RICE IMPROVEMENT

Using Conventional Breeding and Composite Populations with Recessive Male-Sterile Gene

Marc-Henri Châtel and Yolima Ospina

Annual Report 2000

CIRAD

The Centre de coopération internationale en recherche agronomique pour le développement (CIRAD) is a French research organization that specializes in agriculture in the tropics and subtropics. It is a state-owned body and was established in 1984, following the consolidation of French agricultural, veterinary, forestry, and food technology research organizations for the tropics and subtropics.

CIRAD's mission is to contribute to the economic development of these regions through research, experiments, training, and dissemination of scientific and technical information.

The Center employs 1800 persons, including 900 senior staff, who work in about 50 countries. Its budget amounts to approximately 1 billion French francs (152 million euros), more than half of which is derived from public funds.

CIRAD is made up of seven departments: CIRAD-CA (annual crops), CIRAD-CP (tree crops), CIRAD-FLHOR (fruit and horticultural crops), CIRAD-EMVT (livestock production and veterinary medicine), CIRAD-Forêt (forestry), CIRAD-TERA (territories, environment and people) and CIRAD-AMIS (advanced methods for innovation in science).
CIRAD operates through its own research centers, national agricultural research systems, or development projects.

CIAT

The International Center for Tropical Agriculture (CIAT, its Spanish acronym) is dedicated to the alleviation of hunger and poverty in developing countries. CIAT applies science to agriculture to increase food production while sustaining the natural resource base.

CIAT is one of 16 international agricultural research centers sponsored by the Consultative Group on International Agricultural Research (CGIAR).

25 donor countries, international and regional development organizations, and private foundations finance the Center's core budget. In 1997, the donor countries include Australia, Belgium, Brazil, Canada, Colombia, Denmark, France, Germany, Japan, the Netherlands, Norway, Spain, Sweden, Switzerland, the United Kingdom, and the United States of America. Donor organizations include the European Union (EU), the Ford Foundation, the Inter-American Development Bank, the International Development Research Center (IDRC), the International Fund for Agricultural Development (IFAD), the Nippon Foundation, the Rockefeller Foundation, the United Nations Development Program (UNDP), and the World Bank.

Information and conclusions reported in this document do not necessarily reflect the position of any donor agency.

FLAR

The Fund for Latin American and Caribbean Irrigated Rice (FLAR) is a means by which the public and private sectors of Latin American and Caribbean (LAC) countries can control and take responsibility for irrigated rice activities.

FLAR began in January 1995, after an Act of Acceptance was signed by delegates from Brazil, Colombia, Venezuela, the International Center for Tropical Agriculture (CIAT), and the International Rice Research Institute (IRRI). In 1996, Costa Rica, Panama, and the Centre de coopération internationale en recherche agronomique pour le développement (CIRAD) became members.

FLAR's mission is to promote sustainable development of irrigated rice production in LAC, that is, to make it competitive, profitable, and efficient while lowering relative prices of rice for the consumer. FLAR's objectives are:

- To provide up-to-date information on market needs and opportunities of member countries through a permanent forum.
- To pursue a broad approach in regional rice activities that are of interest to all members.
- Increase sustainable rice production, that is, ensure the efficiency of production, equitable distribution of benefits, and resource conservation.
- To focus mainly on irrigated rice.

RICE PROJECT IP-4
Improved Rice Germplasm for Latin America and the Caribbean

COLLABORATIVE PROJECT BETWEEN CIRAD, CIAT, AND FLAR

Rice Improvement, Using Gene Pools and Populations with Male-Sterile Gene And Conventional Breeding

Marc Châtel and Yolima Ospina

September 1999 - September 2000 Report

Summary

Activity 1. Conventional breeding for the upland savannas ecosystem

1. Introduction

As it has been stated in previous reports, we are gradually phasing out most of the activities involving the development of fixed lines, coming from traditional crosses, for direct release to NARS. Nevertheless, as we have advanced segregating lines in the pipeline, we continue their evaluation in Colombia and with our partners.

Furthermore we also evaluate and select inter-specific progenies between *Oryza sativa* and *O. glaberrima* from WARDA and *Oryza sativa* lines from Madagascar.

2. Line selection in Colombia

In Colombia, we continue the evaluation and selection of lines for the development of fixed material to be tested by CORPOICA in the "Altillanura" condition.

CIAT/CIRAD conventional breeding lines

In 1999, 156 lines (26 families of 6 lines) were evaluated and 16 (10.2%) were selected at LES. In each selected line 6 individual plants were harvested. Seeds were stored in the cold chamber, and a sample of each line sent to CIRAD.

WARDA inter-specific lines and *O. glaberrima* accessions

In 1999, one (1) WARDA line and three (3) *O. glaberrima* accessions were selected. The results of the evaluation were remitted to Dr. Cesar Martinez.

3. Use of CIAT/CIRAD lines and line release in Brazil

3.1. Use of CIAT/CIRAD lines

The participation of CIAT/CIRAD material in the different trials continues to be very important. The main characteristics the Brazilian praised from CIRAD/CIAT material are earlyness, plant and grain type.

3.2. Line release

In 1999, 2 lines from CIAT, CT 11614-1-4-1-M (CNA8172) and CT 11251-7-2-M-M (CNA8305) were released as BONANÇA and CARISMA respectively.

4. Line release in Bolivia

In 1999, the CIRAD line IRAT 170 was released as JASAYE.

It is well adapted to the rice cropping system used by small holders.

5. Use of CIAT and CIRAD lines in China

CIRAD- CA has close links with FCRI/YAAS in the Yunnan Province, and had shipped many upland lines in the recent years. After screening, they were used for direct release or as parents.

In 1999, FCRI/YAAS released the variety YUNLU 29, coming from a cross between a Chinese line and IRAT 216.

Lines from the CIAT/CIRAD project are under evaluation in different trials and sites. Progenies from CIAT/CIRAD and Chinese parents are also evaluated.

Activity 2. Population breeding for the upland savannas ecosystem

1. Introduction

The upland rice population breeding project, using recurrent selection, aims at adapting, developing and selecting tropical *japonica* gene pools and populations. The major characteristics we bred, for savanna conditions are:

- Tolerance of soil acidity
- Resistance to diseases; rice blast (*Pyricularia grisea* Sacc.)
- Resistance to pests, mainly rice plant hopper (*Tagosodes orizicolus*)
- Good grain quality (translucent, long-slender grain)
- Early maturity (total cycle about 115 days)

2. Population breeding

The activities we report here were conducted during the cropping seasons 1999 and 2000, at Villavicencio - Meta, "La Libertad Experiment Station" (LES) and off-season at "Palmira Experimental Station" (PES).

2.1. Line development from recurrent populations

During the enhancement of gene pools and populations through recurrent selection, fertile plants are selected.

This selection is the starting point for the development of promising fixed lines for variety release and/or potential parents for our regional partners (Argentina, Brazil, Bolivia, Venezuela and the Caribbean through CRID Net).

2.1.1. Generation S_1

The generation S_1 comes from stored seeds of fertile S_0 plants selected in EEP during 1999B, in the population PCT-4 used for the thesis of Yolima Ospina.

- PCT-4\0\0\0 (original population)
- PCT-4\0\0\2 (original population with 2 recombination)
- PCT-4\SA\1\1 (one cycle of selection for Acid Soil and 1 recombination)
- PCT-4\SA\2\1 (one cycle of selection for Acid Soil and 2 recombination)
- PCT-4\SA\3\1 (one cycle of selection for Acid Soil and 3 recombination)
- PCT-4\SA\4\1 (one cycle of selection for Acid Soil and 4 recombination)
- PCT-4\SA\1\1,SA\1 (two cycles of recurrent selection for Acid Soil).

During 2000A, a total of 229 S_1 lines was observed and selected at LES. Seventy-one (71) S_1 lines were selected by the breeders that attended the Upland Rice Workshop held in LES, during August 7-11. (Bolivia: 14; Brazil: 10; Colombia: 14; Cuba: 14; Venezuela: 5; Argentina: 14)

2.1.2. Generation S_2

The S_2 generation comes from S_0 fertile plants selected in two populations during the cropping season 1999.

- **Population PCT-11\0\0\2** (Second cycle of recombination **\2**)

Cropping season 1999A. Nineteen (19) individual S_0 fertile plants were selected.

During 1999B, the S_1 generation was grown off-season at PES.

During 2000A, the S_2 generation was observed and selected at LES. Results are not yet available

- **Populations PCT-4\0\0\0; PCT-4\SA\1\1; PCT-4\SA\2\1 and PCT-4\SA\3\1**

(Original population, one recombination cycle **\1** after one selection for acid soil **\SA**; two recombination cycles **\2** after one selection for acid soil **\SA**) and three recombination cycles **\3** after one selection for acid soil **\SA**, respectively).

Cropping season 1999 A. Two hundred thirty-seven (237) individual fertile plants were selected.

During 1999B, the S_1 generation was grown off-season at PES.

During 2000A, the S_2 generation was observed and selected at LES.

Thirty- seven (37) S_2 lines were selected by 3 breeders that attended the Upland Rice Workshop held in LES, during August 7-11. (Brazil: 8; Colombia: 15; Venezuela: 14)

2.1.3. Generation S_4

The generation S_4 comes from fertile S_0 plants selected at LES during the cropping season 1998A.

The generations S_1 and S_3 were advanced off-season during 1998 B at PES. The generation S_2 was selected in LES during the cropping season 1999.

- **Populations PCT-5\PHB\1\0,PHB\1,PHB\1**

PCT-A\PHB\1\0,PHB\1,PHB\; and PCT-4\PHB\1\1,PHB\1,PHB\1 (Third cycle of recurrent selection for leaf blast **P** and Hoja Blanca **HB**)

Cropping season 1999A

The 107 S_2 lines were evaluated and 3 selected (3%) in two populations (no selection was made in PCT-5\PHB\1\0,PHB\1,PHB\1).

During 1999B, the S_3 generation was grown off-season at PES. All lines were discarded.

- **Population PCT-4\SA\2\1**

(Second recombination cycle **\2** after one selection for acid soil **\SA**)

Cropping season 1999A

The 73 S_2 lines were evaluated and 5 were selected (6.8%) at LES. In each selected line a different number of individual plants was harvested.

During 1999B, the 23 S_3 lines (3 families of 6 lines, 1 family of 2 lines and 1 family of 3 lines) were grown off-season at PES. All lines were discarded

- **Population PCT-11\0\0\1**

(First cycle of recombination **\1** of the original population)

Cropping season 1999A

The 84 S_2 lines were evaluated and 4 selected (4.8%) at LES. In each selected line a different number of individual plants was harvested.

During 1999B, the 22 S_3 lines (3 families of 6 lines, 1 family of 4 lines) were grown off-season at PES, and 7 were selected.

During 2000A, the S_4 generation was observed and selected at LES.

Six (6) S_4 lines were selected by 3 breeders that attended the Upland Rice Workshop held in LES, during August 7-11. (Brazil: 1; Colombia: 3; Venezuela: 2)

2.1.4. Generation S_6

The generation S_6 comes from S_0 fertile plants selected during 1997A at LES.

The generations S_1, S_3 and S_5 were advanced off-season at PES during 1997B, 1998B and 1999B respectively.

Generations S_2 and S_4 were observed and selected at LES during the cropping seasons 1998A and 1999A respectively.

- **Populations PCT-5\PHB\1\0,PHB\1; PCT-A\PHB\1\0,PHB\1 and PCT-4\PHB\1\1,PHB\1** (Second recurrent selection cycle for leaf blast **P** and "hoja blanca" **HB**)

Cropping season 1999A

The 35 S_4 lines were evaluated at LES and 7 selected (20%) in the **population PCT-4\PHB\1\1,PHB\1 (lines from the two others populations were discarded).** In each selected line 6 fertile plants were harvested.

During 1999B, the 42 S_5 lines (7 families of 6 lines) were grown off-season at PES. Thirty-eight lines were selected.

During 2000A, the S6 generation was observed and selected at LES.

- **Population PCT-4\SA\1\1**

(First cycle of recombination **\1** after one selection for acid soil **\SA**)

Cropping season 1999A

The 390 S_4 lines were evaluated and 44 (11%) selected at LES. In each line 6 fertile plants were harvested.

During 1999B, the 264 S_5 lines (44 families of 6 lines) were grown off-season at PES. 251 lines were selected.

During 2000A, the S_6 generation was observed and selected at LES.

From a total of 289 S_6 lines from the two populations (PCT-4\PHB\1\1,PHB\1 and PCT-4\SA\1\1), 387 S6 lines were selected by the breeders of the six countries that attended the Upland Rice Workshop held in LES, during August 7-11. (Bolivia: 61; Brazil: 52; Colombia: 133; Cuba: 47; Venezuela: 33; Argentina: 61). The number of selected lines is higher than the real number of lines evaluated. This comes from the coincidence between the selection made by different breeders.

2.1.5. Generation S_7

The generation S_7 comes from S_0 fertile plants selected during 1996A at LES.

The generations S_1, S_3 and S_5 were advanced off-season at PES during 1996B, 1997B and 1998B, respectively.

The generations S_2, S_4 and S_6 were observed and selected at LES during the cropping seasons 1997A, 1998A and 1999A respectively.

- **Populations PCT-5\PHB\1\0;PCT-A\PHB\1\0 and PCT-4\PHB\1\1** (First cycle of recurrent selection for leaf blast **P** and rice "hoja blanca" virus **HB**)

Cropping season 1999A

The 150 S_6 lines were evaluated and 13 (8.7%) selected, **(in the population PCT-4\PHB\1\1 only),** at LES. In each selected line, 6 individual plants were harvested.

The S_6 lines were not advanced at PES during 1999 B, but were evaluated for grain quality and tolerance to *Tagosodes orizicolus*. 78 lines were selected.

During 2000 A, the generation S_7 was observed and selected at LES.

Fifty-four (54) S_7 lines were selected by the breeders of the six countries that attended the Upland Rice Workshop held in LES, during August 7-11. (Bolivia: 4; Brazil: 20; Colombia: 15; Cuba: 3; Venezuela: 8; Argentina: 4).

2.1.6. Generation S_9

The generation S_8 comes from fertile S_0 plants selected at LES during the cropping season 1995A.

Generations S_1, S_3, S_5 and S_7 were advanced off-season at PES during 1995B, 1996B, 1997B and 1998B respectively.

Generations S_2, S_4, S_6 and S_8 were observed and selected at LES during the cropping season 1996A, 1997A, 1998A and 1999A respectively.

- **Populations PCT-5\0\0\0, PCT-A\0\0\0, and PCT-4\0\0\1**

(Basic populations with no selection)

Cropping season 1999A

The 301 S_8 lines harvested in PES were evaluated and 44 selected (14.6%) from the two populations **PCT-A\0\0\0, and PCT-4\0\0\1** at LES. In each selected line, 6 individual plants were harvested.

The S_8 lines **were not** advanced at PES during 1999 B, but were evaluated for grain quality and tolerance to *Tagosodes orizicolus*. A total of 307 plants were selected.

- **Population PCT-4\0\0\1>S2** (Selection in S_2 lines of the basic population: LES, 1996A)

Cropping season 1999A

The 72 S_8 lines selected (12 families of 6 lines) were evaluated, and 6 were selected (8%) at LES. In each selected line, 6 individual plants were harvested.

During 1999B, the 36 lines (6 families of 6 lines) were not advanced, but were evaluated for grain quality and tolerance to *Tagosodes orizicolus*. Seeds were kept in the cold chamber of CIAT.

Cropping season 2000A

The 36 lines were evaluated at LES.

- **Populations PCT-5\0\0\0>S3, PCT-A\0\0\0>S3 and PCT-4\0\0\1>S3** (Basic populations. Plant selection in S_3 Lines at PES, 1996 B)

Cropping season 1999A

The 12 lines were evaluated and 1 was selected (8.3%) at LES. In each selected line, 6 individual plants were harvested.

During 1999B, the 36 lines (6 families of 6 lines) were grown off-season at PES, and all were discarded.

During 1999B, the 6 lines (1 family of 6 lines) were not advanced, but were evaluated for grain quality and tolerance to *Tagosodes orizicolus*. Seeds were kept in the cold chamber of CIAT.

Cropping season 2000A

The 6 lines were evaluated at LES.

During 2000 A, the S_9 lines were observed and selected at LES.

Two hundred seventy two (272) S_9 lines were selected by the breeders of the six countries that attended the Upland Rice Workshop held in LES, during August 7-11. (Bolivia: 41; Brazil: 66; Colombia: 56; Cuba: 38; Venezuela: 30; Argentina: 41).

2.2. Yield trials

Grain yield and quality trial using advanced generations

The advanced generations are promising fixed lines that passed through the all selection process. Selection of the best yielding lines showing excellent grain quality was made at LES and PES during 1999A and B semesters.

During the **cropping season 2000**, a trial was set-up at LES with the 24 best lines.

2.3. International upland rice workshop

The first International Workshop on Upland Rice recurrent selection was held at LES, during August 7-11. Segregating lines and populations were evaluated and selected by the breeders of the six countries that attended the event.

The Workshop aimed at:

- Promoting the integration of the upland rice breeders of the region.
- Sharing experiences in the management of breeding populations and the development of fixed lines.
- Selecting at field condition segregating and fixed lines to be introduced in each respective country (much better than only shipping-out lines).

Training breeders that are starting using recurrent selection (Argentina and new partners in Colombia - Universidad del Tolima y CENICAFE).

- Having the concept from the group about the outputs and results of the CIAT/CIRAD project.
- Knowing in a near future (next year) the behavior and adaptation of the selected lines in each Country.

2.4. Population enhancement

The CIAT rice project emphasizes pre-breeding activities. Then we concentrate on the enhancement of populations to be distributed to NARS.

The strategy is to develop and enhance gene pools and populations for well-targeted traits. They are therefore used as reservoir of promising lines and/or potential parents to be developed by national breeding programs.

In the first 3 years of the project, we concentrated on introducing, characterizing and selecting germplasm from Brazil (former joint project between EMBRAPA Rice and Beans). From 1995 onward, we focus on enhancing the selected populations and developing new ones.

2.4.1. Recurrent selection based on S_2 line evaluation

- **Population PCT-4\SA\2\1**

Cropping season 1999A

Recombination

The population PCT-4\SA\2\1 with one cycle of recurrence and recombined twice was grown at LES to obtain the third recombination identified as PCT-4\SA\3\1

Multi-site evaluation of S_2's lines

A set of 155 S_2 lines from the first cycle of recurrence (PCT-4\SA\1\1) was remitted to **Brazil** (EMBRAPA Arroz e Feijão), **Bolivia** (CIAT Santa Cruz), and **Venezuela** (UNELLEZ) for evaluation and selection for line development.

In Bolivia, 23 lines were selected and their progenies S3 evaluated during the cropping season 1999/2000. Thirteen lines were selected.

- **Population PCT-4\SA\3\1**

After the first selection cycle for acid soil **(SA)**, the population PCT-4 was recombined 3 times **(\3\)**. The resulting population was grown at LES during 2000 A, and S0 fertile plants selected. The generation S1 will be grown at PES during 2000 B and the S2 generation evaluated at LES during the cropping season 2001 A.

- **Population PCT-4\SA\1\1**

The population PCT-4\SA\1\1 with one cycle of recurrence (SA\1) was submitted to a second cycle of recurrent selection. The resulting enhanced population

(PCT-4\SA\1\1,SA\1) was grown during the year 2000 at LES. A third cycle of recurrent selection started through the selection of S_0 fertile plants. The generation S_1 will be grown at PES and the S_2 evaluated during 2001 A at LES.

2.4.2. Mass recurrent selection on both sexes for the rice "hora blanca"" virus, blast, and major agronomic traits

- Populations PCT-4\0\0\1, PCT-A\0\0\0, and PCT-5\0\0\0

In 1999, after completed 4 cycles of recurrence, the enhanced populations were stored in the CIAT's cold chamber at PES. They would be dispatched to LAC NARS as reservoir of genotypes for line development.

Results of the enhancement

- **Total resistance to leaf blast**

From the first cycle of selection on, a drastic reduction in the number of infected plants occurs.

The use of mass recurrent selection on both sexes was efficient for the enhancement of the 3 populations. At the same time we selected for total leaf blast resistance, we also selected for good agronomic characters. The enhanced populations will be used as reservoir for the development of fixed lines.

- **Resistance to rice "hoja blanca" virus**

S_2 evaluation of the enhanced populations showed that 97.2% have resistant and intermediate reaction to rice "hora blanca"" virus. They present a lower incidence of the disease than the lines from FEDEARROZ and ICA.

The enhanced populations can be considered as good reservoirs for the development of resistant fixed lines by LAC NARS.

Activity 3. Population breeding for lowland rice

1. Introduction

Population Breeding for Lowland irrigated rice is developed in close collaboration with FLAR partners in Latin America and CIRAD partners in Europe and Asia.

The population breeding project started by introducing to Colombia, different gene pools and populations previously developed in Brazil by Embrapa Rice and Beans Center and CIRAD, and by CIRAD in French Guyana.

The germplasm was characterized at CIAT, Palmira, and the best adapted ones were used to develop new populations. This resulted in three populations that were registered in the recurrent selection catalog as PCT-6, PCT-7, and PCT-8. This work was conducted at CIAT in close collaboration with Drs. C. Martínez and E. P. Guimarães.

A gene pool was also built up, using a different gene of male sterility. The gene pool was registered as GPCT-9.

A second gene pool, developed by CIRAD for temperate climates, was registered as GPIRAT-10.

From late 1996, this basic germplasm was dispatched to our regional partners and outside Latin America. It is the starting point for the development of population breeding in different countries.

In 1999, the II International Workshop on Rice Recurrent Selection, held in Goiânia-Brazil, was the occasion for our partners to present updated information on the use of population breeding.

Written documents were made available to all participants.

A book was edited by Dr. Elcio .P. Guimarães and published jointly by CIRAD, CIAT, Embrapa and Fundación DANAC.

In the final plenary session of the Workshop, it was discussed the opportunity to formalize the actual "not formal" network we have developed through the past years with our partners.

It was decided to create a formal group named "Grupo de Mejoramiento Genético Avanzado de Arroz" (GRUMEGA) with two coordinators: Dr. Elcio P. Guimarães (Embrapa Rice and Beans Center) and Marc Châtel (CIAT/CIRAD). A proposal to FAO for fund raising was prepared and circulated through our

partners. FAO will not fund the network but is acting as a facilitator for fund raising. Until now the "not formal network" has worked perfectly, but with external funds we should be able to develop more networking activities.

2. Development of site-specific composite populations

2.1. Venezuela

Two populations, PCT-6 and PCT-7, were selected as the best introduced material to be used as sources of male-sterile background to develop two new local populations, identified as **PFD-1** and **PFD-2**.

Cropping season 1999

At CIAT Palmira the built-up of the population **PFD-2** was completed and the basic population shipped to DANAC-Venezuela.

2.2. Argentina

Development of local populations

Argentina is developing 3 local populations: **PARG-1**, **PARG-2** and **PARG-3**

Cropping season 1999

Population **PARG-3**

This new population was developed at CIAT by introduction of 50% of variability from 6 new lines into the population PCT-8. The new local population will be ready in late 2000.

2.3. Chile

The Chilean population **PQUI-1** was selected in two sites with climatic differences (Chillán and Colchagua). The two populations, identified as **PQUI-1\Ch\0\1** and **PQUI-1\Co\1\0** were sent to CIAT Palmira for completing the third cycle of recombination.

Cropping season 1999

At CIAT Palmira, we used the remnant seeds of the second recombination to perform the third cycle during the first semester of 1999.

2.4. Uruguay

Three (3) populations are currently developed at CIAT, PURG-**1**, PURG-**2** and PURG-**3**.

Cropping seasons 1999 and 2000

The build-up of the populations for Uruguay is under way at CIAT Palmira.

3. Distributing Germplasm

In 1999, we shipped different populations to new partners in Europe (Spain and France).

4. Registering new populations

In 1999, four (4) new germplasms were registered on request from our collaborators from Chile, China and Venezuela.

PQUI-1 *Japonica* population for irrigated temperate ecosystem (INIA-Quilamapu, Chile).

GPYN-2 *Japonica* gene pool for temperate ecosystem (FCRI/YAAS, Yunnan Province - China).

PFD-1 and **PFD-2** *Indica* populations for tropical lowland ecosystem (DANAC – Venezuela).

5. Fixed line development through anther culture

5.1. From Chilean populations

To fasten the development of fixed lines for Chile, the Chilean populations were processed by anther culture at CIAT.

Cropping season 1999

The populations PQUI-1\Ch\2\0 and PQUI-1\Co\2\0 were grown at CIAT Palmira and plants processed at the CIAT laboratory.
325 R1 lines were produced in 1999. The R2 generation were advanced in Colombia during the first semester of year 2000, and then dispatched to Chile for evaluation and selection during the 2000 - 2001 Chilean cropping season.
The R1 lines were also shipped to the French Rice Center (CFR) in Arles-France, for evaluation during the cropping season 2000. Information received from Dr. Guy Clement from CIRAD in charge of the evaluation stated that these lines showed an excellent early vigor.

5.2. From the *Indica* population PCT-6

Population PCT-6\HB\1,HB\1,Bl(c)\1.

This germplasm is the result of the enhancement of the population PCT-6 for resistance to Hoja Blanca and Blast (two cycles of recurrent selection for the Hoja Blanca Virus -HB-, and one for total blast resistance Bl(c).
It was developed by M. Châtel (see last year report) for Hoja Blanca and by M. Vales for Blast resistance.
In 2000, the population was processed by anther culture at CIAT. The objective is to provide FLAR partners with the resulting lines.

5.3. From conventional crosses

5.3.1. For Romania

Two crosses (OLTENITSA / RUBINO, and CRISTAL / L 203) for cold tolerance, grain quality, and yield potential were processed by the CIAT anther culture laboratory.

Cropping season 1999

A total of 61 R1 DH lines were produced. The R2 seeds were shipped to Romania and also to France and Chile. The results of the evaluation are not yet available.

5.3.2. For Spain

On request from the collaborative project between Spain and CIRAD-CA, four crosses were made at CIAT Palmira and then processed by anther culture.
The F1 generation was grown during late 1999. In early year 2000, plants were processed by anther culture and R1 seeds sent to CIRAD.

Activity 4. Training activities. Conference organization. Workshop and publications

. **Training: National courses**

Colombia

"Curso de Mejoramiento del Cultivo de Arroz" held at CIAT Headquarters, September 25- October 6, 2000

Cuba

We are organizing jointly with **Embrapa (Brazil)** and **IIA (Cuba)** a National Course on recurrent selection to be held in CUBA in June 2001.

. **Thesis**

Eduin Blandón Arias. Student of the "Facultad de Ingeniería Agronómica, Universidad del Tolima".
"Caracterización y Adaptación en las condiciones del Norte del Tolima de Publicans de Arroz (*Oryza sativa* L.) de amplia y estrecha base genética desarrolladas con un gen de androesterilidad".

Yolima Ospina. Assistant of the CIAT/CIRAD project
Master Degree Thesis at the "Universidad Nacional de Palmira".
"Evaluation of genetic progress for acid soil tolerance and different agronomic characteristics".

. **Conference organization**

Brazil - September 1999

The second International Conference on Rice Recurrent Selection Breeding was held in Goiânia, 21 - 24 September 1999, and **organized by CIAT, CIRAD, EMBRAPA and Fundación DANAC, with the support of FAO and FLAR.** All our partners from the different countries attended the conference and presented updated information on the use of population breeding. CIAT, EMBRAPA and Fundación Polar published all the communications in a book.

. **Workshop**

In early 2000 we planed with Embrapa, the venue of an International Workshop at LES. The idea was to call our main partners to come to Colombia and select upland lines that could be useful for their breeding project.

The Workshop took place in Villavicencio during August 7-11, 2000.

Participants from Argentina (Universidad National de Tucumán), Bolivia (CIAT - Santa Cruz), Brazil (Embrapa - Arroz e Feijão), Colombia (CORPOICA, CENICAFE and Universidad del Tolima), Cuba (IIA) and Venezuela (FONAIAP) attended the Workshop.

Each participant presented a brief report about the progress made by his or her respective upland rice breeding project. At the La Libertad experimental Station, line selection was made by each participant (selections are presented in Activity 2.). The selected material was harvested and shipped to the respective countries.

. **Publications**

Book chapters in: "Avances en el Mejoramiento Poblacional del Arroz" (published in October 2000 by CIRAD/CIAT, Embrapa and Fundación DANAC).

Chapter 6: Mejoramiento poblacional de arroz irrigado con énfasis en el virus de la Hoja Blanca.
Borrero. J; Châtel. M and Triana. M

Chapter 8: Selección recurrente en Arroz: situación actual y perspectivas en Cuba.
Polanco. R. P; Châtel. M and Guimarães. E

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MEJORAMIENTO DE ARROZ

Utilizando el Mejoramiento Convencional y Poblaciones con un Gen Recesivo de Androesterilidad

Marc-Henri Châtel y Yolima Ospina

Informe Annual 2000

CIRAD

The Centre de coopération internationale en recherche agronomique pour le développement (CIRAD) is a French research organization that specializes in agriculture in the tropics and subtropics. It is a state-owned body and was established in 1984, following the consolidation of French agricultural, veterinary, forestry, and food technology research organizations for the tropics and subtropics.

CIRAD's mission is to contribute to the economic development of these regions through research, experiments, training, and dissemination of scientific and technical information.

The Center employs 1800 persons, including 900 senior staff, who work in about 50 countries. Its budget amounts to approximately 1 billion French francs (152 million euros), more than half of which is derived from public funds.

CIRAD is made up of seven departments: CIRAD-CA (annual crops), CIRAD-CP (tree crops), CIRAD-FLHOR (fruit and horticultural crops), CIRAD-EMVT (livestock production and veterinary medicine), CIRAD-Forêt (forestry), CIRAD-TERA (territories, environment and people) and CIRAD-AMIS (advanced methods for innovation in science).
CIRAD operates through its own research centers, national agricultural research systems, or development projects.

CIAT

The International Center for Tropical Agriculture (CIAT, its Spanish acronym) is dedicated to the alleviation of hunger and poverty in developing countries. CIAT applies science to agriculture to increase food production while sustaining the natural resource base.

CIAT is one of 16 international agricultural research centers sponsored by the Consultative Group on International Agricultural Research (CGIAR).

25 donor countries, international and regional development organizations, and private foundations finance the Center's core budget. In 1997, the donor countries include Australia, Belgium, Brazil, Canada, Colombia, Denmark, France, Germany, Japan, the Netherlands, Norway, Spain, Sweden, Switzerland, the United Kingdom, and the United States of America. Donor organizations include the European Union (EU), the Ford Foundation, the Inter-American Development Bank, the International Development Research Center (IDRC), the International Fund for Agricultural Development (IFAD), the Nippon Foundation, the Rockefeller Foundation, the United Nations Development Program (UNDP), and the World Bank.

Information and conclusions reported in this document do not necessarily reflect the position of any donor agency.

FLAR

The Fund for Latin American and Caribbean Irrigated Rice (FLAR) is a means by which the public and private sectors of Latin American and Caribbean (LAC) countries can control and take responsibility for irrigated rice activities.

FLAR began in January 1995, after an Act of Acceptance was signed by delegates from Brazil, Colombia, Venezuela, the International Center for Tropical Agriculture (CIAT), and the International Rice Research Institute (IRRI). In 1996, Costa Rica, Panama, and the Centre de coopération internationale en recherche agronomique *pour le développement (CIRAD)* became members.

FLAR's mission is to promote sustainable development of irrigated rice production in LAC, that is, to make it competitive, profitable, and efficient while lowering relative prices of rice for the consumer. FLAR's objectives are:

- To provide up-to-date information on market needs and opportunities of member countries through a permanent forum.
- To pursue a broad approach in regional rice activities that are of interest to all members.
- Increase sustainable rice production, that is, ensure the efficiency of production, equitable distribution of benefits, and resource conservation.
- To focus mainly on irrigated rice.

PROYECTO ARROZ IP-4
Mejoramiento del Arroz para América Latina y el Caribe

PROYECTO COLABORATIVO ENTRE EL CIRAD, EL CIAT Y EL FLAR

Mejoramiento Poblacional con Androesterilidad y Mejoramiento Convencional

Marc Châtel y Yolima Ospina

Informe anual: Septiembre 1999 - Septiembre 2000

Resumen

Actividad 1. Mejoramiento convencional del arroz de sabanas

1. Introducción

Como ya se ha planteado en los informes de los precedentes años, estamos paulatinamente terminando las actividades de desarrollo de líneas fijas, de cruces convencionales, para su entrega inmediata a los programas nacionales. Sin embargo, existen líneas avanzadas creadas anteriormente por el proyecto cuya evaluación sigue, tanto en Colombia como en otros países.

A demás estamos evaluando y seleccionando líneas procedentes de cruces inter-especificos entre *Oryza sativa* y *O. glaberrima* introducidas de WARDA, como también líneas de *Oryza sativa* introducidas de Madagascar.

2. Selección de líneas en Colombia

En Colombia, continuamos la evaluación y selección de líneas para el desarrollo de líneas fijas que serán entregadas a CORPOICA para su adaptación a las condiciones de la Altillanura Colombiana.

Líneas del proyecto convencional CIAT/CIRAD

En 1999, 156 líneas (26 familias de 6 líneas) fueron evaluadas y 16 (10.2%) seleccionadas. En cada una se escogieron 6 plantas individuales. La semilla se guardo en el cuarto frío, y una muestra se envío al CIRAD.

Líneas inter-especificas de WARDA y de *O. glaberrima*

En 1999, una línea de WARDA y 3 de *O. glaberrima* fueran seleccionadas. Los resultados de las evaluaciones se remitieran al Dr. César Martinez.

3. Utilización de la líneas CIAT/CIRAD y lanzamiento en Brasil

3.1. Utilización de las líneas CIAT/CIRAD

La participación del material vegetal del proyecto CIAT/CIRAD siga siendo muy importante. Las principales características de este material son precocidad, el tipo de grano y tipo de planta bien adaptado a las condiciones brasileñas.

3.2. Lanzamiento de líneas

En 1999, 2 de ellas; CT 11614-1-4-1-M (CNA8172) y CT 11251-7-2-M-M (CNA8305), fueron lanzadas como BONANÇA y CARISMA respectivamente.

4. Lanzamiento de líneas en Bolivia

En 1999, la línea IRAT 170 del CIRAD fue lanzada como JASAYE.
Ella es muy bien adaptada a las condiciones de cultivo de los pequeños agricultores.

5. Utilización de las líneas del CIAT y del CIRAD en la China

El CIRAD-CA tiene estrecha colaboración con el FCRI/YAAS en la Provincia del Yunnan. Se enviaron líneas de arroz de secano que, después su evaluación y selección fueron lanzadas como cultivar o utilizadas como progenitores potenciales (IRAT 104, IRAT 359 y IRAT 216 respectivamente).
En 1999, el FCRI/YAAS lanzo la variedad YUNLU 29, que proviene de un cruce entre una línea china y la IRAT 216.
Líneas del proyecto CIRAD/CIAT como también descendencias de cruces entre líneas chinas y CT están siendo evaluadas en diferentes ensayos.

Actividad 2. Mejoramiento poblacional del arroz de sabanas

1. Introducción

El proyecto de mejoramiento poblacional utilizando la *selección recurrente tiene como objetivo* la adaptación, el desarrollo y la selección de poblaciones y acervos genéticos de tipo *japonico* tropical. Las principales características que se buscan mejorar para las condiciones de sabanas son las siguientes:

- Tolerancia a la acidez del suelo
- Resistencia a Piricularia (*Pyricularia grisea* Sacc.)
- Resistencias al insecto vector del virus de la Hoja Blanca (*Tagosodes orizicolus*)
- Buena calidad de grano (translucido y largo- fino)
- Precocidad (ciclo total de 115 días)

2. Mejoramiento poblacional

Las actividades reportadas en este informe fueron conducidas durante la estación de cultivo, Abril - Septiembre 1999, semestres A y B y Abril - Septiembre 2000, semestre A, en Villavicencio - Meta en la Estación Experimental "La Libertad" (EELL) y la Estación Experimental Palmira (EEP).

2.1. Desarrollo de líneas de poblaciones recurrentes

Durante el mejoramiento de las poblaciones por selección recurrente, se seleccionan plantas fértiles.
Estas son el punto de partida para el desarrollo de líneas fijas o de progenitores potenciales, en colaboración con nuestros principales socios (Argentina, Brasil, Bolivia, Venezuela y el Caribe, CRID Net).

2.1.1. Generación S_1

La generación S_1 viene de la semilla guardada de las plantas So seleccionadas en la EELL en el 1999B, en la población PCT-4 que se utilizo para la tesis de Yolima Ospina.

- PCT-4\0\0\0 (población original)
- PCT-4\0\0\2 (población original con 2 recombinaciones)
- PCT-4\SA\1\1 (un ciclo de selección para Suelos Acidos y una recombinación)
- PCT-4\SA\2\1 (un ciclo de selección para Suelos Acidos y dos recombinaciones)
- PCT-4\SA\3\1 (un ciclo de selección para Suelos Acidos y tres recombinaciones)
- PCT-4\SA\4\1 (un ciclo de selección para Suelos Acidos y cuatro recombinaciones)
- PCT-4\SA\1\1,SA\1 (dos ciclos de selección recurrente para Suelos Acidos).

Durante el 2000A, un total de 229 líneas se observo en la EELL. 71 líneas S_1 fueran seleccionadas por los mejoradores de los 6 países que atendieran el Taller Internacional de selección de líneas del 7 al 11 de Agosto en la EELL. (Bolivia: 14; Brasil: 10; Colombia: 14; Cuba: 14; Venezuela: 5; Argentina: 14)

2.1.2. Generación S_2

La generación S_2 viene de plantas fértiles S_0 seleccionadas en dos poblaciones en 1999A.

- **Población PCT-11\0\0\2** (Segundo ciclo de recombinación**\2**)

1999A. Diecinueve (19) plantas individuales S_0 fueran seleccionadas.

1999B, la generación S_1 se avanzó en la EEP.

2000A, la generación S_2 se observó y se seleccionó en la EELL.

- **Poblaciones PCT-4\0\0\0; PCT-4\SA\1\1; PCT-4\SA\2\1 y PCT-4\SA\3\1**

(Población original, una recombinación**\1** después de una selección para Suelos Acidos**\SA**; dos recombinaciones**\2** después de una selección para Suelos Acidos**\SA** y tres recombinaciones**\3** después de una selección para Suelos Acidos**\SA**, respectivamente).

1999A. Doscientos treinta y siete (237) plantas fértiles individuales se seleccionaran.

1999B, la generación S_1 se avanzo en la EEP.

2000A, la generación S_2 se observó y se seleccionó en la EELL.

Treinta y siete (37) líneas S_2 fueran seleccionadas por 3 mejoradores de los 6 países que atendieran el Taller Internacional realizado en la EELL durante Agosto 7-11. (Brasil: 8; Colombia: 15; Venezuela: 14).

2.1.3. Generación S_4

La generación S_4 viene de las plantas fértiles S_0 seleccionadas en la EELL durante 1998A.

Las generaciones S_1 y S_3 se avanzaran durante 1998 B en la EEP. LA generación S_2 se seleccionó en la EELL durante 1999A.

- **Poblaciones PCT-5\PHB\1\0,PHB\1,PHB\1**

PCT-A\PHB\1\0,PHB\1,PHB\; y PCT-4\PHB\1\1,PHB\1,PHB\1 (Tercer ciclo de selección recurrente para Piricularia **P** y Hoja Blanca **HB**)

1999A

Las 107 líneas S_2 fueran evaluadas y 3 se seleccionaran (3%) en dos poblaciones (ninguna selección se hizo en la PCT-5\PHB\1\0,PHB\1,PHB\1).

1999B, la generación S_3 se avanzó en la EEP y todas las líneas fueran descartadas.

- **Población PCT-4\SA\2\1**

(Segundo ciclo de recombinación**\2** después de una selección para Suelos Acidos**\SA**)

1999A

Las 73 líneas S_2 fueran evaluadas y 5 seleccionadas (6.8%) en la EELL. En cada una se eligió un numero diferente de plantas individuales.

1999B, las 23 líneas S_3 (3 familias de 6 líneas, 1 familia de 2 líneas y 1 familia de 3 líneas) se avanzaran en la EEP. Todas fueran descartadas.

- **Población PCT-11\0\0\1**

(un ciclo de recombinación**\1** de la población original)

1999A

Las 84 líneas S_2 fueran observadas y 4 se seleccionaran (4.8%) en la EELL. En cada una se eligió un número diferente de plantas individuales.

1999B, las 22 líneas S_3 (3 familias de 6 líneas, 1 familia de 4 líneas) se avanzaran en la EEP, y 7 se seleccionaran.

Durante 2000A, la generación S_4 se observó y se seleccionó en la EELL. Seis (6) S_4 líneas fueran seleccionadas por los mejoradores de 3 de los 6 países que atendieran el Taller Internacional realizado durante Agosto 7-11. (Brasil: 1; Colombia: 3; Venezuela: 2).

2.1.4. Generación S_6

La generación S_6 viene de plantas fértiles S0 seleccionadas durante 1997A en la EELL.
Las generaciones S_1, S_3 y S_5 se avanzaran en la EEP durante 1997B, 1998B y 1999B respectivamente.
Las generaciones S_2 y S_4 se observaran y se seleccionaran en la EELL durante 1998A y 1999A respectivamente.

- **Poblaciones PCT-5\PHB\1\0,PHB\1; PCT-A\PHB\1\0,PHB\1 y**

PCT-4\PHB\1\1,PHB\1 (Segundo ciclo de selección recurrente para Piricularia **P** y Hoja Blanca **HB**)
1999 A
Las 35 líneas S_4 se evaluaron en la EELL y 7 se seleccionaron (17%) en la población PCT-4\PHB\1\1,PHB\1. En cada línea seleccionada se cosecharon 6 plantas individuales.
1999 B, las 42 líneas S_5 (7 familias de 6 líneas) se sembraron en la EEP y 38 se seleccionaran.
2000A, la generación S_6 se observó y se seleccionó en la EELL.

- **Población PCT-4\SA\1\1**

(Primer ciclo de recombinación **\1** después de una selección para suelos ácidos **\SA**)
1999 A
Las 390 líneas S_4 fueron evaluadas y se seleccionaron 44 (11%) en la EELL. En cada una se escogió 6 plantas individuales.
1999 B, las 264 líneas S_5 (44 familias de 6 líneas) se sembraron en la EEP y 251 líneas fueran seleccionadas.
2000A, la generación S_6 se observó y se seleccionó en la EELL.
De un total de 289 S_6 líneas de las poblaciones (PCT-4\PHB\1\1,PHB\1 y PCT-4\SA\1\1), 387 líneas fueran seleccionadas por los mejoradores de los 6 países que atendieran el Taller Internacional de Agosto 7-11. (Bolivia: 61; Brasil: 52; Colombia: 133; Cuba: 47; Venezuela: 33; Argentina: 61). El numero de líneas seleccionadas es mayor que el numero total de líneas, pues hay coincidencia en las selecciones de los diferentes países.

2.1.5. Generación S_7

La generación S_7 viene de las plantas S_0 seleccionadas en la EELL, en 1996A.
Las generaciones S_1, S_3 y S_5 se avanzaron en la EEP durante 1996B, 1997B y 1998B respectivamente.
Las generaciones S_2, S_4 y S_6 se observaron y se seleccionaron en la EELL durante 1997A, 1998A y 1999A respectivamente.

- **Poblaciones PCT-5\PHB\1\0; PCT-A\PHB\1\0 y**

PCT-4\PHB\1\1 (Primer ciclo de selección recurrente para Piricularia en hoja **P** y Hoja Blanca **HB**)
1999A
Las 150 líneas S_6 fueron evaluadas y se seleccionaron 13 (8.6%) en la EELL. En cada una de las líneas seleccionadas se cosecharon 6 plantas individuales.
1999B, las 78 líneas (13 familias de 6 líneas) no se sembraron en la EEP pero pasaran por evaluación de calidad de grano y de *Tagosodes orizicolus*. 78 líneas fueran seleccionadas.
2000A, la generación S_7 fue observada y seleccionada en la EELL.
De un total de 78 líneas S_7 observadas, 54 fueran seleccionadas por los mejoradores de los 6 países que atendieran el Taller Internacional de Agosto 7-11. (Bolivia: 4; Brasil: 20; Colombia: 15; Cuba: 3; Venezuela: 8; Argentina: 4).

2.1.6. Generación S_9

La generación S_8 viene de las plantas S_0 seleccionadas en la EELL durante 1995A.
Las generaciones S_1, S_3, S_5 y S_7 fueron avanzadas en la EEP durante 1995B, 1996B, 1997B y 1998B respectivamente.

Las generaciones S_4, S_6 y S_8 se observaron y se seleccionaron en la EELL durante 1996A, 1997A, 1998A y 1999A respectivamente.

- **Poblaciones PCT-5\0\0\0, PCT-A\0\0\0, y PCT-4\0\0\1**

(Poblaciones originales sin selección recurrente)

1999A

Las 301 líneas S_8 se evaluaron y se seleccionaron 44 (14.6%) en la EELL. En cada línea seleccionada se cosecho 6 plantas individuales.

1999B, las 264 líneas (44 familias de 6 líneas) no se sembraron en la EEP pero pasaran por evaluación de calidad de grano y de *Tagosodes orizicolus*. Un total de 307 plantas fue seleccionado.

- **Población PCT-4\0\0\1>S2** (Selección en líneas S_2 de la población original, EELL 1996A)

1999A

Las 72 líneas S_8 se evaluaron y se seleccionaron 6 (8%) en la EELL. En cada una se cosecharon 6 plantas individuales.

1999B, las 36 líneas (6 familias de 6 líneas) no se sembraron en la EEP pero pasaran por evaluación de calidad de grano y de *Tagosodes orizicolus*. La semilla se guardo en el cuarto frío de CIAT.

2000A

Las 36 líneas se evaluaran en la EELL.

- **Poblaciones PCT-5\0\0\0>S3, PCT-A\0\0\0>S3 y PCT-4\0\0\1>S3**

(Población base con selección de plantas en líneas S_3 en la EEP en 1996 B)

1999A

Las 12 líneas S_8 se evaluaron y se selecciono 1 (8%) en la EELL. En cada una se cosecharon 6 plantas individuales.

1999B, las 6 líneas (1 familia de 6 líneas) no se sembraron en la EEP pero pasaran por evaluación de calidad de grano y de *Tagosodes orizicolus*. La semilla se guardo en el cuarto frío de CIAT.

2000A, las 6 líneas S_9 se observaran y se seleccionaran en la EELL.

De un total de 307 líneas S_9, 272 fueran seleccionadas por los mejoradores de los 6 países que atendieran el Taller Internacional de Agosto 7-11. (Bolivia: 41; Brasil: 66; Colombia: 56; Cuba: 38; Venezuela: 30; Argentina: 41).

2.2. Ensayo

Ensayo de rendimiento y calidad de grano de líneas en generación avanzadas

Las generaciones avanzadas corresponden a líneas fijas que pasaran por todas las etapas de evaluación y selección. Se hizo una selección de algunos materiales en la EELL y la EEP durante 1999A y 1999B.

Durante 2000A, un ensayo fue montado en la EELL con 24 líneas y 3 testigos.

2.3. Taller internacional de selección de líneas

El primer Taller Internacional de selección de material de arroz de secano se realizo en la EELL durante Agosto 7-11. Líneas segregantes y poblaciones fueran evaluadas y seleccionadas por los mejoradores de 6 países que atendieran el evento.

