

ICAR Sponsored

**Winter School
On**

**Understanding Flowering Mechanism and Management of
Bearing in Sub-tropical Fruits**

01st to 21st December, 2017



**Course Director
Dr. Vishal Nath**

**Course Co-ordinators
Dr. Sanjay Kumar Singh
Dr. Alemwati Pongener
Dr. Alok Kumar Gupta**

Organized
By

**भा.कृ.अनु.प.-राष्ट्रीय लीची अनुसंधान केन्द्र
ICAR-NATIONAL RESEARCH CENTRE ON LITCHI
मुशहरी प्रक्षेत्र, मुजफ्फरपुर ८४२ ००२, बिहार
Mushahari Farm, Muzaffarpur - 842 002, Bihar**

Website: www.nrclitchi.org



Flowering is an amazing, integrated and complex process of multifactorial control. Due to its great importance in agriculture the subject has been studied extensively with respect to eco-physiology ranging to biophysics aspects. Alternate Bearing (AB) refers to an alternating cropping pattern that is internally regulated by the plant. This phenomenon is widespread in many perennial trees and shrubs, but is not universal. Perennial fruit crops initiate flower buds for next season's crop in the current season (guava), one year old physiological mature shoots (mango, litchi). The alternation of large and small crops is caused by competition between the current season's crop and the coming season's flower buds. Some theories were formulated to explain flowering, based on several researches carried out along decades, involving aspects on physiology, genetics (related to the sensibility of plants to climatic factors) and adaptation.

The goal of this Winter School is to identify the cultural, physiological, biochemical and genetic mechanism driving irregular bearing in sub tropical and tropical fruit trees and eventually minimize its effects through novel production approaches, adopting GAPs, managing intrinsic factors of flowering to achieve premium quality fruits with enhanced factor productivity of each arboreal branches of the tree canopy.

COURSE CONTENT

1. Source-sink relationship and physiology of flowering in mango, citrus, grapes, guava, litchi and other sub tropical fruits crops and managing its crop-load and bearing behaviour.
2. Nutritional and hormonal dynamics under abiotic stress for induction of flowering with regularity.
3. Managing alternate bearing tendencies in major tropical and sub tropical fruit trees through INM, IPM, canopy architecture management, rejuvenations and replanting.
4. Role and implications of application of floral inducers, growth inhibitors and retardants on bearing of the fruit trees.
5. Vital physiological and biochemical changes occurring during vegetative to floral phases
6. Quick and qualitative analysis for identifying the nutrient deficiencies under abiotic stress and managing plant nutrition in a changed climate implications.
7. Approaches for improving photosynthetic efficiency under abiotic stresses.
8. Controlling flowering by natural and artificial intervention (Mechanical or chemical) during growth phases.
9. Physico-chemical changes during post harvest flush emergence and at FBD stage.
10. Innovative approaches for estimation of various parameters on physiology and biochemistry using HPLC, GCMS, AAS, IRGA, UV-VIS spectrophotometers etc.

ABOUT THE VENUE AND LOCATION

The ICAR-National Research Centre on Litchi, Muzaffarpur is premier national institute for conducting research and developments on litchi and provide leadership at national level. It also acts as a national repository of information on litchi production, processing, value addition, and provides consultancy services to end users. The ICAR-National Research Centre on Litchi was established on 6th June, 2001 with a sprawling research farm of about 100 acres. The Centre has state of art laboratory facilities having equipments like GCMS, HPLC, AAS, UV-VIS spectrophotometer, Growth Chamber, leaf area meter, portable photosynthesis system, trinocular phase contrast microscope, inverted phase contrast microscope, stereo binocular microscope, lyophilizer, ultracentrifuge, modified atmospheric packaging unit, hydro-cooling system, forced-air cooling system, cool storage facilities etc. Currently, the Centre has 14 scientific, 3 technical, 10 administrative and 3 supporting staff.

ELIGIBILITY

Active researchers/ teachers not below the rank of Assistant Professor or equivalent from SAUs/ CUs/ DUs/ ICAR/ National Institutes/ SMS of KVKs, Govt. Department official involve in plant management having minimum two years of experience, in the disciplines of Agriculture/ Horticulture/ Plant Physiology/Plant Biochemistry/Botany/Life Sciences are eligible to apply. A total of 25 candidates will be selected for this course. The selection of the candidates will be made by a Screening Committee as per the available guidelines of the ICAR.

