

Training course on

Application of molecular markers in crop breeding

Plant breeding is based around the identification and utilisation of genetic variation. The breeder makes decisions at several key points in the process. First in deciding on the most appropriate parents for use in crosses. Then the selection strategy is applied to identify the most desirable individuals amongst the progeny of the cross. The efficiency of the breeding and selection process can be assessed in many different ways including the ultimate success of the varieties released and the frequency with which new varieties are produced. A major cost and logistical issue in plant breeding are the actual number of lines that need to be carried through the evaluation and selection phases of a program. Large breeding programs for annual crops may carry hundreds of thousands of lines to produce a new variety only once every few years. Field trials can be expensive and evaluation of some traits, such as quality and yield stability can be expensive to assess. Molecular markers have proved to be a powerful tool in accelerating the breeding program and there are now many examples available to show the efficacy of such markers.

The use of molecular markers to track loci and genome regions in crop plants is now routinely applied in many breeding programs. The location of major loci is now known for many disease resistance genes, tolerances to abiotic stresses and quality traits. Improvements in marker screening techniques have also been important in facilitating the tracking of genes. For markers to be effective, they must be closely linked to the target locus and be able to detect polymorphisms in material likely to be used in a breeding program. The prime applications of markers in most breeding programs have been in backcross breeding where loci are tracked to eliminate specific genetic defects in elite germplasm, for the introgression of recessive traits and in the selection of lines with a genome make-up close to the recurrent parent. In progeny breeding, markers have proved valuable in building crucial parents and in enriching F1s from complex crosses. Markers have also improved the strategies for gene deployment and enhanced the understanding of the genetic control of complex traits such as components of quality and broad adaptation.

Gaining knowledge on molecular marker techniques and its use in plant breeding is need of the hour for every plant breeder. Hence, to impart knowledge in the younger plant breeders, this training programme is being organized.

Objective

This training programme will be useful in learning about various uses of molecular markers in plant breeding viz., Marker Assisted Selection, Marker Assisted Backcrossing, Marker Assisted Recurrent Selection, Phenotyping for Marker-Assisted Breeding, Genetic Mapping and QTL identification, Association mapping, Genomic selection, Genome-wide association studies (GWAS) etc. and will provide hands on experience to the trainees.

Theme

This course is designed for young plant breeders who wish to incorporate modern marker-based molecular approaches in their work. Areas covered include the following:

- 1.Genetic diversity and germplasm
- 2.Phenotypic and Genotypic markers
- 3.Selection of Markers and Marker Assisted Selection
- 4.Marker Assisted Backcrossing
- 5.Marker Assisted Recurrent Selection
- 6.Association mapping and Linkage
- 7.Genomic selection
- 8.Genome-wide association studies (GWAS)
- 9.Transgenics

About the training

The training will comprise lecture and practical sessions handled by experts from this University and also by invited experts from other Universities / Institutions.

Date and Venue

The training programme will be organised for 21 days from **22.11.2018 to 12.12.2018** at Centre for Plant Breeding and Genetics, Tamil Nadu Agricultural University, Coimbatore.

Accommodation and Travelling Allowance

Free boarding and lodging will be provided to the participants during the training period at the Tamil Nadu Agricultural University Campus, Coimbatore according to the budget provided by the ICAR. The expenditure on travel will be borne by the centre. Travel in the train (other than Shatabdi or Rajdhani) by AC II tier or AC III tier will be reimbursed to the concerned, subject to the proof of travel and availability of funds.

About TNAU

Participants reaching Coimbatore by road or by rail (Railway Station) can use the State Transport Buses (1A, 1B, 1C, 1D) plying to Vadavalli and get down at Botanical Garden, University gate. Alternatively, for information, they can make use of auto rickshaws/call taxis available at the outside of bus stand/ railway station. During November - December, the weather at Coimbatore will be slightly cool and pleasant.

Number of participants

The number of participants is restricted to 25.

Eligibility

Participants are invited from SAU's / ICAR Institutes. The candidate should possess M.Sc. (Ag.) /Ph.D. in Plant Breeding and Genetics / Genetics /Agricultural Botany with a minimum of two years of teaching or research experience. The age of the participants should not exceed 45 years.

How to apply

The participant should submit application in the prescribed format given below only online using CBP portal through <http://iasri.res.in/cbp> or at <http://icar.org.in>. Before the filling online application, Principle approval of competent authority may be obtained by the individual. After filling the online application, take a printout of the application and get it approved by the competent authority of the organization. Upload the scanned copy of application through CBP portal” **on or before 15.09.2018.**

**Application form for Participation in Training Course on
“Application of molecular markers in crop breeding”
(22 Nov 2018 to 12 Dec 2018)**

1. Full name (in block letters)
2. Designation & Pay scale
3. Present employer and address with Ph.No.& Email ID
4. Postal address to which reply should be sent (in block letters) (Give telegraphic/fax/Email addresses)
5. Permanent address
6. Date of birth
7. Sex: Male/Female
8. Teaching/Research/Professional experience (mention post held during last 5 years and number of publications)
9. Marital status (Married/Unmarried)
10. Mention if you have participated in any research seminar, summer, winter schools/ short courses etc. during the past five years under ICAR/other organizations.
11. Academic record

Exam passed	Main/ Subsidiary Subjects	Year of passing	University/ Institution
Bachelor's			
Master's			
Ph.D.			

Other certificates/diploma/degree etc.

Current field of Research:

Date:

Place:

Signature of the applicant

Recommendation of the forwarding Institute

Signature with designation
and address of the recommending authority

Certificate

It is certified that the information furnished has been verified with the office record and found correct.

Signature with designation

(Office seal)

Course Director	
Dr. K. Ganesamurthy	Director (i/c), E-mail: directorcpbg@tnau.ac.in Phone: 0422-6611215 Mobile : 09489056702 Fax: 0422-6611415
Course Co-ordinators	
Dr. A. John Joel	Professor (PBG), PG Education E-mail: jnjoel@gmail.com Phone: 0422-6611329 Mobile: 09486010754
Dr.T.Kalaimagal	Professor (PBG), Genetics Unit E-mail: kalaimagal.t@gmail.com Phone: 0422-6611329 Mobile: 09486231385
Dr. K.N. Ganesan	Professor (PBG), Genetics Unit E-mail: knganesan71@gmail.com Phone: 0422-6611329 Mobile: 09487019529
Centre for Plant Breeding and Genetics Tamil Nadu Agricultural University Coimbatore - 641 003 , Tamil Nadu	

Applications are to be uploaded to CBP vortal

All the other communications are to be made to the Course Director

E.Mail: directorcpbg@tnau.ac.in

**TAMIL NADU AGRICULTURAL
UNIVERSITY**



**ICAR – CAFT in GPB
Training on**

**Application of molecular markers
in crop breeding**

(22 Nov 2018 to 12 Dec 2018)

Circular & Application

**Centre of Advanced Faculty Training in
Genetics and Plant Breeding**

**Centre for Plant Breeding and Genetics
Tamil Nadu Agricultural University
Coimbatore – 641 003
TAMIL NADU**