El propósito del Taller era de:

- Promover la integración de los mejoradores de arroz de secano de la región.
- Compartir las experiencias en el manejo del mejoramiento poblacional y el desarrollo de líneas fijas.
- Seleccionar en condiciones de campo líneas segregantes y fijas a ser introducidas en los proyectos nacionales de cada país.
- Entrenar a los mejoradores que están apenas empezando utilizar el mejoramiento poblacional (Argentina- región de Tucumán y Colombia -Universidad del Tolima y CENICAFE).
- Tener el concepto del grupo sobre los resultados alcanzados por el proyecto CIAT/CIRAD.

- Conocer en un cercano futuro el comportamiento y adaptación del material seleccionado en cada uno de los países.

2.4. Mejoramiento poblacional

EL proyecto Arroz de CIAT se enfoca en el pre-mejoramiento. Entonces nos concentramos en el mejoramiento de poblaciones para su posterior entrega a los programas nacionales.

La estrategia es de desarrollar y mejorar germoplasma para características de interés. Estos germoplasmas mejorados sirven como fuente para el desarrollo de líneas fijas y/o progenitores potenciales para los programas nacionales.

2.4.1. Selección recurrente con evaluación de descendencias S_2

- **Población PCT-4\SA\2\1**

1999 A

Recombinación

La población PCT-4\SA\2\1 con un ciclo de selección recurrente seguido de dos recombinaciones se sembró en la EELL para obtener el tercer ciclo de recombinación identificado como PCT-4\SA\3\1

Evaluación multi-local de líneas S_2

155 líneas S_2 fueron enviadas a Brasil (EMBRAPA Arroz e Feijão), Bolivia (CIAT Santa Cruz), y **Venezuela** (UNELLEZ) para evaluación, selección y desarrollo de líneas.

En Bolivia, 22 líneas fueron seleccionadas y sus progenies S_3 evaluadas durante la campaña 1999/2000. 13 líneas S_3 fueran seleccionadas.

- **Población PCT-4\SA\3\1**

Después del primer ciclo de selección para Suelos Acidos (SA), la población PCT-4 fue recombinada 3 veces (\3\). La población resultante fue sembrada en la EELL durante el año 2000 y se seleccionaran plantas fértiles La generación S1 será avanzada en la EEP durante 2000B y la generación S2 será evaluada en la EELL en el 2001A.

- **Población PCT-4\SA\1\1**

La población PCT-4\SA\1\1 con un ciclo de selección recurrente(SA\1) fue sometida a un segundo ciclo de recorrencia. La población mejorada resultante (PCT-4\SA\1\1,SA\1) fue sembrada durante 2000A en la EELL. Un tercer ciclo de selección recurrente empezó con la selección de plantas fértiles S_0. La generación S_1 será avanzada en la EEP durante 2000B, y la generación S_2 será evaluada en la EELL durante 2001A.

2.4.2. Selección recurrente masal en ambos sexos para piricularia, el virus de la hoja blanca, y caracteres agronómicos.

- **Poblaciones PCT-4\0\0\1, PCT-A\0\0\0, y PCT-5\0\0\0**

1998B, después de haber completado 4 ciclos de selección recurrente, las poblaciones mejoradas se almacenaron en el cuarto frío de CIAT. Ellas serán enviadas a los programas nacionales, para analizar su comportamiento y seleccionarlas.

Resultados del mejoramiento

- **Resistencia total a piricularia hoja**

A partir del primer ciclo de selección se observo una muy fuerte disminución del numero de plantas infectadas.

- **Resistencia al virus de la hoja blanca**

La evaluación de líneas S_2 del germoplasma mejorado mostró que 97.2% de ellas presentaron resistencia o reacción intermediaria al virus de la hoja blanca.

La utilización de la selección recurrente masal sobre los dos sexos fue eficiente para el mejoramiento de las 3 poblaciones. Al mismo tiempo que se seleccionaba para la resistencia total a la Piricularia, se ha

hecho unas selecciones para los caracteres agronómicos. Las poblaciones mejoradas serán utilizadas por los programas nacionales cono fuente de germoplasma mejorado para el desarrollo de líneas.

Actividad 3. Mejoramiento poblacional del arroz de riego

1. Introducción

El proyecto de mejoramiento poblacional para el arroz de riego se esta desarrollando en América Latina en colaboración con los socios del FLAR y en Europa y Asia con los socios del CIRAD.

El proyecto comenzó con la introducción en Colombia de diferentes acervos genéticos y poblaciones desarrolladas en Brasil por el Embrapa Arroz e Feijão y el CIARD, y en Guyana Francesa por el CIRAD.

El germoplasma introducido fue caracterizado en CIAT Palmira, y los mejores adaptados fueron utilizados para crear nuevas poblaciones. El resultado fue la obtención de 3 nuevas poblaciones que se registraron como PCT-6, PCT-7, y PCT-8. Este trabajo se hizo en colaboración con los Dr. C. Martínez y E. P. Guimarães.

Se creo también un acervo genético con un nuevo gene de androesterilidad, diferente del utilizado anteriormente. El acervo se registro como GPCT-9.

Otro acervo, anteriormente desarrollado por el CIRAD para las condiciones de clima templado fue registrado como GPIRAT-10.

A partir del final del año de 1996, los germoplasmas base fueron enviados a diferentes programas nacionales en América Latina. Estos germoplasmas fueron el punto de partida de los programas de mejoramiento poblacional en los países.

En septiembre de 1999, el Segundo Taller Internacional de Selección Recurrente en Arroz se realizó en Goiânia-Brasil. Durante este evento, los diferentes colaboradores presentaron los avanzos alcanzados en sus proyectos de mejoramiento. Un documento con todas las publicaciones fue distribuido a los participantes. El Dr. Elcio Guimarães editó un libro que será publicado en Octubre del año 2000 por el CIRAD, el CIAT, la Embrapa y la Fundación DANAC.

Al final del segundo Taller de Selección Recurrente de Goiânia, se discutió la oportunidad de formalizar la actual "red informal" que se desarrollo a lo largo de los años con los socios.

Se decidió la creación de un grupo formal llamado "Grupo de Mejoramiento Genético Avanzado de Arroz" (GRUMEGA) con dos coordinadores; Dr. Elcio P. Guimarães (Embrapa Arroz e Feijão) y Marc Châtel del proyecto CIAT/CIRAD. Una propuesta de proyecto de red fue sometida a los socios y presentado a la FAO para que nos ayudara en encontrar un financiamiento. Hasta el momento, la red informal ha funcionado perfectamente pero si se pudiera conseguir mas fondos, se podría desarrollar mas actividades.

En este informe solo estaremos presentando las actividades desarrolladas en Colombia por el proyecto CIAT/CIRAD.

2. Desarrollo de poblaciones locales

2.1. Venezuela

Las dos poblaciones, PCT-6 y PCT-7, fueron seleccionadas como las mejores dentro de las introducidas. Ellas fueron utilizadas como fuente de androesterilidad para crear dos poblaciones locales identificadas como **PFD-1** y **PFD-2**.

1999

La población **PFD-2** fue sintetizada en CIAT Palmira y se envío a DANAC-Venezuela.

2.2. Argentina

En Argentina se están creando 3 poblaciones denominadas **PARG-1**, **PARG-2** y **PARG-3**

están reportada en el capitulo Actividad 2.). El material seleccionado fue cosechado y enviado a las respectivas Instituciones.

. Publicaciones

Capítulos del libro:"Avances en el Mejoramiento Poblacional del Arroz" (publicado en Octubre 2000 por CIRAD/CIAT, Embrapa y Fundación DANAC).

Capitulo 6: Mejoramiento poblacional de arroz irrigado con énfasis en el virus de la Hoja Blanca.
Borrero. J; Châtel. M y Triana. M

Capitulo 8: Selección recurrente en Arroz: situación actual y perspectivas en Cuba.
Polanco. R. P; Châtel. M y Guimarães. E

Capitulo 10: Mejoramiento poblacional en Uruguay: caracterización y desarrollo de germoplasma.
Pérez de Vida. F. B; Châtel. M y Borrero. J

Capitulo 11: Desarrollo de poblaciones de arroz en Argentina.
Marassi. J. E; Marassi. M. A; Châtel. M y Borrero. J

Capitulo 12: Desarrollo de poblaciones japonicas para Chile.
Hernaiz. S; Alvarado. R; Châtel. M y Borrero. J

Chapter 15: Mejoramiento poblacional del arroz de sabanas.
Ospina. Y; Châtel. M; y Guimarães. E

Informes

- Achievements of the Rice Collaborative Project between CIRAD-CA and CIAT. CIAT- CIO Strategic Alliance Meeting
Montpellier-France, 22-24 June, 1999.
- Collaborative Project between CIRAD CIAT and FLAR
Population Breeding using gene pools and populations with recessive male-sterile gene, and conventional breeding. Annual Report CIAT/CIRAD/FLAR - October 1999.

Presentaciones

Francia - Junio y Septiembre 1999

- CIAT/CIO Strategic alliance meeting
The CIAT/CIRAD rice collaborative project. Montpellier-France, June 1999
- Diversité des partenariats et excellence scientifique. Montpellier-France, September 1999

Bolivia - Febrero 2000

Selección recurrente en Arroz; proyecto CIAT/CIRAD
Santa Cruz de la Sierra - Bolivia; Febrero 2000

Argentina - Marzo 2000

Arroz de secano en Latinoamérica
Universidad de Tucumán-Argentina; Marzo 2000

Posteres

- Upland Rice for High Altitude.
An option against food insecurity in the Andean hillsides
Valès. M; Châtel. M; Borrero, J; Barrios. E y Roa. J.I
- Breeding strategy for durable rice blast resistance.
Recurrent selection for complete and partial resistance and other agronomic traits
Valès. M; Châtel. M; Borrero.j y Dossmann.J
3rd International Crop Science Congress 2000-10-31
Agosto 17-22, Hamburgo-Alemania

1999

Población **PARG-3**

Esta población se esta sintetizando en CIAT Palmira por la introducción de 6 líneas, representando 50% de nueva variabilidad, en la población PCT-8. La nueva población estará lista al final del 2000.

2.3. Chile

La población chilena **PQUI-1** fue seleccionada en dos sitios (Chillan y Colchagua) que corresponden a dos situaciones climáticas diferentes. Las dos poblaciones se identifican como **PQUI-1\Ch\0\1** y **PQUI-1\Co\1\0** se mandaran al CIAT Palmira para completar sur segundo ciclo de recombinación.

1999

En CIAT Palmira, se completo el tercer ciclo de recombinación de ambas poblaciones durante el primer semestre de 1999.

2.4. Uruguay

Tres (3) poblaciones están siendo creadas en colaboración con el CIAT Palmira. Son ellas: **PURG-1, PURG-2** y **PURG-3**

1999 y 2000

La creación de estas poblaciones se esta realizando en CIAT Palmira.

3. Distribución de germoplasma

En 1999, se envío unas poblaciones base a nuevos socios, en Europa (España y Francia).

4. Registración de nuevas poblaciones

En 1999, se registraron 4 nuevas poblaciones a pedido de nuestros colaboradores en Chile, China y Venezuela.

- **PQUI-1** Población *Japonica* para las condiciones de clima templado (INIA-Quilamapu, Chile).
- **GPYN-2** Acervo genético *Japonica* para las condiciones de clima templado (FCRI/YAAS, Provincia del Yunnan - China).
- **PFD-1** y **PFD-2** Poblaciones *Indica* para riego tropical (DANAC – Venezuela).

5. Desarrollo de líneas fijas por cultivo de anteras

5.1. Población chilena

Para adelantar la obtención de líneas fijas para Chile, las dos poblaciones chilenas pasaron por cultivo de anteras en el laboratorio de CIAT.

1999

Las poblaciones PQUI-1\Ch\2\0 y PQUI-1\Co\2\0 se sembraran en CIAT Palmira y sus plantas fueron procesadas en el laboratorio.

325 líneas R1 fueron producidas y la generación R2 fue avanzada en Colombia y luego su semilla enviada a Chile para la evaluación y selección durante la campaña 2000/2001.

Las líneas R1 se enviaran al Centro Francés del Arroz (CFR) de Arles en Francia, para su evaluación durante el año 2000. Información recibida del Dr. Clément muestra que estas líneas tienen un excelente vigor inicial que es una característica de alta relevancia para las condiciones locales de cultivo.

5.2. Población *Indica* PCT-6

Población PCT-6\HB\1,HB\1,Bl(c)\1.

Esta población es el resultado del mejoramiento de la población PCT-6 para la resistencia al virus de la Hoja Blanca y a la Piricularia (dos ciclos de selección recurrente para Hoja Blanca Virus -HB- hecho por Marc Châtel, y uno para la resistencia total a la Piricularia Bl(c) hecho por el Dr. M. Valès.

En el año 2000, la población paso por cultivo de anteras en el laboratorio del CIAT. El objetivo es de entregar líneas fijas a los socios del FLAR después de una evaluación el Colombia.

5.3. Cruces convencionales

5.3.1. Para Rumania

Dos cruces simples, (OLTENITSA / RUBINO, y CRISTAL / L 203) específicamente hechos para la tolerancia al frío, rendimiento y calidad de grano, fueron procesados en el laboratorio de CIAT.

1999

Un total de 61 líneas R1 fue producida y su semilla enviada a Rumania, Francia y Chile.

5.3.2. Para España

A pedido de España y del CIRAD-CA, 4 cruces simples se hicieran en CIAT, para después ser procesados por cultivo de anteras.

La semilla F1 se ha producido, la generación F1 se sembró en el segundo semestre de 1999. Las plantas fueran procesadas durante el primer semestre del año 2000 y la generación R1 enviada al CIRAD.

Actividad 4. Entrenamiento. Organización de conferencias. Talleres y publicaciones

. Entrenamiento: Cursos nacionales

Colombia

"Curso de Mejoramiento del Cultivo de Arroz" realizado en CIAT Palmira, Septiembre 25 - Octubre 6, 2000

Cuba

Estamos organizando junto con el Embrapa (Brasil) y el IIA (Cuba) un Curso Nacional de Mejoramiento Poblacional que tendrá lugar en CUBA en Junio del 2001.

. Tesis

Eduin Blandón Arias. Facultad de Ingeniería Agronómica, Universidad del Tolima.

"Caracterización y Adaptación en las condiciones del Norte del Tolima de poblaciones de Arroz (*Oryza sativa* L.) de amplia y estrecha base genética desarrolladas con un gen de androesterilidad".

Yolima Ospina. Asistente del proyecto CIAT/CIRAD. Universidad Nacional de Palmira.

"Evaluación del progreso genético para las condiciones de suelos ácidos y diferentes características agronómicas".

. Organización de conferencia

Brasil - Septiembre 1999

La Segunda Conferencia Internacional de Mejoramiento Poblacional por selección recurrente se realizo en Goiânia, del 21 al 24 de Septiembre del 1999. La organizaran el CIAT, el CIRAD, la EMBRAPA y la Fundación DANAC, con el soporte de la FAO y del FLAR. Todos nuestros socios atendieran la conferencia y presentaran sus resultados actualizados. Se publico un libro agrupando las presentaciones.

. Taller

Al principio del 2000, planificamos con la Embrapa, la organización de un Taller Internacional en la EELL. La idea era de invitar a nuestros socios para seleccionar líneas segregantes y poblaciones.

El Taller tuvo lugar en Villavicencio del 7 al 11 de Agosto del 2000.

Participantes de Argentina (Universidad Nacional de Tucumán), Bolivia (CIAT - Santa Cruz), Brasil (Embrapa - Arroz e Feijão), Colombia (CORPOICA, CENICAFE y Universidad del Tolima), Cuba (IIA) y Venezuela (FONAIAP) atendieran el Taller.

Cada participante presento resultados sobre el progreso alcanzado por su proyecto de mejoramiento de arroz de secano. El la EELL los participantes seleccionaran líneas segregantes y fijas (las selecciones

RICE IMPROVEMENT

Using Conventional Breeding and Composite Populations with Recessive Male-Sterile Gene

Marc-Henri Châtel and Yolima

Annual Report 2000

PRESENTATION

1. CIAT RICE PROJECT

CIAT is developing its research activities according to a project management system. The title of the rice project is **"Improved Rice Germplasm for Latin America and the Caribbean"**. Its breakdown structure is presented in Appendix 1.

2. FUND FOR LATINAMERICAN IRRIGATED RICE (FLAR)

FLAR was created in 1995. In September 1996, CIRAD signed an agreement with the Fund and became member.

Beginning in 1997, the CIRAD/CIAT collaborative project developed research activities with FLAR on recurrent selection breeding for irrigated lowland rice.

3. CIRAD/CIAT/FLAR COLLABORATIVE PROJECT

The 2000-work plan of the CIAT/CIRAD/FLAR collaborative project is presented in Appendix 2.

The next Strategic Alliance Meeting between CIAT, CIRAD, INRA, and IRD (former ORSTOM) will take place in June 2001, at CIAT headquarters in Palmira.

3.1. Conventional breeding

In 1996, due to strategic changes, the activities conducted by the conventional breeding project for upland savanna rice were reduced. But were reactivated to a certain extent since 1997 because of the availability of promising lines previously developed and the out-coming of lines developed from recurrent populations using traditional pedigree method.

Starting in 1998, upland lines were shipped to new partners identified during 1997:

- **Colombia**, Ministry of Agriculture (Atlantic Coast region),
- **Argentina**, National University of Tucumán,
- **Paraguay**, Rice Producers Association of Itapua,
- **Peru**, National Maize and Rice Program, and
- **Venezuela**, Fondo Nacional de Investigación Agropecuarias (FONAIAP).
- **The Caribbean**, **Guyana**, **Belize** and **Cuba** were identified as new partners, through the Caribbean Rice Industry Development Network (CRID Net).

We maintain strong relationships with:

- **Brazil**, EMBRAPA Rice and Beans Center,
- **Bolivia**, CIAT Santa Cruz

In 1999, three (3) lines were released in two countries.
Bolivia: **JASAYE (IRAT 170)**
Brazil: **BONANÇA** and **CARISMA**

3.2. Population breeding

Population breeding by recurrent selection is a new tool that allows broadening the genetic base for the creation of new varieties.

3.2.1. Introduction

Genetic uniformity, or lack of genetic diversity, is of major concern to breeders, geneticists, and the agricultural community in general.
In many crops, genetic improvement is usually accomplished by reducing genetic diversity in the gene pools used to develop new varieties. But genetic uniformity is now considered as increasing a crop's potential vulnerability to disasters caused by biotic or abiotic constraints.
In Latin America, the genetic diversity of rice varieties depends on a small genetic core of land races (1 in Appendix 3).
One way of broadening the genetic base of Latin American rice and assessing the genotype-by-environment interaction is to identify specific potential parents and pool them to develop new, genetically broad-based, breeding material.
CIAT and CIRAD new breeding strategies focus on developing and improving populations to provide sources of fixed lines or potential parents with specific traits required by national breeding programs. One suitable breeding method to achieve this goal is recurrent selection.

3.2.2. Main activities

Started in 1992, the CIRAD/CIAT rice improvement collaborative project introduced from Brazil and French Guyana, and developed in Colombia (CIAT Palmira and Villavicencio) gene pools and populations segregating for a male-sterile recessive gene (2 in Appendix 3).
At first, the main objectives of the project were:

- To understand the performance of the introduced germplasm,
- To maintain and multiply the germplasm by harvesting male-sterile plants,
- To select fertile plants for fixed lines or potential parents,
- To start germplasm enhancement by recurrent selection, and
- To create, in collaboration with LAC NARS, new site-specific populations.

Since 1995, we are focusing with ours regional partners, on line development and enhancement of different upland and lowland populations, especially for blast

resistance, earliness, tolerance to acid soils, grain quality and grain yield for upland ecosystem. For lowland conditions (tropical, sub-tropical, and temperate climate) the objectives are resistance to rice blast and "hoja blanca" virus, tolerance to cold, and grain yield and quality.

As International Centers, we also develop germplasm with broad genetic base, in order to gather, and maintain variability. To these germplasms we apply low selection pressure to maintain high variability and adaptation to broad ecoregions.

CIAT and CIRAD breeding strategies focus on developing and improving populations, (pre-breeding) and gradually phasing out of the development of finished lines for direct release.

Pre-breeding aims at providing National Programs (NARS) with enhanced genetic reservoirs for potential lines and/or parents with specific traits.

3.2.3. Expertise sharing

The expertise of the CIAT/CIRAD collaborative project on recurrent selection is shared with regional NARS through activity reports, didactic documents, field visits, workshops and training.

3.2.4. International training courses

The first International Course on Rice Recurrent Selection Breeding was held at CIAT in 1996. Fifteen scientists from 13 countries attended the course. Back in their home countries, many began using population breeding.

The second one (International and National) took place in 1998, in Venezuela and was organized by the DANAC Foundation.

The third one is planned to be held in Cuba during the first week of July 2001, and is organized jointly by the "Institute de Investigaciones del Arroz" (IIA) of Cuba, the CIAT/CIRAD Project and Embrapa Rice and Beans Center.

3.2.5. Conferences

The First International Conference on Rice Recurrent Selection was held in Goiânia-Brazil, in March 1995. CIAT/CIRAD and EMBRAPA Rice jointly organized it and Beans Center.

The second one was held at the same place, and was organized by the same Institutions, during September 21-24. Scientists from 10 countries (Argentina, Bolivia, Brazil, Colombia, Chile Cuba, El Salvador, Panama, Uruguay, and Venezuela) presented their results on population breeding. The CIRAD/CIAT project presented 4 communications. Observers from Spain and the Food and Agriculture Organization of the United Nations (FAO) also attended the meeting.

At the end of the workshop, FAO supported the idea of establishing a formal group on Advanced Breeding Methods (Hybrid rice, population breeding, and biotechnology) in Latin America and the Caribbean.
The group named "Advanced Rice Breeding Group" (Grupo de Mejoramiento Genético Avanzado en Arroz - GRUMEGA in Spanish) - was formally set-up, and a project profile written by CIAT/CIRAD and EMBRAPA.
FAO will act as a facilitator, helping presenting the project to donors.

3.2.6. Line selection workshop

The first International Workshop for line selection at field condition was held in Villavicencio, Colombia in August 7-12. The CIAT/CIRAD Project and Embrapa Rice organized it and Beans Center. Participants from Argentina, Bolivia, Brazil, Colombia, Cuba and Venezuela attended the event. Each participant paid for is air ticket for coming to Colombia. Lines were selected by the participants and then dispatched to them.

3.2.7. Monitoring progress

We are monitoring with our LAC partners, the use of the basic and enhanced populations developed by the project. We also help doing special work at CIAT Palmira:

- Development of site-specific populations,
- Generation advance, recombination cycles, and
- Anther culture.

3.2.8. Registering populations for recurrent selection breeding

On request from breeders, the project is in charge of registering new populations developed by NARS.
In October 1999, five populations were registered. Their origin and genetic composition are presented in Appendix 4.

- PQUI-1 developed by INIA Quilamapu-Chile,
- PFD-1 and PFD-2 developed by Fundación DANAC - Venezuela, and
- PYN-1 and GPYN-2 developed by the Food Crops research Institute (FCRI) of the Yunnan Academy of Agricultural Sciences (YAAS) Yunnan Province -China.

3.2.9. Expertise transfer

Recurrent selection germplasm crosses continents. On request, we have shipped populations to Europe (France and Spain) and Asia (China).

In Europe, we initiate collaboration with the French Center for Rice (Centre Français du Riz) and a Spanish Seed Company.
In China, the project collaborates with FCRI/YAAS. FCRI has developed two local japonica germplasms based on the CIAT/CIRAD population PCT-5. The two germplasms are identified as PYN-1 and GPYN-2 for upland and irrigated conditions respectively.
A concept note for an Inter-Center Project on expertise transfer to West Africa (CIAT/CIRAD, WARDA and CORAF) was prepared, and contacts were established with WARDA.

4. ACKNOWLEDGMENTS

This document reports the research activities developed during the period September 1999 - September 2000 at "La Libertad" Experimental Station (LES) in Villavicencio, Department of Meta, Colombia) and at CIAT headquarters (Palmira Experimental Station (PES), Department of Valle, Colombia.
Francisco Rodriguez and Victor Hugo Lozano to whom we are very grateful conducted all the fieldwork at the main upland rice experimental station in Villavicencio.
In Latin America and the Caribbean, research activities are conducted in close collaboration with scientists from different Countries.
In Asia, we initiated, in 1997 and 1999 respectively, collaboration with two Provinces of the People's Republic of China:
- The Yunnan Province, with FCRI/YAAS and,
- The Hainan Province, with the Chinese Academy of Tropical Agricultural Sciences (CATAS).
In Europe, collaboration started during the 2000 cropping season with the CIRAD-CA/CALIM Program and the French Center for Rice (Centre Français du Riz -CFR- in French) and a Spanish Seed Company.

We would like to acknowledge the excellent collaboration developed with the following scientists:

Argentina

María Antonia Marassi	Universidad de Corrientes
Juan Antonio Marassi	Universidad de la Plata
Marta Genoveva Nicosia	Universidad Nacional de Tucumán
José Villegas	Universidad Nacional de Tucumán

Bolivia	
Roger Taboada Paniagua	CIAT Santa Cruz de la Sierra
R. Guzmán	CIAT Santa Cruz de la Sierra
J. Viruez	CIAT Santa Cruz de la Sierra
Brazil	
Elcio Perpetuo Guimarães	EMBRAPA Arroz e Feijão
Chile	
Roberto Alvarado	INIA-Quilamapú
Santiago Ignacio Hernaiz Lagos	INIA-Quilamapú
China	
Tao Dayun	FCRI/YAAS, Province of Yunnan
Li Kai Mian	CATAS, Province of Hainan
Colombia	
Hernando Delgado Huertas	CORPOICA-Regional 8
Edgar Corredor	FEDEARROZ
Argeniro Moreno	CENICAFE
Javier Osorio	Universidad del Tolima
Cuba	
Rene Perez Polanco	IIA Sancti-Spiritus
El Salvador	
Ramón Eduardo Servillón	CENTA
France	
Guy Clément	CIRAD-CA/Calim and CFR
Spain	
José Pedro Castells Franch	Semillas Certificadas Castells
Venezuela	
Alberto Herrera G.	Universidad (UNILLEZ)
Eduardo Graterol	Fundación DANAC
Carlos Gamboa	Fundación DANAC
Gelis Torrealba	INIA (former FONAIAP)
Uruguay	
Fernando Blaz Pérez de Vida	INIA-Treinta y Trés

ACTIVITY 1.

CONVENTIONAL BREEDING FOR THE UPLAND SAVANNAS ECOSYSTEM

1. INTRODUCTION

As it has been stated earlier, we are phasing out most of the activities involving the development of fixed lines from conventional crosses, for direct release by NARS. Nevertheless as we have advanced segregating lines in the pipeline, we continue their evaluation, in Colombia and with our partners.

The number of out-coming lines developed from recurrent populations by pedigree method has steadily increased from 1997 on. In 2000, 90% of the lines under selection comes from recurrent populations.

We also evaluate and select inter-specific progenies between *Oryza sativa* and *O. glaberrima* from WARDA, in collaboration with Dr. Cesar Martinez of the CIAT Rice project.

In 1996, we sent savanna upland lines (F4 and F5 generation) to Embrapa Rice and Beans Center for observation and seed increase. These lines were sent back to CIAT, Palmira, in 1997.

In 1998, the lines were seed increased and dispatched to different countries.

2. LINE SELECTION IN COLOMBIA

In Colombia, we continue the evaluation and selection of lines for the development of fixed material to be tested by CORPOICA in the "Altillanura" condition. We also evaluate and select inter-specific progenies between *Oryza sativa* and *O. glaberrima* from WARDA.

- **CIAT/CIRAD conventional breeding lines**

During 1998, we selected 24 lines that presented the best characteristics of adaptation to acid soil condition.

In 1999, 156 lines (26 families of 6 lines) were evaluated and 16 (10.2%) were selected at LES (table 1). In each selected line 6 individual plants were harvested.

The line "LÍNEA 30" or CIRAD 409 is to be released next year by CORPOICA. It is already tested in different cropping systems (rotation with others crops and in inter-cropping with perennial species.

- **WARDA inter-specific lines and *O. glaberrima* accessions**

Since 1996 we are evaluating this germplasm for selecting potential parents to be incorporated in the development of new populations.

In 1999, one WARDA line and 3 *O. glaberrima* accessions were selected.

3. USE OF CIAT/CIRAD LINES, AND LINE RELEASE IN BRAZIL

The participation of CIAT/CIRAD material in the different trials continues to be very important. The main characteristics the Brazilian praised from CIRAD/CIAT material are earlyness, plant and grain type.

3.1. Use of CIAT/CIAT lines

In relation to previous years, the number of CT lines is reduced in the nursery and preliminary trials (6% and 3% respectively) but is still expressive in the advanced trials were 47% of the tested lines are from CIAT. The reduction of the participation in due to the out-coming of promising lines selected by the Brazilian project.

EMBRAPA is also using CT lines as parents for crosses.

- F1 generation: **20%** of the crosses have at least one CT parent
- F2 generation: 4% of the crosses have at least one CT parent
- F3 generation: 9% of the crosses have at least one CT parent
- F5 generation: **14%** of the crosses have at least one CT parent
- F6 generation: **31%** of the crosses have at least one CT parent

3.2. Line release

During the period 1994-1997, 4 lines were released in different States of Brazil. They are:

CONFIANÇA (States of Roraima and Minas Gerais),

CANASTRA (States of Minas Gerais, Goias, Tocantins, Piaui and Maranhão),

MARAVILHA (Goias, Mato Grosso, Tocantins, Para, Roraima and Rondonia),

PRIMAVERA (States of Goias, Tocantins, Maranhão, Piaui, Mato Grosso and Mato Grosso do Sul). Two of them come from the CIAT conventional breeding program:

CANASTRA **CT 7415-6-5-1-2-B**

MARAVILHA **CT 6516-23-10-1-2-2-B**

In 1998, three new CIAT lines were identified as very promising candidates for official release.

CNA8172 **CT 11614-1-4-1-M**

CNA8305 **CT 11251-7-2-M-M**

CNA8436 **CT 11251-7-2-M-1-M-M**

In 1999, CT 11614-1-4-1-M (CNA8172) and **CT 11251-7-2-M-M** (CNA8305) were released as **BONANÇA** and **CARISMA** respectively.

During the period 1994-1999, from a total of 6 varieties released in Brazil, 4 are from CIAT.

4. LINE RELEASE IN BOLIVIA

In 1999, the CIRAD line **IRAT 170** was released as **JASAYE**.
It is well adapted to rice cropping system used by small holders.

5. USE OF CIAT AND CIRAD LINES IN CHINA

CIRAD- CA has close links with FCRI/YAAS, and had shipped many upland lines in the recent years. After screening, they were used for direct release or as parents.
In 1996 the CIRAD line **IRAT 104** was released in the Yunnan Province.
In 1998, the line **IRAT 359** showed very promising results and acceptability by farmers in demonstration fields. It will be released next year.
In 1999, FCRI/YAAS released the variety **YUNLU 29**, coming from a cross between a Chinese line and **IRAT 216**.
In this framework, **starting in 1995**, the CIAT/CIRAD project sent to China the first set of savanna lines developed in Brazil and Colombia. Preliminary results were promising. New CT lines were shipped and are under evaluation in different trials and sites as well as progenies from CIAT and Chinese parents.

ACTIVITY 2.

POPULATION BREEDING FOR THE SAVANNAS ECOSYSTEM

1. INTRODUCTION

The upland rice population breeding project, using recurrent selection, aims at adapting, developing and selecting tropical *japonica* gene pools and populations. The major characteristics we are looking for are:

- Tolerance of soil acidity
- Resistance to diseases; rice blast (*Pyricularia grisea* Sacc.) and rice "hoja blanca" virus
- Resistance to pests, mainly rice plant hopper (*Tagosodes orizicolus*)
- Good grain quality (translucent, long-slender grain)
- Early maturity (total cycle about 115 days)

2. POPULATION BREEDING

The activities we report here were conducted during two seasons at two experiment stations.

- Off season 1999 (1999 B): October 1999 - March 1999 at CIAT Palmira - Valle, "Palmira Experiment Station" (PES)
- Cropping season 2000 (2000 A): April - September 2000 at Villavicencio – Meta, "La Libertad Experiment Station" (LES).

Soil and climatic characteristics of LES experimental station are presented in the tables 1, and 2.

2.1. Line Development from recurrent populations

During the enhancement of gene pools and populations through recurrent selection, fertile plants are selected.

This selection is the starting point for the development of promising fixed lines for variety release and/or potential parents for our regional partners (Argentina, Brazil, Bolivia, Venezuela and the Caribbean through CRID Net).

During the 2000-cropping season, a total of 1147 lines were evaluated.

2.1.1. Generation S_1

The generation S_1 comes from the sowing of kept seeds of fertile S_0 plants selected at EEP during 1999B, in the different steps of the enhancement of the population PCT-4 (Thesis of Yolima Ospina).

- **PCT-4\0\0\0** *(original population)*

- **PCT-4\0\0\2** (original population with 2 recombination)
- **PCT-4\SA\1\1** (one cycle of selection for **Acid Soil** and **1** recombination)
- **PCT-4\SA\2\1** (one cycle of selection for **Acid Soil** and **2** recombination)
- **PCT-4\SA\3\1** (one cycle of selection for **Acid Soil** and **3** recombination)
- **PCT-4\SA\4\1** (one cycle of selection for **Acid Soil** and **4** recombination)
- **PCT-4\SA\1\1,SA\1** (two cycles of recurrent selection for Acid Soil)

Cropping season 2000

A total of 223 lines S_1 was observed and selected at LES (Table 3). Thirty-six (36) lines were selected (Table 3.1). Breeders of six countries that attended the Upland Rice Workshop held at LES, during August 7-11, selected a total of 71 lines; (Bolivia: 14; Brazil: 10; Colombia: 14; Cuba: 14; Venezuela: 5; Argentina: 14. The total number of lines selected by the breeders is higher than the number of lines selected. This comes from the multiple selection of some lines by different breeders.

2.1.2. Generation S_2

The generation S_2 comes from S_0 fertile plants selected in two populations, at LES, during the cropping season 1999A.

The generation S_1 was advanced off-season during 1999B at PES.

- **Population PCT-11**

- **PCT-11\0\0\2** (2 recombination cycles \2\ of the original population)

Cycles

Cropping season 1999A

Nineteen (19) individual fertile plants were selected.

During 1999B the S_1 generation was grown off-season at PES and evaluated for tolerance to rice "hora blanca" virus.

Cropping season 2000A

Fifteen (15) lines were observed at LES and 1 selected.

- **Population PCT-4**

- **PCT-4\SA\3\1** (3 recombination cycles \3\ after one selection for acid soil \SA\)

Cycles

Cropping season 1999A

Sixty-one (61) individual fertile plants were selected.

During 1999B the S_1 generation was grown off-season at PES and evaluated for tolerance to the rice "hora blanca" virus.

Cropping season 2000A

Forty-six (46) lines were observed at LES and 6 selected.

- Population PCT-4

- PCT-4\0\0\0 (Original population)
- PCT-4\SA\1\1 (One recombination cycle \1\ after one selection for acid soil \SA\)
- PCT-4\SA\2\1 (Two recombination cycles \2\ after one selection for acid soil \SA\)
- PCT-4\SA\3\1 (Three recombination cycles \3\ after one selection for acid soil \SA\)

Cycles

During 1998B, *the above populations were grown at PEL, and S0 fertile plants were selected.*

Cropping season 1999A

The generation S_1 of the different populations was evaluated in a specific trial for the thesis of Yolima Ospina. Some promising S_1 lines were selected for the development of future lines. A total of 176 lines were selected and the seed was kept in the cold chamber at PEL.

Cropping season 2000A

The 191 S_2 lines were evaluated at LES and 31 selected.

A total of 237 S_2 lines from the different populations was observed at LES (Table 4). Thirty-eight (38) lines were selected (Table 4.1). Breeders of 3 countries that attended the Upland Rice Workshop held at LES, during August 7-11, selected a total of 37 lines; (Brazil: 8; Colombia: 15; Venezuela: 14)

2.1.3. Generation S_4

The generation S_4 comes from S_0 fertile plants selected in the population PCT-11 at LES, during the cropping season 1998A. The generations S_1 and S_3 were grown off-season during 1998B and 1999B respectively. The generation S_2 was evaluated at LES during the cropping season 1999A.

- **Populations PCT-5, PCT-A and PCT-4**

- **PCT-5\PHB\1\0,PHB\1,PHB\1** (3 recurrent selections for leaf blast P and Hoja Blanca HB)
- **PCT-A\PHB\1\0,PHB\1,PHB\1** (3 recurrent selections for leaf blast P and Hoja Blanca HB)
- **PCT-4\PHB\1\1,PHB\1,PHB\1** (3 recurrent selections for leaf blast P and Hoja Blanca HB)

Cycles

During 1998A, *we selected a total of 107 fertile S_0 plants (30, 24 and 53 plants respectively).*

During 1998B, *the 107 lines S_1 were advanced off-season at PES*

Cropping season 1999A

The 107 S_2 lines were evaluated and 3 selected (3%) in two populations (no selection was made in PCT-5\PHB\1\0,PHB\1,PHB\1). In each selected line a different number of individual plants was harvested.

During 1999B, the 13 lines (2 families of 6 lines and 1 family of 1 line) were advanced off-season and evaluated for tolerance to rice "hora blanca" virus at PES. **All the lines were discarded.**

- **Population PCT-4**

- PCT-4\SA\2\1 (2 recombination cycles **\2** after one selection for acid soil **\SA**)

Cycles

During 1998 A, *we selected 73 plants S_0 from the second cycle of recombination, after one selection for acid soil.*

During 1998 B, *the generation S_1 was grown off-season at PES.*

Cropping season 1999 A

The 73 S_3 lines were evaluated and 5 were selected (6.8%) at LES (table 6). In each selected line a different number of individual plants was harvested.

During 1999 B, the 23 S_3 lines (3 families of 6 lines, 1 family of 2 lines and 1 family of 3 lines) were grown off-season and evaluated for tolerance to the rice "hora blanca" virus at PES. **All the lines were discarded.**

- **Population PCT-11**

- PCT-11\0\0\1 (1 cycle of recombination **\1** of the original population)

Cycles

During 1997B, *at PES, the basic population PCT-11 was recombined once. The first cycle of recombination of the basic population was identified as PCT-11\0\0\1.*

Cropping season 1998A

The population PCT-11\0\0\1 was grown at LES, starting its evaluation and selection. Ninety-five (95) fertile S_0 plants were selected.

During 1998B, *the generation S_1 was grown off-season at PES. Eleven (11) lines were discarded and 84 harvested.*

Cropping season 1999A

The 84 S_2 lines were evaluated and 4 selected (4.8%) at LES. In each selected line a different number of individual plants was harvested.

During 1999 B, the 22 S_3 lines (3 families of 6 lines, 1 family of 4 lines) was grown off-season and evaluated for tolerance to rice "hora blanca" virus at PES. Seven S_3 lines (7) were selected.

Cropping season 2000A

The seven (7) S_4 lines were observed and selected at LES (Table 5), three (3) lines were selected (Table 5.1). Breeders of 3 countries that attended the Upland Rice Workshop held in LES, during August 7-11, selected a total of 5 lines; (Brazil: 1; Colombia: 3; Venezuela: 1). The total number of lines selected by the breeders is higher than the number of lines selected. This comes from the multiple selection of some lines by different breeders.

2.1.4. Generation S_6

The generation S_6 comes from S_0 fertile plants selected during 1997A at LES.
The generations S_1, S_3 and S_5 were advanced off-season at PES during 1997B, 1998B and 1999B respectively.
The generations S_2 and S_4 were observed and selected at LES during the cropping seasons 1998A and 1999A respectively

- **Populations PCT-5, PCT-A and PCT-4**

- **PCT-5\PHB\1\0,PHB\1** (2 recurrent selection cycles for leaf blast P and Hoja Blanca HB)
- **PCT-A\PHB\1\0,PHB\1** (2 recurrent selection cycles for leaf blast P and Hoja Blanca HB)
- **PCT-4\PHB\1\1,PHB\1** (2 recurrent selection cycles for leaf blast P and Hoja Blanca HB)

Cycles

During 1997A, *fertile plants were selected for line development. In each population PCT-5\PHB\1\0,PHB\1; PCT-A\PHB\1\0,PHB\1; and PCT-4\PHB\1\1,PHB\1; 41, 13, and 12 fertile S_0 plants, respectively, were harvested.*

During 1997B, *the S_1 generation was grown off-season at PES.*

Cropping season 1998A

The 66 S_2 lines were evaluated at LES and 8 (12%) were selected from the 3 populations. In each selected line 6 fertile plants were harvested.

During 1998B, *the 48 S3 lines (8 families of 6 lines) were grown at PES and two families from the population PCT-A\PHB\1\1,PHB\1 and PCT-5\PHB\1\0,PHB\1 were discarded. A total of 35 S_3 lines (6 families) was harvested.*

Cropping season 1999A

The 35 S_4 lines were evaluated at LES and 7 selected (20%) only in the population PCT-4\PHB\1\1,PHB\1. In each selected line, 6 fertile plants were harvested.

During 1999B, the 42 S_5 lines (7 families of 6 lines) were grown off-season and evaluated for tolerance to rice "hora blanca" virus at PES. Thirty-eight (38) lines were selected.

Cropping season 2000A

The 38 lines were evaluated at LES and 19 selected.

- **Population PCT-4**

- **PCT-4\SA\1\1** (1 recombination cycle **\1** after one selection for acid soil **\SA**)

Cycles

During 1997 A, *155 fertile S_0 plants were selected at LES.*

Cropping season 1998 A

153 S_2 lines were evaluated and 65 (42.5%) were selected, and in each line 6 fertile plants were harvested.

During 1998 B, *the 390 S_3 lines (65 families of 6 lines) were grown at PES.*

Cropping season 1999 A

The 390 S_4 lines were evaluated and 44 (11,3%) selected at LES. In each selected line 6 fertile plants were harvested.

During 1999 B, the 264 S_5 lines (44 families of 6 lines) were grown off-season and evaluated for tolerance to rice "hora blanca" virus at PES. Two hundred and fifty one (251) lines were selected.

Cropping season 2000A

The 253 lines were evaluated at LES and 167 selected.

From a total of 291 S_6 lines were observed at LES (Table 6), one hundred eighty-six were selected (Table 6.1). Breeders from 6 countries that attended the Upland Rice Workshop held in LES, during August 7-11, selected a total of 387 lines; (Bolivia: 61; Brazil: 52; Colombia: 133; Cuba: 47; Venezuela: 33; Argentina: 61). The total number of lines selected by the breeders is higher than the number of lines selected. This comes from the multiple selection of some lines by different breeders.

2.1.5. Generation S_7

The generation S_7 comes from S_0 fertile plants selected during 1996A at LES.

The generations S_1, S_3 and S_5 were advanced off-season at PES during 1996B, 1997B and 1998B respectively.

The generations S_2, S_4 and S_6 were observed and selected at LES during the cropping seasons 1997A, 1998A and 1999A respectively.

- **Populations PCT-5, PCT-A and PCT-4**

- **PCT-5\PHB\1\0** (1 recurrent selection for leaf blast P and Hoja Blanca HB)
- **PCT-A\PHB\1\0** (1 recurrent selection for leaf blast P and Hoja Blanca HB)
- **PCT-4\PHB\1\1** (1 recurrent selection for leaf blast P and Hoja Blanca HB)

Cycles

***During 1996A**, from the first recurrent selection cycle for leaf blast and rice "hora blanca" virus, we selected 211 S_0 fertile plants, distributed as follows:*

- *49 in PCT-5\PHB\1\0 (11.5% of the total number of fertile plants)*
- *48 in PCT-A\PHB\1\0 (12.4% of the total number of fertile plants)*
- *114 in PCT-4\PHB\1\1 (17.3% of the total number of fertile plants)*

***During 1996B**, the S_1 generation (211 S1 lines) were grown at PES and the S_2 seeds sent to LES to grow the S_2 generation during 1997 A.*

***During 1997A**, from the 211 S_2 lines evaluated at LES, 25 were selected.*

- *PCT-5\PHB\1\0 -- 1 line selected (2%)*
- *PCT-A\PHB\1\0 -- 2 lines selected (4%)*
- *PCT-4\PHB\1\1 -- 22 lines selected (19%)*

In each selected line, 6 individual plants were selected.

***During 1997B**, the 150 S_3 lines (25 families of 6 lines) were grown at PES.*

Cropping season 1998A

From the 150 S4 lines evaluated at LES, 35 (23.3%) were selected only in the population PCT-4. The lines of the two others populations were discarded.

- *PCT-5\PHB\1\0 no selection*
- *PCT-A\PHB\1\0 no selection*
- ***PCT-4\PHB\1\1** 35 lines selected (23.3%)*

In each selected line 6 fertile plants were harvested.

***During 1998B**, the 210 S_5 lines (35 families of 6 lines) were grown off-season at PES and 150 (25 families of 6 lines) selected.*

Cropping season 1999A

The 150 S_6 lines were evaluated and 13 (8.7%) selected at LES. In each selected line, 6 individual plants were harvested. The 78 lines (13 families of 6 lines) were not advanced, but were evaluated for grain quality and tolerance to *Tagosodes orizicolus*. Seeds were kept in the cold chamber of CIAT.

Cropping season 2000A

Seventy-six (76) lines were evaluated at LES and 40 selected.

From the 76 S_7 lines evaluated at LES during 2000A (Table 7.), forty (40) were selected (Table 7.1). Breeders of six countries that attended the Upland Rice Workshop held in LES, during August 7-11, selected a total of 54 lines; (Bolivia: 4; Brazil: 20; Colombia: 15; Cuba: 3; Venezuela: 8; Argentina: 4). The total number of lines selected by the breeders is higher than the number of lines selected. This comes from the multiple selection of some lines by different breeders.

2.1.6. Generation S_9

The generation S_9 comes from fertile S_0 plants selected at LES during the cropping season 1995A.

The generations S_1, S_3, S_5 and S_7 were advanced off-season at PES during 1995B, 1996B, 1997B and 1998B respectively.

The generations S_2, S_4, S_6 and S_8 were observed and selected at LES during the cropping seasons 1996A, 1997A, 1998A and 1999A respectively.

- **Populations PCT-5, PCT-A, and PCT-4**

- **PCT-5\0\0\0** (Basic populations without selection)
- **PCT-A\0\0\0** (Basic populations without selection)
- **PCT-4\0\0\1** (Basic populations without selection)

Cycles

During the 1995A-cropping season at LES, we selected 55, 85, and 18 fertile S_0 plants in PCT-5\0\0\0, PCT-A\0\0\0, and PCT-4\0\0\1, respectively, and during the off-season (1995 B), we grew the S_1 generation at PES.

During the 1996A cropping season, we observed 158 S_2 and 3 checks (Oryzica Sabana 6, IAC 165, and CIRAD 409) at LES, and selected mainly for plant type and yield potential, discarding 102 S2 lines (64.5%). A total of 56 S_2 lines (35.4%) were selected:

- *PCT-5\0\0\0 -- 21 lines (38.1%)*
- *PCT-A\0\0\0 --26 lines (30.6%)*
- *PCT-4\0\0\1 -- 9 lines (50.0%)*

From the 56 selected lines, we harvested 178 fertile plants: 62 from PCT-5\0\0\0, 91 from PCT-A\0\0\0, and 25 from PCT-4\0\0\1.

Different selection intensity was applied to each selected S_2 line, according to the phenotypic value of the lines (grain yield potential, and plant and grain type). For example, the highest average selection intensity in three PCT-5\0\0\0 S_2 lines was 14% and the lowest average was 1.6% in 14 S_2 lines.

