TABLE OF CONTENTS

EXECUTIVE SUMARY

PROJECT IP-4: IMPROVED RICE FOR LATIN AMERICA AND THE CARIBBEAN

PROJECT MANAGER: FERNANDO CORREA

Project Description

Goal

To generate food security and employment associated with rice production with emphasis on improving the options for the small farmers.

Objective

To produce robust high yielding rice varieties requiring lower inputs, we will provide well-characterized progenitors and advanced materials with an ample genetic base as well as information and training.

Target Ecoregion

Low and Mid Altitude Regions of Latin America and the Caribbean.

Principal Collaborators: France CIRAD, IRD & Genoplante, FLAR, IRRI, WARDA, Japan JIRCAS, Korea RDA, Brazil EMBRAPA, Colombia FEDEARROZ & CORPOICA, Peru INIA, Venezuela INIA & DANAC, Cuba IIA, Nicaragua INTA, Bolivia CIAT Santa Cruz, Chile INIA, Uruguay INIA, Argentina U. Corrientes & U. Tucumán, China, US Universities: KSU, Cornell, Purdue, LSU, U. Arkansas, Texas A&M and Yale.

CGIAR system linkages: Enhancement and Breeding (50%); Protecting the Environment (20%); Saving Biodiversity (15%); Transfer of Technologies (10%); Crop Systems (5%). Linked to IRRI and WARDA.

CIAT project linkages: Germplasm conservation SB-1, genomics SB-2, participatory research SW-3 for upland in hillsides PE-3 and cropping systems SW-2 for the savannahs.

1. IP-4 Project Log Frame (2006)

PROJECT: **IMPROVED RICE FOR LATIN AMERICA AND THE CARIBBEAN**
PROJECT MANAGER: **FERNANDO CORREA**

	Outputs	Intended users	Outcome	Impact
Output 1: Enhanced gene pools				
Output Targets 2006 .	Enhanced gene pools and advanced lines with disease resistance to rice blast and rice hoja blanca complex that are high yielding with good grain quality for both irrigated and upland rice	Rice researchers, FLAR, and breeding programs throughout the region	Rice breeding methods and strategies for development, evaluation and selection of promising rice lines that result in varieties released by the rice sectors resulting in higher rice yields.	A robust rice sector will generate employment and maintain low rice prices for the consumers.

	Outputs	Intended users	Outcome	Impact
Output 2: Integrated crop, pest and disease Management				
Output Targets 2006 .	Characterization of the diversity of rice pathogens, resistance genes, and transfer of technology to partners	Rice pathologists and breeders	Better practices in place to reduce losses caused by pathogens as well as decreased use of agrichemicals.	The ecosystem will be less contaminated and the workers will be healthier.
	Integrated Pest, Disease, and Crop Management strategies adapted for at least 5 countries .	Rice scientists, extension agents and farmers.	Prerequisite for developing information based system as it confirms efficacy in local production systems	A more competitive rice sector with lower negative impact on the environment.

	Outputs	Intended users	Outcome	Impact
Output 3: Intensification and diversification of rice systems for small farmers				
Output Targets 2006 .	Varieties including specialized high value rice (ethnic) and management practices (organic) developed for small rice farmers using participatory methods in two countries in Central America.	Small holders who produce rice and extension agents.	Better-organized small farmers. Increased yields and options that allow crop diversification including high value crops.	Improved livelihoods of small farmers. A dynamic and robust rice sector.

