



IARI NEWS



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IARI Foundation Day Celebration – 2018

IARI having a rich history of more than 113 years of excellence in research, teaching and extension celebrated its Foundation Day on April 1, 2018. Dr. Trilochan Mohapatra, Secretary (DARE) and Director General (ICAR) was the Chairman of the function. Dr. R.S. Paroda, former Secretary (DARE) and Director General (ICAR), and Chairman, TAAS was the Speaker of the 3rd Foundation Day Lecture. Dr. A.K. Singh, DDG (Agricultural Extension), ICAR and Director, IARI; Dr. R.K. Jain, Dean and Joint Director (Education), IARI; Dr. J.P. Sharma, Joint Director (Extension & Research), IARI and Major Manmohan Singh Verka, IARI Fellow Farmer graced the occasion. In the welcome address, Dr. R.K. Jain mentioned that Dr. T. Mohapatra was the initiator of this lecture series and he had the desire of a "Discovery Centre", for which the Institute has taken initiative to establish. Dr. A.K. Singh congratulated all on the occasion of IARI Foundation Day. He enumerated the most significant achievements of the Institute during the last one year. Dr. T. Mohapatra, Chairman of the function, introduced the Speaker of Foundation Day Lecture. Dr. R.S. Paroda delivered the lecture on an appropriate topic "Innovation-led Agricultural Growth: Challenges and Opportunities". Dr. Paroda desired that IARI should serve as "Seat of Innovation". Major Manmohan Singh Verka lauded IARI's consistent role in increasing farmers' productivity. Six "Best Worker Awards" were also presented to the staff of IARI to motivate the entire staff. Dr. J.P. Sharma while presenting the formal vote of thanks, appreciated all for attending the Foundation Day celebration.

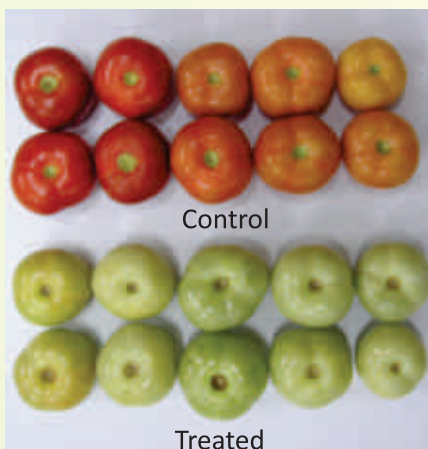


Dr. R.S. Paroda, former Secretary (DARE) and Director General (ICAR) and Chairman, TAAS delivering the 3rd Foundation Day Lecture at Dr. B.P. Pal Auditorium

RESEARCH

Ethanol Vapour Treatment Delays Ripening of Tomato Fruits

Tomato fruits are not suitable for storage at lower temperatures. At present, there is no effective method, technique or treatment to delay ripening and thereby improving post-harvest management of tomatoes. A study carried out in this direction showed that treatment of tomato fruits with ethanol vapours delays ripening by 5 to 7 days at storage temperature of 25 °C. Effective dose of ethanol was found to be dependent on variety, quantity, duration of treatment and capacity of the container used for treatment. This work pointed out the possibility that ethanol (a bioactive compound) treatment can be a promising and cost-effective way of delaying ripening of tomato fruits.



Delaying effect of ethanol vapour treatment on ripening of tomato fruits in var. Pusa Ruby

