

## PLANT GENETIC RESOURCES

Plant Genetic resources are a common heritage of mankind that provide a great deal of benefits such as food, fuel, clothing, medicines and housing.

To conserve these resources in adequate conditions, while maintaining their physical and genetic integrity is essential to the well being of future generations.

## LONG TERM CONSERVATION OF SEED GERMPLASM

Long term conservation at the Brazilian Agricultural Research Corporation EMBRAPA is developed by means of a Seed Base Genebank, created in 1976, aiming to guarantee for many decades, the survival of germplasm seeds of current and potential socio-economic interest, ensuring the maintenance of basic resources for food and agriculture.

## ENRICHMENT OF SEED GERMPLASM

The enhancement of the genetic variability available in the seed bank is performed by collecting, introducing and exchanging germplasm obtained from National and International Institutions, and from the Active Genebanks of the Brazilian Network of Genetic Resources (RENARGEN), coordinated by Embrapa.



## OPERATIONAL PROCEDURES

### Cleaning

After removing impurities, representative sub-samples of seeds are taken in order to determine the seed moisture content, viability and seed health conditions.

### Drying

To ensure conservation, seeds are dried to moisture content levels between 3 to 7%, depending on the species.

### Sample Size

The recommended quantity is about 1.500 to 2.000 seeds per sample, for long-term conservation purposes.

### Seed Viability Evaluation

Germination tests are performed before and during storage to ensure seed viability. The germination percentage has to be above 75% and, preferably, greater than 85% in order to guarantee the genetic integrity of the accessions.

### Seed Health Evaluation

The seed health tests are performed to evaluate the occurrence of diseases associated with seed-borne pathogens.

### Packaging and Storage

Dried seeds are packed in non-permeable laminated aluminum foil bags that are hermetically sealed. The bags are internally and externally identified with bar-code labels and stored in cold rooms at  $-20^{\circ}\text{C}$ , for long-term conservation.



Cold storage room ( $-20^{\circ}\text{C}$ )

### Monitoring Seed Viability

The control of seed viability during long-term conservation is performed by germination tests, carried out each 10 years, depending on the species and their viability.

If the germination test results indicate that a seed-sample has its viability reduced and/or the quantity of seeds in the sample is less than the minimum limit of 1.500 seeds, a sample of this germplasm has to be sent to its respective active genebank for regeneration and multiplication.

### Documentation

All the identification data and the activities related to the conservation process of each accession is documented in the collection database, that integrates the Brazilian Information System of Genetic Resources (SIBRARGEN), allowing direct identification of every accession and quick user's search.

### Results

The seed Genebank currently contains around 100.000 seed samples of approximately 690 botanic species of native and exotic cereal,

legume, forage, oilseed, horticultural, medicinal, forest and fiber plants, all of agricultural and environmental interest.

This collection represents an important reservoir of national and international genetic diversity. It encompasses and preserves the maximum possible of important gene pools, for future use in breeding programs and biotechnological innovation, contributing to the sustainability and security of the Brazilian agriculture.



Aluminum foil bags

Main collections conserved (1976 to 2006)

COLLECTIONS	GENUS	NUMBER OF SAMPLES
Tomato	Lycopersicon	1.304
Sunflower	Helianthus	1.352
Sesame	Sesamum	1.546
Pea	Pisum	1.569
Cucumber	Cucurbita	1.736
Cotton	Gossypium	2.836
Sorghum	Sorghum	3.603
Maize	Zea	3.961
Wheat	Triticum	5.640
Cowpea	Vigna	5.936
Soy Bean	Glycine	7.489
Rice	Oryza	9.846
Common Bean	Phaseolus	13.302
Barley*	Hordeum	29.233

\* Part of the International Barley Collection

Embrapa Recursos Genéticos e Biotecnologia  
 Empresa Brasileira de Pesquisa Agropecuária  
 Ministério da Agricultura, Pecuária e Abastecimento  
 Parque Estação Biológica Final W/5 Norte  
 Fone: (61) 3448-4770, 3448-4769 Fax: 3340-3666  
 Brasília, DF

[www.cenargen.embrapa.br](http://www.cenargen.embrapa.br)  
[sac@cenargen.embrapa.br](mailto:sac@cenargen.embrapa.br)

# LONG TERM SEED CONSERVATION AT EMBRAPA

## BASE COLLECTION SECURITY AND SUSTAINABILITY OF THE BRAZILIAN AGRICULTURE



Criação e Arte: Raul César Tiragem: 2000 - exemplares