



*Winter School  
on*

**Innovative Approaches for Improvement of Perennial  
Horticultural Crops**

**(November 16 to December 06, 2018)**

*Sponsored by*



**INDIAN COUNCIL OF AGRICULTURAL RESEARCH  
NEW DELHI**

*Organized by*



**DIVISION OF FRUITS AND HORTICULTURAL TECHNOLOGY  
ICAR-INDIAN AGRICULTURAL RESEARCH INSTITUTE  
NEW DELHI-110 012**

**IMPORTANT DATES**

Last date of receipt of application	: September 05, 2018
Intimation of selection	: September 20, 2018
Confirmation of participation by candidates	: October 01, 2018

<http://www.iari.res.in>

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**Innovative Approaches for Improvement of Perennial Horticultural Crops**  
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The ICAR-Indian Agricultural Research Institute, New Delhi, invites applications from faculty and scientists of the Indian universities / Research institutions for a 3-week (21 days) training programme on “*Innovative Approaches for Improvement of Perennial Horticultural Crops*” sponsored by the Indian Council of Agricultural Research, New Delhi, scheduled from **November 16 to December 06, 2018**.

**OBJECTIVE**

The major objective of this training programme is to train young faculty and scientists on basic and strategic areas directly linked with improvement of perennial horticultural crops with particular reference to latest approaches in breeding methods and application of molecular tools. The exposure to innovative approaches for improvement of perennial horticultural crops will assist researchers to update their knowledge and skills about the advances taking place in the area of genetic improvement of perennial horticultural crops. Hands-on training will also be imparted in addition to lectures by eminent experts so that the participants could apply the same in their ongoing/ future research programmes.

**ABOUT THE ORGANISER**

Division of Fruits and Horticultural Technology has made significant contributions in the terms of development of improved varieties in mango, grape, papaya, guava *etc.* It has made major breakthroughs by developing globally famous mango varieties like Amrapali and Mallika. Five mango hybrids, namely, Pusa Arunima, Pusa Pratibha, Pusa Shreshth, Pusa Peetamber and Pusa Lalima having red peel colour and a selection (Pusa Surya) were developed and released during recent years. These mango hybrids are gaining popularity among the mango growers. In grape, four hybrids, namely, Pusa Urvashi, Pusa Navrang, Pusa Aditi and Pusa Trishar have been developed. The tenturier hybrid Pusa Navrang is commercially adopted in grape growing especially for juice making purpose. Number of papaya varieties have also been released by the division and two potential gynodioecious lines has also been identified. In citrus four new varieties, namely, Pusa Abhinav & Pusa Udit (acid lime) and Pusa Sharad & Pusa Round (sweet orange) were released. The

Division is also credited with the development of first guava rootstock, Pusa Srijan, which imparts dwarfness in the scion varieties and has tolerance to wilt. Mango, grape, guava and citrus germplasm have been characterized using diverse molecular marker systems. A SSR marker related to green fruit colour was also identified in mango. Two EST-SSRs have been identified having potential to ascertain hybridity in mango progeny. The transcriptome analysis of mango germplasm from diverse eco-geographical regions is underway. The annotation of transcripts has provided several indications which would be useful in ascertaining the genetics of horticultural traits. Recently, Division has been instrumental in successfully developing *in vitro* approaches in crop improvement for developing desired scion/ rootstock genotypes. The transcriptome analysis of mango germplasm from diverse eco-geographical regions is also underway. The annotation of transcripts has provided several indications which would be useful in ascertaining the genetics of several traits. Pre-selection criteria for predicting vigour in young rootstock plants in mango and citrus have been standardized on the basis of leaf stomatal index. The division is one of the main contributory partner for the whole genome sequencing of Amrapali mango. In the proposed training, these approaches will be discussed and demonstrated.

## ABOUT THE TRAINING

The proposed training will cover the important aspects like breeding priorities and strategies in perennial horticultural crops in India, plant genome analysis for identification of agriculturally important genes, molecular mapping for important traits in fruit crops; breeding for higher productivity, quality and other horticultural traits in fruits and perennial vegetable and flower crops, molecular breeding and marker assisted selection for crop improvement, advances in heterosis and plant breeding, innovative in plant breeding techniques in developing climate smart genotypes of horticultural crops, overview of functional genomics: its role in fruit crops improvement, biotechnology for a pesticide free fruit production, gene editing in important fruit crops, recent advances in canopy architectural engineering in fruit crops, bio-fortification in horticultural crops: genomics and genetic approaches *etc.* This training aims to introduce the participants to recent advances made in breeding approaches and varietal and rootstocks development, particularly in perennial horticultural crops. Further, there will be discussion on application of various emerging tools and techniques for genetic improvement. Apart from basics of crop improvement and molecular techniques, the participants will also be provided hands on training in conducting breeding exercises under field and laboratory conditions together with different phenotyping and genotyping techniques

