International Training on

Modern Millet Crop Improvement Technologies in Kenya

Empowering African millet breeders through advanced breeding technologies



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

under the aegis of
CGIAR CapSha Accelerator and Breeding for Tomorrow (B4T) Science Program

16 to 22 November 2026
Kenya

Introduction

Millets (*pearl millet, finger millet and small millets*) are climate-smart, nutrient-rich cereals that are uniquely adapted to dryland environments, making them essential for sustainable agriculture, food security, and improved nutrition in Africa and Southeast Asia. In Kenya, where nearly 80% of the land is classified as arid and semi-arid, recurrent droughts and climate change continue to threaten agricultural productivity. Developing high-yielding, climate-resilient, and nutrient-rich millet varieties through modern breeding technologies offers a sustainable pathway to combating malnutrition, enhancing livelihoods, and building resilient agrifood systems. Recent advances in millets crop improvement technologies, including high-throughput phenotyping, genomics, molecular breeding, and predictive breeding, are transforming breeding programs and significantly increasing their genetic gains. Integrating these modern approaches with conventional breeding enables breeders to develop improved cultivars more efficiently while addressing evolving production constraints.

About the course

This international training program is designed to strengthen the capacity of African plant breeders, geneticists, researchers, and early-career scientists working on **finger millet, pearl millet, and small millet crops.** Participants will gain practical knowledge and hands-on experience in modern breeding strategies, genomic tools, and breeding data management used in contemporary millet improvement programs. The course combines classroom lectures, laboratory practicals, field demonstrations, computational exercises, and interactive discussions delivered by **ICAR (Indian Council of Agricultural Research) and internationally recognized scientists from ICRISAT and partner institutions.** Participants will also have opportunities to exchange experiences, discuss breeding challenges, and develop collaborative strategies for strengthening millets improvement programs across Eastern Southern Africa (ESA) countries.

Objectives of the course

1. Strengthen capacity in modern millet breeding technologies
2. Develop practical skills in genomics, phenotyping, and speed breeding
3. Accelerate genetic gain through integrated breeding approaches
4. Enhance breeding for climate resilience, nutrition, and productivity
5. Promote collaboration among African millet breeding programs

The program is designed for:

- Plant breeders
- Geneticists
- Crop scientists

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ICAR
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Dryland Academy

- Researchers from National Agricultural Research and Extension Systems (NARES)
- State Agriculture University (SAU) faculty
- Early-career scientists
- PhD students
- Seed company professionals
- Non-government organisations
- CGIAR partners
- Development organisations involved in millet improvement

Duration of the course and location

Nov 16-22nd 2026 (5-7 days as per training need assessment)

Location: ICRISAT Office/Kiboko Research Station, Kenya

Expected Outcomes

Participants will be able to:

- Design efficient millet breeding strategies
- Apply modern phenotyping and breeding data analysis tools
- Integrate genomics and molecular breeding into crop improvement programs
- Improve breeding efficiency and accelerate genetic gain
- Develop climate-resilient, nutrition-sensitive, and market-oriented millet varieties
- Strengthen collaborative breeding networks across Africa

Approach of the training:

The course combines theory, hands-on practicals and field immersion to provide comprehensive training in modern millet breeding. Participants will receive practical training in germplasm evaluation, crossing techniques, precision phenotyping, speed breeding, genomics-assisted breeding, breeding informatics, and decision-support tools, complemented by field visits, laboratory demonstrations, and peer-to-peer knowledge exchange. The approach is designed to strengthen technical competencies while promoting innovation, collaboration, and application of advanced breeding technologies across African breeding programs.

Application:

Prospective applicants from Kenya, Tanzania, Uganda, Ethiopia, and Zimbabwe are eligible to apply for the course at the link given below.
Deadline to apply for the training course:
20 October 2026
https://forms.gle/9GM4HAjBrdz4nHqbA

Outlines of the course:

(Themes covered during the course)

- Germplasm characterization and utilization
- Crossing techniques and hybridization
- Selection methods (Pedigree, Bulk, SSD)
- Hybrid breeding
- Multi-environment testing
- MAS, QTL mapping, GWAS, GS
- Speed breeding
- High-throughput phenotyping
- Breeding data management
- Experimental designs and data analysis
- Seed production and quality assurance
- Variety registration and release

Training Materials

- Expert lectures
- Field demonstrations
- Group discussions and networking sessions
- Certificate of Completion

Coordinators

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