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

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1999 Report: Summary

CONVENTIONAL BREEDING FOR UPLAND SAVANNA

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 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.

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

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

- **Lines from Madagascar**

Dr. Michel Vales introduced in Colombia, progenies from crosses made in Madagascar for the highlands. F3 progenies were evaluated. No selection was made.

3. 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.

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

POPULATION BREEDING FOR SAVANNA RICE

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 season 1999 (1999 A), from April to September at Villavicencio - Meta, "La Libertad Experiment Station" (LES).

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 S0

The first step in the development of fixed lines is the selection of individual fertile plants.

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

Cropping season 1999 A
Nineteen (19) individual fertile plants were selected.
During 1999 B, the S1 generation will be grown off-season at PES.

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

Cropping season 1999 A
Sixty-one (61) individual fertile plants were selected.
During 1999 B, the S1 generation will be grown off-season at PES.

2.1.2. Generation S2

The generation S2 comes from fertile S0 plants selected at LES during the cropping season 1998 A.

The generation S1 was advanced off-season during 1998 B at PES.

- **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 1999 A

The 107 lines S2 were evaluated and 3 selected (3%) in two populations (no selection was made in PCT-5\PHB\1\0,PHB\1,PHB\1).

During 1999 B, the S3 generation S3 will be advanced off-season at PES.

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

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

Cropping season 1999 A

The 73 lines S2 were evaluated and 5 were selected (6.8%) at LES. In each selected line a different number of individual plants was harvested.

During 1999 B, the 23 lines S3 (3 families of 6 lines, 1 family of 2 lines and 1 family of 3 lines) will be grown off-season at PES.

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

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

Cropping season 1999 A

The 84 lines S2 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 lines S3 (3 families of 6 lines, 1 family of 4 lines) will be grown off-season at PES.

2.1.3. Generation S4

The generation S4 comes from S0 fertile plants selected during 1997 A at LES.

Generations S1 and S3 were advanced off-season at PES during 1997 B and 1998 B respectively.

Generations S2 and S4 were observed and selected at LES during the cropping seasons 1998 A and 1999 A 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 1999 A

The 35 lines S4 were evaluated at LES and 7 selected (20%) in the population PCT-4\PHB\1\1,PHB\1. In each selected line 6 fertile plants were harvested.

During 1999 B, the 42 lines S5 (7 families of 6 lines) will be grown off-season at PES.

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

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

Cropping season 1999 A

The 390 lines S4 were evaluated and 44 (11%) selected at LES. In each line 6 fertile plants were harvested.

During 1999 B, the 264 lines S5 (44 families of 6 lines) will be grown off-season at PES.

2.1.4. Generation S6

The generation S6 comes from S0 fertile plants selected during 1996 A at LES.

Generations S1, S3 and S5 were advanced off-season at PES during 1996 B, 1997 B and 1998 B respectively.

Generations S2, S4 and S6 were observed and selected at LES during the cropping seasons 1997 A, 1998 A and 1999 A 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 Hoja Blanca **HB**)

Cropping season 1999 A

The 150 lines S6 were evaluated and 13 (8.7%) selected at LES. In each selected line, 6 individual plants were harvested.

During 1999 B, the 78 lines (13 families of 6 lines) will be grown off-season at PES.

2.1.5 Generation S8

The generation S8 comes from fertile S0 plants selected at LES during the cropping season 1995 A.

Generations S1, S3, S5 and S7 were advanced off-season at PES during 1995 B, 1996 B, 1997 B and 1998 B respectively.

Generations S2, S4, S6 and S8 were observed and selected at LES during the cropping seasons 1996 A, 1997 A, 1998 A and 1999 A 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 1999 A

The 301 lines S8 harvested in PES were evaluated and 44 selected (14.6%) at LES. In each selected line, 6 individual plants were harvested.

During 1999 B, the 264 lines (44 families of 6 lines) will be grown off-season at PES.

- **Population PCT-4\0\0\1>S2**

Cropping season 1999 A

The 72 lines S8 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 1999 B, the 36 lines (6 families of 6 lines) will be grown off-season at PES.

- **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 S3 Lines at PES, 1996 B)

Cropping season 1999 A

The 12 lines were evaluated and 1 was selected (8.3%) at LES. In each selected line, 6 individual plants were harvested.
During 1999 B, the 6 lines (1 family of 6 lines) will be grown off-season at PES.

2.1.6. Advanced generations

These generations are promising fixed lines that were selected from the first introduced populations from Brazil in 1992.

- **Populations CNA-IRAT 5 and CNA-IRAT A**

Cropping Seasons 1998 A and 1999 A
The best lines were used to set-up the regional INGER-LAC acid soil nursery called "Vivero Internacional de Observacion para América Latina" (VIOAL suelos ácidos.

2.1.7. Upland line Registration

CIAT does not register lines: when a specific line does well in a given country, the national institution of that country may decide to name and release it for commercial cultivation.

CIRAD has a mechanism by which breeders can register specific material. The line is named CIRAD (and is also given its local synonym, if it is the result of collaborative work).

During 1998, we apply for their registration in the CIRAD rice catalog.
In 1999, these lines were seed increased at PES for further distribution to regional NARS.

2.1.8. Line dispatch to NARS

During 1999, we dispatched seed samples (S8 generation) to our main collaborators in LAC and abroad, for evaluation and selection.

Samples of 385 lines were shipped to:

Argentina	Universidad de Tucumán
Brazil	EMBRAPA Arroz e Feijão
Bolivia	CIAT- Bolivia, Santa Cruz de la Sierra
Venezuela	FONAIAP
The Caribbean	CRID Net
Cuba	IIA
China	FCRI/YAAS - Yunnan
	CATAS - Hainan

The results of the evaluation and local selection will be presented next year.

2.2. POPULATION MAINTENANCE through RECOMBINATION

During 1999, no population maintenance was made, enough seed is stored in the CIAT's cold chamber.

2.3. 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.

2.3.1. Recurrent Selection Based on S2 Line Evaluation

- **Population PCT-4\0\0\1**

Cropping season 1999 A

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 S2's lines

A set of 155 lines S2 from the first cycle of recurrence was remitted to **Brazil** (EMBRAPA Arroz e Feijão), **Bolivia** (CIAT Santa Cruz), and **Venezuela** (UNELLEZ) for evaluation and selection for line development.

In Bolivia, 22 lines were selected and their progenies will be evaluated next year.

Selection of So fertile plants

Individual selection of fertile plant was made in the population PCT-4\SA\2\1 (see generation S0)

2.3.2. Mass Recurrent Selection for Both Sexes for "Hoja Blanca", 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 the "Hoja Blanca" virus**

S2 evaluation of the enhanced populations showed that 97.2% have resistant and intermediate reaction to Hoja Blanca. 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.

2.3.3. Recombination of the population PCT-11

The new population was developed during 1997 and 1998.

Cropping season 1999
The second cycle of recombination was completed at LES.
Fertile plants of the second recombination (population PCT-11\0\0\2) were selected, (see generation S0).

2.4. REGISTERING NEW POPULATIONS

In 1999, one (1) new germplasm was registered, on request from our partner in China.

- **PYN-1** *Japonica* population for upland-hillsides ecosystem (FCRI/YAAS, Yunnan Province - China).

2.5. SPECIAL STUDY. Genetic Progress, Population PCT-4

Principal objective
Master Degree Thesis of Yolima Ospina at the "Universidad Nacional de Palmira".

Specific objective
Evaluation of genetic progress for acid soil tolerance and different agronomic characteristics like; flowering time, plant height and grain yield, through recombination cycles Genetic progress after one selection cycle and effect of different recombination cycles.

Method
Evaluation of S1 lines in two contrasted plots for soil acidity.
The statistical design was the Augmented Federer blocks composed by S1 from the four population and 6 checks (3 susceptible - CICA 8, CICA 9 y Oryzica Llanos 5 - and 3 tolerant - Oryzica Sabana 6, Oryzica Sabana 10 y CIRAD 409 - to soil acidity).
Data were collected and are currently processed.

POPULATION BREEDING for LOWLAND RICE

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 is being edited by Dr. Elcio .P. Guimarães and will be published by CIAT, CIRAD and EMBRAPA Rice and Beans.

In this report, we will only describe the activities developed in Colombia, by the CIAT/CIRAD project.

2. POPULATION BREEDING for 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 sent to DANAC-Venezuela.

3. POPULATION BREEDING for 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.

4. POPULATION BREEDING for CHILE

The Chilean population **PQUI-1** was selected in two sites with climatic differences (Chillan 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 second 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.

5. POPULATION BREEDING for URUGUAY

Three (3) populations are currently developed in collaboration with CIAT: **PURG-1, PURG-2** and **PURG-3**

Cropping Season 1999

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

6. MAINTAINING GERMPLASM

Because we manage the catalogue for rice germplasm for recurrent selection, we also have the responsibility to ensure the presence of sufficient seed in the germplasm bank. Because of sufficient disposability of seed, no multiplication was done this year.

7. DISTRIBUTING GERMPLASM

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

8. 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).

9. FIXED LINES from CHILEAN POPULATIONS through ANTHER CULTURE

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 will be advanced in Colombia during the first semester of year 2000, and then dispatched to Chile.

10. FIXED LINES from CROSSES for ROMANIA through ANTHER CULTURE

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 was produced. The R2 seeds were shipped to Romania and also to France and Chile.

11. FIXED LINES from CROSSES for SPAIN through ANTHER CULTURE

On request from Spain and CIRAD-CA, four crosses were made at CIAT Palmira and will be processed by anther culture.

The F1 hybrid seed was obtained, and the F1's generations will be grown during the last trimester of 1999. In early year 2000, plants will be processed by anther culture.

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

PROYECTO COLABORATIVO ENTRE EL CIRAD, CIAT, y FLAR

Mejoramiento Poblacional con Androesterilidad y Mejoramiento Convencional

Marc Châtel, Yolima Ospina, y Jaime Borrero

Informe anual 1999: Resumen

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 para su entrega inmediata a los programas nacionales. Sin embargo, existen líneas avanzadas creadas 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.

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

En 1999, una línea de WARDA y 3 de *O. glaberrima* fueran seleccionadas.

- **Líneas de Madagascar**

Descendencias de cruces hechos en Madagascar para secano de laderas fueron introducidas en Colombia, por el Dr. Michel Vales. Descendencias F3 fueran evaluadas. Ninguna líneas fue seleccionada.

3. LANZAMIENTO de LÍNEAS en BRASIL

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.

En 1998, 3 nuevas líneas CIAT fueron identificadas como promisorias para su lanzamiento.

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 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 CT como también descendencias de cruces entre líneas chinas y CT están siendo evaluadas en diferentes ensayos.

MEJORAMIENTO POBLACIONAL PARA 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 de 1999 en Villavicencio - Meta en la , Estación Experimental "La Libertad" (EELL).

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 S0

El primer paso del desarrollo es la selección de plantas fértiles.

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

1999 A
19 plantas individuales fueron seleccionadas.
1999 B, la generación S1 se sembrara en EEP.

- **Población PCT-4\SA\3\1** (Tercer ciclo de recombinación**\3** después de una selección para suelos ácidos **\SA**)

1999 A
61 plantas individuales fueron seleccionadas.
Durante 1999 B, la generación S1 se sembrara en EEP.

2.1.2. Generación S2

La generación S2 viene de las plantas fértiles S0 seleccionadas durante 1998 A en la EELL.

Se ha avanzado la generación S1 en EEP durante 1998 B.

- **Poblaciones PCT-5\PHB\1\0,PHB\1,PHB\1 PCT-A\PHB\1\0,PHB\1,PHB\1; y PCT-4\PHB\1\1,PHB\1,PHB\1** (Tres ciclos de selección recurrente para Piricularia en hojas P y Hoja Blanca HB)

1999 A

107 líneas S2 fueron avaluadas y se seleccionaron 3 (3%) en dos poblaciones (ninguna selección se hizo en la población PCT-5\PHB\1\0,PHB\1,PHB\1).

1999 B, la generación S3 se sembró en la EEP.

- **Población PCT-4\SA\2\1**

(Segundo ciclo de recombinación **\2** después de una selección para suelos ácidos **\SA**)

1999 A

73 líneas S2 fueron evaluadas y se seleccionaron 5 (6.8%) en EELL. En cada línea seleccionada se escogieron números distintos de plantas.

1999 B, las 23 líneas S3 (3 familias de 6 líneas, 1 familia de 2 líneas y 1 familia de 3 líneas) se sembró en la EEP.

- **Población PCT-11\0\0\1**

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

1999 A

84 líneas S2 fueron evaluadas y se seleccionaron 4 (4.8%) en EELL. En cada línea seleccionada se escogieron números distintos de plantas.

1999 B, las 22 líneas S3 (3 familias de 6 líneas, 1 familia de 4 líneas) se sembraron en EEP.

2.1.3. Generación S4

La generación S4 viene de plantas fértiles S0 seleccionadas durante 1997 A en la EELL.

Las generaciones S1 y S3 se avanzaron en la EEP, durante 1997 B y 1998 B respectivamente.

Las generaciones S2 y S4 se observaron y se seleccionaron en la EELL durante 1998 A y 1999 A 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 S4 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 S5 (7 familias de 6 líneas) se sembraron en la EEP.

- **Población PCT-4\SA\1\1**

(Primer ciclo de recombinación \1\ después de una selección para suelos ácidos **\SA**)

1999 A

Las 390 líneas S4 fueron evaluadas y se seleccionaron 44 (11%) en la EELL. En cada una se escogió 6 plantas individuales.

1999 B, las 264 líneas S5 (44 familias de 6 líneas)se sembraron en la EEP.

2.1.4. Generación S6

La generación S6 viene de las plantas S0 seleccionadas en la EELL, en 1996 A.

Las generaciones S1, S3 y S5 se avanzaron en la EEP durante 1996 B, 1997 B y 1998 B respectivamente.

Las generaciones S2, S4 y S6 se observaron y se seleccionaron en la EELL durante 1997 A, 1998 A y 1999 A 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)

1999 A

Las 150 líneas S6 fueron evaluadas y se seleccionaron 13 (8.6%) en la EELL. En cada una de las líneas seleccionadas se cosecharon 6 plantas individuales.

1999 B, las 78 líneas (13 familias de 6 líneas) se sembraron en la EEP.

2.1.5 Generación S8

La generación S8 viene de las plantas S0 seleccionadas en la EELL durante 1995 A.

Las generaciones S1, S3, S5 y S7 fueron avanzadas en la EEP durante 1995 B, 1996 B, 1997 B y 1998 B respectivamente.

Las generaciones S4, S6 y S8 se observaron y se seleccionaron en la EELL durante 1996 A, 1997 A, 1998 A y 1999 A respectivamente.

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

(Poblaciones base sin selección recurrente)

1999 A

Las 301 líneas S8 se evaluaron y se seleccionaron 44 (14.6%) en la EELL. En cada línea seleccionada se cosecho 6 plantas individuales.

1999 B, las 264 líneas (44 familias de 6 líneas) se sembraron en la EEP.

- **Población PCT-4\0\0\1>S2**

1999 A

Las 72 líneas S8 se evaluaron y se seleccionaron 6 (8%) en la EELL. En cada una se cosecharon 6 plantas individuales.

1999 B, las 36 líneas (6 familias de 6 líneas) se sembraron en la EEP.

- **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 S3 en la EEP en 1996 B)
1999 A
Las 12 líneas S8 se evaluaron y se selecciono 1 (8%) en la EELL. En cada una se cosecharon 6 plantas individuales.
1999 B, las 6 líneas (1 familia de 6 líneas) se sembraron en la EEP.

2.1.6. Generaciones avanzadas

Estas generaciones son representadas por líneas fijas promisorias seleccionadas a partir de las poblaciones introducidas de Brasil en el año de 1992.

- **Poblaciones CNA-IRAT 5 y CNA-IRAT A**

1998 A y 1999 A
Las mejores líneas fueron utilizadas para formar el ensayo regional del INGER-LAC "Vivero Internacional de Observación para América Latina" (VIOAL suelos ácidos).

2.1.7. Registró de líneas

El CIAT no registra líneas, pero el CIRAD tiene un mecanismo por el cual los mejoradores pueden registrar sus líneas. Las líneas son llamadas de CIRAD y se hace referencia a los obtentores.

Durante el año 1998, hemos aplicado por registrar algunas líneas en el catalogo del CIRAD.
En 1999, estas líneas fueron multiplicadas y distribuidas a los programas nacionales.

2.1.8. Envío de líneas a los programas nacionales

Durante el año de 1999, hemos enviado muestras de 385 líneas S8 a los siguientes socios, para su evaluación y selección.

Argentina	Universidad de Tucumán
Brasil	EMBRAPA Arroz e Feijão
Bolivia	CIAT- Bolivia, Santa Cruz de la Sierra
Venezuela	FONAIAP
El Caribe	CRID Net
Cuba	IIA
China	FCRI/YAAS - Yunnan
	CATAS - Hainan

Los resultados de las evaluaciones serán presentados en el informe del año próximo.

2.2. MANTENIMIENTO DE LAS POBLACIONES con RECOMBINACIÓN

Durante 1999, no se ha multiplicado ningún germoplasma, pues tenemos semilla suficiente guardada en el cuarto frío de CIAT.

2.3. 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 reservorio para el desarrollo de líneas fijas y/o progenitores potenciales para los programas nacionales.

2.3.1. Selección recurrente con evaluación de descendencias S2

- **Población PCT-4\0\0\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 S2

155 líneas S2 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.

Selección de plantas fértiles S0

Selección de plantas fértiles se hizo en la población PCT-4\SA\2\1 (ver generación S0)

2.3.2. Selección recurrente masal en ambos sexos para Piricularia, Hoja Blanca, y caracteres agronómicos.

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

Durante 1998 B, 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 S2 del germoplasma mejorado mostró que 97.2% de ellas presentaron resistencia o reacción intermediaria al virus de la Hoja Blanca.

2.3.3. Recombinación de la población PCT-11

Esta población se sintetizo durante 1997 y 1998.

1999 A

Se completo el segundo ciclo de recombinación en la EELL.
Plantas fértiles S0 se seleccionaron en la población PCT-11\0\0\2 (ver generación S0).

2.4. REGISTRACIÓN de NUEVAS POBLACIONES

En 1999, una población se registro a pedido de la China.

- **PYN-1** Población *Japonica* para las condiciones de ladera (FCRI/YAAS, Provincia de Yunnan - China).

2.5. ESTUDIO ESPECIAL. Progreso genético, población PCT-4

Objetivo principal

Tesis de grado de Maestría de la Ingra. Yolima Ospina. Universidad Nacional de Palmira.

Objetivo especifico

Evaluación del progreso genético para tolerancia a suelo ácido y otros caracteres agronómicos como, floración altura de planta rendimiento en diferentes ciclos de recombinación. Progreso genético después de un ciclo de selección y efecto de diferentes ciclos seguidos de recombinación.

Método

Evaluación de líneas S1 en dos ambientes contrastantes de acidez de suelo.
El diseño estadístico es el de bloques aumentados de Federer compuestos de líneas S1 y 6 testigos (3 susceptibles - CICA 8, CICA 9 y Oryzica Llanos 5 - y 3 tolerantes - Oryzica Sabana 6, Oryzica Sabana 10 y CIRAD 409 - a la acidez del suelo).
Los datos están siendo procesados.

MEJORAMIENTO POBLACIONAL para ARROZ DE RIEGO

1. INTRODUCCIÓN

El proyecto de mejoramiento poblacional 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 Drs. 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 Goiania-Brasil. Durante este evento, los diferentes colaboradores presentaron los avanzos alcanzados en sus proyecto de mejoramiento. Un documento con todas las publicaciones fue distribuido a los participantes. Se debe editar un libro que será publicado conjuntamente por CIAT, CIRAD y EMBRAPA Arroz e Feijão.

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

2. MEJORAMIENTO POBLACIONAL para 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.

3. MEJORAMIENTO POBLACIONAL para ARGENTINA

Desarrollo de poblaciones locales

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

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.

4. MEJORAMIENTO POBLACIONAL para 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

Se completo el tercer ciclo de recombinación de ambas poblaciones durante el primer semestre de 1999.

5. MEJORAMIENTO POBLACIONAL para URUGUAY

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

1999

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

6. MANTENIMIENTO del GERMOPLASMA

El proyecto CIAT/CIRAD esta encargado de registrar el germoplasma para selección recurrente y consecuentemente de su mantenimiento (multiplicación). Como tenemos suficiente semilla guardada en el cuarto frío de CIAT ninguna multiplicación se ha hecho este año.

7. ENVIO de GERMOPLASMA

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

8. REGISTRACIÓN de NUEVOAS 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, Yunnan Provincia - China).
- **PFD-1** y **PFD-2** Poblaciones *Indica* para riego tropical (DANAC - Venezuela).

9. DESARROLLO DE LÍNEAS FIJAS de POBLACIONES CHILENAS por CULTIVO DE ANTERAS

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 será avanzada en Colombia y luego su semilla enviada a Chile.

10. DESARROLLO DE LÍNEAS FIJAS de CRUCES CONVENCIONALES 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 fueron producida y su semilla enviada a Rumania, Francia y Chile.

11. DESARROLLO DE LÍNEAS FIJAS de CRUCES CONVENCIONALES 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 serán procesadas durante el primer semestre del año 2000.

CHAPTER I

PRESENTATION

1. CIAT RICE PROJECT

2. FUND FOR LATINAMERICAN AND THE CARIBBEAN IRRIGATED RICE (FLAR)

3. CIRAD/CIAT/FLAR COLLABORATIVE PROJECT

3.1. CONVENTIONAL BREEDING

3.2. POPULATION BREEDING

4. ACKNOWLEDGMENTS

CHAPTER I

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 1999-work plan of the CIAT/CIRAD/FLAR collaborative project is presented in Appendix 2.

The 4th Strategic Alliance Meeting between CIAT, CIRAD, INRA, and IRD (former ORSTOM) was held during June 21-24, 1999 at Montpellier, France.

The conclusion of the meeting for Rice Improvement pointed out that, quote: "Development of Improved Rice Populations using recurrent selection and conventional breeding is being accomplished very efficiently in terms of technical and scientific results, as well as development and training activities. CIAT considers that the work conducted by Marc Châtel is clearly a priority for CIAT".

3.1. CONVENTIONAL BREEDING

In 1996, after the leaving of the CIAT scientist in charge, 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.

In 1998 and 1999, 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).

We maintain strong relationships with:

- **Brazil**, EMBRAPA Rice and Beans Center,
- **Bolivia**, CIAT Santa Cruz, and
- **Venezuela**, National Experimental University of the Oriental Plains "Ezequiel Zamora" (UNILLEZ).

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

In the **Caribbean**, **Guyana**, **Belize** and **Cuba** were identified as new partners, through the Caribbean Rice Industry Development Network (CRIDNet).

3.2. POPULATION BREEDING

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.

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 fecundated male-sterile plants,
- To select fertile plants for fixed lines or potential parents,
- To start population enhancement, using recurrent selection, and
- To create, in collaboration with LAC NARS, new populations by incorporating local variability into the best-adapted 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 Blaca 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 ecoregional regions.

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.

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.

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 in June 2001.

Workshops

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

The second one was held at the same place, and 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.

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 specific populations for future local use,
- generation advance, recombination cycles, and
- anther culture.

Registering populations for recurrent selection breeding

On request from breeders, the project is in charge of registering new populations developed by NARS.

In 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,

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. CIAT and CIRAD are making the follow-up.

4. ACKNOWLEDGMENTS

This document reports the research activities developed during the second semester of 1998 (1998 B) at CIAT headquarters (Palmira Experimental Station (PES), Department of Valle, Colombia) and the first semester of 1999 (1999 A), and "La Libertad" Experiment Station (LES) Villavicencio, Department of Meta, Colombia).

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, a 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 will start during the next cropping season with 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 received from the following scientists:

Argentina	
María Antonia Marassi	Universidad de Corrientes
Juan Antonio Marassi	Universidad de la Plata
Marta Genoveva Nicosia	Universidad Nacinal de Tucumán
José Villegas	Universidad Nacinal de Tucumán
Bolivia	
Roger Taboada Paniagua	CIAT Santa Cruz de la Sierra
R. Guzmán	CIAT Santa Cruz de la Sierra
Brazil	
Emilio da Maia de Castro	EMBRAPA Arroz e Feijão
Elcio Perpetuo Guimarães	EMBRAPA Arroz e Feijão
James Taillebois	CIRAD-CA

Chile	
Roberto Alvarado	INIA-Quilamapú
Santiago Ignacio Hernaiz Lagos	INIA-Quilamapú
China	
Tao Dayun	FCRI/YAAS, Yunnan Province
Li Kai Mian	CATAS, Hainan Province
Colombia	
Hernando Delgado Huertas	CORPOICA-Regional 8
Edgar Corredor	FEDEARROZ
Costa Rica	
Randolph Campos Morera	Ministry of Agriculture
Cuba	
Rene Perez Polanco	IIA Sancti-Spiritus
El Salvador	
Ramón Eduardo Servillón	CENTA
France	
Guy Clément	CIRAD/CFR
Panama	
Ariel E. Jaén Sánchez	Universidad de Panama
Spain	
José Pedro Castells Franch	Semillas Certificadas Castells
Venezuela	
Alberto Herrera G.	Universidad (UNILLEZ)
Eduardo Graterol	DANAC - Fundación Polar
Carlos Gamboa	DANAC - Fundación Polar
Gelis Torrealba	FONAIAP
Uruguay	
Fernando Blaz Pérez de Vida	INIA-Treinta y Trés

CHAPTER II

CONVENTIONAL BREEDING FOR UPLAND SAVANNA

1. INTRODUCTION
2. LINE SELECTION in COLOMBIA
3. LINE RELEASE in BRAZIL
4. LINE RELEASE in BOLIVIA
5. USE of CIAT and CIRAD LINES in CHINA

CHAPTER II

CONVENTIONAL BREEDING FOR UPLAND SAVANNA

1. INTRODUCTION

As it has been stated earlier, we are gradually phasing out most of the activities involving the development of fixed lines 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.

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

In 1996 B, 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 B, 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, and *Oryza sativa* lines from Madagascar.

- **CIAT/CIRAD conventional breeding lines**

During 1998 A, 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.

- **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 (tables 2 and 3).

- **Lines from Madagascar**

Dr. Michel Vales introduced progenies from crosses made in Madagascar for the highlands, in Colombia. F3 progenies were evaluated (table 4). The lines present low vigor and non-adapted plant type. No selection was made.

3. 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.

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), and
PRIMAVERA (States of Goias, Tocantins, Maranhão, Piaui, Mato Grosso and Mato Grosso do Sul).

From these, the CIAT conventional breeding program developed 2:

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.

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, **in 1995**, the CIAT/CIRAD project sent to China the first set of savanna lines developed in Brazil and Colombia. Preliminary results were promising.

In 1997, line **CT 9278-11-14-2-1-M** was identified as very promising parent.

New CT lines are under evaluation in different trials and sites as well as progenies from CIAT and Chinese parents.

Table1. Evaluation of lines from the conventional breeding project

La libertad experimental station, 1999A

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	BI	BI	FI 50%	LSc	BS	GD	NBI
1	S990001	1006	CT11231-2-2-1-M-1	3	1	1	85	5	3	3	1
2	S990002	1007	CT11231-2-2-1-M-2	5	1	1	82	5	3	3	1
3	S990003	1008	CT11231-2-2-1-M-3	3	1	1	86	5	3	3	1
4	S990004	1009	CT11231-2-2-1-M-4	3	1	1	85	3	3	3	1
5	S990005	1010	CT11231-2-2-1-M-5	3	1	1	83	3	3	3	1
	T1		CIRAD 409	5	1	1	66	3	1	1	1
	T2		O.Sabana 6	3	2	2	85	3	1	1	1
	T3		O.Sabana 10	5	1	1	90	3	1	1	1
6	S990006	1011	CT11231-2-2-1-M-6	5	2	1	80	3	1	1	1
7	S990007	1012	CT9899-12-6-3P-1-4-M-1	5	2	2	85	3	3	3	1
8	S990008	1013	CT9899-12-6-3P-1-4-M-2	5	2	1	80	5	3	3	1
9	S990009	1014	CT9899-12-6-3P-1-4-M-3	5	2	3	83	3	3	1	1
10	S990010	1015	CT9899-12-6-3P-1-4-M-4	5	2	1	83	3	3	1	1
11	S990011	1016	CT9899-12-6-3P-1-4-M-5	5	2	2	80	3	3	1	1
12	S990012	1017	CT9899-12-6-3P-1-4-M-6	5	2	2	82	3	3	1	1
13	S990013	1018	CT9907-5-3-1P-3-1-M-1	5	1	1	79	1	1	3	1
14	S990014	1019	CT9907-5-3-1P-3-1-M-2	5	1	1	80	1	1	1	1
15	S990015	1020	CT9907-5-3-1P-3-1-M-3	5	2	1	80	3	1	1	1
16	S990016	1021	CT9907-5-3-1P-3-1-M-4	5	1	1	82	3	1	1	1
17	S990017	1022	CT9907-5-3-1P-3-1-M-5	5	1	1	80	3	1	1	1
18	S990018	1023	CT9907-5-3-1P-3-1-M-6	5	1	1	82	3	1	1	1
19	S990019	1024	CT11632-3-3-M-1	5	1	1	91	3	3	3	1
20	S990020	1025	CT11632-3-3-M-2	5	1	1	90	3	1	3	1
21	S990021	1026	CT11632-3-3-M-3	5	1	1	90	3	1	1	1
22	S990022	1027	CT11632-3-3-M-4	5	1	1	90	3	1	1	1
23	S990023	1028	CT11632-3-3-M-5	5	1	1	90	3	3	1	1
24	S990024	1029	CT11632-3-3-M-6	5	1	1	90	3	3	3	1
25	S990025	1030	CT11891-3-3-3-M-1	3	1	1	63	3	1	1	1
26	S990026	1031	CT11891-3-3-3-M-2	3	1	1	64	3	1	1	1
27	S990027	1032	CT11891-3-3-3-M-3	3	1	1	63	3	1	1	1
28	S990028	1033	CT11891-3-3-3-M-4	3	1	1	63	3	1	1	1
29	S990029	1034	CT11891-3-3-3-M-5	3	2	1	63	3	1	1	1
30	S990030	1035	CT11891-3-3-3-M-6	3	1	1	63	3	1	1	1
31	S990031	1036	CT11231-2-2-1-3-M-1	5	3	2	78	3	1	1	1
32	S990032	1037	CT11231-2-2-1-3-M-2	5	2	1	78	3	1	1	1
33	S990033	1038	CT11231-2-2-1-3-M-3	5	2	2	77	3	1	1	1
34	S990034	1039	CT11231-2-2-1-3-M-4	5	2	1	80	3	1	1	1
35	S990035	1040	CT11231-2-2-1-3-M-5	5	1	1	77	3	1	1	1
36	S990036	1041	CT11231-2-2-1-3-M-6	5	1	1	78	1	1	1	1
37	S990037	1042	CT11891-3-3-3-M-1	5	1	1	64	1	1	1	1
38	S990038	1043	CT11891-3-3-3-M-2	5	1	1	64	3	1	1	1
39	S990039	1044	CT11891-3-3-3-M-3	5	1	1	63	3	1	1	1
40	S990040	1045	CT11891-3-3-3-M-4	1	1	1	64	1	1	1	1
41	S990041	1046	CT11891-3-3-3-M-5	1	1	1	64	1	1	1	1
42	S990042	1047	CT11891-3-3-3-M-6	1	1	1	63	1	1	1	1
43	S990043	1048	CT13366-8-2-M-1	1	1	1	76	1	1	1	1
44	S990044	1049	CT13366-8-2-M-2	1	3	2	70	3	1	1	1
45	S990045	1050	CT13366-8-2-M-3	1	2	1	68	3	1	1	1
46	S990046	1051	CT13366-8-2-M-4	1	1	1	70	1	1	1	1
47	S990047	1052	CT13366-8-2-M-5	3	1	1	75	1	1	1	1
48	S990048	1053	CT13366-8-2-M-6	3	3	1	70	1	1	1	1
49	S990049	1054	CT13366-9-3-M-1	3	2	1	76	1	1	1	1

