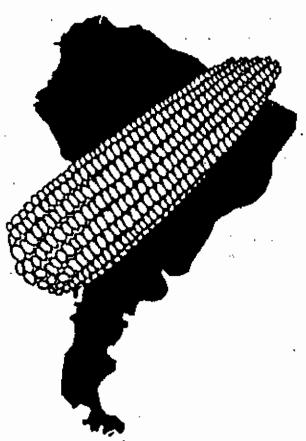
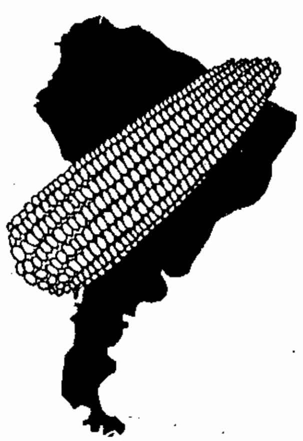
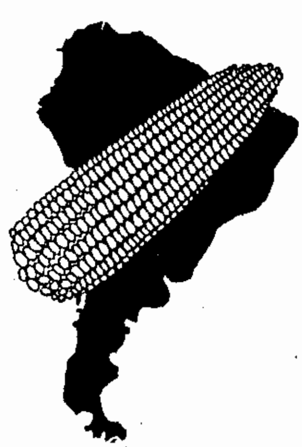
CIMMYT

Programa Suramericano de Maíz

Annual Report 2001

ANNUAL REPORT 2001

SOUTH AMERICAN REGIONAL MAIZE PROGRAM (SARMP)
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July 2002

Title: Annual Report 2000
CIMMYT's South American Regional Maize Program (SARMP). Cali, Colombia.

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In the text, locations planted in Colombia are described as PM (Palmira), VV1, VV2 (Villavicencio at 60 and 70% aluminum saturation, respectively), and MN (Menegua). Selection for resistance to biotic stresses (Phaeosphaeria and Cercospora leaf spots) the nurseries and selections were done at Caicedonia (CD), and Turipana (TP). The planting seasons are described by the two last digits of the year, followed by either A or B, indicating the spring (Apr.-Jul.), or the winter (Sept.-Jan.) planting seasons, respectively.

Acknowledgments

Activities developed by the SARMP have been sponsored by the following institutions:
- Colombian Ministry of Agriculture, through contribution to CGIAR
- Interamerican Development Bank
- Fondo Regional de Tecnología Agropecuaria (FONTAGRO)
- Federación Nacional de Cerealistas (FENALCE), Colombia

Special recognition to the field and technical support staff for their interest, responsability, and good work to accomplish what is described in this report.

Summary

1. Introduction

The main research activities of the SARMP have continued to be guided towards the development and improvement of maize germplasm with tolerance to aluminum toxic- acid soils. These type of soils are present in approximately 40% of the arable land in tropical countries, with extremely poor soils due to low pH, and either deficiency or toxicity of some micronutrients. The products derived from this research are targeted to develop maize germplasm with tolerance to acid soils and some regional biotic stresses which are limiting factors for maize production in countries in the region, including fall armyworm, phaeosphaeria leaf spot, polysora and physopella rusts, corn stunt, rayado fino, and sugarcane mosaic virus. The program has developed, and concentrates its activities, in the improvement of 4 genetically broad based populations, including 2 heterotic populations with yellow (SA3 and SA4) and 2 heterotic populations with white (SA6 and SA7) endosperm. Inbred lines, open pollinated varieties, synthetics, and hybrids have been generated from these four base populations, and their products tested by interested collaborating programs. The above four base acid soil-tolerant populations are being improved following a reciprocal recurrent selection scheme. Germplasm is improved by testing and selecting tolerant germplasm in nurseries established at Villavicencio, Menegua, and Palmira, in Colombia, and collaborating countries in South America. Germplasm generated from these populations is offered to NARS to be evaluated for resistance to important biotic stresses in the region. Selected germplasm is both introgressed in the base populations and used to generate resistant source populations, inbred lines, and synthetics.

2. Major outputs

- Improvement of the 2 yellow (SA 3 and SA 4), and 2 white (SA 6 and SA 7) heterotic populations has continued following a reciprocal recurrent selection scheme. During PM01A, C2-S1 lines were derived from the 4 heterotic populations. In the PM01B season, these lines were evaluated *per se* and simultaneously topcrossed to their corresponding heterotic testers to generate topcrosses line x tester. In addition, lines of new selected introduced germplasm were also topcrossed to these heterotic testers in their corresponding grain color. The resulting topcrosses were evaluated for agronomic performance. Yellow grain heterotic testers used were CLA18 for Pop. SA3, and CLA17 for Pop. SA4. During the PM01B season S1 lines were generated in white grain Pops. SA6 and SA7.

- Genetic variability continues to be added in the 4 heterotic base populations being improved for their tolerance to acid soils. During 2001, new germplasm received from Argentina, Thailand, and Mexico HQ, was selected and advanced. Several of these lines were either topcrossed with the heterotic testers in the same grain color, or used in the development of disease-resistant synthetics. Topcrosses are to be evaluated before merging this new germplasm in the corresponding heterotic population.

- Several DMR lines received from Thailand proved to have desirable characters and tolerance under acid soil conditions. These were increased and promoted as CLAs.

- In the Atlantic Coast of Colombia, trials including 3 QPM and 2 normal yellow endosperm hybrids planted in Validation Trials were conducted under ICA's supervision during 2000A and B seasons. Data collected showed that one normal and one QPM hybrids were superior to the normal commercial hybrid check included in the trials. These two hybrids are to be officially released in 2002 and 2003..

- CORPOICA Altillanura H111 was released in Aug. 2001 at the CI La Libertad, CORPOICA. This is a TWC hybrid for the acid soils of the Llanos of Colombia.

- Based on data obtained in QPM trials planted in the acid soil savanna, it was concluded that higher levels of acid soil-tolerance was required in QPM germplasm to be used when under this stress.

- In Peru, seeds of 3 QPM SC hybrids and their parents continued to be increased. These, plus additional normal and QPM entries were evaluated in demonstration plots in farmers fields. After two planting seasons (2001A and 2001B), some of these entries are to be released in 2002.

- In Portuguesa, Venezuela, in Aug. 2001, the TWC white flint hybrid FONAIAP 2002 with parents from CIMMYT-HQ was released.

- Additional data was received from collaborators planting the Acid Soil VI and VII White and Yellow Trials, including white and yellow normal OPVs. Seed of selected synthetics was increased for distribution.

- Due to increased demand, seeds of most OPVs and hybrids included in Acid Soil Trials VII, IX and X Yellow and White were increased. Progenitors of all hybrids included in the trials were also increased.

- Using data on the performance of topcrosses evaluated in 6 and 8 collaborating institutions planting the yellow or white crosses, selected lines were recombined and generated two heterotic populations that should be used for NARS in the region. In addition, 80 selected yellow lines were increased.

3. Nurseries

3.1. Germplasm introductions

New desirable genes have continued to be introduced in the base populations under improvement. During 2001, a total of 81 new entries with different genetic backgrounds were introduced from Argentina, Thailand, and CIMMYT HQ. This new germplasm has special atributes, including tolerance to biotic and abiotic stresses present in the locations where they were improved. All introductions were evaluated for general adaptation, and desirable ones were increased.

3.1.1. From Thailand

a. The presence of sorghum downy mildew (*Peronosclerospora sorghi*) has officially been reported in maize plantings in several locations along the Atlantic Coast of Colombia and Yaracuy area in Venezuela. Based on request from researchers in these two countries, DMR germplasm was requested and introduced from Thailand. In TP01B, seeds of 47 DMR entries received from Thailand were dispatched to CI Turipana, Colombia, to be increased. DMR entries included 36 inbred lines and 11 bulks of populations and OPVs selected for DMR. Entries received were:

i. DMR lines

Pedigree	Pedigree
Nsx9210-B-S2-12-#	Nsx-B-S2-6-#
Nsx9210-B-S2-13-#	Nsx-B-S2-7-#
Nsx9210-B-S2-14-#	Nsx-B-S2-10-#
Nsx9210-B-S2-21-#	Nsx-B-S2-11-#
Nsx9210-B-S2-22-#	Nsx-B-S2-12-#
Nsx9210-B-S2-24-#	Nsx-B-S2-14-#
Nsx9210-B-S2-27-#	Nsx-B-S2-15-#
Nsx9210-B-S2-35-#	Nsx-B-S2-18-#
Nsx9210-B-S2-36-#	Nsx-B-S2-19-#
Nei908-B-S2-2-#	Nsx-B-S2-21-#
Nei908-B-S2-10-#	Nsx-B-S2-22-#
Nei908-B-S2-12-#	Nsx-B-S2-23-#
Nei908-B-S2-16-#	Nsx-B-S2-24-#
Nei908-B-S2-17-#	Nsx-B-S2-26-#
Nei908-B-S2-21-#	Nsx-B-S2-27-#
Parent of TF 9224-1 No.6-1-2-#	Nsx-B-S2-28-#
Parent of SW-DMR 89145-1 No.2-1-2-B-#	Nsx-B-S2-29-#
Parent of SW-DMR 92145-2 No.1-1-4-#	CA14502-#
Nsx-B-S2-1-#	CA03116-#
Nsx-B-S2-2-#	CA34514-#
Nsx-B-S2-3-#	

ii. DMR populations and OPVs

Pedigree	Pedigree
Pop 145C5-#	Pop 345C5-#
S98D147-#	Pop 352C0HS-#
S98D AMATL-#	CA03130xCA14502-#
Pop 102C1-#	CA03116xCA14502-#
Pop 100C6-#	CA00334xCA34514-#
Pop 300C6-#	

Due to severe drought at flowering time, only a few entries could be increased and limited amounts of seed of these entries was returned to SARMP. All DMR entries, plus additional ones received from ARMP-India, are to be increased in PM02A and B seasons.

b. Seeds from few selected ears from yellow and white sweet corn sources received from Thailand and USA in 2000 were mechanically mixed and planted in PM01A. Desirable plants were self-pollinated. A total of 30 and 17 yellow and white ears were harvested, respectively. These were planted ear-to-row in PM01B, and bulk-pollinated. A mechanical mixture of seed form selected ears is to be planted in PM02A.

3.1.2. From CIMMYT-HQ

A total of 3 and 1 lines with waxy and high oil, respectively, were received from Mexico. These were increased for further distribution to interested programs.