The S_3 generation was grown during 1996 B at PES and the S_4 seeds sent to LES, to advance the S_4 generation during 1997 A.

During 1997A, from the 178 S_4 lines evaluated, 47 were selected

- *PCT-5\0\0\0 -- 3 lines selected (5%)*
- *PCT-A\0\0\0 -- 35 lines selected (38%)*
- *PCT-4\0\0\1 -- 9 lines selected (36%)*

From each selected line, 6 individual plants were selected.

During 1997B, the 282 S_5 lines (47 families of 6 lines) were grown at PES.

Cropping season 1998A

From the 282 S_6 lines 64 (22.7%) were selected.

- *PCT-5\0\0\0 1 line selected (5.5%)*
- *PCT-A\0\0\0 44 lines selected (16.0%)*
- *PCT-4\0\0\1 18 lines selected (6.7%)*

In each selected line 6 fertile plants were harvested.

During 1998B, the 378 S_7 lines (63 families of 6 lines) were grown off-season at PES. From that total, 77 lines were discarded.

Cropping season 1999A

The 301 S_8 lines harvested in PES were evaluated and 44 selected (14.6%) at PES in the two populations PCT-A\0\0\0 and PCT-4\0\0\1. In each selected line, 6 individual plants were harvested.

During 1999B, the 264 lines (44 families of 6 lines) were not advanced, but were evaluated for grain quality and tolerance to *Tagosodes orizicolus*. Seeds were kept in the cold chamber of CIAT.

Cropping season 2000A

Two hundred sixty-five 265 lines were evaluated at LES and 123 selected.

- **Population PCT-4\0\0\1>S2** (Selection in S_2 lines of the basic population: LES, 1996A)

Cycles

***During 1996A**, we started enhancing the population PCT-4 through S_2 line evaluation. We took advantage of the 1996 S_2 line trial to select lines and individual fertile plants for line development. From 152 S_2 lines evaluated, we selected 19 (12.5%) and 74 individual plants, based on plant and grain type, and grain yield potential.*

***During 1996B**, the S_3 generation was grown off-season at PES and the S_4 seeds were sent to LES to grow the S_4 generation during 1997 A.*

***During 1997A**, from the 74 S_4 lines evaluated, 16 were selected (22%).*

In each selected line, we harvested 6 individual plants.

***During 1997B**, the 96 S_5 lines (16 families of 6 lines) were grown at PES.*

Cropping season 1998A

From the 96 S_6 lines evaluated, 14 were selected (14.6%). In each selected line 6 fertile plants were harvested.

***During 1998B**, the 84 lines S7 (14 families of 6 lines) were grown at PES. Two families were discarded.*

Cropping season 1999A

The 72 S_8 lines selected (12 families of 6 lines) were evaluated, and 6 were selected (8.3%) at LES. In each selected line, 6 individual plants were harvested.

During 1999B, the 36 lines (6 families of 6 lines) were not advanced, but were evaluated for grain quality and tolerance to *Tagosodes orizicolus*. Seeds were kept in the cold chamber of CIAT.

Cropping season 2000A

The 36 lines were evaluated at LES and 22 selected.

- **PCT-5\0\0\0>S3** (Selection in S_3 Lines of the basic population: PES, 1996B)
- **PCT-A\0\0\0>S3** (Selection in S_3 Lines of the basic population: PES, 1996B)
- **PCT-4\0\0\1>S3** (Selection in S_3 Lines of the basic population: PES, 1996B)

Cycles

***During 1996B**, at PES, we selected 12 individual fertile plants, with suitable characteristics, from S_3 lines. The S_4 seed was sown during 1997 A at LES.*

During 1997A, from the 12 S_4 lines evaluated, only 3 were selected in one population:

- *PCT-5\0\0\0 no selection*
- *PCT-A\0\0\0 no selection*
- *PCT-4\0\0\1 3 lines selected (75%)*

In each selected line, 6 individual plants were selected.

***During 1997B**, the 18 S_5 lines (3 families of 6 lines) were grown at PES.*

***Cropping season 1998A**. The 18 S_6 lines were evaluated at LES, and 2 (11. %) were selected.*

***During 1998B**, the 12 S_7 lines (2 families of 6 lines) were grown off-season at PES.*

Cropping season 1999A

The 12 lines were evaluated and 1 was selected (8.3%) at LES (table 13). From the selected lines, 6 individual plants were harvested.

During 1999B, the 6 lines (1 family of 6 lines) were not advanced, but were evaluated for grain quality and tolerance to *Tagosodes orizicolus*. Seeds were kept in the cold chamber of CIAT.

Cropping season 2000A

The 6 lines were evaluated at LES and 6 selected.

During 2000 A, from a total of 307 S_9 lines was observed at LES (Table 8).One hundred fifty-one (151) lines were selected (Table 8.1). Breeders of six countries that attended the Upland Rice Workshop held in LES, during August 7-11, selected a total of 272 lines; (Bolivia: 41; Brazil: 66; Colombia: 56; Cuba: 38; Venezuela: 30; Argentina: 41). The total number of lines selected by the breeders is higher than the number of lines selected. This comes from the multiple selection of some lines by different breeders.

2.2. Yield trial of advanced lines

The advanced generations are promising fixed lines that passed through the all selection process. Selection of the best yielding lines showing excellent grain quality was made at LES and PES during 1999A and 1999B respectively.

During the cropping season 2000, a trial was set-up at LES with 24 lines and 3 checks. The results are presented in the tables 9 and 9.1.

- The line PCT-4\SA\1\1>975-M-2-M-3 is statistically superior to the 3 checks ("Línea 30, O. Sabana 6 and O. Sabana) in 56%, 70% and 194% respectively.

- Lines PCT-4\SA\1\1>1044-M-3-M-4 and PCT-4\SA\1\1>975-M-3-M-3 are equal to "Línea 30", but superior to O. Sabana 6 and O. Sabana 10 in 57% and 171% respectively.

To confirm the results, the same trial will be set-up during 2001 in two sites (LES and "Altillanura").

2.3. International upland rice workshop

In late 1999, the idea of setting an International Breeder's Workshop was proposed to ours partners, by the CIAT/CIRAD project and EMBRAPA Rice and Beans Center. We considered that the project had something to offer to the upland rice breeders of the region. The activity was placed under the framework of the GRUMEGA network.

2.3.1. Introduction

The first International Workshop on Upland Rice recurrent selection was held at LES, during August 7-11. Segregating lines and populations were evaluated and selected by the breeders of the six countries that attended the event.

2.3.2. Objectives

The Workshop aimed at:

- Promoting the integration of the upland rice breeders of the region.
- Sharing experiences in the management of breeding populations and the development of fixed lines.
- Selecting at field condition segregating and fixed lines to be introduced in each respective country (much better than only shipping-out lines).
- Training breeders that are starting using recurrent selection (Argentina and new partners in Colombia -Universidad del Tolima y CENICAFE).
- Having the concept from the group about the outputs and results of the CIAT/CIRAD project.
- Knowing in a near future (next year) the behavior and adaptation of the selected lines in each country.

2.3.3. Participants

Name	Country	Institution
Marta Nicosia	Argentina	FAZ/Univ. Nacional de Tucumán
Roger Taboada	Bolivia	CIAT/Santa Cruz
Juana Viruez	Bolivia	CIAT/Santa Cruz
René Guzmán	Bolivia	CIAT/Santa Cruz
Elcio Guimarães	Brazil	Embrapa Arroz e Feijão
Sebastião Honorato	Brazil	Embrapa Arroz e Feijão
Javier F. Osorio	Colombia	Univ. del Tolima
Hernando Delgado	Colombia	CORPOICA
Marc-Henri Châtel	Colombia	CIAT/CIRAD
Yolima Ospina	Colombia	CIAT/CIRAD
Argemiro Moreno	Colombia	CENICAFE
Ruben Alfonso	Cuba	Instituto de Investigaciones del Arroz (IIA)
Gelis Torrealba	Venezuela	FONAIAP

2.3.4. Line selection by NARS breeders

The results of the selection are presented in the following table.

Generation	Number of lines	Number of selected lines and %					
		Bolivia	Brazil	Colombia	Cuba	Venezuela	Argentina*
S1	229	14 (6 %)	10 (4.4%)	14 (6,1%)	14 (6,1%)	5 (2,2%)	14 (6,1%)
Average: 11,8 lines Selection Intensity: 5,1%							
S2	237	0	8 (3,4%)	15 (6,3%)	0	14 (5,9%)	0
Average: 6,2 lines Selection Intensity: 2,6%							
S4	7	0	1 (14,3%)	3 (43%)	0	2 (28,6%)	0
Average: 1 line Selection Intensity: 14%							
S6	289	61 (21,1%)	52 (18%)	133 (46%)	47 (16,2%)	33 (11,4%)	61 (21,1%)
Average: 64,5 lines Selection Intensity: 22%							
S7	78	4 (5,1%)	20 (25,6%)	15 (19,2%)	3 (3,4%)	8 (10,3%)	4 (5,1%)
Average: 9 lines (11,5%)							
S9	307	41 (13,3%)	66 (21,5%)	56 (18,2%)	38 (12,3%)	30 (9,8%)	41 (13,3%)
Average: 45,3 lines Selection Intensity: 14,8%							
Total 1147		**120 (10,5%)**	**157 (13,7%)**	**236 (20,6%)**	**102 (8,8%)**	**92 (8%)**	**120 (10,5%)**
Average: 137,8 lines Selection Intensity: 12%							

** Lines selected by Argentina are the same as those selected by Bolivia. The Bolivians for the evaluation and selection of lines trained the Argentinean breeder, who is starting working with upland rice, during the Workshop.*

Between 8 and 20% of the total number of lines was selected by the countries. Colombia, Brazil and Bolivia selected a greater number of lines. The main characteristics of the selected lines are earlyness, modern plant type, long slender grains (of special importance for Brazil), resistance to Blast and yield potential.

2.4. Population enhancement

The CIAT rice project emphasizes pre-breeding activities. Then we concentrate on the enhancement of populations to be distributed to NARS.

The strategy is to develop and enhance gene pools and populations for well-targeted traits. They are therefore used as reservoir of promising lines and/or potential parents to be developed by national breeding programs.
In the first 3 years of the project, we concentrated on introducing, characterizing and selecting germplasm from Brazil (former joint project between EMBRAPA Rice and Beans).
From 1995 onward, we focus on enhancing the selected populations and developing new ones.

2.4.1. Recurrent selection based on S_2 line evaluation

- **Population PCT-4**

- **PCT-4\0\0\1** (Original population with one cycle of recombination)

2.4.1.1. First cycle of recurrent selection

During 1995A, *the original population* ***PCT-4\0\0\1*** *with one recombination was grown at LES to go through the first cycle of recurrent selection.*

*- **Selection of fertile plants: during 1995A a total of** 159 S_0 fertile plants was selected.*

During 1995B, *the S_1 generation was grown at PES.*

During 1996A, *we started the first recurrent selection cycle:*

- ***Evaluation:*** *152 lines of S_2 and 2 checks (Oryzica Sabana 6 and CIRAD 409) were evaluated and selected at LES under the "Augmented Blocks" statistical design.*
- ***Selection:*** *Results of the S_2 trial were analyzed and 53 S_2 lines were selected.*

During 1996B

- ***Recombination:*** *at PES, remaining seeds from the S_0 plants from which originated the selected S_2 lines were mixed and grown to develop the recombined enhanced population.*
- ***Identification:*** *The enhanced recombined population was identified as* ***PCT-4\SA\1\1.***

2.4.1.2. Second cycle of recurrent selection

During 1997A, *the population* ***PCT-4\SA\1\1*** *with one cycle of recurrent selection was grown at LES to go through a second selection cycle.*

*- **Selection of Fertile Plants.** A total of 155 S_0 plants were selected, and a sample of each S0 seed was stored in the cold chamber.*

During 1997B, *the S_1 generation was grown at PES, and S_2 seeds harvested.*

Cropping season 1998A

- ***Evaluation:*** *from the 155 S_2 lines, 152 were evaluated during 1998 A at LES in a trial named "Augmented Blocs of Federer" (BAF).*
- ***Selection:*** *with a selection index of 39.5% we selected the 60 best lines for recombination from the original S_0 selected plants.*

During 1998B

- ***Recombination:*** *the recombination was made at PES by the sowing of the balanced mixture of S_0 seed (equal proportion of seed of each S_0 plant) and harvest of the seeds produced by the male sterile plants. The second cycle of recurrence was identified as PCT-**4\SA\1\1, SA\1**, and the seeds were stored in the cold chamber during 1999.*

- ***Harvest of male-sterile plants (recombination)***

During 1997A, *male-sterile plants of the population **PCT-4\SA\1\1** were harvested individually and their seeds mixed in equal proportions to complete the second cycle of recombination of the population selected one time. The second cycle of recombination was identified as **PCT-4\SA\2\1**. Seeds were kept in the cold chamber during 1998.*

Cropping season 1999A

Recombination

The population **PCT-4\SA\2\1** with one cycle of recurrence and recombined twice was grown at LES to obtain the third recombination identified as **PCT-4\SA\3\1.**

Cropping season 2000A

The population **PCT-4\SA\3\1** was grown at LES.

- **Selection of fertile plants.** Fertile S_0 plants were selected, and a sample of each S_0 seed was stored in the cold chamber for future use.
- **Harvest of male-sterile plants**

Male-sterile plants of the population **PCT-4\SA\3\1** were harvested individually and their seeds mixed in equal proportions to complete the fourth cycle of recombination of the population selected one time. The fourth cycle of recombination was identified as **PCT-4\SA\4\1**. Seeds were kept in the cold chamber for future use.

2.4.1.3. Third cycle of recurrent selection

During the cropping season 2000, the population **PCT-4\SA\1\1,SA\1** with two cycles of recurrent selection was grown at LES to go through a third selection cycle.

- **Selection of fertile plants.** Fertile S_0 plants were selected, and a sample of each S_0 seed was stored in the cold chamber.

During 2000B, the S_1 generation will be grown at PES, and S_2 seeds harvested.

Cropping Season 2001A

- **Evaluation:** *the S_2 lines will be evaluated at LES in a trial named "Augmented Blocs of Federer" (BAF).*
- **Selection:** after evaluation, the best S_2 lines will be selected for their posterior recombination from the original S_0 selected plants.

During 2001B

- **Recombination:** the recombination will be made at PES. The harvest of the seeds produced by the male sterile plants is the third cycle of recurrence, identified as PCT-**4\SA\1\1,SA\1,SA\1.**

- **Population PCT-11**

- **PCT-11\0\0\3** (Original population with 3 cycles of recombination)

The original population **PCT-11** was created in 1997. The first, second and third recombination took place during 1997, 1998 and 1999 respectively.

First cycle of recurrent selection

During 2000A, the original population **PCT-11\0\0\3** with tree recombination was grown at LES to go through the first cycle of recurrent selection.

- **Selection of fertile plants: during 2000A**, S_0 fertile plants were selected.

During 2000B, the S_1 generation will be grown at PES, and S_2 seeds harvested.

During 2001A, we will start the first recurrent selection cycle:

- **Evaluation:** S_2 lines and 3 checks (Oryzica Sabana 6, Oryzica Sabana 10 and CIRAD 409) will be evaluated and selected at LES under the "Augmented Blocks" statistical design.
- **Selection:** *Results analysis of the S_2 trial and selection of the best lines.*

During 2001B

- **Recombination:** at PES, remaining seeds from the S_0 plants from which originated the selected S_2 lines will be mixed and grown to develop the recombined enhanced population.
- **Identification:** The enhanced recombined population will be identified as **PCT-11\SA\1\3.**

2.4.2. Mass recurrent selection on both sexes

- **Populations PCT-4, PCT-A and PCT-5**

- **PCT-4\0\0\1** (Original population)
- **PCT-A\0\0\0** (Original population)
- **PCT-5\0\0\0** (Original population)

2.4.2.1. Selection for total resistance to blast, rice "hora blanca" virus, and major agronomic traits

Cycles

During 1995A, at LES, we eliminated at the vegetative stage all plants showing symptoms of leaf blast and rice "hoja blanca" virus symptoms. At harvest, we selected male-fertile plants. Seeds produced by these plants were the result of fertilization with pollen produced by healthy fertile plants. We selected 102, 99, and 96 male-sterile plants from PCT-5\0\0\0, PCT-A\0\0\0, and PCT-4\0\0\1, respectively, and their seeds were mixed in equal proportions.

The first mass recurrent selection cycles (selection and recombination) were identified as PCT-5\PHB\1\0, PCT-A\PHB\1\0 and PCT-4\PHB\1\1, respectively.

***During 1996A**, the seed mixture of each population with one mass recurrent selection cycle was grown at LES.*

To develop the second recurrent selection cycle, the same selection method as that used during 1995 A was applied. We selected 304, 341, and 442 healthy male-sterile plants, fertilized with pollen of fertile healthy plants, from PCT-5\PHB\1\0, PCT-A\PHB\1\0, and PCT-4\PHB\1\1, respectively, and mixed their seeds in equal proportions.

The second mass recurrent selection cycles (selection and recombination) were identified as PCT-5\PHB\1\0,PHB\1, PCT-A\PHB\1\0,PHB\1, and PCT-4\PHB\1\1,PHB\1, respectively.

***During 1997A**, the seed mixture of each population with two mass recurrent selection cycles was grown at LES.*

To make the third recurrent selection cycle, the same selection method as that used during 1995 A and 1996 A was applied (all plants with symptoms of leaf blast and rice "hoja blanca" were eliminated during their vegetative stage). We selected 218, 253, and 165 healthy male-sterile plants, fertilized with pollen from fertile healthy plants, from PCT-5\PHB\1\0,PHB\1; PCT-A\PHB\1\0,PHB\1; and PCT-4\PHB\1\1,PHB\1, respectively, and their seeds mixed in equal proportions. The third mass recurrent selection cycles (selection and recombination) are identified as:

PCT-5\PHB\1\0,PHB\1,PHB\1; PCT-A\PHB\1\0,PHB\1, PHB\1; and PCT-4\PHB\1\1,PHB\1,

Cropping season 1998A

Fourth cycle of recurrent selection

The seed mixture of each population with 3 mass recurrent selection cycles was grown at LES.

To make the fourth recurrent selection cycle, the same selection method as that used during 1995 A, 1996 A and 1997 A was applied (all plants with symptoms of leaf blast and

rice "hoja blanca" virus were eliminated during their vegetative stage). We selected 180, 200, and 240 healthy male-sterile plants, fertilized with pollen from fertile healthy plants, from PCT-5\PHB\1\0,PHB\1,PHB\1; PCT-A\PHB\1\0,PHB\1, PHB\1; and PCT-4\PHB\1\1,PHB\1, PHB\1 respectively, and their seeds mixed in equal proportions. The fourth mass recurrent selection cycles (selection and recombination) are identified as PCT-5\PHB\1\0,PHB\1,PHB\1, PHB\1; PCTA\PHB\1\0,PHB\1,PHB\, PHB\1; and PCT-4\PHB\1\1,PHB\1,PHB\1, PHB\1.

***During 1998B**, after completed 4 cycles of recurrence, the enhanced populations were stored in the CIAT cold chamber at PES. They would be dispatched to LAC NARS as reservoir of genotypes for line development.*

2.4.2.2. Results of the enhancement

- **Total resistance to leaf blast**

The results of the enhancement of the populations **PCT-4, PCT-A, and PCT-5**, for total leaf blast resistance are presented in the following table.

The original populations presented about 40% of susceptible plant.

From the first cycle of selection on, a drastic reduction in the number of infected plants occurs.

The use of mass recurrent selection on both sexes was efficient for the enhancement of the 3 populations. At the same time we selected for total leaf blast resistance, we also selected for good agronomic characters.

Results of the enhancement of the 3 populations PCT-5, PCT-A y PCT-4 for total leaf blast resistance.

Cycles	Year of evaluation	PCT-5	PCT-A	PCT-4
Basic Population	1995	47.8 *	35.3	42.7
First Cycle	1996	1.5	1.0	0.5
Second Cycle	1997	3.7	3.3	4.5
Third Cycle	1998	0.3	0.2	0.1

* Percent of plants with leaf blast symptom

- **Resistance to rice "hoja blanca" virus**

During the first semester of 1999 at PES, 107 lines S_2 from the 3 populations after 3 cycles of recurrence were evaluated to rice "hoja blanca" in nurseries with high-infected insect pressure. The results of the evaluation are presented in the following table.

The S_2 evaluation of the enhanced populations showed that 97.2% have resistant and intermediate reaction to rice "hoja blanca".

Results of the enhancement of the 3 populations PCT-5, PCT-A and PCT-4, for resistance to rice "hoja blanca".

Reaction to rice "hoja blanca" virus (1-9 scale)	Resistant (1-3)	Intermediate (5)	Susceptible (7-9)
Enhanced Populations	54.2*	42.9	2.8
FEDEARROZ Lines	59.1	30.6	10.2
ICA Lines	51.4	4.0	44.4
IRRI Lines	5.6	4.6	89.7
Colombia 1 (R check)*	90.3	9.7	0.0
Blue Bonnet (S check)*	0.0	3.8	96.2
CICA 8 (I check)*	0.0	86.4	13.6

- Percent of plants with rice "hoja blanca" symptom

* R, S and I: Resistant, Susceptible and Intermediate

The enhanced populations can be considered as good reservoirs for the development of resistant fixed lines by LAC NARS.

Table 1. Soil analysis of the experimental site (Lote Loma 5) " la libertad " Experimental Station, Villavicencio-Meta, Colombia. Cropping season 2000.

	Depth (cm)	O..M (%)	P Bray I (ppm)	pH	Al	Ca	Mg	K	C.I.E	B	Zn	Mn	Cu	Fe	Al Sat. (%)
					Meq./100 gr					ppm					
1	0-20	36	10.1	4.7	3.09	0.62	0.38	0.19	3.57	0.17	0.36	6.86	0.44	17.8	72.10
	20-40	2.8	2.2	4.9	3.15	0.20	0.23	0.15	3.01	0.41	0.21	5.15	0.37	10.3	82.00
2	0-20	4.0	7.9	4.5	3.22	0.54	0.30	0.18	3.28	0.27	0.28	6.40	0.40	13.0	76.50
	20-40	3.0	1.8	4.8	2.97	0.22	0.22	0.10	3.00	0.18	0.17	4.22	0.27	7.61	86.66

Table 2. Climatic characteristics of the cropping season 2000 .
"La Libertad" Experimental Station, Villavicencio-Meta, Colombia.

Characteristic/Month	April	May	June	July	Aug.	Total/Average
Rainfall (mm)	321.6	507.5	325.1	361.2	237.9	1753.3
Temperature (maximum ^{o}C)	29.0	29.7	28.9	28.9	29.4	29.31
Temperature (minimum ^{o}C)	21.8	21.2	21.4	20.9	22.0	21.73
Relative humidity (%)	84	85	87	86	81	84.16
Radiation (Cal/cm^{2})	461.4	424.2	409.3	416.9	407.1	

Table 3. Evaluation of S1 lines (223). "La Libertad Experimental Station", Villavicencio-Meta, Colombia.

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl
	Check	CIRAD 409	5	1	2	70	1	1	1	1
	Check	O.SAB.6	5	5	3	89	3	1	1	1
	Check	O.SAB.10	5	3	2	91	3	1	1	1
		Population PCT-4\0\0\2		**So Plants, PES 1999A**						
1	S010001	PCT-4\0\0\2>1	3	4	3	78	3	3	5	1
2	S010002	PCT-4\0\0\2>2	5	3	2	88	3	3	3	1
3	S010003	PCT-4\0\0\2>3	5	2	2	70	1	3	5	1
4	S010004	PCT-4\0\0\2>4	7	5	2	71	1	3	5	1
5	S010005	PCT-4\0\0\2>5	7	5	5	84	1	1	1	1
6	S010006	PCT-4\0\0\2>6	7	6	5	97	3	3	1	1
7	S010007	PCT-4\0\0\2>7	5	3	6	85	1	3	1	1
8	S010008	PCT-4\0\0\2>8	3	3	3	77	3	3	1	1
9	S010009	PCT-4\0\0\2>9	5	4	3	89	1	3	1	1
10	S010010	PCT-4\0\0\2>10	5	4	4	75	1	5	5	5
11	S010011	PCT-4\0\0\2>11	5	3	3	88	3	3	1	3
12	S010012	PCT-4\0\0\2>12	5	3	2	72	3	3	5	3
13	S010013	PCT-4\0\0\2>13	5	4	3	89	3	3	3	3
14	S010014	PCT-4\0\0\2>14	5	3	4	72	1	3	3	1
15	S010015	PCT-4\0\0\2>15	5	3	3	75	1	3	1	1
16	S010016	PCT-4\0\0\2>16	5	4	3	80	3	3	3	1
17	S010017	PCT-4\0\0\2>17	7	3	2	88	3	1	1	1
18	S010018	PCT-4\0\0\2>18	5	4	4	78	1	3	3	3
19	S010019	PCT-4\0\0\2>19	7	5	5	71	1	3	1	1
20	S010020	PCT-4\0\0\2>20	5	3	2	86	3	3	1	1
21	S010021	PCT-4\0\0\2>21	5	3	4	85	3	3	1	1
22	S010022	PCT-4\0\0\2>22	5	4	4	87	3	3	1	3
23	S010023	PCT-4\0\0\2>23	7	3	3	87	3	3	1	1
24	S010024	PCT-4\0\0\2>24	5	5	5	88	3	3	1	1
25	S010025	PCT-4\0\0\2>25	5	4	3	74	5	3	5	1
26	S010026	PCT-4\0\0\2>26	5	5	4	76	3	3	3	1
27	S010027	PCT-4\0\0\2>27	5	4	3	88	3	3	3	1
28	S010028	PCT-4\0\0\2>28	3	5	4	72	3	1	3	3
29	S010029	PCT-4\0\0\2>29	7	5	4	75	3	1	1	1
30	S010030	PCT-4\0\0\2>30	7	5	4	65	3	1	3	1
31	S010031	PCT-4\0\0\2>31	7	4	3	80	1	3	5	3
32	S010032	PCT-4\0\0\2>32	7	5	5	86	1	3	1	5
33	S010033	PCT-4\0\0\2>33	5	4	2	80	3	3	3	1
34	S010034	PCT-4\0\0\2>34	5	4	3	88	3	1	1	1
35	S010035	PCT-4\0\0\2>35	3	5	4	89	3	5	1	3
36	S010036	PCT-4\0\0\2>36	5	4	3	73	1	3	1	1
37	S010037	PCT-4\0\0\2>37	5	4	2	79	1	3	3	1
38	S010038	PCT-4\0\0\2>38	5	4	3	91	5	3	1	1
39	S010039	PCT-4\0\0\2>39	5	5	4	86	5	3	1	1
40	S010040	PCT-4\0\0\2>40	3	5	5	80	1	3	3	1
41	S010041	PCT-4\0\0\2>41	5	4	4	79	1	3	1	1
42	S010042	PCT-4\0\0\2>42	5	5	4	72	3	3	5	3

Continued .....

Table 3. Continued.....

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl
43	S010043	PCT-4\0\0\2>43	5	4	4	72	1	1	3	1
44	S010044	PCT-4\0\0\2>44	5	5	4	90	3	1	1	1
45	S010045	PCT-4\0\0\2>45	5	5	5	76	3	3	3	1
46	S010046	PCT-4\0\0\2>46	5	5	4	80	3	1	1	1
47	S010047	PCT-4\0\0\2>47	7	5	5	77	1	3	3	1
48	S010048	PCT-4\0\0\2>48	5	3	3	86	3	5	3	1
49	S010049	PCT-4\0\0\2>49	5	3	3	79	1	3	1	1
50	S010050	PCT-4\0\0\2>50	5	4	4	75	3	3	1	3
		Population PCT-4\SA\2\1		**S0 Plants, PES 1999A**						
51	S010051	PCT-4\SA\2\1>1	5	3	2	88	5	3	1	1
52	S010052	PCT-4\SA\2\1>2	7	4	5	79	3	3	1	1
53	S010053	PCT-4\SA\2\1>3	7	3	4	82	1	3	3	1
54	S010054	PCT-4\SA\2\1>4	7	4	3	68	1	3	1	1
	Check	CIRAD 409	5	3	3	71	3	1	1	1
55	S010056	PCT-4\SA\2\1>6	7	3	2	76	3	1	1	1
56	S010057	PCT-4\SA\2\1>7	7	4	2	75	1	3	1	1
	Check	CIRAD 409	5	2	3	70	3	1	1	1
57	S010059	PCT-4\SA\2\1>9	7	2	3	77	1	1	1	1
58	S010060	PCT-4\SA\2\1>10	7	2	3	67	1	3	1	1
	Check	CIRAD 409	3	1	1	70	1	1	1	1
	Check	O.SAB.6	3	5	4	84	3	1	1	1
	Check	O.SAB.10	5	3	2	92	5	3	1	1
59	S010061	PCT-4\SA\2\1>11	5	5	4	79	5	3	3	3
60	S010062	PCT-4\SA\2\1>12	5	5	4	83	5	1	1	1
61	S010063	PCT-4\SA\2\1>13	5	5	4	87	5	1	1	1
62	S010064	PCT-4\SA\2\1>14	7	4	5	86	3	3	1	1
63	S010065	PCT-4\SA\2\1>15	7	4	4	84	3	1	1	1
64	S010066	PCT-4\SA\2\1>16	7	5	4	80	1	3	1	3
65	S010067	PCT-4\SA\2\1>17	5	4	3	84	1	5	3	1
66	S010068	PCT-4\SA\2\1>18	7	3	4	84	3	5	1	1
67	S010069	PCT-4\SA\2\1>19	5	3	3	83	3	5	5	1
68	S010070	PCT-4\SA\2\1>20	5	3	3	85	1	5	7	3
69	S010071	PCT-4\SA\2\1>21	7	5	5	86	1	3	5	3
70	S010072	PCT-4\SA\2\1>22	5	4	4	79	1	3	5	3
71	S010073	PCT-4\SA\2\1>23	5	4	4	83	1	3	5	3
72	S010074	PCT-4\SA\2\1>24	7	3	4	95	1	3	3	1
		CIRAD 409	5	2	3	72	3	3	1	1
73	S010076	PCT-4\SA\2\1>26	7	5	5	100	3	5	5	1
74	S010077	PCT-4\SA\2\1>27	7	3	4	79	3	3	3	3
75	S010078	PCT-4\SA\2\1>28	5	5	3	78	1	3	1	1
76	S010079	PCT-4\SA\2\1>29	3	5	3	84	3	5	5	1
77	S010080	PCT-4\SA\2\1>30	5	5	5	83	1	1	3	1
		CIRAD 409	5	3	3	71	3	1	1	1
78	S010082	PCT-4\SA\2\1>32	7	5	3	89	3	3	3	1
79	S010083	PCT-4\SA\2\1>33	7	5	5	80	3	3	1	3
80	S010084	PCT-4\SA\2\1>34	5	3	3	69	3	1	1	1

Continued .....

Table 3. Continued.....

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl
81	S010085	PCT-4\SA\2\1>35	5	5	4	87	3	5	5	5
82	S010086	PCT-4\SA\2\1>36	7	5	5	83	1	3	1	3
83	S010087	PCT-4\SA\2\1>37	5	5	4	85	1	3	3	1
84	S010088	PCT-4\SA\2\1>38	9	6	5	88	1	1	1	1
85	S010089	PCT-4\SA\2\1>39	9	5	4	88	1	1	1	1
		CIRAD 409	3	4	2	70	1	1	1	1
86	S010091	PCT-4\SA\2\1>41	7	4	3	90	1	1	1	1
		CIRAD 409	5	4	3	73	3	1	1	1
87	S010093	PCT-4\SA\2\1>43	7	5	3	80	3	1	1	1
88	S010094	PCT-4\SA\2\1>44	3	5	3	71	1	1	1	3
89	S010095	PCT-4\SA\2\1>45	1	3	2	83	1	3	3	1
90	S010096	PCT-4\SA\2\1>46	3	5	5	80	1	5	3	3
		Population PCT-4\SA\4\1		**S0 Plants, PES 1999**						
91	S010097	PCT-4\SA\4\1>1	5	5	3	77	1	3	1	5
92	S010098	PCT-4\SA\4\1>2	5	4	3	75	1	3	1	5
93	S010099	PCT-4\SA\4\1>3	5	3	2	72	3	1	7	3
94	S010100	PCT-4\SA\4\1>4	5	4	2	83	3	3	1	1
95	S010101	PCT-4\SA\4\1>5	5	4	3	76	1	1	1	3
96	S010102	PCT-4\SA\4\1>6	5	4	3	79	3	1	1	1
97	S010103	PCT-4\SA\4\1>7	3	4	3	75	1	3	3	1
98	S010104	PCT-4\SA\4\1>8	3	5	3	80	3	3	1	1
99	S010105	PCT-4\SA\4\1>9	5	4	4	83	1	3	5	1
100	S010106	PCT-4\SA\4\1>10	5	4	3	79	3	3	5	3
101	S010107	PCT-4\SA\4\1>11	5	5	4	71	3	1	1	3
102	S010108	PCT-4\SA\4\1>12	5	5	5	69	5	1	7	5
103	S010109	PCT-4\SA\4\1>13	3	5	4	84	1	1	1	3
104	S010110	PCT-4\SA\4\1>14	5	4	3	72	1	3	3	1
105	S010111	PCT-4\SA\4\1>15	5	5	4	72	1	1	1	1
106	S010112	PCT-4\SA\4\1>16	7	5	3	75	1	1	3	1
107	S010113	PCT-4\SA\4\1>17	5	4	3	83	1	3	1	1
108	S010114	PCT-4\SA\4\1>18	5	5	5	87	3	1	1	1
109	S010115	PCT-4\SA\4\1>19	5	4	4	84	3	1	3	1
110	S010116	PCT-4\SA\4\1>20	7	5	3	76	3	1	1	3
111	S010117	PCT-4\SA\4\1>21	3	5	3	63	1	3	3	1
112	S010118	PCT-4\SA\4\1>22	3	4	3	79	1	3	3	3
113	S010119	PCT-4\SA\4\1>23	5	4	3	83	3	5	3	1
114	S010120	PCT-4\SA\4\1>24	5	3	3	71	1	1	1	1
115	S010121	PCT-4\SA\4\1>25	5	3	2	83	1	1	3	1
	Check	CIRAD 409	5	1	1	68	1	1	1	1
	Check	O.SAB.6	3	5	3	87	3	1	3	1
	Check	O.SAB.10	3	3	2	90	3	1	1	1
	Check	CIRAD 409	3	1	1	68	1	1	1	1
	Check	O.SAB.6	3	4	3	88	3	1	1	1
	Check	O.SAB.10	3	3	2	92	3	1	1	1
116	S010122	PCT-4\SA\4\1>26	3	3	3	71	1	1	5	1
117	S010123	PCT-4\SA\4\1>27	5	3	2	86	1	1	1	1

Continued .....

Table 3. Continued.....

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl
118	S010124	PCT-4\SA\4\1>28	5	5	3	75	1	3	1	3
119	S010125	PCT-4\SA\4\1>29	5	3	3	79	1	1	1	1
120	S010126	PCT-4\SA\4\1>30	5	3	3	82	1	1	3	1
121	S010127	PCT-4\SA\4\1>31	7	4	2	80	1	3	3	1
122	S010128	PCT-4\SA\4\1>32	5	5	4	87	1	3	5	5
123	S010129	PCT-4\SA\4\1>33	3	4	3	68	1	1	3	3
124	S010130	PCT-4\SA\4\1>34	3	4	3	83	1	5	5	1
125	S010131	PCT-4\SA\4\1>35	5	4	3	72	1	1	3	1
126	S010132	PCT-4\SA\4\1>36	5	5	4	71	1	1	1	1
127	S010133	PCT-4\SA\4\1>37	3	3	3	80	1	1	1	1
128	S010134	PCT-4\SA\4\1>38	5	4	3	89	1	1	1	1
129	S010135	PCT-4\SA\4\1>39	3	5	5	78	1	1	1	5
130	S010136	PCT-4\SA\4\1>40	5	5	5	78	1	1	1	1
131	S010137	PCT-4\SA\4\1>41	5	5	4	73	1	1	1	3
132	S010138	PCT-4\SA\4\1>42	3	3	3	72	1	1	1	1
133	S010139	PCT-4\SA\4\1>43	1	4	2	80	1	1	3	1
134	S010140	PCT-4\SA\4\1>44	3	3	2	73	1	1	1	3
135	S010141	PCT-4\SA\4\1>45	3	2	3	71	3	1	3	1
136	S010142	PCT-4\SA\4\1>46	5	4	3	75	1	1	1	1
137	S010143	PCT-4\SA\4\1>47	5	4	4	72	1	3	1	1
138	S010144	PCT-4\SA\4\1>48	5	3	2	79	3	5	1	3
139	S010145	PCT-4\SA\4\1>49	3	4	3	88	3	3	3	1
140	S010146	PCT-4\SA\4\1>50	3	4	3	78	3	3	1	1
		Population PCT-4\SA\1\1,SA\1				**S0 Plants, PES 1999A**				
141	S010147	PCT-4\SA\1\1,SA\1>1	3	5	3	87	1	3	1	1
142	S010148	PCT-4\SA\1\1,SA\1>2	5	3	2	78	1	3	1	1
143	S010149	PCT-4\SA\1\1,SA\1>3	5	4	3	83	1	3	1	1
144	S010150	PCT-4\SA\1\1,SA\1>4	5	4	3	79	1	3	3	3
145	S010151	PCT-4\SA\1\1,SA\1>5	5	4	3	84	1	3	3	1
146	S010152	PCT-4\SA\1\1,SA\1>6	7	4	3	81	1	1	3	1
147	S010153	PCT-4\SA\1\1,SA\1>7	7	3	3	81	1	3	3	1
148	S010154	PCT-4\SA\1\1,SA\1>8	5	5	4	77	1	1	1	3
149	S010155	PCT-4\SA\1\1,SA\1>9	5	3	2	75	1	3	3	1
150	S010156	PCT-4\SA\1\1,SA\1>10	5	4	3	72	1	3	5	3
151	S010157	PCT-4\SA\1\1,SA\1>11	7	5	4	84	1	5	3	3
152	S010158	PCT-4\SA\1\1,SA\1>12	5	3	2	75	1	3	3	1
153	S010159	PCT-4\SA\1\1,SA\1>13	5	3	3	73	1	5	1	1
154	S010160	PCT-4\SA\1\1,SA\1>14	9	6	5	86	1	3	1	1
155	S010161	PCT-4\SA\1\1,SA\1>15	7	5	5	71	3	5	3	1
156	S010162	PCT-4\SA\1\1,SA\1>16	7	5	4	83	1	5	1	1
157	S010163	PCT-4\SA\1\1,SA\1>17	5	3	2	85	1	3	1	1
158	S010164	PCT-4\SA\1\1,SA\1>18	5	5	4	81	3	5	5	3
159	S010165	PCT-4\SA\1\1,SA\1>19	5	4	3	78	1	5	1	3
160	S010166	PCT-4\SA\1\1,SA\1>20	7	5	5	75	1	3	1	1
161	S010167	PCT-4\SA\1\1,SA\1>21	5	4	4	80	1	3	1	1
162	S010168	PCT-4\SA\1\1,SA\1>22	5	5	5	83	1	5	5	1

Continued .....

Table 3. Continued.....

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl
163	S010169	PCT-4\SA\1\1,SA\1>23	5	4	4	75	1	3	3	3
164	S010170	PCT-4\SA\1\1,SA\1>24	5	3	3	65	1	3	1	1
165	S010171	PCT-4\SA\1\1,SA\1>25	5	3	3	91	3	5	1	1
166	S010172	PCT-4\SA\1\1,SA\1>26	5	3	3	87	1	1	3	1
167	S010173	PCT-4\SA\1\1,SA\1>27	5	4	3	77	3	1	3	3
168	S010174	PCT-4\SA\1\1,SA\1>28	5	3	3	76	3	3	3	1
169	S010175	PCT-4\SA\1\1,SA\1>29	5	4	3	85	1	1	1	1
170	S010176	PCT-4\SA\1\1,SA\1>30	5	5	5	84	1	5	5	1
171	S010177	PCT-4\SA\1\1,SA\1>31	5	5	5	84	1	3	3	3
172	S010178	PCT-4\SA\1\1,SA\1>32	7	5	5	89	3	1	1	1
173	S010179	PCT-4\SA\1\1,SA\1>33	5	4	4	85	3	1	1	1
174	S010180	PCT-4\SA\1\1,SA\1>34	5	4	3	89	3	5	3	3
175	S010181	PCT-4\SA\1\1,SA\1>35	5	4	4	83	5	3	3	1
176	S010182	PCT-4\SA\1\1,SA\1>36	5	5	4	71	1	1	3	1
	Check	CIRAD 409	5	1	1	70	1	1	1	1
	Check	O.SAB.6	3	5	4	90	3	1	1	1
	Check	O.SAB.10	5	3	3	92	5	1	1	1
177	S010183	PCT-4\SA\1\1,SA\1>37	5	3	3	73	1	3	3	1
178	S010184	PCT-4\SA\1\1,SA\1>38	7	3	3	81	1	3	1	1
179	S010185	PCT-4\SA\1\1,SA\1>39	5	3	2	64	1	3	3	3
180	S010186	PCT-4\SA\1\1,SA\1>40	5	3	2	73	1	3	1	1
181	S010187	PCT-4\SA\1\1,SA\1>41	7	5	4	83	1	3	1	1
182	S010188	PCT-4\SA\1\1,SA\1>42	7	4	3	73	1	3	3	1
183	S010189	PCT-4\SA\1\1,SA\1>43	5	3	2	71	1	3	1	1
184	S010190	PCT-4\SA\1\1,SA\1>44	5	3	2	71	1	3	1	3
185	S010191	PCT-4\SA\1\1,SA\1>45	5	4	5	72	1	1	1	3
186	S010192	PCT-4\SA\1\1,SA\1>46	3	3	3	86	1	3	1	1
187	S010193	PCT-4\SA\1\1,SA\1>47	5	4	4	76	1	3	1	1
188	S010194	PCT-4\SA\1\1,SA\1>48	5	5	4	73	3	5	3	1
189	S010195	PCT-4\SA\1\1,SA\1>49	5	3	3	68	1	1	3	1
190	S010196	PCT-4\SA\1\1,SA\1>50	5	3	3	81	3	5	5	3
191	S010197	PCT-4\SA\1\1,SA\1>51	5	3	2	69	1	1	3	1
		Population PCT-4\0\0\0			**S0 Plants, PES 1998B**					
192	S010198	PCT-4\0\0\0>1	3	4	4	88	3	3	1	1
193	S010199	PCT-4\0\0\0>2	5	4	3	82	3	3	3	1
194	S010200	PCT-4\0\0\0>3	5	3	4	79	5	1	3	1
195	S010201	PCT-4\0\0\0>4	5	5	5	72	3	3	3	5
196	S010202	PCT-4\0\0\0>5	5	5	5	83	3	3	3	3
197	S010203	PCT-4\0\0\0>6	3	5	4	89	3	3	1	3
198	S010204	PCT-4\0\0\0>7	3	5	4	79	3	3	3	1
199	S010205	PCT-4\0\0\0>8	3	4	3	78	3	3	3	1
200	S010206	PCT-4\0\0\0>9	5	5	5	75	3	3	3	5
201	S010207	PCT-4\0\0\0>10	5	5	5	81	3	1	5	3
		Population PCT-4\SA\1\1			**S0 Plants, PES 1998B**					
202	S010208	PCT-4\SA\1\1>1	7	5	5	81	1	3	1	5
203	S010209	PCT-4\SA\1\1>2	5	5	3	83	1	5	3	3

Continued .....

Table 3. Continued.....

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl
204	S010210	PCT-4\SA\1\1>3	5	4	5	89	1	1	3	1
205	S010211	PCT-4\SA\1\1>4	7	5	5	74	1	1	3	1
206	S010212	PCT-4\SA\1\1>5	5	5	5	89	1	3	3	3
207	S010213	PCT-4\SA\1\1>6	5	4	4	80	3	1	1	3
208	S010214	PCT-4\SA\1\1>7	5	5	5	82	1	3	1	1
209	S010215	PCT-4\SA\1\1>8	5	5	4	87	1	5	5	1
210	S010216	PCT-4\SA\1\1>9	5	5	4	72	1	1	3	3
211	S010217	PCT-4\SA\1\1>10	5	5	5	89	5	3	5	3
Population PCT-4\SA\2\1			**S0 Plants, PES 1998B**							
212	S010218	PCT-4\SA\2\1>1	5	5	5	80	1	1	1	5
213	S010219	PCT-4\SA\2\1>2	5	5	5	80	1	3	1	5
Population PCT-4\SA\3\1			**S0 Plants, PES 1998B**							
214	S010220	PCT-4\SA\3\1>1	7	5	4	91	1	5	5	1
215	S010221	PCT-4\SA\3\1>2	7	5	4	85	1	3	5	5
216	S010222	PCT-4\SA\3\1>3	5	6	5	85	1	3	1	3
217	S010223	PCT-4\SA\3\1>4	5	5	5	71	1	1	3	3
218	S010224	PCT-4\SA\3\1>5	3	5	4	81	1	5	3	3
219	S010225	PCT-4\SA\3\1>6	7	5	4	91	1	5	3	1
220	S010226	PCT-4\SA\3\1>7	7	5	5	87	1	3	5	3
221	S010227	PCT-4\SA\3\1>8	5	5	5	86	1	3	1	1
222	S010228	PCT-4\SA\3\1>9	5	4	3	88	1	1	c	3
223	S010229	PCT-4\SA\3\1>10	5	4	4	81	1	5	3	1

Vg = vigor; Bl 1 = leaf blast; Bl 2 = leaf blast; LsC = leaf scald; BS = brown spot; NBl = neck blast;

Gd = grain discoloration. (Scale 1-9: 1 means resistant and 9 susceptible). Fl = flowering (Days).