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	Bl	Bl	Fl 50%	LSc	BS	GD	NBl
50	S990050	1055	CT13366-9-3-M-2	5	2	1	76	1	1	1	1
51	S990051	1056	CT13366-9-3-M-3	5	4	1	76	1	3	1	1
52	S990052	1057	CT13366-9-3-M-4	5	4	1	70	1	1	1	1
53	S990053	1058	CT13366-9-3-M-5	3	3	1	72	1	3	1	1
54	S990054	1059	CT13366-9-3-M-6	3	2	1	84	1	1	3	1
55	S990055	1060	CT13366-9-5-M-1	3	3	1	78	3	1	1	1
56	S990056	1061	CT13366-9-5-M-2	3	2	1	76	3	1	1	1
57	S990057	1062	CT13366-9-5-M-3	5	3	1	75	3	1	1	1
58	S990058	1063	CT13366-9-5-M-4	5	2	1	77	1	1	1	1
59	S990059	1064	CT13366-9-5-M-6	5	4	1	76	1	1	1	1
60	S990060	1065	CT13370-2-1-M-1	3	2	1	78	1	1	1	1
61	S990061	1066	CT13370-2-1-M-2	3	2	1	80	1	1	1	1
62	S990062	1067	CT13370-2-1-M-3	5	1	1	80	1	1	1	1
63	S990063	1068	CT13370-2-1-M-4	5	1	1	80	1	1	1	1
64	S990064	1069	CT13370-2-1-M-5	3	1	1	80	1	1	1	1
65	S990065	1070	CT13370-2-1-M-6	5	1	1	80	1	1	1	1
	T1		CIRAD 409	7	1	1	64	1	1	1	1
	T2		O.Sabana 6	5	3	2	86	1	1	1	1
	T3		O.Sabana 10	7	2	1	91	3	1	1	1
66	S990066	1071	CT13370-3-4-M-1	5	1	1	81	1	1	1	1
67	S990067	1072	CT13370-3-4-M-2	5	1	1	85	1	1	1	1
68	S990068	1073	CT13370-3-4-M-3	5	1	1	86	1	1	1	1
69	S990069	1074	CT13370-3-4-M-4	5	1	1	84	1	1	1	1
70	S990070	1075	CT13370-3-4-M-5	7	1	1	89	1	1	1	1
71	S990071	1076	CT13366-9-5-M-5	7	2	1	81	3	1	1	1
72	S990072	1077	CT13370-3-4-M-6	7	1	1	80	3	1	1	1
73	S990073	1078	CT13371-5-1-M-1	3	3	1	83	3	1	1	1
74	S990074	1079	CT13371-5-1-M-2	3	2	1	82	3	1	1	1
75	S990075	1080	CT13371-5-1-M-3	3	3	1	80	1	1	1	1
76	S990076	1081	CT13371-5-1-M-4	3	2	1	78	1	1	1	1
77	S990077	1082	CT13371-5-1-M-5	1	2	1	80	3	1	1	1
78	S990078	1083	CT13371-5-1-M-6	1	2	1	78	3	1	1	1
79	S990079	1084	CT13382-8-3-M-1	1	2	1	80	3	1	1	1
80	S990080	1085	CT13382-8-3-M-2	1	2	1	78	3	1	1	1
81	S990081	1086	CT13382-8-3-M-3	1	1	1	80	3	1	1	1
82	S990082	1087	CT13382-8-3-M-4	1	1	1	80	3	1	1	1
83	S990083	1088	CT13382-8-3-M-5	3	1	1	80	3	1	1	1
84	S990084	1089	CT13382-8-3-M-6	3	3	1	82	3	1	1	1
85	S990085	1090	CT13382-9-M-1	5	3	1	85	3	1	1	1
86	S990086	1091	CT13382-9-M-2	5	4	2	81	1	1	1	1
87	S990087	1092	CT13382-9-M-3	5	2	1	82	3	1	1	1
88	S990088	1093	CT13382-9-M-4	5	2	1	82	1	1	1	1
89	S990089	1094	CT13382-9-M-5	5	3	1	82	1	1	3	1
90	S990090	1095	CT13382-9-M-6	5	1	1	84	3	1	1	1
91	S990091	1096	CT13569-5-1-M-1	5	2	2	86	1	1	1	1
92	S990092	1097	CT13569-5-1-M-2	5	1	2	85	1	1	1	1
93	S990093	1098	CT13569-5-1-M-3	3	3	1	83	3	1	3	1
94	S990094	1099	CT13569-5-1-M-4	5	2	1	86	5	1	5	1
95	S990095	1100	CT13569-5-1-M-5	5	3	3	89	3	1	3	1
96	S990096	1101	CT13569-5-1-M-6	5	2	1	85	3	1	3	1
97	S990097	1102	CT13569-5-5-M-1	5	1	1	90	3	1	3	1
98	S990098	1103	CT13569-5-5-M-2	5	2	1	84	3	1	1	1
99	S990099	1104	CT13569-5-5-M-3	5	2	1	85	3	1	1	1
100	S990100	1105	CT13569-5-5-M-4	7	2	1	84	3	1	1	1
101	S990101	1106	CT13569-5-5-M-5	5	1	1	82	3	1	1	1

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	Bl	Bl	Fl 50%	LSc	BS	GD	NBl
102	S990102	1107	CT13569-5-5-M-6	5	1	1	84	3	1	1	1
103	S990103	1108	CT13569-5-6-M-1	5	3	1	85	3	1	3	1
104	S990104	1109	CT13569-5-6-M-2	5	3	1	81	3	1	3	1
105	S990105	1110	CT13569-5-6-M-3	5	2	2	89	3	1	3	1
106	S990106	1111	CT13569-5-6-M-4	5	3	1	87	1	1	3	1
107	S990107	1112	CT13569-5-6-M-5	5	3	1	80	3	1	3	1
108	S990108	1113	CT13569-5-6-M-6	5	2	1	78	1	1	1	1
109	S990109	1114	CT13569-8-1-M-1	5	3	2	82	1	1	1	1
110	S990110	1115	CT13569-8-1-M-2	5	2	1	80	1	1	1	1
111	S990111	1116	CT13569-8-1-M-3	5	2	1	83	1	1	1	1
112	S990112	1117	CT13569-8-1-M-4	5	2	1	81	1	1	1	1
113	S990113	1118	CT13569-8-1-M-5	7	2	1	78	1	3	3	1
114	S990114	1119	CT13569-8-1-M-6	5	2	1	78	1	1	1	1
115	S990115	1120	CT13569-8-2-M-1	5	2	1	82	1	1	1	1
116	S990116	1121	CT13569-8-2-M-2	5	2	1	78	1	1	1	1
117	S990117	1122	CT13569-8-2-M-3	5	2	1	81	1	1	1	1
118	S990118	1123	CT13569-8-2-M-4	5	1	1	82	1	1	1	1
119	S990119	1124	CT13569-8-2-M-5	5	2	1	66	1	1	1	1
	T1		CIRAD 409	5	1	3	89	1	1	1	1
	T2		O.Sabana 6	5	4	1	90	1	1	1	1
	T3		O.Sabana 10	7	2	1	67	1	1	1	1
120	S990120	1125	CT13569-8-2-M-6	5	1	1	86	1	1	1	1
121	S990121	1126	CT13570-1-3-M-1	5	1	1	78	1	1	1	1
122	S990122	1127	CT13570-1-3-M-2	5	1	1	81	1	1	1	1
123	S990123	1128	CT13570-1-3-M-3	5	1	1	88	3	1	3	1
124	S990124	1129	CT13570-1-3-M-4	5	1	1	83	1	1	1	1
125	S990125	1130	CT13570-1-3-M-5	3	1	1	78	1	1	1	1
126	S990126	1131	CT13570-1-3-M-6	3	1	1	80	1	1	1	1
127	S990127	1132	CT13570-3-2-M-1	5	1	1	81	1	1	1	1
128	S990128	1133	CT13570-3-2-M-2	3	1	1	79	1	1	3	1
129	S990129	1134	CT13570-3-2-M-3	3	1	1	85	1	1	1	1
130	S990130	1135	CT13570-3-2-M-4	5	1	1	81	3	1	1	1
131	S990131	1136	CT13570-3-2-M-5	3	1	1	80	1	1	3	1
132	S990132	1137	CT13570-3-2-M-6	5	1	1	80	1	1	1	1
133	S990133	1138	CT13570-3-3-M-1	5	2	2	81	1	1	1	1
134	S990134	1139	CT13570-3-3-M-2	3	1	1	82	1	1	1	1
135	S990135	1140	CT13570-3-3-M-3	5	2	1	80	1	1	1	1
136	S990136	1141	CT13570-3-3-M-4	5	2	1	80	1	1	1	1
137	S990137	1142	CT13570-3-3-M-5	3	1	1	87	1	1	1	1
138	S990138	1143	CT13570-3-3-M-6	5	1	1	80	1	1	1	1
139	S990139	1144	CT13570-13-4-M-1	5	1	1	80	1	1	1	1
140	S990140	1145	CT13570-13-4-M-2	3	1	1	80	1	1	1	1
141	S990141	1146	CT13570-13-4-M-3	5	1	1	79	1	1	1	1
142	S990142	1147	CT13570-13-4-M-4	5	1	1	80	1	1	1	1
143	S990143	1148	CT13570-13-4-M-5	5	1	1	83	1	1	1	1
144	S990144	1149	CT13570-13-4-M-6	7	1	1	87	1	1	1	1
145	S990145	1150	CT13571-12-3-M-1	7	1	1	87	1	1	1	1
146	S990146	1151	CT13571-12-3-M-2	5	1	1	66	1	1	1	1
147	S990147	1152	CT13571-12-3-M-3	5	2	1	87	3	1	1	1
148	S990148	1153	CT13571-12-3-M-4	5	1	1	84	3	1	1	1
149	S990149	1154	CT13571-12-3-M-5	5	1	1	85	3	1	1	1
150	S990150	1155	CT13571-12-3-M-6	5	1	1	85	3	1	1	1
151	S990151	1156	CT13572-3-3-M-1	5	1	1	73	1	1	1	1
152	S990152	1157	CT13572-3-3-M-2	5	1	1	68	1	1	1	1
153	S990153	1158	CT13572-3-3-M-3	5	2	1	66	1	1	1	1

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	vg	Bl	Bl	Fl 50%	LSc	BS	GD	NBl
154	S990154	1159	CT13572-3-3-M-4	5	1	1	69	1	1	1	1
155	S990155	1160	CT13572-3-3-M-5	5	1	1	70	1	1	1	1
156	S990156	1161	CT13572-3-3-M-6	5	1	1	68	1	1	1	1

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

Table 1. Selected lines from the conventional breeding project
La libertad experimental station, 1999A

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	Bl	Bl	Fl 50%	LSc	BS	GD	NBl
1	S990009	1014	CT9899-12-6-3P-1-4-M-3	5	2	3	83	3	3	1	1
2	S990009	1014	CT9899-12-6-3P-1-4-M-3	5	2	3	83	3	3	1	1
3	S990025	1030	CT11891-3-3-3-M-1	3	1	1	63	3	1	1	1
4	S990029	1034	CT11891-3-3-3-M-5	3	2	1	63	3	1	1	1
5	S990034	1039	CT11231-2-2-1-3-M-4	5	2	1	80	3	1	1	1
6	S990035	1040	CT11231-2-2-1-3-M-5	5	1	1	77	3	1	1	1
7	S990036	1041	CT11231-2-2-1-3-M-6	5	1	1	78	1	1	1	1
8	S990037	1042	CT11891-3-3-3-M-1	5	1	1	64	1	1	1	1
9	S990041	1046	CT11891-3-3-3-M-5	1	1	1	64	1	1	1	1
10	S990058	1063	CT13366-9-5-M-4	5	2	1	77	1	1	1	1
11	S990072	1077	CT13370-3-4-M-6	7	1	1	80	3	1	1	1
12	S990090	1095	CT13382-9-M-6	5	1	1	84	3	1	1	1
13	S990110	1115	CT13569-8-1-M-2	5	2	1	80	1	1	1	1
14	S990120	1125	CT13569-8-2-M-6	5	1	1	86	1	1	1	1
15	S990152	1157	CT13572-3-3-M-2	5	1	1	68	1	1	1	1
16	S990154	1159	CT13572-3-3-M-4	5	1	1	69	1	1	1	1

Table 2. Evaluation of lines introduced from WARDA
La libertad experimental station, 1999A

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	Bl	Bl	Fl 50%	LSc	BS	GD	NBl
1	S910001	1552	WAB450-I-B-P-82-2-1-1-M	5	2	1	78	1	1	1	1
2	S910002	1553	WAB450-I-B-P-82-2-1-2-M	5	1	1	78	1	1	1	1
3	S910003	1554	WAB450-I-B-P-82-2-1-3-M	5	1	1	78	1	1	1	1
4	S910004	1555	WAB450-I-B-P-82-2-1-4-M	5	1	1	78	1	1	1	1
5	S910005	1556	WAB450-I-B-P-82-2-1-5-M	5	1	1	78	1	1	3	1
6	S910006	1557	WAB450-I-B-P-82-2-1-6-M	5	1	1	77	1	1	1	1
7	S910007	1558	WAB450-II-1-2-P50-HB-1-M	5	1	1	74	1	1	1	1
8	S910008	1559	WAB450-II-1-2-P50-HB-2-M	5	1	1	74	1	1	1	1
9	S910009	1560	WAB450-II-1-2-P50-HB-3-M	7	2	1	77	1	1	1	1
10	S910010	1561	WAB450-II-1-2-P50-HB-4-M	5	1	1	76	1	1	1	1
11	S910011	1562	WAB450-II-1-2-P50-HB-5-M	5	1	1	74	1	1	1	1
12	S910012	1563	WAB450-II-1-2-P50-HB-6-M	5	1	1	74	1	1	1	1
13	S910013	1564	WAB450-I-B-P-78-HB-1-M	5	1	1	70	1	1	1	1
14	S910014	1565	WAB450-I-B-P-78-HB-2-M	3	1	1	68	1	1	1	1
15	S910015	1566	WAB450-I-B-P-78-HB-3-M	3	1	1	68	1	1	1	1
16	S910016	1567	WAB450-I-B-P-78-HB-4-M	3	1	1	70	1	1	1	1
17	S910017	1568	WAB450-I-B-P-78-HB-5-M	3	1	1	68	1	1	1	1
	T1		CIRAD 409	5	1	1	66	3	1	1	1
	T2		O.Sabana 6	3	2	1	89	3	1	1	1
	T3		O.Sabana 10	5	1	1	91	3	1	1	1
18	S910018	1569	WAB450-I-B-P-78-HB-6-M	5	1	1	69	1	1	1	1
19	S910019	1570	WAB450-I-B-P-57-3-1-1-M	3	1	1	75	1	1	1	1
20	S910020	1571	WAB450-I-B-P-57-3-1-2-M	3	1	1	74	3	1	1	1
21	S910021	1572	WAB450-I-B-P-57-3-1-3-M	5	1	1	75	1	1	1	1
22	S910022	1573	WAB450-I-B-P-57-3-1-4-M	5	1	1	75	1	1	1	1
23	S910023	1574	WAB450-I-B-P-57-3-1-5-M	3	1	1	75	1	1	1	1
24	S910024	1575	WAB450-I-B-P-57-3-1-6-M	5	1	1	74	1	1	1	1
25	S910025	1576	WAB450-I-B-P-133-HB-1-M	5	2	1	77	1	1	1	1
26	S910026	1587	WAB450-I-B-P-6-2-1-6-M	5	1	1	76	1	1	1	1
27	S910027	1588	WAB450-16-2-BL1-DR2-1-M	7	1	1	73	1	1	1	1
28	S910028	1589	WAB450-16-2-BL1-DR2-2-M	5	1	1	70	1	1	1	1
29	S910029	1590	WAB450-16-2-BL1-DR2-3-M	5	1	1	73	1	1	1	1
30	S910030	1591	WAB450-16-2-BL1-DR2-4-M	7	1	1	74	1	1	1	1
31	S910031	1592	WAB450-16-2-BL1-DR2-5-M	5	1	1	73	1	1	1	1
32	S910032	1593	WAB450-16-2-BL1-DR2-6-M	5	1	1	69	1	1	1	1
33	S910033	1594	WAB450-16-2-BL1-DV1-1-M	5	1	1	69	1	1	1	1
34	S910034	1595	WAB450-16-2-BL1-DV1-2-M	5	1	1	69	1	1	1	1
35	S910035	1596	WAB450-16-2-BL1-DV1-3-M	5	1	1	70	1	1	1	1
36	S910036	1597	WAB450-16-2-BL1-DV1-4-M	5	1	1	70	1	1	1	1

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

Table 2. Selected line introduced from WARDA
La libertad experimental station, 1999A

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	Bl	Bl	Fl 50%	LSc	BS	GD	NBl
	S910035	1596	WAB450-16-2-BL1-DV1-3-M	5	1	1	70	1	1	1	1

Table 3. *Oryza glaberrima* accessions introduced from WARDA
La libertad experimental station, 1999A

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	Bl	Bl	Fl 50%	LSc	BS	GD	NBl
1	S910037		6331 TOG	3	1	1	101	1	1	1	1
2	S910038		5980 TOG	3	1	1	104		1	1	1
3	S910039		5810 TOG	5	1	1	89	1	1	1	1
4	S910040		5486 TOG	3	1	1	120	1	1	1	1

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

Table 4. Evaluation of F3 progenies from Madagascar (CIRAD-CA/FOFIFA)

La libertad experimental station, 1999A

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	BI	BI	FI 50%	LSc	BS	GD	NBI
1	S930001	1913	PRA 729-ME	5	1	1	67	1	1	1	1
2	S930002	1917	PRA 768-ME	7	3	3	67	1	1	1	7
3	S930003	1918	PRA 769-ME	7	1	1	75	1	3	1	1
4	S930004	1923	PRA 770-ME	7	1	1	69	1	1	3	1
5	S930005	1924	PRA 771-ME	7	1	1	64	1	1	3	1
6	S930006	1934	PRA 772-ME	7	1	2	66	1	3	3	1
7	S930007	1940	PRA 774-ME	7	1	1	58	1	1	1	1
8	S930008	1944	PRA 775-ME	7	1	1	69	1	1	1	1
9	S930009	1988	PRA 736-ME	5	1	1	76	1	3	1	1
10	S930010	1991	PRA 737-ME	5	1	1	76	1	1	3	1
11	S930011	1999	PRA 738-ME	5	1	1	73	1	1	3	1
12	S930012	2007	PRA 742-ME	7	1	1	62	1	1	1	1
13	S930013	2011	PRA 735-ME	5	1	1	63	1	1	3	1
14	S930014	2012	PRA 750-ME	5	1	1	67	1	1	1	1
15	S930015	2013	PRA 745-ME	7	1	1	69	1	1	1	3
16	S930016	2016	PRA 746-ME	7	1	1	62	1	1	3	1
17	S930017	2023	PRA 747-ME	7	1	1	63	1	1	1	1
18	S930018	2025	PRA 748-ME	7	1	1	63	1	1	1	1
19	S930019	2026	PRA 749-ME	5	1	1	63	1	1	1	1
20	S930020	2031	PRA 753-ME	5	1	1	57	1	1	1	1
21	S930021	2056	PRA 764-ME	5	1	1	63	1	1	1	1
22	S930022	2058	PRA 762-ME	3	1	1	72	1	1	1	1
23	S930023	2059	PRA 763-ME	5	1	1	63	1	1	1	3
24	S930024	2060	PRA 765-ME	5	1	1	71	1	1	1	1

Vg = vigor; BI 1 = leaf blast; BI 2 = leaf blast; FI = flowering; LsC = leaf scald; BS = brown spot;

NBI = neck blast; Gd = grain discoloration.

CHAPTER III
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- Population PCT-4\SA\2\1
- Population PCT-11\0\0\1

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CHAPTER III
POPULATION BREEDING FOR SAVANNA RICE

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 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 two seasons at two experiment stations.

- Off season (1998 B): October 1998 - March 1999 at CIAT Palmira - Valle, "Palmira Experiment Station" (PES)
- Cropping season (1999 A): April - September 1999 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).

2.1.1. *Generation S0*

The first step in the development of fixed lines is the selection of individual fertile plants.

- **Population PCT-11\0\0\2**

(Second cycle of recombination **\2**)

Cropping season 1999 *A*

Nineteen (19) individual fertile plants were selected. Table 3.

During 1999 B the S1 generation will be grown off-season at PES and evaluated for tolerance to the Hoja Blanca Virus.

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

(Third recombination cycle **\3** after one selection for acid soil **\SA**)

Cropping season 1999 *A*

Sixty-one (61) individual fertile plants were selected. Table 4.

During 1999 B the S1 generation will be grown off-season at PES and evaluated for tolerance to the Hoja Blanca Virus.

2.1.2. *Generation S2*

The generation S2 comes from fertile S0 plants selected at LES during the cropping season 1998 A.

The generation S1 was advanced off-season during 1998 B at PES.

- **Populations 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

(Third cycle of recurrent selection for leaf blast P and Hoja Blanca **HB**)

Cycles

During 1998 A, we selected a total of 107 fertile S0 plants (30, 24 and 53 plants respectively).

During 1998 B, the 107 lines S1 were advanced off-season at PES

Cropping season 1999 *A*

The 107 lines S2 were evaluated and 3 selected (3%) in two populations (no selection was made in PCT-5\PHB\1\0,PHB\1,PHB\1) (table 5). In each selected line a different number of individual plants was harvested.

During 1999 B, the 13 lines (2 families of 6 lines and 1 family of 1 line) will be advanced off-season and evaluated for tolerance to the Hoja Blanca Virus at PES.

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

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

Cycles

During 1998 A, *we selected 73 plants S0 from the second cycle of recombination, after one selection for acid soil.*

During 1998 B, the generation S1 was grown off-season at PES.

Cropping season 1999 A

The 73 lines S2 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 lines S3 (3 families of 6 lines, 1 family of 2 lines and 1 family of 3 lines) will be grown off-season and evaluated for tolerance to the Hoja Blanca Virus at PES.

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

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

Cycles

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

Cropping Season 1998 A

The PCT-11 Population was grown at LES starting its evaluation and selection. Ninety-five (95) fertile S0 plants were selected.

During 1998 B, the generation S1 was grown off-season at PES. Eleven (11) lines were discarded and 84 harvested.

Cropping season 1999 A

The 84 lines S2 were evaluated and 4 selected (4.8%) at LES (table 7). In each selected line a different number of individual plants was harvested.

During 1999 B, the 22 lines S3 (3 families of 6 lines, 1 family of 4 lines) will be grown off-season and evaluated for tolerance to the Hoja Blanca Virus at PES.

2.1.3. *Generation S4*

The generation S4 comes from S0 fertile plants selected during 1997 A at LES.

Generations S1 and S3 were advanced off-season at PES grown at PES during 1997 B and 1998 B respectively.

Generations S2 and S4 were observed and selected at LES during the cropping seasons 1998 A and 1999 A 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**)

Cycles

During 1997 A, *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 S0 plants, respectively, were harvested.*

During 1997 B, *the S1 generation was grown off-season at PES.*

Cropping Season 1998 A

The 66 S2 lines were evaluated at LES and 8 (12%) were selected from the 3 populations.

In each selected line 6 fertile plants were harvested.

During 1998 B, the 48 lines S3 (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 lines S3 (6 families) was harvested.

Cropping season 1999 A

The 35 lines S4 were evaluated at LES and 7 selected (20%) in the population PCT-4\PHB\1\1,PHB\1 (table 8). In each selected line 6 fertile plants were harvested.

During 1999 B, the 42 lines S5 (7 families of 6 lines) will be grown off-season and evaluated for tolerance to the Hoja Blanca Virus at PES at PES.

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

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

Cycles

During 1997 A, *155 fertile S0 plants were selected at LES.*
Cropping season 1998 A
153 lines S2 were evaluated and 65 (42.5%) were selected, and in each line 6 fertile plants were harvested.

During 1998 B, the 390 lines S3 (65 families of 6 lines) were grown at PES.
Cropping season 1999 A
The 390 lines S4 were evaluated and 44 (11,3%) selected at LES (table 9). In each line 6 fertile plants were harvested.
During 1999 B, the 264 lines S5 (44 families of 6 lines) will be grown off-season and evaluated for tolerance to the Hoja Blanca Virus at PES.

2.1.4. Generation S6

The generation S6 comes from S0 fertile plants selected during 1996 A at LES.

Generations S1, S3 and S5 were advanced off-season at PES during 1996 B, 1997 B and 1998 B respectively.

Generations S2, S4 and S6 were observed and selected at LES during the cropping seasons 1997 A, 1998 A and 1999 A 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 Hoja Blanca **HB**)

Cycles

During 1996 A, *from the first recurrent selection cycle for leaf blast and "hoja blanca" virus, we selected 211 S0 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 1996 B**, the S1 generation (211 S1 lines) were grown at PES and the S2 seeds sent to LES to grow the S2 generation during 1997 A.*

***During 1997 A**, from the 211 S2 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 1997 B**, the 150 S3 lines (25 families of 6 lines) were grown at PES.*

Cropping season 1998 A

From the 150 S4 lines evaluated at LES, 35 (23.3%) were selected.

- *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 1998 B, the 210 lines S5 (35 families of 6 lines) were grown off-season at PES and 150 (25 families of 6 lines) selected.

Cropping season 1999 A

The 150 lines S6 were evaluated and 13 (8.7%) selected at LES (table 10). In each selected line, 6 individual plants were harvested.

During 1999 B, the 78 lines (13 families of 6 lines) will be grown off-season at PES.

2.1.5 Generation S8

The generation S8 comes from fertile S0 plants selected at LES during the cropping season 1995 A.

Generations S1, S3, S5 and S7 were advanced off-season at PES during 1995 B, 1996 B, 1997 B and 1998 B respectively.

Generations S2, S4, S6 and S8 were observed and selected at LES during the cropping seasons 1996 A, 1997 A, 1998 A and 1999 A respectively.

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

(Basic populations without selection)

Cycles

During the 1995 A cropping season *at LES, we selected 55, 85, and 18 fertile S0 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 S1 generation at PES.*

During the 1996 A cropping season, *we observed 158 S2 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 S2 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 S2 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 S2 lines was 14% and the lowest average was 1.6% in 14 S2 lines. The S3 generation was grown during 1996 B at PES and the S4 seeds sent to LES, to advance the S4 generation during 1997 A.

During 1997 A, *from the 178 S4 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 1997 B, *the 282 S5 lines (47 families of 6 lines) were grown at PES.*

Cropping Season 1998 A

From the 282 lines S6, 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 1998 B, the 378 lines S7 (63 families of 6 lines) were grown off-season at PES. From that total, 77 lines were discarded.

Cropping season 1999 A

The 301 lines S8 harvested in PES were evaluated and 44 selected (14.6%) at LES (table 11). In each selected line, 6 individual plants were harvested.

During 1999 B, the 264 lines (44 families of 6 lines) will be grown off-season at PES.

- **Population PCT-4\0\0\1>S2**

Cycles

***During 1996 A**, we started enhancing the population PCT-4 through S2 line evaluation. We took advantage of the 1996 S2 line trial to select lines and individual fertile plants for line development. From 152 S2 lines evaluated, we selected 19 (12.5%) and 74 individual plants, based on plant and grain type, and grain yield potential.*

***During 1996 B**, the S3 generation was grown off-season at PES and the S4 seeds were sent to LES to grow the S4 generation during 1997 A.*

***During 1997 A**, from the 74 S4 lines evaluated, 16 were selected (22%).*

In each selected line, we harvested 6 individual plants.

***During 1997 B**, the 96 S5 lines (16 families of 6 lines) were grown at PES.*

Cropping Season 1998 A

From the 96 lines S6 evaluated, 14 were selected (14.6%). In each selected line 6 fertile plants were harvested.

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

Cropping season 1999 A

The 72 lines S8 selected (12 families of 6 lines) were evaluated, and 6 were selected (8.3%) at LES (table 12). In each selected line, 6 individual plants were harvested.

During 1999 B, the 36 lines (6 families of 6 lines) will be grown off-season at PES.

- **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 S3 Lines at PES, 1996 B)

Cycles

***During 1996 B**, at PES, we selected 12 individual fertile plants, with suitable characteristics, from S3 lines. The S4 seed was sown during 1997 A at LES.*
***During 1997 A**, from the 12 S4 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 1997 B**, the 18 S5 lines (3 families of 6 lines) were grown at PES.*
***Cropping season 1998 A**. The 18 lines S6 were evaluated at LES, and 2 (11. %) were selected.*

During 1998 B, the 12 lines S7 (2 families of 6 lines) were grown off-season at PES.
Cropping season 1999 A
The 12 lines were evaluated and 1 was selected (8.3%) at LES (table 13). In each selected line, 6 individual plants were harvested.
During 1999 B, the 6 lines (1 family of 6 lines) will be grown off-season at PES.

2.1.6. Advanced generations

These generations are promising fixed lines that were selected from the first introduced populations from Brazil in 1992.

- **Populations CNA-IRAT 5 and CNA-IRAT A**

Cycles

***During 1995 B**, at PES, we increased seed of 2 and 4 advanced lines selected from CNA-IRAT 5 and CNA-IRAT A, respectively.*

During 1996 A, we observed these 6 lines at LES. From each of the 6 lines, we selected 5 individual plants.
During 1996 B, we increased seed of the 30 plants at PES to set up a yield trial during 1997 A.
During 1997 A, a yield trial was conducted and analyzed. 8 lines presented a high yield potential and good milling characteristics.

Cropping Seasons 1998 A and 1999 A
The best lines were used to set-up the regional INGER-LAC acid soil nursery called "Vivero Internacional de Observación para America Latina" (VIOAL suelos ácidos, table 14).

2.1.7. Upland line Registration

CIAT does not register lines. When a specific line does well in a given country, the national institution of that country may decide to name and release it for commercial cultivation.

CIRAD has a mechanism by which breeders can register specific material. The line is named CIRAD and is also given a "local synonym", if it is the result of a collaborative work.

Cycles

During 1996, two advanced lines--CNA-IRAT 5 \SA\0\3>127-2-M-2-M and CNA-IRAT A\SA\0\3>1-M-2-M-4-M, selected from the populations CNA-IRAT 5 and CNA-IRAT A--were proposed for registration in the CIRAD rice catalog. They are registered as CIRAD 410 and CIRAD 411, respectively.
During 1997, the results of a yield trial showed that 3 lines were very promising. They were selected from two recurrent populations. They were remitted to INGER LAC to be part of the VIOAL trial for acid soil condition.

During 1998, we apply for their registration in the CIRAD rice catalog.
In 1999, these lines were seed increased at PES for further distribution to regional NARS.

2.1.8. Line dispatch to NARS

During 1999, we dispatched seed samples (S8 generation) to our main collaborators in LAC and abroad, for evaluation and selection.

Samples of 385 lines were shipped to:

Argentina	Universidad de Tucumán
Brazil	EMBRAPA Arroz e Feijão
Bolivia	CIAT- Bolivia, Santa Cruz de la Sierra
Venezuela	FONAIAP
The Caribbean	CRID Net
Cuba	IIA
China	FCRI/YAAS - Yunnan Province
	CATAS - Hainan Province

The results of the evaluation and local selection will be presented next year.

2.2. POPULATION MAINTENANCE through RECOMBINATION

Cycles

Until now, the upland populations were maintained under irrigated conditions at Palmira. But, results obtained in Madagascar under similar condition show that a possible genetic drift toward an increased frequency of Indica plant type may occur in the population.
Such a drift can be explained by a more effective cross-pollination among genotypes with Indica background. We must remember that the male-sterile line used to build up populations is an Indica line (IR 36 male-sterile mutant).
***During the 1996 A cropping season**, we decided to maintain and increase seed of upland populations under savanna conditions. We maintained the following 6 populations: CNA-IRAT 5/0/4, CNA-IRAT A/0/2, CNA-IRAT P/1/1, PCT-A\0\0\0, PCT-5\0\0\0, and PCT-4\0\0\1.*
All male-sterile plants were identified, harvested individually, and their seeds mixed in equal proportions. Fertile plants were also harvested individually and their seeds mixed in equal proportions.
The populations were sent to CIAT Palmira, and stored in a cold chamber until further use by the project or requested by regional NARS breeding programs.

During 1997, 1998 and 1999, no population maintenance was made, enough seed is stored in the CIAT cold chamber.

2.3. 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.

2.3.1. Recurrent Selection Based on S2 Line Evaluation

- **Population PCT-4\0\0\1**

Cycles

During 1995 A, *at LES, 159 S0 fertile plants were selected.*
During 1995 B, *the S1 generation was grown at PES.*
During 1996 A, *we started the first recurrent selection cycle:*

- ***Evaluation:*** *152 lines of S2 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 S2 trial were analyzed and 53 S2 lines were selected.*
- ***Recombination: In 1996 B,*** *at PES, remaining seeds from the S0 plants from which originated the selected S2 lines were mixed and grown to develop the recombined enhanced population.*
- ***Identification:*** *The enhanced recombined population was identified as PCT-4\SA\1\1.*

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

Harvest of Male-Sterile Plants. *Male-sterile plants 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 is identified as PCT-4\SA\2\1. Seed will be stored in the cold chamber for future use.*

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

During 1997 B, *the S1 generation was grown at PES, and S2 seeds harvested.*

Cropping Season 1998 A

From the 155 S2 lines, 152 were evaluated during 1998 A at LES in a trial named "Augmented Blocs of Federer" (BAF), table 5. With a selection index of 39.5% we selected the 60 best lines for recombination from the original S0 selected plants.

During 1998 B, the recombination was made at PES by the sowing of the balanced mixture of S0 seed (equal proportion of seed of each S0 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

Cropping season 1999 A

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 S2's lines

A set of 155 lines S2 from the first cycle of recurrence was remitted to **Brazil** (EMBRAPA Arroz e Feijão), **Bolivia** (CIAT Santa Cruz), and **Venezuela** (UNELLEZ) for evaluation and selection for line development.

In Bolivia, 22 lines were selected and their progenies will be evaluated next year, for fixed line development.

Selection of So fertile plants

Individual selection of fertile plants (table 15) was made in the population PCT-4\SA\2\1 (see table 4, generation S0)

2.3.2. Mass Recurrent Selection for Both Sexes for "Hoja Blanca", Blast, and Major Agronomic Traits

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

Cycles

During 1995 A, *at LES, we eliminated at the vegetative stage all plants showing symptoms of leaf blast and HBV. 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 1996 A, *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 1997 A, *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 "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,PHB\1.