3.1.3. From Zimbabwe

Out of 39 Cercopora resistant lines received from Zimbabwe evaluated in 2000A, 19 lines, including 6 yellow and 13 whites, were selected and increased. These lines were crossed in isolated blocks to corresponding yellow and white testers. These tester have been identified from the acid Soil tolerant base populations. After testing for their heterotic group, lines will be incorporated in the corresponding heterotic base population. From topcrosses generated in 2000B, 3 yellow and 5 white lines were selected and evaluated in 2001B.

3.1.4. From Argentina

Fifty one S3 lines selected for FAW-resistance in northern Argentina, were returned to SARMP for further utilization in the breeding program. These lines were selected from FAW-tolerance nurseries sent to Argentina in 1999, planted under severe natural insect infestation. The 51 lines were evaluated in PM01B. Out of these, 22 S4s (13 yellow and 9 white) were selected. These are to be planted in crossing blocks in the PM02A season and topcrossed to 2 heterotic testers.

a. Lines selected in Argentina for FAW tolerance. PM01A.

Pedigree	Pedigree
Spodopt. Gp A-2-2-5	Amarillo de Tailandia-6-3-5
Spodopt. Gp A-3-3-2	Amarillo de Tailandia-7-1-4
Spodopt. Gp A-5-1-3	Amarillo de Tailandia-25-4-4
Spodopt. Gp A-13-2-3	Amarillo de Tailandia-30-2-3
Spodopt. Gp A-25-1-6	Elsa Balnco-1-4-4
Spodopt. Gp A-39-4-1	ELSA Blanco-1-4-6
Spodopt. Gp A-47-1-3	ELSA Blanco-2-1-2
Spodopt. Gp-46-4-1	ELSA Blanco-2-1-5
Spodopt. Gp A-47-4-5	ELSA Blanco-9-1-1
Spodopt. Gp A-48-1-1	ELSA Blanco-10-3-1
Spodopt. Gp A-18-1-3	ELSA Blanco-11-3-5
Spodopt. Gp A-49-3-2	ELSA Blanco-25-2-3
Spodopt. Gp A-53-1-2	ELSA Amarillo-10-2-3
Spodopt. Gp A-53-1-5	ELSA Amarillo-10-2-5
Spodopt. Gp A-52-3-1	ELSA Amarillo-10-2-1
Spodopt. Gp A-55-1-2	ELSA Amarillo-33-1-3
Spodopt. Gp A-56-1-1	Spodopt. Blanco-14-4-3
Spodopt. Gp A-62-2-1	Spodopt. Blanco-247-3-1
Spodopt. Gp A-63-3-1	Spodopt. Blanco-169-2-2
Spodopt. Gp A-63-3-2	Spodopt. Blanco-81-3-1
Spodopt. Gp A-66-2-3	Lineas de Tailandia-98-1-1
Spodopt. Gp A-129-3-1	Lineas de Tailandia-127-2-2
Blanco de Tailandia-24-4-5	Spodopt. Blanco-5-4-2
Blanco de Tailandia-162-1-1	Spodopt. Blanco-7-1-2
Blanco de Tailandia-194-3-1	Spodopt. Blanco-251-2-1
Blanco de Tailandia-194-3-4	Spodopt. Blanco-251-2-2
Blanco de Tailandia-199-2-5	Spodopt. Blanco-135-5-2
Blanco de Tailandia-245-4-1	
Blanco de Tailandia-247-3-1	
Blanco de Tailandia-249-2-3	

b. Insect-tolerant lines from Argentina selected in PM01B

Pedigree	Pedigree
Yellow	White
Spodopt. Gp A-46-4-1-1	Blanco de Tailandia-24-4-5-1
Spodopt. Gp A-46-4-1-2	Blanco de Tailandia-24-4-5-2
Spodopt. Gp A-46-4-1-3	Blanco de Tailandia-162-1-1-1
Spodopt. Gp A-18-1-3-1	Blanco de Tailandia-162-1-1-2
Spodopt. Gp A-18-1-3-2	Blanco de Tailandia-162-1-1-3
Spodopt. Gp A-18-1-3-3	Blanco de Tailandia-162-1-1-4
Spodopt. Gp A-53-1-2-1	Blanco de Tailandia-162-1-1-5
Spodopt. Gp A-53-1-5-1	Blanco de Tailandia-249-2-3-1
Spodopt. Gp A-53-1-5-2	Blanco de Tailandia-249-2-3-2
Spodopt. Gp A-52-3-1-1	
Spodopt. Gp A-63-3-2-1	
Spodopt. Gp A-63-3-2-2	
Spodopt. Gp A-63-3-2-3	

3.1.5. From Brazil

Introductions from Brazil [Saracura (water-logging tolerant OPV), BR451 (white QPM-OPV), and BR 473 (yellow QPM-OPV)], were self pollinated in PM99B. Through succesive selfing of balanced mechanical bulks, S3s were derived from each variety. In PM01B and B a total of 35 S4 lines were collected from all 3 entries. These are to be planted in PM02A.

3.2. Evaluation and increase of biotic stress tolerant lines

3.2.1. Fall armyworm tolerant lines

After the PM00B harvest, during 2001A season, 37 and 40 S1 and S2 yellow endosperm and 52 white endosperm lines were selected for FAW tolerance. In the PM01B season, a total of 34 and 115 S2 and S3 yellow plus 118 white lines were harvested.

Seeds of selected S2 and S3 lines were recombined into FAW-tolerant synthetics to be included in future Acid Soil Trials. Additionally, these are to be evaluated in nurseries to be distributed to collaborators and they will be evaluated under acid Soil conditions and advanced to be incorporated in the basic heterotic populations.

FAW resistant selections received from Argentina were included and evaluated in the same breeding nurseries.

In PM01A, C0 of selection of Pops. FAW-tolerant Yellow and White were increased. From these, a total of 24 and 32 HS ears were saved. Also, C1 of recombination was obtained in FAW-tolerant Yellow Pop., represented by 32 HS ears collected.

3.2.2. Phaeosphaeria resistant lines

In CD01A season, 36 yellow and 20 white S2 lines selected for phaeosphaeria resistance, respectively, were advanced to S3. A total of 41 and 8 S3 ears were harvested. In 2001B, these lines were self pollinated and selected for tolerance to the disease. A total of 49 yellow and 6 white S4 ears were collected.

Also in CD01A, C0 of Phaeosphaeria resistant Yellow Pop. was obtained, represented by 43 HS ears. Simultaneously, C1 of selection of Phaeospaheria-resistant Yellow and White Pops. were generated. These were represented by 18 and 23 HS ears.

3.2.3. Stunt resistant lines

From 70 and 48 S1 yellow and white ears selected in 2000B for tolerance to the stunt complex, a total of 132 and 38 S2 ears, respectively, were selected. These were included in screening nurseries distributed to collaborating countries.

In PM01B, selected plants in 3 stunt resistant, high yielding, and widely adapted OPVs were self pollinated, and 171 S1 ears were extracted. These will be advanced and selected to be used as new sources of germplasm with high yield and higher level of resistance to this disease.

3.2.4. Cercospora resistant lines

In CD01A, 121 S1 yellow and 99 S1 white lines were derived from S0 yellow and white cercospora resistant selections, respectively. These were planted in disease nurseries and advanced to S2. At harvest, a total of 141 yellow and 113 white S2 ears were collected.

In CD01B, a total of 55 HS, 129 HS, and 200 S4 ears from Pops. Cercospora-resistant Yellow and White, and SRRC0-SA3 were planted under disease conditions. From these, 70 S1, 138 S1 and 58 S5 ears, respectively, were collected.

3.2.5. SCMV resistant lines

In PM01A season, C2 of SCMV-resistant Yellow and White Pops. were generated. At harvest, these cycles were represented by 32 and 34 HS ears, respectively.

3.2.6. Lines from selected hybrids

In evaluations of PM00A, 8 F1s of selected single cross yellow normal and QPM hybrids of different origins were planted to generate lines from these hybrids. Selected yellow endosperm hybrids were:

CLA9xCLA10
CLA12xCLA14
CLA20xCLA24
CLA18xCLA17
CLA28xCLA29
CLA31xCLA32
CML161xCML165

In the PM00A season, bulks of S0 of each of these hybrids were collected. S1 seed of the various hybrids was bulked separately. Bulks of S1s of the 8 hybrids were planted in the PM01A and B seasons where selected plants were advanced to S2. At harvest, a total of 258 S2 ears were harvested from the 8 hybrids in both seasons. Balanced composites of these S2 ears are to be planted in the PM02A season.

3.2.7. Lines from ARMP germplasm

Bulks of S2 ears generated from 4 introductions received from Thailand (Nei 908, Nsx 9210, Nsx B-52, and SW3B), were subsequently advanced to S3 and S4. A total of 119 S4 lines were planted in PM01B. Yellow lines were crossed to yellow testers CLA 17 and 18. To facilitate establishment of isolations, no white lines were topcrossed during this season. Isolations and development of topcrosses is to be done in alternate plantings. Due to their late maturity, several yellow lines could not be crossed to the testers and only few F1 ears could be harvested. Two balanced bulks of F1 ears (line x tester) were developed to be planted in the PM02 season. These late lines will be planted in new crossing blocks to be established in PM02A.

Also, the same 119 S4, plus 52 Sn lines and 23 DMR- OPVs were increased in TP01B. Small amounts of seed increases of 43 S4 lines and 12 OPVs were returned. All these lines are to be increased again in PM02A.

4. Improvement of base populations for acid soil tolerance through RRS

In the cycle PM01A, all 4 populations, including C2 of populations SA3 and SA4 with yellow endosperm, and SA 6 and SA7 with white endosperm, continued to be improved as summarized in the following diagram:

Activities in 4 base populations for acid soil tolerance following a RRS scheme.

PM 2001				
Base Pop.	**Season A**		**Season B**	
	Evaluated	**Selected**	**Evaluated**	**Selected**
SA3	211 C2HS	272 C2S1	-Crossed 272 C2S1 to CLA 18 -Crossed 162 Sn DMR entries to tester CLA 18	-167 C2S1 topcrosses -No topcrosses of DMRs obtained
	70 C1S2	77 C1S3		
SA4	116 C2HS	188 C2S1	-Crossed 188 C2S1 to CLA 17 -Crossed 162 Sn DMR entries to tester CLA 17	-142 C2S1 topcrosses -No topcrosses of DMRs obtained
SA6			107 C2S1	-279 C2S1 to be topcrossed PM02A
SA7	98 C1S2	49 C1S3	100 C2S1	-284 C2S1 to be topcrossed PM02A

Most materials planted in the PM01A season had to be repeated in the 01B season due to a heavy storm which damaged the whole PM nursery after pollinations had been completed.

