21-days Training Course on New Crop Breeding Technologies
21 Nov to 11 Dec 2022
ICRISAT, Hyderabad, India

**Background:** Plant breeding has evolved from a visually-based selection of candidates from a population that have genetic variability for the targeted trait(s), through to the use of sophisticated tools to make data-driven and evidence-based selection decisions. The principles of quantitative genetics are used in plant breeding to select the candidates with the best genotypic value for a target population of environment (TPEs). Quantitative genetics principles have led to the design and refinement of breeding methods for continuous traits. In the recent years, several advances were made in the area of genomics, phenomics, speed breeding, multi-environment testing (MET) in the target environment, data analytics and management tools that have added further options to the crop breeder’s tool kit to accelerate cultivar development and improve operational- and cost-efficiencies. Integration of new tools requires the development of new breeding schemas, and use of the new tools in crop breeding and testing. This requires the engagement of interdisciplinary teams with scientific expertise in genomics, bioinformatics, genetics, statistics, physiology, entomology, agronomy, processing markets and consumer demand.

**Purpose:** To impart training on modern tools and techniques of crop breeding and testing to enhance rates of genetic gain in crop breeding programs and operational efficiency.

**Expected Output:** Trained researchers with enhanced knowledge and skills in the use of new crop breeding tools and techniques, including approaches to testing, generating good quality data, data management and selection decisions.

**Expected Outcome:** Enable crop breeders to adopt modern tools and techniques in crop breeding and testing programs to generate improved germplasm of seed crops.

**Course Duration and Venue:** 21-days International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Hyderabad, India.

**No of participants:** A total of 25 participants that include 10 nominees sponsored by ICAR; and 15 from other public and private institutes.

**Type of Training Materials Used:** The training course includes lectures, training materials (PDF and PowerPoint files), example data sets (Excel files) and Breeding View software plus training license for hands-on practical sessions, visit to facilities and laboratories and field experiments.

[www.icrisat.org](http://www.icrisat.org)  |  Email: Communications-ICHQ@cgiar.org
Course Content and/or Outline
- Modern crop breeding to enhance rate of genetic gain and operational efficiency
- Speed breeding - Rapid Generation Advancement, double haploidy.
- Quantitative genetics for crop breeding
- Breeding strategies for self and cross-pollinated crops, and crop specific breeding approaches
- Crop product profiles & Market Segments
- Target population of environments (TPEs) and multi-environment testing (MET)
- Genomics, marker assisted breeding, and genomic selection
- Gene editing for trait development – a new breeding technology
- Global crop genetic resources: Status, management, utilization, and global policies
- High throughput phenotyping for biotic and abiotic stresses, and quality testing of grain and plant residues
- Managed stress environments for drought tolerance
- Population dynamics of diseases and Insect pests: Implications on crop breeding approaches
- Biometrics for crop breeding - experimental designs and statistical analysis
- Optimizing crop breeding schema and genetic gain assessment
- Mechanization of crop breeding operations & seed processing.

Co-ordinators
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for training logistics and other details

Organized by
International Crops Research Institute for the Semi-Arid Tropics (ICRISAT).

Target Training Audience
Crop breeders engaged in development and testing of improved germplasm will benefit from the training program.