Cropping Season 1998 A

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 "hoja blanca" 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 1998 B, 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.

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. The enhanced populations will be used as reservoir for the development of fixed lines.

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 the "Hoja Blanca" virus**

During the first semester of 1999 at PES, 107 lines S2 from the 3 populations after 3 cycles of recurrence were evaluated to Hoja Blanca in nurseries with high-infected insect pressure. The results of the evaluation are presented in the following table.

The S2 evaluation of the enhanced populations showed that 97.2% have resistant and intermediate reaction to Hoja Blanca. 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.

Results of the enhancement of the 3 populations PCT-5, PCT-A and PCT-4, for resistance to Hoja Blanca.

Reaction to Hoja Blanca (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 Hoja Blanca symptom

2.3.3. Recombination of the population PCT-11

The new population was developed during 1997 and 1998.

Cropping season 1999
The second cycle of recombination was completed at LES.
Fertile plants of the second recombination (population PCT-11\0\0\2) were selected (table 15), (see table 3, generation S0).

2.4. REGISTERING NEW POPULATIONS

In 1999, one new germplasm (see Appendix 4) was registered, on request from our partner in China.

- **PYN-1** *Japonica* population for upland-hillsides ecosystem (FCRI/YAAS, Yunnan Province - China).

2.5. SPECIAL STUDY. Genetic Progress, Population PCT-4

Principal objective
Master Degree Thesis of Miss Yolima Ospina at the "Universidad Nacional de Palmira".

Specific objective
Evaluation of genetic progress for acid soil tolerance and different agronomic characteristics like; flowering time, plant height and grain yield, through recombination cycles
Genetic progress after one selection cycle and effect of different recombination cycles.

Material
Evaluation of S1 lines coming from:

- The original population identified as PCT-4\0\0\0
- The first selection cycle for acid soil tolerance, followed by one, two and three cycles of recombination identified as PCT-4\SA\1\1, PCT-4\SA\2\1 y PCT-4\SA\3\1 respectively.

The study was developed at "La Libertad" Experimental Station Villavicencio-Meta, Colombia, during the first semester of 1999.

S1 lines were obtained at the "CIAT Palmira" Experimental Station during off-season 1998.

Method

Two contrasted plots for soil acidity (application of 300 and 3,000 kg/ha of lime) were used for the study.

The statistical design was the Augmented Federer blocks composed by S1 from the four population and 6 checks (3 susceptible - CICA 8, CICA 9 y Oryzica Llanos 5 - and 3 tolerant - Oryzica Sabana 6, Oryzica Sabana 10 y CIRAD 409 - to soil acidity).

Data were collected and are currently processed.

Table 1. Soil analysis of the experimental site (Lote Loma 5) " la libertad " Experimental Station, Colombia, 1999 cropping season.

	Depth (cm)	O..M (%)	p Bray II (ppm)	pH	Al	Ca	Mg	K	C.I.E	B	Zn	Mn	Cu	Fe	Al Sat. (%)
					Meq./100 gr					ppm					
1	0-20	3.6	13.1	4.7	3.12	0.62	0.38	0.21	3.55	0.17	0.36	6.86	0.44	17.86	72.10
	20-40	2.8	2.8	4.9	3.22	0.20	0.23	0.10	3.06	0.41	0.21	5.15	0.37	10.30	86.00
2	0-20	4.2	7.6	4.7	3.22	0.54	0.30	0.16	3.25	0.27	0.28	6.90	0.40	15.05	76.50
	20-40	3.0	1.8	4.9	2.97	0.22	0.22	0.06	2.75	0.18	0.17	4.22	0.32	7.61	87.66

Table 2. Climatic characteristics of the 1999 cropping season at " La Libertad" Experimental Station, Colombia.

Characteristics	April	May	June	July	Aug.	Sep.	Total/Average
Rainfall (mm)	530.0	411.0	483.0	165.0	138.6	122.5	1850.1
Temperature (maximum °C)	29.0	29.7	28.9	28.9	29.4	30.0	29.31
Temperature (minimum °C)	21.8	21.2	21.4	20.9	22.0	23.1	21.73
Relative humidity (%)	84	85	87	86	81	82	84.16
Radiation (Cal/cm^2)	461.4	424.2	409.3	416.9	407.1	410.2	

Table3. S0 fertile plants selected in the population PCT-11\0\0\2
La Libertad experimental station, 1999A

Nbr.	Field Nbr. 1999A	Pedigree
1	32	PCT-11\0\0\2>32
2	205	PCT-11\0\0\2>205
3	286	PCT-11\0\0\2>286
4	432	PCT-11\0\0\2>432
5	617	PCT-11\0\0\2>617
6	623	PCT-11\0\0\2>623
7	701	PCT-11\0\0\2>701
8	725	PCT-11\0\0\2>725
9	917	PCT-11\0\0\2>917
10	980	PCT-11\0\0\2>980
11	1062	PCT-11\0\0\2>1062
12	1188	PCT-11\0\0\2>1188
13	1313	PCT-11\0\0\2>1313
14	1390	PCT-11\0\0\2>1390
15	1396	PCT-11\0\0\2>1396
16	1418	PCT-11\0\0\2>1418
17	1485	PCT-11\0\0\2>1485
18	1817	PCT-11\0\0\2>1817
19	1947	PCT-11\0\0\2>1947

Table 4. S0 fertile plants selected in the population PCT-4\SA\3\1

La Libertad experimental station, 1999A

Nbr.	Field Nbr. 1999A	Pedigree
1	10	PCT-4\SA\3\1>10
2	49	PCT-4\SA\3\1>49
3	83	PCT-4\SA\3\1>83
4	94	PCT-4\SA\3\1>94
5	118	PCT-4\SA\3\1>118
6	157	PCT-4\SA\3\1>157
7	244	PCT-4\SA\3\1>244
8	257	PCT-4\SA\3\1>257
9	318	PCT-4\SA\3\1>318
10	404	PCT-4\SA\3\1>404
11	426	PCT-4\SA\3\1>426
12	484	PCT-4\SA\3\1>484
13	520	PCT-4\SA\3\1>520
14	524	PCT-4\SA\3\1>524
15	543	PCT-4\SA\3\1>543
16	613	PCT-4\SA\3\1>613
17	695	PCT-4\SA\3\1>695
18	706	PCT-4\SA\3\1>706
19	772	PCT-4\SA\3\1>772
20	829	PCT-4\SA\3\1>829
21	836	PCT-4\SA\3\1>836
22	841	PCT-4\SA\3\1>841
23	843	PCT-4\SA\3\1>843
24	848	PCT-4\SA\3\1>848
25	866	PCT-4\SA\3\1>866
26	869	PCT-4\SA\3\1>869
27	904	PCT-4\SA\3\1>904
28	930	PCT-4\SA\3\1>930
29	936	PCT-4\SA\3\1>936
30	983	PCT-4\SA\3\1>983
31	1009	PCT-4\SA\3\1>1009
32	1034	PCT-4\SA\3\1>1034
33	1058	PCT-4\SA\3\1>1058
34	1082	PCT-4\SA\3\1>1082
35	1084	PCT-4\SA\3\1>1084
36	1089	PCT-4\SA\3\1>1089
37	1109	PCT-4\SA\3\1>1109
38	1175	PCT-4\SA\3\1>1175
39	1231	PCT-4\SA\3\1>1231
40	1241	PCT-4\SA\3\1>1241
41	1296	PCT-4\SA\3\1>1296
42	1307	PCT-4\SA\3\1>1307
43	1327	PCT-4\SA\3\1>1327
44	1334	PCT-4\SA\3\1>1334
45	1335	PCT-4\SA\3\1>1335
46	1345	PCT-4\SA\3\1>1345
47	1377	PCT-4\SA\3\1>1377
48	1378	PCT-4\SA\3\1>1378
49	1402	PCT-4\SA\3\1>1402
50	1413	PCT-4\SA\3\1>1413
51	1441	PCT-4\SA\3\1>1441
52	1489	PCT-4\SA\3\1>1489
53	1631	PCT-4\SA\3\1>1631
54	1701	PCT-4\SA\3\1>1701
55	1704	PCT-4\SA\3\1>1704
56	1781	PCT-4\SA\3\1>1781
57	1818	PCT-4\SA\3\1>1818
58	1839	PCT-4\SA\3\1>1839
59	1850	PCT-4\SA\3\1>1850
60	1867	PCT-4\SA\3\1>1867
61	1917	PCT-4\SA\3\1>1917

Table 5. Evaluation of S2 lines from the populations PCT-4\PHB\1\1,PHB\1,PHB\1> PCT-5\PHB\1\0,PHB\1,PHB\1> and PCT-A\PHB\1\0,PHB\1,PHB\1>
La libertad experimental station, 1999A

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	BI	BI	FI 50%	LSc	BS	GD	NBI
1	S920158	171	PCT-4\PHB\1\1,PHB\1,PHB\1>135-M	5	1	1	66	1	1	3	1
2	S920159	172	PCT-4\PHB\1\1,PHB\1,PHB\1>191-M	5	1	1	70	1	1	1	1
3	S920160	173	PCT-4\PHB\1\1,PHB\1,PHB\1>227-M	3	2	1	66	1	1	3	1
4	S920161	174	PCT-4\PHB\1\1,PHB\1,PHB\1>228-M	5	3	2	75	1	1	3	1
5	S920162	175	PCT-4\PHB\1\1,PHB\1,PHB\1>262-M	5	2	1	73	1	1	3	1
6	S920163	176	PCT-4\PHB\1\1,PHB\1,PHB\1>300-M	5	3	1	74	1	1	1	1
7	S920164	177	PCT-4\PHB\1\1,PHB\1,PHB\1>329-M	3	3	3	85	1	1	3	1
8	S920165	178	PCT-4\PHB\1\1,PHB\1,PHB\1>336-M	5	2	2	74	1	3	5	1
9	S920166	179	PCT-4\PHB\1\1,PHB\1,PHB\1>359-M	5	2	1	64	1	1	1	3
10	S920167	180	PCT-4\PHB\1\1,PHB\1,PHB\1>443-M	5	2	1	82	1	1	3	1
11	S920168	181	PCT-4\PHB\1\1,PHB\1,PHB\1>455-M	5	3	2	75	1	1	3	1
	T1		CIRAD 409	7	1	1	67	1	1	1	1
	T2		O.Sabana 6	3	4	3	88	1	1	1	1
	T3		O.Sabana 10	7	3	2	90	1	1	1	1
12	S920169	182	PCT-4\PHB\1\1,PHB\1,PHB\1>472-M	3	3	2	83	3	1	5	1
13	S920170	183	PCT-4\PHB\1\1,PHB\1,PHB\1>479-M	5	2	1	75	1	1	1	1
14	S920171	184	PCT-4\PHB\1\1,PHB\1,PHB\1>507-M	7	3	2	64	1	1	3	3
15	S920172	185	PCT-4\PHB\1\1,PHB\1,PHB\1>509-M	5	3	3	78	1	1	3	1
16	S920173	186	PCT-4\PHB\1\1,PHB\1,PHB\1>541-M	3	2	1	64	1	1	1	1
17	S920174	187	PCT-4\PHB\1\1,PHB\1,PHB\1>572-M	5	2	1	75	1	1	3	1
18	S920175	188	PCT-4\PHB\1\1,PHB\1,PHB\1>583-M	3	1	1	60	1	1	1	1
19	S920176	189	PCT-4\PHB\1\1,PHB\1,PHB\1>584-M	5	2	1	64	1	1	1	1
20	S920177	190	PCT-4\PHB\1\1,PHB\1,PHB\1>585-M	3	2	1	70	1	3	5	3
21	S920178	191	PCT-4\PHB\1\1,PHB\1,PHB\1>587-M	5	1	1	71	1	1	3	1
22	S920179	192	PCT-4\PHB\1\1,PHB\1,PHB\1>603-M	7	2	2	76	3	1	3	1
23	S920180	193	PCT-4\PHB\1\1,PHB\1,PHB\1>614-M	5	1	1	66	3	1	1	1
24	S920181	194	PCT-4\PHB\1\1,PHB\1,PHB\1>650-M	5	1	1	65	1	1	3	1
25	S920182	195	PCT-4\PHB\1\1,PHB\1,PHB\1>692-M	3	2	2	63	1	1	5	3
26	S920183	196	PCT-4\PHB\1\1,PHB\1,PHB\1>816-M	3	2	1	69	1	3	1	3
27	S920184	197	PCT-4\PHB\1\1,PHB\1,PHB\1>869-M	5	2	1	81	3	1	1	1
28	S920185	198	PCT-4\PHB\1\1,PHB\1,PHB\1>894-M	5	2	3	64	1	1	1	3
29	S920186	199	PCT-4\PHB\1\1,PHB\1,PHB\1>1047-M	5	1	1	66	1	3	5	1
30	S920187	200	PCT-4\PHB\1\1,PHB\1,PHB\1>1062-M	5	1	1	62	1	1	1	1
31	S920188	201	PCT-4\PHB\1\1,PHB\1,PHB\1>1093-M	3	1	1	75	1	1	5	1
32	S920189	202	PCT-4\PHB\1\1,PHB\1,PHB\1>1112-M	3	2	1	68	1	1	1	1
33	S920190	203	PCT-4\PHB\1\1,PHB\1,PHB\1>1155-M	3	1	1	67	1	1	3	3
34	S920191	204	PCT-4\PHB\1\1,PHB\1,PHB\1>1234-M	5	2	1	68	3	1	3	1
35	S920192	205	PCT-4\PHB\1\1,PHB\1,PHB\1>1255-M	5	4	4	85	1	1	3	1
36	S920193	206	PCT-4\PHB\1\1,PHB\1,PHB\1>1264-M	5	2	1	63	1	1	1	1
37	S920194	207	PCT-4\PHB\1\1,PHB\1,PHB\1>1298-M	5	1	2	68	1	1	1	1
38	S920195	208	PCT-4\PHB\1\1,PHB\1,PHB\1>1308-M	7	5	5	72	1	1	1	1
39	S920196	209	PCT-4\PHB\1\1,PHB\1,PHB\1>1335-M	5	4	4	69	1	1	3	1
40	S920197	210	PCT-4\PHB\1\1,PHB\1,PHB\1>1373-M	5	4	4	68	1	1	1	1
41	S920198	211	PCT-4\PHB\1\1,PHB\1,PHB\1>1376-M	5	5	4	64	1	1	1	1
42	S920199	212	PCT-4\PHB\1\1,PHB\1,PHB\1>1377-M	5	3	2	68	1	1	3	1
43	S920200	213	PCT-4\PHB\1\1,PHB\1,PHB\1>1382-M	7	4	3	74	1	1	1	1
44	S920201	214	PCT-4\PHB\1\1,PHB\1,PHB\1>1398-M	5	3	2	65	1	1	3	1
45	S920202	215	PCT-4\PHB\1\1,PHB\1,PHB\1>1487-M	7	2	2	73	1	1	1	1
46	S920203	216	PCT-4\PHB\1\1,PHB\1,PHB\1>1515-M	7	4	4	83	1	1	1	3
47	S920204	217	PCT-4\PHB\1\1,PHB\1,PHB\1>1545-M	7	3	3	64	1	1	1	1
48	S920205	220	PCT-4\PHB\1\1,PHB\1,PHB\1>1734-M	5	4	3	79	1	1	1	1

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	BI	BI	FI 50%	LSc	BS	GD	NBI
49	S920206	221	PCT-4\PHB\1\1,PHB\1,PHB\1>1735-M	5	2	2	73	1	1	3	1
50	S920207	222	PCT-4\PHB\1\1,PHB\1,PHB\1>1864-M	5	2	1	68	1	1	3	1
51	S920208	223	PCT-4\PHB\1\1,PHB\1,PHB\1>1895-M	7	2	1	76	1	3	3	1
52	S920209	224	PCT-4\PHB\1\1,PHB\1,PHB\1>1912-M	5	3	3	64	1	1	1	1
53	S920210	225	PCT-4\PHB\1\1,PHB\1,PHB\1>1945-M	7	2	3	71	1	3	1	1
54	S920211	226	PCT-5\PHB\1\0,PHB\1,PHB\1>126-M	5	1	1	76	1	1	1	1
55	S920212	227	PCT-5\PHB\1\0,PHB\1,PHB\1>163-M	7	2	3	69	1	3	1	1
56	S920213	228	PCT-5\PHB\1\0,PHB\1,PHB\1>192-M	3	1	2	68	1	3	3	1
57	S920214	229	PCT-5\PHB\1\0,PHB\1,PHB\1>226-M	5	1	2	74	1	3	1	1
58	S920215	230	PCT-5\PHB\1\0,PHB\1,PHB\1>230-M	7	2	2	85	1	1	3	1
59	S920216	231	PCT-5\PHB\1\0,PHB\1,PHB\1>242-M	5	2	1	71	1	1	3	1
60	S920217	232	PCT-5\PHB\1\0,PHB\1,PHB\1>258-M	5	2	1	66	1	1	1	1
61	S920218	233	PCT-5\PHB\1\0,PHB\1,PHB\1>331-M	5	2	2	64	1	1	1	1
62	S920219	234	PCT-5\PHB\1\0,PHB\1,PHB\1>338-M	5	1	1	85	1	3	3	1
63	S920220	235	PCT-5\PHB\1\0,PHB\1,PHB\1>384-M	5	1	1	63	1	1	3	1
64	S920221	236	PCT-5\PHB\1\0,PHB\1,PHB\1>385-M	5	2	1	80	1	1	1	1
65	S920222	237	PCT-5\PHB\1\0,PHB\1,PHB\1>439-M	5	2	1	77	1	1	1	1
	T1		CIRAD 409	5	1	1	64	1	1	1	1
	T2		O.Sabana 6	5	4	2	87	1	1	1	1
	T3		O.Sabana 10	5	3	1	89	3	1	1	1
66	S920223	238	PCT-5\PHB\1\0,PHB\1,PHB\1>444-M	5	1	1	74	1	1	3	1
67	S920224	239	PCT-5\PHB\1\0,PHB\1,PHB\1>515-M	5	1	1	72	1	1	1	1
68	S920225	240	PCT-5\PHB\1\0,PHB\1,PHB\1>579-M	5	3	3	69	1	1	3	1
69	S920226	241	PCT-5\PHB\1\0,PHB\1,PHB\1>590-M	5	2	1	68	1	1	1	1
70	S920227	242	PCT-5\PHB\1\0,PHB\1,PHB\1>618-M	5	1	1	70	1	1	3	3
71	S920228	243	PCT-5\PHB\1\0,PHB\1,PHB\1>619-M	5	1	1	64	3	3	3	1
72	S920229	244	PCT-5\PHB\1\0,PHB\1,PHB\1>652-M	7	1	2	77	3	3	3	1
73	S920230	245	PCT-5\PHB\1\0,PHB\1,PHB\1>730-M	7	1	1	66	1	1	3	1
74	S920231	246	PCT-5\PHB\1\0,PHB\1,PHB\1>842-M	7	1	1	69	1	1	3	1
75	S920232	247	PCT-5\PHB\1\0,PHB\1,PHB\1>1037-M	7	1	1	73	1	1	1	1
76	S920233	248	PCT-5\PHB\1\0,PHB\1,PHB\1>1129-M	7	2	1	73	1	1	3	1
77	S920234	249	PCT-5\PHB\1\0,PHB\1,PHB\1>1341-M	7	1	1	73	3	1	3	1
78	S920235	250	PCT-5\PHB\1\0,PHB\1,PHB\1>1591-M	5	1	1	76	3	1	3	1
79	S920236	251	PCT-5\PHB\1\0,PHB\1,PHB\1>1651-M	5	1	1	72	1	1	5	1
80	S920237	252	PCT-5\PHB\1\0,PHB\1,PHB\1>1661-M	5	1	2	69	1	1	1	1
81	S920238	253	PCT-5\PHB\1\0,PHB\1,PHB\1>1670-M	5	1	1	69	1	1	1	1
82	S920239	254	PCT-5\PHB\1\0,PHB\1,PHB\1>1853-M	5	1	3	66	1	1	3	1
83	S920240	255	PCT-5\PHB\1\0,PHB\1,PHB\1>1917-M	9	1	2	77	1	1	1	1
84	S920241	256	PCT-A\PHB\1\0,PHB\1,PHB\1>253-M	7	1	1	67	1	1	1	1
85	S920242	257	PCT-A\PHB\1\0,PHB\1,PHB\1>397-M	5	1	1	78	1	3	3	1
86	S920243	258	PCT-A\PHB\1\0,PHB\1,PHB\1>421-M	5	2	1	67	1	1	1	1
87	S920244	259	PCT-A\PHB\1\0,PHB\1,PHB\1>642-M	7	2	1	77	1	1	3	1
88	S920245	260	PCT-A\PHB\1\0,PHB\1,PHB\1>721-M	7	1	1	82	1	1	5	1
89	S920246	261	PCT-A\PHB\1\0,PHB\1,PHB\1>866-M	7	1	1	69	1	1	3	1
90	S920247	262	PCT-A\PHB\1\0,PHB\1,PHB\1>946-M	7	1	1	69	1	1	3	1
91	S920248	263	PCT-A\PHB\1\0,PHB\1,PHB\1>1058-M	7	1	2	74	1	1	3	1
92	S920249	264	PCT-A\PHB\1\0,PHB\1,PHB\1>1194-M	7	1	2	76	1	1	1	1
93	S920250	265	PCT-A\PHB\1\0,PHB\1,PHB\1>1302-M	7	1	3	76	1	1	3	1
94	S920251	266	PCT-A\PHB\1\0,PHB\1,PHB\1>1326-M	7	1	3	78	1	1	1	1
95	S920252	267	PCT-A\PHB\1\0,PHB\1,PHB\1>1347-M	7	1	1	67	1	1	3	1
96	S920253	268	PCT-A\PHB\1\0,PHB\1,PHB\1>1361-M	5	2	2	71	1	1	3	1
97	S920254	269	PCT-A\PHB\1\0,PHB\1,PHB\1>1447-M	5	1	1	65	1	1	1	1
98	S920255	270	PCT-A\PHB\1\0,PHB\1,PHB\1>1631-M	5	1	1	64	1	1	1	1
99	S920256	271	PCT-A\PHB\1\0,PHB\1,PHB\1>1744-M	5	1	1	66	1	1	3	1
100	S920257	272	PCT-A\PHB\1\0,PHB\1,PHB\1>1802-M	7	1	1	72	1	1	1	1

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	Bl	Bl	Fl 50%	LSc	BS	GD	NBl
101	S920258	273	PCT-A\PHB\1\0,PHB\1,PHB\1>1827-M	7	1	1	68	1	1	1	1
102	S920259	274	PCT-A\PHB\1\0,PHB\1,PHB\1>1834-M	7	1	1	66	1	1	1	1
103	S920260	275	PCT-A\PHB\1\0,PHB\1,PHB\1>1850-M	5	2	1	66	1	1	1	1
104	S920261	276	PCT-A\PHB\1\0,PHB\1,PHB\1>1889-M	7	4	4	77	1	3	3	1
105	S920262	277	PCT-A\PHB\1\0,PHB\1,PHB\1>1933-M	5	3	4	68	1	1	1	1
106	S920263	278	PCT-A\PHB\1\0,PHB\1,PHB\1>1990-M	5	2	1	77	1	3	3	1
107	S920264	279	PCT-A\PHB\1\0,PHB\1,PHB\1>2007-M	7	2	1	69	1	1	1	1

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

Table 5. Selected S2 lines from the two populations, PCT-4\PHB\1\1,PHB\1,PHB\1>, and PCT-A\PHB\1\0,PHB\1,PHB\1>
La libertad experimental station, 1999A

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	Bl	Bl	Fl 50%	LSc	BS	GD	NBl	Nbr.Sel. Pl.
1	S920175	188	PCT-4\PHB\1\1,PHB\1,PHB\1>583-M	3	1	1	60	1	1	1	1	6
2	S920176	189	PCT-4\PHB\1\1,PHB\1,PHB\1>584-M	5	2	1	64	1	1	1	1	6
3	S920259	274	PCT-A\PHB\1\0,PHB\1,PHB\1>1834-M	7	1	1	66	1	1	1	1	1

Table 6. Evaluation of S2 lines from the population PCT-4\SA\2\1

La libertad experimental station, 1999A

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	BI	BI	FI 50%	LSc	BS	GD	NBI
	T1		CIRAD 409	5	1	1	64	1	1	1	1
	T2		O.Sabana 6	3	4	3	86	1	1	3	1
	T3		O.Sabana 10	5	3	1	92	1	1	3	1
1	S920085	96	PCT-4\SA\2\1>38-M	5	1	1	59	1	1	3	3
2	S920086	97	PCT-4\SA\2\1>43-M	5	1	3	72	1	1	1	1
3	S920087	98	PCT-4\SA\2\1>44-M	5	2	1	68	1	1	5	3
4	S920088	100	PCT-4\SA\2\1>113-M	5	1	1	70	1	1	1	1
5	S920089	101	PCT-4\SA\2\1>128-M	5	1	1	72	1	3	1	1
6	S920090	102	PCT-4\SA\2\1>172-M	5	4	5	67	1	1	1	3
7	S920091	103	PCT-4\SA\2\1>190-M	5	3	4	66	1	1	1	3
8	S920092	105	PCT-4\SA\2\1>275-M	5	2	3	63	1	1	1	3
9	S920093	106	PCT-4\SA\2\1>282-M	5	4	3	76	1	3	5	1
10	S920094	107	PCT-4\SA\2\1>287-M	5	2	2	65	1	1	1	1
11	S920095	108	PCT-4\SA\2\1>290-M	5	4	4	69	1	3	1	1
12	S920096	109	PCT-4\SA\2\1>310-M	5	2	1	72	1	1	1	1
13	S920097	110	PCT-4\SA\2\1>317-M	5	3	2	65	1	1	1	1
14	S920098	111	PCT-4\SA\2\1>331-M	5	2	1	66	1	1	1	1
15	S920099	112	PCT-4\SA\2\1>333-M	5	2	1	64	1	1	3	1
16	S920100	113	PCT-4\SA\2\1>335-M	5	2	2	75	1	3	3	1
17	S920101	114	PCT-4\SA\2\1>375-M	3	2	1	62	1	1	1	1
18	S920102	115	PCT-4\SA\2\1>438-M	5	4	3	64	1	1	1	1
19	S920103	116	PCT-4\SA\2\1>473-M	5	2	2	64	1	1	1	3
20	S920104	117	PCT-4\SA\2\1>477-M	7	1	1	84	1	1	3	1
21	S920105	118	PCT-4\SA\2\1>482-M	5	5	5	81	1	3	3	1
22	S920106	119	PCT-4\SA\2\1>521-M	5	4	4	66	1	1	1	1
23	S920107	120	PCT-4\SA\2\1>529-M	5	3	2	66	1	1	3	1
24	S920108	121	PCT-4\SA\2\1>589-M	5	3	1	65	1	1	3	1
25	S920109	122	PCT-4\SA\2\1>617-M	3	2	1	59	3	1	1	1
26	S920110	123	PCT-4\SA\2\1>626-M	3	3	3	82	1	3	5	1
27	S920111	124	PCT-4\SA\2\1>657-M	5	3	2	71	1	1	3	1
28	S920112	125	PCT-4\SA\2\1>664-M	5	2	2	82	1	1	1	1
29	S920113	126	PCT-4\SA\2\1>676-M	3	3	1	63	1	3	1	1
30	S920114	127	PCT-4\SA\2\1>677-M	3	4	3	62	1	1	1	3
	T1		CIRAD 409	5	1	1	64	1	1	1	1
	T2		O.Sabana 6	1	4	3	86	1	1	1	1
	T3		O.Sabana 10	5	3	1	89	3	1	1	1
31	S920115	128	PCT-4\SA\2\1>697-M	3	3	3	73	1	1	1	3
32	S920116	129	PCT-4\SA\2\1>731-M	5	2	1	72	1	1	3	1
33	S920117	130	PCT-4\SA\2\1>734-M	7	3	3	71	1	3	3	1
34	S920118	131	PCT-4\SA\2\1>764-M	5	2	2	74	1	1	1	1
35	S920119	132	PCT-4\SA\2\1>768-M	5	3	1	69	1	1	1	1
36	S920120	133	PCT-4\SA\2\1>779-M	5	2	1	64	1	1	1	1
37	S920121	134	PCT-4\SA\2\1>786-M	5	2	2	65	1	1	1	1
38	S920122	135	PCT-4\SA\2\1>792-M	3	2	3	80	1	3	3	1
39	S920123	136	PCT-4\SA\2\1>805-M	5	2	1	77	1	3	5	1
40	S920124	137	PCT-4\SA\2\1>831-M	5	4	2	63	1	1	1	3
41	S920125	138	PCT-4\SA\2\1>855-M	5	3	2	64	1	1	1	1
42	S920126	139	PCT-4\SA\2\1>979-M	7	3	2	71	1	1	1	1
43	S920127	140	PCT-4\SA\2\1>1020-M	7	4	3	83	1	1	3	1
44	S920128	141	PCT-4\SA\2\1>1158-M	5	3	2	75	1	1	3	1
45	S920129	142	PCT-4\SA\2\1>1181-M	5	2	1	62	1	1	3	3
46	S920130	143	PCT-4\SA\2\1>1190-M	3	2	1	64	1	1	1	1
47	S920131	144	PCT-4\SA\2\1>1196-M	3	2	1	71	1	1	1	1

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	Bl	Bl	Fl 50%	LSc	BS	GD	NBl
48	S920132	145	PCT-4\SA\2\1>1198-M	5	4	3	66	1	1	1	1
49	S920133	146	PCT-4\SA\2\1>1225-M	5	3	1	74	1	1	1	1
50	S920134	147	PCT-4\SA\2\1>1234-M	5	2	1	66	1	1	3	1
51	S920135	148	PCT-4\SA\2\1>1235-M	5	3	3	72	1	1	1	1
52	S920136	149	PCT-4\SA\2\1>1238-M	5	2	2	68	1	1	1	1
53	S920137	150	PCT-4\SA\2\1>1270-M	5	2	1	68	1	1	1	1
54	S920138	151	PCT-4\SA\2\1>1300-M	3	2	3	64	1	1	1	1
55	S920139	152	PCT-4\SA\2\1>1306-M	5	3	2	65	1	1	3	3
56	S920140	153	PCT-4\SA\2\1>1326-M	5	5	4	71	1	3	3	1
57	S920141	154	PCT-4\SA\2\1>1343-M	3	3	1	61	1	1	1	1
	T1		CIRAD 409	3	1	1	64	1	1	1	1
	T2		O.Sabana 6	5	4	3	85	1	1	3	1
	T3		O.Sabana 10	5	3	1	88	3	1	1	1
58	S920142	155	PCT-4\SA\2\1>1416-M	5	4	2	77	1	1	1	3
59	S920143	156	PCT-4\SA\2\1>1417-M	5	3	1	71	1	1	1	1
60	S920144	157	PCT-4\SA\2\1>1492-M	1	2	1	60	1	1	3	1
61	S920145	158	PCT-4\SA\2\1>1513-M	5	4	3	72	1	1	1	3
62	S920146	159	PCT-4\SA\2\1>1559-M	7	3	2	70	1	1	1	1
63	S920147	160	PCT-4\SA\2\1>1564-M	5	3	2	64	1	1	1	1
64	S920148	161	PCT-4\SA\2\1>1605-M	5	4	1	67	1	1	1	1
65	S920149	162	PCT-4\SA\2\1>1615-M	3	3	2	66	1	1	1	1
66	S920150	163	PCT-4\SA\2\1>1669-M	3	2	1	68	1	1	1	1
67	S920151	164	PCT-4\SA\2\1>1699-M	5	4	4	82	1	1	1	1
68	S920152	165	PCT-4\SA\2\1>1728-M	5	2	1	65	1	1	1	1
69	S920153	166	PCT-4\SA\2\1>1794-M	7	5	5	80	1	1	3	3
70	S920154	167	PCT-4\SA\2\1>1807-M	5	2	2	85	1	1	3	1
71	S920155	168	PCT-4\SA\2\1>1836-M	7	3	1	75	1	1	1	1
72	S920156	169	PCT-4\SA\2\1>1923-M	5	2	1	78	1	1	1	1
73	S920157	170	PCT-4\SA\2\1>1985-M	3	2	1	61	1	1	1	3

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

Table 6. Selected S2 lines from the population PCT-4\SA\2\1
La Libertad experimental station, 1999A

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	Bl	Bl	Fl 50%	LSc	BS	GD	NBl	Nbr.Sel. Pl.
1	S920125	138	PCT-4\SA\2\1>855-M	5	3	2	64	1	1	1	1	6
2	S920130	143	PCT-4\SA\2\1>1190-M	3	2	1	64	1	1	1	1	3
3	S920147	160	PCT-4\SA\2\1>1564-M	5	3	2	64	1	1	1	1	6
4	S920149	162	PCT-4\SA\2\1>1615-M	3	3	2	66	1	1	1	1	6
5	S920152	165	PCT-4\SA\2\1>1728-M	5	2	1	65	1	1	1	1	6

