory function was organized by the P G School, IARI in collaboration with External Affairs Ministry, Government of India on April 6, 2016. On this occasion, Shri M. Subbarayudu, Joint Secretary, Ministry of External Affairs, Government of India, New Delhi was the Chief Guest and Dr. Trilochan Mohapatra, Secretary, DARE & DG, ICAR presided over the function. Other dignitaries who graced the occasion were: Dr. Ravinder Kaur, Director (Acting); Mr. Abdul Rashid Hakimi, VC, ANASTU and Dr. R.K. Jain, Dean & Joint Director (Education).

Workshop

The Division of Agricultural Engineering organized a workshop entitled “Machines and Use of Hand Tools for Small Farm Mechanization” on June 17, 2016. The participants included manufacturers and inventors of agricultural tools and equipment from Gujarat, UP and

farmers practicing non fossil fuel technologies.

Seminar

The Institute’s Division of Agricultural Engineering organized a seminar on “Present Status and Future Prospects of Custom Hiring of Agro-machines in India” on June 27, 2016. The seminar was graced by Dr. Ravinder Kaur, Director (Acting), IARI, Dr. K. V. Prabhu, Joint Director (Research) and Shri Ashwani Kumar, Joint Secretary, Ministry of Agriculture and Farmers Welfare, Government of India and heads of the divisions. The leading manufacturers of agromachines from Punjab, Haryana, UP, Karnataka and Tamil Nadu, custom service providers, policy makers, experts and farmers’ representatives participated in the seminar. Promising equipment and machines developed by the Institute were also exhibited for the information of participants.

MISCELLANEOUS

New External Funded Projects Sanctioned

- ❖ “Incorporation of biotic stress resistance gene(s) in the genetic background of Pusa Basmati 1509 through marker assisted backcross breeding” funded by DBT. Principal Investigator: Dr. A.K. Singh, Head, Division of Genetics.
- ❖ “Development of low phytic acid (*lpa*)-based quality protein maize (QPM) genotypes through marker-assisted selection” funded by DST. Principal

Investigator: Dr. Vignesh M., Scientist, Division of Genetics.

- ❖ “Marker assisted pyramiding of APR and seedling resistance genes for durable rust resistance in wheat (*Triticum aestivum* L.)” funded by DBT. Principal Investigator: Dr. Vinod, Professor, Division of Genetics/ Dr. M. Sivasamy, Head, IARI Regional Station, Wellington.
- ❖ “Hyperspectral remote sensing for precision agriculture” funded by DST. Principal Investigator: Dr. Rabi N. Sahoo, Senior Scientist, Division of Agricultural Physics.
- ❖ “Formulation and validation of DUS testing guidelines for lemon (*Citrus limeon* (L.) *Burm*) and pummed (*Citrus grandis*)” funded by PPV & FRA. Principal Investigator: Dr. A.K. Dubey, Principal Scientist, Division of FHT.
- ❖ “India- UK Nitrogen Fixation Centre (IUNFC)” funded by DBT. Principal Investigator: Dr. K. Annapurna, Head, Division of Microbiology.
- ❖ “Gene differential expression studies in regular and irregular bearing mango varieties” funded by DST. Principal Investigator: Dr. Nimisha Sharma, Scientist, Division of FHT.
- ❖ “Indo-UK Centre for Improvement of Nitrogen Use Efficiency in Wheat” funded by DBT. Principal Investigator: Dr. Renu Pandey, Sr. Scientist, Division of Plant Physiology.
- ❖ “Newton-Bhabha Virtual Centre on nitrogen efficiency of whole-cropping systems for improved

performance and resilience in agriculture” funded by DBT. Principal Investigator: Dr. H. Pathak, Professor, CESCRA.

- ❖ “Expression of resistance to diapausing and nondiapausing spotted stem borer, *Chilo partellus* in sorghum and maize: implications for crop improvement and IPM” funded by ICAR. Principal Investigator: Dr. M.K. Dhillon, Senior Scientist, Division of Entomology.
- ❖ “CRP on agro-biodiversity (cabbage)” funded by ICAR. Principal Investigator: Dr. Chander Prakash, Principle Scientist, IARI Regional Station, Katrain.
- ❖ “CRP on agro-biodiversity component evaluation and use in prioritized crops” funded by ICAR. Principal Investigator: Dr. M. Sivasamy, Head, IARI Regional Station, Wellington.

