

63417 ing

CIAT in Synthesis

Solutions That Cross Frontiers



COLECCION HISTORICA



CIAT

Centro Internacional de Agricultura Tropical
International Center for Tropical Agriculture

63417 ing

The Journey to Sustainable Rural Livelihoods

The International Center for Tropical Agriculture (CIAT) is a not-for-profit research and development organization dedicated to reducing poverty and hunger while protecting natural resources in developing countries. This brochure describes who we are, the work we do, and our vision of how science and technology can help poor people improve their lives, now and in the future.

The tropical world is often painted as a forbidding zone of chronic poverty, malnutrition, and environmental degradation. But these problems, though very real and pervasive, are by no means intractable. With the right kind of support, rural people across the tropics, who account for most of the world's poor, are capable of changing their lives and their land for the better.

CIAT is helping these people reach three intermediate destinations

on their journey to sustainable rural livelihoods:

1. Competitive agriculture
2. Healthy agroecosystems
3. Rural innovation

As rural families reach those destinations, they see marked improvement in their lives. Children no longer go to bed hungry, and parents know where the next meal is coming from. They have the means to satisfy this and life's other necessities, because they have gained access to new seeds and knowledge that enable them to intensify the production and value-added processing of diverse agricultural products. Moreover, they feel reasonably sure of continued advances, because they and their neighbors have worked together to protect the natural resources on which future agricultural productivity depends.



What kind of help do rural communities in the tropics need to make the journey to sustainable rural livelihoods?

One of the most necessary ingredients is socially and environmentally progressive science that offers individuals and communities the means to solve problems and seize opportunities for improving their welfare.

CIAT's experience demonstrates that persistent research on key crops and natural resource management is a highly effective and direct way to address the needs of the tropical world's rural poor. Progress in agriculture also helps poor migrants to the cities by improving urban food supplies and pumping extra cash into the economy, thus fueling growth and creating jobs.

In conducting research for development, the Center draws on expertise in five complementary areas:

- Agrobiodiversity and genetics
- Ecology and management of pests and diseases
- Soil ecology and improvement
- Analysis of spatial information
- Socioeconomic analysis

The outcomes of this research are genetically improved crops, environmentally sound approaches for managing natural resources, as well as practical methods and information for solving problems and guiding decisions.

We refer to these products as "solutions that cross frontiers," because they transcend national boundaries and surmount formidable barriers to improved human welfare. With such products rural communities are better prepared to compete in globalized economies, preserve the health of agroecosystems, and build local capacity for technical and social innovation.

CIAT

63417

COLECCION HISTORICA

101466



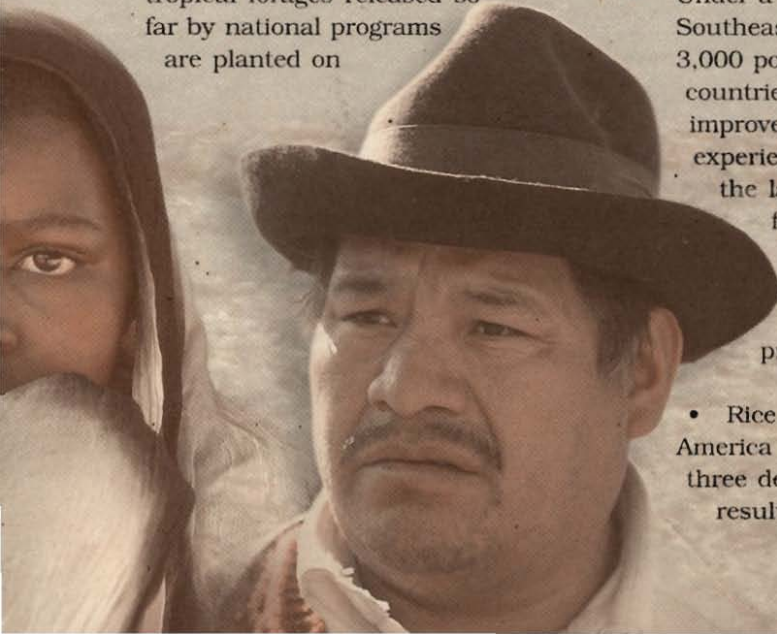
COLECCION HISTORICA

The Difference Science Makes

*T*he impact, so far, of our joint endeavors with international and national partners:

- In the last decade or so, bean production in Latin America has increased by about 25 percent, despite a substantial decrease in area planted. Steady growth in yield has resulted to a large degree from widespread adoption of improved varieties by small farmers. About 240 varieties originating from CIAT germplasm have been released in the region, generating total economic benefits estimated at US\$1.2 billion.
- African national programs have released 111 CIAT-related bean varieties, together with improved farming practices. Production increases resulting from new varieties have an estimated total value of \$102 million. Women have been the main beneficiaries, since they account for most of the continent's bean production.
- National programs in Asia and Latin America have released 62 CIAT-related cassava varieties. The cumulative value of the increased production derived from these varieties is estimated at more than \$432 million in Asia and \$81 million in Latin America.
- CIAT contributed importantly to the search in South America for natural enemies that could control the cassava mealybug and cassava green mite in sub-Saharan Africa. These pests devastated production across the continent, threatening a major food source for about 200 million Africans. The highly successful biological control campaign was coordinated by our sister center in Nigeria, the International Institute of Tropical Agriculture (IITA).
- In the 1980s the Center launched a series of integrated projects in Brazil, Colombia, and Ecuador aimed at devising a research and development strategy that would empower farmers to establish, operate, and manage local cassava-based industries.





One such project in Colombia created economic benefits totaling about \$19 million through improved cassava production and processing. An impact study showed that the project also built local capacity to market crops and identify new economic opportunities.

- In Latin America the 45 improved tropical forages released so far by national programs are planted on

about 6.8 million hectares. New grasses have been shown to boost livestock productivity by a factor of 16 over native species. The cumulative value of the meat and milk production increases brought about by new forage grasses and legumes is estimated at \$1.4 billion.

- Under a recent project in Southeast Asia, about 3,000 poor farm families in five countries adopted one or more improved forages. Their experience has demonstrated the large potential of forages for boosting livestock production in marginal upland environments while reducing grazing pressure on the land.
- Rice production in Latin America has tripled over the last three decades, partly as a result of the approximately

300 improved rice varieties developed by CIAT and national programs. Today these varieties account for more than 70 percent of the region's total rice production. More efficient production has helped lower the price of this vital staple by about 40 percent, benefiting the urban and rural poor in particular.

- Participatory research approaches are increasing the effectiveness of technology development and transfer. One method by which farmers operate local agricultural research committees is now being used in eight Latin American countries. Other participatory approaches devised by CIAT and its partners are being widely applied in Southeast Asia as well as eastern and central Africa.

Agrobiodiversity and Genetics

Farmers at Worka village in central Ethiopia were pleased to find a new bean variety that doubles their crop yields, is well suited to local food preparations, and has strong market appeal. But they weren't so keen on its drab, scientific label—Line A176. Instead, they named it Roba, or “pouring rain”—the ultimate tribute to a new crop variety in this drought-prone region.

As that and many other such experiences show, genetically enhanced crops are a powerful way to improve rural livelihoods—strengthening food security and human nutrition, raising incomes, and contributing to plant and soil health.

To multiply farmers' crop options, CIAT has built a strong global program for research on plant genetics and agrobiodiversity, focused on species that are especially important to poor people living in marginal environments (see box). In this work Center staff conserve and evaluate the vast array

of plant genetic diversity in our modern gene bank. Drawing on this unique resource, they improve crops through state-of-the-art methods—from biotechnology to farmer participatory plant breeding.

With the aid of molecular marker techniques, for example, CIAT scientists are increasing the speed and reducing the cost of developing new crop varieties that produce well under stress and satisfy market demands. These and other biotechnology tools (which we employ under strictly enforced biosafety standards) are also enabling our researchers to

unlock valuable genes in crop ancestors and wild relatives. Their work is vital for preparing tropical agriculture to meet new challenges, such as global competition and global climate change.



CIAT conducts international research on the commodities described below. Our work on beans, cassava, and tropical forages has a global reach, while that on rice and tropical fruits targets Latin America and the Caribbean.

Common bean—This is the most important food legume for more than 300 million people, most of them in Latin America, where the crop was domesticated, and in Africa. Rich in protein, iron, and other dietary necessities, the common bean (*Phaseolus vulgaris*) has come to be known as the nearly perfect food. In addition to bolstering human nutrition, it has considerable economic importance, generating income for millions of small farmers. In Africa the vast majority of bean producers are women.

Cassava—A hardy root crop of tropical American origin, cassava (*Manihot esculenta*) provides food and

livelihoods for about 500 million people across the developing world. Farmers particularly appreciate its strong tolerance of drought and poor soils. Some countries are tapping the potential of cassava's starchy roots for processing into animal feed or for industrial use. Thus, in addition to strengthening food security, the crop offers new opportunities to generate employment and income for the poor.