Table 7. Evaluation of S2 lines from the population PCT-11\0\0\1

La libertad experimental station, 1999A

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	BI	BI	FI 50%	LSc	BS	GD	NBI
1	S920001	1	PCT-11\0\0\1>42-M	5	2	1	87	3	1	3	1
2	S920002	2	PCT-11\0\0\1>51-M	5	2	1	84	1	1	1	1
3	S920003	3	PCT-11\0\0\1>52-M	5	3	1	71	1	1	3	1
4	S920004	4	PCT-11\0\0\1>73-M	5	1	1	87	1	1	1	1
5	S920005	5	PCT-11\0\0\1>84-M	3	1	1	68	1	1	1	1
6	S920006	6	PCT-11\0\0\1>87-M	5	1	1	68	1	1	1	1
7	S920007	7	PCT-11\0\0\1>110-M	3	3	1	70	3	1	3	1
8	S920008	8	PCT-11\0\0\1>112-M	3	4	3	71	1	1	3	1
9	S920009	9	PCT-11\0\0\1>134-M	3	4	4	74	1	1	3	1
10	S920010	11	PCT-11\0\0\1>150-M	5	3	1	78	1	1	5	1
11	S920011	12	PCT-11\0\0\1>155-M	5	3	2	68	1	1	3	3
12	S920012	13	PCT-11\0\0\1>166-M	5	3	2	73	1	1	1	1
13	S920013	14	PCT-11\0\0\1>224-M	3	5	3	72	1	1	1	1
14	S920014	15	PCT-11\0\0\1>225-M	5	3	1	72	1	1	5	3
15	S920015	16	PCT-11\0\0\1>228-M	5	1	1	69	1	1	1	1
16	S920016	17	PCT-11\0\0\1>242-M	5	2	1	84	1	1	3	1
17	S920017	19	PCT-11\0\0\1>256-M	3	2	1	72	1	1	3	1
18	S920018	21	PCT-11\0\0\1>269-M	5	3	1	68	1	1	1	1
19	S920019	22	PCT-11\0\0\1>309-M	3	2	1	73	3	1	1	3
20	S920020	23	PCT-11\0\0\1>314-M	5	2	1	68	1	1	1	1
21	S920021	24	PCT-11\0\0\1>317-M	5	2	1	65	1	1	1	1
22	S920022	25	PCT-11\0\0\1>375-M	5	2	1	75	1	1	1	1
23	S920023	26	PCT-11\0\0\1>376-M	5	4	2	68	1	1	3	1
24	S920024	27	PCT-11\0\0\1>386-M	5	3	1	66	1	1	1	1
25	S920025	28	PCT-11\0\0\1>405-M	5	3	3	66	1	1	1	1
26	S920026	29	PCT-11\0\0\1>438-M	7	5	4	85	1	1	3	1
27	S920027	30	PCT-11\0\0\1>493-M	3	2	1	66	1	1	1	1
	T1		CIRAD 409	5	2	2	65	1	1	1	1
	T2		O.Sabana 6	3	4	2	86	1	1	1	1
	T3		O.Sabana 10	5	3	2	92	3	1	1	1
28	S920028	31	PCT-11\0\0\1>509-M	5	4	1	72	1	1	1	3
29	S920029	32	PCT-11\0\0\1>513-M	1	1	1	66	1	1	3	1
30	S920030	33	PCT-11\0\0\1>516-M	5	1	1	82	3	1	1	1
31	S920031	34	PCT-11\0\0\1>522-M	5	2	1	69	1	1	1	1
32	S920032	35	PCT-11\0\0\1>549-M	3	2	2	72	1	1	3	1
33	S920033	36	PCT-11\0\0\1>566-M	3	2	1	83	1	1	3	1
34	S920034	37	PCT-11\0\0\1>576-M	5	3	1	70	1	1	1	1
35	S920035	38	PCT-11\0\0\1>621-M	5	2	1	81	1	1	1	1
36	S920036	39	PCT-11\0\0\1>657-M	5	1	1	69	1	1	3	1
37	S920037	41	PCT-11\0\0\1>727-M	5	4	3	73	1	1	1	1
38	S920038	42	PCT-11\0\0\1>733-M	5	5	4	85	1	3	3	1
39	S920039	43	PCT-11\0\0\1>734-M	5	3	3	85	3	3	3	1
40	S920040	44	PCT-11\0\0\1>781-M	5	4	2	68	1	1	3	3
41	S920041	45	PCT-11\0\0\1>782-M	5	3	3	73	1	1	3	1
42	S920042	46	PCT-11\0\0\1>801-M	5	3	4	68	1	1	3	1
43	S920043	47	PCT-11\0\0\1>810-M	5	5	4	73	1	1	3	3
44	S920044	48	PCT-11\0\0\1>816-M	5	3	3	67	1	1	1	1
45	S920045	49	PCT-11\0\0\1>831-M	5	4	4	71	1	1	1	1
46	S920046	50	PCT-11\0\0\1>841-M	5	2	2	69	1	1	1	1
47	S920047	51	PCT-11\0\0\1>866-M	5	2	2	86	1	1	1	1
48	S920048	52	PCT-11\0\0\1>877-M	5	1	1	66	1	1	1	1
49	S920049	54	PCT-11\0\0\1>905-M	5	1	1	69	1	1	1	1

Nbr.	Field Nbr.	Origin	Pedigree	Vg	BI	BI	FI	LSc	BS	GD	NBI
	1999A	1998B					50%				
50	S920050	56	PCT-11\0\0\1>924-M	7	4	4	79	1	1	1	1
51	S920051	57	PCT-11\0\0\1>943-M	3	1	2	65	1	1	1	1
52	S920052	58	PCT-11\0\0\1>953-M	7	4	3	77	1	1	1	1
53	S920053	59	PCT-11\0\0\1>1013-M	5	3	2	73	1	1	1	1
54	S920054	60	PCT-11\0\0\1>1050-M	5	4	2	65	1	1	1	1
	T1		CIRAD 409	5	2	1	66	1	1	1	1
	T2		O.Sabana 6	5	5	4	86	1	1	1	1
	T3		O.Sabana 10	7	3	2	92	1	1	1	1
55	S920055	61	PCT-11\0\0\1>1083-M	5	3	1	81	1	1	3	1
56	S920056	62	PCT-11\0\0\1>1092-M	5	3	2	68	1	1	1	1
57	S920057	63	PCT-11\0\0\1>1138-M	5	2	2	68	1	1	1	1
58	S920058	64	PCT-11\0\0\1>1184-M	3	1	1	74	1	1	1	1
59	S920059	65	PCT-11\0\0\1>1196-M	5	2	1	74	1	1	3	1
60	S920060	66	PCT-11\0\0\1>1199-M	3	3	1	66	3	1	3	1
61	S920061	67	PCT-11\0\0\1>1308-M	3	3	2	85	1	1	5	3
62	S920062	68	PCT-11\0\0\1>1310-M	3	1	1	69	1	1	1	1
63	S920063	69	PCT-11\0\0\1>1337-M	3	1	1	72	1	1	1	1
64	S920064	70	PCT-11\0\0\1>1372-M	5	1	1	85	1	3	3	1
65	S920065	71	PCT-11\0\0\1>1384-M	5	2	1	80	1	1	1	1
66	S920066	74	PCT-11\0\0\1>1486-M	5	1	1	66	1	1	1	1
67	S920067	75	PCT-11\0\0\1>1520-M	5	2	1	75	1	1	1	1
68	S920068	76	PCT-11\0\0\1>1526-M	5	2	1	63	1	1	1	1
69	S920069	77	PCT-11\0\0\1>1537-M	5	2	1	80	1	1	3	1
70	S920070	78	PCT-11\0\0\1>1600-M	5	2	1	74	1	1	1	3
71	S920071	79	PCT-11\0\0\1>1606-M	7	5	5	84	1	1	3	3
72	S920072	81	PCT-11\0\0\1>1628-M	5	2	2	68	1	1	1	1
73	S920073	82	PCT-11\0\0\1>1629-M	5	4	4	69	1	1	3	3
74	S920074	83	PCT-11\0\0\1>1636-M	5	2	3	70	1	1	1	1
75	S920075	84	PCT-11\0\0\1>1660-M	3	3	1	69	1	1	1	1
76	S920076	85	PCT-11\0\0\1>1670-M	5	4	4	76	1	1	1	1
77	S920077	86	PCT-11\0\0\1>1681-M	5	4	4	63	1	1	3	3
78	S920078	88	PCT-11\0\0\1>1709-M	5	2	2	74	1	1	1	1
79	S920079	89	PCT-11\0\0\1>1777-M	7	4	4	80	1	1	1	1
80	S920080	90	PCT-11\0\0\1>1780-M	5	5	4	85	1	3	1	1
81	S920081	92	PCT-11\0\0\1>1790-M	5	4	3	73	1	1	1	1
82	S920082	93	PCT-11\0\0\1>1814-M	5	4	4	75	1	1	1	1
83	S920083	94	PCT-11\0\0\1>1959-M	5	5	4	75	1	1	1	1
84	S920084	95	PCT-11\0\0\1>1961-M	5	3	2	69	1	1	1	1

Vg = vigor; BI 1 = leaf blast; BI 2 = leaf blast; FI = flowering; LsC = leaf scald; BS = brown spot;
NBI = neck blast; Gd = grain discoloration.

Table 7. Selected S2 lines from the population PCT-11\0\0\2
La Libertad experimental station 1999A

Nbr.	Field Nbr.	Origin	Pedigree	Vg	BI	BI	FI	LSc	BS	GD	NBI	Nbr.Sel.
	1999A	1998B					50%					PI.
1	S920012	13	PCT-11\0\0\1>166-M	5	3	2	73	1	1	1	1	4
2	S920027	29	PCT-11\0\0\1>438-M	7	5	4	85	1	1	3	1	6
3	S920029	32	PCT-11\0\0\1>513-M	1	1	1	66	1	1	3	1	6
4	S920051	57	PCT-11\0\0\1>943-M	3	1	2	65	1	1	1	1	6

Table 8. Evaluation of S4 lines from the population PCT-4\PHB\1\1,PHB\1,>
La libertad experimental station, 1999A

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	Ht	BI	BI	FI 50%	LSc	BS	GD	NBI
1	S940001	280	PCT-4\PHB\1\1,PHB\1>46-M-1-M	7	71	2	1	62	1	3	1	3
2	S940002	281	PCT-4\PHB\1\1,PHB\1>46-M-2-M	7	80	1	1	69	1	3	1	1
3	S940003	282	PCT-4\PHB\1\1,PHB\1>46-M-3-M	7	62	2	2	67	1	5	3	1
4	S940004	283	PCT-4\PHB\1\1,PHB\1>46-M-4-M	7	78	2	2	71	1	1	1	1
5	S940005	284	PCT-4\PHB\1\1,PHB\1>46-M-5-M	7	72	2	2	71	1	3	3	1
6	S940006	285	PCT-4\PHB\1\1,PHB\1>46-M-6-M	7	78	2	1	68	1	3	1	1
7	S940007	286	PCT-4\PHB\1\1,PHB\1>120-M-1-M	5	75	2	1	60	1	3	1	5
8	S940008	287	PCT-4\PHB\1\1,PHB\1>120-M-2-M	5	72	1	1	59	1	1	1	1
9	S940009	288	PCT-4\PHB\1\1,PHB\1>120-M-3-M	7	73	3	2	63	1	1	1	1
10	S940010	289	PCT-4\PHB\1\1,PHB\1>120-M-4-M	7	77	3	2	62	1	1	1	3
11	S940011	290	PCT-4\PHB\1\1,PHB\1>120-M-5-M	7	77	3	3	62	1	1	1	5
12	S940012	291	PCT-4\PHB\1\1,PHB\1>120-M-6-M	7	78	3	3	63	1	1	1	3
13	S940013	298	PCT-4\PHB\1\1,PHB\1>1534-M-1-M	5	83	2	1	62	1	1	1	1
14	S940014	299	PCT-4\PHB\1\1,PHB\1>1534-M-2-M	3	93	1	1	66	1	1	1	1
15	S940015	300	PCT-4\PHB\1\1,PHB\1>1534-M-3-M	3	98	1	1	64	1	1	1	1
16	S940016	301	PCT-4\PHB\1\1,PHB\1>1534-M-4-M	3	96	1	1	62	1	1	3	1
17	S940017	302	PCT-4\PHB\1\1,PHB\1>1534-M-5-M	5	91	1	1	64	1	1	1	1
18	S940018	303	PCT-4\PHB\1\1,PHB\1>1534-M-6-M	5	101	1	1	64	1	1	1	1
	T1		CIRAD 409	5	93	1	1	66	1	1	1	1
	T2		O.Sabana 6	3	104	3	2	85	3	1	1	1
	T3		O.Sabana 10	5	90	2	1	88	1	1	1	1
19	S940019	304	PCT-4\PHB\1\1,PHB\1>1537-M-1-M	5	85	1	1	62	1	1	1	1
20	S940020	305	PCT-4\PHB\1\1,PHB\1>1537-M-2-M	7	82	1	1	63	1	1	1	1
21	S940021	306	PCT-4\PHB\1\1,PHB\1>1537-M-3-M	7	84	1	1	69	1	1	1	1
22	S940022	307	PCT-4\PHB\1\1,PHB\1>1537-M-4-M	9	93	1	1	62	1	1	1	1
23	S940023	308	PCT-4\PHB\1\1,PHB\1>1537-M-5-M	7	93	2	1	63	1	1	1	1
24	S940024	309	PCT-4\PHB\1\1,PHB\1>1537-M-6-M	7	96	1	1	75	1	1	1	1
25	S940025	310	PCT-4\PHB\1\1,PHB\1>1776-M-1-M	7	76	1	1	63	1	1	1	1
26	S940026	311	PCT-4\PHB\1\1,PHB\1>1776-M-2-M	5	78	2	1	64	1	1	1	1
27	S940027	312	PCT-4\PHB\1\1,PHB\1>1776-M-3-M	5	79	2	1	64	1	3	1	1
28	S940028	313	PCT-4\PHB\1\1,PHB\1>1776-M-4-M	5	80	2	1	64	1	1	1	1
29	S940029	314	PCT-4\PHB\1\1,PHB\1>1776-M-5-M	5	83	2	1	66	1	1	1	1
30	S940030	322	PCT-A\PHB\1\0,PHB\1>853-M-1-M	7	93	1	3	64	3	1	1	1
31	S940031	323	PCT-A\PHB\1\0,PHB\1>853-M-2-M	7	90	1	1	68	1	1	1	1
32	S940032	324	PCT-A\PHB\1\0,PHB\1>853-M-3-M	5	97	1	1	64	1	1	1	1
33	S940033	325	PCT-A\PHB\1\0,PHB\1>853-M-4-M	5	96	1	1	66	5	1	1	1
34	S940034	326	PCT-A\PHB\1\0,PHB\1>853-M-5-M	7	93	1	1	66	3	1	4	1
35	S940035	327	PCT-A\PHB\1\0,PHB\1>853-M-6-M	5	97	1	1	67	3	1	1	1

Vg = vigor; BI 1 = leaf blast; BI 2 = leaf blast; FI = flowering; LsC = leaf scald; BS = brown spot;
NBI = neck blast; Gd = grain discoloration.

Table 8. Selected S4 lines from the population PCT-4\PHB\1\1,PHB\1>
La Libertad experimental station, 1999A

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	Ht	BI	BI	FI 50%	LSc	BS	GD	NBI
1	S940008	287	PCT-4\PHB\1\1,PHB\1>120-M-2-M	5	72	1	1	59	1	1	1	1
2	S940010	289	PCT-4\PHB\1\1,PHB\1>120-M-4-M	7	77	3	2	62	1	1	1	3
3	S940013	298	PCT-4\PHB\1\1,PHB\1>1534-M-1-M	5	83	2	1	62	1	1	1	1
4	S940016	301	PCT-4\PHB\1\1,PHB\1>1534-M-4-M	3	96	1	1	62	1	1	3	1
5	S940019	304	PCT-4\PHB\1\1,PHB\1>1537-M-1-M	5	85	1	1	62	1	1	1	1
6	S940023	308	PCT-4\PHB\1\1,PHB\1>1537-M-5-M	7	93	2	1	63	1	1	1	1
7	S940026	311	PCT-4\PHB\1\1,PHB\1>1776-M-2-M	5	78	2	1	64	1	1	1	1

Table 9. Evaluation of S4 lines from the population PCT-4\SA\1\1>

La libertad experimental station, 1999A

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	BI	BI	FI 50%	LSc	BS	GD	NBt
1	S940036	1162	PCT-4\SA\1\1>45-M-1-M	5	1	1	71	3	1	1	1
2	S940037	1163	PCT-4\SA\1\1>45-M-2-M	3	1	1	69	3	1	1	1
3	S940038	1164	PCT-4\SA\1\1>45-M-3-M	5	1	1	72	3	1	1	1
4	S940039	1165	PCT-4\SA\1\1>45-M-4-M	5	1	1	73	3	1	1	1
5	S940040	1166	PCT-4\SA\1\1>45-M-5-M	3	1	1	73	3	1	1	1
6	S940041	1167	PCT-4\SA\1\1>45-M-6-M	5	1	1	75	3	1	1	1
7	S940042	1168	PCT-4\SA\1\1>95-M-1-M	7	1	1	68	3	1	1	1
8	S940043	1169	PCT-4\SA\1\1>95-M-2-M	5	1	1	68	3	1	1	1
9	S940044	1170	PCT-4\SA\1\1>95-M-3-M	5	1	1	69	3	1	1	1
10	S940045	1171	PCT-4\SA\1\1>95-M-4-M	5	2	2	66	3	1	1	1
11	S940046	1172	PCT-4\SA\1\1>95-M-5-M	5	2	1	67	1	1	1	1
12	S940047	1173	PCT-4\SA\1\1>95-M-6-M	5	1	1	68	1	1	1	1
13	S940048	1174	PCT-4\SA\1\1>109-M-1-M	5	1	1	66	1	1	1	1
14	S940049	1175	PCT-4\SA\1\1>109-M-2-M	3	1	1	65	1	1	1	1
15	S940050	1176	PCT-4\SA\1\1>109-M-3-M	5	1	1	64	1	1	1	1
16	S940051	1177	PCT-4\SA\1\1>109-M-4-M	3	1	1	65	1	1	1	1
17	S940052	1178	PCT-4\SA\1\1>109-M-5-M	3	2	1	64	1	1	1	1
18	S940053	1179	PCT-4\SA\1\1>109-M-6-M	5	2	1	64	1	1	1	1
19	S940054	1180	PCT-4\SA\1\1>126-M-1-M	3	1	1	66	3	1	1	1
20	S940055	1181	PCT-4\SA\1\1>126-M-2-M	3	2	1	67	1	1	1	1
21	S940056	1182	PCT-4\SA\1\1>126-M-3-M	5	3	2	67	1	1	1	1
22	S940057	1183	PCT-4\SA\1\1>126-M-4-M	3	1	1	65	3	1	1	1
23	S940058	1184	PCT-4\SA\1\1>126-M-5-M	5	3	2	66	3	1	1	1
24	S940059	1185	PCT-4\SA\1\1>126-M-6-M	5	2	2	65	1	1	1	1
25	S940060	1186	PCT-4\SA\1\1>147-M-1-M	3	1	1	65	1	1	1	1
26	S940061	1187	PCT-4\SA\1\1>147-M-2-M	3	1	1	65	3	1	1	1
27	S940062	1188	PCT-4\SA\1\1>147-M-3-M	5	1	1	67	1	1	1	1
28	S940063	1189	PCT-4\SA\1\1>147-M-4-M	5	1	1	63	1	1	1	1
29	S940064	1190	PCT-4\SA\1\1>147-M-5-M	5	2	1	66	1	1	1	1
30	S940065	1191	PCT-4\SA\1\1>147-M-6-M	5	2	1	64	1	1	1	1
31	S940066	1192	PCT-4\SA\1\1>150-M-1-M	5	1	1	68	1	1	1	1
32	S940067	1193	PCT-4\SA\1\1>150-M-2-M	7	1	1	68	1	1	1	1
33	S940068	1194	PCT-4\SA\1\1>150-M-3-M	5	1	1	69	1	1	1	1
34	S940069	1195	PCT-4\SA\1\1>150-M-4-M	5	1	1	69	1	1	1	1
35	S940070	1196	PCT-4\SA\1\1>150-M-5-M	5	1	1	68	1	1	1	1
36	S940071	1197	PCT-4\SA\1\1>150-M-6-M	5	1	1	73	1	1	1	1
37	S940072	1198	PCT-4\SA\1\1>162-M-1-M	5	1	1	84	1	1	1	1
	T1		CIRAD 409	5	1	1	69	1	1	1	1
	T2		O.Sabana 6	5	3	2	85	1	3	1	1
	T3		O.Sabana 10	7	2	1	92	3	3	1	1
38	S940073	1199	PCT-4\SA\1\1>162-M-2-M	1	1	1	66	1	1	1	1
39	S940074	1200	PCT-4\SA\1\1>162-M-3-M	1	1	1	85	3	1	1	1
40	S940075	1201	PCT-4\SA\1\1>162-M-4-M	3	1	1	89	1	1	1	1
41	S940076	1202	PCT-4\SA\1\1>162-M-5-M	1	1	1	84	1	1	1	1
42	S940077	1203	PCT-4\SA\1\1>162-M-6-M	1	1	1	85	1	1	1	1
43	S940078	1204	PCT-4\SA\1\1>188-M-1-M	1	1	1	85	1	1	1	1
44	S940079	1205	PCT-4\SA\1\1>188-M-2-M	3	1	1	84	1	1	1	1
45	S940080	1206	PCT-4\SA\1\1>188-M-3-M	3	1	1	84	1	1	1	1
46	S940081	1207	PCT-4\SA\1\1>188-M-4-M	3	1	1	85	1	1	1	1
47	S940082	1208	PCT-4\SA\1\1>188-M-5-M	5	1	1	85	1	1	1	1
48	S940083	1209	PCT-4\SA\1\1>188-M-6-M	5	1	1	85	3	1	1	1
49	S940084	1210	PCT-4\SA\1\1>193-M-1-M	3	1	1	83	3	1	1	1

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	Bi	BI	FI 50%	LSc	BS	GD	NBI
50	S940085	1211	PCT-4\SA\1\1>193-M-2-M	1	1	1	83	3	1	1	1
51	S940086	1212	PCT-4\SA\1\1>193-M-3-M	3	1	1	84	3	1	1	1
52	S940087	1213	PCT-4\SA\1\1>193-M-4-M	3	1	1	87	3	1	1	1
53	S940088	1214	PCT-4\SA\1\1>193-M-5-M	3	1	1	83	3	1	1	1
54	S940089	1215	PCT-4\SA\1\1>193-M-6-M	5	1	1	84	3	1	1	1
55	S940090	1216	PCT-4\SA\1\1>195-M-1-M	5	1	1	77	1	1	3	1
56	S940091	1217	PCT-4\SA\1\1>195-M-2-M	5	1	1	77	1	1	1	1
57	S940092	1218	PCT-4\SA\1\1>195-M-3-M	5	1	1	77	1	1	3	1
58	S940093	1219	PCT-4\SA\1\1>195-M-4-M	5	1	1	77	1	1	3	1
59	S940094	1220	PCT-4\SA\1\1>195-M-5-M	5	1	1	78	1	1	3	1
60	S940095	1221	PCT-4\SA\1\1>195-M-6-M	5	1	1	81	1	1	3	1
61	S940096	1222	PCT-4\SA\1\1>223-M-1-M	7	1	1	80	1	1	3	1
62	S940097	1223	PCT-4\SA\1\1>223-M-2-M	5	1	1	80	1	1	3	1
63	S940098	1224	PCT-4\SA\1\1>223-M-3-M	7	1	1	80	1	1	1	1
64	S940099	1225	PCT-4\SA\1\1>223-M-4-M	7	1	1	79	1	1	1	1
	T1		CIRAD 409	5	1	1	65	1	1	1	1
	T2		O.Sabana 6	5	3	3	87	3	1	1	1
	T3		O.Sabana 10	7	2	1	87	3	1	1	1
65	S940100	1226	PCT-4\SA\1\1>223-M-5-M	5	1	1	80	1	1	1	1
66	S940101	1227	PCT-4\SA\1\1>223-M-6-M	7	1	2	82	1	1	3	1
67	S940102	1228	PCT-4\SA\1\1>230-M-1-M	7	1	1	82	1	1	3	1
68	S940103	1229	PCT-4\SA\1\1>230-M-2-M	7	1	1	84	1	1	1	1
69	S940104	1230	PCT-4\SA\1\1>230-M-3-M	7	1	1	82	1	1	3	1
70	S940105	1231	PCT-4\SA\1\1>230-M-4-M	7	1	1	82	1	1	1	1
71	S940106	1232	PCT-4\SA\1\1>230-M-5-M	7	1	1	84	1	1	1	1
72	S940107	1233	PCT-4\SA\1\1>230-M-6-M	9	1	1	85	1	1	1	1
73	S940108	1234	PCT-4\SA\1\1>236-M-1-M	9	1	1	85	1	1	1	1
74	S940109	1235	PCT-4\SA\1\1>236-M-2-M	9	1	1	82	1	1	1	1
75	S940110	1236	PCT-4\SA\1\1>236-M-3-M	9	1	1	85	1	1	1	1
76	S940111	1237	PCT-4\SA\1\1>236-M-4-M	9	1	2	83	1	1	1	1
77	S940112	1238	PCT-4\SA\1\1>236-M-5-M	9	1	2	83	1	1	1	1
78	S940113	1239	PCT-4\SA\1\1>236-M-6-M	9	1	1	83	1	1	1	1
79	S940114	1240	PCT-4\SA\1\1>260-M-1-M	9	1	1	66	1	1	1	1
80	S940115	1241	PCT-4\SA\1\1>260-M-2-M	9	1	1	67	1	1	1	1
81	S940116	1242	PCT-4\SA\1\1>260-M-3-M	9	1	1	65	1	1	1	1
82	S940117	1243	PCT-4\SA\1\1>260-M-4-M	7	1	1	66	1	1	1	1
83	S940118	1244	PCT-4\SA\1\1>260-M-5-M	9	1	1	67	1	1	1	1
84	S940119	1245	PCT-4\SA\1\1>260-M-6-M	9	1	1	64	1	1	1	1
85	S940120	1246	PCT-4\SA\1\1>261-M-1-M	9	1	1	67	1	1	1	1
86	S940121	1247	PCT-4\SA\1\1>261-M-2-M	9	1	1	68	1	1	1	1
87	S940122	1248	PCT-4\SA\1\1>261-M-3-M	9	1	1	64	1	1	1	1
88	S940123	1249	PCT-4\SA\1\1>261-M-4-M	7	1	1	64	1	1	1	1
89	S940124	1250	PCT-4\SA\1\1>261-M-5-M	7	1	1	65	1	1	1	1
90	S940125	1251	PCT-4\SA\1\1>261-M-6-M	9	1	1	64	1	1	1	1
91	S940126	1252	PCT-4\SA\1\1>279-M-1-M	9	1	1	63	1	1	1	1
92	S940127	1253	PCT-4\SA\1\1>279-M-2-M	7	1	1	66	1	1	1	1
93	S940128	1254	PCT-4\SA\1\1>279-M-3-M	9	1	1	67	1	1	1	1
94	S940129	1255	PCT-4\SA\1\1>279-M-4-M	7	1	1	65	1	1	1	1
95	S940130	1256	PCT-4\SA\1\1>279-M-5-M	7	2	1	63	1	1	1	1
96	S940131	1257	PCT-4\SA\1\1>279-M-6-M	7	2	1	66	1	1	1	1
97	S940132	1258	PCT-4\SA\1\1>305-M-1-M	5	1	1	68	1	1	1	1
98	S940133	1259	PCT-4\SA\1\1>305-M-2-M	7	1	1	69	1	1	1	1
100	S940135	1261	PCT-4\SA\1\1>305-M-4-M	7	1	1	68	1	1	1	1
101	S940136	1262	PCT-4\SA\1\1>305-M-5-M	9	2	1	75	1	1	1	1
102	S940137	1263	PCT-4\SA\1\1>305-M-6-M	7	1	1	73	1	1	1	1

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	BI	BI	FI 50%	LSc	BS	GD	NBI
103	S940138	1264	PCT-4\SA\1\1>306-M-1-M	7	2	1	73	1	1	1	1
104	S940139	1265	PCT-4\SA\1\1>306-M-2-M	7	2	1	71	1	1	1	1
105	S940140	1266	PCT-4\SA\1\1>306-M-3-M	7	1	1	69	1	1	1	1
106	S940141	1267	PCT-4\SA\1\1>306-M-4-M	7	2	1	74	1	1	1	1
107	S940142	1268	PCT-4\SA\1\1>306-M-5-M	7	2	1	72	1	1	1	1
108	S940143	1269	PCT-4\SA\1\1>306-M-6-M	7	1	1	72	1	1	1	1
109	S940144	1270	PCT-4\SA\1\1>341-M-1-M	5	1	1	61	1	1	1	1
110	S940145	1271	PCT-4\SA\1\1>341-M-2-M	7	1	1	67	1	3	1	1
111	S940146	1272	PCT-4\SA\1\1>341-M-3-M	5	1	1	67	1	1	1	1
112	S940147	1273	PCT-4\SA\1\1>341-M-4-M	5	1	2	60	1	1	1	1
113	S940148	1274	PCT-4\SA\1\1>341-M-5-M	7	1	1	65	1	1	1	1
114	S940149	1275	PCT-4\SA\1\1>341-M-6-M	5	1	1	66	1	1	1	1
115	S940150	1276	PCT-4\SA\1\1>440-M-1-M	5	1	1	84	1	1	1	1
116	S940151	1277	PCT-4\SA\1\1>440-M-2-M	5	2	1	84	1	1	1	1
117	S940152	1278	PCT-4\SA\1\1>440-M-3-M	5	1	1	66	1	1	1	1
118	S940153	1279	PCT-4\SA\1\1>440-M-4-M	7	1	1	83	1	1	1	1
119	S940154	1280	PCT-4\SA\1\1>440-M-5-M	7	1	1	85	1	1	1	1
120	S940155	1281	PCT-4\SA\1\1>440-M-6-M	5	1	1	81	1	1	1	1
121	S940156	1282	PCT-4\SA\1\1>446-M-1-M	7	1	1	68	1	1	1	1
	T1		CIRAD 409	7	1	1	65	1	1	1	1
	T2		O.Sabana 6	5	1	2	86	1	1	1	1
	T3		O.Sabana 10	7	3	1	88	1	1	1	1
122	S940157	1283	PCT-4\SA\1\1>446-M-2-M	7	1	1	67	1	1	1	1
123	S940158	1284	PCT-4\SA\1\1>446-M-3-M	7	1	1	68	1	1	1	1
124	S940159	1285	PCT-4\SA\1\1>446-M-4-M	7	1	1	66	1	1	1	1
125	S940160	1286	PCT-4\SA\1\1>446-M-5-M	7	1	1	66	1	3	1	1
126	S940161	1287	PCT-4\SA\1\1>446-M-6-M	7	1	1	66	1	3	1	1
127	S940162	1288	PCT-4\SA\1\1>500-M-1-M	7	1	1	64	1	3	1	1
128	S940163	1289	PCT-4\SA\1\1>500-M-2-M	7	1	1	64	1	3	1	1
129	S940164	1290	PCT-4\SA\1\1>500-M-3-M	7	1	1	66	1	1	1	1
130	S940165	1291	PCT-4\SA\1\1>500-M-4-M	7	2	1	66	1	1	1	1
131	S940166	1292	PCT-4\SA\1\1>500-M-5-M	7	3	2	66	1	1	1	1
132	S940167	1293	PCT-4\SA\1\1>500-M-6-M	5	1	1	64	1	3	1	1
133	S940168	1294	PCT-4\SA\1\1>503-M-1-M	9	2	1	68	1	3	1	1
134	S940169	1295	PCT-4\SA\1\1>503-M-2-M	7	1	1	66	1	3	1	1
135	S940170	1296	PCT-4\SA\1\1>503-M-3-M	5	1	1	66	1	3	1	1
136	S940171	1297	PCT-4\SA\1\1>503-M-4-M	5	1	1	64	1	3	1	1
137	S940172	1298	PCT-4\SA\1\1>503-M-5-M	5	1	1	63	1	3	1	1
138	S940173	1299	PCT-4\SA\1\1>503-M-6-M	5	1	1	67	1	3	1	1
139	S940174	1300	PCT-4\SA\1\1>516-M-1-M	7	1	1	67	1	3	1	1
140	S940175	1301	PCT-4\SA\1\1>516-M-2-M	7	1	1	67	1	3	1	1
141	S940176	1302	PCT-4\SA\1\1>516-M-3-M	7	1	1	67	1	1	1	1
142	S940177	1303	PCT-4\SA\1\1>516-M-4-M	7	1	1	67	1	1	1	1
143	S940178	1304	PCT-4\SA\1\1>516-M-5-M	7	1	1	67	1	1	1	1
144	S940179	1305	PCT-4\SA\1\1>516-M-6-M	5	1	1	68	1	3	1	1
145	S940180	1306	PCT-4\SA\1\1>540-M-1-M	7	1	1	66	1	3	1	1
146	S940181	1307	PCT-4\SA\1\1>540-M-2-M	7	1	1	65	1	3	1	1
147	S940182	1308	PCT-4\SA\1\1>540-M-3-M	5	1	1	65	1	3	1	1
148	S940183	1309	PCT-4\SA\1\1>540-M-4-M	7	1	1	66	1	3	1	1
149	S940184	1310	PCT-4\SA\1\1>540-M-5-M	7	2	1	64	1	3	1	1
150	S940185	1311	PCT-4\SA\1\1>540-M-6-M	7	1	1	68	1	3	1	1
151	S940186	1312	PCT-4\SA\1\1>573-M-1-M	7	1	1	73	1	3	1	1
152	S940187	1313	PCT-4\SA\1\1>573-M-2-M	7	1	1	73	3	3	1	1
153	S940188	1314	PCT-4\SA\1\1>573-M-3-M	7	1	1	73	1	3	1	1
154	S940189	1315	PCT-4\SA\1\1>573-M-4-M	7	1	1	69	1	3	1	1

