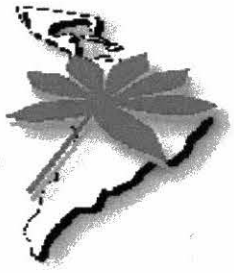
CLAYUCA

Consorcio Latinoamericano y del Caribe de Apoyo a la Investigación y al Desarrollo de la Yuca



SUMMARY ANNUAL REPORT 2002

CIAT

Centro Internacional de Agricultura Tropical
International Center for Tropical Agriculture

PROJECT : LATINOAMERICAN AND CARIBBEAN CONSORTIUM TO SUPPORT CASSAVA RESEARCH AND DEVELOPMENT - CLAYUCA

Inputs:

Investigators:

Name	Discipline	Time Dedication %
Bernardo Ospina	Cassava Postharvest Management Rural Development	100
Luis Fernando Cadavid	Soil Fertility Crop Management	100
Lisímaco Alonso	Post harvest Management Rural Development	100
Jorge Luis Gil	Animal Nutrition	100
Amalia F. Jaramillo	Administrative Management	100
Nidia Betancourth	Communication Specialist	100
Two field workers	Technical	100
Andrea García	Secretary	100

Cooperators:

Within CIAT: Genetic Resources, Cassava Improvement, IPM and Agroindustrial Enterprises.

Outside CIAT: Public ands private sector institutions and agencies, Universities, NGOs and farmer groups from Colombia, Venezuela, Ecuador, Cuba, Haiti, Paraguay, Bolivia, Mexico and Peru.

Budget
(Income during 2002)

Item	Description/Source	Value (US$)
CIAT contribution	Executive Director Position (Seconded to CLAYUCA)	75,400
Subtotal CIAT contribution		**75,400**
Annual quota from country members	Mexico	15,000
	Peru	15,000
	Venezuela	15,000
	Ecuador	1,500
	Colombia (13% of funds given to CIAT)	28,320
Subtotal Annual quota from country members		**74,820**
Colombian quota	Annual membership payment of stakeholders (public and private)	28,488
Subtotal Colombian quota		**28,488**
Special projects income (2002) (Colombia)	1.Dextrines (1)	26,220
	2.Production systems of sweet potato and Cassava	14,774
	3.Training Master Plan-Colombia	65,588
	4.Minimum Tillage	31,794
	5.Cassava Leaves	7,381
	6. Production systems of cassava mechanization of the working of sowing, fertilization and harvests	15,469
	7.Croquetes dry process	16,667
	8.Dextrines (2)	23,667
	9.Training Master Plan-Putumayo	13,483
	10.Vanilla planting material Hardening off-Putumayo	126,000
Subtotal Special projects income (2002) (Colombia)		**341,043**
Special projects income (2002) (International donor)	Regional Cassava-based project (Colombia, Venezuela, Haiti) Approved by Common Fund for Commodities – CFC	475,000 (for two years)
Subtotal Special projects income (2002)		**439,000**
	Carry over 2001	**66,369**
	Total	**1,025,120**

RESEARCH HIGHLIGHTS 2002

`Output 1: Technology development, adaptation and dissemination activities aimed at developing sustainable, efficient and competitive production and processing systems

Activities:

1.1 Development and adaptation and dissemination of technology package for processing of cassava flour for use in animal feeding

Results:

- Three regions in Colombia (Cordoba, Cesar and Putumayo), through processes led by CLAYUCA stakeholders, are implementing agro industrial, cassava-based projects that include the installation of cassava flour processing plants based on the technology developed by CLAYUCA. The private firm selling the processing plant is also a member of CLAYUCA
- Several other regions in Colombia are launching similar agroindustrial, cassava-based projects
- CLAYUCA is consolidating its role as a technology information and technical advice resource that is helping stakeholders to make sound decisions in relation to investment in processing infrastructure

1.2 Adaptation and dissemination of technology package for mechanized planting and harvesting of cassava

Results:

- Technological package adapted by CLAYUCA is now used in two cassava growing regions in Colombia, under commercial scale operations (Atlantico and Casanare)
- CLAYUCA's equipment for mechanized planting has been used by stakeholders in various regions of Colombia, under rental schemes
- Cost-reduction in production costs of around 20% has been confirmed under commercial scale operations, through the mechanization practices for planting and harvesting
- Trials have been initiated to incorporate mechanized fertilization in the same operation with planting, with the aim of further reducing production costs

1.3 Adaptation and dissemination of technology for mechanized harvesting of cassava leaves

Results:

- Very little activities were conducted this year with the mechanical cassava foliage harvester
- Some activities were realized with hand-operated mechanical harvester as an intermediate step towards mechanization of the harvest process in systems for intensive cassava foliage production.