2. Achievements of 2006 Output Targets

Output 1

Output targets for the output on Enhanced Gene Pools were achieved on 100%.
The CIAT-ION nursery with 130 rice lines was distributed to different partners in Colombia, Nicaragua, Costa Rica, and Bolivia. Several sets of advanced rice lines were distributed to partners in the USA (Cornell University, Louisiana State University, U. of Arkansas, and RiceTec), WARDA, and University of South Africa. Rice lines from the biofortification project were sent to: Brazil (EMBRAPA-CNPAF, and University of Rio Grande Do Sul), Colombia, Cuba, Nicaragua, Republica Dominicana, Bolivia, Panamá, and WARDA.
In Bolivia, the first upland/aerobic commercial rice variety selected from the enhanced composite population PCT-4 (recurrent selection) was officially released in 2006 as the variety "ESPERANZA". The variety is adapted both to manual upland and mechanized aerobic rice ecosystems. In Chile, the first commercial variety, "RQuila 28", adapted to the temperate irrigated rice ecosystem, coming from the enhancement and selection of the population PQUI-1 was selected in 2006 and proposed for official release in early 2007. A total of 983 upland rice lines were multiplied and distributed to 25 Institutions from 12 countries.
Four additional commercial rice varieties were developed within the CIAT-FLAR consortium and released in different Latin American countries: ANAR 2006 (Nicaragua), IDIAP 54-05 and IDIAP 145-05 (Panamá) and CENTAURO (Venezuela).

Output 2

The Output Targets for the Output 2: Integrated crop, pest and disease management, were achieved on more than 90%.
This output considers the study of several rice pathogens including the rice blast pathogen (*Pyricularia grisea*), sheath blight (*Rhizoctonia solani*) and the new rice disease detected in Latin America, bacterial panicle blight (*Burkholderia glumae*). For each pathogen, significant advances were made in studying the pathogen diversity and in identifying resistance sources. For the rice blast pathogen, evolution studies allowed to identify potential mutants able to break

resistance gene combinations being used in the breeding program. The advanced detection of these mutants allows the identification of resistance genes that need to be incorporated in the new varieties to move ahead of future changes of the pathogen in natural populations (annual reports 2005-2006). Molecular markers associated to blast resistance genes were identified and implemented for marker assisted selection allowing the introgression of three blast genes into improved rice germplasm (see references). Lack of funding has not allowed the evaluation of large populations for the identification of rice lines carrying the three genes. Advanced lines with durable field blast resistance up to the eight generation were identified and are being multiplied to be given to our FLAR partner for their distribution to partners in the region. These lines can give origin to new varieties or be used as sources of stable resistance. Reliable screening techniques for the identification of resistance sources to the sheath blight pathogen under controlled greenhouse conditions were developed. Commercial rice varieties from Latina America were screened for resistance and resistance sources were identified. Rice populations (recombinant inbreed lines and double haploids) were screened and the information will be used to identify quantitative trait loci associated with resistance as part of a USA study funded by USDA. Characterization of the disease complex mite-fungus-bacteria affecting rice production in Central America and the Caribbean was initiated. A bacterial pathogen (*Burkholderia glumae*) was identified as the major cause of disease symptoms and responsible for economic losses (reference). The role of the mite seems to be more a way for spreading the bacterium. A reliable screening method to identify resistance sources to the bacterium is being developed under controlled conditions and preliminary results suggest that resistance genes to this pathogen are available. We initiated the screening of our germplasm bank as well as our elite and progenitors rice lines. All actual commercial cultivars planted were susceptible. Results will be confirmed under field conditions. Seed treatments using hot water and antibiotics suggest positive control of this pathogen in infected seeds, which is the main source for pathogen infection. Adoption of crop management practices by rice farmers in the region (lower seeding rates, hot water seed treatment, planting date, and adequate fertilization) to favor a healthier crop is also helping to reduce or minimize the presence of this disease complex. This research is being conducted as part of a FONTAGRO project and implementation and adoption practices are being conducted together with FLAR scientists working with different rice farmers in Central America. Activities within this output will continue during 2007.