5. Recycling of lines

5.1. Recycling to improve acid soil tolerance in yellow endosperm lines

In 1999B, 26 S3 lines (19 from SA4 and 7 from SA5) were harvested after inbreeding from lines derived in 1999A from base Pops. SA4 and SA5 selected for tolerance to acid Soils in PM98B. These 26 S3 lines have been merged with 73 S2 lines generated in the recycling of lines for earliness resulting from the cross of CLA27 x CML357. All 99 S2 lines were planted in PM01A. From these, 8S4 lines were generated, including 7 from Pop SA4 and 1 from Pop SA5, and 106 S3 lines. In PM01B, these lines were advanced to generate 11 S5s **(Table 1)** and 110 S4s fot the cross CLA27 x CML357 Pop SA4 (**Table 2**). These lines have been included in genetic studies to estimate their GCA and SCA in crosses with their corresponding heterotic testers.

5.2. Recycling to improve yellow endosperm lines for lodging tolerance

During the PM99B planting, a total of 66 S1 lines were harvested. From these, 26 and 44 S1 ears were collected from Pops SA3 and SA4, respectively **(Table 3)**. Kernels from all selected S1 ears were used to develop a balanced mechanical composite. This was planted in PM00A where selected plants were self pollinated to develop S2s. At harvest, a balanced mechanical composite was developed using kernels from all S2 selected ears. This composite was planted in PM00B where selected plants were selfed. Seeds from all selected S3 ears were used to develop a new balanced mechanical composite. This composite is to be planted in PM01A to generate S4s and initiate identification of heterotic paterns of these lines. Self pollinations developed with white entries were lost in the PM00A planting due to poor germination.

During PM01A and PM01B, balanced composite of S3 lines from Pops SA3 and SA4 selected for lodging tolerance were planted. From these, a total of 22 S4 lines, including 6 from Pop SA3 and 16 from Pop SA4, were generated (**Table 3**). These lines are to be introduced in studies of tester during the PM02A season.

6. Selection for resistance to biotic stresses in special trait populations

6.1. Development of new experimental OPVs based on 1999-2000 and 2000B-2001 nurseries

During 1999-2000, nurseries with various selected entries were distributed to collaborating countries in the region to be screened for resistance to important biotic stresses (**Table 4**). Entries in these nurseries included lines derived from special trait populations and lines generated at various stages in the SARMP RRS improvement program. Entries in nurseries distributed to collaborators in 1999-2000 and 2000B-2001are described **in Tables 4 and 5**.

Using data returning from regional collaborators, during the two semesters, F1s of 56 new synthetics tolerant to biotic and abiotic stresses were generated. In addition, 2 synthetics were advanced to F2 (**Tables 6**). The new experimental varieties were developed by planting remnant seed of lines selected for tolerance to specific stresses and good agronomic characters, and recombined in a diallel fashion. At harvest, kernels from all selected ears were used to develop a mechanical balanced composite (F1) of each new experimental variety. The mechanical bulks were each planted each in 10 rows 5 m long and advanced to F2 by plant to plant crosses. With information received by tbe end of 2001, a total of 51 new experimental varieties were selected (**Table 7**). F1 of these new varieties will be generated during 2002A.These will be included in Acid Soils White or Yellow Trials to be offered in 2002.

Selected synthetics in Acid Soils VI and VII White and Yellow with good agronomic performance, were increased to be included as check entries in future trials.

6.2. Recurrent selection of biotic stress-resistant base populations

C1-S1 lines generated in 1999-2000 in some populations generated as sources of resistance to important biotic stresses in the region, i.e. corn stunt, phaeosphaeria leaf spot, polysora rust, and SCMV, were selected. Selected lines were also recombined in the development of C0 and C1 of white and yellow base populations tolerant to armyworm. Previously, development of C1 of the Fall armyworm-tolerant white population could not be done duc to limited information on lines originally evaluated.

6.3. Advancing lines selected for resistance to biotic stresses

Lines evaluated for resistance to various biotic stresses in the region continued to be self pollinated in order to fix their resistance and improve their agronomic performance.

During both PM01A and B cycles, 89 S1s (including 37 yellow and 52 white) and 40 S2 lines tolerant to FAW, 52 S2 lines resistant to phaeosphaeria (36 yellow and 20 white), 118 S1lines tolerant to stunt (70 yellow and 48 white), 220 S1s (121 yellow and 99 white), 184 HS familes and 200 S4 acid Soil tolertant lines selected for cercospora resistance, were generated and distributed in nurseries to collaborators in SAmerican countries.

In addition, initiated generation of lines from high yielding biotic stress-tolerant base populations, including 152 S3 lines tolerant to FAW (34 yellow and 118 white), 55 S3 lines resistant to phaeosphaeria (49 yellow and 6 white), 140 S2s tolerant to corn stunt (132 yellow and 38 white), 254 S3 lines (141 yellow and 113 white), 218 S1s (70 yellow and 138 white), and 58 S5s (from acid Soil tolerant base populations), tolerant to cercospora. Lines at the S3 stage of inbreeding, or above, will be included in isolated blocks to be crossed to two heterotic testers and determine their heterotic pattern.

From the disease tolerant selected OPVs, 171 S1 lines were generated for stunt tolerance. To continue improvement of base populations tolerant to specific biotic stresses, a total of 67 and 66 HS ears were selected from the Corn Stunt and SCMV tolerant base populations, respectively. These will be used to generate new lines to be sent to collaborators to select for biotic stress tolerance.

6.4. Increases of lines for studies on inheritance of resistance

Lines showing contrasting differences for resistance and susceptibility to corn stunt, phaeosphaeria leaf spot, and sugarcane mosaic virus were increased in PM01B to be used in studies of inheritance of resistance **(Table 8)**. Several of these lines did not have a good seed set. A new set of additional advanced contrasting lines were planted in PM01B to be increased.

7. Regeneration of promising single cross hybrids and OPVs

7.1. Regeneration of promising single crosses

Using data generated in the DI White test of 97A, 37 new hybrids were generated. In addition, 44 yellow and 39 white selected lines from the 4 base heterotic acid Soil-tolerant Pops. SA3 though SA7 were crossed in diallels generating a total of 564 single crosses, including 189 white and 375 with yellow endosperm. These hybrids are to be evaluated. Seeds of 4 additional selected single crosses were increased in PM01A.

During 2001, a total of 22 new single cross hybrids were generated, including 9 yellow and 13 white endosperm. Seed of 18 of these hybrids is being increased to be included in the Acid Soils IX White or Yellow Trials, to be distributed in 2002.

Using selected CLA lines crossed to (CLA283xCLA282), a total of 25 TWC yellow hybrids were generated. These are to be internationally tested in 2002 in new Acid Soils Trials.

7.2. Regeneration of selected entries in Acid Soils VII, X, and XI (W and Y) Trials

During the 2001, 51 varieties in the Acid Soils VII, X and XI with white and yellow endosperm were increased.

Acid Soil VII Yellow	13 OPVs
Acid Soil VII White	5 OPVs
Acid Soil X Yellow	5 OPVs
Acid Soil X White	10 OPVs
Acid Soil XI Yellow	16 OPV
Acid Soil XI White	2 OPVs

7.3. Regeneration of yellow OPVs for Atlantic Coast of Colombia

During 2001B season, special yellow and white endosperm hybrid and OPV trials were prepared to be tested in the Atlantic Coast of Colombia, in collaboration with CORPOICA Reg. 2. Data were collected from 9 locations. In case of the hybrid and variety trials, data from 3 and 2 locations were discarded, respectively, due to high CVs. Performance of some of the hybrids and OPVs was outstanding **(Tables 9 and 10)**. These trials will be planted again in the 2002A season before selecting the best stable entries. **(Fig. 1 and 2)**.

During the PM01A and B, seed of the 17 sinthetics being evaluated was increased.

8. Selection of low P-use efficient germplasm

A new location (Menegua) was identified in los Llanos Orientales of Colombia where evaluation and selection of acid soil tolerance is being done. At this location, P levels were adjusted to 3 and 15 ppm P and 65% aluminum saturation. From a total of 194 S2 lines derived from the acid Soil tolerant Pops. SA3, SA4 and SA7 and 16 CLA S6 lines previously identified as tolerant and susceptible to low P, were planted in both P levels. From these, 69 lines were identified as tolerant and 21 as susceptible to low P levels **(Fig. 1A)**.

Studies on inheritance of tolerance to low P levels were initiated using selected lines identified as tolerant to low P levels (3 ppm P) and good response when under adecuate P levels (15 ppm P). These lines have been crossed in a diallel fashion.

In MT00B, 117 and 93 S2 lines were identified as tolerant and susceptible, respectively, to low P. These lines were planted in MN01A in nurseries adjusted to 3 and 15 ppm P, and 65% Al saturation. These lines were simultaneously planted in PM01A. From these, 109 and 106 S3 lines were derived. Based on their agronomic performance in MN01A, 61 S2s and 8 CLA lines were identified as tolerant, and 19 S2s plus 2 CLAs were identified as susceptible to low P levels.

9. Regional trials

9.1. Performance of OPVs in Acid Soils VI, VII, and VIII (Wand Y) Trials

Data were received from various collaborators planting the Acid Soils VI White and Yellow, VII White and Yellow, VIII White and Yellow, and X White and Yellow Trials.

- In data received on the Acid Soils VI White Trial (14 OPVs plus 1 check), planted at 22 locations, including 13 and 9 locations with acid and normal soils, respectively **(Table 11, Fig. 3)**. Across all locations and soil conditions, the 2 best performing entries were Cimcali 97 Achap 2A SA6, and Cimcali 97 SCMV 2A, with 4.13, and 3.88 t/ha, respectively. Grain yield values of these two entries were not statiscally different (0.05%). The Tuxpeño entry included as check yielded 3.88 t/ha, ranking 9th with all other entries. Correlation of performance of entries under acid and normal soil conditions was r=0.93.

- Data on the Acid Soils VI Yellow Trial (17 OPVs and 2 checks) returning from 27 locations, including 14 and 13 with acid and normal soils, respectively, indicates that, across all locations and soil conditions, the 3 best performing entries were the SC check CLA18xCLA17, followed by the EVs Cimcali 97 Achap 1A SA4 and Cimcali 96 SA4, with 4.78*, 4.32, and 4.20 t/ha, respectively **(Table 12, Fig. 4)**. The SC was statistically superior (0.05%) to all EVs. The OPV check Sikuani ranked 11th, with a grain yield of 3.66 t/ha. Correlation of performance of entries under acid and normal Soil conditions was r=0.85.