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	BI	BI	FI 50%	LSc	BS	GD	NBI
155	S940190	1316	PCT-4\SA\1\1>573-M-5-M	7	1	1	72	1	3	1	1
156	S940191	1317	PCT-4\SA\1\1>573-M-6-M	7	1	1	71	1	3	1	1
157	S940192	1318	PCT-4\SA\1\1>631-M-1-M	7	1	1	75	1	3	1	1
158	S940193	1319	PCT-4\SA\1\1>631-M-2-M	7	1	1	72	1	3	1	1
159	S940194	1320	PCT-4\SA\1\1>631-M-3-M	7	1	1	75	1	3	1	1
160	S940195	1321	PCT-4\SA\1\1>631-M-4-M	7	1	1	69	1	3	1	1
161	S940196	1322	PCT-4\SA\1\1>631-M-5-M	7	1	1	71	5	3	1	1
162	S940197	1323	PCT-4\SA\1\1>631-M-6-M	5	1	1	74	3	3	1	1
163	S940198	1324	PCT-4\SA\1\1>632-M-1-M	7	1	1	75	3	3	1	1
164	S940199	1325	PCT-4\SA\1\1>632-M-2-M	5	1	1	73	3	1	1	1
165	S940200	1326	PCT-4\SA\1\1>632-M-3-M	7	1	1	72	3	3	1	1
166	S940201	1327	PCT-4\SA\1\1>632-M-4-M	7	1	1	72	3	1	1	1
167	S940202	1328	PCT-4\SA\1\1>632-M-5-M	7	1	1	75	3	1	1	1
168	S940203	1329	PCT-4\SA\1\1>632-M-6-M	7	1	1	75	1	1	1	1
169	S940204	1330	PCT-4\SA\1\1>669-M-1-M	7	1	1	73	1	1	1	1
170	S940205	1331	PCT-4\SA\1\1>669-M-2-M	7	1	1	69	3	1	1	1
171	S940206	1332	PCT-4\SA\1\1>669-M-3-M	7	1	1	73	3	1	1	1
172	S940207	1333	PCT-4\SA\1\1>669-M-4-M	7	1	1	73	1	1	1	1
173	S940208	1334	PCT-4\SA\1\1>669-M-5-M	7	1	1	73	3	1	1	1
174	S940209	1335	PCT-4\SA\1\1>669-M-6-M	7	1	1	74	3	1	1	1
175	S940210	1336	PCT-4\SA\1\1>721-M-1-M	7	1	1	72	1	1	1	1
176	S940211	1337	PCT-4\SA\1\1>721-M-2-M	7	1	1	70	1	1	1	1
177	S940212	1338	PCT-4\SA\1\1>721-M-3-M	7	1	1	75	1	1	1	1
178	S940213	1339	PCT-4\SA\1\1>721-M-4-M	7	1	1	69	1	1	1	1
	T1		CIRAD 409	5	1	1	66	1	1	1	1
	T2		O.Sabana 6	5	3	2	86	1	1	1	1
	T3		O.Sabana 10	5	2	1	87	3	1	1	1
179	S940214	1340	PCT-4\SA\1\1>721-M-5-M	5	1	1	69	3	1	1	1
180	S940215	1341	PCT-4\SA\1\1>721-M-6-M	7	1	1	72	1	1	1	1
181	S940216	1342	PCT-4\SA\1\1>722-M-1-M	7	2	1	67	1	1	1	1
182	S940217	1343	PCT-4\SA\1\1>722-M-2-M	7	2	1	67	1	1	1	1
183	S940218	1344	PCT-4\SA\1\1>722-M-3-M	7	1	1	67	1	1	1	1
184	S940219	1345	PCT-4\SA\1\1>722-M-4-M	7	1	1	66	1	1	1	1
185	S940220	1346	PCT-4\SA\1\1>722-M-5-M	7	1	1	66	1	1	1	1
186	S940221	1347	PCT-4\SA\1\1>722-M-6-M	7	1	1	67	1	1	1	1
187	S940222	1348	PCT-4\SA\1\1>763-M-1-M	7	1	1	63	1	1	1	1
188	S940223	1349	PCT-4\SA\1\1>763-M-2-M	7	1	1	63	1	1	1	1
189	S940224	1350	PCT-4\SA\1\1>763-M-3-M	7	1	1	64	1	1	1	1
190	S940225	1351	PCT-4\SA\1\1>763-M-4-M	7	1	1	63	1	1	1	1
191	S940226	1352	PCT-4\SA\1\1>763-M-5-M	7	1	1	63	1	1	1	1
192	S940227	1353	PCT-4\SA\1\1>763-M-6-M	7	1	1	64	1	1	1	1
193	S940228	1354	PCT-4\SA\1\1>813-M-1-M	7	1	1	63	1	1	1	1
194	S940229	1355	PCT-4\SA\1\1>813-M-2-M	7	1	1	65	1	1	1	1
195	S940230	1356	PCT-4\SA\1\1>813-M-3-M	7	1	1	66	1	1	1	1
196	S940231	1357	PCT-4\SA\1\1>813-M-4-M	7	1	1	66	1	1	1	1
197	S940232	1358	PCT-4\SA\1\1>813-M-5-M	7	1	1	66	1	1	1	1
198	S940233	1359	PCT-4\SA\1\1>813-M-6-M	7	1	1	67	1	1	1	1
199	S940234	1360	PCT-4\SA\1\1>881-M-1-M	5	1	1	69	1	1	1	1
200	S940235	1361	PCT-4\SA\1\1>881-M-2-M	5	1	1	68	1	1	1	1
201	S940236	1362	PCT-4\SA\1\1>881-M-3-M	5	1	1	75	3	1	1	1
202	S940237	1363	PCT-4\SA\1\1>881-M-4-M	5	1	1	73	3	1	1	1
203	S940238	1364	PCT-4\SA\1\1>881-M-5-M	5	1	1	68	3	1	1	1
204	S940239	1365	PCT-4\SA\1\1>881-M-6-M	5	1	1	75	3	1	1	1

Nbr.	Field Nbr.	Origin	Pedigree	Vg	BI	BI	FI	LSc	BS	1	NBI
	1999A	1998B					50%				
205	S940240	1366	PCT-4\SA\1\1>895-M-1-M	5	1	1	73	3	1	1	1
206	S940241	1367	PCT-4\SA\1\1>895-M-2-M	1	1	1	68	3	1	1	1
207	S940242	1368	PCT-4\SA\1\1>895-M-3-M	1	1	1	70	1	1	1	1
208	S940243	1369	PCT-4\SA\1\1>895-M-4-M	1	1	1	69	1	1	1	1
209	S940244	1370	PCT-4\SA\1\1>895-M-5-M	1	1	1	69	1	1	1	1
210	S940245	1371	PCT-4\SA\1\1>895-M-6-M	1	1	1	71	1	1	1	1
211	S940246	1372	PCT-4\SA\1\1>910-M-1-M	5	1	1	73	1	1	1	1
212	S940247	1373	PCT-4\SA\1\1>910-M-2-M	5	1	1	73	1	1	1	1
213	S940248	1374	PCT-4\SA\1\1>910-M-3-M	5	1	1	75	1	1	1	1
214	S940249	1375	PCT-4\SA\1\1>910-M-4-M	5	1	1	71	1	1	1	1
215	S940250	1376	PCT-4\SA\1\1>910-M-5-M	5	1	1	72	1	1	1	1
216	S940251	1377	PCT-4\SA\1\1>910-M-6-M	5	1	1	73	1	1	1	1
217	S940252	1378	PCT-4\SA\1\1>948-M-1-M	3	1	1	69	1	1	1	1
218	S940253	1379	PCT-4\SA\1\1>948-M-2-M	3	1	1	68	1	1	1	1
219	S940254	1380	PCT-4\SA\1\1>948-M-3-M	3	1	1	68	1	1	1	1
220	S940255	1381	PCT-4\SA\1\1>948-M-4-M	3	1	1	67	1	1	1	1
221	S940256	1382	PCT-4\SA\1\1>948-M-5-M	3	1	1	66	1	1	1	1
222	S940257	1383	PCT-4\SA\1\1>948-M-6-M	5	1	1	72	1	1	1	1
223	S940258	1384	PCT-4\SA\1\1>975-M-1-M	5	1	1	66	1	1	1	1
224	S940259	1385	PCT-4\SA\1\1>975-M-2-M	5	1	1	66	1	1	1	1
225	S940260	1386	PCT-4\SA\1\1>975-M-3-M	7	1	1	69	1	1	1	1
226	S940261	1387	PCT-4\SA\1\1>975-M-4-M	7	1	1	67	1	1	1	1
227	S940262	1388	PCT-4\SA\1\1>975-M-5-M	7	1	1	66	1	1	1	1
228	S940263	1389	PCT-4\SA\1\1>975-M-6-M	7	1	1	63	1	1	1	1
229	S940264	1390	PCT-4\SA\1\1>982-M-1-M	7	1	1	65	1	1	1	1
230	S940265	1391	PCT-4\SA\1\1>982-M-2-M	7	1	1	72	1	1	1	1
231	S940266	1392	PCT-4\SA\1\1>982-M-3-M	5	2	1	66	1	1	1	1
232	S940267	1393	PCT-4\SA\1\1>982-M-4-M	5	2	1	66	1	1	1	1
	T1		CIRAD 409	5	1	1	63	1	1	1	1
	T2		O.Sabana 6	5	3	2	86	3	1	1	1
	T3		O.Sabana 10	5	2	1	87	3	1	1	1
233	S940268	1394	PCT-4\SA\1\1>982-M-5-M	7	1	1	73	1	1	1	1
234	S940269	1395	PCT-4\SA\1\1>982-M-6-M	7	1	1	75	1	1	1	1
235	S940270	1396	PCT-4\SA\1\1>1013-M-1-M	7	1	1	76	1	1	1	1
236	S940271	1397	PCT-4\SA\1\1>1013-M-2-M	7	1	2	78	1	1	1	1
237	S940272	1398	PCT-4\SA\1\1>1013-M-3-M	7	1	1	80	1	1	1	1
238	S940273	1399	PCT-4\SA\1\1>1013-M-4-M	7	1	1	81	1	1	1	1
239	S940274	1400	PCT-4\SA\1\1>1013-M-5-M	7	1	1	74	1	1	1	1
240	S940275	1401	PCT-4\SA\1\1>1013-M-6-M	7	1	1	77	1	1	1	1
241	S940276	1402	PCT-4\SA\1\1>1036-M-1-M	5	1	1	68	1	1	1	1
242	S940277	1403	PCT-4\SA\1\1>1036-M-2-M	5	1	1	73	1	1	1	1
243	S940278	1404	PCT-4\SA\1\1>1036-M-3-M	5	1	1	73	1	1	1	1
244	S940279	1405	PCT-4\SA\1\1>1036-M-4-M	5	1	1	68	1	1	1	1
245	S940280	1406	PCT-4\SA\1\1>1036-M-5-M	5	1	1	70	1	1	1	1
246	S940281	1407	PCT-4\SA\1\1>1036-M-6-M	5	1	1	72	1	1	1	1
247	S940282	1408	PCT-4\SA\1\1>1044-M-1-M	5	1	1	72	1	1	1	1
248	S940283	1409	PCT-4\SA\1\1>1044-M-2-M	5	1	1	70	1	1	1	1
249	S940284	1410	PCT-4\SA\1\1>1044-M-3-M	5	1	1	73	1	1	1	1
250	S940285	1411	PCT-4\SA\1\1>1044-M-4-M	5	1	1	72	1	1	1	1
251	S940286	1412	PCT-4\SA\1\1>1044-M-5-M	5	1	1	72	3	1	1	1
252	S940287	1413	PCT-4\SA\1\1>1044-M-6-M	5	2	1	73	3	1	1	1
253	S940288	1414	PCT-4\SA\1\1>1108-M-1-M	5	1	1	73	3	1	1	1
254	S940289	1415	PCT-4\SA\1\1>1108-M-2-M	5	1	1	71	1	1	1	1
255	S940290	1416	PCT-4\SA\1\1>1108-M-3-M	3	1	1	68	3	3	1	1
256	S940291	1417	PCT-4\SA\1\1>1108-M-4-M	7	1	1	68	1	1	1	1

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	BI	BI	FI 50%	LSc	BS	GD	NBI
257	S940292	1418	PCT-4\SA\1\1>1108-M-5-M	7	1	1	68	1	1	1	1
258	S940293	1419	PCT-4\SA\1\1>1108-M-6-M	7	1	1	75	1	1	1	1
259	S940294	1420	PCT-4\SA\1\1>1116-M-1-M	7	1	1	73	1	1	1	1
	T1		CIRAD 409	7	1	1	66	1	1	1	1
	T2		O.Sabana 6	7	3	2	88	3	1	1	1
	T3		O.Sabana 10	7	2	1	89	3	1	1	1
260	S940295	1421	PCT-4\SA\1\1>1116-M-2-M	5	1	1	77	1	1	1	1
261	S940296	1422	PCT-4\SA\1\1>1116-M-3-M	5	1	1	75	1	1	1	1
262	S940297	1423	PCT-4\SA\1\1>1116-M-4-M	5	1	1	75	1	1	1	1
263	S940298	1424	PCT-4\SA\1\1>1116-M-5-M	5	1	1	73	1	1	1	1
264	S940299	1425	PCT-4\SA\1\1>1116-M-6-M	5	1	1	72	1	1	1	1
265	S940300	1426	PCT-4\SA\1\1>1127-M-1-M	7	1	1	69	1	1	1	1
266	S940301	1427	PCT-4\SA\1\1>1127-M-2-M	7	1	1	68	1	1	1	1
267	S940302	1428	PCT-4\SA\1\1>1127-M-3-M	7	1	2	68	1	1	1	1
268	S940303	1429	PCT-4\SA\1\1>1127-M-4-M	7	1	1	71	1	1	1	1
269	S940304	1430	PCT-4\SA\1\1>1127-M-5-M	7	1	1	72	1	1	1	1
270	S940305	1431	PCT-4\SA\1\1>1127-M-6-M	7	1	1	68	1	1	1	1
271	S940306	1432	PCT-4\SA\1\1>1156-M-1-M	7	1	1	65	1	1	1	1
272	S940307	1433	PCT-4\SA\1\1>1156-M-2-M	5	1	1	63	1	1	1	1
273	S940308	1434	PCT-4\SA\1\1>1156-M-3-M	5	1	1	63	1	1	1	1
274	S940309	1435	PCT-4\SA\1\1>1156-M-4-M	7	1	1	66	1	1	1	1
275	S940310	1436	PCT-4\SA\1\1>1156-M-5-M	7	2	1	63	1	1	1	1
276	S940311	1437	PCT-4\SA\1\1>1156-M-6-M	7	1	1	65	1	1	1	1
277	S940312	1438	PCT-4\SA\1\1>1199-M-1-M	7	1	1	63	1	1	1	1
278	S940313	1439	PCT-4\SA\1\1>1199-M-2-M	5	1	1	62	1	1	1	1
279	S940314	1440	PCT-4\SA\1\1>1199-M-3-M	7	1	1	65	1	1	1	1
280	S940315	1441	PCT-4\SA\1\1>1199-M-4-M	7	1	2	64	1	1	1	1
281	S940316	1442	PCT-4\SA\1\1>1199-M-5-M	7	1	1	63	1	1	1	1
282	S940317	1443	PCT-4\SA\1\1>1199-M-6-M	5	1	1	62	1	1	1	1
283	S940318	1444	PCT-4\SA\1\1>1206-M-1-M	5	1	1	67	1	1	1	1
284	S940319	1445	PCT-4\SA\1\1>1206-M-2-M	5	1	1	62	1	1	1	1
285	S940320	1446	PCT-4\SA\1\1>1206-M-3-M	5	1	1	63	1	1	1	1
286	S940321	1447	PCT-4\SA\1\1>1206-M-4-M	5	1	1	63	1	1	1	1
287	S940322	1448	PCT-4\SA\1\1>1206-M-5-M	5	1	1	63	1	1	1	1
288	S940323	1449	PCT-4\SA\1\1>1206-M-6-M	5	1	1	62	1	1	1	1
289	S940324	1450	PCT-4\SA\1\1>1236-M-1-M	5	1	1	62	1	1	1	1
290	S940325	1451	PCT-4\SA\1\1>1236-M-2-M	5	1	1	63	1	1	1	1
291	S940326	1452	PCT-4\SA\1\1>1236-M-3-M	5	1	1	62	1	1	1	1
292	S940327	1453	PCT-4\SA\1\1>1236-M-4-M	5	1	1	62	1	1	1	1
293	S940328	1454	PCT-4\SA\1\1>1236-M-5-M	5	1	1	63	1	1	1	1
294	S940329	1455	PCT-4\SA\1\1>1236-M-6-M	7	1	1	66	1	1	1	1
295	S940330	1456	PCT-4\SA\1\1>1241-M-1-M	7	1	1	66	1	1	1	1
296	S940331	1457	PCT-4\SA\1\1>1241-M-2-M	7	1	1	63	1	1	1	1
297	S940332	1458	PCT-4\SA\1\1>1241-M-3-M	7	1	3	63	1	1	1	1
298	S940333	1459	PCT-4\SA\1\1>1241-M-4-M	7	1	3	64	1	1	1	1
299	S940334	1460	PCT-4\SA\1\1>1241-M-5-M	5	1	2	63	1	1	1	1
300	S940335	1461	PCT-4\SA\1\1>1241-M-6-M	7	1	2	66	1	1	1	1
301	S940336	1462	PCT-4\SA\1\1>1260-M-1-M	7	1	1	63	1	3	1	1
302	S940337	1463	PCT-4\SA\1\1>1260-M-2-M	7	2	1	63	1	3	1	1
303	S940338	1464	PCT-4\SA\1\1>1260-M-3-M	7	1	1	63	1	3	1	1
304	S940339	1465	PCT-4\SA\1\1>1260-M-4-M	7	1	1	63	1	1	1	1
305	S940340	1466	PCT-4\SA\1\1>1260-M-5-M	5	1	1	66	1	3	1	1
306	S940341	1467	PCT-4\SA\1\1>1260-M-6-M	7	1	1	63	1	1	1	1
307	S940342	1468	PCT-4\SA\1\1>1270-M-1-M	7	1	1	63	1	1	1	1
308	S940343	1469	PCT-4\SA\1\1>1270-M-2-M	7	1	1	65	1	3	1	1

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	BI	BI	FI 50%	LSc	BS	GD	NBI
309	S940344	1470	PCT-4\SA\1\1>1270-M-3-M	7	1	1	65	1	3	1	1
310	S940345	1471	PCT-4\SA\1\1>1270-M-4-M	7	1	1	64	1	1	1	1
311	S940346	1472	PCT-4\SA\1\1>1270-M-5-M	7	1	1	66	1	1	1	1
312	S940347	1473	PCT-4\SA\1\1>1270-M-6-M	7	1	1	66	1	1	1	1
313	S940348	1474	PCT-4\SA\1\1>1272-M-1-M	7	1	1	64	1	3	1	1
314	S940349	1475	PCT-4\SA\1\1>1272-M-2-M	5	1	1	68	1	1	1	1
315	S940350	1476	PCT-4\SA\1\1>1272-M-3-M	5	1	1	63	1	1	1	1
316	S940351	1477	PCT-4\SA\1\1>1272-M-4-M	5	1	1	63	1	1	1	1
317	S940352	1478	PCT-4\SA\1\1>1272-M-5-M	5	1	1	66	1	1	1	1
318	S940353	1479	PCT-4\SA\1\1>1272-M-6-M	5	1	1	66	1	1	1	1
	T1		CIRAD 409	5	1	1	64	1	1	1	1
	T2		O.Sabana 6	5	3	2	87	3	1	1	1
	T3		O.Sabana 10	7	2	1	90	3	1	1	1
319	S940354	1480	PCT-4\SA\1\1>1475-M-1-M	5	1	1	72	1	1	1	1
320	S940355	1481	PCT-4\SA\1\1>1475-M-2-M	5	1	1	72	1	1	1	1
321	S940356	1482	PCT-4\SA\1\1>1475-M-3-M	5	1	1	72	1	1	1	1
322	S940357	1483	PCT-4\SA\1\1>1475-M-4-M	5	1	1	70	1	1	1	1
323	S940358	1484	PCT-4\SA\1\1>1475-M-5-M	5	1	1	68	1	1	1	1
324	S940359	1485	PCT-4\SA\1\1>1475-M-6-M	5	1	1	68	1	1	1	1
325	S940360	1486	PCT-4\SA\1\1>1479-M-1-M	5	1	1	68	1	1	1	1
326	S940361	1487	PCT-4\SA\1\1>1479-M-2-M	5	1	1	75	1	1	1	1
327	S940362	1488	PCT-4\SA\1\1>1479-M-3-M	5	1	1	68	1	1	1	1
328	S940363	1489	PCT-4\SA\1\1>1479-M-4-M	5	1	1	66	1	1	1	1
329	S940364	1490	PCT-4\SA\1\1>1479-M-5-M	5	1	1	69	1	1	1	1
330	S940365	1491	PCT-4\SA\1\1>1479-M-6-M	5	1	1	73	1	1	1	1
331	S940366	1492	PCT-4\SA\1\1>1486-M-1-M	5	1	1	72	1	1	1	1
332	S940367	1493	PCT-4\SA\1\1>1486-M-2-M	5	1	1	72	1	1	1	1
333	S940368	1494	PCT-4\SA\1\1>1486-M-3-M	5	1	1	72	1	1	1	1
334	S940369	1495	PCT-4\SA\1\1>1486-M-4-M	5	1	1	67	1	1	1	1
335	S940370	1496	PCT-4\SA\1\1>1486-M-5-M	5	1	1	66	1	1	1	1
336	S940371	1497	PCT-4\SA\1\1>1486-M-6-M	5	1	1	66	1	1	1	1
337	S940372	1498	PCT-4\SA\1\1>1549-M-1-M	5	1	1	69	1	1	1	1
338	S940373	1499	PCT-4\SA\1\1>1549-M-2-M	5	1	1	73	1	1	1	1
339	S940374	1500	PCT-4\SA\1\1>1549-M-3-M	5	1	1	66	1	1	1	1
340	S940375	1501	PCT-4\SA\1\1>1549-M-4-M	5	2	1	63	1	1	1	1
341	S940376	1502	PCT-4\SA\1\1>1549-M-5-M	7	2	1	72	1	1	1	1
342	S940377	1503	PCT-4\SA\1\1>1549-M-6-M	5	1	1	69	1	1	1	1
343	S940378	1504	PCT-4\SA\1\1>1566-M-1-M	5	1	1	65	1	3	1	1
344	S940379	1505	PCT-4\SA\1\1>1566-M-2-M	5	1	1	69	1	3	1	1
345	S940380	1506	PCT-4\SA\1\1>1566-M-3-M	5	1	1	68	1	3	1	1
346	S940381	1507	PCT-4\SA\1\1>1566-M-4-M	5	1	1	66	1	1	1	1
347	S940382	1508	PCT-4\SA\1\1>1566-M-5-M	5	1	1	72	1	1	1	1
348	S940383	1509	PCT-4\SA\1\1>1566-M-6-M	5	1	1	62	1	1	1	1
349	S940384	1510	PCT-4\SA\1\1>1576-M-1-M	5	1	1	69	1	1	1	1
350	S940385	1511	PCT-4\SA\1\1>1576-M-2-M	5	1	1	68	1	1	1	1
351	S940386	1512	PCT-4\SA\1\1>1576-M-3-M	5	1	1	69	3	1	1	1
352	S940387	1513	PCT-4\SA\1\1>1576-M-4-M	5	1	1	66	3	1	1	1
353	S940388	1514	PCT-4\SA\1\1>1576-M-5-M	5	1	1	66	3	1	1	1
354	S940389	1515	PCT-4\SA\1\1>1576-M-6-M	5	1	1	65	3	1	1	1
355	S940390	1516	PCT-4\SA\1\1>1632-M-1-M	5	1	1	66	3	1	1	1
356	S940391	1517	PCT-4\SA\1\1>1632-M-2-M	5	1	1	73	3	1	1	1
357	S940392	1518	PCT-4\SA\1\1>1632-M-3-M	5	1	1	66	3	1	1	1
358	S940393	1519	PCT-4\SA\1\1>1632-M-4-M	3	1	1	65	3	1	1	1
359	S940394	1520	PCT-4\SA\1\1>1632-M-5-M	5	1	1	66	3	1	1	1
360	S940395	1521	PCT-4\SA\1\1>1632-M-6-M	3	1	1	65	3	1	1	1

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	BI	BI	FI 50%	LSc	BS	GD	NBI
361	S940396	1522	PCT-4\SA\1\1>1689-M-1-M	3	1	1	66	1	1	1	1
362	S940397	1523	PCT-4\SA\1\1>1689-M-2-M	3	1	1	66	3	1	1	1
363	S940398	1524	PCT-4\SA\1\1>1689-M-3-M	3	1	1	67	1	1	1	1
364	S940399	1525	PCT-4\SA\1\1>1689-M-4-M	3	1	1	67	1	1	1	1
365	S940400	1526	PCT-4\SA\1\1>1689-M-5-M	5	1	1	66	1	1	1	1
366	S940401	1527	PCT-4\SA\1\1>1689-M-6-M	3	1	1	67	1	1	1	1
367	S940402	1528	PCT-4\SA\1\1>1702-M-1-M	3	2	1	66	1	1	1	1
368	S940403	1529	PCT-4\SA\1\1>1702-M-2-M	5	1	1	67	1	1	1	1
369	S940404	1530	PCT-4\SA\1\1>1702-M-3-M	5	1	1	66	1	1	1	1
370	S940405	1531	PCT-4\SA\1\1>1702-M-4-M	3	1	1	66	1	1	1	1
371	S940406	1532	PCT-4\SA\1\1>1702-M-5-M	3	1	1	68	1	1	1	1
372	S940407	1533	PCT-4\SA\1\1>1702-M-6-M	3	1	1	66	1	1	1	1
	T1		CIRAD 409	5	1	1	64	1	1	1	1
	T2		O.Sabana 6	3	3	1	87	3	1	1	1
	T3		O.Sabana 10	5	2	1	87	3	1	1	1
373	S940408	1534	PCT-4\SA\1\1>1837-M-1-M	5	1	1	67	1	1	1	1
374	S940409	1535	PCT-4\SA\1\1>1837-M-2-M	5	1	1	68	1	1	1	1
375	S940410	1536	PCT-4\SA\1\1>1837-M-3-M	5	1	1	63	1	1	1	1
376	S940411	1537	PCT-4\SA\1\1>1837-M-4-M	5	1	1	65	1	1	1	1
377	S940412	1538	PCT-4\SA\1\1>1837-M-5-M	5	1	1	68	1	1	1	1
378	S940413	1539	PCT-4\SA\1\1>1837-M-6-M	5	1	1	64	1	1	1	1
379	S940414	1540	PCT-4\SA\1\1>1878-M-1-M	5	1	1	66	1	1	1	1
380	S940415	1541	PCT-4\SA\1\1>1878-M-2-M	5	1	1	70	1	1	1	1
381	S940416	1542	PCT-4\SA\1\1>1878-M-3-M	5	1	1	66	1	1	1	1
382	S940417	1543	PCT-4\SA\1\1>1878-M-4-M	5	1	1	66	1	1	1	1
383	S940418	1544	PCT-4\SA\1\1>1878-M-5-M	5	1	1	66	1	1	1	1
384	S940419	1545	PCT-4\SA\1\1>1878-M-6-M	5	1	1	66	1	1	1	1
385	S940420	1546	PCT-4\SA\1\1>1928-M-1-M	5	1	1	66	1	1	1	1
386	S940421	1547	PCT-4\SA\1\1>1928-M-2-M	5	1	1	66	1	1	1	1
387	S940422	1548	PCT-4\SA\1\1>1928-M-3-M	5	1	1	66	1	1	1	1
388	S940423	1549	PCT-4\SA\1\1>1928-M-4-M	5	1	1	67	1	1	1	1
389	S940424	1550	PCT-4\SA\1\1>1928-M-5-M	5	1	1	67	1	1	1	1
390	S940425	1551	PCT-4\SA\1\1>1928-M-6-M	5	1	1	66	1	1	1	1

Vg = vigor; BI 1 = leaf blast; BI 2 = leaf blast; FI = flowering; LsC = leaf scald; BS = brown spot; NBI = neck blast; Gd = grain discoloration.

