Ministerie van Economische Zaken,
Landbouw en Innovatie

SAFEGUARDING COCOA GENEBANKS IN TRINIDAD

The threat of genetic erosion is alleviated by the propagation of genotypes and the upgrading of facilities at The International Cocoa Genebank in Trinidad.

The International Cocoa Genebank in Trinidad (ICGT) is the largest and most genetically diverse collection of cocoa germplasm that is in the public domaine. It holds over 2000 different accessions that are freely available to the global cocoa research community.

A GERMPLASM is a collection of genetic resources for an organism. For plants, the germplasm may be stored as a seed collection or, for trees, in a nursery.

The ICGT faced a serious risk of genetic erosion through loss of plants from the collection particularly through drought and fire. Irrigation and security were also an issue. Material from a second existing collection (Marper Farm) needed to be established in the main collection before it was lost to disease and old age.

Cocoa germplasm, the "raw material" for plant breeding, is a vital resource in the improvement and sustainability of cocoa production. Access to a genetically diverse range of germplasm is essential for plant breeders to select material with disease resistance and good agronomic and quality characteristics.

For many crop plants, germplasm can be stored in the form of dried seeds but this is not possible with cocoa since its seeds normally germinate as soon as they are removed from the pod and they do not survive the drying/freezing process. Therefore, cocoa germplasm is maintained as living trees in field genebanks. A living tree collection has the advantages that the plants can be evaluated for their characteristics and potential, and budwood, seed or pollen can be readily supplied. However field genebanks are costly to maintain and are at risk from plant loss due to environmental, pest/disease and human causes. The risk of loss can be reduced by establishing plants derived from rooted cuttings. Plants established through grafting or budding are more prone to problems of clone mis-identification due to the possibility of outgrowth of the rootstock material.

Researchers, nursery managers, breeders, farmers, genebank managers, traders and manufacturers can all benefit from the project. The project has provided the following results:

- It has insured the conservation of, and access to, a wide diversity of germplasm, including unimproved types and materials which have been developed as sources of resistance to important cocoa diseases. Varieties developed from this germplasm will be capable of

producing high yields with minimal inputs even when under pressure from pests and diseases. These can be used freely by the cocoa research community.

- A total of 405 clones of 248 different varieties have been established.
- Greater understanding of propagation techniques has been gained, particularly with respect to the rooting of cuttings. A new propagation facility at the University of West Indies has enabled this.

Survival rates were improved by extending periods in the propagation bins, encouraging parent trees to produce vigorous new growth by heavy pruning, irrigation, and the application of fertilizer and a systemic insecticide.

- An irrigation system has been established and proved successful through the worst drought since the 1960s. This success has encouraged others, including the MFPLMA[1] and local farmers, to consider similar systems to protect their plantings. In addition the security of the premises has been improved.
- Overall the project will help Cacao Net's Global Strategy for Cocoa Conservation.

Information can be accessed through:

- Annual Reports of the Cocoa Research Unit.(www.sta.uwi.edu/cru/cra.asp)
- The website of the Cocoa Research Unit (www.uwi.edu/cru/cruProjects.asp).
- International conference Proceedings of the 16th International Cocoa Research Conference
- Training programmes on germplasm management are being organized.
- Direct contact to Professor P. Umaharan

The material in the ICGT has been placed in the public domain by the FAO Trust fund. It is available upon request from members of the cocoa research community and other *bona fide* users. Material is supplied using a Standard Material Transfer Agreement. Appropriate arrangements for intermediate quarantine are made to ensure the safe movement of germplasm. (For example, through the International Cocoa Quarantine Centre, Reading (www.icgd.reading.ac.uk/quarantine.php)

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