



Preserving Germplasm: Strategies and Accomplishments of the Consultative Group on International Agricultural Research

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DESCRIPTION

Germplasm is the living genetic material of plants and animals that can be used for breeding or research purposes. It includes seeds, cuttings, embryos, sperm, eggs, and other tissue samples that contain the genetic information of a species or a variety. Germplasm is essential for maintaining and enhancing the diversity of crops and livestock, which is the basis for food security and agricultural development. CGIAR (Consultative Group on International Agricultural Research) works with global partners to research ways to improve food and nutrition security, natural resources and ecosystem services, and reduce poverty. One of the key activities of CGIAR is to conserve and make available the genetic diversity of crops and trees for food and agriculture. This is done through the CGIAR GenBank Platform, which supports the operations of 11 genebanks and Germplasm Health Units (GHUs) across the world.

The CGIAR genebanks hold more than 750,000 accessions of over 3,000 crop and tree species, representing a unique global resource of plant genetic diversity. These collections include wild relatives, landraces, improved varieties, and breeding materials of major food crops such as rice, wheat, maize, cassava, potato, banana, beans, chickpea, lentil, sorghum, millet, barley, and forages. The genebanks also conserve important tree species such as coffee, cocoa, coconut, rubber, mango, citrus, apple, pear, peach, plum, apricot, cherry, almond, walnut, pistachio, olive, date palm, and many others.

The CGIAR genebanks follow high scientific standards of operation to ensure the long-term conservation and viability of the germplasm. They operate under strict scientific guidelines to monitor, test, germinate, multiply, characterize, clean, grow, store, and distribute germplasm. They also use advanced technologies such as genotyping, phenotyping, and Digital Sequence Information (DSI) to enrich the data and value of the collections. They ensure that the germplasm is free from pests and diseases through the GHUs, which provide phytosanitary protection and diagnostic services.

The CGIAR genebanks distribute germplasm to users in more than 100 countries worldwide every year, upon request and under the terms and conditions of the International Treaty on Plant Genetic Resources for Food and Agriculture. The users include farmers, researchers, breeders, educators, policymakers, and civil society organizations. The germplasm is used for various purposes such as crop improvement, diversification, food production, commerce, and agricultural development. The genebanks also facilitate the exchange of germplasm among CGIAR centers and national partners, as well as the repatriation and restoration of germplasm to countries of origin or diversity.

The CGIAR genebanks play a vital role in supporting breeding programs and enhancing crop resilience and adaptation to climate change. They provide access to a wide range of genetic diversity and specific traits that can help improve yield, quality, nutrition, pest and disease resistance, drought and heat tolerance, and other agronomic characteristics. They also collaborate with other CGIAR research programs and platforms to exploit the tools and data resulting from large-scale genotyping and phenotyping initiatives. They participate in trait discovery and allele mining projects to identify useful genes and alleles from the collections. They develop discovery-ready genetic resources that are pre-breeding materials with enhanced diversity and trait information.

The CGIAR genebanks also contribute to strengthening the global system for the conservation and use of plant genetic resources for food and agriculture. They uphold their legal commitments and participate in the development of international genetic resource agreements. They advocate for CGIAR and its country partners to play mutually beneficial roles in improving the global system's operation and breadth. They co-develop curricula and support consultations, training, and capacity strengthening for priority international efforts. They also raise awareness and advocate for the importance of germplasm conservation and use for food security and sustainable development. In summary, CGIAR plays a crucial role in germplasm conservation by safeguarding a unique global

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resource of crop and tree diversity; by making it available to users worldwide under an enabling policy environment; by supporting breeding programs and enhancing crop resilience

and adaptation to climate change; and by strengthening the global system for the conservation and use of plant genetic resources for food and agriculture.