Table 9. Selected S4 lines from the population PCT-4\SA\1\1>
La libertad experimental station, 1999A

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	BI	BI	FI 50%	LSc	BS	GD	NBI
1	S940091	1217	PCT-4\SA\1\1>195-M-2-M	5	1	1	77	1	1	1	1
2	S940144	1270	PCT-4\SA\1\1>341-M-1-M	5	1	1	61	1	1	1	1
3	S940146	1272	PCT-4\SA\1\1>341-M-3-M	5	1	1	67	1	1	1	1
4	S940161	1287	PCT-4\SA\1\1>446-M-6-M	7	1	1	66	1	3	1	1
5	S940164	1290	PCT-4\SA\1\1>500-M-3-M	7	1	1	66	1	1	1	1
6	S940167	1293	PCT-4\SA\1\1>500-M-6-M	5	1	1	64	1	3	1	1
7	S940173	1299	PCT-4\SA\1\1>503-M-6-M	5	1	1	67	1	3	1	1
8	S940176	1302	PCT-4\SA\1\1>516-M-3-M	7	1	1	67	1	1	1	1
9	S940179	1305	PCT-4\SA\1\1>516-M-6-M	5	1	1	68	1	3	1	1
10	S940182	1308	PCT-4\SA\1\1>540-M-3-M	5	1	1	65	1	3	1	1
11	S940208	1334	PCT-4\SA\1\1>669-M-5-M	7	1	1	73	3	1	1	1
12	S940211	1337	PCT-4\SA\1\1>721-M-2-M	7	1	1	70	1	1	1	1

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	BI	BI	FI 50%	LSc	BS	GD	NBI
13	S940213	1339	PCT-4\SA\1\1>721-M-4-M	7	1	1	69	1	1	1	1
14	S940215	1341	PCT-4\SA\1\1>721-M-6-M	7	1	1	72	1	1	1	1
15	S940218	1344	PCT-4\SA\1\1>722-M-3-M	7	1	1	67	1	1	1	1
16	S940223	1349	PCT-4\SA\1\1>763-M-2-M	7	1	1	63	1	1	1	1
17	S940228	1354	PCT-4\SA\1\1>813-M-1-M	7	1	1	63	1	1	1	1
18	S940233	1359	PCT-4\SA\1\1>813-M-6-M	7	1	1	67	1	1	1	1
19	S940259	1385	PCT-4\SA\1\1>975-M-2-M	5	1	1	66	1	1	1	1
20	S940260	1386	PCT-4\SA\1\1>975-M-3-M	7	1	1	69	1	1	1	1
21	S940266	1392	PCT-4\SA\1\1>982-M-3-M	5	2	1	66	1	1	1	1
22	S940278	1404	PCT-4\SA\1\1>1036-M-3-M	5	1	1	73	1	1	1	1
23	S940281	1407	PCT-4\SA\1\1>1036-M-6-M	5	1	1	72	1	1	1	1
24	S940284	1410	PCT-4\SA\1\1>1044-M-3-M	5	1	1	73	1	1	1	1
25	S940307	1433	PCT-4\SA\1\1>1156-M-2-M	5	1	1	63	1	1	1	1
26	S940313	1439	PCT-4\SA\1\1>1199-M-2-M	5	1	1	62	1	1	1	1
27	S940316	1442	PCT-4\SA\1\1>1199-M-5-M	7	1	1	63	1	1	1	1
28	S940319	1445	PCT-4\SA\1\1>1206-M-2-M	5	1	1	62	1	1	1	1
29	S940324	1450	PCT-4\SA\1\1>1236-M-1-M	5	1	1	62	1	1	1	1
30	S940327	1453	PCT-4\SA\1\1>1236-M-4-M	5	1	1	62	1	1	1	1
31	S940331	1456	PCT-4\SA\1\1>1241-M-1-M	7	1	1	66	1	1	1	1
32	S940334	1460	PCT-4\SA\1\1>1241-M-5-M	5	1	2	63	1	1	1	1
33	S940341	1467	PCT-4\SA\1\1>1260-M-6-M	7	1	1	63	1	1	1	1
34	S940343	1469	PCT-4\SA\1\1>1270-M-2-M	7	1	1	65	1	3	1	1
35	S940346	1472	PCT-4\SA\1\1>1270-M-5-M	7	1	1	66	1	1	1	1
36	S940353	1479	PCT-4\SA\1\1>1272-M-6-M	5	1	1	66	1	1	1	1
37	S940360	1486	PCT-4\SA\1\1>1479-M-1-M	5	1	1	68	1	1	1	1
38	S940370	1496	PCT-4\SA\1\1>1486-M-5-M	5	1	1	66	1	1	1	1
39	S940371	1497	PCT-4\SA\1\1>1486-M-6-M	5	1	1	66	1	1	1	1
40	S940372	1498	PCT-4\SA\1\1>1549-M-1-M	5	1	1	69	1	1	1	1
41	S940383	1509	PCT-4\SA\1\1>1566-M-6-M	5	1	1	62	1	1	1	1
42	S940387	1513	PCT-4\SA\1\1>1576-M-4-M	5	1	1	66	3	1	1	1
43	S940389	1515	PCT-4\SA\1\1>1576-M-6-M	5	1	1	65	3	1	1	1
44	S940409	1535	PCT-4\SA\1\1>1837-M-2-M	5	1	1	68	1	1	1	1

Table 10. Evaluation of S6 lines from the population PCT-4\PHB\1\1>
La libertad experimental station, 1999A

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	BI	BI	FI 50%	LSc	BS	GD	NBI
1	S960001	328	PCT-4\PHB\1\1>145-M-3-M-1-M	7	3	2	73	1	1	1	1
2	S960002	329	PCT-4\PHB\1\1>145-M-3-M-2-M	5	3	2	68	1	1	1	1
3	S960003	330	PCT-4\PHB\1\1>145-M-3-M-3-M	3	3	2	72	1	1	1	1
4	S960004	331	PCT-4\PHB\1\1>145-M-3-M-4-M	5	2	1	66	3	1	1	1
5	S960005	332	PCT-4\PHB\1\1>145-M-3-M-5-M	5	1	1	74	1	1	1	1
6	S960006	333	PCT-4\PHB\1\1>145-M-3-M-6-M	3	1	2	64	1	1	1	1
7	S960007	334	PCT-4\PHB\1\1>145-M-5-M-1-M	5	2	2	67	1	1	1	1
8	S960008	335	PCT-4\PHB\1\1>145-M-5-M-2-M	7	2	1	67	1	1	1	1
9	S960009	336	PCT-4\PHB\1\1>145-M-5-M-3-M	5	1	1	64	1	1	1	1
	T1		CIRAD 409	7	1	1	64	1	1	1	1
	T2		O.Sabana 6	5	3	1	85	3	1	3	1
	T3		O.Sabana 10	7	2	1	87	3	1	3	1
10	S960010	337	PCT-4\PHB\1\1>145-M-5-M-4-M	7	1	1	65	1	1	1	1
11	S960011	338	PCT-4\PHB\1\1>145-M-5-M-5-M	7	1	1	66	1	1	1	1
12	S960012	339	PCT-4\PHB\1\1>145-M-5-M-6-M	7	1	1	66	1	1	1	1
13	S960013	346	PCT-4\PHB\1\1>209-M-6-M-1-M	7	1	1	68	1	1	3	1
14	S960014	347	PCT-4\PHB\1\1>209-M-6-M-2-M	7	1	1	73	1	1	1	1
15	S960015	348	PCT-4\PHB\1\1>209-M-6-M-3-M	7	1	1	70	1	1	1	1
16	S960016	349	PCT-4\PHB\1\1>209-M-6-M-4-M	5	1	1	73	1	1	1	1
17	S960017	350	PCT-4\PHB\1\1>209-M-6-M-5-M	7	2	1	74	1	1	1	1
18	S960018	351	PCT-4\PHB\1\1>209-M-6-M-6-M	5	1	1	70	1	1	1	1
19	S960019	358	PCT-4\PHB\1\1>231-M-6-M-1-M	7	2	1	66	1	1	1	1
20	S960020	359	PCT-4\PHB\1\1>231-M-6-M-2-M	7	2	1	66	1	1	1	1
21	S960021	360	PCT-4\PHB\1\1>231-M-6-M-3-M	5	2	1	65	1	1	1	1
22	S960022	361	PCT-4\PHB\1\1>231-M-6-M-4-M	7	1	1	66	1	1	1	1
23	S960023	362	PCT-4\PHB\1\1>231-M-6-M-5-M	5	1	1	66	1	1	1	1
24	S960024	363	PCT-4\PHB\1\1>231-M-6-M-6-M	7	1	1	66	1	1	3	1
25	S960025	364	PCT-4\PHB\1\1>277-M-3-M-1-M	7	1	3	85	1	3	3	3
26	S960026	365	PCT-4\PHB\1\1>277-M-3-M-2-M	5	1	1	80	1	1	3	1
27	S960027	366	PCT-4\PHB\1\1>277-M-3-M-3-M	5	2	2	83	1	1	5	1
28	S960028	367	PCT-4\PHB\1\1>277-M-3-M-4-M	5	2	1	80	1	1	3	1
29	S960029	368	PCT-4\PHB\1\1>277-M-3-M-5-M	7	2	1	83	1	3	3	1
30	S960030	369	PCT-4\PHB\1\1>277-M-3-M-6-M	7	2	2	79	1	1	5	1
31	S960031	376	PCT-4\PHB\1\1>277-M-5-M-1-M	7	1	1	69	1	1	3	1
32	S960032	377	PCT-4\PHB\1\1>277-M-5-M-2-M	7	2	1	72	1	1	1	1
33	S960033	378	PCT-4\PHB\1\1>277-M-5-M-3-M	7	1	1	73	1	1	1	1
34	S960034	379	PCT-4\PHB\1\1>277-M-5-M-4-M	5	1	1	74	1	1	3	1
35	S960035	380	PCT-4\PHB\1\1>277-M-5-M-5-M	5	1	1	75	1	1	1	1
36	S960036	381	PCT-4\PHB\1\1>277-M-5-M-6-M	7	1	1	68	1	1	3	1
37	S960037	382	PCT-4\PHB\1\1>277-M-6-M-1-M	7	2	1	65	1	1	1	1
38	S960038	383	PCT-4\PHB\1\1>277-M-6-M-2-M	7	1	1	66	1	1	1	1
39	S960039	384	PCT-4\PHB\1\1>277-M-6-M-3-M	7	1	1	63	1	1	1	1
40	S960040	385	PCT-4\PHB\1\1>277-M-6-M-4-M	7	1	1	66	1	1	1	1
41	S960041	386	PCT-4\PHB\1\1>277-M-6-M-5-M	7	1	1	66	1	1	1	1
42	S960042	387	PCT-4\PHB\1\1>277-M-6-M-6-M	7	1	1	63	1	1	1	1
43	S960043	388	PCT-4\PHB\1\1>368-M-1-M-1-M	5	1	1	66	1	3	3	1
44	S960044	389	PCT-4\PHB\1\1>368-M-1-M-2-M	5	1	1	61	1	1	1	1
45	S960045	390	PCT-4\PHB\1\1>368-M-1-M-3-M	5	1	1	67	1	1	1	1
46	S960046	391	PCT-4\PHB\1\1>368-M-1-M-4-M	7	1	1	64	1	1	1	1
47	S960047	392	PCT-4\PHB\1\1>368-M-1-M-5-M	5	1	1	63	1	1	1	1
48	S960048	393	PCT-4\PHB\1\1>368-M-1-M-6-M	5	1	1	63	1	1	3	1

br.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	BI	BI	FI 50%	LSc	BS	GD	NBI
49	S960049	406	PCT-4\PHB\1\1>453-M-1-M-1-M	5	1	1	68	1	1	1	1
50	S960050	407	PCT-4\PHB\1\1>453-M-1-M-2-M	5	2	1	69	1	1	1	1
51	S960051	408	PCT-4\PHB\1\1>453-M-1-M-3-M	5	1	1	69	1	1	1	1
52	S960052	409	PCT-4\PHB\1\1>453-M-1-M-4-M	5	2	1	72	3	1	1	1
53	S960053	410	PCT-4\PHB\1\1>453-M-1-M-5-M	5	1	1	71	1	1	1	1
54	S960054	411	PCT-4\PHB\1\1>453-M-1-M-6-M	5	1	1	69	3	1	1	1
55	S960055	412	PCT-4\PHB\1\1>453-M-2-M-1-M	7	1	1	68	1	3	1	1
56	S960056	413	PCT-4\PHB\1\1>453-M-2-M-2-M	5	1	1	68	3	3	1	1
57	S960057	414	PCT-4\PHB\1\1>453-M-2-M-3-M	5	1	1	66	1	3	1	1
58	S960058	415	PCT-4\PHB\1\1>453-M-2-M-4-M	5	1	1	63	1	1	1	1
59	S960059	416	PCT-4\PHB\1\1>453-M-2-M-5-M	5	1	1	75	1	3	1	1
60	S960060	417	PCT-4\PHB\1\1>453-M-2-M-6-M	7	1	1	68	1	1	1	1
61	S960061	418	PCT-4\PHB\1\1>485-M-2-M-1-M	7	2	2	76	1	3	1	1
62	S960062	419	PCT-4\PHB\1\1>485-M-2-M-2-M	7	1	1	75	1	1	1	1
63	S960063	420	PCT-4\PHB\1\1>485-M-2-M-3-M	7	1	1	69	1	1	1	1
64	S960064	421	PCT-4\PHB\1\1>485-M-2-M-4-M	5	1	1	70	1	1	1	1
65	S960065	422	PCT-4\PHB\1\1>485-M-2-M-5-M	7	1	1	73	1	1	1	1
66	S960066	423	PCT-4\PHB\1\1>485-M-2-M-6-M	7	3	1	78	1	1	1	1
	T1		CIRAD 409	7	1	1	66	1	1	1	1
	T2		O.Sabana 6	5	2	1	86	3	1	3	1
	T3		O.Sabana 10	5	1	1	88	3	1	3	1
	T1		CIRAD 409	5	1	1	63	1	1	1	1
	T2		O.Sabana 6	5	1	1	86	1	1	3	1
	T3		O.Sabana 10	7	1	1	89	1	1	3	1
67	S960067	424	PCT-4\PHB\1\1>538-M-2-M-1-M	5	1	1	68	1	1	1	1
68	S960068	425	PCT-4\PHB\1\1>538-M-2-M-2-M	5	1	1	66	1	1	1	1
69	S960069	426	PCT-4\PHB\1\1>538-M-2-M-3-M	5	1	1	66	1	1	1	1
70	S960070	427	PCT-4\PHB\1\1>538-M-2-M-4-M	5	1	1	68	1	1	1	1
71	S960071	428	PCT-4\PHB\1\1>538-M-2-M-5-M	7	1	1	69	1	1	1	1
72	S960072	429	PCT-4\PHB\1\1>538-M-2-M-6-M	5	1	1	72	1	1	1	1
73	S960073	436	PCT-4\PHB\1\1>603-M-5-M-1-M	5	1	1	73	1	1	1	1
74	S960074	437	PCT-4\PHB\1\1>603-M-5-M-2-M	7	1	1	75	1	1	1	1
75	S960075	438	PCT-4\PHB\1\1>603-M-5-M-3-M	7	1	1	68	1	1	1	1
76	S960076	439	PCT-4\PHB\1\1>603-M-5-M-4-M	5	1	1	64	1	1	1	1
77	S960077	440	PCT-4\PHB\1\1>603-M-5-M-5-M	5	1	1	73	1	1	1	1
78	S960078	441	PCT-4\PHB\1\1>603-M-5-M-6-M	5	1	1	63	1	1	1	1
79	S960079	442	PCT-4\PHB\1\1>749-M-2-M-1-M	5	1	1	66	1	1	1	1
80	S960080	443	PCT-4\PHB\1\1>749-M-2-M-2-M	5	1	1	74	1	1	1	1
81	S960081	444	PCT-4\PHB\1\1>749-M-2-M-3-M	7	1	1	71	1	1	1	1
82	S960082	445	PCT-4\PHB\1\1>749-M-2-M-4-M	7	1	1	70	1	1	1	1
83	S960083	446	PCT-4\PHB\1\1>749-M-2-M-5-M	7	4	4	70	1	1	1	1
84	S960084	447	PCT-4\PHB\1\1>749-M-2-M-6-M	7	3	3	69	1	1	1	1
85	S960085	448	PCT-4\PHB\1\1>751-M-3-M-1-M	7	2	2	69	1	1	1	1
86	S960086	449	PCT-4\PHB\1\1>751-M-3-M-2-M	5	2	2	66	1	1	1	1
87	S960087	450	PCT-4\PHB\1\1>751-M-3-M-3-M	7	1	1	66	1	1	1	1
88	S960088	451	PCT-4\PHB\1\1>751-M-3-M-4-M	7	1	1	72	1	1	1	1
89	S960089	452	PCT-4\PHB\1\1>751-M-3-M-5-M	5	1	1	70	1	1	1	1
90	S960090	453	PCT-4\PHB\1\1>751-M-3-M-6-M	7	1	1	90	1	1	1	1
91	S960091	460	PCT-4\PHB\1\1>752-M-1-M-1-M	5	1	3	78	1	1	1	1
92	S960092	461	PCT-4\PHB\1\1>752-M-1-M-2-M	5	1	1	66	1	1	1	1
93	S960093	462	PCT-4\PHB\1\1>752-M-1-M-3-M	7	1	3	64	1	1	1	1
94	S960094	463	PCT-4\PHB\1\1>752-M-1-M-4-M	5	1	1	63	1	1	1	1
95	S960095	464	PCT-4\PHB\1\1>752-M-1-M-5-M	5	1	1	64	1	1	1	1
96	S960096	465	PCT-4\PHB\1\1>752-M-1-M-6-M	5	1	1	62	1	1	1	1
97	S960097	472	PCT-4\PHB\1\1>752-M-4-M-1-M	5	1	1	82	1	3	3	1

Nbr.	Field Nbr.	Origin	Pedigree	Vg	BI	BI	FI	LSc	BS	GD	NBI
	1999A	1998B					50%				
98	S960098	473	PCT-4\PHB\1\1>752-M-4-M-2-M	7	1	1	77	1	1	3	1
99	S960099	474	PCT-4\PHB\1\1>752-M-4-M-3-M	7	3	1	83	1	1	1	1
100	S960100	475	PCT-4\PHB\1\1>752-M-4-M-4-M	7	3	1	84	1	3	3	1
101	S960101	476	PCT-4\PHB\1\1>752-M-4-M-5-M	5	2	2	75	1	1	3	1
102	S960102	477	PCT-4\PHB\1\1>752-M-4-M-6-M	5	2	1	80	1	1	1	1
103	S960103	484	PCT-4\PHB\1\1>783-M-4-M-1-M	5	3	1	76	1	1	1	1
104	S960104	485	PCT-4\PHB\1\1>783-M-4-M-2-M	5	2	1	80	1	1	1	1
105	S960105	486	PCT-4\PHB\1\1>783-M-4-M-3-M	7	2	3	84	1	3	1	1
106	S960106	487	PCT-4\PHB\1\1>783-M-4-M-4-M	7	3	1	83	1	3	1	1
107	S960107	488	PCT-4\PHB\1\1>783-M-4-M-5-M	5	2	1	82	1	3	3	1
108	S960108	489	PCT-4\PHB\1\1>783-M-4-M-6-M	7	1	1	82	1	3	1	1
109	S960109	490	PCT-4\PHB\1\1>783-M-5-M-1-M	5	3	1	68	1	1	3	1
110	S960110	491	PCT-4\PHB\1\1>783-M-5-M-2-M	5	2	1	69	1	1	3	1
111	S960111	492	PCT-4\PHB\1\1>783-M-5-M-3-M	5	3	3	64	1	1	1	1
112	S960112	493	PCT-4\PHB\1\1>783-M-5-M-4-M	5	3	2	66	1	1	1	1
113	S960113	494	PCT-4\PHB\1\1>783-M-5-M-5-M	5	3	1	66	1	1	1	1
114	S960114	495	PCT-4\PHB\1\1>783-M-5-M-6-M	7	2	3	74	1	1	1	1
115	S960115	496	PCT-4\PHB\1\1>822-M-1-M-1-M	5	1	1	72	1	1	1	1
116	S960116	497	PCT-4\PHB\1\1>822-M-1-M-2-M	5	1	1	69	1	1	1	1
117	S960117	498	PCT-4\PHB\1\1>822-M-1-M-3-M	5	1	1	69	1	1	1	1
118	S960118	499	PCT-4\PHB\1\1>822-M-1-M-4-M	5	1	1	69	1	1	1	1
119	S960119	500	PCT-4\PHB\1\1>822-M-1-M-5-M	5	1	1	68	1	1	1	1
120	S960120	501	PCT-4\PHB\1\1>822-M-1-M-6-M	5	1	1	70	1	1	1	1
121	S960121	508	PCT-4\PHB\1\1>846-M-4-M-1-M	5	1	1	66	1	1	1	1
122	S960122	509	PCT-4\PHB\1\1>846-M-4-M-2-M	5	1	1	70	1	1	1	1
123	S960123	510	PCT-4\PHB\1\1>846-M-4-M-3-M	3	1	1	66	1	1	1	1
	T1		CIRAD 409	3	1	1	66	1	1	1	1
	T2		O.Sabana 6	3	3	2	85	3	1	1	1
	T3		O.Sabana 10	3	2	1	87	3	1	3	1
124	S960124	511	PCT-4\PHB\1\1>846-M-4-M-4-M	3	2	1	69	1	1	1	1
125	S960125	512	PCT-4\PHB\1\1>846-M-4-M-5-M	5	1	2	68	1	1	1	1
126	S960126	513	PCT-4\PHB\1\1>846-M-4-M-6-M	5	1	1	63	1	1	1	1
127	S960127	514	PCT-4\PHB\1\1>1678-M-4-M-1-M	3	2	1	63	1	1	1	1
128	S960128	515	PCT-4\PHB\1\1>1678-M-4-M-2-M	3	2	1	64	1	3	3	1
129	S960129	516	PCT-4\PHB\1\1>1678-M-4-M-3-M	3	1	1	64	1	1	1	1
130	S960130	517	PCT-4\PHB\1\1>1678-M-4-M-4-M	3	1	1	66	1	1	1	1
131	S960131	518	PCT-4\PHB\1\1>1678-M-4-M-5-M	3	2	1	74	1	1	1	1
132	S960132	519	PCT-4\PHB\1\1>1678-M-4-M-6-M	5	1	1	71	3	1	1	1
133	S960133	520	PCT-4\PHB\1\1>1723-M-1-M-1-M	3	1	1	82	1	1	1	1
134	S960134	521	PCT-4\PHB\1\1>1723-M-1-M-2-M	5	4	3	79	1	3	3	1
135	S960135	522	PCT-4\PHB\1\1>1723-M-1-M-3-M	5	2	3	84	1	3	3	1
136	S960136	523	PCT-4\PHB\1\1>1723-M-1-M-4-M	5	3	1	83	1	1	3	1
137	S960137	524	PCT-4\PHB\1\1>1723-M-1-M-5-M	5	2	1	83	1	1	3	1
138	S960138	525	PCT-4\PHB\1\1>1723-M-1-M-6-M	5	3	2	85	1	1	3	1
139	S960139	526	PCT-4\PHB\1\1>1723-M-2-M-1-M	5	2	2	87	5	1	3	1
140	S960140	527	PCT-4\PHB\1\1>1723-M-2-M-2-M	5	1	1	73	3	1	1	1
141	S960141	528	PCT-4\PHB\1\1>1723-M-2-M-3-M	3	1	1	66	3	1	1	1
142	S960142	529	PCT-4\PHB\1\1>1723-M-2-M-4-M	3	1	1	66	3	1	1	1
143	S960143	530	PCT-4\PHB\1\1>1723-M-2-M-5-M	5	1	1	83	3	1	1	1
144	S960144	531	PCT-4\PHB\1\1>1723-M-2-M-6-M	3	1	1	81	5	1	1	1
145	S960145	532	PCT-4\PHB\1\1>1723-M-3-M-1-M	3	1	1	70	1	1	1	1
146	S960146	533	PCT-4\PHB\1\1>1723-M-3-M-2-M	3	1	1	71	1	1	1	1
147	S960147	534	PCT-4\PHB\1\1>1723-M-3-M-3-M	3	1	1	69	1	1	1	1
148	S960148	535	PCT-4\PHB\1\1>1723-M-3-M-4-M	3	1	1	75	1	3	3	1

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	BI	BI	FI 50%	LSc	BS	GD	NBI
149	S960149	536	PCT-4\PHB\1\1>1723-M-3-M-5-M	5	2	2	75	1	1	1	1
150	S960150	537	PCT-4\PHB\1\1>1723-M-3-M-6-M	5	3	1	86	3	1	1	1

= vigor; BI 1 = leaf blast; BI 2 = leaf blast; FI = flowering; LsC = leaf scald; BS = brown spot;
BI = neck blast; Gd = grain discoloration.

able 10. Selected S6 lines from the population PCT-4\PHB\1\1>
La Libertad experimental station, 1999A

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	BI	BI	FI 50%	LSc	BS	GD	NBI
1	S960004	331	PCT-4\PHB\1\1>145-M-3-M-4-M	5	2	1	66	3	1	1	1
2	S960012	339	PCT-4\PHB\1\1>145-M-5-M-6-M	7	1	1	66	1	1	1	1
3	S960021	360	PCT-4\PHB\1\1>231-M-6-M-3-M	5	2	1	65	1	1	1	1
4	S960051	408	PCT-4\PHB\1\1>453-M-1-M-3-M	5	1	1	69	1	1	1	1
5	S960068	425	PCT-4\PHB\1\1>538-M-2-M-2-M	5	1	1	66	1	1	1	1
6	S960069	426	PCT-4\PHB\1\1>538-M-2-M-3-M	5	1	1	66	1	1	1	1
7	S960072	429	PCT-4\PHB\1\1>538-M-2-M-6-M	5	1	1	72	1	1	1	1
8	S960077	440	PCT-4\PHB\1\1>603-M-5-M-5-M	5	1	1	73	1	1	1	1
9	S960116	497	PCT-4\PHB\1\1>822-M-1-M-2-M	5	1	1	69	1	1	1	1
10	S960123	510	PCT-4\PHB\1\1>846-M-4-M-3-M	3	1	1	66	1	1	1	1
11	S960124	511	PCT-4\PHB\1\1>846-M-4-M-4-M	3	2	1	69	1	1	1	1
12	S960127	514	PCT-4\PHB\1\1>1678-M-4-M-1-M	3	2	1	63	1	1	1	1
13	S960132	519	PCT-4\PHB\1\1>1678-M-4-M-6-M	5	1	1	71	3	1	1	1

Table 11. Evaluation of S8 lines from the populations PCT-5\0\0\0>, PCT-A\0\0\0> y PCT-4\0\0\1>
La libertad experimental station, 1999A

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	BI	BI	FI 50%	LSc	BS	GD	NBI
1	S980001	538	PCT-5\0\0\0>1496-M-1-M-3-M-1-M	3	1	2	76	1	1	1	1
2	S980002	539	PCT-5\0\0\0>1496-M-1-M-3-M-2-M	3	1	3	75	1	1	1	3
3	S980003	540	PCT-5\0\0\0>1496-M-1-M-3-M-3-M	3	1	2	78	1	1	3	1
4	S980004	541	PCT-5\0\0\0>1496-M-1-M-3-M-4-M	3	2	1	75	1	1	3	1
5	S980005	542	PCT-5\0\0\0>1496-M-1-M-3-M-5-M	3	4	3	75	1	1	3	3
6	S980006	543	PCT-5\0\0\0>1496-M-1-M-3-M-6-M	5	4	2	75	1	1	1	3
7	S980007	544	PCT-A\0\0\0>175-M-1-M-4-M-1-M	5	4	3	63	1	1	1	1
8	S980008	545	PCT-A\0\0\0>175-M-1-M-4-M-2-M	7	4	3	66	1	1	1	1
9	S980009	546	PCT-A\0\0\0>175-M-1-M-4-M-3-M	7	4	3	63	1	1	1	1
10	S980010	547	PCT-A\0\0\0>175-M-1-M-4-M-4-M	7	3	1	63	1	1	1	1
11	S980011	548	PCT-A\0\0\0>175-M-1-M-4-M-5-M	7	3	1	64	1	1	1	1
12	S980012	549	PCT-A\0\0\0>175-M-1-M-4-M-6-M	7	4	4	62	1	1	1	1
13	S980013	550	PCT-A\0\0\0>175-M-1-M-5-M-1-M	5	3	3	63	1	1	1	1
14	S980014	551	PCT-A\0\0\0>175-M-1-M-5-M-2-M	5	3	3	62	1	1	1	1
15	S980015	552	PCT-A\0\0\0>175-M-1-M-5-M-3-M	7	3	1	64	1	1	1	1
16	S980016	553	PCT-A\0\0\0>175-M-1-M-5-M-4-M	7	2	1	66	1	1	1	1
17	S980017	554	PCT-A\0\0\0>175-M-1-M-5-M-5-M	7	2	1	63	1	1	1	1
18	S980018	555	PCT-A\0\0\0>175-M-1-M-5-M-6-M	5	3	2	63	1	1	1	1
19	S980019	556	PCT-A\0\0\0>175-M-3-M-1-M-1-M	5	2	3	63	1	1	1	1
20	S980020	557	PCT-A\0\0\0>175-M-3-M-1-M-2-M	5	1	1	62	1	1	1	1
21	S980021	558	PCT-A\0\0\0>175-M-3-M-1-M-3-M	3	1	1	63	1	1	1	1
22	S980022	559	PCT-A\0\0\0>175-M-3-M-1-M-4-M	5	3	2	62	1	1	1	1
23	S980023	560	PCT-A\0\0\0>175-M-3-M-1-M-5-M	5	2	1	62	1	1	1	1
24	S980024	561	PCT-A\0\0\0>175-M-3-M-1-M-6-M	3	1	1	63	1	1	1	1
25	S980025	562	PCT-A\0\0\0>175-M-3-M-3-M-1-M	5	3	2	69	1	1	1	1
26	S980026	563	PCT-A\0\0\0>175-M-3-M-3-M-2-M	7	2	1	70	1	1	1	1
27	S980027	564	PCT-A\0\0\0>175-M-3-M-3-M-3-M	7	2	1	69	1	1	1	1
	T1		CIRAD 409	5	1	1	66	1	1	1	1
	T2		O.Sabana 6	5	4	2	86	3	1	1	1
	T3		O.Sabana 10	7	2	1	89	3	1	1	1
28	S980028	565	PCT-A\0\0\0>175-M-3-M-3-M-4-M	5	2	1	68	1	1	1	1
29	S980029	566	PCT-A\0\0\0>175-M-3-M-3-M-5-M	7	3	1	69	1	1	1	1
30	S980030	567	PCT-A\0\0\0>175-M-3-M-3-M-6-M	7	4	2	72	1	1	1	1
31	S980031	574	PCT-A\0\0\0>175-M-4-M-4-M-1-M	7	2	1	69	1	1	1	1
32	S980032	575	PCT-A\0\0\0>175-M-4-M-4-M-2-M	7	2	1	69	1	1	1	1
33	S980033	576	PCT-A\0\0\0>175-M-4-M-4-M-3-M	7	3	2	66	1	1	1	1
34	S980034	577	PCT-A\0\0\0>175-M-4-M-4-M-4-M	7	2	1	66	1	1	1	1
35	S980035	578	PCT-A\0\0\0>175-M-4-M-4-M-5-M	7	2	2	72	1	1	1	1
36	S980036	579	PCT-A\0\0\0>175-M-4-M-4-M-6-M	7	1	1	69	1	1	1	1
37	S980037	580	PCT-A\0\0\0>175-M-4-M-5-M-1-M	5	1	1	68	1	1	1	1
38	S980038	581	PCT-A\0\0\0>175-M-4-M-5-M-2-M	7	1	1	70	1	1	1	1
39	S980039	582	PCT-A\0\0\0>175-M-4-M-5-M-3-M	5	1	1	66	1	3	1	1
40	S980040	583	PCT-A\0\0\0>175-M-4-M-5-M-4-M	5	1	2	69	1	1	1	1
41	S980041	584	PCT-A\0\0\0>175-M-4-M-5-M-5-M	5	1	1	72	1	3	1	1
42	S980042	585	PCT-A\0\0\0>175-M-4-M-5-M-6-M	7	1	1	66	1	1	1	1
43	S980043	586	PCT-A\0\0\0>175-M-6-M-1-M-1-M	7	1	1	69	1	1	1	1
44	S980044	587	PCT-A\0\0\0>175-M-6-M-1-M-2-M	7	1	1	70	1	1	1	1
45	S980045	588	PCT-A\0\0\0>175-M-6-M-1-M-3-M	7	2	1	73	1	1	1	1
46	S980046	589	PCT-A\0\0\0>175-M-6-M-1-M-4-M	7	1	1	75	1	1	1	1
47	S980047	590	PCT-A\0\0\0>175-M-6-M-1-M-5-M	7	1	1	75	1	1	1	1
48	S980048	591	PCT-A\0\0\0>175-M-6-M-1-M-6-M	7	1	1	75	1	1	1	1

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	Bl	Bl	Fl 50%	LSc	BS	GD	NBl
49	S980049	592	PCT-A\0\0\0>189-M-2-M-2-M-1-M	7	1	1	83	3	1	1	1
50	S980050	593	PCT-A\0\0\0>189-M-2-M-2-M-2-M	7	1	1	83	3	1	1	1
51	S980051	594	PCT-A\0\0\0>189-M-2-M-2-M-3-M	7	1	1	84	3	1	1	1
52	S980052	595	PCT-A\0\0\0>189-M-2-M-2-M-4-M	7	1	1	84	3	1	1	1
53	S980053	596	PCT-A\0\0\0>189-M-2-M-2-M-5-M	7	2	2	85	3	1	1	1
54	S980054	597	PCT-A\0\0\0>189-M-2-M-2-M-6-M	7	2	2	84	3	1	1	1
	T1		CIRAD 409	7	1	1	66	1	1	1	1
	T2		O.Sabana 6	5	4	4	86	3	1	1	1
	T3		O.Sabana 10	7	2	2	89	3	1	1	1
55	S980055	598	PCT-A\0\0\0>189-M-4-M-3-M-1-M	5	4	4	83	3	3	3	1
56	S980056	599	PCT-A\0\0\0>189-M-4-M-3-M-2-M	5	5	5	82	3	3	3	2
57	S980057	600	PCT-A\0\0\0>189-M-4-M-3-M-3-M	5	5	5	82	3	3	3	2
58	S980058	601	PCT-A\0\0\0>189-M-4-M-3-M-4-M	5	5	5	80	3	1	3	1
59	S980059	602	PCT-A\0\0\0>189-M-4-M-3-M-5-M	5	4	4	80	3	3	3	2
60	S980060	603	PCT-A\0\0\0>189-M-4-M-3-M-6-M	5	3	3	80	3	3	3	1
61	S980061	604	PCT-A\0\0\0>189-M-4-M-4-M-1-M	5	4	4	80	3	3	3	2
62	S980062	605	PCT-A\0\0\0>189-M-4-M-4-M-2-M	5	2	2	80	3	3	3	1
63	S980063	606	PCT-A\0\0\0>189-M-4-M-4-M-3-M	5	2	2	80	3	1	1	1
64	S980064	607	PCT-A\0\0\0>189-M-4-M-4-M-4-M	5	3	3	82	3	1	1	1
65	S980065	608	PCT-A\0\0\0>189-M-4-M-4-M-5-M	5	2	2	82	3	1	1	1
66	S980066	609	PCT-A\0\0\0>189-M-4-M-4-M-6-M	5	3	3	82	3	1	3	1
67	S980067	610	PCT-A\0\0\0>189-M-4-M-5-M-1-M	5	3	3	82	3	1	1	1
68	S980068	611	PCT-A\0\0\0>189-M-4-M-5-M-2-M	5	3	3	82	3	1	1	1
69	S980069	612	PCT-A\0\0\0>189-M-4-M-5-M-3-M	5	3	3	82	3	1	1	1
70	S980070	613	PCT-A\0\0\0>189-M-4-M-5-M-4-M	5	3	3	82	3	1	1	1
71	S980071	614	PCT-A\0\0\0>189-M-4-M-5-M-5-M	5	3	3	82	3	1	1	1
72	S980072	615	PCT-A\0\0\0>189-M-4-M-5-M-6-M	5	2	2	82	3	1	1	1
73	S980073	616	PCT-A\0\0\0>189-M-4-M-6-M-1-M	7	3	3	81	3	1	1	1
74	S980074	617	PCT-A\0\0\0>189-M-4-M-6-M-2-M	5	2	2	81	3	1	1	1
75	S980075	618	PCT-A\0\0\0>189-M-4-M-6-M-3-M	7	3	3	81	3	1	1	1
76	S980076	619	PCT-A\0\0\0>189-M-4-M-6-M-4-M	5	3	3	81	3	1	1	1
77	S980077	620	PCT-A\0\0\0>189-M-4-M-6-M-5-M	5	3	3	82	3	1	1	1
78	S980078	621	PCT-A\0\0\0>189-M-4-M-6-M-6-M	5	3	3	82	3	1	1	1
79	S980079	622	PCT-A\0\0\0>278-M-1-M-1-M-1-M	7	4	4	82	3	1	1	1
80	S980080	623	PCT-A\0\0\0>278-M-1-M-1-M-2-M	5	3	3	82	3	3	1	1
81	S980081	624	PCT-A\0\0\0>278-M-1-M-1-M-3-M	5	3	3	81	3	3	1	1
82	S980082	625	PCT-A\0\0\0>278-M-1-M-1-M-4-M	7	2	2	83	3	3	1	1
83	S980083	626	PCT-A\0\0\0>278-M-1-M-1-M-5-M	5	3	3	82	3	3	1	1
84	S980084	627	PCT-A\0\0\0>278-M-1-M-1-M-6-M	5	3	3	81	3	3	1	1
85	S980085	628	PCT-A\0\0\0>278-M-1-M-2-M-1-M	3	4	4	80	3	3	1	1
86	S980086	629	PCT-A\0\0\0>278-M-1-M-2-M-2-M	3	3	3	80	3	1	1	1
87	S980087	630	PCT-A\0\0\0>278-M-1-M-2-M-3-M	5	4	4	80	3	1	1	1
88	S980088	631	PCT-A\0\0\0>278-M-1-M-2-M-4-M	7	4	4	83	3	1	1	1
89	S980089	632	PCT-A\0\0\0>278-M-1-M-2-M-5-M	3	4	4	82	3	3	1	1
90	S980090	633	PCT-A\0\0\0>278-M-1-M-2-M-6-M	5	3	3	80	3	1	1	1
91	S980091	634	PCT-A\0\0\0>394-M-1-M-1-M-1-M	5	2	2	85	1	1	1	1
92	S980092	635	PCT-A\0\0\0>394-M-1-M-1-M-2-M	5	2	2	84	1	1	1	1
93	S980093	636	PCT-A\0\0\0>394-M-1-M-1-M-3-M	5	1	1	85	1	1	1	1
94	S980094	637	PCT-A\0\0\0>394-M-1-M-1-M-4-M	5	1	1	84	1	1	1	1
95	S980095	638	PCT-A\0\0\0>394-M-1-M-1-M-5-M	5	4	4	82	1	3	1	1
96	S980096	639	PCT-A\0\0\0>394-M-1-M-1-M-6-M	7	3	3	85	1	3	1	1
97	S980097	640	PCT-A\0\0\0>394-M-1-M-4-M-1-M	3	3	3	74	1	1	1	1
98	S980098	641	PCT-A\0\0\0>394-M-1-M-4-M-2-M	5	2	1	74	1	1	1	1
99	S980099	642	PCT-A\0\0\0>394-M-1-M-4-M-3-M	5	2	3	75	1	1	3	1
100	S980100	643	PCT-A\0\0\0>394-M-1-M-4-M-4-M	5	2	1	75	1	1	1	1