Output 3

Selection of high performing well-praised rice varieties for different upland cropping systems and agro-ecological areas of Central America through participatory methods were achieved on more than 80%.
Two varieties in process of registration and three to be proposed for registration and release in 2007 in Nicaragua: two for low inputs upland cropping systems of the north-eastregion (Serviteca); one for the mechanized upland cropping systems of the north-pacific region (INTA); two very early upland lines for dry areas and/or new cropping systems (INTA). Farmers, NGO and extension technicians and NARS scientists trained on PCI approaches methods. Germplasm exchange and training course on PCI approaches with Guatemala, El Salvador and Costa Rica (germplasm in intermediate on-farm trials in Guatemala). No significant breeding work achieved on high value rice (just starting): 20%. Outputs on management practices: 20% (because of budget limitations, climatic and partnership constraints.

Another line derived from the cross Caiapo x *O. glaberrima* (African cultivated species) was identified trough participatory breeding by small farmers in Nicaragua as a variety and seed is being multiplied for commercial planting. Small farmers in Bolivia have identified a traditional variety called "azucena" as a potential variety for special markets.

3. Research Highlights 2006

- Understanding of meiotic process of F1 hybrids between *O. sativa* x *O. latifolia* including abnormalities in spindle formation, chromosome segregation and cytokinesis leading to polyads formation, which give rise to unviable pollen and sterility, and chromosome elimination. Evaluation of about 13,000 breeding lines and identification of promising lines for CIAT-ION nurseries. Promising interespecific breeding lines with high yield potential, tolerance to main diseases and good grain quality were identified and included in the CIAT-ION nursery made available to NARs in 2006. Out of the 194 lines, 65 were from interspecific crosses. Two varieties for low inputs upland cropping systems in process to be registered by a private partner of the project (launching at mid-2007). Following convincing validation trials carried out in 2005 and 2006, future launching by the Nicaraguan agriculture research institute (INTA) of a very early line for upland areas with drought constraints and a line for favorable upland mechanized cropping systems. Follow-up of the participatory plant breeding schemes with associated farmers and NGOs in two areas of Nicaragua. Creation of a national Participatory Crop Improvement (PCI) network in Nicaragua.
- The blast resistance in the cultivar Oryzica Llanos 5 (durable blast resistance for more than 15 years) was found to have very complex inheritance. The durable broad-spectrum resistance in the rice cultivar Oryzica Llanos 5 is associated with multiple genes of major and minor effects that induce resistance to different blast isolates. Twenty-one QTL present in nine chromosomes were detected and associated with resistant traits in Oryzica Llanos 5. Most but not all of the QTL occurred in the same genomic regions of other genes that had been reported in the literature. None of the QTLs was effective against all blast isolates and all were isolate specific. One QTL mapped to a region on chromosome 9 where no blast resistance genes had yet been mapped. Another QTL near the bottom of rice chromosome 11 was found to be significantly associated with partial resistance. Advanced breeding lines (generation F_7-F_{11}) with transgenic-resistance to RHBV combining high yield potential, good grain quality, tolerance to *Rhizoctonia* and characterized profile for strain resistance to pyricularia were developed. These plants are ready to be evaluated by peers and to decide potential process for deployment to farmers.
- Chloroplast and nuclear sequences selected and tested for genome and species characterization of *Oryza* allowing characterization of species composition and direction of gene flow in samples collected in farmers' fields in Colombia and Venezuela. High through-output methodology PCR-real time based for analysis of gene flow in rice at landscape level optimized. Set up international collaboration on experimental design and data collection for gene flow at landscape level that may allow adaptation of expert model systems for tropical conditions, applicable tool for biosafety decision process by competent authorities. Near-completion of a clean lab for handling and preparing rice samples for iron and zinc analysis, establishment of a methodology for running iron and zinc analysis in rice at CIAT, and establishment of base lines for iron and zinc.