1.4 Development, adaptation and dissemination of technology package for producing a refined cassava flour through a dry process, which can be used as the starting point for the production of glue for industrial uses and starch for human consumption

Results:

- Development of the technology package is almost completed with successful results
- Two-thesis works are near conclusion on the topics of: 1. The use of cassava flour for the production of glue for industrial uses and 2. The abstention of a highly refined cassava flour for use in human consumption
- Two industries identified as potential market and end users for both products were contacted and agreed to conduct trials under commercial scale operations, to use the glue in the production of plywood and the refined flour in the production of human foods
- A trial will be initiated in the short future with a bakery products industry to look at the feasibility of using the refined cassava flour to produce bakery products

1.5 Installation, operation and adaptation of equipment for rapider, massive multiplication of cassava planting material, based on the Temporary Inmersion System

Results:

- Equipment has been used by CLAYUCA stakeholder (biotechnology private firm). His contribution to the adaptation phase has been very important and has allowed the solution to the contamination problem detected during the initial trials
- Discussions are underway to install the equipment at CIAT, as part of the scientific park. Potential importance of this movement of the SIT system to CIAT could be a) the possibility of decentralizing the production of in-vitro genetic material that is being sent to different countries and b) the possibility of producing massive amounts of indexed planting material of excellent quality, to be planted in CIAT's fields. This could be an important strategy considering the current levels of contamination by frog-skiing disease that are appearing in cassava planting material at CIAT

1.6 Development, adaptation and dissemination of methods for hardening and handling cassava in-vitro plants that have been produced massively through biotechnology methods such us the Temporary Inmersion System. A safe, simple process has been developed that allows the development of healthy plants to be transplanted into the fields

Results:

- Methodology fully developed
- Near 70,000 cassava plants were hardened off and transplanted to commercial plots
- Average yields obtained in these plots was 54 ton per ha, in a 3,5 has cassava plot
- Technical assistance and coaching was given to a stakeholder private firm that was having problems with the hardening off phase of in-vitro produced plants. Rate of survival was drastically increased.
- Methodology of hardening off has been used successfully with in-vitro sweet potato plants
- Methodology being tested in hardening off of vanilla plants brought to CIAT as part of a Scientific Park new project
- Methodology was presented to participants in a workshop organized by CIAT on rapid propagation methods for planting material

Output 2: Increased membership and consolidation of CLAYUCA as a regional planning and coordination mechanism to support cassava research and development activities in Latin America and the Caribbean region

Activities:

2.1 Follow up visits and coordination of activities with member countries and private and public sector stakeholders in each member country

Results:

- Membership of CLAYUCA in Colombia has increased. Some members went away but new ones kept coming
- Ministry of Science and Technology (M C y T) in Venezuela has consolidated its role as the coordinating institution for CLAYUCA in this country. Plans are under way to establish FUNVEYUCA, a foundation type scheme that will become the principal partner of CLAYUCA in Venezuela
- Peru became a new member of CLAYUCA. Leading institution is the Instituto Nacional de Investigación Agrícola-INIA.
- Third planning and evaluation meeting of the Consortium was held at CIAT with participation of 5 countries
- Technical assistance missions of CIAT and CLAYUCA personnel were realized in Venezuela, Colombia, Haiti, Mexico and Peru
- Training activities were conducted in Colombia, Venezuela, Haiti, Mexico and Peru
- Bolivia, Paraguay, Ecuador and Cuba continue to be country members that have not consolidated its participation in the Consortium. So far, their participation in activities promoted by CLAYUCA has been minimal.