Table 3.1. Selected S1 lines (36). "La Libertad Experimental Station" Villavicencio-Meta, Colombia

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl	Plant Sel.	Upland Workshop. Lines selected by:						
												Arg.	Bol.	Bol. 2002	Bra.	Col.	Cuba	Ven.
Population PCT-4\0\0\2																		
1	S010007	PCT-4\0\0\2>7	5	3	6	85	1	3	1	1	2				X			
2	S010008	PCT-4\0\0\2>8	3	3	3	77	3	3	1	1	6	X	X				X	
3	S010020	PCT-4\0\0\2>20	5	3	2	86	3	3	1	1	8	X	X		X		X	
4	S010029	PCT-4\0\0\2>29	7	5	4	75	3	1	1	1	4	X	X				X	
5	S010030	PCT-4\0\0\2>30	7	5	4	65	3	1	3	1	4	X	X				X	
6	S010032	PCT-4\0\0\2>32	7	5	5	86	1	3	1	5	1		X					
7	S010033	PCT-4\0\0\2>33	5	4	2	80	3	3	3	1	6	X	X			X	X	
8	S010036	PCT-4\0\0\2>36	5	4	3	73	1	3	1	1	1					X		
9	S010037	PCT-4\0\0\2>37	5	4	2	79	1	3	3	1	8	X	X			X	X	
10	S010049	PCT-4\0\0\2>49	5	3	3	79	1	3	1	1	7	X	X				X	X
Population PCT-4\SA\2\1																		
11	S010052	PCT-4\SA\2\1>2	7	4	5	79	3	3	1	1	1				X			
12	S010053	PCT-4\SA\2\1>3	7	3	4	82	1	3	3	1	1				X			
13	S010054	PCT-4\SA\2\1>4	7	4	3	68	1	3	1	1	6	X	X				X	
14	S010057	PCT-4\SA\2\1>7	7	4	2	75	1	3	1	1	4	X	X				X	
15	S010059	PCT-4\SA\2\1>9	7	2	3	77	1	1	1	1	5	X	X		X		X	
16	S010060	PCT-4\SA\2\1>10	7	2	3	67	1	3	1	1	6	X	X				X	X
17	S010062	PCT-4\SA\2\1>12	5	5	4	83	5	1	1	1	6	X	X		X	X	X	
18	S010067	PCT-4\SA\2\1>17	5	4	3	84	1	5	3	1	2	X	X					
19	S010068	PCT-4\SA\2\1>18	7	3	4	84	3	5	1	1	4	X	X		X		X	
20	S010069	PCT-4\SA\2\1>19	5	3	3	83	3	5	5	1	1						X	
21	S010078	PCT-4\SA\2\1>28	5	5	3	78	1	3	1	1	1				X			
22	S010084	PCT-4\SA\2\1>34	5	3	3	69	3	1	1	1	1				X			
23	S010086	PCT-4\SA\2\1>36	7	5	5	83	1	3	1	3	1				X			
24	S010089	PCT-4\SA\2\1>39	9	5	4	88	1	1	1	1	1					X		
25	S010093	PCT-4\SA\2\1>43	7	5	3	80	3	1	1	1	1					X		
26	S010094	PCT-4\SA\2\1>44	3	5	3	71	1	1	1	3	3							
Population PCT-4\SA\4\1																		
27	S010101	PCT-4\SA\4\1>5	5	4	3	76	1	1	1	3	1					X		
28	S010104	PCT-4\SA\4\1>8	3	5	3	80	3	3	1	1	1					X		
29	S010107	PCT-4\SA\4\1>11	5	5	4	71	3	1	1	3	1					X		
30	S010125	PCT-4\SA\4\1>29	5	3	3	79	1	1	1	1	1					X		
31	S010137	PCT-4\SA\4\1>41	5	5	4	73	1	1	1	3	1					X		
32	S010138	PCT-4\SA\4\1>42	3	3	3	72	1	1	1	1	2					X		X
33	S010142	PCT-4\SA\4\1>46	5	4	3	75	1	1	1	1	1					X		
34	S010174	PCT-4\SA\1\1,SA\1>2	5	3	3	76	3	3	3	1	1							X
35	S010190	PCT-4\SA\1\1,SA\1>4	5	3	2	71	1	3	1	3	1							X
Population PCT-4\SA\3\1																		
36	S010229	PCT-4\SA\3\1>10	5	4	4	81	1	5	3	1	1					X		

Vg = vigor; Bl 1 = leaf blast; Bl 2 = leaf blast; Fl = flowering; LsC = leaf scald; BS = brown spot; NBl = neck blast;

Gd = grain discoloration. (Scale 1-9: 1 means resistant and 9 susceptible); Fl = flowering (Days).

Arg.=Argentina; Bol.=Bolivia; Bol 2002=Second Workshop in Bolivia; Bra.=Brazil;Col.=Colombia; Ven.=Venezuela

Table 4. Evaluation of S2 lines (237). "La Libertad Experimental Station", Villavicencio-Meta, Colombia

Nbr.	Field Nbr. 2000A	Pedigree	Vg	BI 1	BI 2	FI	LSc	Bs	Gd	NBI
Populations PCT-4\0\0\0; PCT-4\SA\1\1; PCT-4\SA\2\1 and PCT-4\SA\3\1 S1 Lines, EELL 99A										
1	S020001	PCT-4\0\0\0>37-M	7	3	4	88	1	3	1	1
2	S020002	PCT-4\0\0\0>23-M	7	3	3	75	1	3	3	1
3	S020003	PCT-4\0\0\0>4-M	5	3	4	93	1	3	1	1
4	S020004	PCT-4\0\0\0>7-M	7	4	3	86	3	3	1	1
5	S020005	PCT-4\0\0\0>20-M	5	3	4	94	3	1	1	1
6	S020006	PCT-4\0\0\0>19-M	5	4	3	73	1	3	1	1
7	S020007	PCT-4\0\0\0>8-M	5	5	5	76	3	5	5	3
8	S020008	PCT-4\SA\1\1>15-M	5	5	5	76	3	5	5	3
9	S020009	PCT-4\0\0\0>3-M	7	4	4	80	3	5	5	3
10	S020010	PCT-4\0\0\0>36-M	5	4	3	83	3	3	3	1
11	S020011	PCT-4\SA\1\1>7-M	5	4	5	90	3	3	1	1
12	S020012	PCT-4\0\0\0>14-M	7	5	5	86	3	3	3	1
13	S020013	PCT-4\0\0\0>43-M	5	5	5	97	3	1	1	1
	Check	CIRAD 409	5	1	1	68	1	3	1	1
	Check	O.SAB.6	3	5	5	88	3	1	3	1
	Check	O.SAB.10	5	3	3	90	3	1	1	1
	Check	CIRAD 409	3	1	1	68	1	3	1	1
	Check	O.SAB.6	3	5	5	88	3	1	3	1
	Check	O.SAB.10	5	3	3	91	3	1	1	1
14	S020014	PCT-4\0\0\0>13-M	7	5	5	89	3	1	1	1
15	S020015	PCT-4\0\0\0>28-M	7	4	3	76	1	1	3	3
16	S020016	PCT-4\SA\1\1>8-M	7	3	5	76	1	1	1	3
17	S020017	PCT-4\SA\1\1>3-M	7	4	5	90	1	3	3	1
18	S020018	PCT-4\SA\1\1>4-M	7	5	5	84	1	3	1	3
19	S020019	PCT-4\0\0\0>17-M	5	3	3	88	1	3	1	1
20	S020020	PCT-4\0\0\0>21-M	9	5	5	85	3	5	3	1
21	S020021	PCT-4\0\0\0>39-M	5	3	4	89	3	1	1	1
22	S020022	PCT-4\0\0\0>24-M	5	3	4	77	3	3	1	1
23	S020023	PCT-4\0\0\0>44-M	5	3	3	85	3	3	3	1
24	S020024	PCT-4\0\0\0>18-M	7	5	5	93	3	1	5	1
25	S020025	PCT-4\0\0\0>26-M	7	5	5	73	1	1	1	1
26	S020026	PCT-4\0\0\0>2-M	9	5	5	91	1	3	1	1
27	S020027	PCT-4\0\0\0>34-M	9	4	4	81	1	1	1	3
28	S020028	PCT-4\0\0\0>27-M	7	5	5	76	1	3	3	1
29	S020029	PCT-4\SA\1\1>2-M	5	3	3	77	1	3	3	3
30	S020030	PCT-4\0\0\0>15-M	5	5	5	91	3	5	1	1
31	S020031	PCT-4\0\0\0>1-M	5	4	5	74	1	1	3	3
32	S020032	PCT-4\0\0\0>41-M	5	3	3	75	1	3	3	1
33	S020033	PCT-4\0\0\0>33-M	5	4	3	86	3	1	3	1
34	S020034	PCT-4\SA\1\1>6-M	5	4	3	70	1	1	1	1
35	S020035	PCT-4\0\0\0>6-M	7	3	3	84	1	3	1	1
36	S020036	PCT-4\SA\1\1>11-M	7	3	4	85	3	5	5	3
37	S020037	PCT-4\SA\1\1>13-M	5	4	3	90	3	5	3	1
38	S020038	PCT-4\SA\1\1>12-M	5	3	2	84	3	3	3	1

Continued .....

Table 4. Continued.....

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl
39	S020039	PCT-4\0\0\0>25-M	7	4	3	77	3	3	3	1
40	S020040	PCT-4\SA\1\1>5-M	7	5	5	76	3	1	1	3
41	S020041	PCT-4\0\0\0>22-M	7	4	4	78	3	3	3	3
42	S020042	PCT-4\0\0\0>42-M	7	5	5	81	1	3	3	1
43	S020043	PCT-4\0\0\0>11-M	7	4	4	94	3	1	1	1
44	S020044	PCT-4\0\0\0>9-M	7	5	5	77	1	3	3	1
45	S020045	PCT-4\0\0\0>16-M	7	4	5	84	1	3	3	3
46	S020046	PCT-4\0\0\0>12-M	7	4	3	86	1	3	1	1
47	S020047	PCT-4\0\0\0>10-M	7	3	3	85	1	1	3	1
48	S020048	PCT-4\SA\1\1>10-M	7	5	4	76	3	3	3	1
49	S020049	PCT-4\0\0\0>31-M	7	4	5	90	1	3	1	1
50	S020050	PCT-4\0\0\0>38-M	7	4	5	90	3	1	1	1
51	S020051	PCT-4\SA\1\1>9-M	7	4	5	79	1	3	1	1
52	S020052	PCT-4\0\0\0>5-M	7	3	3	87	3	3	1	3
53	S020053	PCT-4\0\0\0>30-M	5	4	4	86	1	5	3	1
54	S020054	PCT-4\0\0\0>35-M	7	5	5	89	1	1	1	1
55	S020055	PCT-4\0\0\0>32-M	7	4	5	89	1	1	1	1
56	S020056	PCT-4\0\0\0>40-M	7	3	3	76	1	3	1	1
57	S020057	PCT-4\SA\1\1>1-M	7	3	4	74	1	1	1	3
58	S020058	PCT-4\0\0\0>29-M	7	3	4	93	3	3	1	1
59	S020059	PCT-4\SA\1\1>14-M	7	3	4	76	1	3	1	3
60	S020060	PCT-4\SA\2\1>28-M	7	3	3	83	1	3	1	1
61	S020061	PCT-4\SA\2\1>11-M	7	3	4	80	1	1	1	1
62	S020062	PCT-4\SA\1\1>28-M	7	5	5	92	1	3	1	1
63	S020063	PCT-4\SA\2\1>14-M	7	5	5	86	1	3	3	5
64	S020064	PCT-4\SA\1\1>31-M	7	3	3	72	1	3	3	3
65	S020065	PCT-4\SA\2\1>13-M	7	3	4	76	1	1	1	1
66	S020066	PCT-4\SA\1\1>22-M	7	3	4	76	1	1	3	1
67	S020067	PCT-4\SA\1\1>21-M	7	3	4	83	1	1	1	1
68	S020068	PCT-4\SA\2\1>4-M	7	3	5	66	1	1	1	1
69	S020069	PCT-4\SA\2\1>24-M	7	3	5	91	1	1	1	1
70	S020070	PCT-4\SA\1\1>32-M	7	3	3	85	1	1	1	1
71	S020071	PCT-4\SA\1\1>20-M	7	3	3	76	1	3	1	3
72	S020072	PCT-4\SA\1\1>19-M	7	3	4	80	1	1	1	1
73	S020073	PCT-4\SA\1\1>16-M	7	4	4	89	3	3	1	1
	Check	CIRAD 409	5	1	1	70	3	1	1	1
	Check	O.SAB.6	5	5	5	88	5	1	1	1
	Check	O.SAB.10	5	3	2	92	5	1	1	1
74	S020074	PCT-4\SA\2\1>6-M	5	2	3	68	3	1	1	3
75	S020075	PCT-4\SA\1\1>41-M	7	5	4	78	3	1	1	1
76	S020076	PCT-4\SA\2\1>17-M	7	3	3	84	1	5	3	1
77	S020077	PCT-4\SA\2\1>3-M	5	3	4	80	3	5	3	1
78	S020078	PCT-4\SA\1\1>33-M	5	4	4	78	1	1	1	1
79	S020079	PCT-4\SA\2\1>12-M	5	4	4	80	3	1	1	1
80	S020080	PCT-4\SA\2\1>27-M	7	3	4	79	1	3	1	1
81	S020081	PCT-4\SA\2\1>22-M	7	3	4	81	1	3	1	1
82	S020082	PCT-4\SA\1\1>18-M	7	3	3	87	1	1	1	1

Continued .....

Table 4. Continued.....

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl
83	S020083	PCT-4\SA\1\1>37-M	5	3	3	80	1	1	1	1
84	S020084	PCT-4\SA\1\1>25-M	5	3	4	84	1	1	1	1
85	S020085	PCT-4\SA\2\1>18-M	5	3	5	82	1	3	1	1
86	S020086	PCT-4\SA\2\1>15-M	7	2	3	75	1	1	1	1
87	S020087	PCT-4\SA\2\1>29-M	5	5	5	83	3	5	5	1
88	S020088	PCT-4\SA\2\1>25-M	7	3	2	78	1	3	3	1
89	S020089	PCT-4\SA\2\1>5-M	5	2	2	92	1	5	5	1
90	S020090	PCT-4\SA\2\1>16-M	7	3	3	81	1	1	1	3
91	S020091	PCT-4\SA\1\1>34-M	5	3	4	76	1	3	1	5
92	S020092	PCT-4\SA\2\1>19-M	3	2	3	81	1	1	3	1
93	S020093	PCT-4\SA\1\1>29-M	5	2	3	87	1	3	3	1
94	S020094	PCT-4\SA\2\1>7-M	5	3	3	67	1	1	3	1
95	S020095	PCT-4\SA\2\1>10-M	5	2	3	62	1	3	1	1
96	S020096	PCT-4\SA\1\1>39-M	5	5	5	86	1	3	1	1
97	S020097	PCT-4\SA\1\1>44-M	5	2	2	71	1	1	1	1
98	S020098	PCT-4\SA\2\1>23-M	5	3	4	81	1	3	5	3
99	S020099	PCT-4\SA\2\1>21-M	7	5	5	84	1	1	3	1
100	S020100	PCT-4\SA\1\1>27-M	7	5	5	92	1	3	5	3
101	S020101	PCT-4\SA\1\1>43-M	5	3	3	94	3	1	1	1
102	S020102	PCT-4\SA\2\1>1-M	7	4	3	88	1	3	1	1
103	S020103	PCT-4\SA\2\1>2-M	7	4	3	79	1	1	1	1
104	S020104	PCT-4\SA\1\1>38-M	5	4	5	85	1	3	1	1
105	S020105	PCT-4\SA\1\1>23-M	5	4	3	87	1	1	3	1
106	S020106	PCT-4\SA\1\1>17-M	7	5	5	78	1	1	3	1
107	S020107	PCT-4\SA\1\1>36-M	7	4	4	77	1	3	3	3
108	S020108	PCT-4\SA\1\1>24-M	5	5	5	70	1	1	1	1
109	S020109	PCT-4\SA\2\1>8-M	5	5	4	75	1	1	1	1
110	S020110	PCT-4\SA\2\1>9-M	3	3	2	67	1	1	1	1
111	S020111	PCT-4\SA\1\1>26-M	5	3	2	76	1	1	1	1
112	S020112	PCT-4\SA\1\1>35-M	3	3	2	86	1	1	1	1
113	S020113	PCT-4\SA\2\1>20-M	5	3	2	83	1	3	3	1
114	S020114	PCT-4\SA\1\1>40-M	5	3	2	72	1	1	1	1
115	S020115	PCT-4\SA\2\1>26-M	5	4	3	93	5	5	5	1
116	S020116	PCT-4\SA\1\1>42-M	3	3	2	71	1	1	1	1
117	S020117	PCT-4\SA\1\1>30-M	5	3	3	76	1	1	1	1
118	S020118	PCT-4\SA\2\1>40-M	3	3	3	80	3	5	5	1
119	S020119	PCT-4\SA\2\1>30-M	3	3	4	79	1	1	1	1
120	S020120	PCT-4\SA\3\1>7-M	5	3	5	77	1	1	1	1
121	S020121	PCT-4\SA\3\1>2-M	5	3	3	81	1	1	1	3
122	S020122	PCT-4\SA\3\1>15-M	5	3	2	70	1	1	1	1
123	S020123	PCT-4\SA\2\1>44-M	5	4	3	70	1	1	1	3
124	S020124	PCT-4\SA\3\1>41-M	5	4	3	67	3	1	1	1
125	S020125	PCT-4\SA\3\1>42-M	3	3	2	84	1	1	3	1
126	S020126	PCT-4\SA\3\1>9-M	5	3	2	83	1	1	3	1
127	S020127	PCT-4\SA\2\1>34-M	3	2	3	65	1	1	1	1
128	S020128	PCT-4\SA\3\1>31-M	5	3	3	69	1	1	1	1
129	S020129	PCT-4\SA\3\1>18-M	5	3	2	80	1	5	5	1

Continued .....

Table 4. Continued.....

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl
130	S020130	PCT-4\SA\3\1>5-M	5	5	5	72	1	1	3	3
131	S020131	PCT-4\SA\2\1>35-M	5	4	5	85	1	5	5	3
132	S020132	PCT-4\SA\3\1>3-M	3	3	3	81	1	3	1	1
133	S020133	PCT-4\SA\2\1>39-M	5	4	4	78	1	1	1	1
134	S020134	PCT-4\SA\3\1>6-M	7	3	3	76	1	3	1	3
	Check	CIRAD 409	3	1	1	70	1	1	1	1
	Check	O.SAB.6	3	4	4	89	3	1	3	1
	Check	O.SAB.10	3	2	3	94	5	1	1	1
	Check	CIRAD 409	1	1	1	70	1	1	1	1
	Check	O.SAB.6	3	4	4	88	3	1	3	1
	Check	O.SAB.10	3	3	3	92	5	1	1	1
135	S020135	PCT-4\SA\3\1>14-M	5	4	3	90	1	3	5	1
136	S020136	PCT-4\SA3\1>1-M	5	4	4	79	1	1	5	1
137	S020137	PCT-4\SA\3\1>36-M	5	4	3	85	1	1	1	1
138	S020138	PCT-4\SA\2\1>42-M	1	3	2	71	1	1	1	1
139	S020139	PCT-4\SA\3\1>12-M	1	3	3	79	3	1	1	1
140	S020140	PCT-4\SA\3\1>4-M	5	4	4	71	3	1	1	3
141	S020141	PCT-4\SA\3\1>16-M	3	3	4	80	3	1	3	1
142	S020142	PCT-4\SA\2\1>32-M	3	3	3	83	1	1	5	1
143	S020143	PCT-4\SA\3\1>35-M	5	2	2	84	1	1	1	1
144	S020144	PCT-4\SA\3\1>17-M	5	3	3	82	1	1	3	5
145	S020145	PCT-4\SA\3\1>19-M	5	3	3	74	1	1	1	1
146	S020146	PCT-4\SA\3\1>40-M	9	3	4	86	1	1	1	3
147	S020147	PCT-4\SA\3\1>44-M	7	2	2	85	1	1	5	1
148	S020148	PCT-4\SA\2\1>43-M	7	3	3	82	1	1	1	1
149	S020149	PCT-4\SA\3\1>39-M	7	2	2	78	1	1	1	1
150	S020150	PCT-4\SA\2\1>31-M	7	2	3	80	1	1	3	1
151	S020151	PCT-4\SA\3\1>20-M	5	3	3	83	1	1	3	1
152	S020152	PCT-4\SA\2\1>41-M	5	2	2	86	1	1	1	1
153	S020153	PCT-4\SA\3\1>25-M	5	2	1	73	1	1	1	1
154	S020154	PCT-4\SA\3\1>13-M	5	3	2	83	1	1	1	1
155	S020155	PCT-4\SA\2\1>33-M	5	4	5	79	1	1	1	3
156	S020156	PCT-4\SA\3\1>33-M	5	2	3	71	1	1	1	1
157	S020157	PCT-4\SA\3\1>10-M	5	2	3	84	1	1	1	1
158	S020158	PCT-4\SA\3\1>26-M	7	3	3	91	1	3	5	3
159	S020159	PCT-4\SA\3\1>32-M	3	3	3	63	1	1	5	3
160	S020160	PCT-4\SA\3\1>11-M	5	3	4	82	1	1	1	3
161	S020161	PCT-4\SA\2\1>38-M	7	5	4	87	1	3	1	3
162	S020162	PCT-4\SA\3\1>24-M	7	4	3	74	1	3	3	3
163	S020163	PCT-4\SA\3\1>38-M	5	3	3	89	1	3	1	3
164	S020164	PCT-4\SA\3\1>8-M	5	4	4	77	1	1	1	1
165	S020165	PCT-4\SA\3\1>23-M	5	3	2	87	1	1	3	1
166	S020166	PCT-4\SA\3\1>27-M	5	3	5	80	1	1	5	3
167	S020167	PCT-4\SA\3\1>29-M	7	2	2	83	1	1	1	1
168	S020168	PCT-4\SA\3\1>30-M	5	2	2	83	1	1	1	1
169	S020169	PCT-4\SA\3\1>34-M	7	3	3	83	1	1	1	1
170	S020170	PCT-4\SA\3\1>37-M	7	3	3	83	3	1	1	3

Continued .....

Table 4. Continued.....

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl
171	S020171	PCT-4\SA\3\1>28-M	5	2	2	81	3	1	5	1
172	S020172	PCT-4\SA\3\1>21-M	5	5	5	68	3	1	1	1
173	S020173	PCT-4\SA\3\1>22-M	5	4	4	89	1	1	1	1
174	S020174	PCT-4\SA\3\1>43-M	5	2	3	78	1	1	1	1
175	S020175	PCT-4\SA\2\1>37-M	5	2	3	83	1	1	3	1
176	S020176	PCT-4\SA\2\1>36-M	5	3	2	84	1	1	1	1
Population PCT-11\0\0\2			**S1 Lines, EEP 2000A**							
177	S020177	PCT-11\0\0\2>1-M	5	2	2	88	1	3	1	1
178	S020178	PCT-11\0\0\2>2-M	5	3	3	66	1	1	1	1
179	S020179	PCT-11\0\0\2>3-M	5	2	3	81	1	1	1	1
180	S020180	PCT-11\0\0\2>4-M	5	3	2	74	1	1	1	1
181	S020181	PCT-11\0\0\2>5-M	5	2	2	82	1	1	1	1
182	S020182	PCT-11\0\0\2>8-1	5	2	1	86	3	1	1	1
183	S020183	PCT-11\0\0\2>8-2	5	2	2	77	1	1	3	1
184	S020184	PCT-11\0\0\2>9-1	5	3	3	77	3	1	3	1
185	S020185	PCT-11\0\0\2>9-2	5	3	3	79	3	1	3	1
186	S020186	PCT-11\0\0\2>10-1	5	2	3	75	1	1	1	1
187	S020187	PCT-11\0\0\2>10-2	5	2	3	76	1	1	1	1
188	S020188	PCT-11\0\0\2>11-1	5	2	1	79	1	1	1	1
189	S020189	PCT-11\0\0\2>11-2	5	2	1	85	3	1	3	1
190	S020190	PCT-11\0\0\2>13-1	5	2	2	73	1	1	1	1
191	S020191	PCT-11\0\0\2>13-2	5	2	2	14	1	1	1	1
Population PCT-4\SA\3\1										
192	S020192	PCT-4\SA\3\1>1-1	3	2	2	72	1	1	1	1
193	S020193	PCT-4\SA\3\1>3-1	5	1	1	76	1	1	1	1
194	S020194	PCT-4\SA\3\1>3-2	5	2	2	76	1	1	1	1
195	S020195	PCT-4\SA\3\1>4-1	7	3	4	83	3	1	3	1
	Check	CIRAD 409	3	1	2	71	1	1	1	1
	Check	O.SAB.6	3	4	4	88	3	1	1	1
	Check	O.SAB.10	5	3	3	92	5	1	1	1
196	S020196	PCT-4\SA\3\1>4-2	5	3	3	78	3	1	1	1
197	S020197	PCT-4\SA\3\1>5-1	5	3	2	76	1	1	3	1
198	S020198	PCT-4\SA\3\1>5-2	5	3	3	71	1	1	3	1
199	S020199	PCT-4\SA\3\1>6-1	5	3	2	86	1	3	3	1
200	S020200	PCT-4\SA\3\1>6-2	5	2	2	86	1	3	3	1
201	S020201	PCT-4\SA\3\1>7-1	7	3	3	77	1	1	1	3
202	S020202	PCT-4\SA\3\1>7-2	7	2	3	79	1	3	3	3
203	S020203	PCT-4\SA\3\1>7-3	7	3	3	83	1	3	3	1
204	S020204	PCT-4\SA\3\1>8-1	7	3	4	83	1	3	1	1
205	S020205	PCT-4\SA\3\1>11-1	3	2	3	69	1	1	1	1
206	S020206	PCT-4\SA\3\1>11-2	5	3	3	75	1	3	1	1
207	S020207	PCT-4\SA\3\1>11-3	3	2	2	75	1	3	1	1
208	S020208	PCT-4\SA\3\1>11-4	5	3	3	76	1	3	1	1
209	S020209	PCT-4\SA\3\1>12-1	7	2	2	91	3	5	3	1
210	S020210	PCT-4\SA\3\1>12-2	5	2	3	84	3	3	5	1
211	S020211	PCT-4\SA\3\1>12-3	5	3	2	82	1	3	5	1

Continued .....

Table 4. Continued.....

Nbr.	Field Nbr. 2000A	Pedigree	Vg	BI 1	BI 2	FI	LSc	Bs	Gd	NBI
212	S020212	PCT-4\SA\3\1>14-1	7	3	3	76	1	1	1	3
213	S020213	PCT-4\SA\3\1>18-1	5	4	3	86	1	3	3	3
214	S020214	PCT-4\SA\3\1>18-2	5	5	4	80	1	1	1	5
215	S020215	PCT-4\SA\3\1>19-1	5	2	2	80	1	3	3	1
216	S020216	PCT-4\SA\3\1>19-2	5	3	2	77	1	3	3	1
217	S020217	PCT-4\SA\3\1>19-3	3	1	2	89	3	1	1	1
218	S020218	PCT-4\SA\3\1>20-1	3	2	3	78	1	5	3	1
219	S020219	PCT-4\SA\3\1>20-2	3	2	4	87	1	5	1	1
220	S020220	PCT-4\SA\3\1>22-1	5	3	2	79	3	3	1	1
221	S020221	PCT-4\SA\3\1>23-1	5	2	3	86	1	5	5	1
222	S020222	PCT-4\SA\3\1>25-1	3	5	5	89	1	1	1	5
223	S020223	PCT-4\SA\3\1>25-2	5	5	5	88	1	3	1	3
224	S020224	PCT-4\SA\3\1>32-1	5	2	1	85	1	3	1	1
225	S020225	PCT-4\SA\3\1>32-2	5	2	2	89	1	3	1	1
226	S020226	PCT-4\SA\3\1>32-3	5	2	1	76	1	3	3	1
227	S020227	PCT-4\SA\3\1>33-1	5	2	2	84	1	3	1	1
228	S020228	PCT-4\SA\3\1>33-2	3	2	2	83	1	1	1	3
229	S020229	PCT-4\SA\3\1>53-1	5	3	3	91	3	3	1	3
230	S020230	PCT-4\SA\3\1>53-2	3	3	4	72	1	3	3	5
231	S020231	PCT-4\SA\3\1>53-3	5	2	4	71	1	1	1	1
232	S020232	PCT-4\SA\3\1>53-4	5	2	3	64	3	1	1	1
233	S020233	PCT-4\SA\3\1>59-1	7	3	3	70	1	5	1	5
234	S020234	PCT-4\SA\3\1>59-2	5	3	2	83	3	5	1	5
235	S020235	PCT-4\SA\3\1>59-3	5	3	2	65	1	1	1	3
236	S020236	PCT-4\SA\3\1>61-1	7	4	4	74	1	3	1	3
237	S020237	PCT-4\SA\3\1>61-2	9	5	6	88	1	1	1	1

Vg = vigor; BI 1 = leaf blast; BI 2 = leaf blast; LsC = leaf scald; BS = brown spot; NBI = neck blast;

Gd = grain discoloration. (Scale 1-9: 1 means resistant and 9 susceptible). FI = flowering (Days).

Table 4.1. Selected S2 lines (38). "La Libertad Experimental Station" Villavicencio-Meta, Colombia

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl	Plant Sel.	Upland Workshop. Lines selected by: Arg.	Bol.	Bol. 2002	Bra.	Col.	Cuba	Ven.
Populations PCT-4\0\0\0, PCT-4\SA\1\1, PCT-4\SA\2\1 and PCT-4\SA\3\1																		
1	S020006	PCT-4\0\0\0>19-M	5	4	3	73	1	3	1	1	1					X		
2	S020015	PCT-4\0\0\0>28-M	7	4	3	76	1	1	3	3	2							
3	S020019	PCT-4\0\0\0>17-M	5	3	3	88	1	3	1	1	1					X		
4	S020025	PCT-4\0\0\0>26-M	7	5	5	73	1	1	1	1	1				X			
5	S020027	PCT-4\0\0\0>34-M	9	4	4	81	1	1	1	3	3					X		
6	S020035	PCT-4\0\0\0>6-M	7	3	3	84	1	3	1	1	1							X
7	S020046	PCT-4\0\0\0>12-M	7	4	3	86	1	3	1	1	2							
8	S020070	PCT-4\SA\1\1>32-M	7	3	3	85	1	1	1	1	2							X
9	S020074	PCT-4\SA\2\1>6-M	5	2	3	68	3	1	1	3	1				X			
10	S020079	PCT-4\SA\2\1>12-M	5	4	4	80	3	1	1	1	2					X		
11	S020081	PCT-4\SA\2\1>22-M	7	3	4	81	1	3	1	1	1				X			
12	S020090	PCT-4\SA\2\1>16-M	7	3	3	81	1	1	1	3	1							X
13	S020103	PCT-4\SA\2\1>2-M	7	4	3	79	1	1	1	1	3				X			
14	S020108	PCT-4\SA\1\1>24-M	5	5	5	70	1	1	1	1	2					X		
15	S020109	PCT-4\SA\2\1>8-M	5	5	4	75	1	1	1	1	2					X		
16	S020110	PCT-4\SA\2\1>9-M	3	3	2	67	1	1	1	1	1					X		
17	S020114	PCT-4\SA\1\1>40-M	5	3	2	72	1	1	1	1	2					X		X
18	S020116	PCT-4\SA\1\1>42-M	3	3	2	71	1	1	1	1	2					X		
19	S020117	PCT-4\SA\1\1>30-M	5	3	3	76	1	1	1	1	1					X		
20	S020119	PCT-4\SA\2\1>30-M	3	3	4	79	1	1	1	1	1					X		
21	S020120	PCT-4\SA\3\1>7-M	5	3	5	77	1	1	1	1	1					X		
22	S020121	PCT-4\SA\3\1>2-M	5	3	3	81	1	1	1	3	2				X			
23	S020123	PCT-4\SA\2\1>44-M	5	4	3	70	1	1	1	3	3					X		
24	S020127	PCT-4\SA\2\1>34-M	3	2	3	65	1	1	1	1	1							X
25	S020132	PCT-4\SA\3\1>3-M	3	3	3	81	1	3	1	1	1							X
26	S020138	PCT-4\SA\2\1>42-M	1	3	2	71	1	1	1	1	2							X
27	S020139	PCT-4\SA\3\1>12-M	1	3	3	79	3	1	1	1	2				X			X
28	S020148	PCT-4\SA\2\1>43-M	7	3	3	82	1	1	1	1	2							
29	S020151	PCT-4\SA\3\1>20-M	5	3	3	83	1	1	3	1	1					X		
30	S020169	PCT-4\SA\3\1>34-M	7	3	3	83	1	1	1	1	1							X
31	S020174	PCT-4\SA\3\1>43-M	5	2	3	78	1	1	1	1	1							X
32	S020200	PCT-4\SA\3\1>6-2	5	2	2	86	1	3	3	1	2				X			
33	S020207	PCT-4\SA\3\1>11-3	3	2	2	75	1	3	1	1	2							X
34	S020220	PCT-4\SA\3\1>22-1	5	3	2	79	3	3	1	1	2							X
35	S020226	PCT-4\SA\3\1>32-3	5	2	1	76	1	3	3	1	2							X
36	S020235	PCT-4\SA\3\1>59-3	5	3	2	65	1	1	1	3	2				X			
37	S020236	PCT-4\SA\3\1>61-1	7	4	4	74	1	3	1	3	2					X		
Population PCT-11\0\0\2																		
38	S020181	PCT-11\0\0\2>5-M	5	2	2	82	1	1	1	1	1							X

Vg = vigor; Bl 1 = leaf blast; Bl 2 = leaf blast; Fl = flowering; LsC = leaf scald; BS = brown spot; NBl = neck blast;

Gd = grain discoloration. (Scale 1-9: 1 means resistant and 9 susceptible); Fl = flowering (Days).

Arg.=Argentina; Bol.=Bolivia; Bol 2002=Second Workshop in Bolivia; Bra.=Brazil;Col.=Colombia; Ven.=Venezuela

Table 5. Evaluation of S4 lines (7). "La Libertad Experimental Station", Villavicencio-Meta, Colombia.

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl
		Population PCT-11\0\0\1		S3 Lines, EEP2000 A						
1	S040001	PCT-11\0\0\1>438-M-1-1	5	1	1	76	1	3	1	1
2	S040002	PCT-11\0\0\1>438-M-1-2	5	2	1	76	1	1	1	1
3	S040003	PCT-11\0\0\1>438-M-3-1	5	2	1	76	1	1	1	1
4	S040004	PCT-11\0\0\1>438-M-3-2	5	1	1	74	1	1	1	1
5	S040005	PCT-11\0\0\1>438-M-3-3	7	2	1	75	1	3	1	1
6	S040006	PCT-11\0\0\1>943-M-2-1	7	3	3	65	1	3	1	1
7	S040007	PCT-11\0\0\1>943-M-2-2	5	2	3	67	1	1	1	1

Vg = vigor; Bl 1 = leaf blast; Bl 2 = leaf blast; LsC = leaf scald; BS = brown spot; NBl = neck blast;

Gd = grain discoloration. (Scale 1-9: 1 means resistant and 9 susceptible). Fl = flowering (Days).

Table 5.1. Selected S4 lines (3). "La Libertad Experimental Station", Villavicencio-Meta, Colombia

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl	Plant Sel.	Upland Workshop. Lines selected by:						
												Arg.	Bol.	Bol.	Bra.	Col.	Cuba	Ven.
Population PCT-11\0\0\1														2002				
1	S040001	PCT-11\0\0\1>438-M-1-1	5	1	1	76	1	3	1	1	Mass					X		X
2	S040004	PCT-11\0\0\1>438-M-3-2	5	1	1	74	1	1	1	1	Mass					X		
3	S040007	PCT-11\0\0\1>943-M-2-2	5	2	3	67	1	1	1	1	Mass				X	X		

Vg = vigor; Bl 1 = leaf blast; Bl 2 = leaf blast; Fl = flowering; LsC = leaf scald; BS = brown spot; NBl = neck blast;

Gd = grain discoloration. (Scale 1-9: 1 means resistant and 9 susceptible); Fl = flowering (Days).

Arg.=Argentina; Bol.=Bolivia; Bol 2002=Second Workshop in Bolivia; Bra.=Brazil;Col.=Colombia; Ven.=Venezuela

Table 6. Continued.....

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl
40	S060040	PCT-4\SA\1\1>341-M-1-M-3-M	7	5	5	78	3	1	1	1
41	S060041	PCT-4\SA\1\1>341-M-1-M-4-M	7	5	5	78	3	1	1	1
42	S060042	PCT-4\SA\1\1>341-M-1-M-5-M	7	5	5	78	3	1	1	1
43	S060043	PCT-4\SA\1\1>341-M-1-M-6-M	7	5	5	77	3	1	1	1
44	S060044	PCT-4\SA\1\1>341-M-3-M-1-M	7	5	5	76	3	1	1	1
45	S060045	PCT-4\SA\1\1>341-M-3-M-2-M	7	5	5	78	3	1	1	1
46	S060046	PCT-4\SA\1\1>341-M-3-M-3-M	7	5	5	78	3	1	1	1
47	S060047	PCT-4\SA\1\1>341-M-3-M-4-M	7	5	5	78	3	1	1	1
48	S060048	PCT-4\SA\1\1>341-M-3-M-5-M	7	5	5	79	3	1	1	1
49	S060049	PCT-4\SA\1\1>341-M-3-M-6-M	7	5	5	79	3	1	1	1
50	S060050	PCT-4\SA\1\1>446-M-6-M-1-M	7	5	5	77	3	1	1	1
51	S060051	PCT-4\SA\1\1>446-M-6-M-2-M	7	5	5	75	3	1	3	1
52	S060052	PCT-4\SA\1\1>446-M-6-M-3-M	7	5	5	78	1	3	3	1
53	S060053	PCT-4\SA\1\1>446-M-6-M-4-M	7	5	5	74	1	3	3	1
54	S060054	PCT-4\SA\1\1>446-M-6-M-5-M	7	5	4	75	1	3	3	1
55	S060055	PCT-4\SA\1\1>446-M-6-M-6-M	7	5	4	76	1	3	3	1
56	S060056	PCT-4\SA\1\1>500-M-3-M-1-M	5	5	4	74	1	3	1	1
57	S060057	PCT-4\SA\1\1>500-M-3-M-2-M	5	4	4	68	1	1	3	1
58	S060058	PCT-4\SA\1\1>500-M-3-M-3-M	7	5	5	75	1	3	3	1
59	S060059	PCT-4\SA\1\1>500-M-3-M-4-M	5	4	4	68	1	1	1	1
60	S060060	PCT-4\SA\1\1>500-M-3-M-5-M	5	4	4	70	1	1	3	1
61	S060061	PCT-4\SA\1\1>500-M-3-M-6-M	5	4	4	72	3	1	1	1
62	S060062	PCT-4\SA\1\1>500-M-6-M-1-M	5	3	3	72	3	1	3	1
63	S060063	PCT-4\SA\1\1>500-M-6-M-2-M	5	4	4	68	3	1	1	1
64	S060064	PCT-4\SA\1\1>500-M-6-M-3-M	5	5	4	73	3	1	1	1
65	S060065	PCT-4\SA\1\1>500-M-6-M-4-M	5	5	4	64	3	5	3	1
66	S060066	PCT-4\SA\1\1>500-M-6-M-5-M	5	5	4	71	3	1	1	1
67	S060067	PCT-4\SA\1\1>500-M-6-M-6-M	5	4	4	73	3	1	3	1
68	S060068	PCT-4\SA\1\1>503-M-6-M-1-M	5	4	3	67	3	1	1	1
69	S060069	PCT-4\SA\1\1>503-M-6-M-2-M	5	3	2	68	3	1	1	1
70	S060070	PCT-4\SA\1\1>503-M-6-M-3-M	5	3	3	76	3	3	1	1
71	S060071	PCT-4\SA\1\1>503-M-6-M-4-M	5	4	3	67	3	1	1	1
	Check	CIRAD 409	3	1	2	69	3	1	1	1
	Check	O.SAB.6	1	5	5	89	3	1	3	1
	Check	O.SAB.10	3	3	3	91	5	1	1	1
72	S060072	PCT-4\SA\1\1>503-M-6-M-5-M	5	4	4	72	3	3	1	1
73	S060073	PCT-4\SA\1\1>503-M-6-M-6-M	5	5	4	73	3	3	1	1
74	S060074	PCT-4\SA\1\1>516-M-3-M-1-M	5	4	3	73	3	3	1	1
75	S060075	PCT-4\SA\1\1>516-M-3-M-2-M	5	4	3	72	3	3	1	1
76	S060076	PCT-4\SA\1\1>516-M-3-M-3-M	5	3	3	76	3	3	1	1
77	S060077	PCT-4\SA\1\1>516-M-3-M-4-M	5	3	3	74	3	3	1	1
78	S060078	PCT-4\SA\1\1>516-M-3-M-5-M	5	4	4	71	3	1	1	1
79	S060079	PCT-4\SA\1\1>516-M-3-M-6-M	5	3	4	76	3	1	1	1
80	S060080	PCT-4\SA\1\1>516-M-6-M-1-M	5	4	4	74	3	1	1	1
81	S060081	PCT-4\SA\1\1>516-M-6-M-2-M	5	4	3	75	3	3	3	1
82	S060082	PCT-4\SA\1\1>516-M-6-M-3-M	5	3	3	75	3	3	3	1
83	S060083	PCT-4\SA\1\1>516-M-6-M-4-M	5	3	2	72	3	1	3	1

Continued .....

Table 6. Continued.....

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl
40	S060040	PCT-4\SA\1\1>341-M-1-M-3-M	7	5	5	78	3	1	1	1
41	S060041	PCT-4\SA\1\1>341-M-1-M-4-M	7	5	5	78	3	1	1	1
42	S060042	PCT-4\SA\1\1>341-M-1-M-5-M	7	5	5	78	3	1	1	1
43	S060043	PCT-4\SA\1\1>341-M-1-M-6-M	7	5	5	77	3	1	1	1
44	S060044	PCT-4\SA\1\1>341-M-3-M-1-M	7	5	5	76	3	1	1	1
45	S060045	PCT-4\SA\1\1>341-M-3-M-2-M	7	5	5	78	3	1	1	1
46	S060046	PCT-4\SA\1\1>341-M-3-M-3-M	7	5	5	78	3	1	1	1
47	S060047	PCT-4\SA\1\1>341-M-3-M-4-M	7	5	5	78	3	1	1	1
48	S060048	PCT-4\SA\1\1>341-M-3-M-5-M	7	5	5	79	3	1	1	1
49	S060049	PCT-4\SA\1\1>341-M-3-M-6-M	7	5	5	79	3	1	1	1
50	S060050	PCT-4\SA\1\1>446-M-6-M-1-M	7	5	5	77	3	1	1	1
51	S060051	PCT-4\SA\1\1>446-M-6-M-2-M	7	5	5	75	3	1	3	1
52	S060052	PCT-4\SA\1\1>446-M-6-M-3-M	7	5	5	78	1	3	3	1
53	S060053	PCT-4\SA\1\1>446-M-6-M-4-M	7	5	5	74	1	3	3	1
54	S060054	PCT-4\SA\1\1>446-M-6-M-5-M	7	5	4	75	1	3	3	1
55	S060055	PCT-4\SA\1\1>446-M-6-M-6-M	7	5	4	76	1	3	3	1
56	S060056	PCT-4\SA\1\1>500-M-3-M-1-M	5	5	4	74	1	3	1	1
57	S060057	PCT-4\SA\1\1>500-M-3-M-2-M	5	4	4	68	1	1	3	1
58	S060058	PCT-4\SA\1\1>500-M-3-M-3-M	7	5	5	75	1	3	3	1
59	S060059	PCT-4\SA\1\1>500-M-3-M-4-M	5	4	4	68	1	1	1	1
60	S060060	PCT-4\SA\1\1>500-M-3-M-5-M	5	4	4	70	1	1	3	1
61	S060061	PCT-4\SA\1\1>500-M-3-M-6-M	5	4	4	72	3	1	1	1
62	S060062	PCT-4\SA\1\1>500-M-6-M-1-M	5	3	3	72	3	1	3	1
63	S060063	PCT-4\SA\1\1>500-M-6-M-2-M	5	4	4	68	3	1	1	1
64	S060064	PCT-4\SA\1\1>500-M-6-M-3-M	5	5	4	73	3	1	1	1
65	S060065	PCT-4\SA\1\1>500-M-6-M-4-M	5	5	4	64	3	5	3	1
66	S060066	PCT-4\SA\1\1>500-M-6-M-5-M	5	5	4	71	3	1	1	1
67	S060067	PCT-4\SA\1\1>500-M-6-M-6-M	5	4	4	73	3	1	3	1
68	S060068	PCT-4\SA\1\1>503-M-6-M-1-M	5	4	3	67	3	1	1	1
69	S060069	PCT-4\SA\1\1>503-M-6-M-2-M	5	3	2	68	3	1	1	1
70	S060070	PCT-4\SA\1\1>503-M-6-M-3-M	5	3	3	76	3	3	1	1
71	S060071	PCT-4\SA\1\1>503-M-6-M-4-M	5	4	3	67	3	1	1	1
	Check	CIRAD 409	3	1	2	69	3	1	1	1
	Check	O.SAB.6	1	5	5	89	3	1	3	1
	Check	O.SAB.10	3	3	3	91	5	1	1	1
72	S060072	PCT-4\SA\1\1>503-M-6-M-5-M	5	4	4	72	3	3	1	1
73	S060073	PCT-4\SA\1\1>503-M-6-M-6-M	5	5	4	73	3	3	1	1
74	S060074	PCT-4\SA\1\1>516-M-3-M-1-M	5	4	3	73	3	3	1	1
75	S060075	PCT-4\SA\1\1>516-M-3-M-2-M	5	4	3	72	3	3	1	1
76	S060076	PCT-4\SA\1\1>516-M-3-M-3-M	5	3	3	76	3	3	1	1
77	S060077	PCT-4\SA\1\1>516-M-3-M-4-M	5	3	3	74	3	3	1	1
78	S060078	PCT-4\SA\1\1>516-M-3-M-5-M	5	4	4	71	3	1	1	1
79	S060079	PCT-4\SA\1\1>516-M-3-M-6-M	5	3	4	76	3	1	1	1
80	S060080	PCT-4\SA\1\1>516-M-6-M-1-M	5	4	4	74	3	1	1	1
81	S060081	PCT-4\SA\1\1>516-M-6-M-2-M	5	4	3	75	3	3	3	1
82	S060082	PCT-4\SA\1\1>516-M-6-M-3-M	5	3	3	75	3	3	3	1
83	S060083	PCT-4\SA\1\1>516-M-6-M-4-M	5	3	2	72	3	1	3	1

Continued .....

Table 6. Continued.....