Validation of SNP markers to be used for the screening of rice genotypes having contrasting levels of iron content in the polished grains. Identification of rice cultivars having 2-3 times more iron than commercial milled rice bought by consumers

4. Major outcome of the Rice Project in 2006: Commercial Rice Varieties Released

Nearly 13,000 breeding lines in different stages of development were evaluated in Santa Rosa and Palmira; percentage of selected material varied depending on the type of cross combinations. About 1224 advanced lines were selected by participants from diverse NARs in a Breeder's Workshop held in Santa Rosa. Wide segregation for desirable traits including grain quality and a good number of plant selections were made for further testing in crosses involving different wild species of rice. Elite lines derived from crosses with *O. latifolia, O. glaberrima*, *O. barthii*, and *O. rufipogon* showed good field performance and high yield potential in replicated trials run by several partners including Fedearroz, our main local partner. As a result and main outcome of the Rice Project activities developed in collaboration with our Latin American Partners, the following rice varieties were released in the region during 2006:

In Bolivia, the first upland/aerobic commercial variety selected from the enhanced composite population PCT-4 was officially released in 2006 as **ESPERANZA**. The variety is adapted both to manual upland and mechanized aerobic rice ecosystems. This variety has the Pedigree CT8240-1-5-2P-M-1P/CT8008-3-12-3P-1X//CT9509-17-3-1-1-M-1-3P-M

In Chile, the first commercial variety, **RQuila 28**, adapted to the temperate irrigated rice ecosystem, coming from the enhancement and selection of the population PQUI-1 was proposed for official release in early 2007

In Salvador, the commercial variety **CENTA A-8** was released by ANAR. This variety came from the cross CT 11519/CT 11492 and Pedigree CT 122249-3-4-3-3P-1P

In Nicaragua, the commercial variety **ANAR 2006** was released by ANAR. Pedigree CT8240-1-5-2P-M-1P/CT8008-3-12-3P-1X//CT9509-17-3-1-1-M-1-3P-M

In Panamá, the commercial variety **IDIAP 54-05** was released by IDIAP. This variety originated form the cross CT9682-2-M-14-1-M-1-3P-M-1/CT10825-1-2-1-3-M//CT8222-7-6-2P-1X. The variety **IDIAP 145-05** was also released in the country. This variety originated form the cross CT8008-16-31-3P-M//CT9682-2-M-14-1-M-1-3P-M-1/CT11008-12-3-1M-4P-4P

In Venezuela, the commercial variety **CENTAURO** was released by FUNDARROZ, INIA and FLAR. This variety originated from the cross ECIA38-2-4-2-5-6/CT822-7-6-2P-1X/FB0007-3-1-6-1-M and Pedigree FL00984-8P11-2P-2P-M-M

5. Publication List

Refereed Journal

1. Flórez-Ramos C.P., Z. Lentini*, M.E. Buitrago, and J. Cock. 2006. Somatic Embryogenesis and Plantlet Regeneration of Mango (*Mangifera indica* L.). *Acta Horticulturae* (In Press)
2. Ruiz J.J., Z. Lentini*, V. Segovia, M. Buitrago, C. Flórez, and J. Cock. 2006. *In vitro* Propagation and Regeneration of *Solanum quitoense* (Lulo) Plants and their Use as Elite Clones by Resource Farmers. Somatic Embryogenesis and Plantlet. *Acta Horticulturae* (In Press).
3. Ceballos*, H., M. Fregene, Z. Lentini, T. Sánchez, Y.I. Puentes, J.C. Pérez, A. Rosero and A.P. Tofiño. 2006. Development and Identification of High-Value Cassava Clones. Acta Horticulturae 703:63-70.
4. Fuentes, J.L., Correa-Victoria, F.J., Escobar, F., Prado, G., Aricapa, G., Duque, M.C., and Tohme, J. 2006. Microsatellite markers linked to the blast resistance gene *Pi-1* in rice for use in marker assisted selection. Euphytica (accepted)
5. Jia, Y., Correa-Victoria, F.J., McClung, A., Zhu, L., Wamishe, Y., Xie, J., Marchetti, M., Pinson, S., Rutger, N., and Correll. J. 2006. Rapid determination of rice cultivar responses to the sheath blight pathogen *Rhizoctonia solani* using a micro-chamber screening method. Plant Disease (accepted)
6. Lopez-Gerena, J., Correa-Victoria, F.J., Prado, G., Tohme, J., Zeigler, R., and Hulbert, S. 2006. Mapping QTL affecting partial resistance and identification of new blast resistance genes in rice (*Oryza sativa*). Theor. Appli. Genet. (submitted)
7. Trouche, G.; Narváez-Rojas, L.; Chow-Wong, Z.; Corrales-Blandón, J. 2006. Fitomejoramiento participativo del arroz de secano en Nicaragua: metodologías, resultados y lecciones aprendidas. Agronomía Mesoamericana (CR) 17(3): 307-322.
8. Trouche, G.; Hocdé, H.; Aguirre-Acuña, S.; Martínez-Sanchez, F.; Gutiérrez-Palacios, N. 2006. Dinámicas campesinas y fitomejoramiento participativo: el caso de los sorgos blancos (Sorghum bicolor, L. Moench) en la region Norte de Nicaragua. Agronomía Mesoamericana (CR) 17(3): 407-425.