- Data received on the Acid Soils VII White Trial (7 OPVs and 2 checks) from 13 locations, including 5 and 8 locations with acid and normal soils, respectively **(Table 13, Fig. 5)**. Across locations and soil conditions, there were no statistical differences between the single cross check CLA176xCLA215 and the EV entry Cerrito 97 Achap 2B, with 4.73 and 4.36 t/ha, respectively. The Tuxpeño check yielded 3.57 t/ha ranking 5th among all other entries. Correlation of performance of entries under acid and normal soil conditions was r=0.93.

- Data received on the Acid Soils VII Yellow Trial (15 OPVs and 3 checks) from 17 locations, including 8 and 9 locations with acid and normal Soils, respectively **(Table 14, Fig. 6)**. Across locations and soil conditions, there were no statistical differences (0.05%) between the local checks and the check SC entry CLA18xCLA17, with 4.46 and 4.17 t/ha, respectively. However, there were significant differences between these 2 checks the check CLA18xCLA17 yielded more (4.17 t/ha) then the best entries Cerrito 97 Achap 1A and Choré 97 Phaeo 1A, with 3.59 and 3.54 t/ha, respectively. The Sikuani OPV check yielded 2.89 t/ha ranking 14th among all other entries. Correlation of performance of entries under acid and normal soil conditions was r=0.80.

- Data received on the Acid Soils VIII White Trial (24 Exp. hybrids and 4 checks) from 7 locations, including 4 and 3 locations with acid and normal soils, respectively **(Table 15, Fig. 7)**. Across locations and soil conditions, the experimental hybrids CLA176xCLA215, CLA185xCLA194, CLA190xCLA212, CLA183xCLA212, and CLA171xCLA204 were nonstatiscally superior (0.05%) to the best local check CML247xCML254, with 4.88 and 4.83, 4.75, 4.67, 4.66, and 4.60 t/ha, respectively. The Tuxpeño OPV check yielded 3.16 t/ha, the last one in the ranking with all other entries. Correlation of performance of entries under acid and normal soil conditions was r=0.56. More data is expected from collaborators.

- Data received on the Acid Soils VIII Yellow Trial (28 Exp. hybrids and 4 checks) from 8 locations, including 4 and 4 locations with acid and normal soils, respectively **(Table 16, Fig. 8)**. Across all locations and soil conditions, four experimental hybrids were nonstatiscally superior (0.05%) to the best local check CORPOICA H108, with 4.49, 4.43, 4.43, 4.41, and 4.31 t/ha, respectively. The Sikuani OPV check yielded 3.11 t/ha, the last one in the ranking among all other entries. Correlation of performance of entries under acid and normal Soil conditions was r=0.64. More data is expected from collaborators.

- Data received on the Acid Soils X White Trial (17 EVs and 3 checks) from 12 locations, including 4 and 8 locations with acid and normal soils, respectively **(Table 17, Fig. 9)**. Across all locations and soil conditions, the highest yielding entry was the check CORPOICA H108, followed by the hybrid check and the OPVs Cimcali 99 and Cimcali 97 Achap 2A SA6 with 5.2, 4.53, 3.90, and 3.73 t/ha, respectively. Correlation of performance of entries under acid and normal soil conditions was r=0.84. More data is expected from collaborators.

- Data received on the Acid Soils X Yellow Trial (12 EVs and 3 checks) from 6 locations, including 1 and 6 locations with acid and normal soils, respectively **(Table 18, Fig. 10)**. Across all locations and soil conditions, there were nonstatistical differences in grain yield (0.05%) between the check CORPOICA H108 (3.90 t/ha) and the EVs Cimcali 99 SCMV SA3 Ac, Cimcali 99 SCMV SA4 N, and Cimcali 99 SCMV SA4 Ac with 3.78, 3.67, and 3.62 t/ha, respectively. The Sikuani OPV check yielded 2.94 t/ha, ranking 11th among all other entries. Correlation of performance of entries under acid and normal soil conditions was r=0.73. More data is expected from collaborators.

Due to shortage of seed to cover the demand of the most recently assambled trials, all entries were increased in the PM01B cycle.

10. Promoting CIMMYT germplasm in the region

10.1. Activities in Bolivia

a. Normal and QPM yellow hybrids

With information collected from trials planted in 2001 at CIAT – Santa Cruz and Tarija, one normal and one QPM yellow finally identified for possible release (**Table 19**). Seed of progenitors and F1 hybrids is being increased for extensive testing during 2001-2002. The select hybrids are:

QPM:	BQ2 x BQ1	=	CML 165 x CML 161
NORMAL:	BN2XBN1	=	CLO 2450 x CML 451

b. Normal and QPM yellow OPVs

Similarly, special trials including 10 yellows OPVs and two local checks were planted during 2001B (**Table 20**). Fourcer of these were selected for further increase and testing during 2002. Varieties selected were:

Tak Fa S9528
Across S9536
S96 G26 TLYD
S97 TLYG H "A y B" (1)

10.2. Activities in Colombia

a. Normal and QPM yellow hybrids and OPVs in the Atlantic Coast

With Corpoica Reg. 2 in the Atlantic-Caribbean coast, during the TP00B and 01A plantings, 5 selected normal and QPM entries were included in separate Validation trials with white or yellow endosperm.

These trials were planted in 4 locations and submitted to ICA for official evaluation. A second season evaluation were also planted for final approval of best selected entries. It is expected that the QPM yellow SC entry HE6AQS and the normal yellow HE9ANS were approved to be released by June 2002 (**Table 21**).

No entries were approved from the white endosperm experimental hybrids since all showed less grain yield than the standard check C343.

Also with Corpoica Reg. 2, special hybrids and OPVs yellow endosperm trials were assambled to be planted along the Atlantic coast. Entries included in the trials were in both normal and QPM endosperm **(Tables 9 and 10)**. Trials included 18 entries and 2 local checks.

During 2001, yellow endosperm hybrid and OPV trials were planted at 11 locations along the Atlantic coast. By Jan. 2002, several promissing entries have been detected in both hybrids and OPV yellow endosperm trials **(Tables 9 and 10, Figs. 1 and 2)**. These trials are to be repeated in the 2002A season.

b. Normal and QPM white and yellow hybrids in Valle del Cauca

With Corpoica Reg. 5, a different set of special white and yellow hybrid trials were prepared. Trials included 18 experimental hybrids, both normal and QPM, and 2 local checks. Trials were planted at 5 locations in the Cauca Valley and several promising entries have been identified **(Tables 22 and 23, Figs. 11 and 12)**. These trials are to be planted again in 2002A season.

c. QPM white and yellow hybrids in Los Llanos

With Corpoica Reg. 8 at the Llanos Orientales, tests involving several QPM yellow and white endosperm hybrids showed that none of the entries included in trials had a stable performance. With this evidence, it was concluded that evaluation of inbred and early generation QPM lines had to be evaluated to select those showing more stable performance in these acid soil conditions.

d. White hybrids selected for validation in Los Llanos

During 2001, five white endosperm acid soil tolerant hybrids were identified in plantings in los Llanos. These hybrids were:

(CML 24 x CML 254) CLA 120
(CML 24 x CML 254) CLA 127
(CML 24 x CML 254) CLA 135
CLA 185 x CLA 194
CLA 183 x CLA 212

Seed was increased to be planted in Validation trials in this acid soil region during 2002A, and eventual release in 2003.

e. Release of CORPOICA H-111 for acid soils

In Aug. 2001, the new acid Soil tolerant TWC hybrid Corpoica H-111 was officially released for the acid Soil savannas of Colombia.

10.3. Activities with Ecuador

a. At Portoviejo Res. Center, INIAP has concluded tests of hybrids involving lines from their program crossed to CIMMYT's CML lines as male parents. These new hybrids, being validated for release during 2002, include 2 SCs and one TWC with CML287 as the male parent, and one additional TWC with CML303 as male parent.

b. At the Pichilingue Res. Center, INIAP is validating the hybrids involving CML287, and CL0 2411 as male parents. These new hybrids are to be released in 2002.

10.4. Activities with Paraguay

In special trials including normal and QPM yellow endosperm entries, six good hybrids were identified. Seed of parental lines were increased to generate additional seed for be further tested. Due to severe drought, seed increases will be repeated during 2002A season.

a. QPM:	CML 161 x CML 165
	(CML 161/CML 165) CML 172
b. Normal:	CLO 2450 x CLG 2501
	CL 2501 x CML 287
	CML 287 x CML 297
	CML 287 x CML 298
	(CML 327/CML 295) CML 223

During 2001 seeds of parents and F1s were planted for increase. Only small amounts of seed were obtained due to trought in the two growing seasons. Increases will be attempted again in early 2002.

10.5. Activities with Peru (MBarandiaran)

During 2001, conducted activities in the Coastal region to identify superior QPM and normal high yielding yellow hybrids with hard endosperm. This was achieved by planting several adaptation trials and seed increases for yellow CMLs, parental lines in plant density trials, QPM hybrid trials, seed increases of QPM-OPVs and four early maturity normal OPVs, seed increase and maintenance of parental lines, F1 hybrid formation, and demonstration plots. During 2001A, all previously mentioned activities involved 44 trials planted at 18 locations, while in 2001B 27 trials were planted at 14 locations. The percentage of success in harvested trials with reliable data was 95% and 85% for each growing season.

i. Demonstration plots

Eighteen and 11 demonstration plots with normal endosperm maize were conducted in 2001A and B, respectively. Each lot included 4-5 entries including 3 experimental single hybrids with normal endosperm (HE1, HE2, HE3), a commercial hybrid as CK1 (T1), and as a second check (T2) using the hybrid planted by the farmer, if different to T1. During season B, three QPM hybrids, one single cross (HQ1) and two 3-way crosses (HQ2, HQ3), were also tested in 7 locations. The hybrids were selected after extensive testing of a number of single and 3-way hybrids from CIMMYT-HQ and SARMP, together with the most popular commercial hybrids currently planted in Peru. The area for each entry ranged from 200- 400 m^2 and all entries were randomized and planted in 2 reps/plot. All demonstration plots, but one, were planted with collaborator farmers following their agronomic practices. Hybrids included in trials were:

HE1 - CML 287 x CML 413
HE2 - CML 287 x CL 00368
HE3 - CML 297 x CL 002410
HQ1 - CML 161 x CML 165
HQ2 - (CML161/CMl 165)CML 172
HQ3 - (CML 172/P66)CML 161

Among the normal endosperm hybrids, HE3 was the best in 16 out of 23 locations (**Table 24**). HE3 showed the highest yields (11.22 and 11.72 t/ha) for season A and B at Motupe 3 and Ascope, respectively. The lowest yields for this hybrid were at Ilimo and Mochumi with 4.48 and 5.77 t/ha, respestively, still superior to other entries. HE1 reached the highest yield of all plots with 12.15 t/ha at Simbal in season A,while HE2 performed better at Pachacamac with 8.94 t/ha (season A) and in Mocan with 9.64 t/ha (season B). It was remarkable the difference in ear aspect and ear sanity among the experimental and commercial hybrids.