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl
84	S060084	PCT-4\SA\1\1>516-M-6-M-5-M	5	4	3	73	3	1	3	1
85	S060085	PCT-4\SA\1\1>516-M-6-M-6-M	5	3	3	74	3	3	3	1
86	S060086	PCT-4\SA\1\1>540-M-3-M-1-M	5	4	3	69	3	1	3	1
87	S060087	PCT-4\SA\1\1>540-M-3-M-2-M	5	4	4	67	3	1	1	1
88	S060088	PCT-4\SA\1\1>540-M-3-M-3-M	5	3	3	72	3	1	1	1
89	S060089	PCT-4\SA\1\1>540-M-3-M-4-M	5	3	3	69	3	3	1	1
90	S060090	PCT-4\SA\1\1>540-M-3-M-5-M	5	4	3	69	3	3	1	1
91	S060091	PCT-4\SA\1\1>540-M-3-M-6-M	5	3	3	69	3	3	3	1
92	S060092	PCT-4\SA\1\1>669-M-5-M-1-M	5	3	2	69	3	1	1	1
93	S060093	PCT-4\SA\1\1>669-M-5-M-2-M	3	2	2	75	3	1	1	1
94	S060094	PCT-4\SA\1\1>669-M-5-M-3-M	3	2	2	75	3	1	1	1
95	S060095	PCT-4\SA\1\1>669-M-5-M-4-M	3	1	2	75	3	1	1	1
96	S060096	PCT-4\SA\1\1>669-M-5-M-5-M	3	1	1	72	3	1	1	1
97	S060097	PCT-4\SA\1\1>721-M-2-M-1-M	5	1	1	77	3	1	1	1
98	S060098	PCT-4\SA\1\1>721-M-2-M-2-M	5	2	2	69	3	1	1	1
99	S060099	PCT-4\SA\1\1>721-M-2-M-3-M	5	3	2	69	3	1	1	1
100	S060100	PCT-4\SA\1\1>721-M-2-M-4-M	5	3	2	72	3	1	1	1
101	S060101	PCT-4\SA\1\1>721-M-2-M-5-M	3	2	1	70	3	1	1	1
102	S060102	PCT-4\SA\1\1>721-M-2-M-6-M	5	2	2	71	3	1	1	1
103	S060103	PCT-4\SA\1\1>721-M-4-M-1-M	5	3	2	73	3	1	1	1
104	S060104	PCT-4\SA\1\1>721-M-4-M-2-M	5	3	2	72	3	1	1	1
105	S060105	PCT-4\SA\1\1>721-M-4-M-3-M	5	2	2	69	3	1	1	1
106	S060106	PCT-4\SA\1\1>721-M-4-M-4-M	5	2	2	74	3	1	1	1
107	S060107	PCT-4\SA\1\1>721-M-4-M-5-M	5	3	1	70	3	1	1	1
108	S060108	PCT-4\SA\1\1>721-M-4-M-6-M	5	3	1	69	3	1	1	1
109	S060109	PCT-4\SA\1\1>721-M-6-M-1-M	5	2	1	64	3	3	3	3
110	S060110	PCT-4\SA\1\1>721-M-6-M-2-M	3	2	2	70	3	1	1	1
111	S060111	PCT-4\SA\1\1>721-M-6-M-3-M	3	2	2	69	3	1	1	1
112	S060112	PCT-4\SA\1\1>721-M-6-M-4-M	5	3	3	72	3	1	1	1
113	S060113	PCT-4\SA\1\1>721-M-6-M-5-M	3	2	2	69	3	1	1	1
114	S060114	PCT-4\SA\1\1>721-M-6-M-6-M	3	3	2	69	3	1	1	1
115	S060115	PCT-4\SA\1\1>722-M-3-M-1-M	5	2	3	72	3	1	1	1
116	S060116	PCT-4\SA\1\1>722-M-3-M-2-M	7	2	3	74	1	1	1	1
117	S060117	PCT-4\SA\1\1>722-M-3-M-3-M	7	4	4	76	1	1	1	1
118	S060118	PCT-4\SA\1\1>722-M-3-M-4-M	9	3	3	79	1	1	1	1
119	S060119	PCT-4\SA\1\1>722-M-3-M-5-M	7	3	2	72	1	1	1	1
120	S060120	PCT-4\SA\1\1>722-M-3-M-6-M	7	3	2	74	1	1	1	1
121	S060121	PCT-4\SA\1\1>763-M-2-M-1-M	9	3	3	79	1	1	1	1
122	S060122	PCT-4\SA\1\1>763-M-2-M-2-M	7	3	3	72	1	1	1	1
123	S060123	PCT-4\SA\1\1>763-M-2-M-3-M	7	3	2	72	1	1	1	1
124	S060124	PCT-4\SA\1\1>763-M-2-M-4-M	7	3	2	74	1	1	1	1
125	S060125	PCT-4\SA\1\1>763-M-2-M-5-M	7	3	3	71	1	1	1	1
126	S060126	PCT-4\SA\1\1>763-M-2-M-6-M	7	2	2	73	1	1	1	1
127	S060127	PCT-4\SA\1\1>813-M-1-M-1-M	7	2	2	75	1	1	1	1
128	S060128	PCT-4\SA\1\1>813-M-1-M-3-M	7	2	2	73	1	1	1	3
129	S060129	PCT-4\SA\1\1>813-M-1-M-4-M	7	2	2	73	1	1	1	3
130	S060130	PCT-4\SA\1\1>813-M-1-M-6-M	7	3	1	76	1	1	1	3

Continued .....

Table 6. Continued.....

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl
131	S060131	PCT-4\SA\1\1>813-M-6-M-1-M	7	2	1	73	1	1	1	3
132	S060132	PCT-4\SA\1\1>813-M-6-M-2-M	7	2	1	75	1	1	1	3
	Check	CIRAD 409	5	1	1	71	1	1	1	1
	Check	O.SAB.6	3	3	4	89	3	1	1	1
	Check	O.SAB.10	3	2	2	92	3	1	1	1
	Check	CIRAD 409	3	1	1	70	1	1	1	1
	Check	O.SAB.6	5	4	3	87	3	1	1	1
	Check	O.SAB.10	5	3	2	91	3	1	1	1
133	S060133	PCT-4\SA\1\1>813-M-6-M-3-M	5	2	2	71	1	1	1	1
134	S060134	PCT-4\SA\1\1>813-M-6-M-4-M	7	2	1	76	1	1	1	1
135	S060135	PCT-4\SA\1\1>813-M-6-M-5-M	7	1	2	77	1	1	1	1
136	S060136	PCT-4\SA\1\1>813-M-6-M-6-M	7	1	1	75	1	1	1	1
137	S060137	PCT-4\SA\1\1>975-M-2-M-1-M	7	1	1	73	1	1	1	1
138	S060138	PCT-4\SA\1\1>975-M-2-M-2-M	5	4	3	77	1	1	1	1
139	S060139	PCT-4\SA\1\1>975-M-2-M-3-M	5	3	2	75	1	1	3	1
140	S060140	PCT-4\SA\1\1>975-M-2-M-4-M	5	4	3	75	1	1	3	1
141	S060141	PCT-4\SA\1\1>975-M-2-M-5-M	5	3	3	76	1	1	3	1
142	S060142	PCT-4\SA\1\1>975-M-2-M-6-M	5	3	3	86	1	1	1	1
143	S060143	PCT-4\SA\1\1>975-M-3-M-1-M	5	3	2	73	1	1	1	1
144	S060144	PCT-4\SA\1\1>975-M-3-M-2-M	5	3	2	75	1	1	1	1
145	S060145	PCT-4\SA\1\1>975-M-3-M-3-M	5	2	3	74	1	1	1	1
146	S060146	PCT-4\SA\1\1>975-M-3-M-4-M	7	2	3	75	1	1	3	1
147	S060147	PCT-4\SA\1\1>975-M-3-M-5-M	7	3	2	77	1	1	3	1
148	S060148	PCT-4\SA\1\1>975-M-3-M-6-M	5	2	2	71	1	1	1	1
149	S060149	PCT-4\SA\1\1>982-M-3-M-1-M	7	3	2	73	1	1	1	1
150	S060150	PCT-4\SA\1\1>982-M-3-M-2-M	5	2	2	75	3	1	1	1
151	S060151	PCT-4\SA\1\1>982-M-3-M-3-M	5	1	3	69	1	1	1	3
152	S060152	PCT-4\SA\1\1>982-M-3-M-4-M	5	1	3	71	1	1	1	1
153	S060153	PCT-4\SA\1\1>982-M-3-M-5-M	5	2	3	71	1	1	1	3
154	S060154	PCT-4\SA\1\1>982-M-3-M-6-M	5	3	4	69	1	1	1	3
155	S060155	PCT-4\SA\1\1>1036-M-3-M-1-M	5	2	3	68	1	1	1	3
156	S060156	PCT-4\SA\1\1>1036-M-3-M-2-M	5	2	1	77	1	1	3	1
157	S060157	PCT-4\SA\1\1>1036-M-3-M-3-M	5	2	1	77	1	1	3	1
158	S060158	PCT-4\SA\1\1>1036-M-3-M-4-M	5	1	1	76	1	1	3	1
159	S060159	PCT-4\SA\1\1>1036-M-3-M-5-M	5	1	2	79	1	1	1	1
160	S060160	PCT-4\SA\1\1>1036-M-3-M-6-M	5	1	2	79	1	1	3	1
161	S060161	PCT-4\SA\1\1>1036-M-6-M-1-M	5	3	1	77	1	1	3	1
162	S060162	PCT-4\SA\1\1>1036-M-6-M-2-M	7	1	1	81	1	1	3	1
163	S060163	PCT-4\SA\1\1>1036-M-6-M-3-M	5	2	1	78	1	1	3	3
164	S060164	PCT-4\SA\1\1>1036-M-6-M-4-M	5	1	1	78	1	1	1	1
165	S060165	PCT-4\SA\1\1>1036-M-6-M-5-M	7	2	2	88	1	1	1	1
166	S060166	PCT-4\SA\1\1>1036-M-6-M-6-M	5	3	2	80	1	1	1	1
167	S060167	PCT-4\SA\1\1>1044-M-3-M-1-M	5	3	2	79	1	1	3	1
168	S060168	PCT-4\SA\1\1>1044-M-3-M-2-M	5	2	3	82	1	1	3	1
169	S060169	PCT-4\SA\1\1>1044-M-3-M-3-M	5	2	2	79	1	1	3	1
170	S060170	PCT-4\SA\1\1>1044-M-3-M-4-M	5	2	2	78	1	1	3	1
171	S060171	PCT-4\SA\1\1>1044-M-3-M-5-M	7	3	2	82	1	1	3	1

Continued .....

Table 6. Continued.....

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl
172	S060172	PCT-4\SA\1\1>1044-M-3-M-6-M	5	1	1	68	1	1	1	1
173	S060173	PCT-4\SA\1\1>1156-M-2-M-1-M	5	1	1	68	1	1	1	1
174	S060174	PCT-4\SA\1\1>1156-M-2-M-2-M	5	1	1	71	1	1	1	1
175	S060175	PCT-4\SA\1\1>1156-M-2-M-3-M	3	1	1	66	1	1	1	1
176	S060176	PCT-4\SA\1\1>1156-M-2-M-4-M	5	1	1	69	1	1	1	1
177	S060177	PCT-4\SA\1\1>1156-M-2-M-5-M	3	2	1	69	1	1	1	1
178	S060178	PCT-4\SA\1\1>1156-M-2-M-6-M	3	2	1	67	1	1	1	1
179	S060179	PCT-4\SA\1\1>1199-M-2-M-2-M	3	1	1	66	1	1	1	1
180	S060180	PCT-4\SA\1\1>1199-M-2-M-3-M	5	1	1	71	1	1	1	1
181	S060181	PCT-4\SA\1\1>1199-M-2-M-4-M	5	1	1	68	1	1	1	1
182	S060182	PCT-4\SA\1\1>1199-M-2-M-5-M	5	2	1	68	1	1	1	1
183	S060183	PCT-4\SA\1\1>1199-M-2-M-6-M	7	1	1	75	1	1	1	1
184	S060184	PCT-4\SA\1\1>1199-M-5-M-1-M	5	1	1	69	1	1	1	1
185	S060185	PCT-4\SA\1\1>1199-M-5-M-2-M	5	1	1	69	3	1	1	1
186	S060186	PCT-4\SA\1\1>1199-M-5-M-3-M	5	2	1	69	1	1	1	1
187	S060187	PCT-4\SA\1\1>1199-M-5-M-4-M	5	1	2	70	1	1	1	1
188	S060188	PCT-4\SA\1\1>1199-M-5-M-5-M	3	1	2	68	1	1	1	1
189	S060189	PCT-4\SA\1\1>1199-M-5-M-6-M	5	1	3	68	1	1	1	1
190	S060190	PCT-4\SA\1\1>1206-M-2-M-1-M	5	1	2	67	1	1	1	1
191	S060191	PCT-4\SA\1\1>1206-M-2-M-2-M	5	1	1	67	1	1	1	1
192	S060192	PCT-4\SA\1\1>1206-M-2-M-3-M	7	1	3	75	1	1	1	1
193	S060193	PCT-4\SA\1\1>1206-M-2-M-4-M	7	1	2	68	1	1	1	1
	Check	CIRAD 409	5	1	2	70	1	1	1	1
	Check	O.SAB.6	5	4	3	88	3	1	1	1
	Check	O.SAB.10	5	3	3	93	3	1	1	1
194	S060194	PCT-4\SA\1\1>1206-M-2-M-5-M	5	2	1	69	1	1	1	1
195	S060195	PCT-4\SA\1\1>1206-M-2-M-6-M	5	1	1	79	1	1	1	1
196	S060196	PCT-4\SA\1\1>1236-M-1-M-1-M	5	1	1	68	1	1	1	1
197	S060197	PCT-4\SA\1\1>1236-M-1-M-2-M	5	1	2	68	1	1	1	1
198	S060198	PCT-4\SA\1\1>1236-M-1-M-3-M	5	1	1	76	1	1	1	1
199	S060199	PCT-4\SA\1\1>1236-M-1-M-4-M	5	1	2	67	1	1	1	1
200	S060200	PCT-4\SA\1\1>1236-M-1-M-5-M	5	1	2	68	1	1	1	1
201	S060201	PCT-4\SA\1\1>1236-M-1-M-6-M	7	1	2	75	1	1	1	1
202	S060202	PCT-4\SA\1\1>1236-M-4-M-1-M	5	1	1	69	1	1	1	1
203	S060203	PCT-4\SA\1\1>1236-M-4-M-2-M	5	1	1	69	1	1	1	1
204	S060204	PCT-4\SA\1\1>1236-M-4-M-3-M	7	2	1	73	1	1	1	1
205	S060205	PCT-4\SA\1\1>1236-M-4-M-4-M	5	1	1	67	1	1	1	1
206	S060206	PCT-4\SA\1\1>1236-M-4-M-5-M	5	1	1	68	1	1	1	1
207	S060207	PCT-4\SA\1\1>1236-M-4-M-6-M	7	1	2	75	1	1	1	1
208	S060208	PCT-4\SA\1\1>1241-M-1-M-1-M	5	1	1	69	1	1	1	1
209	S060209	PCT-4\SA\1\1>1241-M-1-M-2-M	5	1	1	70	1	1	1	1
210	S060210	PCT-4\SA\1\1>1241-M-1-M-3-M	7	1	1	75	1	1	1	1
211	S060211	PCT-4\SA\1\1>1241-M-1-M-4-M	7	1	1	73	1	1	1	1
212	S060212	PCT-4\SA\1\1>1241-M-1-M-5-M	7	1	1	69	1	1	1	1
213	S060213	PCT-4\SA\1\1>1241-M-1-M-6-M	5	3	2	72	1	1	1	1
214	S060214	PCT-4\SA\1\1>1241-M-5-M-1-M	5	1	2	69	3	1	1	1
215	S060215	PCT-4\SA\1\1>1241-M-5-M-2-M	5	1	1	68	3	1	1	1

Continued .....

Table 6. Continued.....

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl
216	S060216	PCT-4\SA\1\1>1241-M-5-M-3-M	5	2	1	71	3	1	1	1
217	S060217	PCT-4\SA\1\1>1241-M-5-M-4-M	5	1	1	63	3	1	1	1
218	S060218	PCT-4\SA\1\1>1241-M-5-M-5-M	5	2	1	66	3	1	1	1
219	S060219	PCT-4\SA\1\1>1241-M-5-M-6-M	5	1	1	74	1	1	1	1
220	S060220	PCT-4\SA\1\1>1260-M-6-M-1-M	5	1	1	70	1	1	1	1
221	S060221	PCT-4\SA\1\1>1260-M-6-M-2-M	5	1	1	68	1	1	1	1
222	S060222	PCT-4\SA\1\1>1260-M-6-M-3-M	7	2	2	70	1	1	1	1
223	S060223	PCT-4\SA\1\1>1260-M-6-M-4-M	5	1	1	68	1	1	1	1
224	S060224	PCT-4\SA\1\1>1260-M-6-M-5-M	5	2	1	71	1	1	1	1
225	S060225	PCT-4\SA\1\1>1260-M-6-M-6-M	7	2	1	72	1	1	1	5
226	S060226	PCT-4\SA\1\1>1270-M-2-M-1-M	7	1	1	71	1	1	1	1
227	S060227	PCT-4\SA\1\1>1270-M-2-M-2-M	5	1	1	71	1	1	1	1
228	S060228	PCT-4\SA\1\1>1270-M-2-M-3-M	5	1	2	76	1	1	1	1
229	S060229	PCT-4\SA\1\1>1270-M-2-M-4-M	5	1	1	71	1	1	1	1
230	S060230	PCT-4\SA\1\1>1270-M-2-M-5-M	5	1	2	69	1	1	1	1
231	S060231	PCT-4\SA\1\1>1270-M-2-M-6-M	5	2	2	72	1	1	1	3
232	S060232	PCT-4\SA\1\1>1270-M-5-M-1-M	5	3	2	69	1	1	1	3
233	S060233	PCT-4\SA\1\1>1270-M-5-M-2-M	5	1	1	73	1	1	1	3
234	S060234	PCT-4\SA\1\1>1270-M-5-M-3-M	5	2	1	74	1	1	1	1
235	S060235	PCT-4\SA\1\1>1270-M-5-M-4-M	5	1	1	69	1	1	1	1
236	S060236	PCT-4\SA\1\1>1270-M-5-M-5-M	5	1	1	72	1	1	1	1
237	S060237	PCT-4\SA\1\1>1270-M-5-M-6-M	5	1	1	75	1	1	1	1
238	S060238	PCT-4\SA\1\1>1272-M-6-M-1-M	5	2	1	72	1	1	1	1
239	S060239	PCT-4\SA\1\1>1272-M-6-M-2-M	5	1	1	74	1	1	1	1
240	S060240	PCT-4\SA\1\1>1272-M-6-M-3-M	5	2	1	76	1	1	1	3
241	S060241	PCT-4\SA\1\1>1272-M-6-M-4-M	5	3	1	71	1	1	1	1
242	S060242	PCT-4\SA\1\1>1272-M-6-M-5-M	3	2	1	70	1	1	1	1
243	S060243	PCT-4\SA\1\1>1272-M-6-M-6-M	3	1	1	78	1	1	1	1
244	S060244	PCT-4\SA\1\1>1479-M-1-M-1-M	3	2	1	70	1	1	1	1
245	S060245	PCT-4\SA\1\1>1479-M-1-M-2-M	3	2	1	73	1	1	1	1
246	S060246	PCT-4\SA\1\1>1479-M-1-M-3-M	3	1	1	75	1	1	1	1
247	S060247	PCT-4\SA\1\1>1479-M-1-M-4-M	3	1	1	72	1	1	1	1
248	S060248	PCT-4\SA\1\1>1479-M-1-M-5-M	3	1	1	68	1	1	1	1
249	S060249	PCT-4\SA\1\1>1479-M-1-M-6-M	3	1	1	75	1	1	1	1
250	S060250	PCT-4\SA\1\1>1486-M-5-M-1-M	3	1	1	73	1	1	1	1
251	S060251	PCT-4\SA\1\1>1486-M-5-M-2-M	1	1	1	69	1	1	1	1
252	S060252	PCT-4\SA\1\1>1486-M-5-M-3-M	1	1	1	73	1	1	1	1
253	S060253	PCT-4\SA\1\1>1486-M-5-M-4-M	1	1	1	68	1	1	1	1
	Check	CIRAD 409	3	1	1	67	1	1	1	1
	Check	O.SAB.6	3	4	3	87	3	1	3	1
	Check	O.SAB.10	3	2	2	90	3	1	1	1
	Check	CIRAD 409	3	1	1	68	1	1	1	1
	Check	O.SAB.6	3	4	3	87	3	1	1	1
	Check	O.SAB.10	3	3	2	89	3	1	1	1
254	S060254	PCT-4\SA\1\1>1486-M-5-M-5-M	1	1	1	71	1	1	1	1
255	S060255	PCT-4\SA\1\1>1486-M-5-M-6-M	3	1	1	71	1	1	1	1
256	S060256	PCT-4\SA\1\1>1486-M-6-M-1-M	3	2	1	73	1	1	1	1

Continued .....

Table 6. Continued.....

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl
257	S060257	PCT-4\SA\1\1>1486-M-6-M-2-M	3	1	1	68	1	1	1	1
258	S060258	PCT-4\SA\1\1>1486-M-6-M-3-M	1	1	1	70	1	1	1	1
259	S060259	PCT-4\SA\1\1>1486-M-6-M-4-M	3	2	1	69	1	1	1	1
260	S060260	PCT-4\SA\1\1>1486-M-6-M-5-M	3	2	1	68	1	1	1	1
261	S060261	PCT-4\SA\1\1>1486-M-6-M-6-M	3	1	1	75	1	1	1	1
262	S060262	PCT-4\SA\1\1>1549-M-1-M-1-M	3	1	1	73	1	1	1	1
263	S060263	PCT-4\SA\1\1>1549-M-1-M-2-M	3	1	1	70	1	1	1	1
264	S060264	PCT-4\SA\1\1>1549-M-1-M-3-M	3	1	1	72	1	1	1	1
265	S060265	PCT-4\SA\1\1>1549-M-1-M-4-M	3	2	1	72	1	1	1	1
266	S060266	PCT-4\SA\1\1>1549-M-1-M-5-M	3	2	1	71	1	1	1	1
267	S060267	PCT-4\SA\1\1>1549-M-1-M-6-M	5	3	3	72	3	1	3	1
268	S060268	PCT-4\SA\1\1>1566-M-6-M-1-M	5	3	3	68	3	1	1	3
269	S060269	PCT-4\SA\1\1>1566-M-6-M-2-M	5	3	4	68	3	1	1	3
270	S060270	PCT-4\SA\1\1>1566-M-6-M-3-M	5	2	4	73	3	3	1	1
271	S060271	PCT-4\SA\1\1>1566-M-6-M-4-M	5	3	3	68	3	3	1	1
272	S060272	PCT-4\SA\1\1>1566-M-6-M-5-M	5	4	3	76	3	3	1	1
273	S060273	PCT-4\SA\1\1>1566-M-6-M-6-M	5	5	4	76	3	3	1	1
274	S060274	PCT-4\SA\1\1>1576-M-4-M-1-M	7	4	3	72	3	1	1	1
275	S060275	PCT-4\SA\1\1>1576-M-4-M-2-M	7	4	4	70	3	1	1	1
276	S060276	PCT-4\SA\1\1>1576-M-4-M-3-M	7	3	3	77	3	3	1	1
277	S060277	PCT-4\SA\1\1>1576-M-4-M-4-M	7	4	3	74	3	1	1	1
278	S060278	PCT-4\SA\1\1>1576-M-4-M-5-M	5	3	3	72	3	1	1	1
279	S060279	PCT-4\SA\1\1>1576-M-4-M-6-M	7	3	3	75	3	1	1	1
280	S060280	PCT-4\SA\1\1>1576-M-6-M-1-M	5	3	2	74	3	1	1	1
281	S060281	PCT-4\SA\1\1>1576-M-6-M-2-M	5	3	2	69	3	1	1	1
282	S060282	PCT-4\SA\1\1>1576-M-6-M-3-M	7	3	3	76	3	1	1	1
283	S060283	PCT-4\SA\1\1>1576-M-6-M-4-M	5	3	3	73	3	1	1	1
284	S060284	PCT-4\SA\1\1>1576-M-6-M-5-M	5	3	3	73	3	1	1	1
285	S060285	PCT-4\SA\1\1>1576-M-6-M-6-M	5	3	2	75	1	1	1	1
286	S060286	PCT-4\SA\1\1>1837-M-2-M-1-M	5	4	4	73	1	1	1	1
287	S060287	PCT-4\SA\1\1>1837-M-2-M-2-M	5	4	3	68	1	3	1	1
288	S060288	PCT-4\SA\1\1>1837-M-2-M-3-M	5	4	4	71	3	3	1	1
289	S060289	PCT-4\SA\1\1>1837-M-2-M-4-M	5	4	4	72	3	3	1	1
290	S060290	PCT-4\SA\1\1>1837-M-2-M-5-M	7	3	3	75	3	1	1	1
291	S060291	PCT-4\SA\1\1>1837-M-2-M-6-M	7	2	3	76	3	1	1	1

Vg = vigor; Bl 1 = leaf blast; Bl 2 = leaf blast; LsC = leaf scald; BS = brown spot; NBl = neck blast;

Gd = grain discoloration. (Scale 1-9: 1 means resistant and 9 susceptible). Fl = flowering (Days).

Table 6.1. Selected S6 lines (186). "La Libertad Experimental Station", Villavicencio-Meta, Colombia

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl	Plant Sel.	Upland Workshop. Lines selected by: Arg.	Bol.	Bol. 2002	Bra.	Col.	Cuba	Ven.
		Population PCT-4\PHB\1\1,PHB\1																
1	S060007	PCT-4\PHB\1\1,PHB\1>120-M-4-M-1-M	7	1	3	68	1	1	1	1	Mass	X	X		X		X	
2	S060013	PCT-4\PHB\1\1,PHB\1>1534-M-1-M-1-M	5	5	5	68	1	1	1	1	Mass					X		
3	S060014	PCT-4\PHB\1\1,PHB\1>1534-M-1-M-2-M	5	5	5	64	1	1	1	1	Mass					X		
4	S060016	PCT-4\PHB\1\1,PHB\1>1534-M-1-M-6-M	7	5	5	73	1	1	1	1	Mass					X		
5	S060017	PCT-4\PHB\1\1,PHB\1>1534-M-4-M-2-M	3	5	5	68	1	1	5	1	Mass					X		
6	S060019	PCT-4\PHB\1\1,PHB\1>1534-M-4-M-4-M	5	4	5	76	3	1	1	1	Mass					X		
7	S060020	PCT-4\PHB\1\1,PHB\1>1534-M-4-M-5-M	5	5	5	68	1	1	5	1	Mass					X		
8	S060021	PCT-4\PHB\1\1,PHB\1>1534-M-4-M-6-M	5	5	4	70	1	1	3	1	Mass					X		
9	S060022	PCT-4\PHB\1\1,PHB\1>1537-M-1-M-1-M	5	4	4	72	3	1	3	1	Mass	X	X			X	X	
10	S060023	PCT-4\PHB\1\1,PHB\1>1537-M-1-M-2-M	5	1	1	63	3	3	1	3	Mass			Y	X			
11	S060024	PCT-4\PHB\1\1,PHB\1>1537-M-1-M-3-M	5	2	1	65	1	3	1	1	Mass	X	X				X	
12	S060026	PCT-4\PHB\1\1,PHB\1>1537-M-1-M-5-M	5	2	1	64	1	3	1	1	Mass				X			
13	S060027	PCT-4\PHB\1\1,PHB\1>1537-M-1-M-6-M	5	1	1	65	1	3	1	1	Mass	X	X				X	
14	S060028	PCT-4\PHB\1\1,PHB\1>1537-M-5-M-1-M	5	1	1	72	1	1	1	1	Mass	X	X				X	
15	S060030	PCT-4\PHB\1\1,PHB\1>1537-M-5-M-3-M	3	2	3	65	3	3	3	3	Mass					X		
16	S060031	PCT-4\PHB\1\1,PHB\1>1537-M-5-M-4-M	3	3	3	71	3	1	1	3	Mass							X
17	S060034	PCT-4\PHB\1\1,PHB\1>1776-M-2-M-1-M	5	3	3	75	3	1	1	1	Mass					X		
18	S060035	PCT-4\PHB\1\1,PHB\1>1776-M-2-M-2-M	5	3	2	68	3	1	1	1	Mass			Y				
19	S060036	PCT-4\PHB\1\1,PHB\1>1776-M-2-M-3-M	5	3	4	67	3	1	1	1	Mass			Y				
		Population PCT-4\SA\1\1																
20	S060046	PCT-4\SA\1\1>341-M-3-M-3-M	7	5	5	78	3	1	1	1	Mass					X		
21	S060049	PCT-4\SA\1\1>341-M-3-M-6-M	7	5	5	79	3	1	1	1	Mass	X	X					
22	S060050	PCT-4\SA\1\1>446-M-6-M-1-M	7	5	5	77	3	1	1	1	Mass					X		
23	S060053	PCT-4\SA\1\1>446-M-6-M-4-M	7	5	5	74	1	3	3	1	Mass					X		
24	S060054	PCT-4\SA\1\1>446-M-6-M-5-M	7	5	4	75	1	3	3	1	Mass			Y				
25	S060058	PCT-4\SA\1\1>500-M-3-M-3-M	7	5	5	75	1	3	3	1	Mass					X		
26	S060063	PCT-4\SA\1\1>500-M-6-M-2-M	5	4	4	68	3	1	1	1	Mass			Y				
27	S060064	PCT-4\SA\1\1>500-M-6-M-3-M	5	5	4	73	3	1	1	1	Mass					X		
28	S060065	PCT-4\SA\1\1>500-M-6-M-4-M	5	5	4	64	3	5	3	1	Mass					X		
29	S060068	PCT-4\SA\1\1>503-M-6-M-1-M	5	4	3	67	3	1	1	1	Mass	X	X				X	
30	S060069	PCT-4\SA\1\1>503-M-6-M-2-M	5	3	2	68	3	1	1	1	Mass				X			
31	S060072	PCT-4\SA\1\1>503-M-6-M-5-M	5	4	4	72	3	3	1	1	Mass			Y		X		
32	S060073	PCT-4\SA\1\1>503-M-6-M-6-M	5	5	4	73	3	3	1	1	Mass					X		
33	S060074	PCT-4\SA\1\1>516-M-3-M-1-M	5	4	3	73	3	3	1	1	Mass							X
34	S060079	PCT-4\SA\1\1>516-M-3-M-6-M	5	3	4	76	3	1	1	1	Mass				X	X		
35	S060080	PCT-4\SA\1\1>516-M-6-M-1-M	5	4	4	74	3	1	1	1	Mass					X		
36	S060082	PCT-4\SA\1\1>516-M-6-M-3-M	5	3	3	75	3	3	3	1	Mass	X	X			X	X	
37	S060083	PCT-4\SA\1\1>516-M-6-M-4-M	5	3	2	72	3	1	3	1	Mass	X	X			X	X	
38	S060085	PCT-4\SA\1\1>516-M-6-M-6-M	5	3	3	74	3	3	3	1	Mass					X		
39	S060086	PCT-4\SA\1\1>540-M-3-M-1-M	5	4	3	69	3	1	3	1	Mass					X		
40	S060088	PCT-4\SA\1\1>540-M-3-M-3-M	5	3	3	72	3	1	1	1	Mass	X	X			X	X	X
41	S060089	PCT-4\SA\1\1>540-M-3-M-4-M	5	3	3	69	3	3	1	1	Mass	X	X			X	X	
42	S060090	PCT-4\SA\1\1>540-M-3-M-5-M	5	4	3	69	3	3	1	1	Mass	X	X		X	X	X	
43	S060091	PCT-4\SA\1\1>540-M-3-M-6-M	5	3	3	69	3	3	3	1	Mass					X		
44	S060093	PCT-4\SA\1\1>669-M-5-M-2-M	3	2	2	75	3	1	1	1	Mass +6	X	X			X	X	X

Continued .....

Table 6.1. Continued .....

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl	Plant Sel.	Upland Workshop. Lines selected by: Arg.	Bol.	Bol. 2002	Bra.	Col.	Cuba	Ven.
		Population PCT-4\SA\1\1																
45	S060094	PCT-4\SA\1\1>669-M-5-M-3-M	3	2	2	75	3	1	1	1	Mass +6	X	X		X	X	X	X
46	S060095	PCT-4\SA\1\1>669-M-5-M-4-M	3	1	2	75	3	1	1	1	Mass +6	X	X		X		X	X
47	S060096	PCT-4\SA\1\1>669-M-5-M-5-M	3	1	1	72	3	1	1	1	Mass +6	X	X	Y		X	X	
48	S060097	PCT-4\SA\1\1>721-M-2-M-1-M	5	1	1	77	3	1	1	1	Mass +6	X	X			X	X	
49	S060098	PCT-4\SA\1\1>721-M-2-M-2-M	5	2	2	69	3	1	1	1	Mass	X	X	Y		X	X	
50	S060099	PCT-4\SA\1\1>721-M-2-M-3-M	5	3	2	69	3	1	1	1	Mass	X	X			X	X	
51	S060100	PCT-4\SA\1\1>721-M-2-M-4-M	5	3	2	72	3	1	1	1	Mass +6					X		
52	S060101	PCT-4\SA\1\1>721-M-2-M-5-M	3	2	1	70	3	1	1	1	Mass			Y		X		X
53	S060102	PCT-4\SA\1\1>721-M-2-M-6-M	5	2	2	71	3	1	1	1	Mass					X		
54	S060103	PCT-4\SA\1\1>721-M-4-M-1-M	5	3	2	73	3	1	1	1	Mass +6	X	X			X	X	
55	S060104	PCT-4\SA\1\1>721-M-4-M-2-M	5	3	2	72	3	1	1	1	Mass					X		X
56	S060105	PCT-4\SA\1\1>721-M-4-M-3-M	5	2	2	69	3	1	1	1	Mass					X		
57	S060106	PCT-4\SA\1\1>721-M-4-M-4-M	5	2	2	74	3	1	1	1	Mass					X		
58	S060107	PCT-4\SA\1\1>721-M-4-M-5-M	5	3	1	70	3	1	1	1	Mass					X		
59	S060109	PCT-4\SA\1\1>721-M-6-M-1-M	5	2	1	64	3	3	3	3	Mass					X		
60	S060110	PCT-4\SA\1\1>721-M-6-M-2-M	3	2	2	70	3	1	1	1	Mass	X	X			X	X	
61	S060111	PCT-4\SA\1\1>721-M-6-M-3-M	3	2	2	69	3	1	1	1	Mass					X		
62	S060112	PCT-4\SA\1\1>721-M-6-M-4-M	5	3	3	72	3	1	1	1	Mass	X	X			X	X	
63	S060113	PCT-4\SA\1\1>721-M-6-M-5-M	3	2	2	69	3	1	1	1	Mass	X	X			X	X	
64	S060114	PCT-4\SA\1\1>721-M-6-M-6-M	3	3	2	69	3	1	1	1	Mass					X		
65	S060115	PCT-4\SA\1\1>722-M-3-M-1-M	5	2	3	72	3	1	1	1	Mass	X	X			X	X	
66	S060116	PCT-4\SA\1\1>722-M-3-M-2-M	7	2	3	74	1	1	1	1	Mass	X	X		X	X	X	X
67	S060117	PCT-4\SA\1\1>722-M-3-M-3-M	7	4	4	76	1	1	1	1	Mass +6	X	X		X	X		X
68	S060118	PCT-4\SA\1\1>722-M-3-M-4-M	9	3	3	79	1	1	1	1	Mass							X
69	S060119	PCT-4\SA\1\1>722-M-3-M-5-M	7	3	2	72	1	1	1	1	Mass	X	X	Y	X	X	X	
70	S060120	PCT-4\SA\1\1>722-M-3-M-6-M	7	3	2	74	1	1	1	1	Mass	X	X		X		X	
71	S060121	PCT-4\SA\1\1>763-M-2-M-1-M	9	3	3	79	1	1	1	1	Mass					X		
72	S060122	PCT-4\SA\1\1>763-M-2-M-2-M	7	3	3	72	1	1	1	1	Mass				X	X		X
73	S060123	PCT-4\SA\1\1>763-M-2-M-3-M	7	3	2	72	1	1	1	1	Mass					X		
74	S060124	PCT-4\SA\1\1>763-M-2-M-4-M	7	3	2	74	1	1	1	1	Mass	X	X		X	X	X	
75	S060125	PCT-4\SA\1\1>763-M-2-M-5-M	7	3	3	71	1	1	1	1	Mass					X		
76	S060126	PCT-4\SA\1\1>763-M-2-M-6-M	7	2	2	73	1	1	1	1	Mass				X			
77	S060130	PCT-4\SA\1\1>813-M-1-M-6-M	7	3	1	76	1	1	1	3	Mass				X			X
78	S060133	PCT-4\SA\1\1>813-M-6-M-3-M	5	2	2	71	1	1	1	1	Mass			Y		X		
79	S060134	PCT-4\SA\1\1>813-M-6-M-4-M	7	2	1	76	1	1	1	1	Mass	X	X				X	
80	S060135	PCT-4\SA\1\1>813-M-6-M-5-M	7	1	2	77	1	1	1	1	Mass							X
81	S060136	PCT-4\SA\1\1>813-M-6-M-6-M	7	1	1	75	1	1	1	1	Mass				X			
82	S060137	PCT-4\SA\1\1>975-M-2-M-1-M	7	1	1	73	1	1	1	1	Mass	X	X		X	X	X	
83	S060138	PCT-4\SA\1\1>975-M-2-M-2-M	5	4	3	77	1	1	1	1	Mass	X	X		X	X		
84	S060139	PCT-4\SA\1\1>975-M-2-M-3-M	5	3	2	75	1	1	3	1	Mass	X	X	Y		X	X	
85	S060140	PCT-4\SA\1\1>975-M-2-M-4-M	5	4	3	75	1	1	3	1	Mass				X	X		
86	S060141	PCT-4\SA\1\1>975-M-2-M-5-M	5	3	3	76	1	1	3	1	Mass				X	X		
87	S060142	PCT-4\SA\1\1>975-M-2-M-6-M	5	3	3	86	1	1	1	1	Mass	X	X			X		X
88	S060143	PCT-4\SA\1\1>975-M-3-M-1-M	5	3	2	73	1	1	1	1	Mass				X	X		
89	S060144	PCT-4\SA\1\1>975-M-3-M-2-M	5	3	2	75	1	1	1	1	Mass	X	X			X	X	
90	S060145	PCT-4\SA\1\1>975-M-3-M-3-M	5	2	3	74	1	1	1	1	Mass	X	X			X		

Continued .....

Table 6.1. Continued .....

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl	Plant Sel.	Upland Workshop. Lines selected by: Arg.	Bol.	Bol. 2002	Bra.	Col.	Cuba	Ven.
		Population PCT-4\SA\1\1																
91	S060146	PCT-4\SA\1\1>975-M-3-M-4-M	7	2	3	75	1	1	3	1	Mass	X	X			X		
92	S060147	PCT-4\SA\1\1>975-M-3-M-5-M	7	3	2	77	1	1	3	1	Mass				X	X		
93	S060150	PCT-4\SA\1\1>982-M-3-M-2-M	5	2	2	75	3	1	1	1	Mass	X	X	Y		X		X
94	S060151	PCT-4\SA\1\1>982-M-3-M-3-M	5	1	3	69	1	1	1	3	Mass					X		
95	S060152	PCT-4\SA\1\1>982-M-3-M-4-M	5	1	3	71	1	1	1	1	Mass	X	X			X		
96	S060153	PCT-4\SA\1\1>982-M-3-M-5-M	5	2	3	71	1	1	1	3	Mass	X	X			X		
97	S060154	PCT-4\SA\1\1>982-M-3-M-6-M	5	3	4	69	1	1	1	3	Mass				X			
98	S060156	PCT-4\SA\1\1>1036-M-3-M-2-M	5	2	1	77	1	1	3	1	Mass					X		
99	S060157	PCT-4\SA\1\1>1036-M-3-M-3-M	5	2	1	77	1	1	3	1	Mass			Y		X		
100	S060158	PCT-4\SA\1\1>1036-M-3-M-4-M	5	1	1	76	1	1	3	1	Mass					X		
101	S060159	PCT-4\SA\1\1>1036-M-3-M-5-M	5	1	2	79	1	1	1	1	Mass				X	X		
102	S060160	PCT-4\SA\1\1>1036-M-3-M-6-M	5	1	2	79	1	1	3	1	Mass					X		
103	S060161	PCT-4\SA\1\1>1036-M-6-M-1-M	5	3	1	77	1	1	3	1	Mass					X		
104	S060162	PCT-4\SA\1\1>1036-M-6-M-2-M	7	1	1	81	1	1	3	1	Mass	X	X			X*		X
105	S060163	PCT-4\SA\1\1>1036-M-6-M-3-M	5	2	1	78	1	1	3	3	Mass					X		
106	S060164	PCT-4\SA\1\1>1036-M-6-M-4-M	5	1	1	78	1	1	1	1	Mass				X	X		
107	S060167	PCT-4\SA\1\1>1044-M-3-M-1-M	5	3	2	79	1	1	3	1	Mass			Y	X			
108	S060168	PCT-4\SA\1\1>1044-M-3-M-2-M	5	2	3	82	1	1	3	1	Mass	X	X			X		
109	S060170	PCT-4\SA\1\1>1044-M-3-M-4-M	5	2	2	78	1	1	3	1	Mass	X	X		X	X		
110	S060171	PCT-4\SA\1\1>1044-M-3-M-5-M	7	3	2	82	1	1	3	1	Mass				X			X
111	S060172	PCT-4\SA\1\1>1044-M-3-M-6-M	5	1	1	68	1	1	1	1	Mass					X		
112	S060173	PCT-4\SA\1\1>1156-M-2-M-1-M	5	1	1	68	1	1	1	1	Mass			Y		X		
113	S060174	PCT-4\SA\1\1>1156-M-2-M-2-M	5	1	1	71	1	1	1	1	Mass					X		
114	S060175	PCT-4\SA\1\1>1156-M-2-M-3-M	3	1	1	66	1	1	1	1	Mass	X	X			X	X	
115	S060176	PCT-4\SA\1\1>1156-M-2-M-4-M	5	1	1	69	1	1	1	1	Mass					X		
116	S060177	PCT-4\SA\1\1>1156-M-2-M-5-M	3	2	1	69	1	1	1	1	Mass	X	X		X	X	X	
117	S060178	PCT-4\SA\1\1>1156-M-2-M-6-M	3	2	1	67	1	1	1	1	Mass					X		X
118	S060179	PCT-4\SA\1\1>1199-M-2-M-2-M	3	1	1	66	1	1	1	1	Mass				X	X		
119	S060180	PCT-4\SA\1\1>1199-M-2-M-3-M	5	1	1	71	1	1	1	1	Mass				X			X
120	S060183	PCT-4\SA\1\1>1199-M-2-M-6-M	7	1	1	75	1	1	1	1	Mass	X	X				X	
121	S060184	PCT-4\SA\1\1>1199-M-5-M-1-M	5	1	1	69	1	1	1	1	Mass					X		
122	S060185	PCT-4\SA\1\1>1199-M-5-M-2-M	5	1	1	69	3	1	1	1	Mass					X		
123	S060186	PCT-4\SA\1\1>1199-M-5-M-3-M	5	2	1	69	1	1	1	1	Mass				X	X		
124	S060187	PCT-4\SA\1\1>1199-M-5-M-4-M	5	1	2	70	1	1	1	1	Mass					X		
125	S060188	PCT-4\SA\1\1>1199-M-5-M-5-M	3	1	2	68	1	1	1	1	Mass	X	X			X	X	X
126	S060189	PCT-4\SA\1\1>1199-M-5-M-6-M	5	1	3	68	1	1	1	1	Mass				X	X		
127	S060190	PCT-4\SA\1\1>1206-M-2-M-1-M	5	1	2	67	1	1	1	1	Mass	X	X		X	X	X	
128	S060191	PCT-4\SA\1\1>1206-M-2-M-2-M	5	1	1	67	1	1	1	1	Mass				X			
129	S060192	PCT-4\SA\1\1>1206-M-2-M-3-M	7	1	3	75	1	1	1	1	Mass			Y				X
130	S060194	PCT-4\SA\1\1>1206-M-2-M-5-M	5	2	1	69	1	1	1	1	Mass				X			
131	S060195	PCT-4\SA\1\1>1206-M-2-M-6-M	5	1	1	79	1	1	1	1	Mass	X	X				X	
132	S060199	PCT-4\SA\1\1>1236-M-1-M-4-M	5	1	2	67	1	1	1	1	Mass				X			
133	S060201	PCT-4\SA\1\1>1236-M-1-M-6-M	7	1	2	75	1	1	1	1	Mass	X	X				X	X
134	S060202	PCT-4\SA\1\1>1236-M-4-M-1-M	5	1	1	69	1	1	1	1	Mass	X	X		X			
135	S060203	PCT-4\SA\1\1>1236-M-4-M-2-M	5	1	1	69	1	1	1	1	Mass	X	X					

Continued .....

Table 6.1. Continued .....

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl	Plant Sel.	Upland Workshop. Lines selected by: Arg.	Bol.	Bol. 2002	Bra.	Col.	Cuba	Ven.
Population PCT-4\SA\1\1																		
136	S060204	PCT-4\SA\1\1>1236-M-4-M-3-M	7	2	1	73	1	1	1	1	Mass				X		X	
137	S060205	PCT-4\SA\1\1>1236-M-4-M-4-M	5	1	1	67	1	1	1	1	Mass				X			
138	S060208	PCT-4\SA\1\1>1241-M-1-M-1-M	5	1	1	69	1	1	1	1	Mass				X			X
139	S060213	PCT-4\SA\1\1>1241-M-1-M-6-M	5	3	2	72	1	1	1	1	Mass				X			
140	S060215	PCT-4\SA\1\1>1241-M-5-M-2-M	5	1	1	68	3	1	1	1	Mass					X		
141	S060218	PCT-4\SA\1\1>1241-M-5-M-5-M	5	2	1	66	3	1	1	1	Mass			Y				
142	S060219	PCT-4\SA\1\1>1241-M-5-M-6-M	5	1	1	74	1	1	1	1	Mass	X	X		X		X	
143	S060223	PCT-4\SA\1\1>1260-M-6-M-4-M	5	1	1	68	1	1	1	1	Mass			Y				
144	S060225	PCT-4\SA\1\1>1260-M-6-M-6-M	7	2	1	72	1	1	1	5	Mass			Y	X			X
145	S060232	PCT-4\SA\1\1>1270-M-5-M-1-M	5	3	2	69	1	1	1	3	Mass			Y				
146	S060237	PCT-4\SA\1\1>1270-M-5-M-6-M	5	1	1	75	1	1	1	1	Mass							X
147	S060239	PCT-4\SA\1\1>1272-M-6-M-2-M	5	1	1	74	1	1	1	1	Mass	X	X				X	
148	S060240	PCT-4\SA\1\1>1272-M-6-M-3-M	5	2	1	76	1	1	1	3	Mass						X	X
149	S060241	PCT-4\SA\1\1>1272-M-6-M-4-M	5	3	1	71	1	1	1	1	Mass					X		
150	S060242	PCT-4\SA\1\1>1272-M-6-M-5-M	3	2	1	70	1	1	1	1	Mass					X		
151	S060243	PCT-4\SA\1\1>1272-M-6-M-6-M	3	1	1	78	1	1	1	1	Mass				X			
152	S060244	PCT-4\SA\1\1>1479-M-1-M-1-M	3	2	1	70	1	1	1	1	Mass			Y	X	X		
153	S060245	PCT-4\SA\1\1>1479-M-1-M-2-M	3	2	1	73	1	1	1	1	Mass					X		
154	S060246	PCT-4\SA\1\1>1479-M-1-M-3-M	3	1	1	75	1	1	1	1	Mass	X	X			X		
155	S060248	PCT-4\SA\1\1>1479-M-1-M-5-M	3	1	1	68	1	1	1	1	Mass				X	X		
156	S060249	PCT-4\SA\1\1>1479-M-1-M-6-M	3	1	1	75	1	1	1	1	Mass	X	X			X	X	X
157	S060252	PCT-4\SA\1\1>1486-M-5-M-3-M	1	1	1	73	1	1	1	1	Mass				X			
158	S060254	PCT-4\SA\1\1>1486-M-5-M-5-M	1	1	1	71	1	1	1	1	Mass					X		
159	S060255	PCT-4\SA\1\1>1486-M-5-M-6-M	3	1	1	71	1	1	1	1	Mass					X		X
160	S060256	PCT-4\SA\1\1>1486-M-6-M-1-M	3	2	1	73	1	1	1	1	Mass					X		
161	S060257	PCT-4\SA\1\1>1486-M-6-M-2-M	3	1	1	68	1	1	1	1	Mass	X	X			X	X	
162	S060258	PCT-4\SA\1\1>1486-M-6-M-3-M	1	1	1	70	1	1	1	1	Mass	X	X			X	X	
163	S060259	PCT-4\SA\1\1>1486-M-6-M-4-M	3	2	1	69	1	1	1	1	Mass				X	X		
164	S060260	PCT-4\SA\1\1>1486-M-6-M-5-M	3	2	1	68	1	1	1	1	Mass					X		
165	S060261	PCT-4\SA\1\1>1486-M-6-M-6-M	3	1	1	75	1	1	1	1	Mass				X	X		X
166	S060262	PCT-4\SA\1\1>1549-M-1-M-1-M	3	1	1	73	1	1	1	1	Mass					X		
167	S060263	PCT-4\SA\1\1>1549-M-1-M-2-M	3	1	1	70	1	1	1	1	Mass					X		
168	S060264	PCT-4\SA\1\1>1549-M-1-M-3-M	3	1	1	72	1	1	1	1	Mass					X		
169	S060265	PCT-4\SA\1\1>1549-M-1-M-4-M	3	2	1	72	1	1	1	1	Mass					X		
170	S060266	PCT-4\SA\1\1>1549-M-1-M-5-M	3	2	1	71	1	1	1	1	Mass					X		
171	S060270	PCT-4\SA\1\1>1566-M-6-M-3-M	5	2	4	73	3	3	1	1	Mass					X		X
172	S060271	PCT-4\SA\1\1>1566-M-6-M-4-M	5	3	3	68	3	3	1	1	Mass					X		
173	S060272	PCT-4\SA\1\1>1566-M-6-M-5-M	5	4	3	76	3	3	1	1	Mass					X		
174	S060273	PCT-4\SA\1\1>1566-M-6-M-6-M	5	5	4	76	3	3	1	1	Mass					X		
175	S060274	PCT-4\SA\1\1>1576-M-4-M-1-M	7	4	3	72	3	1	1	1	Mass	X	X			X	X	
176	S060275	PCT-4\SA\1\1>1576-M-4-M-2-M	7	4	4	70	3	1	1	1	Mass					X		
177	S060276	PCT-4\SA\1\1>1576-M-4-M-3-M	7	3	3	77	3	3	1	1	Mass	X	X					X
178	S060277	PCT-4\SA\1\1>1576-M-4-M-4-M	7	4	3	74	3	1	1	1	Mass					X		
179	S060278	PCT-4\SA\1\1>1576-M-4-M-5-M	5	3	3	72	3	1	1	1	Mass					X		
180	S060282	PCT-4\SA\1\1>1576-M-6-M-3-M	7	3	3	76	3	1	1	1	Mass	X	X		X		X	
181	S060285	PCT-4\SA\1\1>1576-M-6-M-6-M	5	3	2	75	1	1	1	1	Mass					X		

Continued .....