Performance of Improved Pusa Hydrogels in Horticultural Crops in Hilly Region

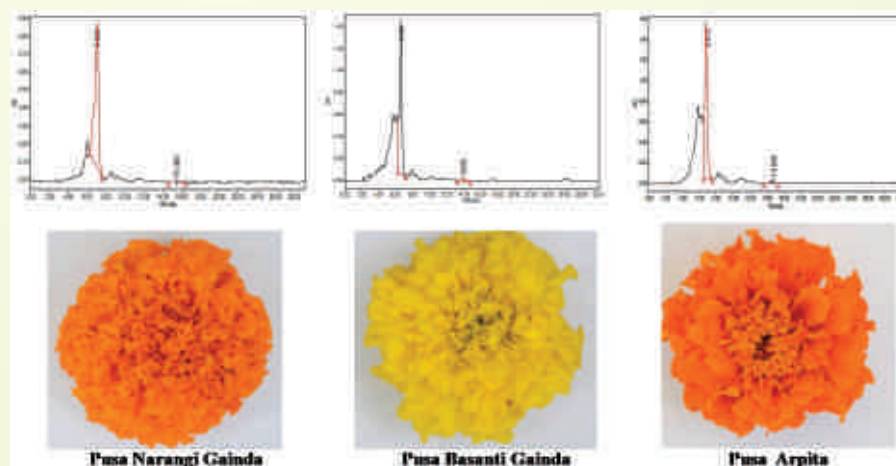
Pusa hydrogel technology developed at the Institute's Division of Agricultural Chemicals and licensed to many

companies generated tremendous awareness among crop growers for use of soil conditioners in agriculture. With an aim to develop an improved version endowed with better benefit-cost ratio, improved versions of Pusa Hydrogel (PHG-1) have been invented. The National and US patents of the process of their preparation have been granted. The team of scientists led by Dr. Anupama Singh is currently involved in optimizing key parameters to bring out industrially viable process of the new product and their assessment. A recent study on the performance of an optimized hydrogel (PHG-1, WAC 600 times) in cauliflower (var. Pusa Snowball K1) in the hilly region at IARI Regional Station, Katrain, Kullu valley, Himachal Pradesh showed significant reduction of irrigation (10 times less amount of water) and at par crop growth as compared to the conventionally irrigated control treatment. The response of PHG-1 was also evaluated on establishment of *Eustoma* seedlings. The establishment of *Eustoma* seed was visibly better

than control and had good seedling vigour as observed by the application of modified new hydrogel.

Optimization of Dehydration Techniques for Higher Retention of Carotenoids in Marigold

Influence of different dehydration techniques, viz., sun drying, hot air oven drying, microwave drying, and vacuum drying on total carotenoids of marigold petals of three varieties, viz., Pusa Arpita, Pusa Basanti Gainda (PBG), and Pusa Narangi Gainda (PNG) were studied. Vacuum drying was the best drying method with respect to preserving its total carotenoids in varieties PNG (2765.76 mg/100 g) and Pusa Arpita (1108.76 mg/100 g) followed by microwave drying (PNG: 2518.08 mg/100 g and Pusa Arpita: 799.16 mg/100 g) and hot air oven drying (PNG: 1968.54 mg/100 g and Pusa Arpita: 659.19 mg/100g). The components of total carotenoids were quantified by HPLC, and lutein and β -carotene contents were found



HPLC generated chromatograms (wavelength 450 nm) of lutein and β carotene of vacuum dried flowers of marigold

maximum in vacuum dried marigold petals of varieties PNG (295.48 $\mu\text{g/g}$) and Pusa Arpita (252.51 $\mu\text{g/g}$). The sun drying method had retained lowest carotenoids, lutein and β -carotene content.

Glycerine Preservation of Foliage for Value Addition

Glycerine drying is most suitable for foliage preservation due to its osmotic nature, therefore; the foliage thus preserved and retains flexibility, shape and texture. Finding out an appropriate concentration of glycerine for better quality of foliage dehydration is important to support the entrepreneurs in the competitive global flower market. A dried flower arrangement without foliage may seem stiff and unnatural. Leaves add much to an arrangement and can easily be preserved by a process known as “glycerinizing.” The present studies were carried out using foliages of four plant species, namely, Silver oak (*Grevillea robusta*), Boston fern (*Nephrolepis exaltata*), Cordyline (*Cordyline fruticosa*) and Asparagus (*Asparagus meyeri*). The methods used for preserving foliage includes



