

Embrapa Genetic Resources and Biotechnology, was created on November 22, 1974, with the aim of preserving the genetic resources for utilization in Brazilian agriculture. In the 1980's research on biological control and on biotechnology were also incorporated in its activities.

The Center currently acts decisively for the development of a sustainable and environmentally balanced agriculture, developing activities in strategic areas for the country.

The research team is organized in four thematic groups, comprising Genetic Resources, Biological Security, Biotechnology and Biological Control. Besides a well equipped library, research is supported by a Capacity Building program, a Technology Transfer and a Business Division.

Genetic Resources

Goals: To preserve the biodiversity, maintaining genetic variability of plants, animals and microorganisms for use in agricultural research.

► Exchange and Collection of Genetic Resources

Nowadays, priority is given to the collection of materials at high risk of extinction from areas of intense human activity, such as the agriculture frontiers and areas destined for the construction of hydroelectric power plants and roads. Exchange of materials is made with national and international Institutions. More than 200,000 samples have already been introduced from abroad, during the last thirty years.

► Conservation and use of genetic resources

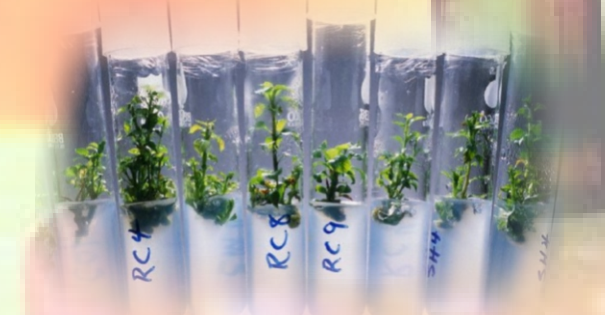
Plants: Seeds of plant species are preserved in cold chambers, allowing storage for more than 100 years. More than 96,000 samples comprising more than 400 species are currently stored.

Animals: In addition to 54,000 samples of semen from several domesticated and wild animal species facing extinction, embryos, tissue samples and DNA are being preserved. There are also projects dealing with *in situ* conservation.

Microorganisms: There are about 3,000 samples of microorganisms fungi, viruses and bacteria for use in the biological control of pests and plant diseases, and as vectors for genetic transformation of important crops. The collection also includes more than 300 samples of edible mushrooms, including those with pharmacological properties.

► **Brazilian Genetic Resources Network - Renargen:** Comprises 180 germplasm banks holding 250,000 samples, distributed all over Brazil.

► **Brazilian Genetic-Resources Information System - Sibrargen:** Database created to organize the information on Brazilian Genetic Resources that can be accessed through Internet.



Biological Security

Goals: To minimize the risks of introduction and establishment of harmful exotic pests to plant species and perform post-introduction quarantine of plant materials introduced into the country, for agricultural research.

► **Post-introduction quarantine:** More than 425,000 samples of plant species have already been analyzed by the Center and, along the years, several exotic pests of highly important crops for Brazilian agribusiness have been detected and intercepted.

► **Plant Health Network - Sanivege:** Develops technologies and identifies risks and threats that endanger food production, in order to assure the quality of exports and imports of Brazilian agribusiness products. More than 2,000 pests that could compromise the trade of fruits, palms and ornamentals have already been identified.

Biotechnology

Goals: To study and explore the genetic potential of native biodiversity and adapted breeds, and to incorporate technological innovations based on molecular and cellular biology supported by bioinformatics.

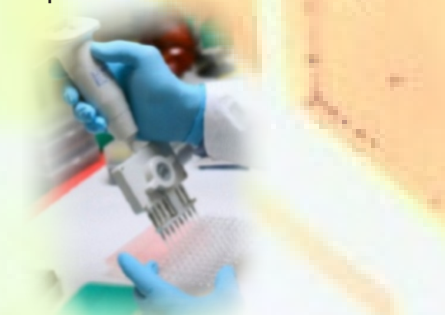
Plant Biotechnology:

► Genomic analyses of banana, rice and *Eucalyptus*, among others; identification of novel genes and molecules; proteomic analysis; development of transgenic plants. The sequencing of the coffee genome and the production of genetically engineered virus-resistant plants of common beans, potato and papaya, are some results already obtained. Several other projects of great socio-economic and environmental impact are currently ongoing.

► Development of methodologies and equipments such as the bioreactor system for large scale production of seedlings, among others.

Animal Biotechnology:

► Development of technologies associated with animal reproduction. The first bovine obtained by embryo splitting, the first zebu bovine produced by embryo transfer, the first bovine clone in Latin America, a clone of a dead animal and the clone of a clone, are some accomplishments of the animal



research group.

► Gene identification, genomic analysis, sexing and embryo splitting, transgenic development. The Center also takes part in the international bovine genome project.

Biological control

Goals: research development to accomplish the biological control of pests, diseases and weeds.

► Microorganisms and insects that can be used as biological control agents have been identified and the research group aims to develop products and technologies that allow the increased usage of these agents in production systems

► Research is also being conducted with semiochemicals (insect-odor) and insect-sounds aiming at pest control and management of beneficial-insects behavior.

► The bioinsecticide *Sphaerus SC* used to control the malaria and the urban mosquitoes, and the bioinsecticide *Bt Horus*, that acts against the "borrachudo" and "dengue" mosquitoes, are achievements of the group. Both products were developed in partnership with the private sector.



Library

The library contains around 23.000 items, comprising books, theses, dissertations, scientific journals, videos, CD-ROMs, softwares, electronic publications and technical magazines. It cooperates with several institutions and offers lending services, bibliographic research, publication standardization, document delivery service, among others.

Access: <http://www.cenargen.embrapa.br/biblioteca/biblioteca.htm>

Capacity Building Program

► An important contribution of the Embrapa Genetic Resources and Biotechnology to society is the training and capacity building program of human resources. Annually, around 200 undergraduate students take part in training programs at the Center and 30 to 40 graduate students perform their research activities in the laboratories.



► The Center is also involved in teaching, offering extension and specialization courses in its main areas of expertise, comprising around 500 students annually.

Technology Transfer and Business

► The Center has 14 protected technologies in Brazil and abroad, which are available to be transferred and licensed. By means of research contracts, a currently available reservoir of knowledge is ready to be transformed into new products and technologies. In partnership with the private sector, several products have been developed or are currently under development.

► In partnership with other Institutions, the center is currently working in a program whereby the technologies developed by Embrapa are licensed to start-up companies.

Embrapa Genetic Resources and Biotechnology

*"Preserving the past
anticipating the future"*



Brazilian Agricultural Research Corporation
National Research Center for Genetic Resources and Biotechnology
Ministry of Agriculture, Livestock and Supply
Parque Estação Biológica - Final W5 norte
phones: (61) 448-4772, 448-4768 Fax: 340-3672
Brasília, DF
Brazil

sac@cenargen.embrapa.br
www.cenargen.embrapa.br



Ministério da Agricultura,
Pecuária e Abastecimento



Tiragem: 5000 exemplares



Brasília-DF
2005