HE3 showed the highest grain yield across locations with 8.61 t/ha and 9.57 t/ha for seasons A and B, respectively. The yield superiority of this hybrid over T1 was of approximately 1 ton per planting season (**Table 24, Fig. 13**). Across locations the hybrids were more productive in the winter (B) season. HE2 showed the lowest yields.

In the yellow QPM hybrids, the highest grain yielding across locations, was HQ1 with 10.19 t/ha, followed by HQ2 and HQ3 with 9.69 and 9.12 t/ha, respectively (**Table 25**).

ii. Parental lines

The lines CML 287, CML 413, CML 297, CL 00368 and CL 02410, involved in the normal endosperm hybrids were planted at different plant densities/ha (83333, 62500, 50000 and 41667, or 0.15, 0.20, 0.25 and 0.30 m between plants, in rows at 0.80 m, respectively). Two-reps randomized trials were conducted in Viru in both growing seasons), and in Pachacamac and Pisco during season A (**Table 26**). No data was collected at the two last experimental sites.

iii. QPM hybrid trials

The performance of 16 experimental TWC and single QPM yellow hybrids, plus 4 normal checks, was evaluated in the 2001B season. Data averaged over 3 coastal locations (Vista Florida, Viru and Huacho) (**Table 27**). One trial was lost in Barranca, and the another trial was planted in the Amazon jungle. One additional objective of these trials was to identify other hybrids different to CML 161 x CML 165, and (CML 161/CML 165)CML 172, already candidates to be released in 2002.

On average, grain yields were similar between normal and QPM hybrids. Nevertheless, the most productive hybrids were QPM and the best normal endosperm hybrid ranked ninth. Similar to CML 161 and CML 165, CML 172 has shown excellent adaptation to the Peruvian coastal conditions and it is present in four out of the five highest yielding hybrids. CML 166 and CLQ 6601 have problems of adaptation, affecting their production capacity. Results of these trials are similar to those of years 1999 and 2000.

10.6. Activities with Venezuela

a. With INIA, at Portuguesa and Maracay Res. Centers, special QPM trials were distributed and planted in multilocation trials (See Annual Reprt 2000). Data of special QPM white hybrid trials planted at 18 locations in Venezuela by the Maracay group, indicates the superiority of some selected QPM hybrids (**Table 28**).

   Using this information, 3 hybrids were selected for further extensive testing in farmers fields during 2001, 2002:

   HQ1 = (CML 144/CML 159) CML 176
   HQ2 = (CLQ 6203/CML 150) CML 176
   HQ3 = (CML 142/CML 150) CML 176

b. In Aug. 2001, the new TWC white flint endosperm hybrid Portuguesa 2002 was officially released by INIA-Portuguesa. This hybrid is 100% CIMMYT germplasm.

11. Development of heterotic populations for NARS

During 2000, topcrosses of yellow lines made available from NARS crossed to CIMMYT's heterotic yellow testers CML 287 and CML 413, were evaluated by several interested NARS in the region. In 2001B, using data on the performance of topcrosses evaluated by 6 collaborating institutions planting the yellow crosses, selected lines were recombined and generated two heterotic yellow populations (**Table 29**). Also, 80 selected yellow lines were increased.

Data of topcrosses of white lines supplied by NARS to CIMMYT's white heterotic testers CML 247 and CML 254 is still expected.

12. Germplasm distribution

During 2000, a total of 64 seed shipments were dispatched, including 13 768 germplasm entries generated in this project. Shipments were sent to 53 collaborators in 38 institutions located in 25 countries. A complete list of these shipments is included in **Table 30.**

13. Development of human resources and assistance to NARS

13.1. Participants to meetings and training courses in Brazil and Mexico

None during 2001.

13.2. Support and equipment to NARS

- Students receiving financial support during 2000:

  a. Alexander Chávez, from Perú, PhD student at the ESALQ, Piracicaba, Brazil, received US$3 600 as complementary and final assistance. This stipend finished in Dic. 2001 when he graduated.

  b. Fredy Salazar
  Colombian PhD Student working in our SARMP. Received US $1.000.oo to cover University fees for 2 semesters.

- Equipment donated to NARS:

  a. Colombia:

  Corpoica Regional 2: 5000 tassel bags
  5000 glassine shoot bags

Corpoica Regional 8: 1000 tassel bags
5000 glassine shoot bags

14. Consultations and visits to NARS

A total of 42 man/days were spent during 2001 in consultations to NARS as follows:

Countries	C. De Leon	L. Narro
Bolivia		Jun. 11-16
Ecuador	Nov. 18-23	
Mexico		Oct. 14-19
Panamá	Oct. 16-19	
Peru	Apr. 16-20	Jul. 14-18
Venezuela	Aug. 29-Sep.7	
Total (days)	**20**	**22**

15. Participation in national and international meetings

M. Barandiaran:

Participated in the following meetings:

- II Seminario Internacional de Semillas. Presented the paper: El CIMMYT y el desarrollo de maíces híbridos. Trujillo, Apr. 2001.
- Curso Taller sobre Innovaciones tecnológicas en semillas. Presented the paper: Innovaciones tecnológicas en el maíz. Trujillo, Apr. 2001.
- Participated in the Symposium: El mejoramiento genético de las plantas en el Peru, sponsored by the Soc. Peruana de Genética. Presented the paper: Identificación de hibridos de maíz amarillo duro, normales y de alta calidad proteica , de alto rendimiento y estabilidad, para zonas maiceras de la Costa Peruana. Lima, Jul. 2001.
- Curso-Taller sobre Producción en Maíz. Presented the paper: Variedades e híbridos de maiz. Lima, Aug. 2001.
- RP5 Working Meetings. Presented the paper: Deployment of maize germplasm in Peru. El Batán, Oct. 2001.
- XV Reunion Anual del Programa Nacional de Maíz. Cusco, Nov. 2001.
- Course: Metodologías de mejoramiento en maíz. Cusco, Nov. 2001.

L. Narro:

i. Workshop on Agricultural Research. Lima, Perú. Jul. 16-21, 2001.

ii. Quantitative genetics and plant breeding in the Twenty-first Century Simposium. Baton Rouge, LA. USA. Mar. 26-28, 2001.

C. De León:

Participated in organizing the "1a. Jornada de Actualización en el cutlivo del maíz dentro de la cadena avícola-porcícola". CORPOICA, CI Turipaná, Cereté. Nov. 28-30, 2001.

16. Publications and germplasm releases

16.1. Publications

The following publications have been either presented in meetings, or published:

De León, C., Narro, L. A., Torres, L.G. y Guerrero, S. C. 2001. CORPOICA Altillanura H-111. CORPOICA, Plegable Divulgativo No. 24.

Gaume, A., Machler, F., De León, C., Narro, L., and Frossard, E. 2001. Low-P tolerance by maize (*Zea mays* L.) genotypes: Significance of root growth, and organic acids and acid phosphatase root exudation. Plant and Soil 228: 253-264

Narro, L.A., Pandey, S., De León, C., Salazar, F., and Arias, M. P. 2001. Implications of soil-acidity tolerant maize cultivars to increase production in developing countries. p. 447-463. *In*: Plant Nutrient Acquisition-New Perspectives. N. Ae, J. Arihara, K. Okada, and A. Srinivasan Eds. Springer-Verlag, Tokyo.

Narro, L. 2001. Resultados de investigación obtenidos en colaboración entre instituciones de Bolivia y CIMMYT. Taller de Investigación en Maíz, Santa Cruz de la Sierra, Bolivia. Ago. 27-28, 2001.

Narro, L.A. 2001. Para producir más maíz. Avicultores 73: 16-17.

Varón de A., F., Castillo, G. P., Huertas, C., De León, C. y Vanegas, H. 2001. Achaparramiento del maíz (*Zea mays* L.) en el Valle del Cauca. Fitopatol. Colombiana 25. (In press).

Varón de A., F., De León, C., Huertas, C. A., Grajales, O. R. y Vanegas, H. 2001. Mancha anular, nueva enfermedad foliar del maíz en el Valle del Cauca. Ascolfi Informa (Colombia) 27:24-25

16.2. Germplasm releases

- CORPOICA H-108, a 3-way cross yellow hybrid developed with 3 lines selected for tolerance to Al toxic-acid Soils by SARMP was released in Aug. 8, 2000. The hybrid is the cross (LASP3/LASP2) x CLA 44.

- FONAIAP 2002, a TWC white flint hybrid with parents from CIMMYT-HQ was released by INIA in Portuguesa, Venezuela.

Table 1. S5 lines selected for recycling from Pop SA4. PM01B

Pedigree
SA4 96A-23-2-3-1-1
SA4 96A-23-2-3-1-2
SA4 96A-23-2-3-1-3
SA4 96A-23-2-3-1-4
SA4 96A-23-2-3-2-1
SA4 96A-23-2-3-2-2
SA4 96A-23-2-3-2-3
SA4 96A-23-2-3-2-4
SA4 96A-23-2-3-2-5
SA4 96A-42-1-2-3-1
SA4 96A-42-1-2-3-2

Table 2. S4 lines selected in the recycling of CML357 for earliness (xCLA27).PM01B.