Table 6.1. Continued .....

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl	Plant Sel.	Upland Workshop. Lines selected by:						
												Arg.	Bol.	Bol.	Bra.	Col.	Cuba	Ven.
		Population PCT-4\SA\1\1												2002				
182	S060286	PCT-4\SA\1\1>1837-M-2-M-1-M	5	4	4	73	1	1	1	1	Mass					X		
183	S060287	PCT-4\SA\1\1>1837-M-2-M-2-M	5	4	3	68	1	3	1	1	Mass					X		
184	S060288	PCT-4\SA\1\1>1837-M-2-M-3-M	5	4	4	71	3	3	1	1	Mass					X		
185	S060289	PCT-4\SA\1\1>1837-M-2-M-4-M	5	4	4	72	3	3	1	1	Mass					X		
186	S060291	PCT-4\SA\1\1>1837-M-2-M-6-M	7	2	3	76	3	1	1	1	Mass							X

Vg = vigor; Bl 1 = leaf blast; Bl 2 = leaf blast; Fl = flowering; LsC = leaf scald; BS = brown spot; NBl = neck blast;

Gd = grain discoloration. (Scale 1-9: 1 means resistant and 9 susceptible); Fl = flowering (Days).

Arg.=Argentina; Bol.=Bolivia; Bol 2002=Second Workshop in Bolivia; Bra.=Brazil;Col.=Colombia; Ven.=Venezuela

Table 7. Evaluation of S7 lines (76). "La Libertad Experimental Station", Villavicencio-Meta, Colombia.

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl
		Population PCT-4\PHB\1\1		S6 Lines, LES 1999A						
1	S060292	PCT-4\PHB\1\1>145-M-3-M-4-M-1	7	2	3	69	1	1	1	1
2	S060293	PCT-4\PHB\1\1>145-M-3-M-4-M-2	7	3	3	75	1	3	1	1
3	S060294	PCT-4\PHB\1\1>145-M-3-M-4-M-3	9	2	4	76	1	1	1	1
4	S060295	PCT-4\PHB\1\1>145-M-3-M-4-M-4	7	2	4	75	1	3	1	1
5	S060296	PCT-4\PHB\1\1>145-M-3-M-4-M-5	7	5	4	75	1	3	1	1
6	S060297	PCT-4\PHB\1\1>145-M-3-M-4-M-6	7	5	4	79	1	3	1	1
7	S060298	PCT-4\PHB\1\1>145-M-5-M-6-M-1	7	5	4	80	1	1	1	1
8	S060299	PCT-4\PHB\1\1>145-M-5-M-6-M-2	7	4	4	76	1	1	1	1
9	S060300	PCT-4\PHB\1\1>145-M-5-M-6-M-3	7	4	4	75	1	1	1	1
10	S060301	PCT-4\PHB\1\1>145-M-5-M-6-M-4	7	4	3	80	1	3	1	1
11	S060302	PCT-4\PHB\1\1>145-M-5-M-6-M-5	7	3	3	76	1	3	1	1
12	S060303	PCT-4\PHB\1\1>145-M-5-M-6-M-6	9	4	4	76	1	1	1	1
13	S060304	PCT-4\PHB\1\1>231-M-6-M-3-M-1	7	3	3	70	1	1	1	1
14	S060305	PCT-4\PHB\1\1>231-M-6-M-3-M-2	7	3	3	76	1	3	1	1
15	S060306	PCT-4\PHB\1\1>231-M-6-M-3-M-3	7	2	2	77	1	3	3	1
16	S060307	PCT-4\PHB\1\1>231-M-6-M-3-M-4	5	2	2	77	1	1	1	1
17	S060308	PCT-4\PHB\1\1>231-M-6-M-3-M-5	7	3	2	75	1	1	1	1
18	S060309	PCT-4\PHB\1\1>231-M-6-M-3-M-6	7	3	3	78	1	1	3	1
19	S060310	PCT-4\PHB\1\1>453-M-1-M-3-M-1	7	3	3	76	1	1	1	1
20	S060311	PCT-4\PHB\1\1>453-M-1-M-3-M-2	7	3	3	75	1	1	3	1
21	S060312	PCT-4\PHB\1\1>453-M-1-M-3-M-3	9	2	2	80	1	1	1	1
22	S060313	PCT-4\PHB\1\1>453-M-1-M-3-M-4	7	3	2	76	1	1	3	1
	Check	CIRAD 409	5	1	1	80	3	1	1	1
	Check	O.SAB.6	3	5	4	89	5	1	1	1
	Check	O.SAB.10	5	3	3	90	5	1	1	1
23	S060314	PCT-4\PHB\1\1>453-M-1-M-3-M-5	7	3	3	75	1	1	1	1
24	S060315	PCT-4\PHB\1\1>453-M-1-M-3-M-6	9	3	4	81	1	1	1	1
25	S060316	PCT-4\PHB\1\1>538-M-2-M-2-M-1	7	3	3	76	1	1	3	1
26	S060317	PCT-4\PHB\1\1>538-M-2-M-2-M-2	9	4	3	79	1	1	1	1
27	S060318	PCT-4\PHB\1\1>538-M-2-M-2-M-3	9	3	4	77	1	1	1	1
28	S060319	PCT-4\PHB\1\1>538-M-2-M-2-M-4	7	4	3	75	1	1	1	1
29	S060320	PCT-4\PHB\1\1>538-M-2-M-2-M-5	7	5	5	77	1	1	1	1
30	S060321	PCT-4\PHB\1\1>538-M-2-M-2-M-6	9	5	5	78	1	1	1	1
31	S060322	PCT-4\PHB\1\1>538-M-2-M-3-M-1	7	4	5	76	1	1	1	1
32	S060323	PCT-4\PHB\1\1>538-M-2-M-3-M-2	7	5	5	75	1	1	1	1
33	S060324	PCT-4\PHB\1\1>538-M-2-M-3-M-3	7	4	5	80	1	1	1	1
34	S060325	PCT-4\PHB\1\1>538-M-2-M-3-M-4	5	4	4	75	1	1	1	1
35	S060326	PCT-4\PHB\1\1>538-M-2-M-3-M-5	7	5	5	80	1	1	1	1
36	S060327	PCT-4\PHB\1\1>538-M-2-M-3-M-6	7	5	5	81	1	1	1	1
37	S060328	PCT-4\PHB\1\1>538-M-2-M-6-M-1	7	5	5	79	1	1	1	1
38	S060329	PCT-4\PHB\1\1>538-M-2-M-6-M-2	7	5	5	80	1		1	1
39	S060330	PCT-4\PHB\1\1>538-M-2-M-6-M-3	7	4	5	79	1	1	1	1
40	S060331	PCT-4\PHB\1\1>538-M-2-M-6-M-4	7	4	4	78	1	1	1	1
41	S060332	PCT-4\PHB\1\1>538-M-2-M-6-M-5	7	3	3	82	1	1	3	1
42	S060333	PCT-4\PHB\1\1>538-M-2-M-6-M-6	9	2	4	85	1	1	1	1

Continued .....

Table 7. Continued .....

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl
43	S060334	PCT-4\PHB\1\1>603-M-5-M-5-M-1	7	2	2	84	1	1	1	1
44	S060335	PCT-4\PHB\1\1>603-M-5-M-5-M-2	7	3	2	85	1	1	5	1
45	S060336	PCT-4\PHB\1\1>603-M-5-M-5-M-3	7	3	2	83	1	1	5	1
46	S060337	PCT-4\PHB\1\1>603-M-5-M-5-M-4	5	3	2	83	1	3	5	1
47	S060338	PCT-4\PHB\1\1>603-M-5-M-5-M-5	5	2	2	76	1	1	1	1
48	S060339	PCT-4\PHB\1\1>603-M-5-M-5-M-6	9	5	3	83	3	1	3	1
49	S060340	PCT-4\PHB\1\1>822-M-1-M-2-M-1	7	5	3	77	1	1	3	1
50	S060341	PCT-4\PHB\1\1>822-M-1-M-2-M-2	7	5	4	80	1	1	1	1
51	S060342	PCT-4\PHB\1\1>822-M-1-M-2-M-3	9	5	5	80	1	1	1	1
52	S060343	PCT-4\PHB\1\1>822-M-1-M-2-M-4	7	4	3	77	1	1	1	1
53	S060344	PCT-4\PHB\1\1>822-M-1-M-2-M-5	7	3	3	75	1	1	1	3
54	S060345	PCT-4\PHB\1\1>822-M-1-M-2-M-6	7	3	2	83	1	1	3	1
55	S060346	PCT-4\PHB\1\1>846-M-4-M-3-M-1	7	5	5	75	1	1	1	3
56	S060347	PCT-4\PHB\1\1>846-M-4-M-3-M-2	7	5	4	75	1	1	1	1
57	S060348	PCT-4\PHB\1\1>846-M-4-M-3-M-3	7	3	3	78	1	1	1	1
58	S060349	PCT-4\PHB\1\1>846-M-4-M-3-M-4	5	3	2	75	1	1	1	1
59	S060350	PCT-4\PHB\1\1>846-M-4-M-3-M-5	5	3	2	75	1	1	1	1
60	S060351	PCT-4\PHB\1\1>846-M-4-M-3-M-6	7	3	2	77	1	1	1	1
61	S060352	PCT-4\PHB\1\1>846-M-4-M-4-M-1	7	4	2	75	1	1	1	1
62	S060353	PCT-4\PHB\1\1>846-M-4-M-4-M-2	7	4	3	75	1	1	1	1
63	S060354	PCT-4\PHB\1\1>846-M-4-M-4-M-3	7	3	3	78	1	3	1	1
64	S060355	PCT-4\PHB\1\1>846-M-4-M-4-M-4	5	5	4	74	1	1	3	1
65	S060356	PCT-4\PHB\1\1>846-M-4-M-4-M-5	5	3	2	69	1	1	5	1
66	S060357	PCT-4\PHB\1\1>846-M-4-M-4-M-6	7	3	2	72	1	1	5	1
67	S060358	PCT-4\PHB\1\1>1678-M-4-M-1-M-1	7	2	2	71	1	1	5	1
68	S060359	PCT-4\PHB\1\1>1678-M-4-M-1-M-2	7	3	2	71	1	1	5	1
69	S060360	PCT-4\PHB\1\1>1678-M-4-M-1-M-3	7	3	2	70	1	1	3	1
70	S060361	PCT-4\PHB\1\1>1678-M-4-M-1-M-4	5	2	1	69	1	1	5	1
71	S060362	PCT-4\PHB\1\1>1678-M-4-M-1-M-5	7	4	2	81	3	1	3	1
72	S060363	PCT-4\PHB\1\1>1678-M-4-M-1-M-6	5	3	2	77	3	1	3	1
73	S060364	PCT-4\PHB\1\1>1678-M-4-M-6-M-1	5	4	3	78	3	1	3	1
74	S060365	PCT-4\PHB\1\1>1678-M-4-M-6-M-2	5	5	5	76	3	1	3	1
75	S060366	PCT-4\PHB\1\1>1678-M-4-M-6-M-3	5	5	5	76	3	1	3	1
76	S060367	PCT-4\PHB\1\1>1678-M-4-M-6-M-4	3	4	4	78	3	1	1	1
	Check	CIRAD 409	1	1	2	68	1	1	1	1
	Check	O.SAB.6	5	5	4	87	3	1	1	1

Vg = vigor; Bl 1 = leaf blast; Bl 2 = leaf blast; LsC = leaf scald; BS = brown spot; NBl = neck blast;

Gd = grain discoloration. (Scale 1-9: 1 means resistant and 9 susceptible). Fl = flowering (Days).

Table 7.1. Selected S7 lines (40) "La Libertad Experimental Station", Villavicencio-Meta, Colombia

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl	Plant Sel.	Upland Workshop. Lines selected by:						
												Arg.	Bol.	Bol. 2002	Bra.	Col.	Cuba	Ven.
Population PCT-4\PHB\1\1																		
1	S060292	PCT-4\PHB\1\1>145-M-3-M-4-M-1	7	2	3	69	1	1	1	1	Mass					X		
2	S060293	PCT-4\PHB\1\1>145-M-3-M-4-M-2	7	3	3	75	1	3	1	1	Mass							X
3	S060295	PCT-4\PHB\1\1>145-M-3-M-4-M-4	7	2	4	75	1	3	1	1	Mass					X		
4	S060296	PCT-4\PHB\1\1>145-M-3-M-4-M-5	7	5	4	75	1	3	1	1	Mass				X			
5	S060299	PCT-4\PHB\1\1>145-M-5-M-6-M-2	7	4	4	76	1	1	1	1	Mass				X			
6	S060300	PCT-4\PHB\1\1>145-M-5-M-6-M-3	7	4	4	75	1	1	1	1	Mass				X			
7	S060304	PCT-4\PHB\1\1>231-M-6-M-3-M-1	7	3	3	70	1	1	1	1	Mass							X
8	S060305	PCT-4\PHB\1\1>231-M-6-M-3-M-2	7	3	3	76	1	3	1	1	Mass					X		
9	S060310	PCT-4\PHB\1\1>453-M-1-M-3-M-1	7	3	3	76	1	1	1	1	Mass							X
10	S060311	PCT-4\PHB\1\1>453-M-1-M-3-M-2	7	3	3	75	1	1	3	1	Mass				X	X		
11	S060314	PCT-4\PHB\1\1>453-M-1-M-3-M-5	7	3	3	75	1	1	1	1	Mass	X	X				X	
12	S060315	PCT-4\PHB\1\1>453-M-1-M-3-M-6	9	3	4	81	1	1	1	1	Mass				X			
13	S060316	PCT-4\PHB\1\1>538-M-2-M-2-M-1	7	3	3	76	1	1	3	1	Mass			Y	X			X
14	S060319	PCT-4\PHB\1\1>538-M-2-M-2-M-4	7	4	3	75	1	1	1	1	Mass	X	X		X	X	X	
15	S060320	PCT-4\PHB\1\1>538-M-2-M-2-M-5	7	5	5	77	1	1	1	1	Mass				X	X		
16	S060323	PCT-4\PHB\1\1>538-M-2-M-3-M-2	7	5	5	75	1	1	1	1	Mass				X			
17	S060324	PCT-4\PHB\1\1>538-M-2-M-3-M-3	7	4	5	80	1	1	1	1	Mass				X			
18	S060325	PCT-4\PHB\1\1>538-M-2-M-3-M-4	5	4	4	75	1	1	1	1	Mass				X	X		
19	S060326	PCT-4\PHB\1\1>538-M-2-M-3-M-5	7	5	5	80	1	1	1	1	Mass				X			
20	S060327	PCT-4\PHB\1\1>538-M-2-M-3-M-6	7	5	5	81	1	1	1	1	Mass				X			
21	S060328	PCT-4\PHB\1\1>538-M-2-M-6-M-1	7	5	5	79	1	1	1	1	Mass				X	X		
22	S060329	PCT-4\PHB\1\1>538-M-2-M-6-M-2	7	5	5	80	1		1	1	Mass			Y				
23	S060330	PCT-4\PHB\1\1>538-M-2-M-6-M-3	7	4	5	79	1	1	1	1	Mass				X			
24	S060331	PCT-4\PHB\1\1>538-M-2-M-6-M-4	7	4	4	78	1	1	1	1	Mass				X			
25	S060332	PCT-4\PHB\1\1>538-M-2-M-6-M-5	7	3	3	82	1	1	3	1	Mass							X
26	S060333	PCT-4\PHB\1\1>538-M-2-M-6-M-6	9	2	4	85	1	1	1	1	Mass				X			
27	S060334	PCT-4\PHB\1\1>603-M-5-M-5-M-1	7	2	2	84	1	1	1	1	Mass				X			X
28	S060335	PCT-4\PHB\1\1>603-M-5-M-5-M-2	7	3	2	85	1	1	5	1	Mass			Y				
29	S060338	PCT-4\PHB\1\1>603-M-5-M-5-M-5	5	2	2	76	1	1	1	1	Mass			Y		X		
30	S060339	PCT-4\PHB\1\1>603-M-5-M-5-M-6	9	5	3	83	3	1	3	1	Mass			Y				
31	S060340	PCT-4\PHB\1\1>822-M-1-M-2-M-1	7	5	3	77	1	1	3	1	Mass					X		
32	S060349	PCT-4\PHB\1\1>846-M-4-M-3-M-4	5	3	2	75	1	1	1	1	Mass					X		
33	S060350	PCT-4\PHB\1\1>846-M-4-M-3-M-5	5	3	2	75	1	1	1	1	Mass				X	X		X
34	S060351	PCT-4\PHB\1\1>846-M-4-M-3-M-6	7	3	2	77	1	1	1	1	Mass				X	X		
35	S060352	PCT-4\PHB\1\1>846-M-4-M-4-M-1	7	4	2	75	1	1	1	1	Mass					X		
36	S060353	PCT-4\PHB\1\1>846-M-4-M-4-M-2	7	4	3	75	1	1	1	1	Mass					X		
37	S060354	PCT-4\PHB\1\1>846-M-4-M-4-M-3	7	3	3	78	1	3	1	1	Mass	X	X				X	
38	S060356	PCT-4\PHB\1\1>846-M-4-M-4-M-5	5	3	2	69	1	1	5	1	Mass			Y				
39	S060360	PCT-4\PHB\1\1>1678-M-4-M-1-M-3	7	3	2	70	1	1	3	1	Mass							X
40	S060363	PCT-4\PHB\1\1>1678-M-4-M-1-M-6	5	3	2	77	3	1	3	1	Mass	X	X					

Vg = vigor; Bl 1 = leaf blast; Bl 2 = leaf blast; Fl = flowering; LsC = leaf scald; BS = brown spot; NBl = neck blast;

Gd = grain discoloration. (Scale 1-9: 1 means resistant and 9 susceptible); Fl = flowering (Days).

Arg.=Argentina; Bol.=Bolivia; Bol 2002=Second Workshop in Bolivia; Bra.=Brazil;Col.=Colombia; Ven.=Venezuela

Table 8. Evaluation of S9 lines (307). "La Libertad Experimental Station", Villavicencio-Meta, Colombia

Nbr.	Field Nbr. 2000A	Pedigree	Vg	BI 1	BI 2	FI	LSc	Bs	Gd	NBI
		Population PCT-A\0\0\0 S8 Lines, LES 1999A								
1	S080001	PCT-A\0\0\0>175-M-1-M-4-M-5-M-1	5	3	2	70	1	1	3	1
2	S080002	PCT-A\0\0\0>175-M-1-M-4-M-5-M-2	5	5	4	63	1	3	1	1
3	S080003	PCT-A\0\0\0>175-M-1-M-4-M-5-M-3	5	4	3	70	1	1	3	1
4	S080004	PCT-A\0\0\0>175-M-1-M-4-M-5-M-4	5	4	3	69	1	1	3	1
5	S080005	PCT-A\0\0\0>175-M-1-M-4-M-5-M-5	7	3	2	70	1	1	3	1
	Check	CIRAD 409	3	1	1	68	1	1	1	1
	Check	O.SAB.6	1	5	3	87	3	1	3	1
	Check	O.SAB.10	3	3	3	87	3	1	1	1
	Check	CIRAD 409	3	1	2	68	3	1	1	1
	Check	O.SAB.6	3	5	3	87	3	1	3	1
	Check	O.SAB.10	5	3	3	87	3	1	1	1
6	S080006	PCT-A\0\0\0>175-M-1-M-4-M-5-M-6	7	4	3	68	1	1	1	1
7	S080007	PCT-A\0\0\0>175-M-1-M-5-M-2-M-1	5	4	3	69	1	1	3	1
8	S080008	PCT-A\0\0\0>175-M-1-M-5-M-2-M-2	5	4	3	69	1	1	5	1
9	S080009	PCT-A\0\0\0>175-M-1-M-5-M-2-M-3	5	5	3	67	1	1	5	1
10	S080010	PCT-A\0\0\0>175-M-1-M-5-M-2-M-4	5	3	2	65	1	1	1	1
11	S080011	PCT-A\0\0\0>175-M-1-M-5-M-2-M-5	5	4	2	64	1	1	1	1
12	S080012	PCT-A\0\0\0>175-M-1-M-5-M-2-M-6	5	3	2	67	1	1	3	1
13	S080013	PCT-A\0\0\0>175-M-1-M-5-M-5-M-1	5	3	2	66	1	1	1	1
14	S080014	PCT-A\0\0\0>175-M-1-M-5-M-5-M-2	5	3	3	68	1	1	3	1
15	S080015	PCT-A\0\0\0>175-M-1-M-5-M-5-M-3	5	3	2	68	1	3	1	1
16	S080016	PCT-A\0\0\0>175-M-1-M-5-M-5-M-4	5	3	2	68	1	1	1	1
17	S080017	PCT-A\0\0\0>175-M-1-M-5-M-5-M-5	7	2	2	70	1	1	1	1
18	S080018	PCT-A\0\0\0>175-M-1-M-5-M-5-M-6	5	3	2	67	1	1	1	1
19	S080019	PCT-A\0\0\0>175-M-3-M-1-M-2-M-1	5	2	1	65	1	1	3	1
20	S080020	PCT-A\0\0\0>175-M-3-M-1-M-2-M-2	7	2	1	68	1	1	1	1
21	S080021	PCT-A\0\0\0>175-M-3-M-1-M-2-M-3	7	3	2	67	1	1	1	1
22	S080022	PCT-A\0\0\0>175-M-3-M-1-M-2-M-4	7	2	1	67	1	1	3	1
23	S080023	PCT-A\0\0\0>175-M-3-M-1-M-2-M-5	7	2	1	68	1	1	1	1
24	S080024	PCT-A\0\0\0>175-M-3-M-1-M-2-M-6	7	2	1	64	1	3	3	1
25	S080025	PCT-A\0\0\0>175-M-3-M-1-M-3-M-1	5	3	2	65	1	3	1	1
26	S080026	PCT-A\0\0\0>175-M-3-M-1-M-3-M-2	7	3	1	69	1	1	1	1
27	S080027	PCT-A\0\0\0>175-M-3-M-1-M-3-M-3	5	2	1	68	1	1	1	1
28	S080028	PCT-A\0\0\0>175-M-3-M-1-M-3-M-4	3	2	1	65	1	3	1	1
29	S080029	PCT-A\0\0\0>175-M-3-M-1-M-3-M-5	5	3	2	68	1	1	1	1
30	S080030	PCT-A\0\0\0>175-M-3-M-1-M-3-M-6	5	1	1	68	3	1	1	1
31	S080031	PCT-A\0\0\0>175-M-3-M-1-M-6-M-1	5	2	1	68	1	1	1	1
32	S080032	PCT-A\0\0\0>175-M-3-M-1-M-6-M-2	7	3	2	72	1	1	1	1
33	S080033	PCT-A\0\0\0>175-M-3-M-1-M-6-M-3	7	2	1	72	1	1	1	1
34	S080034	PCT-A\0\0\0>175-M-3-M-1-M-6-M-4	7	1	1	70	1	1	1	1
35	S080035	PCT-A\0\0\0>175-M-3-M-1-M-6-M-5	7	2	1	74	1	1	1	1
36	S080036	PCT-A\0\0\0>175-M-3-M-1-M-6-M-6	5	2	1	70	1	1	3	1
37	S080037	PCT-A\0\0\0>175-M-3-M-3-M-2-M-1	5	3	2	75	1	3	3	1
38	S080038	PCT-A\0\0\0>175-M-3-M-3-M-2-M-2	5	3	2	78	1	3	3	1
39	S080039	PCT-A\0\0\0>175-M-3-M-3-M-2-M-3	5	3	2	78	1	3	5	1

Continued .....

Table 8. Continued .....

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl
40	S080040	PCT-A\0\0\0>175-M-3-M-3-M-2-M-4	5	3	2	76	1	3	5	1
41	S080041	PCT-A\0\0\0>175-M-3-M-3-M-2-M-5	5	3	2	77	1	3	3	1
42	S080042	PCT-A\0\0\0>175-M-3-M-3-M-2-M-6	5	3	2	77	3	3	3	1
43	S080043	PCT-A\0\0\0>175-M-3-M-3-M-3-M-1	5	4	2	68	3	3	1	1
44	S080044	PCT-A\0\0\0>175-M-3-M-3-M-3-M-2	7	3	2	78	1	3	1	1
45	S080045	PCT-A\0\0\0>175-M-3-M-3-M-3-M-3	5	4	2	70	1	1	1	1
46	S080046	PCT-A\0\0\0>175-M-3-M-3-M-3-M-4	5	3	2	70	1	1	3	1
47	S080047	PCT-A\0\0\0>175-M-3-M-3-M-3-M-5	5	3	2	73	1	1	1	1
48	S080048	PCT-A\0\0\0>175-M-3-M-3-M-3-M-6	5	2	1	70	1	1	3	1
49	S080049	PCT-A\0\0\0>175-M-4-M-5-M-5-M-1	7	3	2	76	1	3	1	1
50	S080050	PCT-A\0\0\0>175-M-4-M-5-M-5-M-2	7	3	3	77	1	3	1	1
51	S080051	PCT-A\0\0\0>175-M-4-M-5-M-5-M-3	7	3	3	76	1	5	1	1
52	S080052	PCT-A\0\0\0>175-M-4-M-5-M-5-M-4	7	5	4	77	1	3	1	1
53	S080053	PCT-A\0\0\0>175-M-4-M-5-M-5-M-5	7	4	4	83	1	3	1	1
54	S080054	PCT-A\0\0\0>175-M-4-M-5-M-5-M-6	7	3	3	80	1	3	1	1
55	S080055	PCT-A\0\0\0>175-M-6-M-1-M-5-M-1	7	3	3	86	1	3	1	1
56	S080056	PCT-A\0\0\0>175-M-6-M-1-M-5-M-2	7	4	4	84	1	5	1	1
57	S080057	PCT-A\0\0\0>175-M-6-M-1-M-5-M-3	7	4	5	90	1	3	1	1
58	S080058	PCT-A\0\0\0>175-M-6-M-1-M-5-M-4	7	4	4	81	1	3	3	1
59	S080059	PCT-A\0\0\0>175-M-6-M-1-M-5-M-5	7	4	4	86	1	3	1	1
60	S080060	PCT-A\0\0\0>175-M-6-M-1-M-5-M-6	7	3	3	85	1	5	1	1
61	S080061	PCT-A\0\0\0>189-M-2-M-2-M-5-M-1	5	2	1	84	1	3	1	1
62	S080062	PCT-A\0\0\0>189-M-2-M-2-M-5-M-2	5	3	2	84	1	5	1	1
63	S080063	PCT-A\0\0\0>189-M-2-M-2-M-5-M-3	5	2	1	85	1	1	1	1
64	S080064	PCT-A\0\0\0>189-M-2-M-2-M-5-M-4	5	2	1	84	1	1	1	1
65	S080065	PCT-A\0\0\0>189-M-2-M-2-M-5-M-5	7	1	1	84	1	1	1	1
66	S080066	PCT-A\0\0\0>189-M-2-M-2-M-5-M-6	5	1	1	84	1	3	1	1
	Check	CIRAD 409	3	1	1	69	1	1	1	1
	Check	O.SAB.6	3	4	3	88	3	1	1	1
	Check	O.SAB.10	3	3	2	91	3	1	1	1
67	S080067	PCT-A\0\0\0>189-M-4-M-4-M-3-M-1	5	3	2	80	3	3	1	1
68	S080068	PCT-A\0\0\0>189-M-4-M-4-M-3-M-2	7	3	4	81	1	3	1	1
69	S080069	PCT-A\0\0\0>189-M-4-M-4-M-3-M-3	5	3	3	80	1	3	1	1
70	S080070	PCT-A\0\0\0>189-M-4-M-4-M-3-M-4	5	3	3	80	1	1	1	1
71	S080071	PCT-A\0\0\0>189-M-4-M-4-M-3-M-5	5	3	3	81	1	1	1	1
72	S080072	PCT-A\0\0\0>189-M-4-M-4-M-3-M-6	5	3	3	82	1	3	1	1
73	S080073	PCT-A\0\0\0>189-M-4-M-4-M-4-M-1	5	3	3	81	1	3	1	1
74	S080074	PCT-A\0\0\0>189-M-4-M-4-M-4-M-2	5	3	3	83	1	3	1	1
75	S080075	PCT-A\0\0\0>189-M-4-M-4-M-4-M-3	7	2	2	83	3	3	1	1
76	S080076	PCT-A\0\0\0>189-M-4-M-4-M-4-M-4	5	2	3	81	1	3	1	1
77	S080077	PCT-A\0\0\0>189-M-4-M-4-M-4-M-5	7	3	3	84	1	3	1	1
78	S080078	PCT-A\0\0\0>189-M-4-M-4-M-4-M-6	7	3	3	83	1	3	1	1
79	S080079	PCT-A\0\0\0>189-M-4-M-4-M-5-M-1	5	3	3	83	1	3	1	1
80	S080080	PCT-A\0\0\0>189-M-4-M-4-M-5-M-2	5	3	2	84	3	3	1	1
81	S080081	PCT-A\0\0\0>189-M-4-M-4-M-5-M-3	5	4	2	83	1	3	1	1
82	S080082	PCT-A\0\0\0>189-M-4-M-4-M-5-M-4	5	3	3	84	1	3	1	1
83	S080083	PCT-A\0\0\0>189-M-4-M-4-M-5-M-5	7	3	3	86	1	3	1	1
84	S080084	PCT-A\0\0\0>189-M-4-M-4-M-5-M-6	5	2	2	80	3	3	1	1

Continued .....

Table 8. Continued .....

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl
85	S080085	PCT-A\0\0\0>189-M-4-M-5-M-2-M-1	5	2	2	80	1	3	1	1
86	S080086	PCT-A\0\0\0>189-M-4-M-5-M-2-M-2	5	3	1	82	1	1	1	1
87	S080087	PCT-A\0\0\0>189-M-4-M-5-M-2-M-3	5	3	2	79	3	1	1	1
88	S080088	PCT-A\0\0\0>189-M-4-M-5-M-2-M-4	5	3	2	80	3	1	1	1
89	S080089	PCT-A\0\0\0>189-M-4-M-5-M-2-M-5	5	2	3	82	3	1	1	1
90	S080090	PCT-A\0\0\0>189-M-4-M-5-M-2-M-6	5	3	3	81	3	1	1	1
91	S080091	PCT-A\0\0\0>189-M-4-M-5-M-4-M-1	5	3	3	80	3	3	1	1
92	S080092	PCT-A\0\0\0>189-M-4-M-5-M-4-M-2	5	2	2	82	3	3	1	1
93	S080093	PCT-A\0\0\0>189-M-4-M-5-M-4-M-3	5	2	2	81	3	3	1	1
94	S080094	PCT-A\0\0\0>189-M-4-M-5-M-4-M-4	5	3	2	81	3	3	1	1
95	S080095	PCT-A\0\0\0>189-M-4-M-5-M-4-M-5	7	3	3	83	3	3	1	1
96	S080096	PCT-A\0\0\0>189-M-4-M-5-M-4-M-6	5	2	3	81	3	1	1	1
97	S080097	PCT-A\0\0\0>189-M-4-M-6-M-3-M-1	5	2	3	79	3	1	1	1
98	S080098	PCT-A\0\0\0>189-M-4-M-6-M-3-M-2	5	2	3	83	3	3	1	1
99	S080099	PCT-A\0\0\0>189-M-4-M-6-M-3-M-3	3	2	2	79	3	3	1	1
100	S080100	PCT-A\0\0\0>189-M-4-M-6-M-3-M-4	3	2	3	79	3	1	1	1
101	S080101	PCT-A\0\0\0>189-M-4-M-6-M-3-M-5	5	5	2	82	3	1	1	1
102	S080102	PCT-A\0\0\0>189-M-4-M-6-M-3-M-6	5	2	2	82	1	3	1	1
103	S080103	PCT-A\0\0\0>278-M-1-M-1-M-5-M-1	5	2	2	83	1	3	1	1
104	S080104	PCT-A\0\0\0>278-M-1-M-1-M-5-M-2	5	2	2	81	1	3	1	1
105	S080105	PCT-A\0\0\0>278-M-1-M-1-M-5-M-3	5	2	2	78	1	3	1	1
106	S080106	PCT-A\0\0\0>278-M-1-M-1-M-5-M-4	5	2	1	79	1	3	1	1
107	S080107	PCT-A\0\0\0>278-M-1-M-1-M-5-M-5	5	3	2	82	1	3	1	1
108	S080108	PCT-A\0\0\0>278-M-1-M-1-M-5-M-6	3	2	2	81	1	1	1	1
109	S080109	PCT-A\0\0\0>278-M-1-M-2-M-1-M-1	3	2	1	79	1	3	1	1
110	S080110	PCT-A\0\0\0>278-M-1-M-2-M-1-M-2	5	3	3	80	3	3	1	1
111	S080111	PCT-A\0\0\0>278-M-1-M-2-M-1-M-3	5	2	2	78	3	3	1	1
112	S080112	PCT-A\0\0\0>278-M-1-M-2-M-1-M-4	7	2	3	78	3	1	1	1
113	S080113	PCT-A\0\0\0>278-M-1-M-2-M-1-M-5	5	3	3	79	1	3	1	1
114	S080114	PCT-A\0\0\0>278-M-1-M-2-M-1-M-6	5	2	2	77	3	3	1	1
115	S080115	PCT-A\0\0\0>278-M-1-M-2-M-2-M-1	5	2	2	79	1	1	1	1
116	S080116	PCT-A\0\0\0>278-M-1-M-2-M-2-M-2	5	2	2	79	1	1	1	1
117	S080117	PCT-A\0\0\0>278-M-1-M-2-M-2-M-3	5	1	2	79	1	3	1	1
118	S080118	PCT-A\0\0\0>278-M-1-M-2-M-2-M-4	5	1	1	77	1	3	1	1
119	S080119	PCT-A\0\0\0>278-M-1-M-2-M-2-M-5	5	2	2	81	1	3	1	1
120	S080120	PCT-A\0\0\0>278-M-1-M-2-M-2-M-6	3	2	2	78	1	3	1	1
121	S080121	PCT-A\0\0\0>394-M-1-M-1-M-3-M-1	3	1	2	83	1	3	1	1
122	S080122	PCT-A\0\0\0>394-M-1-M-1-M-3-M-2	3	1	1	83	1	3	1	1
123	S080123	PCT-A\0\0\0>394-M-1-M-1-M-3-M-3	3	1	1	83	1	3	1	1
124	S080124	PCT-A\0\0\0>394-M-1-M-1-M-3-M-4	3	1	1	79	1	3	1	1
125	S080125	PCT-A\0\0\0>394-M-1-M-1-M-3-M-5	3	1	2	83	1	3	1	1
126	S080126	PCT-A\0\0\0>394-M-1-M-1-M-3-M-6	3	1	1	81	1	3	1	1
	Check	CIRAD 409	3	1	1	67	1	1	1	1
	Check	O.SAB.6	3	4	4	86	3	1	1	1
	Check	O.SAB.10	5	2	2	90	3	1	1	1
	Check	CIRAD 409	3	1	1	68	1	1	1	1

Continued .....

Table 8. Continued .....

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl
	Check	O.SAB.6	3	4	4	86	3	1	1	1
	Check	O.SAB.10	3	3	2	90	3	1	1	1
127	S080127	PCT-A\0\0\0>394-M-1-M-1-M-5-M-1	3	2	2	80	1	1	1	1
128	S080128	PCT-A\0\0\0>394-M-1-M-1-M-6-M-1	3	1	3	83	3	1	1	1
129	S080129	PCT-A\0\0\0>394-M-1-M-6-M-5-M-1	5	3	3	78	3	1	1	1
130	S080130	PCT-A\0\0\0>394-M-1-M-6-M-5-M-2	5	3	3	74	1	1	1	1
131	S080131	PCT-A\0\0\0>394-M-1-M-6-M-5-M-3	5	3	4	80	1	1	1	1
132	S080132	PCT-A\0\0\0>394-M-1-M-6-M-5-M-4	5	2	3	75	1	1	1	1
133	S080133	PCT-A\0\0\0>394-M-1-M-6-M-5-M-5	3	2	3	75	1	1	1	1
134	S080134	PCT-A\0\0\0>394-M-1-M-6-M-5-M-6	5	3	3	78	1	1	1	1
135	S080135	PCT-A\0\0\0>394-M-2-M-2-M-5-M-1	7	2	3	81	1	1	1	1
136	S080136	PCT-A\0\0\0>394-M-2-M-2-M-5-M-2	7	3	4	83	1	1	1	1
137	S080137	PCT-A\0\0\0>394-M-2-M-2-M-5-M-3	7	4	5	85	1	1	1	1
138	S080138	PCT-A\0\0\0>394-M-2-M-2-M-5-M-4	7	2	2	81	1	1	1	1
139	S080139	PCT-A\0\0\0>394-M-2-M-2-M-5-M-5	7	3	3	83	1	1	1	1
140	S080140	PCT-A\0\0\0>394-M-2-M-2-M-5-M-6	7	3	4	86	1	1	1	1
141	S080141	PCT-A\0\0\0>394-M-2-M-3-M-2-M-1	7	2	2	84	1	1	1	1
142	S080142	PCT-A\0\0\0>394-M-2-M-3-M-2-M-2	7	2	2	83	1	1	1	1
143	S080143	PCT-A\0\0\0>394-M-2-M-3-M-2-M-3	7	2	3	86	1	1	1	1
144	S080144	PCT-A\0\0\0>394-M-2-M-3-M-2-M-4	7	3	3	83	1	1	1	1
145	S080145	PCT-A\0\0\0>394-M-2-M-3-M-2-M-5	7	2	3	82	1	1	1	1
146	S080146	PCT-A\0\0\0>394-M-2-M-3-M-2-M-6	7	3	3	84	1	1	1	1
147	S080147	PCT-A\0\0\0>394-M-2-M-3-M-5-M-1	5	3	3	84	1	1	1	1
148	S080148	PCT-A\0\0\0>394-M-2-M-3-M-5-M-2	7	2	3	83	1	1	1	1
149	S080149	PCT-A\0\0\0>394-M-2-M-3-M-5-M-3	7	2	3	87	1	1	1	1
150	S080150	PCT-A\0\0\0>394-M-2-M-3-M-5-M-4	7	3	4	84	1	1	3	1
151	S080151	PCT-A\0\0\0>394-M-2-M-3-M-5-M-5	7	3	4	83	1	1	1	1
152	S080152	PCT-A\0\0\0>394-M-2-M-3-M-5-M-6	7	2	3	86	1	1	1	1
153	S080153	PCT-A\0\0\0>1169-M-1-M-4-M-5-M-1	5	2	2	72	1	1	3	1
154	S080154	PCT-A\0\0\0>1169-M-1-M-4-M-5-M-2	5	2	2	72	1	1	1	1
155	S080155	PCT-A\0\0\0>1169-M-1-M-4-M-5-M-3	5	2	1	74	1	1	1	1
156	S080156	PCT-A\0\0\0>1169-M-1-M-4-M-5-M-4	5	1	1	73	1	1	3	1
157	S080157	PCT-A\0\0\0>1169-M-1-M-4-M-5-M-5	5	2	1	73	1	1	3	1
158	S080158	PCT-A\0\0\0>1169-M-1-M-4-M-5-M-6	5	2	2	76	1	1	3	1
159	S080159	PCT-A\0\0\0>1169-M-1-M-4-M-6-M-1	5	2	1	72	1	1	3	1
160	S080160	PCT-A\0\0\0>1169-M-1-M-4-M-6-M-2	5	2	1	72	1	1	1	1
161	S080161	PCT-A\0\0\0>1169-M-1-M-4-M-6-M-3	5	2	2	76	1	1	1	1
162	S080162	PCT-A\0\0\0>1169-M-1-M-4-M-6-M-4	5	2	1	70	1	1	1	1
163	S080163	PCT-A\0\0\0>1169-M-1-M-4-M-6-M-5	5	3	2	72	1	1	3	1
164	S080164	PCT-A\0\0\0>1169-M-1-M-4-M-6-M-6	5	2	2	76	1	1	3	1
165	S080165	PCT-A\0\0\0>1321-M-2-M-4-M-5-M-1	3	4	4	69	1	1	3	3
166	S080166	PCT-A\0\0\0>1321-M-2-M-4-M-5-M-2	3	4	3	69	1	1	3	3
167	S080167	PCT-A\0\0\0>1321-M-2-M-4-M-5-M-3	5	4	4	73	1	1	3	1
168	S080168	PCT-A\0\0\0>1321-M-2-M-4-M-5-M-4	5	3	4	70	1	1	3	1
169	S080169	PCT-A\0\0\0>1321-M-2-M-4-M-5-M-5	5	3	3	69	1	1	3	1
170	S080170	PCT-A\0\0\0>1321-M-2-M-4-M-5-M-6	5	4	4	73	1	1	1	1
171	S080171	PCT-A\0\0\0>1321-M-2-M-4-M-6-M-1	5	4	4	70	1	1	3	3

Continued .....

Table 8. Continued .....

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl
172	S080172	PCT-A\0\0\0>1321-M-2-M-4-M-6-M-2	5	3	3	69	1	1	3	1
173	S080173	PCT-A\0\0\0>1321-M-2-M-4-M-6-M-3	5	4	4	70	1	1	3	1
174	S080174	PCT-A\0\0\0>1321-M-2-M-4-M-6-M-4	5	3	4	69	1	1	3	1
175	S080175	PCT-A\0\0\0>1321-M-2-M-4-M-6-M-5	5	3	3	70	1	1	3	1
176	S080176	PCT-A\0\0\0>1321-M-2-M-4-M-6-M-6	5	3	3	70	3	1	3	1
177	S080177	PCT-A\0\0\0>1485-M-1-M-4-M-1-M-1	3	3	3	69	3	3	1	1
178	S080178	PCT-A\0\0\0>1485-M-1-M-4-M-1-M-2	3	2	2	74	3	3	1	1
179	S080179	PCT-A\0\0\0>1485-M-1-M-4-M-1-M-3	7	3	3	78	1	3	1	1
180	S080180	PCT-A\0\0\0>1485-M-1-M-4-M-1-M-4	7	2	3	77	1	3	1	1
181	S080181	PCT-A\0\0\0>1485-M-1-M-4-M-1-M-5	7	3	4	78	1	3	1	1
182	S080182	PCT-A\0\0\0>1485-M-1-M-4-M-1-M-6	7	3	4	80	1	3	1	1
183	S080183	PCT-A\0\0\0>1488-M-5-M-1-M-6-M-1	5	2	2	84	3	3	1	1
184	S080184	PCT-A\0\0\0>1488-M-5-M-1-M-6-M-2	5	2	2	84	3	3	1	1
185	S080185	PCT-A\0\0\0>1488-M-5-M-1-M-6-M-3	5	3	2	87	3	3	1	1
186	S080186	PCT-A\0\0\0>1488-M-5-M-1-M-6-M-4	5	2	2	84	3	3	1	1
	Check	CIRAD 409	5	1	1	69	1	1	1	1
	Check	O.SAB.6	5	4	4	88	3	1	1	1
	Check	O.SAB.10	5	3	2	91	3	1	1	1
187	S080187		3	1	2	83	3	3	1	1
188	S080188	PCT-A\0\0\0>1488-M-5-M-1-M-6-M-6	7	2	2	86	3	3	1	1
189	S080189	PCT-A\0\0\0>1674-M-6-M-6-M-1-M-1	5	2	2	75	3	3	1	1
190	S080190	PCT-A\0\0\0>1674-M-6-M-6-M-1-M-2	5	2	3	77	3	3	1	1
191	S080191	PCT-A\0\0\0>1674-M-6-M-6-M-1-M-3	7	2	2	79	3	3	1	1
192	S080192	PCT-A\0\0\0>1674-M-6-M-6-M-1-M-4	7	2	2	76	3	3	1	1
193	S080193	PCT-A\0\0\0>1674-M-6-M-6-M-1-M-5	5	1	2	77	3	3	1	1
194	S080194	PCT-A\0\0\0>1674-M-6-M-6-M-1-M-6	5	2	1	78	3	3	1	1
195	S080195	PCT-A\0\0\0>1674-M-6-M-6-M-2-M-1	5	1	1	71	3	3	1	1
196	S080196	PCT-A\0\0\0>1674-M-6-M-6-M-2-M-2	5	1	1	70	3	3	1	1
197	S080197	PCT-A\0\0\0>1674-M-6-M-6-M-2-M-3	5	1	1	75	3	3	1	1
198	S080198	PCT-A\0\0\0>1674-M-6-M-6-M-2-M-4	5	1	1	72	3	3	1	1
199	S080199	PCT-A\0\0\0>1674-M-6-M-6-M-2-M-5	5	1	1	72	3	3	1	1
200	S080200	PCT-A\0\0\0>1674-M-6-M-6-M-2-M-6	5	1	2	76	3	3	1	1
201	S080201	PCT-A\0\0\0>1674-M-6-M-6-M-4-M-1	5	2	3	75	3	3	1	3
202	S080202	PCT-A\0\0\0>1674-M-6-M-6-M-4-M-2	5	2	1	79	1	1	1	1
203	S080203	PCT-A\0\0\0>1674-M-6-M-6-M-4-M-3	5	1	1	75	1	3	1	1
204	S080204	PCT-A\0\0\0>1674-M-6-M-6-M-4-M-4	5	2	1	71	1	1	1	1
205	S080205	PCT-A\0\0\0>1674-M-6-M-6-M-4-M-5	5	2	1	71	3	1	1	1
206	S080206	PCT-A\0\0\0>1674-M-6-M-6-M-4-M-6	5	1	1	76	1	1	1	1
207	S080207	PCT-A\0\0\0>1955-M-3-M-4-M-6-M-1	5	1	2	78	3	1	1	1
208	S080208	PCT-A\0\0\0>1955-M-3-M-4-M-6-M-2	5	2	2	80	3	1	1	1
209	S080209	PCT-A\0\0\0>1955-M-3-M-4-M-6-M-3	7	2	2	82	3	1	1	1
210	S080210	PCT-A\0\0\0>1955-M-3-M-4-M-6-M-4	7	2	3	87	1	1	1	1
211	S080211	PCT-A\0\0\0>1955-M-3-M-4-M-6-M-5	7	2	2	84	1	1	1	1
212	S080212	PCT-A\0\0\0>1955-M-3-M-4-M-6-M-6	7	2	1	86	1	1	1	1
213	S080213	PCT-A\0\0\0>2083-M-2-M-4-M-3-M-1	5	1	1	67	1	3	1	1
214	S080214	PCT-A\0\0\0>2083-M-2-M-4-M-3-M-2	5	1	1	68	1	3	1	1
215	S080215	PCT-A\0\0\0>2083-M-2-M-4-M-3-M-3	7	1	1	73	1	3	1	1

Continued .....