Dr. Trilochan Mohapatra, Secretary, DARE and Director-General, ICAR, New Delhi delivering the 25th Dr. B.P. Pal Memorial Lecture at Dr. B.P. Pal auditorium, IARI

keeping the stems in glycerine solution i.e. uptake method or immersing the complete foliage in glycerin solution i.e. full dip method. From the present studies it is concluded that 1:3 ratio of glycerine and water was found most suitable for most of the species studied followed by 1:2 and as far as the method of glycerinization is concerned for asparagus and fern, full dip method and for cordyline and silver oak, uptake method were found better for most of the parameters studied.

EDUCATION

Dr. B.P. Pal Memorial Lecture

The 25th Dr. B.P. Pal Memorial Lecture was delivered by Dr. Trilochan Mohapatra, Secretary, DARE and Director-General, ICAR, New Delhi on June 19, 2018 on the topic "Our Agricultural Future" at Dr. B.P. Pal auditorium, IARI. Dr. A.K. Srivastava, Chairman, ASRB, New Delhi presided over the function. Dr. R.K. Jain, Dean & Joint Director (Education), IARI welcomed the Chairman, Speaker and the audience present on this occasion. Dr. A.K. Singh, Director, IARI introduced the Chairperson and the lecture series while Dr. A.K. Srivastava, Chairman of the session, introduced the Speaker. Dr. Vinod, President, Genetics Club and Professor, Genetics and Plant Breeding presented the vote of thanks.



Different value added products made up of glycerine dried foliage

EXTENSION

Participation in Exhibition

The Institute participated in the exhibition during Farmers' Fair and Agro-industrial Exhibition at NDUA&T, Faizabad on April 5 to 6, 2018. IARI stall was awarded First Prize.

Field Days Organized

During the reported period, two field days on “Summer Moong” were organized on June 6 and 23, 2018 in Tirpari and Tajnagar villages of Gurugram district, respectively. In these field days, 83 farmers and 17 farm women participated.

World Environment Day

The *Krishi Vigyan Kendra*, Shikohpur organized World Environment Day on June 5, 2018 in Tirpari village, Gurugram, Haryana, in which 43 farmers participated.

Live Video Conferencing of Prime Minister to Farmers

The Hon'ble Prime Minister of India, Shri Narendra Modi had a live conferencing with farmers all over the country to assess the impact of various Government schemes launched in favour of farming community on June 20, 2018. The live video conferencing was shown through webcast at KVK campus in which 180 farmers and farm women of Gurugram district were present. During the programme Hon'ble Union Minister of Agriculture and Farmers' Welfare, Shri Radha Mohan Singh, Dr. A.K. Singh, Deputy Director General (Extension), ICAR and Director, IARI, and Dr. J.P. Sharma, Joint Director (Extension), IARI were present at the campus. The

farmers were advised to give more emphasis on Integrated Farming System rather than focusing on farming only in order to achieve Hon'ble Prime Minister's goal of doubling the farmers' income by 2022.

Chaupal Charcha

The Institute organized two *Chaupal Charcha* in Khajurka village, Palwal district and Rajpur village, Aligarh district on May 17 and 31, 2018, respectively. During these *Charcha*, an effort was made to link farmers with State department officials in solving farmers' queries and updating them with development programmes being run by the State Governments. IARI scientists and officers of the state departments of Agriculture along with 200 farmers and farm women participated in these interface events.

CAPACITY BUILDING

Trainings

The Division of Agricultural Extension conducted four training programmes under the UNDP sponsored project entitled

“Strengthening Agri-nutri Linkage for Enhancing Nutritional Security and Empowering Farm Women in India: Leveraging Agriculture for Nutrition” at: i) Sehjadpur village, Sonipat block, Sonipat district, Haryana from April 17 to 19, 2018; ii) Nangla village, Badli block, Jhajjar district, Haryana from April 24 to 26, 2018 ; iii) Ujina, Mewat district, Haryana from April 26 to 28, 2018; and iv) Badli block, Jhajjar district, Haryana from May 17 to 19, 2018. Fifty one rural women representing various Self Help Groups participated in each of the training programmes.