PROCEDURE FOR PARTICIPATION

Eligible and interested candidates may submit application form in prescribed proforma online through CBP vortal site (<http://iasri.res.in/cbp> or <http://cbp.icar.gov.in>). To create User ID use "Create New Account" link. After login, click on "Participate in Training" link and fill the proforma. Take a printout and send nomination duly forwarded by the competent authority in the prescribed format to Course Director, ICAR-National Research Centre on Litchi, Mushahari Farm, Muzaffarpur 842 002, Bihar. In case of any difficulty in applying online using CBP vortal, the participants may also send the application form duly filled-in and approved by the competent authority of the organization or through proper channel to Course Director on the address given in brochure. Brochure for application is available on the NRCL website (www.nrclitchi.org). The last date for receiving nomination is October 30th, 2017.

Maximum participation could be 25 in numbers. Advance copy may be sent by e-mail but final selection will be made only after receipt of hard copy forwarded by competent authority. The selection of the candidates will be informed by Telephone/ E-mail / Fax etc. latest by 8th November, 2017.

TRAVELLING ALLOWANCE

The candidates selected for participation in the training will be reimbursed travelling expenses as per their entitlement restricted to 2nd AC rail fare by the shortest route after submission of original tickets. No DA will be paid to the participants.

BOARDING AND LODGING

Participants will be provided free boarding and lodging as per ICAR norms and trainees will be accommodated in the ICAR-NRCL Guest House.

HOW TO REACH?

The Centre is situated at Mushahari on Muzaffarpur-Pusa Road at about 8 km from Muzaffarpur railway station. This is located at a distance of 85 km from Patna Jn. (90 km from Patna Airport and 200 km from Bodhgaya Airport) and 25 km from the historic place Vaishali.

Route I: From Muzaffarpur Railway Station → Company Baugh [or Motijheel Road → Kalyani Chowk] → Jail Chowk Bus stand → drive onto Muzaffarpur-Pusa Road → Rohua Patrol Pump (100 m ahead) NRC on Litchi - Mushahari Farm, Muzaffarpur.

Route II: From Patna by Bus → Get down at Ramdyalu Nagar → Aghoria Bazar Chowk → Mithanpura Chowk - come via Bela or Jail Chowk → Rohua Patrol Pump (100 m ahead) NRC on Litchi - Mushahari Farm, Muzaffarpur

PLACES OF TOURIST INTEREST

The city Muzaffarpur is famous for 'Shahi' litchi referred as 'Litchi Kingdom' is situated on the bank of *Burhi Gandak* river which flows from the Someshwar Hills of Himalayas. It exists from 18th century and named after Muzaffar Khan, a revenue officer during the British Raj.

Vaishali, one of the world's first democratic republics in the 6th century B.C. in the time of the Vajjis and the Lichchavis remains an important pilgrim center for both Buddhists and Jains, attracting also historians foraging for the past. Lord Buddha visited Vaishali frequently and at Kolhua, close by, preached his last sermon. To commemorate the event, Emperor Ashoka, in the third century B.C. erected one of his famous lion pillars here. Jainism, too, has its origins in Vaishali, for in 527 B.C., Lord Mahavir was born on the outskirts of the city, and lived in Vaishali. Places to see includes *Ashokan Pillar (The Lion Pillar)*, *Bawan Pokhar Temple*, *Budha Stupa-I & II*, *Abhiskek Pushkarn (Coronation tank)*, *Kundalpur (Birth place of Lord Mahavira)*, *Shanti Stupa* etc.

EVALUATION

The participants will evaluate the course programme for the quality of contents, suitability and usefulness to the target clientele through well-designed questionnaire. Likewise, the participants will also be subjected to an assessment.

IMPORTANT DATES

Last date for receipt of application: 30th October, 2017

Intimation of Selection of Candidates: 3rd November, 2017

Last date for confirmation from participants: 8th November, 2017

All correspondences may kindly be addressed to

Dr. Vishal Nath

Course Director or

Dr. Sanjay Kumar Singh

Course Co-ordinator

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