Book Chapters

1. Calvert L.A. and Z. Lentini. 2007. Rice Hoja Blanca Virus. *In:* Characterization, Diagnosis and Management of Plant Viruses. Vol. 4: Grain Crops and Ornamentals. Govind P. Rao, Claude Bragard and Benedicte S.M. Lebas (Editors). Stadium Press ILLC, Texas, USA. ISBN 1-933699-34-5. p: 85-99.
2. Marc Châtel, Yolima Ospina and Gilles Trouche. 2006. Impact of the rice synthetic population breeding project for Latin America and the Caribbean. In: France and the CGIAR. Delivering Scientific Results for Agricultural Development. Chapter 1: Scientific Partnerships. Producing more and better food. Publication coordinated by Daniel Rocchi, Liaison Officer at the CGIAR Secretariat in Washington.Washington, U.S.A. CGIAR, p.44-47.

Other publications

1. Correa-Victoria, F.J. 2006. Improving Blast Resistance for Upland Rice in Colombia: a Challenging Task. 31st Rice Technical Working Group Meeting. The Woodlands, Texas, February 26-March 1, 2006.
2. Correa-Victoria, F.J. 2006. Identification of molecular markers for pyramiding rice blast resistance genes. Second Research Coordination Meeting. Nanjing, China, April 10-14, 2006.
3. Correa-Victoria, F.J. 2006. Avances en la investigación en enfermedades del arroz: *Pyricularia grisea.* II Congreso Brasilero de la Cadena Productiva del Arroz. VIII Reunión Nacional de Pesquisa de Arroz. EMBRAPA, Brasilia 26-28 de Abril, 2006. (Invited speaker).
4. Correa-Victoria, F.J. 2006. Situación del complejo acaro-hongo-bacteria en el arroz. Segundo Congreso Arrocero. San José, Costa Rica, Junio 29-30, 2006. (Invited speaker).
5. Correa-Victoria, F.J. 2006. Using rice differentials with known blast resistance genes for pathogen characterization and improving rice cultivars in Latin America. Rice Blast Workshop IRRI-JIRCAS. IRRI, Los Baños, Philippines, August 29-30, 2006.

