



INITIATIVE ON

Accelerated Breeding

Background

Many farmers face shifting climate, nutritional, market and natural resource challenges, but they are growing very old (>20-40 years) crop varieties, and therefore not benefiting from recent breeding efforts. To overcome this challenge, Accelerated Breeding aims to ensure CGIAR-NARES breeding networks deliver higher rates of genetic gain and improved variety adoption. A step-change in performance for needed complex traits can be delivered through quantitatively optimized and data-driven approaches, faster cycles, and greater focus on development of farmer- and consumer- preferred varieties adapted to distinct production environments, markets and end uses.

Objective

The initiative aims to increase CGIAR-NARES breeding strategies and capacity to deliver higher rates of genetic gain in the form of farmer-preferred varieties, and to decrease the average age of varieties in farmers' fields. In addition to adopting quantitatively optimized and data driven approaches, the initiative will also improve the approach to testing candidate variety performance by broadening it to be more representative of farmers' conditions and end-user preferences – hence, achieving higher genetic gains on farm. This will provide real-time adaptation to climate change, evolving markets and production systems.

Scope of the Accelerated Breeding Initiative

Through five interconnected Work Packages, Accelerated Breeding works to:

1. **Re-FOCUS** breeding teams and objectives to meet farmers' needs, in particular the needs of women, through achievable product profiles targeting prioritized regions and market segments.
2. **Re-ORGANIZE** breeding teams to drive efficiency gains through coordinated engagement of specialists and processes using a common organizational framework, stage gates, key performance indicators and handover criteria.
3. **TRANSFORM** CGIAR-NARES breeding networks to be more inclusive and impactful, with empowered national partners, along with customized capacity building, standardized key performance indicators, division of labor and resources across partners according to comparative advantage – all aligned with national priorities.
4. **DISCOVER** optimum traits and deployments through agile, demand-driven and effective trait discovery and deployment pipelines, and development of elite donor lines with novel and highly valuable traits.
5. **ACCELERATE** population improvement and variety identification through optimizing breeding pipelines (trailing, parent selection, cycle time, breeding resources, tools and services, etc.), assuring all programs deliver market-demanded varieties that deliver greater rates of genetic gain per dollar invested.

Accelerated Breeding Initiatives activities being implemented in Uganda

Activities currently being implemented in Uganda focus on CGIAR-NARES breeding networks for banana, common bean, cassava, groundnut, maize, millets, potato, rice, sorghum and sweet potato. The initiative builds on the efforts of CGIAR Excellence in Breeding (EiB) that worked to modernize breeding in line with Crop to End Hunger (CETH) funder requests. Accelerated Breeding activities include:

- Breeding program and breeding station infrastructural assessments that led to customized capacity development plans to support modernization of NARO breeding pipelines in addition to augmenting the role NARO plays in regional breeding networks in East Africa and beyond for a number of key crops including maize, beans, rice, cassava, groundnuts, sweet and Irish potato, sorghum, pearl millet networks.
- Support deployment and adoption of Breeding Data Management Systems by various NARO breeding pipelines that has enabled historical institutional data to be stored in a central database and for historical genetic gains to be calculated and published in an international peer reviewed journal.
- Support operational costing of NARO breeding programs that enables accurate budget development and service cost recovery.
- NARO's Namulonge and Serere stations were selected as 15 core hubs in Sub Saharan Africa to benefit from Crops to End Hunger (CtEH) investments in infrastructure and equipment.

CGIAR is a global research partnership for a food-secure future. Learn more at www.cgiar.org

We would like to thank all funders who support this research through their contributions to the CGIAR Trust Fund: www.cgiar.org/funders.



INITIATIVE ON

Accelerated Breeding

- Intensive training of NARO scientists via ‘Breeding Scheme Optimization and Quantitative Genetics’ course, along with follow-up from quantitative geneticists
- Ongoing, continuous support from Accelerated Breeding Initiative to support NARO pipelines to develop capacity and play a stronger regional role.

How Accelerated Breeding Initiative relates to other One CGIAR initiatives in Uganda

Accelerated Breeding works closely with other Genetic Innovation Initiatives, including:

- Market intelligence: breeding efforts are guided by behavioral intelligence on variety adoption and turnover.
- Seed Equal: ensures well-functioning seed and output markets to deliver improved varieties to customers.
- Gene Banks: makes novel, prioritized genetic diversity available to breeding programs, improving the development and delivery of specific traits.
- Breeding Resources: ensures CGIAR/NARES partners can deliver on Accelerated Breeding goals by improving access to shared services, tools and capacity development.

How Accelerated Breeding Initiative relates to other One CGIAR initiatives in Uganda

Initiative activities contribute to the NDP 3 and the agro-industrialization objective of increasing agricultural production and productivity in Uganda. Specifically:

- Agro-industrialization and private sector development: Development of market demanded crop varieties suitable for processing and export industry with full engagement of private sector players.
- Natural resources, environment, climate change, land and water management: Development of climate responsive and resilient crop varieties.
- Human capital development: Building capacity in breeding and associated disciplines and job creation.
- Nutrition and health: Development of biofortified crop varieties.
- Regional development: Promoting regional cooperation in variety development targeting regional market segmentation and regional product profiles.

- Innovation, technology development and transfer: Conducting state-of-the art scientific research on understanding and deploying prioritized traits for different crops for healthy and vibrant value chains.

How it envisages working with key stakeholders in Uganda

The initiative works with:

- Research or innovation partners to co-design and implement the Initiative’s work in Uganda. NARO and Universities are primary research partners.
- Scaling partners, to support the initiative’s efforts to promote adoption of its outputs by government and development partners. This includes NARO (Including NARO Holdings and Extension arm), MAAIF, private seed companies, District Local Governments, farmer cooperatives, NGOs and individual farmers. Other secondary scaling partners are value chain actors like processors, traders and seed companies.

To learn more

Michael Quinn, Initiative Lead, m.quinn@cgiar.org

Clare Mukankusi, Uganda focal point: c.mukankusi@cgiar.org

CGIAR is a global research partnership for a food-secure future. CGIAR science is dedicated to transforming food, land, and water systems in a climate crisis. Its research is carried out by 13 CGIAR Centers/Alliances in close collaboration with hundreds of partners, including national and regional research institutes, civil society organizations, academia, development organizations and the private sector. www.cgiar.org

We would like to thank all funders who support this research through their contributions to the CGIAR Trust Fund: www.cgiar.org/funders.

To learn more about this Initiative, please visit

on.cgiar.org/AcceleratedBreeding.

To learn more about this and other **Initiatives in the CGIAR Research**

Portfolio, please visit www.cgiar.org/cgiar-portfolio

CGIAR is a global research partnership for a food-secure future. Learn more at www.cgiar.org

We would like to thank all funders who support this research through their contributions to the CGIAR Trust Fund: www.cgiar.org/funders.