Pedigree	Pedigree
(CLA27xCML357)HC12-1-1-1-1	(CLA27xCML357)HC10-3-4-2-2
(CLA27xCML357)HC12-1-1-1-2	(CLA27xCML357)HC10-3-4-2-3
(CLA27xCML357)HC12-1-1-1-3	(CLA27xCML357)HC10-3-5-1-1
(CLA27xCML357)HC12-1-1-1-4	(CLA27xCML357)HC10-3-5-1-2
(CLA27xCML357)HC12-1-1-1-5	(CLA27xCML357)HC10-3-5-1-3
(CLA27xCML357)HC12-1-2-2-1	(CLA27xCML357)HC10-3-5-2-1
(CLA27xCML357)HC12-1-2-2-2	(CLA27xCML357)HC1-6-2-1-1
(CLA27xCML357)HC12-1-5-2-1	(CLA27xCML357)HC1-6-2-1-2
(CLA27xCML357)HC12-1-5-2-2	(CLA27xCML357)HC1-6-2-1-3
(CLA27xCML357)HC12-1-5-3-1	(CLA27xCML357)HC1-6-2-2-1
(CLA27xCML357)HC12-1-5-3-2	(CLA27xCML357)HC1-6-2-2-2
(CLA27xCML357)HC12-1-5-3-3	(CLA27xCML357)HC1-6-2-2-3
(CLA27xCML357)HC1-4-2-1-1	(CLA27xCML357)HC1-6-2-2-4
(CLA27xCML357)HC1-4-2-1-2	(CLA27xCML357)HC1-6-3-1-1
(CLA27xCML357)HC3-2-2-1-1	(CLA27xCML357)HC1-6-3-1-2
(CLA27xCML357)HC3-2-2-1-2	(CLA27xCML357)HC1-6-3-1-3
(CLA27xCML357)HC3-2-2-2-1	(CLA27xCML357)HC1-6-3-1-4
(CLA27xCML357)HC3-2-2-2-2	(CLA27xCML357)HC1-6-3-1-5
(CLA27xCML357)HC3-2-4-1-1	(CLA27xCML357)HC1-6-3-1-6
(CLA27xCML357)HC3-2-4-1-2	(CLA27xCML357)HC1-6-3-2-1
(CLA27xCML357)HC5-3-1-2-1	(CLA27xCML357)HC1-6-3-2-2
(CLA27xCML357)HC8-3-4-2-1	(CLA27xCML357)HC1-6-5-1-1
(CLA27xCML357)HC8-3-4-2-2	(CLA27xCML357)HC1-6-5-2-1
(CLA27xCML357)HC8-3-4-2-3	(CLA27xCML357)HC1-6-5-2-2
(CLA27xCML357)HC8-3-4-2-4	(CLA27xCML357)HC1-1-1-1-1
(CLA27xCML357)HC8-3-7-2-1	(CLA27xCML357)HC1-1-1-1-2
(CLA27xCML357)HC8-3-7-2-2	(CLA27xCML357)HC1-1-1-1-3
(CLA27xCML357)HC8-3-7-3-1	(CLA27xCML357)HC1-1-2-2-1
(CLA27xCML357)HC8-3-7-4-1	(CLA27xCML357)HC1-1-3-1-1
(CLA27xCML357)HC8-3-7-4-2	(CLA27xCML357)HC1-1-5-2-1
(CLA27xCML357)HC8-3-7-4-3	(CLA27xCML357)HC1-1-5-2-2
(CLA27xCML357)HC8-3-7-4-4	(CLA27xCML357)HC1-1-6-1-1
(CLA27xCML357)HC8-3-7-4-5	(CLA27xCML357)HC1-1-6-1-2
(CLA27xCML357)HC8-3-7-4-6	(CLA27xCML357)HC1-1-6-2-1
(CLA27xCML357)HC8-3-7-4-7	(CLA27xCML357)HC1-1-6-2-2
(CLA27xCML357)HC8-3-7-4-8	(CLA27xCML357)HC1-1-6-2-3
(CLA27xCML357)HC10-3-1-1-1	(CLA27xCML357)HC1-1-6-2-4
(CLA27xCML357)HC10-3-1-1-2	(CLA27xCML357)HC1-1-6-2-5
(CLA27xCML357)HC10-3-1-1-3	(CLA27xCML357)HC1-5-1-1-1
(CLA27xCML357)HC10-3-1-3-1	(CLA27xCML357)HC1-5-1-1-2
(CLA27xCML357)HC10-3-1-3-2	(CLA27xCML357)HC1-5-3-1-1
(CLA27xCML357)HC10-3-1-4-1	(CLA27xCML357)HC1-5-3-1-2
(CLA27xCML357)HC10-3-1-4-2	(CLA27xCML357)HC4-2-1-1-1
(CLA27xCML357)HC10-3-1-5-1	(CLA27xCML357)HC4-2-1-1-2
(CLA27xCML357)HC10-3-1-5-2	(CLA27xCML357)HC4-2-1-1-3
(CLA27xCML357)HC10-3-1-5-3	(CLA27xCML357)HC4-2-1-2-1
(CLA27xCML357)HC10-3-1-5-4	(CLA27xCML357)HC4-2-1-2-2
(CLA27xCML357)HC10-3-2-1-1	(CLA27xCML357)HC4-2-1-2-3
(CLA27xCML357)HC10-3-2-1-2	(CLA27xCML357)HC4-2-1-2-4
(CLA27xCML357)HC10-3-2-1-3	(CLA27xCML357)HC4-2-1-2-5
(CLA27xCML357)HC10-3-3-3-1	(CLA27xCML357)HC4-2-3-1-1
(CLA27xCML357)HC10-3-4-1-1	(CLA27xCML357)HC4-2-5-1-1
(CLA27xCML357)HC10-3-4-1-2	(CLA27xCML357)HC4-2-5-1-2
(CLA27xCML357)HC10-3-4-1-3	(CLA27xCML357)HC4-2-5-1-3
(CLA27xCML357)HC10-3-4-2-1	(CLA27xCML357)HC4-3-1-1-1

Table 3. Lodging tolerant lines selected from Pops SA3 and SA4. PM01B

Pedigree	Pedigree
SA3-Acame-S5(Mez)-S1B-S2B-S3B-1	SA4-Acame-S7(Mez)-S1B-S2B-S3B-6
SA3-Acame-S5(Mez)-S1B-S2B-S3B-2	SA4-Acame-S7(Mez)-S1B-S2B-S3B-7
SA3-Acame-S5(Mez)-S1B-S2B-S3B-3	SA4-Acame-S7(Mez)-S1B-S2B-S3B-8
SA3-Acame-S5(Mez)-S1B-S2B-S3B-4	SA4-Acame-S7(Mez)-S1B-S2B-S3B-9
SA3-Acame-S5(Mez)-S1B-S2B-S3B-5	SA4-Acame-S7(Mez)-S1B-S2B-S3B-10
SA3-Acame-S5(Mez)-S1B-S2B-S3B-6	SA4-Acame-S7(Mez)-S1B-S2B-S3B-11
SA4-Acame-S7(Mez)-S1B-S2B-S3B-1	SA4-Acame-S7(Mez)-S1B-S2B-S3B-12
SA4-Acame-S7(Mez)-S1B-S2B-S3B-2	SA4-Acame-S7(Mez)-S1B-S2B-S3B-13
SA4-Acame-S7(Mez)-S1B-S2B-S3B-3	SA4-Acame-S7(Mez)-S1B-S2B-S3B-14
SA4-Acame-S7(Mez)-S1B-S2B-S3B-4	SA4-Acame-S7(Mez)-S1B-S2B-S3B-15
SA4-Acame-S7(Mez)-S1B-S2B-S3B-5	SA4-Acame-S7(Mez)-S1B-S2B-S3B-1came

Table 4. Entries included in nurseries and yield trials offered to collaborators to screen for resistance to stresses and agronomic performance. Distributed 1999B and 2000A.

Material	No. entries	Reps	Rows/plot	Row length
a. Lines				
S1 FAW Yellow	57	2	1	2.5
S1 FAW White	32	2	1	2.5
S1 Phaeo Yellow	14	2	1	2.5
S1 SCMV Yellow	144	2	1	2.5
S1 SCMV White	106	2	1	2.5
S3 Stunt Yellow	267	2	1	2.5
S3 Phaeo Yellow	52	2	1	2.5
S3 Poly Yellow	16	2	1	2.5
S8 Acid Soil tol.	10	2	1	2.5
CLAs	39	2	1	2.5
b. Yield trials				
Acid Soil V Yellow	28	4	2	5
Acid Soil VI Yellow	20	4	2	5
Acid Soil VI White	16	4	2	5
Acid Soil VII Yellow	21	4	2	5
Acid Soil VII White	16	4	2	5
Heterotic Gps Yellow	170	2	2	5
Heterotic Gps White	140	2	22	5
QPM Yellow	15	2	2	5
QPM White	15	2	2	5

Table 5. Entries included in nurseries and yield trials offered to collaborators to screen for resistance to stresses and agronomic performance. Distributed 2000B-2001A.

Material	No entries	Reps	Rows / plot	Row length
a. Lines				
S2 Pob Enfermds Yellow	121	1	1	2.5
S2 Pob Enfermds White	99	1	1	2.5
S2 Pob Stunt Yellow	70	1	1	2.5
S2 Pob Stunt White	48	1	1	2.5
S2 Pob Phaeo. Yellow	36	1	1	2.5
S2 Pob Phaeo. White	20	1	1	2.5
S1 Tol FAW Yellow	37	1	1	2.5
S1 Tol FAW White	52	1	1	2.5
S2 Pob Acid soil (C1-S2) Yellow	100	1	1	2.5
S2 Pob Acid soil (C1-S2) White	140	1	1	2.5
CLA Yellow	60	1	1	2.5
CLA White	60	1	1	2.5
b. Yield trials				
Acid Soil VI Yellow	20	4	2	5
Acid Soil VI White	16	4	2	5
Acid Soil VII Yellow	21	4	2	5
Acid Soil VII White	16	4	2	5
Acid Soil X Yellow	24	4	2	5
Acid Soil X White	20	4	2	5

Table 6. Components of 2 experimental varieties tolerant to biotic stresses advanced to F2 and of 18 new varieties generated in 2000B.

a. F1s of experimental varieties advanced to F2 (PM00A):

1.	Sete Lagoas 98 Phaeo 1A	13 S8 Pob. SA3
2.	Sete Lagoas 98 Poly 1A	1 S5 TSR 23
		1 S4 Pop. 26 TSR
		3 S4 Pop. 28 TSR
		1 S2 DMR-ST Pool
		2 S2 TSR Syn.
		5 Parent SW DMR89145
		2 CIAT 89345-B-20
		5 S1 Pioneer 3228-B-3

b. Components of experimental varieties (F1generated in PM00B):