Nbr.	Field Nbr.	Origin	Pedigree	Vg	Bl	Bl	Fl	LSc	BS	GD	NBl
	1999A	1998B					50%				
101	S980101	644	PCT-A\0\0\0>394-M-1-M-4-M-5-M	5	2	1	75	1	1	1	1
102	S980102	645	PCT-A\0\0\0>394-M-1-M-4-M-6-M	5	2	1	74	1	1	1	1
103	S980103	646	PCT-A\0\0\0>394-M-1-M-5-M-1-M	3	2	1	84	3	1	1	1
104	S980104	647	PCT-A\0\0\0>394-M-1-M-5-M-2-M	3	2	1	79	3	1	1	1
105	S980105	648	PCT-A\0\0\0>394-M-1-M-5-M-3-M	3	3	2	78	3	1	1	1
106	S980106	649	PCT-A\0\0\0>394-M-1-M-5-M-4-M	3	2	1	80	3	1	1	1
107	S980107	650	PCT-A\0\0\0>394-M-1-M-5-M-5-M	3	2	1	82	3	1	1	1
108	S980108	651	PCT-A\0\0\0>394-M-1-M-5-M-6-M	3	2	1	83	3	1	1	1
109	S980109	652	PCT-A\0\0\0>394-M-1-M-6-M-1-M	3	2	1	78	3	1	3	1
110	S980110	653	PCT-A\0\0\0>394-M-1-M-6-M-2-M	3	2	1	78	3	1	3	1
111	S980111	654	PCT-A\0\0\0>394-M-1-M-6-M-3-M	5	2	1	78	3	1	3	1
112	S980112	655	PCT-A\0\0\0>394-M-1-M-6-M-4-M	5	2	1	78	3	3	1	1
113	S980113	656	PCT-A\0\0\0>394-M-1-M-6-M-5-M	5	2	2	77	3	1	3	1
114	S980114	657	PCT-A\0\0\0>394-M-1-M-6-M-6-M	5	3	2	80	1	3	1	1
	T1		CIRAD 409	7	1	1	66	1	1	3	1
	T2		O.Sabana 6	5	3	2	85	3	1	1	1
	T3		O.Sabana 10	5	3	1	89	3	1	3	1
115	S980115	658	PCT-A\0\0\0>394-M-2-M-1-M-1-M	5	2	2	84	3	1	1	1
116	S980116	659	PCT-A\0\0\0>394-M-2-M-1-M-2-M	5	1	1	80	3	3	3	1
117	S980117	660	PCT-A\0\0\0>394-M-2-M-1-M-3-M	5	1	1	84	3	3	3	1
118	S980118	661	PCT-A\0\0\0>394-M-2-M-1-M-4-M	5	2	1	76	1	1	1	1
119	S980119	662	PCT-A\0\0\0>394-M-2-M-1-M-5-M	7	2	1	84	1	1	1	1
120	S980120	663	PCT-A\0\0\0>394-M-2-M-1-M-6-M	7	1	1	84	3	3	3	1
121	S980121	664	PCT-A\0\0\0>394-M-2-M-2-M-1-M	7	1	1	81	1	3	3	1
122	S980122	665	PCT-A\0\0\0>394-M-2-M-2-M-2-M	7	1	1	81	1	3	3	1
123	S980123	666	PCT-A\0\0\0>394-M-2-M-2-M-3-M	7	1	1	81	1	3	3	1
124	S980124	667	PCT-A\0\0\0>394-M-2-M-2-M-4-M	7	1	1	81	1	3	3	1
125	S980125	668	PCT-A\0\0\0>394-M-2-M-2-M-5-M	7	1	1	82	1	3	3	1
126	S980126	669	PCT-A\0\0\0>394-M-2-M-2-M-6-M	5	1	1	82	1	3	3	1
127	S980127	670	PCT-A\0\0\0>394-M-2-M-3-M-1-M	7	2	1	81	1	1	1	1
128	S980128	671	PCT-A\0\0\0>394-M-2-M-3-M-2-M	5	2	1	82	1	1	1	1
129	S980129	672	PCT-A\0\0\0>394-M-2-M-3-M-3-M	5	1	1	82	1	1	1	1
130	S980130	673	PCT-A\0\0\0>394-M-2-M-3-M-4-M	5	1	1	80	1	1	1	1
131	S980131	674	PCT-A\0\0\0>394-M-2-M-3-M-5-M	5	2	2	81	1	1	1	1
132	S980132	675	PCT-A\0\0\0>394-M-2-M-3-M-6-M	5	1	2	80	1	3	3	1
133	S980133	676	PCT-A\0\0\0>503-M-1-M-1-M-1-M	5	1	1	75	1	1	1	1
134	S980134	677	PCT-A\0\0\0>503-M-1-M-1-M-2-M	5	1	1	77	1	1	1	1
135	S980135	678	PCT-A\0\0\0>503-M-1-M-1-M-3-M	5	1	1	79	1	1	1	1
136	S980136	679	PCT-A\0\0\0>503-M-1-M-1-M-4-M	5	1	1	74	1	1	1	1
137	S980137	680	PCT-A\0\0\0>503-M-1-M-1-M-5-M	5	1	1	75	1	1	1	1
138	S980138	681	PCT-A\0\0\0>503-M-1-M-1-M-6-M	5	1	1	71	1	1	1	1
139	S980139	682	PCT-A\0\0\0>1169-M-1-M-4-M-1-M	5	1	1	68	1	1	1	1
140	S980140	683	PCT-A\0\0\0>1169-M-1-M-4-M-2-M	5	1	1	68	1	1	1	1
141	S980141	684	PCT-A\0\0\0>1169-M-1-M-4-M-3-M	5	1	1	66	1	1	1	1
142	S980142	685	PCT-A\0\0\0>1169-M-1-M-4-M-4-M	5	1	1	66	1	1	1	1
143	S980143	686	PCT-A\0\0\0>1169-M-1-M-4-M-5-M	5	1	1	68	3	1	1	1
144	S980144	687	PCT-A\0\0\0>1169-M-1-M-4-M-6-M	5	1	1	66	3	1	1	1
145	S980145	694	PCT-A\0\0\0>1321-M-2-M-4-M-1-M	3	1	1	61	1	1	1	1
146	S980146	695	PCT-A\0\0\0>1321-M-2-M-4-M-2-M	3	1	1	63	1	1	1	1
147	S980147	696	PCT-A\0\0\0>1321-M-2-M-4-M-3-M	3	1	1	62	1	1	1	1
148	S980148	697	PCT-A\0\0\0>1321-M-2-M-4-M-4-M	3	1	1	63	1	1	1	1
149	S980149	698	PCT-A\0\0\0>1321-M-2-M-4-M-5-M	3	1	1	74	1	1	1	1
150	S980150	699	PCT-A\0\0\0>1321-M-2-M-4-M-6-M	3	1	1	62	1	1	1	1
151	S980151	706	PCT-A\0\0\0>1485-M-1-M-4-M-1-M	3	1	1	67	1	1	1	1
152	S980152	707	PCT-A\0\0\0>1485-M-1-M-4-M-2-M	5	1	1	74	1	1	3	1

Nbr.	Field Nbr.	Origin	Pedigree	Vg	Bl	Bl	Fl	LSc	BS	GD	NBl
	1999A	1998B					50%				
153	S980153	708	PCT-A\0\0\0>1485-M-1-M-4-M-3-M	3	1	1	66	1	1	3	1
154	S980154	709	PCT-A\0\0\0>1485-M-1-M-4-M-4-M	3	1	1	68	1	1	3	1
155	S980155	710	PCT-A\0\0\0>1485-M-1-M-4-M-5-M	3	1	1	68	1	1	3	1
156	S980156	711	PCT-A\0\0\0>1485-M-1-M-4-M-6-M	3	2	1	67	1	1	3	1
157	S980157	718	PCT-A\0\0\0>1488-M-4-M-1-M-1-M	5	1	1	69	1	1	1	3
158	S980158	719	PCT-A\0\0\0>1488-M-4-M-1-M-2-M	3	1	1	73	1	1	1	1
159	S980159	720	PCT-A\0\0\0>1488-M-4-M-1-M-3-M	3	1	1	69	1	1	1	1
160	S980160	721	PCT-A\0\0\0>1488-M-4-M-1-M-4-M	3	1	1	73	1	1	1	1
161	S980161	722	PCT-A\0\0\0>1488-M-4-M-1-M-5-M	3	1	1	73	1	1	1	1
162	S980162	723	PCT-A\0\0\0>1488-M-4-M-1-M-6-M	3	1	1	66	1	1	1	1
163	S980163	724	PCT-A\0\0\0>1488-M-4-M-4-M-1-M	3	1	1	85	5	3	1	1
164	S980164	725	PCT-A\0\0\0>1488-M-4-M-4-M-2-M	3	1	1	82	5	3	1	1
165	S980165	726	PCT-A\0\0\0>1488-M-4-M-4-M-3-M	3	1	1	81	5	3	1	1
166	S980166	727	PCT-A\0\0\0>1488-M-4-M-4-M-4-M	3	1	1	85	3	1	1	1
167	S980167	728	PCT-A\0\0\0>1488-M-4-M-4-M-5-M	3	1	1	85	3	1	1	1
168	S980168	729	PCT-A\0\0\0>1488-M-4-M-4-M-6-M	3	1	1	84	3	1	1	1
	T1		CIRAD 409	3	1	1	63	1	1	1	1
	T2		O.Sabana 6	3	3	1	85	3	1	1	1
	T3		O.Sabana 10	5	2	1	87	3	1	1	1
169	S980169	730	PCT-A\0\0\0>1488-M-4-M-5-M-1-M	5	1	1	88	5	3	1	1
170	S980170	731	PCT-A\0\0\0>1488-M-4-M-5-M-2-M	5	1	1	88	5	3	1	1
171	S980171	733	PCT-A\0\0\0>1488-M-4-M-5-M-4-M	5	1	1	89	5	3	1	1
172	S980172	734	PCT-A\0\0\0>1488-M-4-M-5-M-5-M	5	1	1	89	5	3	1	1
173	S980173	735	PCT-A\0\0\0>1488-M-4-M-5-M-6-M	5	1	1	88	3	3	1	1
174	S980174	736	PCT-A\0\0\0>1488-M-5-M-1-M-1-M	5	1	1	84	5	3	1	1
175	S980175	737	PCT-A\0\0\0>1488-M-5-M-1-M-2-M	5	1	1	87	5	3	1	1
176	S980176	738	PCT-A\0\0\0>1488-M-5-M-1-M-3-M	5	1	1	87	3	3	1	1
177	S980177	739	PCT-A\0\0\0>1488-M-5-M-1-M-4-M	5	1	1	84	3	1	1	1
178	S980178	740	PCT-A\0\0\0>1488-M-5-M-1-M-5-M	5	1	1	85	3	1	1	1
179	S980179	741	PCT-A\0\0\0>1488-M-5-M-1-M-6-M	5	1	1	85	3	1	1	1
180	S980180	748	PCT-A\0\0\0>1674-M-2-M-4-M-1-M	5	1	1	66	1	3	1	1
181	S980181	749	PCT-A\0\0\0>1674-M-2-M-4-M-2-M	5	1	1	69	1	1	1	1
182	S980182	750	PCT-A\0\0\0>1674-M-2-M-4-M-3-M	7	1	1	74	1	1	1	1
183	S980183	751	PCT-A\0\0\0>1674-M-2-M-4-M-4-M	5	1	1	75	1	1	1	1
184	S980184	752	PCT-A\0\0\0>1674-M-2-M-4-M-5-M	5	1	1	71	1	1	1	1
185	S980185	753	PCT-A\0\0\0>1674-M-2-M-4-M-6-M	5	1	1	72	1	1	1	1
186	S980186	754	PCT-A\0\0\0>1674-M-6-M-3-M-1-M	5	2	1	70	1	1	1	1
187	S980187	755	PCT-A\0\0\0>1674-M-6-M-3-M-2-M	5	2	3	73	1	1	1	1
188	S980188	756	PCT-A\0\0\0>1674-M-6-M-3-M-3-M	5	2	1	69	1	1	1	1
189	S980189	757	PCT-A\0\0\0>1674-M-6-M-3-M-4-M	5	3	2	73	1	1	1	1
190	S980190	758	PCT-A\0\0\0>1674-M-6-M-3-M-5-M	5	3	1	70	1	1	1	1
191	S980191	759	PCT-A\0\0\0>1674-M-6-M-3-M-6-M	5	3	1	72	1	1	1	1
192	S980192	760	PCT-A\0\0\0>1674-M-6-M-6-M-1-M	3	2	1	74	1	1	1	1
193	S980193	761	PCT-A\0\0\0>1674-M-6-M-6-M-2-M	5	1	1	68	1	1	1	1
194	S980194	762	PCT-A\0\0\0>1674-M-6-M-6-M-3-M	5	1	1	68	1	1	1	1
195	S980195	763	PCT-A\0\0\0>1674-M-6-M-6-M-4-M	3	1	1	66	1	1	1	1
	T1		CIRAD 409	5	1	1	66	3	1	1	1
	T2		O.Sabana 6	3	3	1	85	3	1	1	1
	T3		O.Sabana 10	5	2	1	88	3	1	1	1
196	S980196	764	PCT-A\0\0\0>1674-M-6-M-6-M-5-M	3	2	1	72	3	1	1	1
197	S980197	765	PCT-A\0\0\0>1674-M-6-M-6-M-6-M	3	3	1	75	1	1	1	1
198	S980198	766	PCT-A\0\0\0>1788-M-2-M-2-M-1-M	3	3	1	73	1	1	1	3
199	S980199	767	PCT-A\0\0\0>1788-M-2-M-2-M-2-M	5	2	1	75	1	1	1	1
200	S980200	768	PCT-A\0\0\0>1788-M-2-M-2-M-3-M	5	2	1	74	3	1	1	1
201	S980201	769	PCT-A\0\0\0>1788-M-2-M-2-M-4-M	5	2	1	72	1	1	1	1

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	Bl	Bl	Fl 50%	LSc	BS	GD	NBl
202	S980202	770	PCT-A\0\0\0>1788-M-2-M-2-M-5-M	5	3	1	72	1	1	1	1
203	S980203	771	PCT-A\0\0\0>1788-M-2-M-2-M-6-M	5	2	2	74	1	1	1	1
204	S980204	772	PCT-A\0\0\0>1955-M-3-M-4-M-1-M	5	1	1	75	3	1	1	1
205	S980205	773	PCT-A\0\0\0>1955-M-3-M-4-M-2-M	5	1	1	72	5	1	1	1
206	S980206	774	PCT-A\0\0\0>1955-M-3-M-4-M-3-M	5	1	1	74	5	1	1	1
207	S980207	775	PCT-A\0\0\0>1955-M-3-M-4-M-4-M	5	1	1	72	3	1	1	1
208	S980208	776	PCT-A\0\0\0>1955-M-3-M-4-M-5-M	5	1	1	72	3	1	1	1
209	S980209	777	PCT-A\0\0\0>1955-M-3-M-4-M-6-M	5	1	1	73	3	1	1	1
210	S980210	790	PCT-A\0\0\0>2083-M-1-M-6-M-1-M	5	2	1	66	3	1	1	1
211	S980211	791	PCT-A\0\0\0>2083-M-1-M-6-M-2-M	5	2	1	66	3	1	1	1
212	S980212	792	PCT-A\0\0\0>2083-M-1-M-6-M-3-M	5	1	1	67	3	1	1	1
213	S980213	793	PCT-A\0\0\0>2083-M-1-M-6-M-4-M	5	1	1	64	1	1	1	1
214	S980214	794	PCT-A\0\0\0>2083-M-1-M-6-M-5-M	5	1	1	64	1	1	1	1
215	S980215	795	PCT-A\0\0\0>2083-M-1-M-6-M-6-M	5	1	1	64	1	1	1	1
216	S980216	796	PCT-A\0\0\0>2083-M-2-M-1-M-1-M	5	1	1	62	1	1	1	1
217	S980217	797	PCT-A\0\0\0>2083-M-2-M-1-M-2-M	5	1	1	62	1	1	1	1
218	S980218	798	PCT-A\0\0\0>2083-M-2-M-1-M-3-M	5	1	1	62	1	1	1	1
219	S980219	799	PCT-A\0\0\0>2083-M-2-M-1-M-4-M	5	1	1	66	1	1	1	1
220	S980220	800	PCT-A\0\0\0>2083-M-2-M-1-M-5-M	5	2	1	62	3	1	1	1
221	S980221	801	PCT-A\0\0\0>2083-M-2-M-1-M-6-M	5	1	1	62	1	1	1	1
222	S980222	802	PCT-A\0\0\0>2083-M-2-M-3-M-1-M	5	1	1	63	1	1	1	1
	T1		CIRAD 409	7	1	1	64	3	1	1	1
	T2		O.Sabana 6	5	3	1	85	3	1	1	1
	T3		O.Sabana 10	5	2	1	90	3	1	1	1
223	S980223	803	PCT-A\0\0\0>2083-M-2-M-3-M-2-M	5	1	1	63	1	1	1	1
224	S980224	804	PCT-A\0\0\0>2083-M-2-M-3-M-3-M	5	1	1	64	1	1	1	1
225	S980225	805	PCT-A\0\0\0>2083-M-2-M-3-M-4-M	5	1	1	63	1	1	1	1
226	S980226	806	PCT-A\0\0\0>2083-M-2-M-3-M-5-M	5	1	1	63	3	1	1	1
227	S980227	807	PCT-A\0\0\0>2083-M-2-M-3-M-6-M	5	1	1	62	3	1	1	1
228	S980228	808	PCT-A\0\0\0>2083-M-2-M-4-M-1-M	5	1	1	62	1	1	1	1
229	S980229	809	PCT-A\0\0\0>2083-M-2-M-4-M-2-M	5	1	1	64	1	1	1	1
230	S980230	810	PCT-A\0\0\0>2083-M-2-M-4-M-3-M	3	1	1	63	1	1	1	1
231	S980231	811	PCT-A\0\0\0>2083-M-2-M-4-M-4-M	5	1	1	62	3	1	1	1
232	S980232	812	PCT-A\0\0\0>2083-M-2-M-4-M-5-M	7	1	1	64	3	1	1	1
233	S980233	813	PCT-A\0\0\0>2083-M-2-M-4-M-6-M	3	1	1	63	1	1	1	1
234	S980234	814	PCT-4\0\0\1>1311-M-2-M-1-M-1-M	3	1	1	76	3	1	1	1
235	S980235	815	PCT-4\0\0\1>1311-M-2-M-1-M-2-M	7	1	1	82	3	1	1	1
236	S980236	816	PCT-4\0\0\1>1311-M-2-M-1-M-3-M	5	1	1	76	3	1	1	1
237	S980237	818	PCT-4\0\0\1>1311-M-2-M-1-M-5-M	5	1	1	77	3	1	1	1
238	S980238	819	PCT-4\0\0\1>1311-M-2-M-1-M-6-M	7	1	1	77	3	1	1	1
239	S980239	832	PCT-4\0\0\1>90-M-2-M-5-M-1-M	5	1	1	68	3	1	1	1
240	S980240	833	PCT-4\0\0\1>90-M-2-M-5-M-2-M	5	1	1	64	3	1	1	1
241	S980241	834	PCT-4\0\0\1>90-M-2-M-5-M-3-M	5	1	1	66	1	1	1	1
242	S980242	835	PCT-4\0\0\1>90-M-2-M-5-M-4-M	5	1	1	66	1	1	1	1
243	S980243	836	PCT-4\0\0\1>90-M-2-M-5-M-5-M	5	1	1	64	1	1	1	1
244	S980244	837	PCT-4\0\0\1>90-M-2-M-5-M-6-M	5	1	1	63	1	1	1	1
245	S980245	838	PCT-4\0\0\1>90-M-2-M-6-M-1-M	3	1	1	64	1	1	1	1
246	S980246	839	PCT-4\0\0\1>90-M-2-M-6-M-2-M	3	1	1	64	1	3	1	1
247	S980247	840	PCT-4\0\0\1>90-M-2-M-6-M-3-M	5	1	1	64	1	1	1	1
248	S980248	841	PCT-4\0\0\1>90-M-2-M-6-M-4-M	5	1	1	64	1	1	1	1
249	S980249	842	PCT-4\0\0\1>90-M-2-M-6-M-5-M	5	1	1	64	1	1	1	1
250	S980250	843	PCT-4\0\0\1>90-M-2-M-6-M-6-M	5	1	1	64	1	1	1	1
251	S980251	844	PCT-4\0\0\1>106-M-3-M-1-M-1-M	5	1	1	69	3	1	1	1
252	S980252	845	PCT-4\0\0\1>106-M-3-M-1-M-2-M	5	1	1	64	3	1	1	1
253	S980253	846	PCT-4\0\0\1>106-M-3-M-1-M-3-M	3	1	1	63	1	1	1	1

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	BI	BI	FI 50%	LSc	BS	GD	NBI
254	S980254	847	PCT-4\0\0\1>106-M-3-M-1-M-4-M	3	1	1	63	1	3	1	1
255	S980255	848	PCT-4\0\0\1>106-M-3-M-1-M-5-M	5	1	1	63	3	1	1	3
256	S980256	849	PCT-4\0\0\1>106-M-3-M-1-M-6-M	5	1	1	66	1	1	1	3
257	S980257	862	PCT-4\0\0\1>2435-M-2-M-6-M-1-M	5	1	1	67	1	3	1	1
258	S980258	863	PCT-4\0\0\1>2435-M-2-M-6-M-2-M	3	1	1	69	1	3	1	1
259	S980259	864	PCT-4\0\0\1>2435-M-2-M-6-M-3-M	3	1	1	64	1	3	1	1
260	S980260	865	PCT-4\0\0\1>2435-M-2-M-6-M-4-M	5	1	1	70	1	3	1	1
261	S980261	866	PCT-4\0\0\1>2435-M-2-M-6-M-5-M	5	1	1	69	1	3	1	1
262	S980262	867	PCT-4\0\0\1>2435-M-2-M-6-M-6-M	5	1	1	69	1	3	1	1
263	S980263	868	PCT-4\0\0\1>2485-M-1-M-1-M-1-M	5	1	1	70	1	3	1	1
264	S980264	869	PCT-4\0\0\1>2485-M-1-M-1-M-2-M	5	1	1	68	1	3	1	1
265	S980265	870	PCT-4\0\0\1>2485-M-1-M-1-M-3-M	5	1	1	69	1	3	1	1
266	S980266	871	PCT-4\0\0\1>2485-M-1-M-1-M-4-M	5	2	1	69	1	1	1	1
267	S980267	872	PCT-4\0\0\1>2485-M-1-M-1-M-5-M	5	1	1	68	1	1	1	1
268	S980268	873	PCT-4\0\0\1>2485-M-1-M-1-M-6-M	5	1	1	69	1	1	1	1
269	S980269	874	PCT-4\0\0\1>2485-M-1-M-6-M-1-M	3	2	1	80	5	1	1	1
270	S980270	875	PCT-4\0\0\1>2485-M-1-M-6-M-2-M	3	2	1	81	5	1	1	1
271	S980271	876	PCT-4\0\0\1>2485-M-1-M-6-M-3-M	3	3	1	81	5	1	1	1
272	S980272	877	PCT-4\0\0\1>2485-M-1-M-6-M-4-M	3	4	3	82	5	1	1	1
273	S980273	878	PCT-4\0\0\1>2485-M-1-M-6-M-5-M	3	3	2	81	5	1	1	1
274	S980274	879	PCT-4\0\0\1>2485-M-1-M-6-M-6-M	3	2	1	81	5	1	1	1
275	S980275	880	PCT-4\0\0\1>2485-M-2-M-2-M-1-M	3	1	1	79	5	1	1	1
276	S980276	881	PCT-4\0\0\1>2485-M-2-M-2-M-2-M	3	3	2	78	5	1	1	1
277	S980277	882	PCT-4\0\0\1>2485-M-2-M-2-M-3-M	3	2	1	80	5	1	1	1
278	S980278	883	PCT-4\0\0\1>2485-M-2-M-2-M-4-M	3	1	1	77	3	1	1	1
279	S980279	884	PCT-4\0\0\1>2485-M-2-M-2-M-5-M	3	2	1	80	5	1	1	1
280	S980280	885	PCT-4\0\0\1>2485-M-2-M-2-M-6-M	5	2	1	78	5	1	1	1
281	S980281	901	PCT-4\0\0\1>2485-M-3-M-1-M-4-M	5	2	1	73	3	1	1	1
282	S980282	902	PCT-4\0\0\1>2485-M-3-M-1-M-5-M	5	3	1	75	1	1	1	1
	T1		CIRAD 409	5	1	1	66	1	1	1	1
	T2		O.Sabana 6	5	3	1	86	3	1	1	1
	T3		O.Sabana 10	5	2	1	90	3	1	1	1
283	S980283	903	PCT-4\0\0\1>2485-M-3-M-1-M-6-M	5	1	1	73	1	1	1	1
284	S980284	904	PCT-4\0\0\1>2485-M-3-M-3-M-1-M	7	1	1	74	1	1	1	1
285	S980285	905	PCT-4\0\0\1>2485-M-3-M-3-M-2-M	7	2	1	75	1	1	1	1
286	S980286	906	PCT-4\0\0\1>2485-M-3-M-3-M-3-M	7	3	1	73	1	1	1	1
287	S980287	907	PCT-4\0\0\1>2485-M-3-M-3-M-4-M	5	2	1	74	1	1	1	1
288	S980288	908	PCT-4\0\0\1>2485-M-3-M-3-M-5-M	7	2	1	74	1	1	1	1
289	S980289	909	PCT-4\0\0\1>2485-M-3-M-3-M-6-M	5	2	1	73	1	1	1	1
290	S980290	910	PCT-4\0\0\1>2485-M-3-M-4-M-1-M	5	2	1	74	1	1	1	1
291	S980291	911	PCT-4\0\0\1>2485-M-3-M-4-M-2-M	5	2	1	72	1	1	1	1
292	S980292	912	PCT-4\0\0\1>2485-M-3-M-4-M-3-M	5	1	1	73	1	1	1	1
293	S980293	913	PCT-4\0\0\1>2485-M-3-M-4-M-4-M	5	1	1	73	1	1	1	1
294	S980294	914	PCT-4\0\0\1>2485-M-3-M-4-M-5-M	5	1	1	74	1	1	1	1
295	S980295	915	PCT-4\0\0\1>2485-M-3-M-4-M-6-M	5	1	1	75	1	1	1	1
296	S980296	916	PCT-4\0\0\1>2486-M-1-M-1-M-1-M	5	1	1	74	1	1	1	1
297	S980297	917	PCT-4\0\0\1>2486-M-1-M-1-M-2-M	5	1	1	73	1	1	1	1
298	S980298	918	PCT-4\0\0\1>2486-M-1-M-1-M-3-M	5	1	1	73	1	1	1	1
299	S980299	919	PCT-4\0\0\1>2486-M-1-M-1-M-4-M	5	1	1	73	1	1	1	1
300	S980300	920	PCT-4\0\0\1>2486-M-1-M-1-M-5-M	5	1	1	73	1	1	1	1
301	S980301	921	PCT-4\0\0\1>2486-M-1-M-1-M-6-M	5	1	1	74	1	1	1	1

Vg = vigor; BI 1 = leaf blast; BI 2 = leaf blast; FI = flowering; LsC = leaf scald; BS = brown spot;

NBI = neck blast; Gd = grain discoloration.

