A.5231 Alliance Circulation:

Cocoa Research Sub-Committee

Preliminary Report

Assessments on the distribution and abundance of Cocoa *Theobroma cacao* (L.) in Guyana, with the view for research development and utilization

During August and September 1996 productive investigations were undertaken in Guyana and Trinidad in order to develop the ongoing interests for the conservation and documentation of cocoa diversity. These studies expand upon investigations undertaken during July-October 1995 (Watkins *et al* 1996). The initial objectives of this study were;

- to continue the strengthening of institutional links between the UK and Guyanese authorities for cocoa research;
- to discuss with the Ministry of Agriculture specifics concerning the exportation of cocoa material for genetic research at the University of Reading;
- to facilitate the training of Guyanese personnel in the curation of cocoa at the IICA Cocoa Germplasm Bank at Timehri;
- to document in further detail the cocoa collections at Timehri, including the permanent tagging of trees, production of a photographic library and the collection of leaf material for genetic finger printing analysis.
- to, where possible, collect leaf material from localities surrounding Georgetown including Kurupukari and Canal no.1.

Background

Watkins *et al* (1996) undertook assessments on the current distribution and abundance of cocoa in Guyana, and identified 23 localities where cocoa was currently grown. Cocoa at these localities were identified as being from mixed origins, with wild, old Dutch, and abandoned commercial plantations, and scattered cultivated cocoa along the coastal margins of Guyana. Watkins *et al* (1996) also re-documented an

IICA/Ministry of Agriculture cocoa genebank at the Central Horticultural Research Station at Timehri.

The history of cocoa in Guyana is poorly documented, but through those studies undertaken by Watkins *et al* (1996), and further investigations this year, a better picture of the origins of Guyanese cocoa can be generated. Currently cocoa in Guyana is only grown on a small localized basis, with farmers typically growing less 3,000 trees, and selling the cocoa beans in local markets. *Full details in the final report.*

Summary of activities

- Production of an EU INCO research proposal for the conservation and management of native crop species for improved production.

- Collection of cocoa leaf material from key coastal localities for preliminary genetic analysis.

- Further documentation and permanent tagging of the cocoa trees held at the Horticultural Station, Timehri.

- Discussions with relevant authorities in Guyana and Trinidad for the development of cocoa research.

After the study equipment and funds were donated to the National Agricultural Research Institution (NARI), to assist in the strengthening of cocoa research in Guyana.

Meetings and correspondence were made with relevant authorities in Guyana to discuss cocoa research, this included the Guyana Forestry Commission (GFC), and the EU Delegation. Both parties expressed significant interest in the research activities. The GFC particularly welcomed the INCO initiative, and wished to emphasize the importance of training workshops for the application of genetic finger-printing techniques to other disciplines, such as agroforestry.

Several institutions expressed concern over the export of genetic material which may be of commercial value. While the export of material for academic research may be warranted (although there is currently no legislation in place to control the movement of such material), the export of material with potential commercial value must be

strictly controlled. Currently permission to export material is granted by the *Ministry of Agriculture* after approval from the *Office of the President.*

Collection of cocoa material

A total of 46 leaf samples (collected in duplicate), were collected from representative cocoa collections from the coastal margins of Guyana. This included leaf samples from 31 trees of the 41 cocoa trees housed at the Central Horticultural Station at Timehri. The remaining 10 trees could not be sampled due to the overgrown and waterlogged nature of the collection. All sampled trees at Timehri were permanently tagged.

Specimen numbers

The following cocoa leaf material was collected between the 19th and 30th August '96.

T0321 to T0352	Timehri genebank collection (31 specimens)
P001 to P005	Canal no. 1, Demerara River (five specimens)
E001 to E010	Present Hope Farm, nr. Parika, Essequibo River (10 specimens)

Material collected was of no commercial value, and was collected for preliminary scientific research only. The material is currently housed at the School of Plant Sciences at the University of Reading, awaiting genetic analysis using microsatelite technology. The results from the analysis will form the basis for further detailed investigations into the genetic diversity and conservation of cocoa in Guyana.

The final report will include a detailed description of the trees sampled, accompanied with a photographic record of each sample, and a summary of the genetic analysis for future reference and development of the project. These studies form the basis for further detailed investigations, but will allow for positive identification of cocoa clones currently housed in Guyana, since records and tree tags have since been lost.

EU INCO proposal for germplasm management and conservation

A significant proportion of the time spent in Trinidad and Guyana involved the co-ordination and completion of an EU INCO-DC research proposal for investigations into germplasm management and conservation of native crop species for improved production. The native crop species being cocoa, pineapple and papaya. The proposal involves the close collaboration between three EU and two DC partners and is being

co-ordinated by the *Faculty of Natural Sciences & Agriculture, University of the West Indies*. The proposed project involves *in-situ, ex-situ* and *in-vitro* conservation techniques for the documentation, conservation and characterization of three important native species. The objectives of the INCO proposal being;

1. to facilitate the collection, curation and characterization of germplasm material for *ex-situ* and *in-vitro* conservation of native perennial crop species in Guyana and Trinidad & Tobago, with the establishment of national genebanks supported by training and technological initiatives;

2. to undertake detailed analysis of the genotypic variation in three native perennial crop species, specifically with respect to the application of new molecular techniques for germplasm characterization;

3. to investigate current diversity of native crops in farming systems in Guyana, the importance of this diversity, and the practices of utilization and maintenance of the diversity by farmers. Different farming systems analysis techniques will be used to study the potential *in-situ* conservation of perennial crop species;

4. provide technical support and guidelines for breeders and smallholders in the development of improved native crop production;

5. to facilitate the transfer of native crop genetic material to international genebanks, and strengthening regional capacity in native crop production research.

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