The Institute's Centre for Agricultural Technology Assessment and Transfer (CATAT) organized a training programme on “Improved Horticultural Technologies of Sub-Tropical Fruits” from April 24 to 28, 2018. A total of 28 farmers and 2 horticultural officials from Una District, Himachal Pradesh participated in the programme.

The Institute's *Krishi Vigyan Kendra*, Shikohpur organized



Demonstration of Fruit Jam and Tomato Ketchup preparation



A training on "Integrated Plant Nutrient Management (IPNM) in Kharif Crops"

two training programmes for Extension personnel on: i) "Integrated Pest Management (IPM) in Kharif Crops" on May 18, 2018 at Gurugram (21 ADOs participated); and ii) "Integrated Plant Nutrient Management (IPNM) in Kharif Crops" on May 31, 2018 at Gurugram (21 ADOs of Haryana Agriculture Department participated).

The Institute conducted a training on "Advances in Biological Control of Plant Diseases" under the Center of Advance Faculty Training (CAFT) in the Division of Plant Pathology from May 24 to June 13, 2018. Twenty five trainees from various ICAR institute, SAUs, KVKs and general universities participated in the training.

Workshop

The joint review workshop of IARI-VOs partnership outreach programme and National Extension programme was organized on May 19, 2018. The assessment of performance of the crops/technologies under demonstrations during Kharif, 2017 and coverage of Rabi 2017-18 were discussed under the

chairmanship of Dr. A.K. Singh, DDG (Agricultural Extension), ICAR and Director, IARI. Dr. J. P. Sharma, Joint Director, (Extension and Research), IARI provided the guidance to the partner organisations to decide the future course of action and strengthen the programme.

MISCELLANEOUS

External Funded New Projects Sanctioned

- "Induction of doubled haploids (DHs) in target species through microspore culture" funded by SERB, DST. Amount: ₹ 26.62 lakhs for three years. Principal Investigator: Dr. Kanwar Pal Singh, Principal Scientist, Division of Floriculture and Landscaping.
- "Identification of resistance source against prominent races and functional characterization of avirulence genes of *Xanthomonas campestris* pv. *campestris* causing black rot diseases of crucifer crops" funded by SERB, DST. Amount: ₹38.41 lakhs for three years. Principal

Investigator: Dr. Dinesh Singh, Principal Scientist, Division of Plant Pathology.

- "Phylogeny, classification and biogeography of the leafhopper subfamily *Deltoccephalinae* (Hemiptera: Cicadellidae) funded by SERB, DST. Amount: ₹31.49 lakhs for three years. Principal Investigator: Dr. Naresh M. Meshram, Scientist, Division of Entomology.
- "Functional analyses of pathogenicity genes of *Colletotrichum orbiculare* using RNAi for management of cucumber anthracnose" funded by SERB, DST. Amount: ₹37.97 lakhs for three years. Principal Investigator: Dr. V. Shanmugam, Sr. Scientist, Division of Plant Pathology.
- "Characterization, race profiling and genetic analysis of wheat powdery mildew pathogen (*Blumeria graminis* f.sp. *tritici* (DC) Speer (Syn. *Erysiphe graminis* DC f.sp. *tritici*) in India" funded by DBT. Amount: ₹ 56.358 lakhs for three years. Principal Investigators: Dr. P. Nallathambi, Principal Scientist, IARI Regional Station Wellington and Dr. Santosh Watpade, Scientist, IARI Regional Station, Shimla.
- "Agricultural productivity in climate change scenarios: impacts and adaptation pathways (A National Facility for Capacity Building on Simulation Modeling in Agriculture)"