Table 8. Continued .....

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl
216	S080216	PCT-A\0\0\0>2083-M-2-M-4-M-3-M-4	5	2	1	68	1	3	1	1
217	S080217	PCT-A\0\0\0>2083-M-2-M-4-M-3-M-5	5	2	1	68	1	1	1	1
218	S080218	PCT-A\0\0\0>2083-M-2-M-4-M-3-M-6	5	2	1	72	1	1	1	1
		Population PCT-4\0\0\1								
219	S080219	PCT-4\0\0\1>90-M-2-M-6-M-4-M-1	5	2	1	71	1	3	1	1
220	S080220	PCT-4\0\0\1>90-M-2-M-6-M-4-M-2	5	2	1	71	1	1	3	1
221	S080221	PCT-4\0\0\1>90-M-2-M-6-M-4-M-3	5	2	1	72	1	1	3	1
222	S080222	PCT-4\0\0\1>90-M-2-M-6-M-4-M-4	5	1	1	70	1	1	3	5
223	S080223	PCT-4\0\0\1>90-M-2-M-6-M-4-M-5	5	1	1	65	1	1	3	3
224	S080224	PCT-4\0\0\1>90-M-2-M-6-M-4-M-6	5	1	1	72	1	1	3	1
225	S080225	PCT-4\0\0\1>90-M-2-M-6-M-6-M-1	3	2	1	65	1	1	1	1
226	S080226	PCT-4\0\0\1>90-M-2-M-6-M-6-M-2	3	2	1	64	1	1	1	1
227	S080227	PCT-4\0\0\1>90-M-2-M-6-M-6-M-3	3	1	1	75	1	1	1	1
228	S080228	PCT-4\0\0\1>90-M-2-M-6-M-6-M-4	3	1	1	72	1	1	3	1
229	S080229	PCT-4\0\0\1>90-M-2-M-6-M-6-M-5	3	1	1	68	1	1	1	1
230	S080230	PCT-4\0\0\1>90-M-2-M-6-M-6-M-6	7	3	3	72	1	1	1	1
231	S080231	PCT-4\0\0\1>106-M-3-M-1-M-2-M-1	5	2	1	67	3	1	1	1
232	S080232	PCT-4\0\0\1>106-M-3-M-1-M-2-M-2	3	1	1	67	3	1	1	1
233	S080233	PCT-4\0\0\1>106-M-3-M-1-M-2-M-3	5	1	1	69	3	1	1	1
234	S080234	PCT-4\0\0\1>106-M-3-M-1-M-2-M-4	5	2	2	66	3	1	1	1
235	S080235	PCT-4\0\0\1>106-M-3-M-1-M-2-M-5	3	2	1	64	3	1	1	1
236	S080236	PCT-4\0\0\1>106-M-3-M-1-M-2-M-6	3	2	2	69	3	1	1	1
237	S080237	PCT-4\0\0\1>106-M-3-M-1-M-4-M-1	3	2	1	64	3	3	1	1
238	S080238	PCT-4\0\0\1>106-M-3-M-1-M-4-M-2	3	2	1	65	3	3	1	1
239	S080239	PCT-4\0\0\1>106-M-3-M-1-M-4-M-3	3	3	1	68	3	3	1	1
240	S080240	PCT-4\0\0\1>106-M-3-M-1-M-4-M-4	3	2	1	69	3	3	1	3
241	S080241	PCT-4\0\0\1>106-M-3-M-1-M-4-M-5	5	2	2	67	3	1	1	1
242	S080242	PCT-4\0\0\1>106-M-3-M-1-M-4-M-6	5	2	2	69	3	3	1	1
243	S080243	PCT-4\0\0\1>2435-M-2-M-6-M-3-M-1	3	2	1	68	3	1	1	1
244	S080244	PCT-4\0\0\1>2435-M-2-M-6-M-3-M-2	3	1	1	69	3	1	1	1
245	S080245	PCT-4\0\0\1>2435-M-2-M-6-M-3-M-3	7	2	2	72	3	1	1	1
246	S080246	PCT-4\0\0\1>2435-M-2-M-6-M-3-M-4	7	2	1	71	3	1	3	1
247	S080247	PCT-4\0\0\1>2435-M-2-M-6-M-3-M-5	5	2	1	69	3	1	3	1
	Check	CIRAD 409	5	1	1	71	1	1	1	1
	Check	O.SAB.6	3	4	3	88	3	1	3	1
	Check	O.SAB.10	5	2	2	92	3	1	1	1
	Check	CIRAD 409	5	1	1	69	1	1	1	1
	Check	O.SAB.6	3	4	3	89	3	1	1	1
	Check	O.SAB.10	5	2	2	92	3	1	1	1
248	S080248	PCT-4\0\0\1>2485-M-1-M-1-M-4-M-1	5	2	1	76	1	3	3	1
249	S080249	PCT-4\0\0\1>2485-M-1-M-1-M-4-M-2	5	1	1	76	1	1	3	1
250	S080250	PCT-4\0\0\1>2485-M-1-M-1-M-4-M-3	7	2	1	83	1	1	1	1
251	S080251	PCT-4\0\0\1>2485-M-1-M-1-M-4-M-4	7	2	1	78	1	1	1	1
252	S080252	PCT-4\0\0\1>2485-M-1-M-1-M-4-M-5	5	2	1	77	1	3	1	1
253	S080253	PCT-4\0\0\1>2485-M-1-M-1-M-4-M-6	5	2	1	77	1	3	1	1
254	S080254	PCT-4\0\0\1>2485-M-2-M-2-M-5-M-1	5	2	1	78	1	3	1	1
255	S080255	PCT-4\0\0\1>2485-M-2-M-2-M-5-M-2	3	2	2	78	1	1	1	1

Continued .....

Table 8. Continued .....

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl
256	S080256	PCT-4\0\0\1>2485-M-2-M-2-M-5-M-3	5	1	2	81	1	1	1	1
257	S080257	PCT-4\0\0\1>2485-M-2-M-2-M-5-M-4	5	1	2	72	1	1	1	1
258	S080258	PCT-4\0\0\1>2485-M-2-M-2-M-5-M-5	3	2	2	73	1	1	1	1
259	S080259	PCT-4\0\0\1>2485-M-2-M-2-M-5-M-6	7	1	2	75	1	1	1	1
260	S080260	PCT-4\0\0\1>2485-M-3-M-3-M-4-M-1	3	1	1	72	1	1	1	1
261	S080261	PCT-4\0\0\1>2485-M-3-M-3-M-4-M-2	3	1	1	73	1	1	1	1
262	S080262	PCT-4\0\0\1>2485-M-3-M-3-M-4-M-3	5	2	1	75	1	1	1	1
263	S080263	PCT-4\0\0\1>2485-M-3-M-3-M-4-M-4	5	2	1	73	1	1	1	1
264	S080264	PCT-4\0\0\1>2485-M-3-M-3-M-4-M-5	5	2	1	73	1	1	1	1
265	S080265	PCT-4\0\0\1>2485-M-3-M-3-M-4-M-6	5	1	1	75	1	1	1	1
		Population PCT-4\0\0\1>S2								
266	S080266	PCT-4\0\0\1>S2-41-1-M-4-M-6-M-1	1	1	1	68	3	1	1	1
267	S080267	PCT-4\0\0\1>S2-41-1-M-4-M-6-M-2	1	1	1	68	3	1	1	1
268	S080268	PCT-4\0\0\1>S2-41-1-M-4-M-6-M-3	1	1	1	72	3	1	1	1
269	S080269	PCT-4\0\0\1>S2-41-1-M-4-M-6-M-4	1	1	1	69	3	1	1	1
270	S080270	PCT-4\0\0\1>S2-41-1-M-4-M-6-M-5	1	1	1	69	3	1	1	1
271	S080271	PCT-4\0\0\1>S2-41-1-M-4-M-6-M-6	1	1	1	73	1	1	1	1
272	S080272	PCT-4\0\0\1>S2-41-1-M-6-M-2-M-1	1	1	1	72	1	1	1	1
273	S080273	PCT-4\0\0\1>S2-41-1-M-6-M-2-M-2	1	1	1	73	1	1	1	1
274	S080274	PCT-4\0\0\1>S2-41-1-M-6-M-2-M-3	3	1	1	75	1	1	1	1
275	S080275	PCT-4\0\0\1>S2-41-1-M-6-M-2-M-4	1	1	1	74	1	1	1	1
276	S080276	PCT-4\0\0\1>S2-41-1-M-6-M-2-M-5	3	1	1	75	1	1	1	1
277	S080277	PCT-4\0\0\1>S2-41-1-M-6-M-2-M-6	3	1	1	77	1	1	1	1
278	S080278	PCT-4\0\0\1>S2-41-1-M-6-M-5-M-1	1	1	1	73	1	1	1	1
279	S080279	PCT-4\0\0\1>S2-41-1-M-6-M-5-M-2	1	1	1	74	1	1	1	1
280	S080280	PCT-4\0\0\1>S2-41-1-M-6-M-5-M-3	3	1	1	77	1	1	1	1
281	S080281	PCT-4\0\0\1>S2-41-1-M-6-M-5-M-4	3	2	1	75	1	1	1	1
282	S080282	PCT-4\0\0\1>S2-41-1-M-6-M-5-M-5	3	1	1	75	1	1	1	1
283	S080283	PCT-4\0\0\1>S2-41-1-M-6-M-5-M-6	3	2	2	76	1	1	1	1
284	S080284	PCT-4\0\0\1>S2-1584-4-M-4-M-1-M-1	7	4	4	85	1	1	1	1
285	S080285	PCT-4\0\0\1>S2-1584-4-M-4-M-1-M-2	7	4	4	86	1	1	1	1
286	S080286	PCT-4\0\0\1>S2-1584-4-M-4-M-1-M-3	9	5	5	86	1	1	1	1
287	S080287	PCT-4\0\0\1>S2-1584-4-M-4-M-1-M-4	7	5	5	86	1	1	1	1
288	S080288	PCT-4\0\0\1>S2-1584-4-M-4-M-1-M-5	7	5	5	84	1	1	1	1
289	S080289	PCT-4\0\0\1>S2-1584-4-M-4-M-1-M-6	7	5	5	86	1	1	1	1
290	S080290	PCT-4\0\0\1>S2-1584-4-M-5-M-2-M-1	5	3	3	84	1	1	1	3
291	S080291	PCT-4\0\0\1>S2-1584-4-M-5-M-2-M-2	5	1	2	84	1	1	1	3
292	S080292	PCT-4\0\0\1>S2-1584-4-M-5-M-2-M-3	5	1	3	86	1	3	1	3
293	S080293	PCT-4\0\0\1>S2-1584-4-M-5-M-2-M-4	5	1	2	85	1	3	1	3
294	S080294	PCT-4\0\0\1>S2-1584-4-M-5-M-2-M-5	5	1	3	89	1	3	1	3
295	S080295	PCT-4\0\0\1>S2-1584-4-M-5-M-2-M-6	7	1	3	86	1	3	1	3
296	S080297	PCT-4\0\0\1>S2-1584-4-M-5-M-4-M-1	5	1	3	83	1	3	1	3
297	S080298	PCT-4\0\0\1>S2-1584-4-M-5-M-4-M-2	7	3	2	84	1	3	1	3
298	S080299	PCT-4\0\0\1>S2-1584-4-M-5-M-4-M-3	5	3	2	81	1	3	1	3
299	S080300	PCT-4\0\0\1>S2-1584-4-M-5-M-4-M-4	5	2	3	79	1	3	1	5
300	S080301	PCT-4\0\0\1>S2-1584-4-M-5-M-4-M-5	5	3	2	83	1	3	1	3
301	S080302	PCT-4\0\0\1>S2-1584-4-M-5-M-4-M-6	5	2	2	83	1	3	1	3

Continued .....

Table 8. Continued .....

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl
Population PCT-4\0\0\1>S3										
302	S080303	PCT-4\0\0\1>S3-41-2-2-4-M-5-M-1	5	1	1	73	1	1	1	1
303	S080304	PCT-4\0\0\1>S3-41-2-2-4-M-5-M-2	7	2	2	80	1	1	1	1
304	S080305	PCT-4\0\0\1>S3-41-2-2-4-M-5-M-3	5	1	1	75	1	1	1	1
305	S080306	PCT-4\0\0\1>S3-41-2-2-4-M-5-M-4	7	1	1	74	1	1	1	1
306	S080307	PCT-4\0\0\1>S3-41-2-2-4-M-5-M-5	5	2	1	78	1	1	1	1
307	S080308	PCT-4\0\0\1>S3-41-2-2-4-M-5-M-6	5	1	1	76	1	1	1	1

Vg = vigor; Bl 1 = leaf blast; Bl 2 = leaf blast; LsC = leaf scald; BS = brown spot; NBl = neck blast;

Gd = grain discoloration. (Scale 1-9; 1 means resistant and 9 susceptible). Fl = flowering (Days).

Table 8.1. Selected S9 lines (151). "La Libertad Experimental Station", Villavicencio-Meta, Colombia

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl	Plant Sel.	Upland Workshop. Lines selected by: Arg.	Bol.	Bol. 2002	Bra.	Col.	Cuba	Ven.
		Poblaciones PCT-A\0\0\0																
1	S080001	PCT-A\0\0\0>175-M-1-M-4-M-5-M-1	5	3	2	70	1	1	3	1	Mass				X	X		X
2	S080002	PCT-A\0\0\0>175-M-1-M-4-M-5-M-2	5	5	4	63	1	3	1	1	Mass				X	X		
3	S080003	PCT-A\0\0\0>175-M-1-M-4-M-5-M-3	5	4	3	70	1	1	3	1	Mass	X	X		X	X	X	
4	S080004	PCT-A\0\0\0>175-M-1-M-4-M-5-M-4	5	4	3	69	1	1	3	1	Mass			Y		X		
5	S080005	PCT-A\0\0\0>175-M-1-M-4-M-5-M-5	7	3	2	70	1	1	3	1	Mass	X	X				X	
6	S080011	PCT-A\0\0\0>175-M-1-M-5-M-2-M-5	5	4	2	64	1	1	1	1	Mass					X		
7	S080012	PCT-A\0\0\0>175-M-1-M-5-M-2-M-6	5	3	2	67	1	1	3	1	Mass	X	X			X	X	
8	S080013	PCT-A\0\0\0>175-M-1-M-5-M-5-M-1	5	3	2	66	1	1	1	1	Mass					X		
9	S080014	PCT-A\0\0\0>175-M-1-M-5-M-5-M-2	5	3	3	68	1	1	3	1	Mass	X	X			X	X	
10	S080015	PCT-A\0\0\0>175-M-1-M-5-M-5-M-3	5	3	2	68	1	3	1	1	Mass	X	X			X	X	X
11	S080016	PCT-A\0\0\0>175-M-1-M-5-M-5-M-4	5	3	2	68	1	1	1	1	Mass	X	X			X	X	
12	S080020	PCT-A\0\0\0>175-M-3-M-1-M-2-M-2	7	2	1	68	1	1	1	1	Mass			Y	X			
13	S080026	PCT-A\0\0\0>175-M-3-M-1-M-3-M-2	7	3	1	69	1	1	1	1	Mass				X			
14	S080028	PCT-A\0\0\0>175-M-3-M-1-M-3-M-4	3	2	1	65	1	3	1	1	Mass	X	X	Y		X	X	X
15	S080029	PCT-A\0\0\0>175-M-3-M-1-M-3-M-5	5	3	2	68	1	1	1	1	Mass					X		
16	S080037	PCT-A\0\0\0>175-M-3-M-3-M-2-M-1	5	3	2	75	1	3	3	1	Mass				Y			
17	S080044	PCT-A\0\0\0>175-M-3-M-3-M-3-M-2	7	3	2	78	1	3	1	1	Mass				X			
18	S080045	PCT-A\0\0\0>175-M-3-M-3-M-3-M-3	5	4	2	70	1	1	1	1	Mass				X			
19	S080046	PCT-A\0\0\0>175-M-3-M-3-M-3-M-4	5	3	2	70	1	1	3	1	Mass					X		
20	S080048	PCT-A\0\0\0>175-M-3-M-3-M-3-M-6	5	2	1	70	1	1	3	1	Mass				X			
21	S080050	PCT-A\0\0\0>175-M-4-M-5-M-5-M-2	7	3	3	77	1	3	1	1	Mass	X	X	Y			X	
22	S080061	PCT-A\0\0\0>189-M-2-M-2-M-5-M-1	5	2	1	84	1	3	1	1	Mass	X	X		X		X	
23	S080062	PCT-A\0\0\0>189-M-2-M-2-M-5-M-2	5	3	2	84	1	5	1	1	Mass				X			
24	S080064	PCT-A\0\0\0>189-M-2-M-2-M-5-M-4	5	2	1	84	1	1	1	1	Mass	X	X		X		X	
25	S080065	PCT-A\0\0\0>189-M-2-M-2-M-5-M-5	7	1	1	84	1	1	1	1	Mass			Y				
26	S080067	PCT-A\0\0\0>189-M-4-M-4-M-3-M-1	5	3	2	80	3	3	1	1	Mass				X			
27	S080069	PCT-A\0\0\0>189-M-4-M-4-M-3-M-3	5	3	3	80	1	3	1	1	Mass				X			
28	S080070	PCT-A\0\0\0>189-M-4-M-4-M-3-M-4	5	3	3	80	1	1	1	1	Mass				X			
29	S080073	PCT-A\0\0\0>189-M-4-M-4-M-4-M-1	5	3	3	81	1	3	1	1	Mass				X	X		
30	S080076	PCT-A\0\0\0>189-M-4-M-4-M-4-M-4	5	2	3	81	1	3	1	1	Mass	X	X		X		X	
31	S080079	PCT-A\0\0\0>189-M-4-M-4-M-5-M-1	5	3	3	83	1	3	1	1	Mass				X			
32	S080082	PCT-A\0\0\0>189-M-4-M-4-M-5-M-4	5	3	3	84	1	3	1	1	Mass				X			
33	S080083	PCT-A\0\0\0>189-M-4-M-4-M-5-M-5	7	3	3	86	1	3	1	1	Mass	X	X		X		X	
34	S080085	PCT-A\0\0\0>189-M-4-M-5-M-2-M-1	5	2	2	80	1	3	1	1	Mass				X			
35	S080086	PCT-A\0\0\0>189-M-4-M-5-M-2-M-2	5	3	1	82	1	1	1	1	Mass			Y				
36	S080090	PCT-A\0\0\0>189-M-4-M-5-M-2-M-6	5	3	3	81	3	1	1	1	Mass				X			
37	S080091	PCT-A\0\0\0>189-M-4-M-5-M-4-M-1	5	3	3	80	3	3	1	1	Mass				X	X		
38	S080092	PCT-A\0\0\0>189-M-4-M-5-M-4-M-2	5	2	2	82	3	3	1	1	Mass					X		
39	S080093	PCT-A\0\0\0>189-M-4-M-5-M-4-M-3	5	2	2	81	3	3	1	1	Mass				X			
40	S080094	PCT-A\0\0\0>189-M-4-M-5-M-4-M-4	5	3	2	81	3	3	1	1	Mass							X
41	S080095	PCT-A\0\0\0>189-M-4-M-5-M-4-M-5	7	3	3	83	3	3	1	1	Mass				X			
42	S080097	PCT-A\0\0\0>189-M-4-M-6-M-3-M-1	5	2	3	79	3	1	1	1	Mass				X			
43	S080098	PCT-A\0\0\0>189-M-4-M-6-M-3-M-2	5	2	3	83	3	3	1	1	Mass	X	X		X		X	
44	S080099	PCT-A\0\0\0>189-M-4-M-6-M-3-M-3	3	2	2	79	3	3	1	1	Mass				X	X		
45	S080105	PCT-A\0\0\0>278-M-1-M-1-M-5-M-3	5	2	2	78	1	3	1	1	Mass				X	X		

Continued .....

Table 8.1, Continued .....

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl	Plant Sel.	Upland Workshop. Lines selected by: Arg.	Bol.	Bol. 2002	Bra.	Col.	Cuba	Ven.
		Poblaciones PCT-A\0\0\0																
46	S080106	PCT-A\0\0\0>278-M-1-M-1-M-5-M-4	5	2	1	79	1	3	1	1	Mass				X			
47	S080108	PCT-A\0\0\0>278-M-1-M-1-M-5-M-6	3	2	2	81	1	1	1	1	Mass	X	X		X		X	
48	S080109	PCT-A\0\0\0>278-M-1-M-2-M-1-M-1	3	2	1	79	1	3	1	1	Mass			Y	X			X
49	S080110	PCT-A\0\0\0>278-M-1-M-2-M-1-M-2	5	3	3	80	3	3	1	1	Mass	X	X		X		X	
50	S080115	PCT-A\0\0\0>278-M-1-M-2-M-2-M-1	5	2	2	79	1	1	1	1	Mass	X	X	Y	X	X	X	
51	S080116	PCT-A\0\0\0>278-M-1-M-2-M-2-M-2	5	2	2	79	1	1	1	1	Mass				X			
52	S080118	PCT-A\0\0\0>278-M-1-M-2-M-2-M-4	5	1	1	77	1	3	1	1	Mass	X	X		X	X	X	
53	S080119	PCT-A\0\0\0>278-M-1-M-2-M-2-M-5	5	2	2	81	1	3	1	1	Mass	X	X				X	X
54	S080120	PCT-A\0\0\0>278-M-1-M-2-M-2-M-6	3	2	2	78	1	3	1	1	Mass			Y	X			X
55	S080122	PCT-A\0\0\0>394-M-1-M-1-M-3-M-2	3	1	1	83	1	3	1	1	Mass				X			
56	S080124	PCT-A\0\0\0>394-M-1-M-1-M-3-M-4	3	1	1	79	1	3	1	1	Mass	X	X					
57	S080125	PCT-A\0\0\0>394-M-1-M-1-M-3-M-5	3	1	2	83	1	3	1	1	Mass				X			
58	S080126	PCT-A\0\0\0>394-M-1-M-1-M-3-M-6	3	1	1	81	1	3	1	1	Mass	X	X		X	X	X	
59	S080127	PCT-A\0\0\0>394-M-1-M-1-M-5-M-1	3	2	2	80	1	1	1	1	Mass	X	X	Y	X		X	X
60	S080128	PCT-A\0\0\0>394-M-1-M-1-M-6-M-1	3	1	3	83	3	1	1	1	Mass				X			
61	S080131	PCT-A\0\0\0>394-M-1-M-6-M-5-M-3	5	3	4	80	1	1	1	1	Mass	X	X					
62	S080133	PCT-A\0\0\0>394-M-1-M-6-M-5-M-5	3	2	3	75	1	1	1	1	Mass				X	X		
63	S080134	PCT-A\0\0\0>394-M-1-M-6-M-5-M-6	5	3	3	78	1	1	1	1	Mass			Y		X	X	
64	S080135	PCT-A\0\0\0>394-M-2-M-2-M-5-M-1	7	2	3	81	1	1	1	1	Mass	X	X			X		
65	S080136	PCT-A\0\0\0>394-M-2-M-2-M-5-M-2	7	3	4	83	1	1	1	1	Mass				X	X		
66	S080138	PCT-A\0\0\0>394-M-2-M-2-M-5-M-4	7	2	2	81	1	1	1	1	Mass	X	X				X	
67	S080139	PCT-A\0\0\0>394-M-2-M-2-M-5-M-5	7	3	3	83	1	1	1	1	Mass	X	X				X	
68	S080143	PCT-A\0\0\0>394-M-2-M-3-M-2-M-3	7	2	3	86	1	1	1	1	Mass			Y				
69	S080144	PCT-A\0\0\0>394-M-2-M-3-M-2-M-4	7	3	3	83	1	1	1	1	Mass							X
70	S080145	PCT-A\0\0\0>394-M-2-M-3-M-2-M-5	7	2	3	82	1	1	1	1	Mass	X	X				X	
71	S080146	PCT-A\0\0\0>394-M-2-M-3-M-2-M-6	7	3	3	84	1	1	1	1	Mass	X	X	Y	X	X	X	X
72	S080147	PCT-A\0\0\0>394-M-2-M-3-M-5-M-1	5	3	3	84	1	1	1	1	Mass					X		
73	S080149	PCT-A\0\0\0>394-M-2-M-3-M-5-M-3	7	2	3	87	1	1	1	1	Mass					X		
74	S080150	PCT-A\0\0\0>394-M-2-M-3-M-5-M-4	7	3	4	84	1	1	3	1	Mass	X	X			X*		
75	S080151	PCT-A\0\0\0>394-M-2-M-3-M-5-M-5	7	3	4	83	1	1	1	1	Mass							X
76	S080152	PCT-A\0\0\0>394-M-2-M-3-M-5-M-6	7	2	3	86	1	1	1	1	Mass			Y				
77	S080153	PCT-A\0\0\0>1169-M-1-M-4-M-5-M-1	5	2	2	72	1	1	3	1	Mass	X	X				X	
78	S080158	PCT-A\0\0\0>1169-M-1-M-4-M-5-M-6	5	2	2	76	1	1	3	1	Mass						X	X
79	S080161	PCT-A\0\0\0>1169-M-1-M-4-M-6-M-3	5	2	2	76	1	1	1	1	Mass			Y				
80	S080162	PCT-A\0\0\0>1169-M-1-M-4-M-6-M-4	5	2	1	70	1	1	1	1	Mass			Y				
81	S080165	PCT-A\0\0\0>1321-M-2-M-4-M-5-M-1	3	4	4	69	1	1	3	3	Mass							X
82	S080176	PCT-A\0\0\0>1321-M-2-M-4-M-6-M-6	5	3	3	70	3	1	3	1	Mass			Y				
83	S080177	PCT-A\0\0\0>1485-M-1-M-4-M-1-M-1	3	3	3	69	3	3	1	1	Mass							X
84	S080180	PCT-A\0\0\0>1485-M-1-M-4-M-1-M-4	7	2	3	77	1	3	1	1	Mass			Y				
85	S080181	PCT-A\0\0\0>1485-M-1-M-4-M-1-M-5	7	3	4	78	1	3	1	1	Mass							X
86	S080183	PCT-A\0\0\0>1488-M-5-M-1-M-6-M-1	5	2	2	84	3	3	1	1	Mass				X			
87	S080188	PCT-A\0\0\0>1488-M-5-M-1-M-6-M-6	7	2	2	86	3	3	1	1	Mass			Y	X	X		
88	S080189	PCT-A\0\0\0>1674-M-6-M-6-M-1-M-1	5	2	2	75	3	3	1	1	Mass							X
89	S080190	PCT-A\0\0\0>1674-M-6-M-6-M-1-M-2	5	2	3	77	3	3	1	1	Mass				X			
90	S080192	PCT-A\0\0\0>1674-M-6-M-6-M-1-M-4	7	2	2	76	3	3	1	1	Mass							X
91	S080194	PCT-A\0\0\0>1674-M-6-M-6-M-1-M-6	5	2	1	78	3	3	1	1	Mass			Y				

Continued .....

Table 8.1. Continued .....

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl	Plant Sel.	Upland Workshop. Lines selected by: Arg.	Bol.	Bol. 2002	Bra.	Col.	Cuba	Ven.
		Poblaciones PCT-A\0\0\0																
92	S080196	PCT-A\0\0\0>1674-M-6-M-6-M-2-M-2	5	1	1	70	3	3	1	1	Mass					X		
93	S080197	PCT-A\0\0\0>1674-M-6-M-6-M-2-M-3	5	1	1	75	3	3	1	1	Mass							X
94	S080206	PCT-A\0\0\0>1674-M-6-M-6-M-4-M-6	5	1	1	76	1	1	1	1	Mass					X		
95	S080208	PCT-A\0\0\0>1955-M-3-M-4-M-6-M-2	5	2	2	80	3	1	1	1	Mass			Y	X			
96	S080209	PCT-A\0\0\0>1955-M-3-M-4-M-6-M-3	7	2	2	82	3	1	1	1	Mass							X
97	S080210	PCT-A\0\0\0>1955-M-3-M-4-M-6-M-4	7	2	3	87	1	1	1	1	Mass				X			
98	S080212	PCT-A\0\0\0>1955-M-3-M-4-M-6-M-6	7	2	1	86	1	1	1	1	Mass	X	X		X			
99	S080214	PCT-A\0\0\0>2083-M-2-M-4-M-3-M-2	5	1	1	68	1	3	1	1	Mass			Y				
100	S080215	PCT-A\0\0\0>2083-M-2-M-4-M-3-M-3	7	1	1	73	1	3	1	1	Mass							X
		Population PCT-4\0\0\1																
101	S080220	PCT-4\0\0\1>90-M-2-M-6-M-4-M-2	5	2	1	71	1	1	3	1	Mass			Y				
102	S080224	PCT-4\0\0\1>90-M-2-M-6-M-4-M-6	5	1	1	72	1	1	3	1	Mass							X
103	S080225	PCT-4\0\0\1>90-M-2-M-6-M-6-M-1	3	2	1	65	1	1	1	1	Mass			Y				
104	S080227	PCT-4\0\0\1>90-M-2-M-6-M-6-M-3	3	1	1	75	1	1	1	1	Mass			Y	X			
105	S080238	PCT-4\0\0\1>106-M-3-M-1-M-4-M-2	3	2	1	65	3	3	1	1	Mass					X		
106	S080239	PCT-4\0\0\1>106-M-3-M-1-M-4-M-3	3	3	1	68	3	3	1	1	Mass					X		X
107	S080242	PCT-4\0\0\1>106-M-3-M-1-M-4-M-6	5	2	2	69	3	3	1	1	Mass			Y				
108	S080245	PCT-4\0\0\1>2435-M-2-M-6-M-3-M-3	7	2	2	72	3	1	1	1	Mass							X
109	S080248	PCT-4\0\0\1>2485-M-1-M-1-M-4-M-1	5	2	1	76	1	3	3	1	Mass			Y				
110	S080251	PCT-4\0\0\1>2485-M-1-M-1-M-4-M-4	7	2	1	78	1	1	1	1	Mass					X		
111	S080252	PCT-4\0\0\1>2485-M-1-M-1-M-4-M-5	5	2	1	77	1	3	1	1	Mass					X		
112	S080253	PCT-4\0\0\1>2485-M-1-M-1-M-4-M-6	5	2	1	77	1	3	1	1	Mass			Y		X		
113	S080255	PCT-4\0\0\1>2485-M-2-M-2-M-5-M-2	3	2	2	78	1	1	1	1	Mass				X			
114	S080256	PCT-4\0\0\1>2485-M-2-M-2-M-5-M-3	5	1	2	81	1	1	1	1	Mass	X	X			X	X	
115	S080257	PCT-4\0\0\1>2485-M-2-M-2-M-5-M-4	5	1	2	72	1	1	1	1	Mass	X	X	Y		X	X	
116	S080258	PCT-4\0\0\1>2485-M-2-M-2-M-5-M-5	3	2	2	73	1	1	1	1	Mass	X	X		X	X	X	
117	S080259	PCT-4\0\0\1>2485-M-2-M-2-M-5-M-6	7	1	2	75	1	1	1	1	Mass							X
118	S080260	PCT-4\0\0\1>2485-M-3-M-3-M-4-M-1	3	1	1	72	1	1	1	1	Mass					X		
119	S080261	PCT-4\0\0\1>2485-M-3-M-3-M-4-M-2	3	1	1	73	1	1	1	1	Mass					X		
120	S080262	PCT-4\0\0\1>2485-M-3-M-3-M-4-M-3	5	2	1	75	1	1	1	1	Mass					X		
121	S080263	PCT-4\0\0\1>2485-M-3-M-3-M-4-M-4	5	2	1	73	1	1	1	1	Mass					X		
122	S080264	PCT-4\0\0\1>2485-M-3-M-3-M-4-M-5	5	2	1	73	1	1	1	1	Mass					X		
123	S080265	PCT-4\0\0\1>2485-M-3-M-3-M-4-M-6	5	1	1	75	1	1	1	1	Mass					X		
		Population PCT-4\0\0\1>S2																
124	S080266	PCT-4\0\0\1>S2-41-1-M-4-M-6-M-1	1	1	1	68	3	1	1	1	Mass				X	X		
125	S080267	PCT-4\0\0\1>S2-41-1-M-4-M-6-M-2	1	1	1	68	3	1	1	1	Mass			Y	X			
126	S080268	PCT-4\0\0\1>S2-41-1-M-4-M-6-M-3	1	1	1	72	3	1	1	1	Mass				X			X
127	S080269	PCT-4\0\0\1>S2-41-1-M-4-M-6-M-4	1	1	1	69	3	1	1	1	Mass	X	X				X	
128	S080271	PCT-4\0\0\1>S2-41-1-M-4-M-6-M-6	1	1	1	73	1	1	1	1	Mass	X	X		X		X	
129	S080273	PCT-4\0\0\1>S2-41-1-M-6-M-2-M-2	1	1	1	73	1	1	1	1	Mass				X			
130	S080275	PCT-4\0\0\1>S2-41-1-M-6-M-2-M-4	1	1	1	74	1	1	1	1	Mass				X			
131	S080277	PCT-4\0\0\1>S2-41-1-M-6-M-2-M-6	3	1	1	77	1	1	1	1	Mass			Y				
132	S080282	PCT-4\0\0\1>S2-41-1-M-6-M-5-M-5	3	1	1	75	1	1	1	1	Mass			Y				
133	S080283	PCT-4\0\0\1>S2-41-1-M-6-M-5-M-6	3	2	2	76	1	1	1	1	Mass				X		X	X

Continued .....

Table 8.1. Continued .....

Nbr.	Field Nbr. 2000A	Pedigree	Vg	Bl 1	Bl 2	Fl	LSc	Bs	Gd	NBl	Plant Sel.	Upland Workshop. Lines selected by: Arg.	Bol.	Bol. 2002	Bra.	Col.	Cuba	Ven.
Poblaciones PCT-A\0\0\0																		
134	S080284	PCT-4\0\0\1>S2-1584-4-M-4-M-1-M-1	7	4	4	85	1	1	1	1	Mass	X	X					
135	S080285	PCT-4\0\0\1>S2-1584-4-M-4-M-1-M-2	7	4	4	86	1	1	1	1	Mass	X	X				X	
136	S080286	PCT-4\0\0\1>S2-1584-4-M-4-M-1-M-3	9	5	5	86	1	1	1	1	Mass	X	X					
137	S080287	PCT-4\0\0\1>S2-1584-4-M-4-M-1-M-4	7	5	5	86	1	1	1	1	Mass				X			
138	S080288	PCT-4\0\0\1>S2-1584-4-M-4-M-1-M-5	7	5	5	84	1	1	1	1	Mass			Y	X			
139	S080292	PCT-4\0\0\1>S2-1584-4-M-5-M-2-M-3	5	1	3	86	1	3	1	3	Mass			Y				
140	S080294	PCT-4\0\0\1>S2-1584-4-M-5-M-2-M-5	5	1	3	89	1	3	1	3	Mass				X			
141	S080295	PCT-4\0\0\1>S2-1584-4-M-5-M-2-M-6	7	1	3	86	1	3	1	3	Mass				X			
142	S080297	PCT-4\0\0\1>S2-1584-4-M-5-M-4-M-1	5	1	3	83	1	3	1	3	Mass			Y				X
143	S080299	PCT-4\0\0\1>S2-1584-4-M-5-M-4-M-3	5	3	2	81	1	3	1	3	Mass					X		
144	S080300	PCT-4\0\0\1>S2-1584-4-M-5-M-4-M-4	5	2	3	79	1	3	1	5	Mass	X	X		X	X	X	X
145	S080302	PCT-4\0\0\1>S2-1584-4-M-5-M-4-M-6	5	2	2	83	1	3	1	3	Mass					X		
Population PCT-4\0\0\1>S3																		
146	S080303	PCT-4\0\0\1>S3-41-2-2-4-M-5-M-1	5	1	1	73	1	1	1	1	Mass	X	X	Y		X	X	X
147	S080304	PCT-4\0\0\1>S3-41-2-2-4-M-5-M-2	7	2	2	80	1	1	1	1	Mass					X		
148	S080305	PCT-4\0\0\1>S3-41-2-2-4-M-5-M-3	5	1	1	75	1	1	1	1	Mass					X	X	X
149	S080306	PCT-4\0\0\1>S3-41-2-2-4-M-5-M-4	7	1	1	74	1	1	1	1	Mass	X	X			X		
150	S080307	PCT-4\0\0\1>S3-41-2-2-4-M-5-M-5	5	2	1	78	1	1	1	1	Mass					X		
151	S080308	PCT-4\0\0\1>S3-41-2-2-4-M-5-M-6	5	1	1	76	1	1	1	1	Mass					X	X	

Vg = vigor; Bl 1 = leaf blast; Bl 2 = leaf blast; Fl = flowering; LsC = leaf scald; BS = brown spot; NBl = neck blast;

Gd = grain discoloration. (Scale 1-9: 1 means resistant and 9 susceptible); Fl = flowering (Days).

Arg.=Argentina; Bol.=Bolivia; Bol 2002=Second Workshop in Bolivia; Bra.=Brazil;Col.=Colombia; Ven.=Venezuela

Table 9. Yiel Trial of Advanced Lines. "La Libertad Experimental Station", Villavicencio-Meta, Colombia. Fenotipic and Diseases characteristics.

Line	Pedigree	Vigor (1-9)			Height (cm)			Flowering (Days)			Tillers (10 Plants)			Panicule (10 Plants)			BI (1-9)			NBI (1-9)			LSc (1-9)			Bs (1-9)			GD (1-9)		
2000A		I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
14	PCT-4\SA\1\1>1044-M-3-M-2	3	3	5	104	98	86	79	69	77	74	91	73	72	88	72	2	1	2	1	3	1	1	1	1	1	1	1	1	1	1
3	PCT-4\SA\1\1>540-M-3-M-4	5	3	3	94	92	88	70	71	94	84	74	62	83	70	61	1	1	2	1	1	1	1	3	5	3	3	1	3	5	1
18	PCT-4\SA\1\1>1479-M-1-M-2	3	5	5	84	90	87	70	69	69	69	61	83	66	58	74	1	1	2	1	3	3	1	1	1	1	1	1	3	1	1
25	CIRAD 409	3	3	5	90	100	93	70	69	71	108	63	84	105	63	75	1	1	1	1	1	3	1	3	1	1	1	1	1	1	1
19	PCT-4\SA\1\1>1479-M-1-M-3	3	3	3	78	91	103	73	72	72	88	106	73	79	106	72	1	11	1	3	5	1	1	1	3	1	1	3	3	1	1
11	PCT-4\SA\1\1>982-M-3-M-4	3	3	3	87	106	96	69	74	73	56	113	84	53	99	81	2	1	1	3	1	1	3	3	1	1	1	1	1	3	1
10	PCT-4\SA\1\1>975-M-3-M-4	3	3	5	93	102	86	73	68	75	80	84	67	67	84	62	1	2	1	1	1	1	3	3	1	1	1	1	3	3	3
26	O. SABANA 6	3	3	3	92	99	90	90	69	72	71	93	76	69	89	72	4	2	1	1	1	1	5	3	3	1	1	1	1	3	1
2	PCT-4\SA\1\1>540-M-3-M-3	3	3	5	85	100	88	67	72	64	85	93	97	79	85	91	2	1	1	1	1	1	3	3	3	1	1	3	1	3	1
20	PCT-4\SA\1\1>1479-M-1-M-5	3	3	3	70	103	87	76	64	75	82	111	80	77	105	80	1	1	1	1	1	1	3	3	1	1	3	1	1	1	1
23	PCT-4\SA\1\1>1837-M-2-M-2	5	3	3	83	109	86	75	69	88	78	67	61	57	67	54	1	1	3	1	1	1	3	3	5	3	1	1	3	3	1
16	PCT-4\SA\1\1>1260-M-6-M-6	3	3	3	105	92	88	71	74	68	95	89	96	94	88	89	1	1	2	1	3	1	3	3	3	1	1	3	1	1	1
9	PCT-4\SA\1\1>975-M-3-M-3	5	3	3	91	103	86	74	71	72	55	63	76	55	62	70	2	1	1	1	1	1	3	3	3	1	1	1	3	1	1
13	PCT-4\SA\1\1>1036-M-6-M-2	3	1	1	93	101	89	75	71	72	94	64	94	93	63	89	1	3	1	1	1	1	3	5	3	1	1	1	1	1	1
17	PCT-4\SA\1\1>1479-M-1-M-1	3	3	3	82	90	102	74	86	67	89	61	89	86	60	84	2	1	2	1	1	1	3	3	3	1	1	1	3	1	1
27	O. SABANA 10	5	3	3	81	101	96	97	74	72	56	71	66	49	68	63	2	2	1	1	1	1	7	1	3	1	1	1	1	3	1
7	PCT-4\SA\1\1>975-M-2-M-3	3	3	3	84	98	109	69	75	67	96	77	85	93	75	80	1	2	1	1	1	1	3	1	3	1	1	1	1	3	3
21	PCT-4\SA\1\1>1479-M-1-M-6	3	5	1	93	93	96	73	74	77	109	103	92	98	101	81	2	2	2	1	1	1	3	3	3	1	1	1	1	1	1
24	PCT-4\SA\1\1>1837-M-2-M-3	5	3	3	100	92	98	67	77	75	96	95	112	93	90	104	1	2	1	1	1	1	3	5	3	1	1	1	3	3	1
4	PCT-4\SA\1\1>540-M-3-M-5	5	3	1	102	100	99	73	92	68	100	64	106	94	65	100	1	1	1	1	1	1	1	3	3	1	1	1	3	3	3
5	PCT-4\SA\1\1>975-M-2-M-1	3	1	3	96	99	101	66	69	69	96	109	115	93	115	113	1	2	1	1	1	3	3	3	5	1	3	1	3	3	1
12	PCT-4\SA\1\1>982-M-3-M-5	3	3	3	102	100	102	68	71	69	74	77	76	71	80	75	2	2	2	1	1	1	3	3	3	1	1	1	3	1	1
6	PCT-4\SA\1\1>975-M-2-M-2	5	3	3	99	88	108	77	71	70	53	100	87	48	95	86	1	1	1	1	1	1	3	1	3	1	1	1	3	1	3
15	PCT-4\SA\1\1>1044-M-3-M-4	5	3	1	103	98	114	74	70	76	62	81	85	55	70	81	1	1	1	1	1	1	3	3	3	3	3	1	3	1	1
22	PCT-4\SA\1\1>1576-M-4-M-1	5	5	3	104	100	103	71	74	75	74	83	115	61	88	111	1	2	2	1	1	1	3	1	1	1	1	1	1	1	1
8	PCT-4\SA\1\1>975-M-3-M-2	5	2	3	108	88	108	73	79	69	60	60	62	59	55	52	1	2	1	1	1	1	1	3	3	1	1	3	5	1	3
1	PCT-4\SA\1\1>516-M-6-M-3	3	2	3	107	85	101	73	71	73	61	99	101	49	89	95	1	1	1	1	1	1	1	1	3	1	1	1	3	3	1

BI = Leaf blast; NBI = Neck blast; LsC = Leaf scald; BS = Brown spot; GD = Grain discoloration.

Scale 1-9 : 1 means resistant and 9 susceptible.

Table 9.1. Yield Trial of Advanced Lines. "La Libertad Experimental Station", Villavicencio-Meta, Colombia
Grain Yield and Quality.

Line	Pedrigree	Yield Kg/ha	Duncan	Grain Characteristic											
				Alcaly test						White Belly			Grain Type		
				I	II	III	I	II	III	I	II	III	I	II	III
1	PCT-4\SA\1\1>516-M-6-M-3	3095	ABCD	2.0	4.8	3.8	A	I	I	0.6	0.8	2.0	L	L	L
2	PCT-4\SA\1\1>540-M-3-M-3	2243	CDEF	4.7	5.0	3.5	I	I	A, I	1.0	0.6	0.4	L	L	L
3	PCT-4\SA\1\1>540-M-3-M-4	1878	EF	5.0	4.5	5.0	I	I, A	I	1.0	0.4	0.6	L	L	L
4	PCT-4\SA\1\1>540-M-3-M-5	2832	ABCDE	2.4	4.7	4.6	A	I	I	0.8	0.8	0.4	L	L	L
5	PCT-4\SA\1\1>975-M-2-M-1	2947	ABCDE	5.0	3.3	4.0	I	A, I	I	0.4	1.0	1.4	L	L	L
6	PCT-4\SA\1\1>975-M-2-M-2	3275	ABC	2.5	2.7	3.7	I	A	I, A	2.0	0.4	1.0	L	L	L
7	PCT-4\SA\1\1>975-M-2-M-3	3644	A	3.3	2.4	4.0	A, I	A	I, A	1.0	0.6	0.4	L	L	L
8	PCT-4\SA\1\1>975-M-3-M-2	3115	ABCD	4.4	2.3	5.0	I, A	A	I	1.2	0.4	1.6	L	L	L
9	PCT-4\SA\1\1>975-M-3-M-3	3367	AB	3.6	3.5	3.5	I, A	A/I	A/I	0.6	0.4	0.6	L	L	L
10	PCT-4\SA\1\1>975-M-3-M-4	3321	ABC	2.0	2.0	3.5	A	A	A/I	0.4	0.2	0.6	L	L	L
11	PCT-4\SA\1\1>982-M-3-M-4	2781	ABCDE	2.2	2.2	3.6	A	A	I, A	2.0	1.2	1.2	L	L	L
12	PCT-4\SA\1\1>982-M-3-M-5	3277	ABC	2.2	3.5	3.7	A	I/A	I, A	2.2	2.0	2.2	L	L	L
13	PCT-4\SA\1\1>1036-M-6-M-2	2868	ABCDE	3.6	3.8	4.9	I, A	I, A	I	1.4	1.2	0.8	L	L	L
14	PCT-4\SA\1\1>1044-M-3-M-2	3003	ABCD	4.0	3.7	5.0	I	I, A	I	2.6	2.4	2.0	L	L	L
15	PCT-4\SA\1\1>1044-M-3-M-4	3379	AB	3.0	3.0	4.0	A	A	I	1.0	2.0	2.0	L	L	L
16	PCT-4\SA\1\1>1260-M-6-M-6	2313	BCDE	2.0	2.5	2.5	A	A	A	1.0	1.2	1.2	L	L	L
17	PCT-4\SA\1\1>1479-M-1-M-1	3239	ABCD	3.7	3.8	4.0	I, A	I, A	I, A	2.0	1.6	2.4	L	L	L
18	PCT-4\SA\1\1>1479-M-1-M-2	2771	ABCDE	4.0	4.0	4.6	I	I, A	I	2.0	2.0	3.0	L	L	L
19	PCT-4\SA\1\1>1479-M-1-M-3	3028	ABCD	3.5	4.0	4.0	I/A	I, A	I/A	1.4	2.0	4.0	L	L	L
20	PCT-4\SA\1\1>1479-M-1-M-5	3016	ABCD	3.5	3.5	3.8	I/A	I/A	I, A	2.2	2.0	3.8	L	L	L
21	PCT-4\SA\1\1>1479-M-1-M-6	3265	ABC	5.5	4.0	4.2	I/A	I, A	I, A	2.0	2.0	4.2	L	L	L
22	PCT-4\SA\1\1>1576-M-4-M-1	2237	CDEF	2.4	3.1	4.1	A	A	I	2.0	1.0	4.1	L	L	L
23	PCT-4\SA\1\1>1837-M-2-M-2	2273	BCDE	4.6	4.8	4.0	I, A	I	I	1.4	0.6	4.0	L	L	L
24	PCT-4\SA\1\1>1837-M-2-M-3	2352	BCDE	4.4	5.0	4.6	I, A	I	I, A	0.6	0.4	4.6	L	L	L
25	CIRAD 409	2332	BCDE	2.0	4.8	4.6	I	I, A	I, A	0.4	1.0	4.6	L	L	L
26	O.SABANA 6	2140	CDEF	3.5	4.5	5.0	I/A	I	I	0.6	0.8	5.0	L	L	L
27	O.SABANA 10	1240	F	2.6	3.2	2.0	A	A, I	A	0.6	1.0	2.0	L	L	L

ACTIVITY 3.