1.	Granada 00 Phaeo 1A-SA3:	5 S1 Pop. SA3
		2 S1 Synt. SA5
		2 CLA
2.	Granada 00 Phaeo 1A-SA4:	9 S1 Pop. SA4
3.	Granada 00 Phaeo 1A:	4 S2 mats recycling
		3 S1 Hybds. Thail.
4.	Granada 00 Phaeo 2A-SA6:	3 Sn Pop. SA6
5.	Granada 00 Phaeo 2A-SA7:	6 S1 Pop. SA7
		1 CLA
6.	Cap. Miranda 99 (1) Bact 1F:	6 S1 Hybds Brazil
7.	Cap. Miranda 99 (2) Bact 1F:	6 S1 Hybds. Brazil
8.	Cap. Miranda 99 Cog 1A-SA3:	5 S5 Pop. SA3
		3 S1 Pop. SCMV-SA3
9.	Cap. Miranda 99 Cog 1A-SA4:	1 CLA
		5 S1 Pop. SCMV-SA4
		4 S1 Pop. SCMV-79
10.	Cap. Miranda 99 (1) Cog 1F:	3 S1 Hybds Brazil
11.	Cap. Miranda 99 (2) Cog 1F:	4 S3 Hybds Brazil
12.	Cap. Miranda 99 Achap 1A:	1 CLA
		6 S1 Pop. Cog. Amar.
13.	Cap. Miranda 99 Achap 1A-SA3:	7 S1 Pop. SCMV-SA3
14.	Cap. Miranda 99 Achap 1A-SA4:	8 S1 Pop. SCMV-SA4
15.	Cap. Miranda 99 Achap 1A-P79:	7 S1 Pop. SCMV-79
16.	Cap. Miranda 99 (1) Achap 1F:	6 S1 Hybds. Brazil
17.	Cap. Miranda 99 (2) Achap 1F:	3 S3 Hybds. Brazil
18.	Cap. Miranda 99 (3) Achap 1F:	3 S3 Hybds. Brazil
19.	Turipaná 00 Cog 1A-SA4:	4 S8 Pop. SA4
20.	Turipaná 00 Cog 1C:	9 S1 Pop. Cog. Amar.
21.	Turipaná 00 Cog 2C:	7 S1 Pop.Cog. Bco.
22.	Boliche 00 Achap 1A:	5 S5 Pop. SA3
		8 S3 Hybds. Brazil
23.	Portoviejo 00 (1) Achap 1A:	1 CLA
		4 S3 Hybds. Brazil
		2 S5 Pop. SA3

Table. 6. Continued…

24.	Portoviejo 00 (2) Achap 1A:	7 S3 Hybds. Brazil
25.	Portoviejo 00 Poly 1A:	8 S3 Hybds. Brazil
26.	Portoviejo 00 Phaeo 1A:	9 S3 Hybds. Brazil
27.	Cimcali 99 SCMV 1A-SA3:	10 S1 Pop. SA3
28.	Cimcali 99 SCMV 1A-SA4:	4 S1 Pop. SA4
		6 S4 Parents Thail.
29.	Cimcali 99 SCMV 2A-SA6:	7 S1 Pop. SA6
30.	Cimcali 99 SCMV 2A-SA7:	5 S1 Pop. SA7
		3 S1 Resist. Insects
31.	Cimcali 00 SCMV 1A-CLA:	12 CLA
32.	Cimcali 00 SCMV 2A-CLA:	8 CLA
33.	Maracay 97 Achap 2C:	7 S2 Pop. 73 Achap.
		8 S2 Pop. 76 Achap.
34.	Caicedonia 00 Phaeo 1A:	5 HS Hybds. Col.
		2 S1 Pop. Phaeo. Amar.
		1 S1 Pop. Achap. Amar.
		4 S1 Topcrosses TSR Amar.
35.	Caicedonia 00 Phaeo 2A:	4 HS Hybds. Col.
		4 S1 Topcrosses TSR Bco.
		2 HS -Varts Col.
36.	Villavicencio 99 Phaeo 1A-SA3:	13 S1 Pop. SA3
37.	Villavicencio 99 Phaeo 1A-SA4:	13 S1 Pop. SA4
38.	Villavicencio 99 Phaeo 2A-SA6:	15 S1 Pop. SA6
39.	Villavicencio 99 Phaeo 2A-SA7:	12 S1 Pop. SA7
40.	Villavicencio 99 Phaeo 1F:	8 S2 Hybds. Brazil
41.	Villavicencio 99 Phaeo 1A-CLA:	10 CLA Amar.
42.	Villavicencio 99 Phaeo 1A-P:	1 S7 Hyb. Thail. tol. low P.
		1 CML Tol. tol. low P.
		4 S4 Pop. SA3 tol. low P.
43.	Villavicencio 99 Phaeo 1A:	7 S2 Recyc. CML
		1 S2 Synt. SA4
		3 S2 Synt. SA5
44.	Villavicencio 99 Phaeo 1A-TSR:	5 S1 Topcrosses TSR Amar.
45.	Villavicencio 99 Phaeo 2A-TSR:	5 S1 Topcrosses TSR Bco.
46.	Villavicencio 99 Phaeo 1A-GCA:	1 S6 Pop. SA3
		6 S6 Pop.SA4
47.	Sete Lagoas 99 Ac 1F:	10 S2 Hybds Brazil
48.	Sete Lagoas 99 Ac 1A-SA3:	12 S1 Pop. SA3
49.	Sete Lagoas 99 Ac 1A-SA4:	11 S1 Pop. SA4
50.	Pajonal 99 (1) Cog 1A-CLA:	11 CLA Amar.
51.	Pajonal 99 (2) Cog 1A:	13 S1 Pop. Cog. Amar.
51.	Pajonal 99 Phaeo 1F:	11 S2 Hybds. Brazil
53.	Pajonal 99 Phaeo 1F-S2 Ac:	13 S2 Hybds. Brazil
54.	Pajonal 99 Achap 1F-S2:	13 S2 Hybds. Brazil
55.	Pajonal 99 Achap 1F-S3:	9 S3 Hybds. Brazil
56.	Pajonal 99 Poly 1F:	10 S2 Hybds. Brazil

Table7. Components of 51 new experimental varieties selected from data arriving in late 2001. To be generated in PM02A

	Varieties	Components
1	Menegua 01Cog1C(Pob Cog)	8 S1 SR Pob Cog Am
2	Menegua 01Phaeo1A	8 S2 Pob TSR Am
3	Menegua 01Cog2C	7 S1 SR Pob Cog Bl
4	Menegua 01Phaeo1A(CLA-AS8)	7 CLAs
5	Menegua 01Phaeo2A(CLA-AS8)	8 CLAs
6	Menegua 01Phaeo1A(CLA-AS9)	8 CLAs, 2 CMLs
7	Menegua 01Alum1A	7 S8 Pob SA4, 1 CLA
8	Menegua 01LowP1A	4 S9 Pob SA4, 1 CLA
9	Menegua 01LowP2A	6 S9 Pob SA8
10	Villavicencio 01Phaeo1A	3 S2 OPVs, 4 S2 Pob TSR Am
11	Villavicencio 01Phaeo1AS2	5 S2 SR Pob Phaeo, 1 S2 Pob Insect
12	Villavicencio 01Cog2AS2	4 S2 SR Pob Phaeo, 6 CLAs
13	Villavicencio 01Cog1AS1	8 S2 Pob Cog Am
14	Villavicencio 01Cog2AS1	7 S2 Pob Cog Bl
15	Villavicencio 01Phaeo1ACLA	10 CLAs, 2 CMLs
16	Villavicencio 01Acid2AS8	12 S9 Pob SA8
17	Villavicencio 01Acid1AS8	5 S8 Pob SA4, 2 CLAs
18	Pajonal 00Cog1AS1	6 S1 Pob Cog Am, 3 CLAs
19	Portoviejo 01Cog1AS2	8 S2 Pob Insect Am
20	Portoviejo 01Cog1AS1	5 S1 Pob Cog Am, 2 S3 Insct Am
21	Portoviejo 01Phaeo1AS2	6 S2 Pob Phaeo Am
22	Portoviejo 01Acid Soil 1A(CML-CLA)	10 CLAs
23	Portoviejo 01Achap1AS1	10 S1 SR Pob Achap Am
24	Portoviejo 01Phaeo1AS2	7 S2 Pob Phaeo Am
25	Boliche 01Achap1AS1	9 S1 SR Pob Achap Am
26	Cimcali 02(1)Achap2A-1	5 S3 Pob SA6-C2, 5 S3 Pob SA7-C2
27	Cimcali 02Achap1A(CLA)	11 CLAs
28	Cimcali 02Achap2A(CLA)	8 CLAs, 2 CL0, 1 CML
29	Cimcali 02Achap1(Phaeo)	6 S3 Pob Phaeo Am
30	Cimcali 02Achap1A(Insec)	6 S3 Pob Insect Am
31	Cimcali 02Achap(Insec)	10 S3 Pob Insect Bl
32	Cimcali 02Achap1S4	7 S3 Pob Insect Am
33	Cimcali 02SCMV1A(S3 Enf)	4 S3 OPVs, 5 S3 TSR Am
34	Cimcali 02SCMV1A(S2Achap)	12 S2 Pob Achap Am
35	Cimcali 02SCMV2A(S3 Enf)	4 S3 TSR Bl, 1 S3 Pob SA
36	Cimcali 02SCMV2A(Achap)	10 S2 Pob Achap Bl
37	Agua Fria 01Insec1ACLA	8 CLAs
38	Agua Fria 01Insec2ACLA	10 CLAs
39	Agua Fria 01Insec1AS2	11 S2 Pob SA3-SRR-C1, 1 S2 Pob S4-SRR-C1
40	Agua Fria 01Insec2AS2	TSR
41	Agua Fria 01Insec1AFAWS1	9 S1 SR Pob Cog Am
42	Agua Fria 01Insec2AFAWS1	10 S1 SR Pob Cog Bl
43	Agua Fria 01Insec1AchapS1	11 S1 SR Pob Achap Am
44	Agua Fria 01Insec2AAchapS1	9 S1 SR Pob Achap Bl
45	Agua Blanca 01Cog1AS1	5 S1 SR Pob Cog Am
46	Agua Blanca 01 Achap2AS1	6 S1 SR Pob Achap Bl
47	Agua blanca 01Cog2AS2	8 S2 Pob Insect Bl
48	Agua Blanca 01Cog2AS1	7 S2 SR Pob Cog Bl
49	Agua Blanca 01Achap1AS1	7 S1 SR Pob Achap Am
50	Sete Lagoas 00Phaeo1ASA3	3 S3 Pob SA3-SRR-C1, 1 S4 Pob 79, 1 S2 Mx
51	Sete Lagoas 00Phaeo1C	2 S3 Pob SA3-SRR-C1, 2 Sn Pob 24, 1 S2 Mx