- funded by DST-MRDP. Amount: ₹ 232.46 lakhs for three years. Principal Investigator: Dr. S. Naresh Kumar, Principal Scientist, CESCRA.
- “Efficacy evaluation of encapsulated fungal formulation for improving crop phosphorus nutrition” funded by DBT. Amount: ₹ 33.15 lakhs for three years. Principal Investigator: Dr. Geeta Singh, Principal Scientist, Division of Microbiology.
 - “Emmer wheat (*Triticum dicoccum*) improvement through mutation” funded by BRNS (DAE). Amount: ₹25.94 lakhs for three years. Principal Investigator: Dr. Vikas V.K., Scientist, IARI Regional Station, Wellington.
 - “Improvement in popular water-use efficient sharbati wheat varieties of central zone for terminal heat tolerance and lodging resistance through induced mutation” BRNS (DAE). Amount: ₹ 25.98 lakhs for three years. Principal Investigator: Dr. Jang Bahadur Singh, Senior Scientist, IARI Regional Station, Indore.
 - “DST-ICRISAT Centre of Excellence on Climate Change Research for Plant Protection (CoE-CCRPP) : Pest and Disease management for Climate Change Adaptation (Lead Centre: ICRISAT)” DST-ICRISAT. Amount: ₹ 44.9 lakhs for five years. Principal Investigator: Dr. Amrender Kumar, Principal Scientist, AKMU.
 - “Functional validation of polyamine biosynthesis genes for reproductive heat stress tolerance in rice” funded by CSIR. Amount: ₹ 29.16 lakhs for three years. Principal Investigator: Dr. Madan Pal Singh, Professor, Division of Plant Physiology.
 - “Studies on biological effect of Alpha irradiation in comparison with Gamma rays on pollen of some field crops” funded by BRNS, BARC. Amount: ₹ 29.48 lakhs for three years. Principal Investigator: Dr. P. Jayaprakash, Principal Scientist, IARI Regional Station, Wellington.
 - “National Knowledge Management Centre for Agricultural Education and Research” funded by ICAR-NAHEP. Amount: ₹ 164.16 lakhs for four years. Principal Investigator: Dr. Amrender Kumar, Principal Scientist, AKMU.
 - “Enhancing resource-use efficiency and farmer's income through conservation agriculture technologies in pulses under different rainfed cropping systems” funded by ICARDA South Asia & China Regional Program. Amount: USD 84530 for five years. Principal Investigator: Dr. Raj Singh, Principal Scientist, Division of Agronomy.
 - “Scaling breeding and agronomic management for increasing wheat productivity and adaptation to climate change causing rising temperature and water scarcity in South Asia” funded by Beutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Germany (Lead Centre-CIMMYT). Amount: Euro 36000 for three years. Principal Investigator: Dr. Rajbir Yadav, Principal Scientist, Division of Genetics.
 - “Scaling breeding and agronomic management for increasing wheat productivity and adaptation to climate change causing rising temperature and water scarcity in South Asia” funded by Beutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Germany (Lead Centre-CIMMYT). Amount: Euro 36000 for three years. Principal Investigator: Dr. S.V. Sai Prasad, Head, IARI Regional Station, Indore.

Patents Granted

- An improved neem larvicidal composition. Indian Patent No. 282129
- A slow or controlled release mosquito larvicidal composition and a process for preparation thereof. Indian Patent No. 282133
- Light, heat and water resistant neem meliacin concentrates and products with controlled release. Indian Patent No. 291334
- A novel formulation of the plant growth promoting

Rhizobacteria with enhanced shelf-life and the method of its preparation”. Indian Patent No. 2925244

- Super absorbents and the method(s) of obtaining the same. US patent No. 9833767
- Development of polymeric formulations of bioactive molecules and method of preparation thereof. Indian Patent No. 295150.
- Nano encapsulated hexaconazole: A novel fungicide and the process for making the same. Indian Patent No. 292080.
- Composition for early, profuse sporulation under Solid State, of the improvised isolate of *Trichoderma harzianum* and a process thereof.