Rice—Rice (*Oryza sativa*) is the most important food grain in most of the tropical areas of Latin America and the Caribbean, where it supplies more calories in people's diets than wheat, maize, cassava, or potatoes. More efficient rice production is a central prerequisite for bettering the lot of the region's urban and rural poor.

Tropical forages—The many species of tropical forages are a prominent feature of agricultural landscapes around the world. Improved forage grasses and legumes boost meat, milk, and fish



production, helping to enhance human nutrition and raise farm income. But they also have many other uses beyond their traditional role in livestock production. Nitrogen-fixing legumes, for example, enhance soil fertility, increasing the productivity of other crops.

Tropical fruits—An estimated 2,300 tropical fruit species show production potential. Some of them offer small farmers the opportunity to break into lucrative domestic and export markets, while at the same time improving family nutrition and land management.

Our Donors

Asian Development Bank

Australia

- Australian Agency for International Development (AusAid)
- Australian Centre for International Agricultural Research (ACIAR)

Belgium

- General Administration for Cooperation in Development (AGCD)

Brazil

- Brazilian Agricultural Research Enterprise (Embrapa)

Canada

- Canadian International Development Agency (CIDA)
- International Development Research Centre (IDRC)

Colombia

- Colombian Institute for the Development of Science and Technology (COLCIENCIAS)
- Ministry of Agriculture and Rural Development
- National Program for the Transfer of Agricultural Technology (PRONATTA)

Denmark

- Danish International Development Assistance (Danida)

European Union (EU)

- Food and Agriculture Organization (FAO) of the United Nations

France

- Center for International Cooperation in Agricultural Research for Development (CIRAD)
- Institute of Research for Development (IRD)
- Ministry of Foreign Affairs
- National Institute for Agricultural Research (INRA)

Germany

- Federal Ministry of Cooperation and Economic Development (BMZ)
- German Agency for Technical Cooperation (GTZ)

Inter-American Development Bank (IDB)

- International Fund for Agricultural Development (IFAD)

Italy

- Ministry of Foreign Affairs

Japan

- Ministry of Foreign Affairs
- The Nippon Foundation

Mexico

- Secretariat of Agriculture, Livestock, and Rural Development

Netherlands

- Ministry of Foreign Affairs

New Zealand

- Ministry of Foreign Affairs and Trade (MFAT)

Norway

- Norwegian Agency for Development Cooperation (NORAD)
- Royal Ministry of Foreign Affairs

Peru

- Ministry of Agriculture

South Africa

- Ministry of Agriculture and Land Affairs

Spain

- Ministry of Agriculture

Sweden

- Swedish International Development Agency (SIDA)

Switzerland

- Federal Institute of Technology Development (ETH)
- Swiss Agency for Development and Cooperation (SDC)
- Swiss Centre for International Agriculture (ZIL)

Thailand

- Department of Agriculture

United Kingdom

- Department for International Development (DFID)
- Natural Resources Institute (NRI)
- United Nations Environment Programme (UNEP)

United States of America

- The Ford Foundation
- The Rockefeller Foundation
- United States Agency for International Development (USAID)
- United States Department of Agriculture (USDA)

- W.K. Kellogg Foundation

Venezuela

- Fundación Polar

The World Bank

- World Resources Institute (WRI)

Traveling in Good Company

*H*elping rural people in the tropics achieve sustainable livelihoods is among the most pressing challenges facing humanity at the outset of the 21st century. Though there are many upward pathways to this destination, each entails an arduous journey with

obstacles or difficult choices at every turn.

Millions of poor farmers in the developing world are eager to make that journey. But they won't get far if they must travel alone. At CIAT we believe that, by banding together in

the company of dedicated scientists and development professionals, rural people can reach the intermediate destinations of competitive agriculture, healthy agroecosystems, and rural innovation. Our commitment is to offer these travelers "solutions that cross frontiers" at every step of the way.



Our Mission

To reduce hunger and poverty in the tropics through collaborative research that improves agricultural productivity and natural resource management.

CIAT LIBRARY



100077572

For more information contact:

CIAT

Apartado Aéreo 6713

Cali, Colombia

Phone: (57-2) 445-0000 (direct) or
(1-650) 833-6625 (via USA)

Fax: (57-2) 445-0073 (direct) or
(1-650) 833-6626 (via USA)

E-mail: ciat@cgiar.org

Internet: www.ciat.cgiar.org

Text: Nathan Russell

Photos: Alfredo Camacho, Julio Martinez,
David Mowbray, Luis Fernando Pino,
Juan Carlos Quintana, and
Nathan Russell

Design: Oscar Idarraga

Printing: Feriva S. A.

October 2001



CIAT

Centro Internacional de Agricultura Tropical
International Center for Tropical Agriculture