2.2 Contacts with public and private groups in countries interested in becoming members of CLAYUCA

Results

- Dominican Republic participated as observer in the 3rd Annual Meeting. Plans are underway to become member of the Consortium
- Promotion visits were realized to Panama and Dominican Republic to discuss possible mechanisms to facilitate adhesion of cassava sectors in these two countries to CLAYUCA

Output 3: Donor support seeking aimed at financing cassava research and development activities conducted by the Consortium

Activities:

3.1 Project proposals writing and follow up negotiations with Colombian Ministry of Agriculture

Results:

- Five proposals approved during the period January-December 2002. Total value of these proposals was Col$ 153,845

3.2 Project proposals writing and follow up negotiations with private sector enterprises in Colombia, to finance specific activities

Results:

- Four proposals approved during the period January to December 2002. Total value of these proposals was Col$ 61,198

3.3 Project proposals writing and follow up negotiations with international donors aimed at seeking financial support for cassava research and development activities conducted by the Consortium

Results:

- Project proposal presented to Common Fund for Commodities (CFC) was approved
- Total budget approved was US$ 439,000 for a two years period
- A three years second phase of the project has been suggested by the donor, based upon the results of the first phase approved
- Activities expected to initiate in January 2003

Output 4: Consolidation of CLAYUCA as a technology clearing house and as an important partner in human resources development for the cassava sector in Latin America and the Caribbean region

Activities:

4.1 Training activities for cassava researchers, technology transfer agents, farmer groups and private sector enterprises, conducted at CIAT and in member countries

Results:

- Six courses conducted in Colombia with a total of 350 participants
- Three courses conducted in Venezuela with a total of 150 participants
- CLAYUCA technical personnel participated in a course organized by CIAT in Haiti
- Technical personnel from four countries participated in hands on training activities at CIAT

4.2 Thesis Work projects with Agronomy, Agricultural, Industrial and Agroindustrial Engineering conducted in agreement with 3 Universities (Valle, Nacional and San Buenaventura)

Results:

- 3 thesis work projects finished in 2002-10-23
- One thesis work initiated in 2002 to be finished in 2003

4.3 Publication and dissemination of scientific information related to cassava research and development

Results:

- Publication of Book and booklet on cassava production, processing and utilization, finally completed. 1000 units were printed
- Book and booklet are selling hot. About 450 units will be sold in three months
- Document on the use of cassava in poultry feeding, published by the Colombian Federation of Poultry Growers was translated into English and made available as PDF document in Clayuca web page
- Translation to English of book "La Yuca en la Alimentación Animal, by Julian Buitrago", continues. Two additional chapters will be included in English version. Although intended to be circulated as Web document, financial support will be sought during 2003 to publish it.
- CLAYUCA launched an electronic version of its Bulletin. Two issues were distributed in 2002.

Output 5: Contribution to the formulation and implementation of a collaborative agreement with IITA, seeking a more integrated, system-wide framework for cassava research and development activities

Activities:

5.1 Consultancy mission to Malawi and Tanzania (February 21-28, 2002)

Results:

- Activities conducted as agreed upon in work plan
- Semi annual report prepared and presented

5.2 Participation in SARRNET Steering Committee meeting , Pretoria, South Africa, march, 2002

Results:

- Presentation on results obtained

5.2 Facilitator/Coordinator role for training of African technical personnel in Brazil and Colombia

Results:

- Three SARRNET staff participated in Scientific exchange mission in Colombia and Brazil, organized and coordinated by CLAYUCA

PERFORMANCE INDICATORS, CLAYUCA 2002

1. TECHNOLOGY, METHODS, TOOLS

➢ TECHNOLOGY PROCESS DEVELOPED FOR PRODUCTION OF GLUE FROM REFINED CASSAVA FLOUR

The refined flour is now being used at a commercial scale for a plywood industry and trials are underway for evaluating its use in a paper industry and a human food industry. The economic importance and impact of this technology is that the price of the refined cassava flour is set up in comparison with the price of wheat flour, a product which is imported , has a higher value and has become very expensive in Colombia due to the variation in the exchange rate. Conversely, the cassava flour used in animal feeding has its price fixed in comparison with maize. An additional advantage of this technology is that it does not generate a contaminant effluent as the technology currently used for cassava starch production

➢ METHODOLY DEVELOPED FOR THE HARDENING OFF PHASE OF CASSAVA PLANTS PRODUCED THROUGH IN-VITRO SYSTEMS

The importance of this methodology is in relation with the development of improved biotechnology systems for production of in-vitro plants, and the increased demand for healthy, good quality planting material. The experiences available at CIAT for post in-vitro management of plantlets was based on small numbers and the initial results with the hardening off phase of massive numbers were negative. After some months of learning by doing work, an improved methodology was developed that allows almost 100% survival of the plants during this critical phase. The method has also been used with success in the hardening off phase of sweet potato plants and is currently been tested with vanilla plants.