“Arise”, Launch Pad for Agri-Startups

Zonal Technology Management and Business Planning & Development Unit, ICAR-IARI New Delhi organized a Zonal Workshop and launched the second edition of its AgriBiz Incubation programme “Arise 2016, Launch Pad for Agri-Startups” on June 9, 2016 in association with ICAR institutes & state agricultural universities of North India. Dr. T. Mohapatra, Secretary, DARE and Director-General, ICAR presented keynote address where he mentioned that the word ‘Arise’ reminds the visionary words of Swami Vivekananda ‘Arise awake



Inauguration of “Arise”, Launch Pad for Agri-Startups

and stop not till the goal is reached’. Arise, Launch Pad for Agri-Startups aims to provide a platform for budding agripreneurs, by providing innovative solution to today’s market needs.

Swachhta Pakhwara

The Institute organized *Swachhta Pakhwara* from May 15 to 30, 2016. It started with the oath ceremony, and pledge for the collection and disposal of unwanted garbage and waste

from every division and residential colonies of the Institute. During this drive, PadamBhushan, Dr. Bindeshwar Pathak, social reformer of contemporary India and the founder of Sulabh International motivated the employees of the Institute about cleanliness. During this cleanliness drive, the health inspectors and residents of Janak Vihar colony of IARI worked continuously for 15 days and cleaned all the terraces, garages, stairs and balconies. The employees of the Institute also collected all the wastes from the vicinity of quarters and playgrounds. The Director advised the residents of the colony to collect their biodegradable and non-biodegradable wastes in separate bins (green colored for bio-degradable and blue colored for non-biodegradable), which were kept in each block of JanakVihar and throughout the



Oath taking ceremony during Swachhta Pakhwara



Swachhta leaders who wielded the broom

campus. The closing ceremony was held on May 30, 2016 in Janak Vihar in the presence of the Director and other employees of the Institute. During this programme, plants were also planted around the playgrounds. After this cleanliness drive, Janak Vihar now presents a new picture of “*Swachhta Abhiyaan*”.

International Yoga Day Celebration

The Institute organized a programme on “Yoga in Daily Life” on the occasion of the International Yoga Day on June 21, 2016 at PG Hostel Ground, Vasant Hostel, IARI, New Delhi. ‘Free Mass Yoga Sessions’ were organized during June 18-27, 2016 in which students, staff, families of the Institute employees participated. Interactive Sessions with Mr. Manas Bhattacharji of Swami Vivekananda *Yoga Anusandhana Asthana* and Ms. Nishu Bhandula & Mr. Jugal Kishore of Morarji Desai National Institute of Yoga were also conducted.

Corporate Membership

In this quarter, 31 new corporate members were registered and 34 members renewed their registration. Total revenue generated between April-June was three lakh eleven thousand rupees (₹ 3,11,000).

Technology Commercialization

- ❖ STFR Meter was licensed to Om Agro Organics.

- ❖ VAM Technologies was licensed to HCM Agro Products Pvt. Ltd.
- ❖ Improved STFR Meter with 12 parameter was licensed to WS Telematics Pvt. Ltd., Nagarjuna Agro-chemicals Pvt. Ltd., Plasti Surge Pvt. Ltd. and Om Agro Organics.

Patent Filed

- ❖ Digital soil test and fertilizer recommendation meter.

Honours/Awards

- ❖ Dr. K.K. Bandyopadhyay, Principal Scientist, Division of Agricultural Physics; and

Dr. V.K. Baranwal, Principal Scientist, Division of Plant Pathology were elected as Fellows, National Academy of Agricultural Sciences for the year 2015-16.

- ❖ Dr. Alka Joshi received Young Scientist Award in International Conference on “Recent Advances in Food Processing and Biotechnology” at BHU, Varanasi.
- ❖ Drs. Shalini G. Rudra, V.R. Sagar and Shruti Sethi received the Best Feature Article Award from the Association of Food Scientists and Technologists.

Visitors from Abroad

During the period April-June, 2016, six delegations– one each from Bhutan, BRICS, Angola, Israel, Korea and Kenya– visited the Institute. Angolan delegation was led by H.E. Eng. Afonso Pedro Canga, Minister of Rural Development, Angola; Israeli delegation was led by H.E. Uri Ariel, Agriculture & Rural Development Minister, Israel; and Korean delegation was led by H.E. Rikil song, Vice Minister, Korea. H.E. Gen Candido Pereira dos Santos Van-Dunem, Minister of former Combatants & Veteran of the Homeland, Angola also visited the Institute.



A delegation from Angola with IARI team

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