POPULATION BREEDING FOR THE LOWLAND ECOSYSTEM

1. INTRODUCTION

The population breeding project started by introducing to Colombia, different gene pools and populations previously developed in Brazil by EMBRAPA Rice and Beans Center and CIRAD, and by CIRAD in French Guyana.

The germplasm was characterized at CIAT, Palmira, and the best-adapted ones were used to develop new populations. This resulted in three populations that were registered in the recurrent selection catalog as PCT-6, PCT-7, and PCT-8. This work was conducted at CIAT in close collaboration with Drs. C. Martínez and E. P. Guimarães.

A gene pool was also built up, using a different gene of male sterility. The gene pool was registered as GPCT-9.

A second gene pool, developed by CIRAD for temperate climates, was registered as GPIRAT-10.

From late 1996, this basic germplasm was dispatched to our regional partners and outside Latin America. It is the starting point for the development of population breeding in different countries.

In 1999, the II International Workshop on Rice Recurrent Selection, held in Goiânia-Brazil, was the occasion for our partners to present updated information on the use of population breeding.

Written documents were made available to all participants.

A book titled "Avances en el Mejoramiento Poblacional en Arroz" was published in October 2000 by CIAT, CIRAD, Embrapa (Brazil) and DANAC (Venezuela).

This report only describes the activities developed in Colombia, by the CIAT/CIRAD project. For more information about the activities developed by LAC NARS, please refer to the above publication.

2. DEVELOPMENT OF SITE-SPECIFIC COMPOSITE POPULATIONS

Our NARS Partners develop site-specific Composite Populations. By this, each partner owns its national germplasm, and breeders are more concerned in its management, that only dealing with "foreign introduced" populations.

2.1. Venezuela

Two populations, PCT-6 and PCT-7, were selected as the best introduced material to be used as sources of male-sterile background to develop two new local populations, identified as **PFD-1** and **PFD-2**.

PFD-1

Male-sterile plants of PCT-6 were crossed with 5 lines: FONAIAP 1; CT 9868-3-2-3-1-4P-M-1-1P; IR 62140-48-3-1-2-3; CT 9509-17-3-1-1-M-1-3P-M-1 and CT 10310-15-3-2P-4-3

PFD-2

Male-sterile plants of PCT-6 were crossed with 4 lines: CT 9868-3-2-3-1-4P-M-1-1P; IR 62140-48-3-1-2-3; CT 10310-15-3-2P-4-3; CT 9509-17-3-1-1-M-1-3P-M-1

During 1999, the build-up of the population **PFD-2** was completed at CIAT and the basic population sent to DANAC-Venezuela. Recurrent Selection started in 2000.

In mid 2000, a National rice population breeding project presented by DANAC and FONAIAP was approved for funding by CONICIT.

2.2. Argentina

Three site-specific composite populations are developed, two in Argentina (**PARG-1** and **PARG-2**) and one at CIAT (**PARG-3**).

Population PARG-1

This germplasm is a new population with narrow genetic base, and corresponds to the mixture of the best male-sterile plants harvested in the selected progenies from fertile plants of the 3 populations PCT-6, 7, and 8.

Population PARG-2

This germplasm comes from the mixture of 50% of the population PCT-8\0\0\2 and 50% of PARG-1.

After passing through 3 cycles of recombination, the two populations are used (starting in 2000) as direct source of fertile plants for line development.

Population PARG-3

This new population was developed at CIAT by introduction of 50% of variability coming from 6 local lines into the population PCT-8.

During 1999 and 2000, individual crosses were made at CIAT between male-sterile plants of the population PCT-8 and the 6 parents. The generation F1 was observed. F2 seeds of each individual cross were mixed in equal proportion to obtain the basic population.

The population PARG-3\0\0\1, with one cycle of recombination was shipped to Argentina in late 2000.

This new germplasm is the starting point for recurrent selection breeding in Argentina.

Argentina is preparing a national rice population breeding plan that congregates the activities developed by the Universities of Corrientes, La Plata and Tucumán.

2.3. Chile

The Chilean population **PQUI-1** was split in two parts. One sample was sown in Chillán and the other one in the northern part of the rice growing area where climatic conditions are warmer. The two populations identified as **PQUI-1\Ch\0\1** and **PQUI-1\Co\1\0** were sent to CIAT Palmira for completing the second cycle of recombination.

***In 1998**, the second cycle of recombination was shipped to Chile, but the seed transited through Miami and was incinerated by the plant protection service of the USA. Fortunately we have not shipped all the seed produced in Palmira.*

In Chile, Santiago Hernaiz took the right decision in sowing the first cycle of recombination in order to go-on with his project.

During 1999 and 2000, we used the remnant seeds of the second recombination to perform the third cycle during the first semester of 1999.

Fixed lines were developed through anther culture at CIAT laboratory. A total of 325 R1 line was produced. The R2 generation was advanced at CIAT Palmira and the resulting seed dispatched to Chile for evaluation during 2000/2001 cropping season.

2.4. Uruguay

During the 1997-cropping season, Fernando Perez de Vida crossed different parents with sterile plants from the temperate gene pool GPIRAT-10 to develop new populations. The hybrid seed was shipped to CIAT Palmira to grow the F1 generation.

In 1998, Fernando gets to the US to course his Ph.D. and we agreed on developing the new populations at CIAT.

Population PURG-1

It comes from the introduction of 17 lines with short grain quality into the gene pool GPIRAT-10. The objective is to develop a site-specific population for short grain quality; witch represents a new target export market for Uruguay.

Population PURG-2

It comes from the introduction of 60 long grain lines into the gene pool GPIRAT-10.

Population PURG-3

It has a broader genetic base, and is the result of physical seed mixture of the two previous populations with male-sterile plants selected in the best progenies derived from the original gene pool GPIRAT-10.

During 1999 and 2000, the build-up of the 3 populations have been under way at CIAT Palmira. They would be shipped to Uruguay as soon as Fernando Perez de Vida is back to his country.

3. DISTRIBUTING GERMPLASM

Since 1995, we started to release recurrent selection populations and gene pools to NARS in Latin America and in West Africa and Asia.

In 1999, we shipped different populations to new partners in Europe (Spain and France).

4. REGISTERING NEW POPULATIONS

In 1999, four (4) new germplasms (see Appendix 4) were registered on request from our collaborators from Chile, China and Venezuela.

- **PQUI-1**, *Japonica* population for irrigated temperate ecosystem (INIA-Quilamapu, Chile).
- **GPYN-2**, *Japonica* gene pool for temperate ecosystem (FCRI/YAAS, Province of Yunnan - China).
- **PFD-1** and **PFD-2**, *Indica* populations for tropical lowland ecosystem (DANAC - Venezuela).

5. FIXED LINE DEVELOPMENT THROUGH ANTHER CULTURE

The objective is to fasten the development of fixed lines for our partners, mainly those that cannot have two cropping seasons due to climatic conditions.

5.1. From Chilean populations

Populations PQUI-1\Ch\2\0 and PQUI-1\Co\2\0

During 1999, the populations were grown at CIAT Palmira and plants processed by the CIAT laboratory. 325 R1 lines were produced.

During 2000, the R2 generation was advanced at CIAT during the first semester. The resulting seeds were shipped to Chile for evaluation and selection, during the 2000/2001 cropping season.

A sample of the R1 generation was shipped to France. They were evaluated during the cropping season 2000. The first result of the evaluation show that the lines present

an excellent initial vigor witch is a very important characteristic for the specific French conditions.

5.2. From the *Indica* population PCT-6

Population PCT-6\HB\1,HB\1,Bl(c)\1.

This germplasm is the result of the enhancement of the population PCT-6 for resistance to rice "hoja blanca" virus and Blast (two cycles of recurrent selection for rice "hoja blanca" virus -HB- and one for total blast resistance Bl(c).

It was developed by M. Châtel (see last year report) for rice "hoja blanca" virus and by M. Vales for Blast resistance.

In 2000, the population was processed by anther culture at CIAT. The objective is to provide FLAR partners with the resulting lines.

5.3. From conventional crosses

CIRAD-CA has developed collaborative work with different European Countries.

5.3.1. For Romania

In the framework of the collaboration with the Romanian institution FUNDULEA, two crosses designed for cold tolerance, grain quality, and yield potential were processed by the CIAT anther culture laboratory.

During 1999, two crosses were processed: OLTENITSA / RUBINO, and CRISTAL /L 203, and a total of 61 R1 DH lines was produced. The R2 seeds were shipped to Romania and also to France and Chile.

5.3.2. For Spain

Also in the framework of the collaboration with Spain, four crosses were made at CIAT Palmira and processed by anther culture.

During 1999, the crosses were performed, the F1 hybrid seed was obtained, and the F1's generations were grown at CIAT.

In 2000, the 4 crosses were processed by anther culture.

ACTIVITY 4.

TRAINING, CONFERENCE ORGANIZATION AND WORKSHOP

1. TRAINING

1.1. National course

- **Colombia**

"Curso de Mejoramiento del Cultivo de Arroz" held at CIAT Headquarters, September 25 - October 6, 2000

- **Cuba**

We are organizing jointly with **Embrapa (Brazil)** and **IIA (Cuba)** a National Course on recurrent selection to be held in Sancti Spiritus - Cuba, in June 2001.

1.2.Thesis

- **Eduin Blandón Arias.** Student of the "Facultad de Ingeniería Agronómica, Universidad del Tolima".

"Caracterización y Adaptación en las condiciones del Norte del Tolima de poblaciones de Arroz (Oryza sativa L.) de amplia y estrecha base genética desarrolladas con un gen de androesterilidad".

- **Yolima Ospina.** Assistant of the CIAT/CIRAD project

Master Degree Thesis at the "Universidad Nacional de Palmira".

"Evaluation of genetic progress for acid soil tolerance and different agronomic characteristics".

2. CONFERENCE ORGANIZATION

- **Brazil**

The second International Conference on Rice Recurrent Selection Breeding was held in Goiânia, 21 - 24 September 1999, and organized by CIAT, CIRAD, EMBRAPA and Fundación DANAC, with the support of FAO and FLAR. All our partners from the different countries attended the conference and presented updated information on the use of population breeding. CIAT, EMBRAPA and Fundación Polar published all the communications in a book.

3. WORKSHOP

In early 2000 we planed with Embrapa, the venue of an International Workshop at LES. The idea was to call our main partners to come to Colombia and select upland lines that could be useful for their breeding project.

The Workshop took place in Villavicencio during August 7-11, 2000.

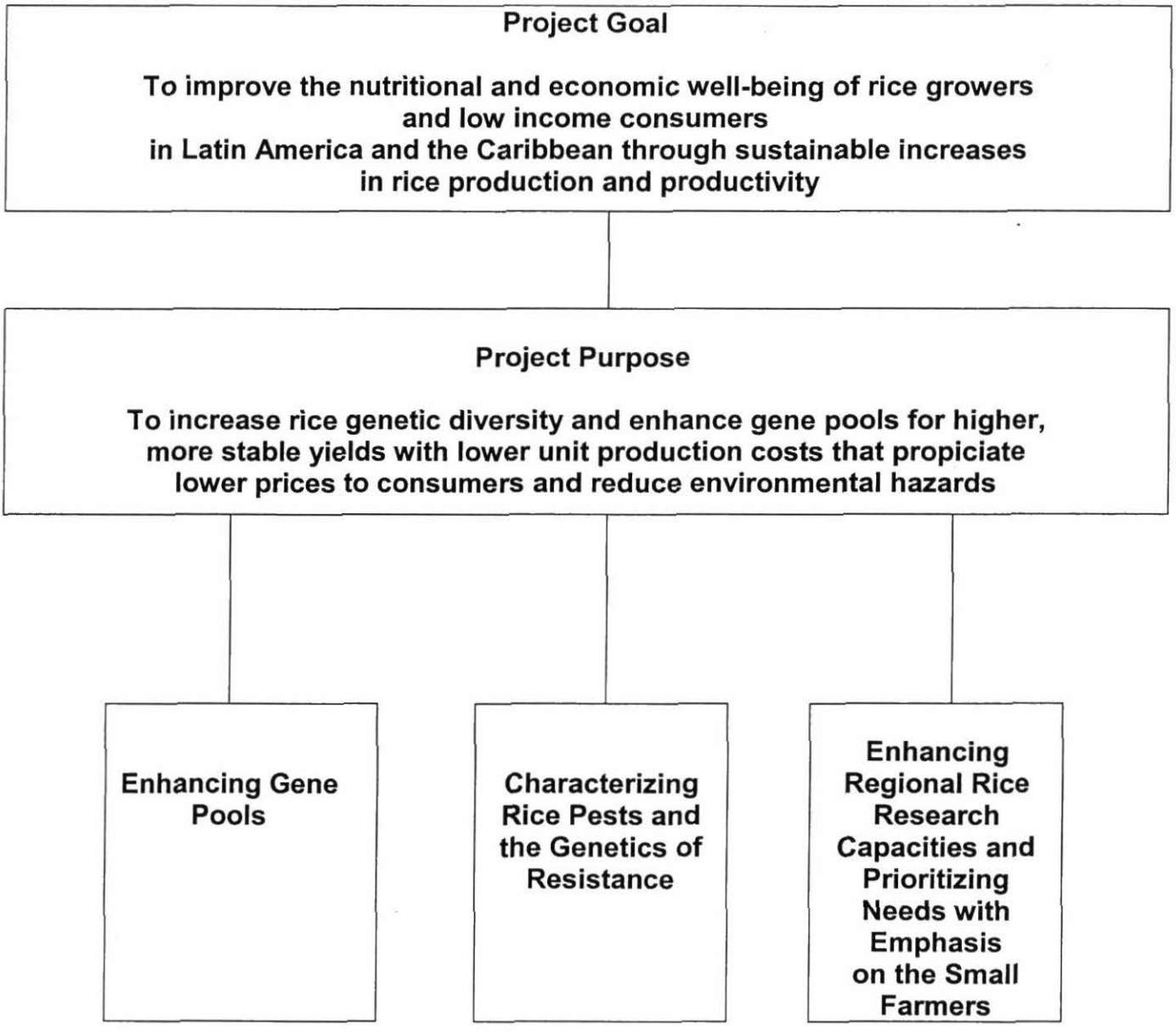
Participants from Argentina (Universidad National de Tucumán), Bolivia (CIAT - Santa Cruz), Brazil (Embrapa - Arroz e Feijão), Colombia (CORPOICA, CENICAFE and Universidad del Tolima), Cuba (IIA) and Venezuela (FONAIAP) attended the Workshop.

Each participant presented a brief report about the progress made by his respective upland rice-breeding project.

At "La Libertad experimental Station", line selection was made by each participant (see Activity 2.). The selected material was harvested and shipped to the respective countries.

APPENDIX 1. CIAT RICE PROJECT IP-4 and LOGICAL FRAMEWORK

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



Goal Germplasm of beans, cassava, tropical forages, rice and their wild relatives collected, conserved and enhanced and made accessible to NARS and other partners.	• A sufficient number of accessions (of beans, cassava and tropical forages) representing genetic diversity are conserved and *managed ex-situ.* • Strategies and guidelines for in-situ management of biodiversity of beans, cassava and tropical forages have been developed and tested *with users.* • Accessible germplasm of beans, cassava, tropical forages and rice meet NARS standards in terms of productivity, stability, agronomic traits and user needs. • Techniques and relevant information for more efficient and reliable germplasm improvement are accessible to users.	• CIAT's germplasm bank inventories. • Partners technical reports. • *Annual reports.*	
Purpose To increase rice genetic diversity and enhance gene pools for higher, more stable yields with lower unit production costs that propiciate lower *prices to consumers and* reduce environmental hazards.	• Evaluations of yield potential (interspecific, wide, elite crosses and recurrent selection). • Continued use of improved germplasm by NARS. • Monitoring rice production practices and markets. • IPM practices in place for stable production and cleaner environment. • Rice lines selected with desired gene traits. • Potential sources for high levels of biotic and abiotic stress resistance.	• Databases. • Project, CIAT and NARS annual reports. • Publications. Promotional Activities (conferences, training, workshops, field days)	• Stability (internal and external) • National policies favor adoption of new technology.
Outputs 1. Enhancing Gene Pools. 2. Characterizing Rice Pests and the Genetics of Resistance. 3. Enhancing Regional Rice Research Capacities and Prioritizing Needs with Emphasis on the Small Farmers	• Pathogen/pest variation and source of resistance identified. • IPM strategies. • Workshops. • Training courses. • Farmers' surveys.	• Project progress *report for 2000.* • Publications. • Project progress and workshop reports	• Continued support from CIAT/CIRAD/FLAR. • Continued adequate funding. • Recommendations adopted by NARS and implemented by farmers.

OUTPUT1: ENHANCING GENEPOOLS **Activities** A. Rice improvement using conventional breeding and gene pools/populations with recesive male-sterile genes. Evaluation of savannas upland rice lines in Latin American countries. B. Developing upland rice for small landholders C. Advance and evaluation of inter-specific gene pools. D. Introgression of new plant type genes into LAC's gene pools. E. The use of anther culture and in vitro culture for enhancement of gene pools.	• Rice populations developed and improved (tolerance soil acidity; resistance to blast, RHBV, *T. orizicolus* (13); good grain quality; early maturity. • Number of field trials planted and lines selected. • Populations distributed to NARS for line development. Populations developed (14); populations in process (12); populations yield tested/molecular characterized (4). Partners (WARDA, CIRAD, EMBRAPA, CORNELL). • Number of crosses made (433); tropical irrigated (226), temperate (155), upland (52). Number of selected lines. • Double haploids: interspecific crosses (386), acceleration breeding populations (815), somaclones (3758-Venezuela; 4440-Colombia)	• Project progress report for 2000. • Field visits and evaluations in testing sites. • Breeding populations distributed to LAC. • Breeding populations in storage and field. • Best lines and QTL'S identified. • Breeding populations in storage and field. . • Double haploids in storage • Publications.	• Continued support from CIAT/CIRAD/FLAR. • Adequate funding and timely release of budget. • Favorable climate. • Continued financial support for anther culture lab. • Crosses, field support and operational costs provided by FLAR.
OUTPUT 2. CHARACTERIZING RICE PESTS AND THE GENETICS OF RESISTANCE **Activities** A. Characterizing the interactions of host plant resistance to rice blast, sheath blight and grain discoloration B. Characterizing and using partial and complete resistance for the control of rice blast. C. Characterizing the	• Virulence spectrum and genetic structure of rice pathogens. • Molecular markers associated and number of resistance genes. • Sources of complete, complementary and partial resistance. • Rice lines with diversified resistance to RHBV and *T. orizicolus*. • Understanding components of resistance to the RHBV complex. • Crop management components developed.	• Collection of rice pathogens. • Database of resistance sources • Crosses made among resistance sources.F7 lines with stable blast resistance combining genes Pi-1 and Pi-2. • Rice genome map with blast resistance genes mapped. • Rice progress report for 2000 • Publications • Publication and diagnostic kit available. • Resistant germplasm selected under	• Rice crosses and populations developed by breeders. • Biotech. Unit identify molecular markers associated with resistance. • Continue collaboration with FLAR. • Continue adequate funding from Colombia and Rockefeller. • Continue support and adequate funding from CIAT, CIRAD, and FLAR.

interactions of host plant rice hoja blanca virus and *T. orizicolus* complex D. Foreign genes as novel sources of resistance to rice hoja blanca virus and *Rhizoctonia solani* E. Characterizing the interactions of host plant, *Polymyxa graminis* and rice stripe necrotic virus that causes entorchamiento.	• *Transgenic lines with* RHBV-viral genes with reduced symptoms produced and evaluated. • Transgenes introgressed into commercial cultivars. • *Using novel genes for* multicomponent resistance to rice pathogens. • Characterization of the RSNV and vector complex. • Development of germplasm evaluation methods.	artificial conditions.	• Continued funding from Colombia, Rockefeller, Colciencias. • Permission for field testing of transgenic plants is granted. • Continued support and adequate funding.
OUTPUT 3. ENHANCING REGIONAL RICE RESEARCH CAPACITIES AND PRIORITIZING NEEDS WITH EMPHASIS ON THE SMALL FARMERS **Activities** A. FLAR and economics of rice production systems - Analysis of national rice samples in Colombia. - Creation of a network of rice economics in Latin America (RECAL). - FLAR breeding and crop management activities in LAC (training). - Promotional and diffusion of activities and research impact. B. Rice Economics	• *Costs and coefficients* of production. • National breeding plans written. • Number of scientists trained. • Published reports of courses. • *FLAR publications.* • Budget.	• Rice progress report for 2000.	• Special funds continue. • Recommendations adopted by farmers. • Adequate funding and timely release of budget.

APPENDIX 2. WORK PLANS 2000

Individual Work Plan

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

Subproject: Collaborative Rice Project between CIAT and CIRAD
Starts: January 2000 **Ends:** December 2000 **Your Name**: Marc CHATEL **Project Manager:** Fernando CORREA

Project of Subproject Outputs and Indicators	**Specific Indicators for the outputs**
Output 1.	Population developed and improved.
	Populations and lines developed, and used by NARS.
Enhanced Gene Pools: Savannas Upland Rice Conventional and Recurrent Selection Breeding.	**Important Assumptions of the Activity Level**
	Continued support from CIAT and CIRAD. Adequate funding and timely release of budget. NARS willing and capable to try-out/use new improved populations.

Activities	**Semester 1**									**Semester 2**		
	Jan.	**Feb.**	**Mar.**	**Apr.**	**May**	**Jun.**	**Jul.**	**Aug.**	**Sep.**	**Oct.**	**Nov.**	**Dec.**
1.1. Recurrent Selection: Population Enhancement.												
1.1.1. Population PCT-4: Third cycle of recurrent selection ; selection of S0 fertile plants.				****	****	****	****	****				
1.1.2. Generation S1, off-season at Palmira.	**** 2001	**** 2001	**** 2001								****	****
1.1.2. Genetic progress assesment for savannas condition. (Master Thesis – Yolima Ospina)	****	****	****	****	****	****	****	****	****	****	****	****
1.2. Recurrent Selection: New Upland Savanna Population.												
1.2.1. **Population PCT-11**: First cycle of recurrent selection; selection of S0 fertile plants.				****	****	****	****	****				
1.2.2. Generation S1, off-season at Palmira.	**** 2001	**** 2001	**** 2001								****	****
1.3. Recurrent Selection: Line development from different populations.												
1.3.1. Selection and evaluation of segregating lines.				****	****	****	****	****				
1.3.2. Off-season multiplication (Palmira)	*** 2001	**** 2001	**** 2001								****	***
1.4. Conventional Breeding.												
1.4.1. Line shipping to NARS. Monitoring their use by NARS and line release.				****	****	****	****	****				
1.5. Strengthening NARS and training.												
1.5.1. Preparation of the First National/International course on rice recurrent selection to be held in Cuba in 2001.			****			****				****		
1.5.2. Visits and field work with NARS. Argentina (Tucuman), Bolivia (Santa Cruz) , Venezuela (Fonaiap and Reunillez), Brazil (EMBRAPA Arroz e Feijao), the Carribean (CRID Net) and ASIA (China)		****	****						****			
1.5.3. Germplasm distribution and evaluation with Partners (Latin America, CIRAD, Africa, and China).		****								****		
1.6. Follow-up of the projects: **-Recurrent Selection for West Africa: CIAT/CIRAD and WARDA/CORAF** **-GRUMEGA Project, in collaboration with EMBRAPA Rice and Beans and FAO**												
1.7. Publications: - **Annual CIAT/CIRAD Report** - **Recurrent Germplasm Catalogue year 2000**												

Individual Work Plan

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

Subproject: Collaborative Rice Project between CIAT, CIRAD, and FLAR
Starts: January 2000 **Ends:** December 2000 **Your Name**: Marc CHATEL **Project Managers:** Fernando CORREA
Luis SANINT

Project of Subproject Outputs and Indicators	**Specific Indicators for the outputs**
Output 1.	Population developmed and improvemed.
	Populations and lines developed, and used by NARS.
Enhanced Gene Pools: Tropical, Sub-Tropical and Temperate Lowland Rice:	**Important Assumptions of the Activity Level**
Recurrent Selection Breeding with NARS.	Continued support from CIAT, CIRAD, and FLAR. Adequate funding and timely release of budget. NARS willing and capable to try out/use new improved populations.

Activities	**Semester 1**						**Semester 2**					
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1.1. Recurrent Selection: New Temperatel lowland Population.												
1.1.1. Recombination population PCT-12	****	****	****	****	****		****	****	****	****		
1.1.2. PCT-12 Enhancement for global characteristics				****	****	****	****	****				
1.1.3. Development of populations for: ARGENTINA (PARG-3) and URUGUAY (PURG-1, 2 and 3)	****	****	****	****	****	****	****	****	****	****	****	****
1.2. Recurrent Selection: Line development from different populations.												
1.2.1. Selection of S0 fertile plants in different populations	****	****		****	****	****	****	****				
1.2.2. S1 Off-season multiplication at Palmira.	****	****	****	****								
1.2.3. R2 generation of anther culture lines for CHILE	****	****	****	****								
1.3. Strengthening NARS.												
1.3.1. - Assessment of Recurrent Selection progress in LAC Temperate and Subtropical Lowlands: Argentina, Chile, and Southern Brazil.	****	****	****	****	****	****	****	****	****	****	****	****
1.3.2. - Assessment of Recurrent Selection Progress in Tropical Lowlands: Colombia, Venezuela, Costa Rica, El Salvador, Panama, and Cuba.	****	****	****	****	****	****	****	****	****	****	****	****
1.3.3. - Use of Recurrent Selection Germplasm in Europe (France and Spain) Use of the Chilean population PQUI-1 and sub-tropical population PCT-8.	****	****	****	****	****	****	****	****	****	****	****	****
1.3.4. - Assessment of Recurrent Selection Progress in Asia (China). Use of GPYN-2.	****	****	****	****	****	****	****	****	****	****	****	****
1.3. 5. Visits and field work with NARS		****	****						****	****		
1.3.6. Germplasm distribution and evaluation with Partners: .Latin America and the Caribbean .CIRAD .Europe		****								****		
1.5. Training												
1.5.1. Preparation of the First National/International course on rice recurrent selection to be held in Cuba in 2001.							****	****		****		
1.6. Follow-up of the project: -GRUMEGA Project, in collaboration with EMBRAPA Rice and Beans and FAO												
1.8. Publications: - **Annual CIAT/CIRAD Report** - **Recurrent Germplasm Catalogue year 2000**												

APPENDIX 3. REFERENCES

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Châtel, M.; *et al.* CIRAD/CIAT/FLAR annual reports, 1996, 1997, 1998 and 1999.

APPENDIX 4. PUBLICATIONS

- **BOOK CHAPTERS**

In "Avances en el Mejoramiento Poblacional en Arroz" (published in October 2000 by CIRAD/CIAT, Embrapa and Fundación DANAC).

Chapter 6: Mejoramiento poblacional de arroz irrigado con énfasis en el virus de la Hoja Blanca.
Borrero. J; Châtel. M y Triana. M

Chapter 8: Selección recurrente en Arroz: situación actual y perspectivas en Cuba.
Polanco. R. P; Châtel. M y Guimaraes. E

Chapter 10: Mejoramiento poblacional en Uruguay: caracterización y desarrollo de germoplasma.
Pérez de Vida. F. B; Châtel. M y Borrero. J

Chapter 11: Desarrollo de poblaciones de arroz en Argentina.
Marassi. J. E; Marassi. M. A; Châtel. M y Borrero. J

Chapter 12: Desarrollo de poblaciones japonicas para Chile.
Hernaiz. S; Alvarado. R; Châtel. M y Borrero. J

Chapter 15: Mejoramiento poblacional del arroz de sabanas.
Ospina. Y; Châtel. M; y Guimarães. E

- **REPORTS**

- Achievements of the Rice Collaborative Project between CIRAD-CA and CIAT, CIAT- CIO Strategic Alliance Meeting. Montpellier-France, June 22-24, 1999.
- Collaborative Project between CIRAD CIAT and FLAR. Population Breeding using gene pools and populations with recessive male-sterile gene, and conventional breeding. Annual Report CIAT/CIRAD/FLAR - October 1999.

- **PRESENTATIONS**

France - June and September 1999

- CIAT/CIO Strategic Alliance Meeting . The CIAT/CIRAD rice collaborative project, Montpellier-France, June 1999
- Diversité des partenariats et excellence scientifique. Montpellier-France, September 1999

Bolivia - February 2000

Selección recurrente en Arroz; proyecto CIAT/CIRAD.
Santa Cruz de la Sierra - Bolivia, February 2000

Argentina - March 2000

Arroz de secano en Latinoamerica
Universidad de Tucumán-Argentina, March 2000

- **POSTERS**

- Upland Rice for High Altitude.
An option against food insecurity in the Andean hillsides

Valès. M; Châtel. M; Borrero, J; Barrios. E and Roa. J.I
- Breeding strategy for durable rice blast resistance.
Recurrent selection for complete and partial resistance and other agronomic traits
Valès. M; Châtel. M; Borrero.j and Dossmann.J
3rd International Crop Science Congres 2000-10-31
17-22 August, Hamburg-Germany.

APPENDIX 5. GERMPLASM REGISTRATION

PYN-1

Institution:	FCRI / YAAS
Year of registration:	1999
Scientists:	Dayun Tao, Fengyi Hu, Youqiong Yang, Peng Xu, and Jing Li
Ecosystem:	Temperate lowland & upland
Objectives:	For lowland: Tropical germplasm with blast resistance and fine grain quality For upland: Low temperature tolerance and fine plant type
Germplasm type:	*Japonica* population
Population development:	Synthesis of a new population.
Male-sterility source:	Plants of PCT-5
Cytoplasm source:	Polycytoplasm PCT-5
New variability:	32 cultivars from Yunnan, Japan
Crossing method:	Manual crossing between sterile plants of PCT-5 and cultivars
Seed mixture:	F2 seeds from each individual cross
Proportion mixture:	Equal for all crosses
Genetic constitution:	See table 1
Germplasm identification:	Basic population PYN-1\0\0\0
Actual users:	FCRI/YAAS, Yunnan
Request for seed to:	Dayun Tao Food Crops Research Institute Yunnan Academy of Agricultural Sciences Kunming 650205 The People's Republic of China Phone & fax: 86-871-5893754 E-mail: tao@ms.kmb.ac.cn

Genetic constitution of PYN-1

Parent	Origin/Cross	Frequency (%)	Remark
Li Jing No. 2		1.56	Strong cold tolerance
Li Jing No. 3		1.56	Strong cold tolerance
Li Jing No. 686		1.56	Strong cold tolerance
Hei Xuan No. 5		1.56	Strong cold tolerance
He 16	76174 / 50-701 / Jinglin 768	1.56	Strong cold tolerance, high yield
Dian Yu No. 1	ZiNuomi / Keqing No. 3	1.56	High yield potential (15 T/ ha)
Dian Jun No. 8		1.56	High yield, cold tolerance
Xinan 175	Not clear	1.56	Wide adaptation
Xiao Bei Gu	Traditional from Yunnan	1.56	Strong cold tolerance
Ban Jimang	Traditional from Yunnan	1.56	Strong cold tolerance
Jing Diao No. 3	Selection of Dabaigu	1.56	High yield, cold tolerance
Kun Jing No. 4	Jing lin 768 / Remei	1.56	High yield, cold tolerance
Yun Jing No. 9	Selection of Xinan 175	1.56	Strong cold tolerance
Yun Jing No. 23	78-220 / BL4	1.56	High yield, cold tolerance
Yun Jing No. 33	Zhannongai /4/ Chenbao No. 2 // hanzinuo / Fu 127(-) /// 672/716	1.56	High yield, cold tolerance
Yun Jing No. 38		1.56	High yield, cold tolerance
Yun Jing No. 135	Hongzaosheng / Jinglin 768	1.56	High yield, cold tolerance
Yun Jing No. 136	Selection of Xinan 175	1.56	High yield, cold tolerance
Cheng Bao No. 1		1.56	Blast resistance
He Xi No. 2	Hongzaosheng / Jing hong No. 1	1.56	High yield, cold tolerance
He Xi No. 4	Hongzaosheng / Yun Jing 135	1.56	High yield, cold tolerance
He Xi No. 22-2	Xifong / Cu Jing No. 4	1.56	High yield
He Xi No. 24	Hongzaosheng / Cun Jing No. 4	1.56	High yield
He Xi No. 35		1.56	High yield, cold tolerance
He Xi No. 39	Cu Jing No. 3 / Yunqing No. 3	1.56	High yield
He Xi No. 40	He Xi No. 15 / Yunnen No. 15	1.56	High yield, cold tolerance
He Xi No. 41		1.56	High yield, cold tolerance
He Xi No. 42	He Xi No. 24 / He Xi No. 21	1.56	High yield
Dian Xi No. 1	He Xi No. 34 // Cu Jing No. 7 /	1.56	High yield, cold tolerance
Cu Jing No. 17	Yunqing No. 3	1.56	High yield
Cu Jing No. 22		1.56	High yield
Cu Jing No. 23	Cu Jing No. 7 / 85-54	1.56	High yield
PCT-5	**Upland** *Japonica* Population	50	Tropical *japonica*, blast resistance, grain quality

GPYN-2

Institution:	FCRI / YAAS
Year of registration:	1999
Scientists:	Dayun Tao, Fengyi Hu, Youqiong Yang, Pong Xu, and Jing Li
Ecosystem:	Temperate lowland
Objectives:	High yield, blast resistance, low temperature tolerance, fine grain quality
Germplasm type:	*Japonica* population
Population development:	Synthesis of a new derived gene pool
Male-sterility source:	Plants of PCT-5
Cytoplasm source:	Polycytoplasm PCT-5
New variability:	30 cultivars from Yunnan, Japan
Crossing method:	Manual crossing between sterile plants of PCT-5 and cultivars, then backcrossing with respect cultivars as male parents
Seed mixture:	BC1F2 seeds from each individual cross
Proportion mixture:	Equal for all crosses
Genetic constitution:	See table 2
Germplasm identification:	Basic population GPYN-2\0\0\0
Actual users:	Yunnan
Request for seed to:	Dayun Tao Food Crops Research Institute Yunnan Academy of Agricultural Sciences Kunming 650205 The People's Republic of China Phone & fax: 86-871-5893754 E-mail: tao@ms.kmb.ac.cn

Genetic constitution of GPYN-2

Parent	Origin/Cross	Frequency (%)	Remark
Li Jing No. 2		2.5	Strong cold tolerance
Li Jing No. 3		2.5	Strong cold tolerance
Li Jing No. 686		2.5	Strong cold tolerance
Hei Xuan No. 5		2.5	Strong cold tolerance
He 16	76174 / 50-701 / Jinglin 768	2.5	Strong cold tolerance, high yield
Dian Yu No. 1	ZiNuomi / Keqing No. 3	2.5	High yield potential (15 T / ha)
Dian Jun No. 8		2.5	High yield, cold tolerance
Xinan 175	Not clear	2.5	Wide adaptation
Ban Jimang	Traditional one from Yunnan	2.5	Strong cold tolerance
Jing Diao No. 3	Selection of Dabaigu	2.5	High yield, cold tolerance
Kun Jing No. 4	Jing lin 768 / Remei	2.5	High yield, cold tolerance
Yun Jing No. 9	Selection of Xinan 175	2.5	Strong cold tolerance
Yun Jing No. 23	78-220 / BL4	2.5	High yield, cold tolerance
Yun Jing No. 33	Zhannongai /4/ Chenbao No. 2 // hanzinuo / Fu 127(-) /// 672/716	2.5	High yield, cold tolerance
Yun Jing No. 38		2.5	High yield, cold tolerance
Yun Jing No. 135	Hongzaosheng / Jinglin 768	2.5	High yield, cold tolerance
Yun Jing No. 136	Selection of Xinan 175	2.5	High yield, cold tolerance
Cheng Bao No. 1		2.5	Blast resistance
He Xi No. 2	Hongzaosheng / Jing hong No. 1	2.5	High yield, cold tolerance
He Xi No. 4	Hongzaosheng / Yun Jing 135	2.5	High yield, cold tolerance
He Xi No. 24	Hongzaosheng / Cun Jing No. 4	2.5	*High yield*
He Xi No. 35		2.5	High yield, cold tolerance
He Xi No. 39	Cu Jing No. 3 / Yunqing No. 3	2.5	High yield
He Xi No. 40	He Xi No. 15 / Yunnen No. 15	2.5	High yield, cold tolerance
He Xi No. 41		2.5	High yield, cold tolerance
He Xi No. 42	He Xi No. 24 / He Xi No. 21	2.5	High yield
Dian Xi No. 1	He Xi No. 34 // Cu Jing No. 7 /	2.5	High yield, cold tolerance
Cu Jing No. 17	Yunqing No. 3	2.5	High yield
Cu Jing No. 22		2.5	High yield
Cu Jing No. 23	Cu Jing No. 7 / 85-54	2.5	High yield
PCT-5	**Upland** *Japonica* Population	25	Tropical *japonica*, blast resistance, grain quality

PFD-1

Institution:	DANAC Venezuela
Year of registration:	1999
Scientists:	Eduardo Graterol
Ecosystem:	Tropical irrigated
Objectives:	Adaptation to rainy conditions in Venezuela
Germplasm type:	*Indica* population
Population development:	Introduction of new variability into PCT-6
Male-sterility source:	Plants of PCT-6 (population developed with male-sterile plants of IRAT MANA, which has male-sterile gene from IR 36
Cytoplasm source:	From PCT-6
New variability:	5 lines of different origin
Crossing method:	Hand crossing between lines and male-sterile plants
Evaluation:	F1's from each single cross
Seed mixture:	F2 seed of all F1 plants
Proportion mixture:	Equal proportion of all crosses
Recombination:	Twice on male-sterile plants without selection
Genetic constitution:	See table
Germplasm identification:	Basic recombined population PFD –1\0\0\2
Actual users:	DANAC Venezuela
Request for seed to:	Eduardo Graterol Fundación para la Investigación Agrícola Danac Rice program Apartado Postal 182, San Felipe, Venezuela Phone: 58-54-319812 and 319565 Fax: 58-54-318512 E-mail: egratero@danac.org.ve

Genetic constitution of PFD-1

Parent	Origin/Cross	Frequency (%)
FONAIAP 1	P1386-6-8M-1-3M-1/P3767	10.0
CT 9868-3-2-3-1-4P-M-1-1P	Tox 1859-120-6M-3/P5446-8-4-1-2//P3844-F3-22-1-1X	10.0
CT 10310-15-3-2P-4-3	P3083-F4-56-2-2/ITA306//CT8154-1-9-2	10.0
IR 62140-48-3-1-2-3	IR50401-77-2-1-3/IR36366-28-3-1-2-2	10.0
CT 9509-17-3-1-1-M-1-3P-M-1	ECIA 24-107-1/IR25840-64-1-3//CT5746-18-11-4-1-3X	10.0
PCT-6*	*Indica* Population	50.0
B4353C-Kn-7-0-0-2	-	*5.55*
BG989	*BG563/BG379-2*	*5.55*
PNA 1004F4-33	*Inti/BG90-2*	*5.55*
OR83-23	*CO18/Hema*	*5.55*
RP2087-115-10-5-1	*RP1017-76-1-4-3/Manasarovar*	*5.55*
Oryzica 3	*CICA 7//CICA 8/ Pelita I-1*	*5.55*
Perla	-	*5.55*
Oryzica Llanos 4	*CR1113/IRAT 122//Colombia 1/P 1274-6-8M*	*5.55*
Morelos A88	*C318Za76-7/C99Za76-1*	*5.55*
*IRAT MANA***	*Indica Population*	*50.0*
CNA1613	*CNPAF- Brazil*	*3.33*
CNA 3814	*CNPAF-Brazil*	*3.33*
CNA 4191	*CNPAF-Brazil*	*3.33*
CNA 4987	*CNPAF-Brazil*	*3.33*
CNA 4995	*CNPAF-Brazil*	*3.33*
CNA 5179	*CNPAF-Brazil*	*3.33*
CNA 5551	*CNPAF-Brazil*	*3.33*
CNA 6158	*CNPAF-Brazil*	*3.33*
CT 6163-8-9-1-2A	*CIAT- Colombia*	*3.33*
IR 841-63-5-18-2	*IRRI-Philippines*	*3.33*
IRAT 335	*IRAT-Brazil*	*3.33*
IRAT 347	*IRAT-French Guiana*	*3.33*
IRAT 348	*IRAT-French Guiana*	*3.33*
P 5747-12-9-3-7	*Colombia*	*3.33*
#26 W	-	*3.33*
*CNA-IRAT M ****	*Indica Population*	*50.0*

** GENETIC CONSTITUTIUON OF PCT-6*
*** GENETIC CONSTITUTIUON OF CNA-IRAT MANA*
**** GENETIC CONSTITUTION OF CNA-IRAT M: Selection for grain shape in GPCNA-18*

PFD-2

Institution:	DANAC Venezuela
Year of registration:	1999
Scientists:	Eduardo Graterol
Ecosystem:	Tropical irrigated
Objectives:	Adaptation to drought conditions in Venezuela
Germplasm type:	*Indica* population
Population development:	Introduction of new variability into PCT-7
Male-sterility source:	Plants of PCT-7 (population developed with male-sterile plants of IRAT1/420P, which has male-sterile gene from IR 36
Cytoplasm source:	From PCT-7
New variability:	4 lines of different origin
Crossing method:	Hand crossing between lines and male-sterile plants
Evaluation:	F1's from each single cross
Seed mixture:	F2 seed of all F1 plants
Proportion mixture:	Equal proportion of all crosses
Recombination:	Twice on male-sterile plants without selection
Genetic constitution:	See table
Germplasm identification:	Basic recombined population PFD –2\0\0\2
Actual users:	DANAC Venezuela
Request for seed to:	Eduardo Graterol Fundación pra la Investigación Agrícola Danac Rice program Apartado Postal 182, San Felipe, Venezuela Phone: 58-54-319812 and 319565 Fax: 58-54-318512 E-mail: egratero@danac.org.ve

Genetic constitution of PFD-2

Parent	Origin/Cross	Frequency (%)
CT 9868-3-2-3-1-4P-M-1-1P	Tox 1859-120-6M-3/P5446-8-4-1-2//P3844-F3-22-1-1X	**12.5**
CT10310-15-3-2P-4-3	**P3083-F4-56-2-2/ITA306//CT8154-1-9-2**	**12.5**
IR62104-48-3-1-2-3	**IR50401-77-2-1-3/IR36366-28-3-1-2-2**	**12.5**
CT9509-17-3-1-1-M-1-3P-M-1	**ECIA 24-107-1/IR25840-64-1-3//CT5746-18-11-4-1-3X**	**12.5**
PCT-7*	***Indica* Population**	**50.0**
B4353C-Kn-7-0-0-2	-	***8.33***
BG989	***BG563/BG379-2***	***8.33***
PNA 1004F4-33-1	***Inti/BG90-2***	***8.33***
OR83-23	***CO18/Hema***	***8.33***
Oryzica 3	***CICA 7//CICA 8/ Pelita I-1***	***8.33***
RP2087-115-10-5-1	***RP1017-76-1-4-3/Manarovar***	***8.33***
IRAT 1/420P*	***Indica Population***	***50.00***

** Genetic constitution of PCT-7*

*****IRAT 1/420P: Selection for earliness in CNA-IRAT 4 (GPCNA-18)***

PQUI -1

Institution:	INIA Quilamapu, Chile
Year of registration:	1999
Scientists:	Santiago Hernaiz and Roberto Alvarado
Ecosystem:	Temperate irrigated
Objectives:	Adaptation to cold temperatures
Germplasm type:	*Japonica* population
Population development:	Introduction of new variability into GPIRAT-10
Male-sterility source:	Plants of GPIRAT-10 (gene pool developed with male-sterility from IR 36)
Cytoplasm source:	From GPIRAT-10
New variability:	5 Chilean lines
Crossing method:	Hand crossing between lines and male-sterile plants of GPIRAT-10
Evaluation:	CIAT-Colombia, F1 generation advance at
Seed mixture:	CIAT, Colombia ,F2 seed of all F1 plants
Proportion mixture:	Different proportion of each single crosses
Recombination:	INIA Quilamapu, Chile
Genetic constitution:	See table
Germplasm identification:	Basic recombined population PQUI -1\0\0\1
Actual users:	INIA Quilamapu, Chile
Request for seed to:	Santiago Hernaiz and Roberto Alvarado INIA Quilamapu, Rice program Avenida Vicente Mendez 515 426 Chillán - Chile Phone: 56-42 209708 and 209701 Fax: 56-42 209599 E-mail: shernaiz@quilamapu.inia.ch ralvarado@quilamapu.inia.ch

Genetic constitution of PQUI -1

Parent	Origin/Cross	Frequency (%)
Diamante	Chilean variety	10.30
Buli	Chilean variety	13.30
Quila 67108	Chilean line	16.22
CINIA 609	Chilean line	5.09
CINIA 606	Chilean line	5.09
GPIRAT-10*	Japonica Gene Pool	50.0
Anseatico	*- Italy*	*1.19*
Bonnetbell	*-USA*	*2.60*
Europa	*-Italy*	*1.19*
Koral	*-Italy*	*1.19*
Mutique Vercelli	*-Italy*	*2.60*
Rocca	*-Italy*	*1.19*
Sesia	*-Italy*	*1.19*
Strella	*-Italy*	*1.19*
Miara	*-Italy*	*14.41*
6FMT	*Lebonnet//CI9881/IR659-10-8-3*	*1.41*
IRAT 112	*-Upland*	*1.41*
L 202	*IR456-3-2-1-sel/72-3-2-2-7-8//L 201*	*1.41*
Lebonnet	*-USA*	*1.41*
Mercury	*Short Mars/Nato*	*1.41*
Alan	*Labelle/L 201*	*1.92*
Labelle	*Belle Patna/Dawn*	*1.92*
Mejanes 4	*-France*	*1.92*
Rexmont	*USA Newrex/Bellemont*	*1.92*
Skybonnet	*USABluebelle//Belle Patna/Dawn*	*1.92*
Ariete	*-France*	*2.60*
Delta	*-Italy*	*1.19*
Italpatna	*-Italy*	*1.19*
Lido	*-Italy*	*2.60*
Rica	*Nortai//CI9545/Nova*	*2.60*
Senatore Novelli	*-Italy*	*1.19*