## LOCATION AND WEATHER CONDITIONS

The ICAR-Indian Agricultural Research Institute, popularly known as 'Pusa Institute', is the country's premier institution for research and higher education in the field of agricultural sciences. Delhi is well connected through railways and roads with different parts of the country. It is located about 8 km west of New Delhi railway station, Old Delhi railway station, 25 km from Anand Vihar Railway station and 10 km from the Maharana Pratap Inter-State Bus Terminus (ISBT). The weather during training period is predicted to be moderately cool with temperatures ranging from 28<sup>0</sup> to 22<sup>0</sup>C (High) and 15<sup>0</sup>C to 9<sup>0</sup>C (Low)

## ELIGIBILITY OF PARTICIPANTS

M.Sc./Ph.D. degree in Horticulture with specialisation in Fruit Science/ Vegetable Science or Plant Breeding involved in breeding of perennial horticultural crops and working not below the rank of Scientist/ Assistant Professor and equivalent in Horticulture or relevant subjects of ICAR/ Central University /State University.

## TRAVEL, BOARDING AND LODGING

**HOW TO APPLY:** The participants should apply online (ICAR mandate) using CBP portal through or under the link; Capacity Building Programme at portal through <http://iasri.res.in/cbp> or under the link Capacity Building Programme at <http://icar.org.in>. After filling the online application, take a printout of the same and get it approved by the competent authority of the organization and upload the scanned copy of application through CBP portal on or before 05.09.2018. Selection of participants will be from complete online applications and the selected participants list will be uploaded/ displayed on the portal. However, he/ she may send an advance copy (*via* email) directly to the Course Director. The selected candidates will also be informed individually through e-mail.

**TA/DA & Accommodation:** The participants will be reimbursed **to and fro fare restricted to AC-II-Tier train ticket** or any State road transport Bus services as per the ICAR guidelines (**No air ticket will be entertained**). Participants should produce a Certificate that they have not availed TA/DA from their host organization (Head of the Department/ Institute). The training period will be considered 'On Duty' by the participant's parent institution. Participants are requested not to bring their spouse or any family members as there is no scope to make arrangement for their accommodation. Participants are requested to make his/ her own arrangement of transport to reach

the ICAR-IARI, Pusa Campus on their arrival. Free shared accommodation in the **Sindhu Guest House** of the institute and free boarding (food) will be provided to the candidates during the training duration. The local candidates are not eligible for boarding; however, they will be provided working lunch.

*Note: After the candidates have been intimated about their selection, they should immediately reply with a firm acceptance. Cancellation at the last moment for casual reasons after acceptance will be regarded as a serious breach of ethical conduct since it may deprive other candidates who could have availed the opportunity.*

### **CORRESPONDENCE SHOULD BE ADDRESSED TO**

Prof. S.K. Singh, Head and Principal Scientist  
Course Director  
Division of Fruits and Horticultural Technology,  
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**Detailed information is also available at:**  
<http://cbp.icar.gov.in/> and <http://www.iari.res.in>

### **FOR MORE INFORMATION, KINDLY CONTACT**

- 1 Dr Amit Kumar Goswami  
Course Coordinator  
Email: amit.tkg@gmail.com, Mobile No: 07428928799
- 2 Dr Jai Prakash  
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**Application for the Winter School on “Innovative Approaches for Improvement of Perennial Horticultural Crops”, November 16 to December 06, 2018**

1. Name of the applicant:.....
2. Sex : Male/ Female
3. Present Designation:.....
4. Date of Birth and Age:.....
5. Communication Address: .....

.....

Phone: Office:.....Residence:.....,Mobile:.....,  
Fax:..... E-mail:.....

6. Permanent Address:.....

7. Marital Status: Married/ Unmarried.

8. Educational Qualifications (from Graduation onwards):

Degree	Subject(s)	Year	Percentage of marks/ Division/ OGPA	University/ Institution
B.Sc.				
M.Sc.				
Ph.D.				

9. Employment Record

Position/ Designation	Pay Scale	From	To	Employer

Research Experience

- a) Area of research:.....
- b) Publications during last Five years (Please attach list)
- c) Indicate the future plans (One page) on utilizing the technical expertise gained from the training programme in your research (Attach a separate sheet)
- d) Indicate whether you have attended for Summer/ Winter School /Training programme earlier: .....

10. Relevance of the training to the applicant’s present academic and research activity:  
.....

11. Registration fee of Rs. 50/- (DD/ Postal Order No..... dated..... (in favour of the Director, ICAR-IARI, New Delhi) (Non-refundable).

Date:  
Place:

Signature of the Applicant

**CERTIFICATE**

It is certified that the information furnished by the candidate has been verified and found correct.

Recommendation of the Forwarding Authority.....

(Signature & Seal)