

CGIAR Breeding Resources Initiative

CGIAR has a powerful 50-year legacy of breeding new crops for developing countries struggling with food and climate insecurity. Breeding Resources Initiative (under CGIAR's Genetic Innovation Action Area) ensures CGIAR and national partners have the services, skills and technologies needed to improve crops faster, better, and with a higher return on investment.

Vision: what does success look like?

Our vision is that CGIAR and national crop breeding partners substantially improve breeding speed, accuracy and results. This will ensure a continual flow of nutritious, climate-resilient, user-demanded varieties used by smallholder farmers in Africa, Asia and Latin America. This transformation will be a direct result of institutionalizing modern breeding practices, technologies, and analytics offered as professionalized services. CGIAR/national agricultural research and extension services (NARES) will adopt and improve on advances that have revolutionized breeding into an efficient and effective data-driven enterprise in the private sector.

“ Bringing CGIAR's powerful 50-year legacy of breeding for food and climate security to the next level



Photo: CIMMYT/Peter Lowe

Our Challenge

Today CGIAR-NARES breeding networks face new, rapidly shifting challenges: programs must be modernized to proactively breed for changing climate conditions and market demands, in addition to yield and nutrition. However, when assessed by the rate of genetic gain or varietal replacement, CGIAR is not keeping pace with the complex and evolving needs for new varieties in the developing world.

Modern breeding leverages standardized operations producing large volumes of consistent genotype and phenotype data, short turnaround times for processing of that data, and top-notch decision support. However, a fragmented landscape of independently operating programs and Centers has meant uneven uptake among programs, crops and countries – and inefficient deployment of these solutions.

Piloting technological solutions are often one-off projects that lack sufficient investment in organizational competencies needed to adopt and maintain the technologies in developing country contexts. High costs, including maintenance and depreciation, require sustainable operations. Through targeting technologies and people, and via private-public partnerships, Breeding Resources has massive potential to scale services and innovations. This will enable Breeding Resources' main objective: increasing genetic gains in smallholder farmer fields.

Main activities

Breeding Resources centrally designs, coordinates and/or delivers crop-agnostic services – cutting duplication of infrastructural and personnel investments across CGIAR and NARES partners. We deliver results by:

Coordinating shared services and technologies

Breeding Resources develops cross-crop breeding support services to improve efficiency, speed and accuracy in:

- Farm mechanization and engineering, and the improved agronomic practices that go with them.
- Drone image phenotyping
- Lab services including genotyping, sequencing, nutritional testing
- Nurseries and trialing support services
- Data science and decision support
- Data management

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Facilitating capacity building and process improvement

For technologies to work, people must also be trained, and new processes and workflows implemented – all in the face of a constantly turning breeding cycle. Breeding Resources delivers services to help staff implement change:

- Capacity development delivered through a centrally coordinated unit, supporting (or sourcing) training, training materials, and curricula by experts
- Coaching in continuous improvement tools, techniques, and mindsets
- Support to apply formal process management methods to breeding SOPs and workflows
- Implementation of a quality management system for breeding operations

The people-focussed services build capacity, trust, empowerment, and institutional knowledge in local settings. This mix will achieve sustainable modernized breeding operations for One CGIAR.

Target outcomes

Investments in Breeding Resources Initiative mean in-demand crop varieties will be developed faster, more efficiently and with increased genetic gains, as a result of:

- Shared services cost reduction by 25% in a majority of target programs
- Ongoing breeding program improvement across at least 70% of targeted breeding programs
- At least 70% of targeted breeding programs make data-driven decisions using genomic, phenotypic and environmental data
- Increased capacity in 15+ national partner institutions
- Accuracy and consistency raised through standardized protocols, harmonized operations, quality management systems
- Establishment of performance monitoring system to track progress and hold teams accountable

Budget

Stable funding is needed to ensure technology is available and affordable for CGIAR / NARES. Initiative funding needs do not often align well with typical project funds, as we are developing shared services and enhancing capacities to be used by CGIAR in perpetuity.

Budget overview (As of April 2023. All USD)	Per year	Over three years
Budget needed	\$19,567,000	\$58,701,000
Funds obtained, 2023	10,656,468	
Funds sought, 2023	8,910,532	