

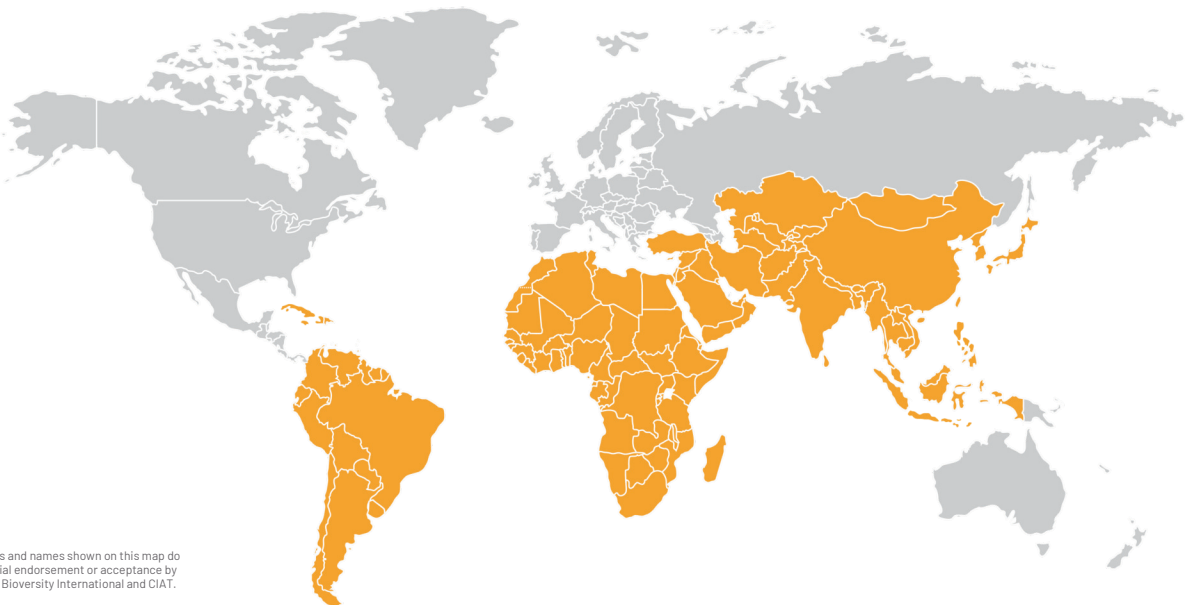
## Our Goal

The Anther Culture Laboratory of the Rice Program aims to produce homozygous lines from segregating lines by chromosomal doubling of haploid pollen and plant regeneration in an in-vitro cultivation cycle. This technique generates stable lines in a reduced time compared to conventional breeding methods.



## Who we work with

The laboratory provides its services to partners and NARES of the Rice Program in Latin America and the Caribbean, as well as in Asia and Africa.



The boundaries and names shown on this map do not imply official endorsement or acceptance by the Alliance of Bioversity International and CIAT.

## How we work

- 1 F1 Plant Generation:** We select parent lines of interest and perform controlled crosses to obtain F1 seeds, which are then sown in the field.
- 2 Anther Culture:** We extract anthers from F1 plants and culture them in vitro, where they undergo cell growth (callus formation) and subsequent differentiation.
- 3 In Vitro Seedling Generation:** Differentiated calluses develop leaves and roots, forming complete seedlings. These are acclimated in a greenhouse before being transplanted to the field.
- 4 Double Haploid Plant Selection:** During the reproductive stage, we conduct phenotypic evaluations to identify and select double haploid plants.

## The impact .....

- **Efficiency in breeding timelines:** The production of homozygous lines in a single in vitro cultivation cycle significantly reduces the time required compared to conventional methods, accelerating the development of new rice varieties.
- **Greater precision in genetic selection:** The generation of completely homozygous lines allows for a more accurate evaluation of desirable traits, facilitating the selection of materials with high agronomic potential and disease resistance.
- **Optimization of resources in breeding programs:** By reducing the number of generations needed to obtain stable lines, the use of space, inputs, and time is optimized, increasing efficiency in resource allocation.
- **Adaptation to the needs of the rice sector:** The rapid generation of improved lines enables a swift response to sector challenges such as climate change, disease resistance, and the demand for better-quality and higher-yielding varieties.

## Actions for innovation .....



**Optimization of in vitro culture protocols:** Adjustment of culture media and growth chamber conditions to enhance plant regeneration efficiency.



**Process automation and digitalization:** Development of databases and traceability systems for more precise recording and analysis of each stage of the process.



**Application of biotechnological tools:** Use of molecular markers to select effective F1 plants and identify target genes in double haploid plants.



**Interdisciplinary collaboration:** Integration with other areas of the Rice Program to share advancements and validate innovative methodologies.

## Our partners .....



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## Technologies .....



### Anther culture technique

This technique allows homozygous lines to be obtained quickly by regenerating rice plants from anthers, reducing breeding time.



### Embryo rescue

Recovers developing embryos from crosses with low viability, ensuring uniformity and genetic stability in regenerated plants.



### Molecular marker-assisted selection

Uses DNA markers to identify key traits such as resistance or grain quality, increasing precision and efficiency in line selection.

To know more about the program, visit us:



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