Workshop and Conferences

- Lentini, Z*. 2006. Biotecnología y Riesgos Fitosanitarios *Invited Key-note lecture*. 2do Curso Internacional sobre Riesgos Fitosanitarios para la Agricultura Colombiana. Cali, Colombia December 2006. Funded by MADR Colombia.
- Coordination and Execution of Course: Capacitación para el Fortalecimiento de la capacidad institucional del Ministerio de Ambiente, Vivienda y Desarrollo Territorial y Autoridades Ambientales Regionales en materia de Biotecnología y Bioseguridad Ambiental de OGM con énfasis en Plantas Transgénicas. Abril 26, 27, y 28 de 2006. Funded by Colombia GEF/WB Biosafety Project.
- Trouche, G.; Hocdé, H.; Aguirre S. 2006. Sélection participative des sorghos au Nicaragua : approche et dispositifs. *In:* Lançon J., Weltzien E., Floquet A. Eds. Gestion du partenariat dans les projets de sélection participative. Actes de l'atelier Recherche 14-18 Mars 2005, Cotonou, Benin: 159-173.
- Lancon, J.; Bertrand, B.; Clément-Demange, A.; Hocdé, H.; Nouy, B.; Trouche, G. 2006. What determines the stakeholders'participation in plant breeding programs? Cases studies in the South. *In:* Lançon J., Weltzien E., Floquet A. Eds. Gestion du partenariat dans les projets de sélection participative. Actes de l'atelier Recherche 14-18 Mars 2005, Cotonou, Benin: 179-193.
- Taller de selección de material genético de arroz de secano y de riego. Villavicencio-Colombia. August 15-18, 2006. 61 participants from 12 countries (Bolivia; Colombia; Costa Rica; Cuba; Dominican Republic; France; Guatemala; Madagascar; Nicaragua; Panama; Peru and Venezuela)
- Correa-Victoria, F.J. 2006. Improving Blast Resistance for Upland Rice in Colombia: a Challenging Task. 31st Rice Technical Working Group Meeting. The Woodlands, Texas, February 26-March 1, 2006.

- Correa-Victoria, F.J. 2006. Identification of molecular markers for pyramiding rice blast resistance genes. Second Research Coordination Meeting. Nanjing, China, April 10-14, 2006.
- Correa-Victoria, F.J. 2006. Avances en la investigación en enfermedades del arroz: *Pyricularia grisea.* II Congreso Brasilero de la Cadena Productiva del Arroz. VIII Reunión Nacional de Pesquisa de Arroz. EMBRAPA, Brasilia 26-28 de Abril, 2006. (Invited speaker).
- Correa-Victoria, F.J. 2006. Situación del complejo acaro-hongo-bacteria en el arroz. Segundo Congreso Arrocero. San José, Costa Rica, Junio 29-30, 2006. (Invited speaker).
- Correa-Victoria, F.J. 2006. Using rice differentials with known blast resistance genes for pathogen characterization and improving rice cultivars in Latin America. Rice Blast Workshop IRRI-JIRCAS. IRRI, Los Baños, Philippines, August 29-30, 2006.

6. List of proposals funded in 2006, dollar value of contract and donor

- Gene Flow Analysis for Environmental safety in the Tropics. CIAT – University of Costa Rica – Hannover University and BBA, Germany. Donor: EURO 450,000 (2005-2007).
- Development and evaluation of drought-tolerant rice transgenic plants. GCP SB3 USD 70,000 (2005-2006)
- The Latin America: Multi-country capacity-building for compliance with the Cartagena Protocol on biosafety. PDF-B: Development of PAD (Project Appraisal Document). Donor: GEF-World Bank. USD 260,000 (Nov 2005-April 2007)
- Latin America: Multi-country capacity-building for compliance with the Cartagena Protocol on biosafety (Brazil, Colombia, Costa Rica, Peru). USD 5 million. Donor: GEF-World Bank
- Impacto ambiental de la adopción del arroz resistente a las imidazolinoas en sistemas productivos contrastantes de América Latina (AL). INIA-UCV-CIAT. USD 420,000. Donor: Fontagro.
- Capacitación en fitomejoramiento genético e intercambio de germoplasma para utilizar los recursos genéticos del arroz en América Latina y el Caribe TCP/RLA/3102 (A) USD 340,000.00. FAO
- High iron and zinc rice lines. AgroSalud. CIDA-Cananda US$230,000.
- Interspecific bridges to get full access to genetic diversity found in O. glaberrima: GCP , US 300,000 total; about US$ 80,000 for CIAT. To get started in 2007.
- Cenicafe. Technical assistance to the Coffee Genome funded by MADR: US30,000.
- Identification and expression analysis of genes important for iron translocation to the rice grain , hp+ us 15,000.
- Reducción del uso y desarrollo de resistencia a plaguicidas en el cultivo del arroz y fríjol en Colombia, Venezuela y Ecuador. FONTAGRO. US$ 224,000 (2006-2008)
- Manejo del complejo acaro-hongo-bacteria, nuevo reto para arroceros centroamericanos. FONTAGRO. US$ 360,000 (2006-2008)
- Identify and use candidate genes and other molecular markers linked to quantitative trait loci which control milling quality and resistance to sheath blight disease. USDA National Research Initiative Competitive Grants Program. CIAT US$ 47,000 (2005-2007).