➢ ADVANCES MADE IN THE DEVELOPMENT OF METHODOLOGIES FOR THE PRODUCTION OF DEXTRINES FROM CASSAVA STARCH AND REFINED FLOUR (FOR INDUSTRIAL USES)

This technology development process has advanced as expected. Still requires more research work. Important advances have been made. The importance of this work is that it could become the basis for investment programmes in processing plants for the production of cassava-based high value products that are currently imported and have increasing demand. This technology can be very well suited for rural and economic development strategies that are trying to use the cassava crop as the main emphasis.

➢ **ADVANCES MADE IN THE DEVELOPMENT OF METHODOLOGIES FOR THE PRODUCTION OF CROQUETTES FROM REFINED CASSAVA FLOUR (HUMAN CONSUMPTION USES)**

Cassava croquetes for human consumption is a novel product that is experiencing a rising demand in urban markets. Currently, its production is based in the processing of fresh cassava roots that, in many cases, have to be transported from distant sites, very long distances and high transportation costs. Moreover, the quality of the roots when they arrive to the processing factory is usually very poor. The importance of this technology, if developed successfully, is that it will allow the processing of the cassava roots into flour, at the production site, and the cassava flour can then be transported to the croquettes factory. The technology development process is proceeding as expected.

2. PUBLICATIONS

➢ **Book published**

- La Yuca en el Tercer Milenio. Sistemas Modernos de Producción, Procesamiento, Utilización y Comercialización.

- Guía practica para el manejo de las enfermedades, las plagas y las deficiencias nutricionales de la Yuca.

CLAYUCA and the project IP-3 coordinated the production, editing and publication of this book and the practical guide. After almost 20 years since the last book was published, there was a clear need for a reference publication that can help the cassava society in the region to improve its knowledge, information and experiences about cassava –based technologies. The initial printing was 1000 books. Financial support was obtained from the Minister of Agriculture of Colombia and the Colombia Poultry Growers Federation. Contacts are being made with some donors to finance its publication in English language.

➢ **Book chapters**

- Published six.

➢ **Document published**

- **Cassava in poultry feeding.**

This working document published originally by the Colombian Poultry Producers Federation was translated into English and published as a PDF document. Financial support for this work was obtained through SARRNET, a cassava and sweet potato based network coordinated by IITA in Africa.

➢ **Scientific Meetings Presentations**
- **Three presentations**

3. STRENGTHENING NARS AND STAKEHOLDERS

➢ **Training courses**
- Six courses in Colombia (Production, processing and utilization technologies
- Three in Colombia (Production, processing and utilization technologies
- One course in Haiti (Production, processing and utilization technologies
- One Workshop in Colombia (Post harvest management of cassava

➢ **Individualized training**
- Venezuelan technicians on rapid multiplication and hardening off methodologies
- 1 technician from Panama on IPM methodologies

➢ **PhD, M.Sc. and pre graduate students**
- B.Sc. 7 students

➢ **Workshops and Meetings**
- III Stakeholders Annual Meeting (Executive and Technical Committee), CIAT, Cali, Colombia
- JIRCAS International Symposium, Ph Action Working Meeting
- Tsukuba, Japan
- 7th Regional Cassava Workshop for Asian Countries, Bangkok, Thailand
- Colombian Soil Society Congress, Cali, Colombia
- International Workshop on Cassava Genetic Resources, Lima, Peru

➢ **Technical assistance to stakeholders**
- Consultancy visit to Mexico
- Consultancy visit to Haiti
- Consultancy visit to Peru
- Consultancy visit to Venezuela
- 10 Consultancy visits to stakeholders in Colombia

4. PARTNERSHIPS, COLLABORATIVE AGREEMENTS

- Consultancy visit to Tanzania and Malawi as part of collaborative agreement IITA/CIAT/SARRNET/CLAYUCA
- Steering Committee Meeting of SARRNET, Pretoria, South Africa

5. *RESOURCE MOBILIZATION*

- **Fund contribution form stakeholders**
  - Four countries contributed its annual quota
  - Four countries have not yet contributed its annual quota
- **Proposals funded - Colombia**
- 5 proposals were funded by the Colombian Minister of Agriculture
- 1 proposal was funded by the Colombian Poultry Producers Federation
- **Proposals funded – International Donors**
- 1 proposal was approved by the Common Fund for Commodities - CFC Federation