Table 11. Selected S8 lines from the populations PCT-A\0\0\0> y PCT-4\0\0\1>
La Libertad experimental station, 1999A

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	BI	BI	FI 50%	LSc	BS	GD	NBI
1	S980011	548	PCT-A\0\0\0>175-M-1-M-4-M-5-M	7	3	1	64	1	1	1	1
2	S980014	551	PCT-A\0\0\0>175-M-1-M-5-M-2-M	5	3	3	62	1	1	1	1
3	S980017	554	PCT-A\0\0\0>175-M-1-M-5-M-5-M	7	2	1	63	1	1	1	1
4	S980020	557	PCT-A\0\0\0>175-M-3-M-1-M-2-M	5	1	1	62	1	1	1	1
5	S980021	558	PCT-A\0\0\0>175-M-3-M-1-M-3-M	3	1	1	63	1	1	1	1
6	S980024	561	PCT-A\0\0\0>175-M-3-M-1-M-6-M	3	1	1	63	1	1	1	1
7	S980026	563	PCT-A\0\0\0>175-M-3-M-3-M-2-M	7	2	1	70	1	1	1	1
8	S980027	564	PCT-A\0\0\0>175-M-3-M-3-M-3-M	7	2	1	69	1	1	1	1
9	S980041	584	PCT-A\0\0\0>175-M-4-M-5-M-5-M	5	1	1	72	1	3	1	1
10	S980047	590	PCT-A\0\0\0>175-M-6-M-1-M-5-M	7	1	1	75	1	1	1	1
11	S980053	596	PCT-A\0\0\0>189-M-2-M-2-M-5-M	7	2	2	85	3	1	1	1
12	S980063	606	PCT-A\0\0\0>189-M-4-M-4-M-3-M	5	2	2	80	3	1	1	1
13	S980064	607	PCT-A\0\0\0>189-M-4-M-4-M-4-M	5	3	3	82	3	1	1	1
14	S980065	608	PCT-A\0\0\0>189-M-4-M-4-M-5-M	5	2	2	82	3	1	1	1
15	S980068	611	PCT-A\0\0\0>189-M-4-M-5-M-2-M	5	3	3	82	3	1	1	1
16	S980070	613	PCT-A\0\0\0>189-M-4-M-5-M-4-M	5	3	3	82	3	1	1	1
17	S980075	618	PCT-A\0\0\0>189-M-4-M-6-M-3-M	7	3	3	81	3	1	1	1
18	S980083	626	PCT-A\0\0\0>278-M-1-M-1-M-5-M	5	3	3	82	3	3	1	1
19	S980085	628	PCT-A\0\0\0>278-M-1-M-2-M-1-M	3	4	4	80	3	3	1	1
20	S980086	629	PCT-A\0\0\0>278-M-1-M-2-M-2-M	3	3	3	80	3	1	1	1
21	S980093	636	PCT-A\0\0\0>394-M-1-M-1-M-3-M	5	1	1	85	1	1	1	1
22	S980113	656	PCT-A\0\0\0>394-M-1-M-6-M-5-M	5	2	2	77	3	1	3	1
23	S980125	668	PCT-A\0\0\0>394-M-2-M-2-M-5-M	7	1	1	82	1	3	3	1
24	S980128	671	PCT-A\0\0\0>394-M-2-M-3-M-2-M	5	2	1	82	1	1	1	1
25	S980131	674	PCT-A\0\0\0>394-M-2-M-3-M-5-M	5	2	2	81	1	1	1	1
26	S980143	686	PCT-A\0\0\0>1169-M-1-M-4-M-5-M	5	1	1	68	3	1	1	1
27	S980144	687	PCT-A\0\0\0>1169-M-1-M-4-M-6-M	5	1	1	66	3	1	1	1
28	S980149	698	PCT-A\0\0\0>1321-M-2-M-4-M-5-M	3	1	1	74	1	1	1	1
29	S980150	699	PCT-A\0\0\0>1321-M-2-M-4-M-6-M	3	1	1	62	1	1	1	1
30	S980151	706	PCT-A\0\0\0>1485-M-1-M-4-M-1-M	3	1	1	67	1	1	1	1
31	S980179	741	PCT-A\0\0\0>1488-M-5-M-1-M-6-M	5	1	1	85	3	1	1	1
32	S980192	760	PCT-A\0\0\0>1674-M-6-M-6-M-1-M	3	2	1	74	1	1	1	1
33	S980193	761	PCT-A\0\0\0>1674-M-6-M-6-M-2-M	5	1	1	68	1	1	1	1
34	S980195	763	PCT-A\0\0\0>1674-M-6-M-6-M-4-M	3	1	1	66	1	1	1	1
35	S980209	777	PCT-A\0\0\0>1955-M-3-M-4-M-6-M	5	1	1	73	3	1	1	1
36	S980230	810	PCT-A\0\0\0>2083-M-2-M-4-M-3-M	3	1	1	63	1	1	1	1
37	S980248	841	PCT-4\0\0\1>90-M-2-M-6-M-4-M	5	1	1	64	1	1	1	1
38	S980250	843	PCT-4\0\0\1>90-M-2-M-6-M-6-M	5	1	1	64	1	1	1	1
39	S980252	845	PCT-4\0\0\1>106-M-3-M-1-M-2-M	5	1	1	64	3	1	1	1
40	S980254	847	PCT-4\0\0\1>106-M-3-M-1-M-4-M	3	1	1	63	1	3	1	1
41	S980259	864	PCT-4\0\0\1>2435-M-2-M-6-M-3-M	3	1	1	64	1	3	1	1
42	S980266	871	PCT-4\0\0\1>2485-M-1-M-1-M-4-M	5	2	1	69	1	1	1	1
43	S980279	884	PCT-4\0\0\1>2485-M-2-M-2-M-5-M	5	2	1	80	5	1	1	1
44	S980287	907	PCT-4\0\0\1>2485-M-3-M-3-M-4-M	5	2	1	74	1	1	1	1

Table 12. Evaluation of S8 lines from the population PCT-4\0\0\1>S2
La libertad experimental station, 1999A

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	BI	BI	FI 50%	LSc	BS	GD	NBI
1	S980302	922	PCT-4\0\0\1>S2-41-1-M-4-M-1-M	3	1	1	69	1	1	1	1
2	S980303	923	PCT-4\0\0\1>S2-41-1-M-4-M-2-M	3	1	1	69	1	1	1	1
3	S980304	924	PCT-4\0\0\1>S2-41-1-M-4-M-3-M	3	1	1	68	1	1	1	1
4	S980305	925	PCT-4\0\0\1>S2-41-1-M-4-M-4-M	3	1	1	70	1	1	1	1
5	S980306	926	PCT-4\0\0\1>S2-41-1-M-4-M-5-M	3	1	1	69	1	1	1	1
6	S980307	927	PCT-4\0\0\1>S2-41-1-M-4-M-6-M	3	1	1	68	1	1	1	1
7	S980308	928	PCT-4\0\0\1>S2-41-1-M-6-M-1-M	3	1	1	69	1	1	1	1
8	S980309	929	PCT-4\0\0\1>S2-41-1-M-6-M-2-M	3	1	1	68	1	1	1	1
	T1		CIRAD 409	5	1	1	63	1	1	1	1
	T2		O.Sabana 6	5	3	1	85	3	1	1	1
	T3		O.Sabana 10	5	2	1	88	3	1	1	1
9	S980310	930	PCT-4\0\0\1>S2-41-1-M-6-M-3-M	3	1	1	70	3	1	1	1
10	S980311	931	PCT-4\0\0\1>S2-41-1-M-6-M-4-M	3	1	1	71	1	1	1	1
11	S980312	932	PCT-4\0\0\1>S2-41-1-M-6-M-5-M	3	1	1	70	1	1	1	1
12	S980313	933	PCT-4\0\0\1>S2-41-1-M-6-M-6-M	3	1	1	68	1	1	1	1
13	S980314	934	PCT-4\0\0\1>S2-1803-3-M-3-M-1-M	5	1	1	74	3	1	1	1
14	S980315	935	PCT-4\0\0\1>S2-1803-3-M-3-M-2-M	5	1	1	73	5	1	1	1
15	S980316	936	PCT-4\0\0\1>S2-1803-3-M-3-M-3-M	5	1	1	73	5	1	1	1
16	S980317	937	PCT-4\0\0\1>S2-1803-3-M-3-M-4-M	5	1	1	73	5	1	1	1
17	S980318	938	PCT-4\0\0\1>S2-1803-3-M-3-M-5-M	5	1	1	73	5	1	1	1
18	S980319	939	PCT-4\0\0\1>S2-1803-3-M-3-M-6-M	5	1	1	73	3	1	1	1
19	S980320	940	PCT-4\0\0\1>S2-1803-3-M-4-M-1-M	5	2	1	72	3	1	1	1
20	S980321	941	PCT-4\0\0\1>S2-1803-3-M-4-M-2-M	5	2	1	71	3	1	1	1
21	S980322	942	PCT-4\0\0\1>S2-1803-3-M-4-M-3-M	5	1	1	71	5	1	1	1
22	S980323	943	PCT-4\0\0\1>S2-1803-3-M-4-M-4-M	5	1	1	73	3	1	1	1
23	S980324	944	PCT-4\0\0\1>S2-1803-3-M-4-M-5-M	5	1	1	71	3	1	1	1
24	S980325	945	PCT-4\0\0\1>S2-1803-3-M-4-M-6-M	5	1	1	72	3	1	1	1
25	S980326	946	PCT-4\0\0\1>S2-2324-4-M-1-M-1-M	3	1	1	66	1	1	1	1
26	S980327	947	PCT-4\0\0\1>S2-2324-4-M-1-M-2-M	3	1	1	68	1	1	1	1
27	S980328	948	PCT-4\0\0\1>S2-2324-4-M-1-M-3-M	5	1	1	66	1	1	1	1
28	S980329	949	PCT-4\0\0\1>S2-2324-4-M-1-M-4-M	5	1	1	66	1	1	1	1
29	S980330	950	PCT-4\0\0\1>S2-2324-4-M-1-M-5-M	5	1	1	66	1	1	1	1
30	S980331	951	PCT-4\0\0\1>S2-2324-4-M-1-M-6-M	5	1	1	68	1	1	1	1
31	S980332	952	PCT-4\0\0\1>S2-1584-4-M-4-M-1-M	3	1	1	84	3	3	1	1
32	S980333	953	PCT-4\0\0\1>S2-1584-4-M-4-M-2-M	5	1	1	83	3	3	1	1
33	S980334	954	PCT-4\0\0\1>S2-1584-4-M-4-M-3-M	5	1	1	82	3	3	1	1
34	S980335	955	PCT-4\0\0\1>S2-1584-4-M-4-M-4-M	5	2	1	82	3	3	1	1
35	S980336	956	PCT-4\0\0\1>S2-1584-4-M-4-M-5-M	5	2	1	84	3	1	1	1
36	S980337	957	PCT-4\0\0\1>S2-1584-4-M-4-M-6-M	5	2	1	80	1	1	1	1
37	S980338	958	PCT-4\0\0\1>S2-1584-4-M-5-M-1-M	5	1	1	82	1	1	1	1
38	S980339	959	PCT-4\0\0\1>S2-1584-4-M-5-M-2-M	5	1	1	82	1	1	1	1
39	S980340	960	PCT-4\0\0\1>S2-1584-4-M-5-M-3-M	5	1	1	85	3	1	1	1
40	S980341	961	PCT-4\0\0\1>S2-1584-4-M-5-M-4-M	5	1	1	84	1	1	1	1
41	S980342	962	PCT-4\0\0\1>S2-1584-4-M-5-M-5-M	5	1	1	83	1	1	1	1
42	S980343	963	PCT-4\0\0\1>S2-1584-4-M-5-M-6-M	5	1	1	83	1	1	1	1
43	S980344	964	PCT-4\0\0\1>S2-1584-4-M-6-M-1-M	5	1	1	85	1	1	1	1
44	S980345	965	PCT-4\0\0\1>S2-1584-4-M-6-M-2-M	5	3	2	84	1	1	1	1
45	S980346	966	PCT-4\0\0\1>S2-1584-4-M-6-M-3-M	5	3	2	85	3	1	1	1
46	S980347	967	PCT-4\0\0\1>S2-1584-4-M-6-M-4-M	5	2	1	78	3	1	1	1
47	S980348	968	PCT-4\0\0\1>S2-1584-4-M-6-M-5-M	5	2	1	75	3	1	1	1
48	S980349	969	PCT-4\0\0\1>S2-1584-4-M-6-M-6-M	5	2	1	74	5	1	1	1
49	S980350	970	PCT-4\0\0\1>S2-2197-3-M-3-M-1-M	7	2	1	77	3	1	1	1

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	Bl	Bl	Fl 50%	LSc	BS	GD	NBl
50	S980351	971	PCT-4\0\0\1>S2-2197-3-M-3-M-2-M	7	1	1	75	3	1	3	1
51	S980352	972	PCT-4\0\0\1>S2-2197-3-M-3-M-3-M	7	1	1	74	3	1	3	1
52	S980353	973	PCT-4\0\0\1>S2-2197-3-M-3-M-4-M	7	1	1	77	1	1	3	1
53	S980354	974	PCT-4\0\0\1>S2-2197-3-M-3-M-5-M	7	1	1	74	3	1	1	1
54	S980355	975	PCT-4\0\0\1>S2-2197-3-M-3-M-6-M	7	1	1	78	3	1	1	1
55	S980356	976	PCT-4\0\0\1>S2-2197-3-M-6-M-1-M	5	1	1	78	1	1	1	1
56	S980357	977	PCT-4\0\0\1>S2-2197-3-M-6-M-2-M	5	1	1	73	1	1	1	1
57	S980358	978	PCT-4\0\0\1>S2-2197-3-M-6-M-3-M	5	1	1	75	3	1	1	1
58	S980359	979	PCT-4\0\0\1>S2-2197-3-M-6-M-4-M	5	1	1	76	1	1	1	1
59	S980360	980	PCT-4\0\0\1>S2-2197-3-M-6-M-5-M	3	1	1	72	3	1	1	1
60	S980361	981	PCT-4\0\0\1>S2-2197-3-M-6-M-6-M	3	1	1	75	1	1	1	1
61	S980362	982	PCT-4\0\0\1>S2-1038-1-M-4-M-1-M	5	1	1	84	1	1	1	1
62	S980363	983	PCT-4\0\0\1>S2-1038-1-M-4-M-2-M	5	1	1	84	1	1	1	1
	T1		CIRAD 409	5	1	1	66	3	1	1	1
	T2		O.Sabana 6	5	3	2	85	3	1	1	1
	T3		O.Sabana 10	5	2	1	88	1	1	1	1
63	S980364	984	PCT-4\0\0\1>S2-1038-1-M-4-M-3-M	5	1	1	81	1	1	1	1
64	S980365	985	PCT-4\0\0\1>S2-1038-1-M-4-M-4-M	5	1	1	84	1	1	1	1
65	S980366	986	PCT-4\0\0\1>S2-1038-1-M-4-M-5-M	5	1	1	83	1	1	1	1
66	S980367	987	PCT-4\0\0\1>S2-1038-1-M-4-M-6-M	5	1	1	83	1	1	1	1
67	S980368	988	PCT-4\0\0\1>S2-1038-1-M-6-M-1-M	5	2	1	83	1	1	1	1
68	S980369	989	PCT-4\0\0\1>S2-1038-1-M-6-M-2-M	5	2	1	85	3	1	1	1
69	S980370	990	PCT-4\0\0\1>S2-1038-1-M-6-M-3-M	5	1	2	83	3	3	1	1
70	S980371	991	PCT-4\0\0\1>S2-1038-1-M-6-M-4-M	3	1	1	82	3	3	1	1
71	S980372	992	PCT-4\0\0\1>S2-1038-1-M-6-M-5-M	5	1	1	82	3	3	1	1
72	S980373	993	PCT-4\0\0\1>S2-1038-1-M-6-M-6-M	5	2	1	83	1	3	1	1

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

Table 12. Selected S8 lines from the population PCT-4\0\0\1>S2
La Libertad experimental station, 1999A

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	Bl	Bl	Fl 50%	LSc	BS	GD	NBl
1	S980307	927	PCT-4\0\0\1>S2-41-1-M-4-M-6-M	3	1	1	68	1	1	1	1
2	S980309	929	PCT-4\0\0\1>S2-41-1-M-6-M-2-M	3	1	1	68	1	1	1	1
3	S980312	932	PCT-4\0\0\1>S2-41-1-M-6-M-5-M	3	1	1	70	1	1	1	1
4	S980332	952	PCT-4\0\0\1>S2-1584-4-M-4-M-1-M	3	1	1	84	3	3	1	1
5	S980339	959	PCT-4\0\0\1>S2-1584-4-M-5-M-2-M	5	1	1	82	1	1	1	1
6	S980341	961	PCT-4\0\0\1>S2-1584-4-M-5-M-4-M	5	1	1	84	1	1	1	1

Table 13. Evaluation of S8 lines from the population PCT-4\0\0\1>S3
(Basic population. Plant selection in S3 lines at PES in 1996 B)
La Libertad experimental station, 1999A

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	BI	BI	FI 50%	LSc	BS	GD	NBI
1	S980374	994	PCT-4\0\0\1>S3-41-2-2-3-M-1-M	5	1	1	75	3	1	1	1
2	S980375	995	PCT-4\0\0\1>S3-41-2-2-3-M-2-M	5	1	1	75	3	1	1	1
3	S980376	996	PCT-4\0\0\1>S3-41-2-2-3-M-3-M	5	1	1	74	1	1	1	1
4	S980377	997	PCT-4\0\0\1>S3-41-2-2-3-M-4-M	5	1	1	75	3	1	1	1
5	S980378	998	PCT-4\0\0\1>S3-41-2-2-3-M-5-M	5	1	1	75	3	1	1	1
6	S980379	999	PCT-4\0\0\1>S3-41-2-2-3-M-6-M	5	1	1	73	1	1	1	1
7	S980380	1000	PCT-4\0\0\1>S3-41-2-2-4-M-1-M	5	1	1	72	1	1	1	1
8	S980381	1001	PCT-4\0\0\1>S3-41-2-2-4-M-2-M	3	2	1	71	3	1	1	1
9	S980382	1002	PCT-4\0\0\1>S3-41-2-2-4-M-3-M	3	1	1	71	1	1	1	1
10	S980383	1003	PCT-4\0\0\1>S3-41-2-2-4-M-4-M	5	2	1	73	1	1	1	1
11	S980384	1004	PCT-4\0\0\1>S3-41-2-2-4-M-5-M	3	1	1	69	1	1	1	1
12	S980385	1005	PCT-4\0\0\1>S3-41-2-2-4-M-6-M	3	1	1	69	1	1	1	1

Vg = vigor; BI 1 = leaf blast; BI 2 = leaf blast; FI = flowering; LsC = leaf scald; BS = brown spot;
NBI = neck blast; Gd = grain discoloration.

Table 13. Selected S8 lines from the population PCT-4\0\0\1>S3
La Libertad experimental station, 1999A

Nbr.	Field Nbr. 1999A	Origin 1998B	Pedigree	Vg	BI	BI	FI 50%	LSc	BS	GD	NBI
1	S980384	1004	PCT-4\0\0\1>S3-41-2-2-4-M-5-M	3	1	1	69	1	1	1	1

Table 14. INGER-LAC: "Vivero Internacional de Observación para America Latina" (VIOAL) para suelos ácidos
Nursery for Acid soils, 1998/1999

Cons.	Pedigree	Vg	Bl 1	Bl 2	AC	NBl	Fl (50%)	LSc	BS	VHB	Gd	Ht	G.T	W.B	S.T	Amyl. (%)	White Rice (%)	Head Rice (%)
1	CNA-IRAT 5\SA\0\3>127-2-M-1-M-2	3	1	2	1	1	63	1	1	1	1	104	I	0.6	L	29	80.14	66.76
2	CNA-IRAT A\SA\0\3>1-M-2-M-1-M-1	5	1	1	1	1	66	1	1	9	1	102	H	0.8	L	22	69.40	62.95
3	CNA-IRAT A\SA\0\3>1-M-2-M-1-M-2	3	1	1	1	1	66	1	1	9	1	99	H	1.2	L	22	73.88	67.10
4	CNA-IRAT A\SA\0\3>1-M-2-M-1-M-5	3	1	1	1	1	65	1	1	9	1	108	H	2.2	L	20	66.72	59.61
5	CNA-IRAT A\SA\0\3>1-M-2-M-2-M-1	3	1	1	1	1	63	1	1	9	1	112	H	2.0	L	22	71.29	63.15
6	CNA-IRAT A\SA\0\3>1-M-2-M-2-M-4	3	1	1	1	1	65	1	1	9	1	105	H	1.2	L	24	65.67	58.30
7	CNA-IRAT A\SA\0\3>1-M-2-M-3-M-2	3	1	1	1	1	65	1	1	9	1	112	H	1.6	L	20	67.58	58.56
8	CNA-IRAT A\SA\0\3>1-M-2-M-3-M-4	5	1	1	1	1	65	1	1	9	1	113	H	1.0	L	23	70.20	63.50
9	CNA-IRAT A\SA\0\3>1-M-2-M-3-M-5	5	1	1	1	1	65	1	1	9	1	112	H	1.8	L	22	71.64	65.38
10	CNA-IRAT A\SA\0\3>1-M-2-M-4-M-2	3	1	1	1	1	66	3	1	9	1	97	H	1.6	L	23	72.99	65.89
11	CNA-IRAT A\SA\0\3>1-M-2-M-4-M-3	1	1	1	1	1	68	3	1	9	1	95	H	1.2	L	21	72.15	67.10
12	CNA-IRAT A\SA\0\3>1-M-2-M-4-M-4	3	1	1	1	1	69	1	1	9	1	95	H	1.2	L	22	74.24	67.95
13	CNAx3608-6-1-2-2-1-M-M	3	1	2	1	1	68	1	1	9	1	112	-	0.1	EL			
14	CNAx3619-3-1-B-2-M-M	3	1	4	1	1	86	3	1	9	1	102	I	1.2	L			
15	CNAx4754-80-B-M-7-M-M	3	3	2	1	1	66	1	1	9	1	97	-	0.6	EL			
16	CNAx4754-128-B-M-4-M	3	1	1	1	1	74	1	1	9	1	95	H	1.0	L			
17	CNAx4754-61-B-M-20-M	3	1	1	1	1	91	3	1	9	1	104	H	0.4	L			
18	CT13480-M-16-1-M-M	3	1	1	1	1	86	3	1		3	63	-	-	-			
19	CT13480-M-10-1-M-M	1	1	2	1	1	94	5	1		3	68	B	0.6	L			
20	CT13480-M-9-2-M-M	1	1	1	1	1	85	3	1		3	69	I	1.2	L			
21	CT13503-M-3-1-M-M	1	1	3	1	1	85	3	3		3	88	BI	0.8	L			
22	CT13503-M-13-1-M-M	3	2	2	1	3	86	5	3		5	76	B	0.2	L			
23	CT13503-M-18-1-M-M	3	1	1	1	1	85	5	1		5	78	I	0.6	L			
24	CT13503-M-18-2-M-M	1	1	1	1	1	86	5	3		5	76	-	1.0	L			
25	CT13503-M-18-3-M-M	1	1	1	1	1	86	5	3		5	74	-	2.0	EL			
26	CIRAD 409	1	1	1	1	1	62	3	1		1	91	I	1.2	L	24	71.06	66.60
27	CIRAD 410	3	3	3	1	1	67	3	5		1	87	I	3.8	M	24	85.20	65.86
28	CIRAD 411	5	3	3	1	1	70	3	3		1	102	HI	2.8	L	17	87.25	56.32
29	ORYZICA SABANA 6	3	3	4	1	1	82	5	1		1	106	I	2.2	L	26	73.04	56.67
30	ORYZICA SABANA 10	3	2	1	1	1	86	3	1		1	106	H	1.2	L	23	71.53	61.73
31	IRAT 216	4	7	2	1	1	87	3	3			85						

Vg = vigor; Bl 1 y 2 = leaf blast; AC= acid soil reaction; Fl = flowering; LSc = leaf scald; BS = brown spot; NBl = neck blast; Gd = grain discoloration; Ht = height (cm); G.T. = gelatinization temperature; W.B. = white belly; Amyl. = amylose content.

CHAPTER IV

POPULATION BREEDING FOR LOWLAND RICE

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CHAPTER IV

POPULATION BREEDING for LOWLAND RICE

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 Guiana.

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 is being edited by Dr. Elcio .P. Guimarães and will be published by CIAT, CIRAD and EMBRAPA Rice and Beans.

In this report, we will only describe the activities developed in Colombia, by the CIAT/CIRAD project.

2. POPULATION BREEDING for 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

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

Cropping Season 1999

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

3. POPULATION BREEDING for ARGENTINA

Development of local populations

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. After some cycles of recombination it will be used as direct source of fertile plants for line development.

Population **PARG-2**

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

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

4. POPULATION BREEDING for CHILE

The Chilean population **PQUI-1** was split in two parts. One sample was sown in Chillan and the other one in the northern part of the rice growing area where climatic conditions are different. 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 October 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.

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

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.

Fixed lines were developed through anther culture at CIAT laboratory. A total of 325 R1 lines was produced. The R2 generation will be grown at CIAT Palmira and the resulting seed dispatched to Chile for evaluation during 1999/2000 cropping season.

5. POPULATION BREEDING for URUGUAY

During the 1997-cropping season, Fernando Perez de Vida crosses different lines with sterile plants from the GPIRAT-10 gene pool. The hybrid seed was shipped to CIAT Palmira to grow the F1.

Three (3) populations are developed:

PURG-1 comes from the introduction of 17 lines with short grain quality into GPIRAT-10. The objective is to develop a local population for short grain quality; witch represents a new target export market for Uruguay.

PURG-2 comes from the introduction of 60 long grain lines into the gene pool GPIRAT-10.

PURG-3 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.

Cropping Season 1999

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

6. MAINTAINING GERMPLASM

Because we manage the catalogue for rice germplasm for recurrent selection, we also have the responsibility to ensure the presence of sufficient seed in the germplasm bank. Because of sufficient disposability of seed, no multiplication was done this year.

7. 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).

8. 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, Yunnan Province - China).
- PFD-1 and PFD-2 *Indica* populations for tropical lowland ecosystem (DANAC - Venezuela).

9. FIXED LINE DEVELOPMENT from CHILEAN POPULATIONS, through ANTHER CULTURE

To fasten the development of fixed lines for Chile where only one cropping season is possible, we decided to process through anther culture, the Chilean populations with two recurrent selection cycles.

Cropping season 1998/1999

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, and the R2 generation will be advanced in Colombia during the first semester of year 2000. The resulting seeds will be shipped to Chile for evaluation and selection, during the 2000/2001 cropping season.

10. FIXED LINE DEVELOPMENT from CONVENTIONAL CROSSES for ROMANIA, through ANTHER CULTURE

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

Cropping season 1999

Two crosses were processed: OLTENITSA / RUBINO, and CRISTAL /L 203.

A total of 61 R1 DH lines was produced. The R2 seeds were shipped to Romania and also to France and Chile.

11. FIXED LINE DEVELOPMENT from CONVENTIONAL CROSSES for SPAIN, through ANTHER CULTURE

In the framework of the collaboration between CIRAD-CA Montpellier and Spain, four crosses were made at CIAT Palmira and will be processed by anther culture.

The F1 hybrid seed was obtained, and the F1's generations will be grown during the last trimester of 1999. In early year 2000, plants will be processed by anther culture.

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

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

Project Goal

To improve the nutritional and economic well-being of rice growers and low income consumers in Latin America and the Caribbean through sustainable increases in rice production and productivity

Project 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

- Enhanced Gene Pools
- Physiological Basis for Rice Traits Understood
- Host-Pests Interaction in Rice Characterized
- Project Priorities and Research Capacities Enhanced

Project Log-Frame

Narrative Summary	Measurable Indicators	Means of Verification	Important Assumptions
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. Enhanced Gene Pools. 2. Physiological Basis for Rice Traits Understood. 3. Host-Pests Interaction in Rice Characterized. 4. Project Priorities and Research Capacities Enhanced.	• Pathogen/pest variation and source of resistance identified. • IPM strategies. • Workshops. • Training courses. • Farmers' surveys.	• Project progress report for 1998. • Project progress report for 1998. • Publications. • Progress reports. • Publications. • Project progress and workshop reports	• Continued support from CIAT/CIRAD/FLAR. • Weed scientist in place. • Continued adequate funding. • Recommendations adopted by NARS and implemented by farmers.

Narrative Summary	Measurable Indicators	Means of Verification	Important Assumptions
Activities			
1.1. Rice improvement for upland and lowland using recurrent selection and conventional breeding. 1.2. Evaluation of savannas upland rice lines in Latin American countries. 1.3. Population maintenance through recombination. 1.4. Registration of new populations 1.5. Distribution of breeding populations to LAC countries. 1.6. Conventional and recurrent selection breeding for hillsides upland rice.	• 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.	• Project progress report for 1998. • Field visits and evaluations in testing sites. • Breeding populations distributed to LAC.	• Continued support from CIAT/CIRAD/FLAR. • Adequate funding and timely release of budget.
1.7. Identification and selection for useful traits in wild rices with the aid of molecular markers. Improvement of yield potential in interspecific crosses by backcross and QTL analyses.	• Populations developed (14); populations in process (12); populations yield tested/molecular characterized (4). Partners (WARDA, CIRAD, EMBRAPA, CORNELL).	• Project progress report for 1998. • Breeding populations in storage and field. • Best lines and QTL'S identified.	• Adequate support from IP-4. • Favorable climate.
1.8. Evaluation of interspecific populations. Introgression of new plant type (NPT-IRRI) into LAC's gene pools.	• Number of crosses made (433); tropical irrigated (226), temperate (155), upland (52). Number of selected lines.	• Project progress report for 1998. • Breeding populations in storage and field.	• Adequate funding and timely release of budget. • Continued financial support for anther culture lab.
1.9. Use of anther and in vitro culture for enhancement of gene pools.	• Double haploids: interspecific crosses (386), acceleration breeding populations (815), somaclones (3758-Venezuela; 4440-Colombia)	• Project progress report 1998. • Double haploids in storage	• Crosses, field support and operational costs provided by FLAR.
2.1. Weed control enhanced by the use of new genotypes and practices. 2.2. Identification of rice cultivars with tolerance to submergence. 2.3. Identification of rice cultivars exhibiting high weed competition. 2.4. Characterization of useful traits in new plant type derived populations.	• Screening methods for tolerance to submergence developed. • Number of genotypes with tolerance to submergence • Weed competitive varieties developed • Yield components in NPT identified.	• Project progress report for 1998. • Publications.	• Adequate funding and management support. • Weed scientist in place (IRRI/CIAT).

3.1. Monitoring changes in genetic structure and virulence diversity of the rice blast pathogen. 3.2. Characterization and improving methods for developing durable disease resistance (complete/partial resistance) 3.3. Genetics and dissection of blast resistance genes using molecular markers. 3.4. Development and characterization of resistance to RHBV and *Tagosodes orizicolus.* 3.5. Develop and promote IPM strategies to control RHBV. 3.6. Control of RHBV through nucleoprotein mediated cross protection in transgenic rice. 3.7. Physical, chemical and molecular characterization of the rice stripe necrosis virus. 3.8. Development of RSNV diagnostic methods and germplasm screening techniques to implement control measures.	• 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.* • More effective colony management. • Crop management components developed. • Increases capacity of NARS to screen germplasm. • Transgenic lines with RHBV-viral genes (187) with reduced symptoms. • Transgenes introgressed into commercial cultivars. • Characterization of RSNV and vector finished. • Different control strategies for RSNV are implemented.	• 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 1998. • Rice progress report for 1998. • Publications • Rice progress report for 1998. • Publication and diagnostic kit available. • Resistant germplasm selected under artificial conditions.	• 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. • Continued funding from Colombia, Rockefeller, Colciencias. • Permission for field testing of transgenic plants is granted. • Continued support and adequate funding.
4.1. Analysis of national rice samples in Colombia. 4.2. Creation of a network of rice economics in Latin America (RECAL). 4.3. FLAR breeding and crop management activities in Latin America and the Caribbean (training). 4.4. Promotional and diffusion of activities and research impact. 4.5. FLAR Interactions with CIRAD/CIAT/IRRI. 4.6. Collaboration with Forest Margins project for the development of improved upland rice cultivars for the Peruvian Selva.	• Costs and coefficients of production. • National breeding plans written. • Number of scientists trained. • Published reports of courses. • FLAR publications. • Budget.	• Rice progress report for 1998.	• Special funds continue. • Recommendations adopted by farmers. • Adequate funding and timely release of budget.

APPENDIX 2. Individual Work Plan

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 1999 **Ends:** December 1999 **Your Name:** Marc CHATEL **Project Manager:** Fernando Correa

Project of Subproject Outputs and Indicators	**Specific Indicators for the outputs**
Output 1. **Enhanced Gene Pools** **Savanna Upland Rice** **Conventional and Recurrent Selection Breeding.**	Population development and improvement. Line development and use by NARS. **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. Use of Recurrent Selection for acid soils. S2 progenies evaluation under acid soil				*****	*****	*****	*****	*****				
1.1.2. Recombination of the best S2 progenies (Palmira)	***** 2000	***** 2000	***** 2000							*****	*****	*****
1.1.3 Evaluation and recombination of 3 populations enhanced by 3 cycles of Recurrent Selection for total resistance to Blast.				*****	*****	*****	*****	*****				
1.2. Recurrent Selection: New Upland Savanna Population.												
1.2.1. Recombination cycle of population PCT-11				*****	*****	*****	*****	*****				
1.2.2. Population Enhancement for global characteristics				*****	*****	*****	*****	*****				
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)	***** 2000	***** 2000	***** 2000									
1.4. Conventional Breeding.												
1.4.1. Evaluation and selection of breeding lines.				*****	*****	*****	*****	*****				
1.4.2. Off season multiplication (Palmira)	***** 2000	***** 2000	***** 2000							*****	*****	*****

1.5. Strengthening NARS and training.												
1.5.1. Preparation of the 2d International Rice Recurrent Selection Workshop (to be held in September 1999 in Brazil)			*****	*****				*****	*****			
1.5.2. Visits and field work with NARS. Argentina (Tucuman), Bolivia (Santa Cruz) , Venezuela (Reunillez), and Brazi (EMBRAPA Arroz e Feljao).I		*****	*****					*****	*****			
1.5.3. Germplasm distribution and evaluation with Partners (Latin America, CIRAD, Africa, and China)		*****								*****		
1.6. Annual Report and Publications.												

Individual Work Plan

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

Subproject: Collaborative Rice Project between CIAT, CIRAD, and FLAR

Starts: January 1999 **Ends:** December 1999 **Your Name:** Marc CHATEL **Project Managers:** Fernando Correa
Luis Sanint

Project of Subproject Outputs and Indicators	**Specific Indicators for the outputs**											
Output 1. **Enhanced Gene Pools** **Tropical and Temperate Lowland Rice** **Use of Recurrent Selection Breeding.**	Population development and improvement. Line development and use by NARS. **Important Assumptions of the Activity Level** 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: Population Enhancement.												
1.1.1. Purification of 3 Populations for Hoja Blanca.		*****	*****									
1.1.2. Recombination of the purified germplasm				*****	*****	*****	*****					
1.2. Recurrent Selection: New Tropical lowland Population.												
1.2.1. Recombination of the population PCT-12	*****	*****	*****	*****	*****		*****	*****	*****	*****		
1.2.2. PCT-12 Enhancement for global characteristics				*****	*****	*****	*****	*****				
1.3. Recurrent Selection: Line development from different populations.												
1.3.1. Selection of S0 fertile plants in different populations	*****	*****		*****	*****	*****	*****	*****				
1.3.2. S1 Off season multiplication (Palmira)	*****	*****	*****	*****								
1.4. Strengthening NARS.												
1.4.1. Assessment of Recurrent Selection progress for LAC Temperate and Subtropical Lowlands: Argentina, Chile, Uruguay and Southern Brazil	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
1.4.2. Assessment of Recurrent Selection Progress for Tropical Lowlands: Colombia, Venezuela, Costa Rica, El Salvador, Panama, and Cuba.	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
1.4.3. Recurrent Selection in Venezuela (DANAC): Definition of recurrent selection activities in Venezuela	*****	*****	*****	*****								

1.4.4.	Recurrent Selection Germplasm for Europe .Use of the Chilean population PQUI-1						*****	*****	*****	*****			
1.4. 5.	Visits and field work with NARS			*****						*****			
1.4.6.	Germplasm distribution and evaluation with Partners: .Latin America and the Caribbean .CIRAD .Europe		*****								*****		
1.5. Training													
1.5.1.	Preparation of the 2d International Rice Recurrent Selection Workshop (to be held in September 1999 in Brazil)		*****	*****						*****	*****		
1.6. Annual Report and Publications													

APPENDIX 3. REFERENCES

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APPENDIX 4. 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	*Intl/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 Chillan - 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*

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).

The Center's core budget is financed by 25 donor countries, international and regional development organizations, and private foundations. 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.