- Phenotype evaluation of mutant collection for sheath blight resistance within the commissioned research project PI: Dr. Mathias Lorieux/Dr. I. Manabu (2006-2007). US$ 8,000
- Rice breeding for disease resistance and grain quality in Cuba. IAEA. US$ 30,000 (CIAT US$ 3,750). Within a Project on Pyramiding of mutated genes contributing to crop quality and resistance to stress affecting quality. Project for 15 countries and several crops (US$ 750,000 for five years).

7. Problems encountered and their solutions

- In July 2006, CIBIOGEM (Mexico National Biosafety Secretary) indicated the impossibility of Mexico to participate in implementation of the project entitled: The Latin America: Multi-country capacity-building for compliance with the Cartagena Protocol on biosafety. USD 5 million. Donor: GEF-World Bank. The decision was communicated to the World Bank, and modifications of activities were jointly adjusted without affecting the outcome of the multi-country project.
- The main problem encountered for 2006 was the elimination of funding from the Colombian Government to the Rice Project and the reduction of core budget assigned to the Project by CIAT. Special Projects were funded during 2006 that will help to cover part of the gap in funding but will not be enough for future budget reduction expected to be implemented for 2007-2008. Special projects do not generally fund costs of personnel, which do not solve all the problems of budget reductions at the Center
- Transaction costs continue to be too high. It is very hard to keep up with breeding, coordination and supervision of diverse activities, and field work due to too many meetings, travel and paper work. Even my support team feels overloaded. We have tried to more carefully divide and assign responsibilities among support staff and field workers to do our job without sacrificing efficiency, quality and quality of life.
- As last year this year we managed to keep going our core breeding activities by using other sources of funding, especially from AgroSalud, and Cenicafe.
- The stability and sustainability of the Rice Project continues to be a major concern. We have to be more creative and original in approaching the Latin American rice sectors to obtain additional funding for our core activities. There are sectors that actually are not contributing to funding research activities but that are willing to contribute if an adequate mechanism is proposed to them.

8. Staff List (2006)

Principal Staff	Allocation of time IP-4	Other	Affiliations	Location
Dr. Lee Calvert	70%		CIAT	CIAT HQ
Dr. Marc Chatel	100%		CIRAD/CIAT	CIAT HQ
Dr. Fernando Correa	100%		CIAT	CIAT HQ
Dr. Zaida Lentini	20%	80% SB-2	CIAT	CIAT HQ
Dr. Mathias Lorieux	50%	50% SB-2	IRD/CIAT	CIAT HQ
Dr. César Martínez	50%	50% SB-2	CIAT	CIAT HQ
Dr. Rafael Meneses	20%		IIA Cuba/CIAT	CIAT/Cuba
Dr. Gilles Trouche	100%		CIRAD/CIAT	Nicaragua/CIAT
Principal Staff positions in IP-4: 5.1 Associated projects 1.8				
Dr. Carlos Bruzzone Works as a consultant			(INIA)	INIA/CIAT Peru

9. Summary Budget

ACTUAL EXPENDITURES 2006

PROJECT IP4: Improved Rice for Latin America and the Caribbean

SOURCE	AMOUNT US$	PROPORTION (%)
Unrestricted Core	388,100	57%
Restricted Core		0%
		0%
Sub-total	**388,100**	**57%**
Special Projects	287,959	43%
		0%
Total Project	**676,059**	**100%**