



Annual Report 2006

Project IP-4: Improved Rice Germplasm for Latin America and the Caribbean



**For Internal Circulation
and Discussion Only**

April 2007



OUTPUT 1. ENHANCING GENE POOLS (1208 kb)

1A. BROADENING THE GENETIC BASE OF RICE IN LATIN AMERICA AND THE CARIBBEAN 1

- *Rice synthetic population breeding project for Latin America and the Caribbean..... 1*
- *Rice breeding for drought tolerance. Molecular marker and ecophysiological model based recurrent selection for population improvement..... 6*

1B. BROADENING THE GENETIC BASE OF IRRIGATED RICE IN LATIN AMERICA12

- *Chromosome elimination in the diploid *Oryza sativa* L. x tetraploid *O. latifolia* Desv.12*
- *Utilization of Wild Rice Species at CIAT to Broaden the Genetic Base of Cultivated Rice in Latin America25*
- *Development of high iron and zinc rice lines to Combat Malnutrition in Latin America and the Caribbean.....30*
- *Validation of SNP markers located in rice iron homeostasis candidate genes.....40*

1C. THE USE OF ANther CULTURE AND EMBRYO RESCUE FOR ENHANCEMENT OF GENE POOLS.....44

- *Increased frequency plant regeneration for various pretreatment combinations to callus derived from anther culture of indica rice (*Oryza sativa* L.) varieties.....48*

1D. GENE FLOW ANALYSIS AND GENETIC DIVERSITY IN RICE.....54

- *Characterization of Genetic Diversity: Relationships and potential origin of the weedy rice complex in Colombia.....54*
- *Scaling up analysis gene flow analysis from rice into weedy rice at landscape under farmers' commercial conditions.....61*
- *Use of chloroplast DNA polymorphisms for gene flow analysis in rice.....80*

OUTPUT 2. CHARACTERIZING RICE PESTS AND GENETICS OF RESISTANCE (310 kb)

2A. Rice Blast Disease (<i>Pyricularia grisea</i>).....	94
• Identification of molecular markers linked to rice blast resistance genes	94
• Mapping resistance genes associated with the durable blast resistance in the commercial rice cultivar Oryzica Llanos 5	102
• Inheritance of the resistance to <i>Pyricularia grisea</i> in the rice lines Tres Marias and 75-1-127	108
2B. Characterizing of the Complex of Rice Hoja Blanca Virus and <i>Tagosodes Orizicolus</i>	117
• Understanding the Genetics of Resistance to Rice Hoja Blanca Virus.	117
2C. Characterizing Rice Pest and Genetics Resistance	124
• Final selection for RHBV resistance and yield potential of advanced breeding generation from crosses with transgenic rice resistant to RHBV in the field in 2006	124

**OUTPUT 3. ENHANCING REGIONAL RICE RESEARCH CAPACITIES AND
PRIORITIZING WITH EMPHASIS ON THE SMALL FARMERS (120 kb)**

3A. Participatory breeding of upland rice in Nicaragua	131
1. Germplasm enhancement and selection using participatory approaches.....	132
2. Experimental designs and cropping conditions	133
3. Approaches and methods for PCI activities	133
3B. Upland rice germplasm improvement for Central America	141
1. Germplasm development	142
2. Experimental designs and trials management	143
3C. Annual Report Summary.....	146
1. Research Highlights 2006	146
2. Problems encountered and their solutions	148
3. Indicators.....	149
1. List technologies, Methods, & tools	149
<i>Varietal Releases</i>	149
<i>Germplasm Distributed</i>	150
<i>Electronic Modules</i>	150
2. Publication list	150
<i>a. In Referred Journals</i>	150
<i>b. In Books</i>	151
<i>c. Conferences and Workshops</i>	151
<i>d. Posters</i>	152
<i>e. Oral Presentations</i>	152
<i>g. Policy briefs</i>	153
3. Trips made during 2006	153
4. Training list conducted during 2006	155
5. Resource mobilization list.....	155
6. List of Partners	156
8. List of Visitors	157