Trademark Registered

- IP Spectra: IP Facilitation Centre for Agro based MSME's
- Logo of IP Spectra
- IP Spectra: IP Facilitation Centre for Agro based MSME's.

IP Care

'IP Care' advisory service under IP spectra has been established at IP Cell, ZTM&BPD Unit, IARI to provide free IP consultancy to start-ups, researchers and entrepreneurs on 2nd and 4th Friday of every month from 11 AM to 1 PM.

Technologies Commercialized

In this trimester, new Rice varieties PB 1718, PB 1728 and PB 1637 were licensed to eighteen (18), sixteen (16) and

four (04) industry partners, respectively; Five vegetable varieties, namely, brinjal-Pusa Uttam, tomato-Pusa Gaurav, chilli-Pusa Jwala, cauliflower-Pusa Sharad & sponge gourd-Pusa Sneha were licensed to one industry partner, and STFR Meter technology was licensed to one industry partner thus, generating a revenue of ₹ 39,50,000.

Arise Business Incubation Programme

Under IInd Arise Business Incubation Programme 'Arise, Launch pad for Agri Start-ups' for 2017-18, six (06) incubatees have been incubated at ZTM&BPD Unit, IARI as follows:

Name	Company name
Sai Krishna Dandamudi	Padmavati Agro Services
Saurav Khandelwal	SSR Agrotech
Jasveer Singh	Sense it Out Intelligent Solutions Pvt. Ltd
Sarang Nerkar	Innosapien Agro Technologies Pvt. Ltd.
Deepak Verma/ Ravi Shankar Sharma	Aginnovate Farm Pvt. Ltd.
Chitpal Singh	Himalayan-Maharani Promoters &

Corporate Membership

In this quarter, total 50 industry partners were registered through corporate memberships. Out of which 11 new members were enrolled and 39 existing members renewed their membership, generating a revenue of ₹ 46,500/-.

Hindi Workshop

A workshop on subject “Information Regarding Filling up the Performa of Quarterly Hindi Report Part 1 & 2 and Information about Official Language Policy & Rules” was organized on June 29, 2018 in CESCRA auditorium of the

Institute. Mr. Jai Prakash Narayan, Hindi Officer, National Physical Laboratory, was the guest speaker on this occasion. He delivered his lecture on the above subject and after that a practice session was also arranged to make the participants aware of all the technical parts to be taken care of while filling up the quarterly and annual report. He presented his lecture with the help of power point presentation. The workshop was attended by *Rajbhasha* nodal officers from different divisions.

Award

- The Institute was awarded First Prize for doing outstanding work in

implementation of *Rajbhasha* Hindi for the year 2017-18 under the NARAKAS (North Delhi) 'Utkrisht *Rajbhasha* Karyanwayan Puraskar Yojna' and Consolation Prize for *Rajbhasha Patrika Puraskar* to Institute's *Rajbhasha Patrika* 'Pusa Surbhi'.

International Yoga Day Celebration

IARI celebrated the fourth International Yoga Day on June 21, 2018 at PG Hostel Ground. A large number of participants including Dr. T. Mohapatra (Secretary, DARE and Director-



Fourth International Yoga day celebration at IARI

General, ICAR), Dr. A.K. Singh (Director, IARI), Dr. R.K. Jain (Dean, IARI), Dr. N.K. Singh (Project Director, NRCPB) and other senior officials from IARI & ICAR and students participated in the programme. About one hour yoga session was held under the guidance of professional yoga teachers.

The Institute's *Krishi Vigyan Kendra*, Shikohpur also celebrated the 4th International Yoga Day on June 21, 2018 at its campus in which all the staff practiced yoga in morning hours.

Visitors from Abroad

During the period April-June, 2018, five delegations – two from Nepal, and one each from Brazil, Russia and Denmark visited the Institute.



The Nepalese delegation interacting with IARI team

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