Table 8. Lines included in inheritance of resistance studies. PM01B

	Tolerant		Susceptible
a. Corn stunt lines			
1	SRR-C0 SA6HC(43x25)-3-1-2-1-B	1	SRR-C0 SA7HC(19x62)-1-3-1-1-B
2	SRR-C0 SA6HC(37x2)-2-1-1-2-B	2	SRR-C0 SA7HC(59x17)-5-1-1-2-B
3	SRR-C0 SA6HC(48x46)-3-1-1-2-B	3	SRR-C0 SA7HC(7x40)-3-2-1-B
4	SRR-C0 SA6HC(32x2)-3-2-2-B	4	SRR-C0 SA7HC(15x8)-3-3-1-B
5	SRR-C0 SA6HC(37x2)-2-3-2-B	5	SRR-C0 SA7HC(31x40)-2-1-1-B
b. Phaeosphaeria lines			
1	SA3-C4HC(16X25)-2-1-1-4-2-2-1-3-B-B	1	SRR-C1SA3MH26-2
2	SA3-C4HC(16X25)-2-1-1-4-3-3-2-1-B-B	2	CLA3SA3-C4HC(16x25)-2-4-6-7-B-B-B-B
3	SA3-C4HC(16X25)-2-1-1-4-5-2-2-3-B-B	3	CLA24 SA4-HC7-1-5-1-3-1-6-B-B-B-B-B-B-B
4	SA3-C4HC(16X25)-2-1-4-5-5-2-3-1-B-B	4	SRR-C1SA3MH32-2
5	SA3-C4HC(16X25)-2-1-4-5-5-2-3-4-B-B	5	SRR-C1SA3MH146-3
c. SCMV lines			
1	CLA246SA6C4HC21-4-2-5-2-2-B-B	1	CLA117SA6C4HC1-8-2-3-3-5-4-1-#-B
2	CLA118SA6C4HC1-8-2-3-3-5-4-2-B-B	2	CLA119SA6C4HC21-4-2-5-2-4-1-1-B-B
3	CLA220SA6-C2HC(1X13)-5-4-6-3-3-2-2-	3	CLA122SA6C4HC25-4-2-1-1-3-7-1-B-B-B-B
4	CLA178SA6C4HC19-6-2-2-1-2-B-B-B-B	4	CLA126SA7C4HC41-6-2-2-5-3-1-1-B-B-B-B
5	CLA221SA6-C2HC(1X13)-5-4-6-3-3-2-2-	5	CLA127SA8C3HC114-14-2-1-1-4-2-1-B-B-B-B

Fig.1A. Grain yield of 15 acid soil tolerant lines planted at 4 and 15 ppm P in acid soil conditions with 65% Al saturation.

Entry	Pedigree	MN01AAl= 65% P= 15 ppmP		MN01AAl= 65% P= 4 ppm		Grain yld	Yld loss	Differ.
		Loc3		Loc4		t/ha	%	Loc 3-4
1	NST90201(S)C0-422-2-3-1-3-2-1-B-B	1.97	14	0.21	15	1.77	89.6	1.77
2	NST90201(S)C0-422-2-3-1-7-2-1-B-B	2.88	7	0.69	10	2.19	75.9	2.19
3	SA3-C4HC(16x25)-2-4-9-7-B-B-B-B-1-B-B	2.79	8	0.94	8	1.85	66.2	1.85
4	SA3-C4HC(16x25)-2-4-9-7-B-B-B-B-2-B-B	1.51	15	0.94	9	0.57	37.9	0.57
5	SA3-C4HC(16x25)-2-4-9-7-B-B-B-B-3-B-B	2.34	13	1.39	5	0.95	40.6	0.95
6	SA3-C4HC(16x25)-2-4-9-7-B-B-B-B-4-B-B	2.75	9	1.03	7	1.72	62.5	1.72
7	SA3-C4HC(16x25)-2-4-3-1-B-B-B-B-1-B-B	4.39	1	2.04	1	2.35	53.6	2.35
8	SA3-C4HC(16x25)-2-4-3-1-B-B-B-B-2-B-B	3.51	4	1.64	2	1.87	53.3	1.87
9	SA3-C4HC(16x25)-2-4-3-1-B-B-B-B-3-B-B	3.4	5	1.58	3	1.82	53.5	1.82
10	SA3-C4(14x17)-4-3-1-2-1-1-2-2-B-B-B-B	3.04	6	0.64	12	2.4	78.9	2.4
11	SA3C4(14x17)-4-3-1-2-1-1-2-4-B-B-B	3.6	2	0.67	11	2.94	81.5	2.94
12	SA4HC7-1-5-1-3-4-7-B-B-2-B-B-B	2.64	10	0.54	14	2.09	79.4	2.09
13	SA5HC1-3-8-4-1-2-1-B-1-B-B-B	2.58	11	0.6	13	1.98	76.6	1.98
14	SA8C3HC114-5-2-5-4-3-2-1-1-B-B	3.59	3	1.23	6	2.35	65.6	2.35
15	SA8C3HC114-5-2-5-4-3-2-1-3-B-B	2.48	12	1.55	4	0.93	37.6	0.93

Table 9. Agronomic performance of 20 yellow endosperm hybrids including 5 checks, planted in the Atlantic coast of Colombia. 2001B

Entry	Pedigree	Grain yld (t/ha)					Hgt		Silk	ASI	Lodg		Asp		Ear	End	Husk
				Across 6 locs			Plt	Ear	date		Root	Stalk	Plt	Ear	rot	hard	cover
		Mean	Rank	b	PCA1	PCA2	cm		days		%		1-5		%	1-5	%
1	HE 119 (LE 101 x LE 102)	5.08	1	0.88	0.89	0.84	213.8	98.2	53.0	1.2	0.8	3.1	2.2	2.0	7.6	1.8	1.6
2	HE 120 (LE 103 X LE 104)	4.54	3	1.15	0.41	0.13	206.1	109.5	54.5	2.7	0.8	4.5	1.8	2.1	6.1	3.3	2.2
3	HE 121 (LE 103 x LE 102)	3.76	12	0.86	0.52	0.23	188.5	85.0	53.7	1.9	0.5	0.8	1.8	2.5	10.0	2.0	1.3
4	HE 122 (LE 105 x LE 101)	4.57	2	1.36	0.45	-0.94	216.1	100.6	50.7	0.8	0.8	1.2	1.9	2.0	6.5	1.7	1.9
5	HE 123 (LE 106 X LE 101)	4.52	4	1.05	-0.33	-0.15	206.7	105.8	52.6	1.2	0.4	1.0	2.3	1.8	6.4	1.2	1.0
6	HE 124 (LE 107 x LE 108)	3.85	9	1.23	0.16	-0.21	199.0	86.5	52.9	2.6	2.0	5.6	2.6	2.3	8.2	2.2	1.9
7	HE 125 (LE 109 x LE 110)	3.96	7	1.02	0.40	0.30	209.2	101.0	52.3	1.7	2.2	2.8	2.3	2.4	7.0	1.4	0.9
8	HE 126 (LE 109 x LE 111)	3.79	11	0.86	0.08	0.03	218.6	108.4	51.7	2.5	0.3	3.6	2.3	2.2	5.3	1.4	1.2
9	HE 127 (LE 109 x LE 112)	3.74	13	0.95	-0.88	0.29	207.6	106.2	51.5	2.4	0.2	0.5	2.5	2.5	8.3	1.5	2.7
10	HE 128 (LE 113/LE 114) LE 115	3.93	8	0.87	-0.46	0.24	211.0	102.1	53.4	3.0	0.4	2.6	2.1	2.3	12.6	1.5	10.2
11	HE 129 (LE 109/LE 110) LE 113	3.82	10	1.05	0.15	-0.08	209.1	98.0	52.6	2.0	1.7	4.9	2.4	2.3	7.0	1.7	1.4
12	HE 13 (LE 114 x LE 113) LE 115	3.61	15	0.94	0.14	0.23	194.8	90.9	52.6	2.0	1.0	0.3	2.3	2.5	13.3	1.5	1.8
13	HE 131 (LE 114 x LE 113) LE 115	3.46	17	0.62	-0.55	0.19	180.7	88.2	52.0	1.6	0.4	5.6	2.3	2.4	12.1	1.5	6.9
14	Cimcali 97Achap1ASA4	3.00	20	0.66	-0.65	0.20	189.5	89.5	51.3	1.6	0.7	8.4	2.5	2.7	19.4	1.9	4.7
15	HE 132 (LE 116 x LE 117)	3.73	14	1.10	-0.05	-0.14	189.9	78.7	50.5	2.1	1.1	7.5	3.1	2.1	7.9	1.8	7.8
16	HE 133 (LE 118/LE 117) LE 119	3.37	18	1.26	0.15	-0.44	205.8	87.6	51.5	1.8	2.0	9.7	3.0	2.4	10.1	1.5	12.2
17	Corpoica H108 (CK)	4.06	5	0.85	-0.27	0.31	193.5	86.4	49.3	1.7	4.4	5.1	2.7	1.9	7.5	1.4	1.1
18	Corpoica H111 (CK)	3.54	16	0.94	-0.24	-0.29	197.6	89.3	51.0	2.5	2.5	7.1	3.0	2.7	8.4	1.5	1.2
19	Local check1 (G5423)	3.22	19	1.05	0.16	-0.24	189.6	89.0	51.6	1.4	0.6	4.5	2.7	2.5	15.5	1.8	1.7
20	Local check2 (P3041)	4.02	6	1.29	-0.10	-0.50	199.8	96.7	53.3	1.6	0.6	5.3	2.0	2.2	14.5	1.6	2.2
Mean		3.88					201.3	94.9	52.1	1.9	1.2	4.2	2.5	2.3	9.7	1.7	3.3
Max		5.08					218.6	109.5	54.5	3.0	4.4	9.7	3.5	2.7	19.4	3.3	12.2
Min		3.00					180.7	78.7	49.3	0.8	0.2	0.3	1.5	1.8	5.3	1.2	0.9
LSD (0.05)		0.59					9.76	5.57	1.4	1.5	2.0	5.2	1.0	0.35	5.2	0.3	6.7
CV (%)		16.60					5.1	8.6	2.7	93.3	3.0	6.4	18.9	19.0	8.6	25.1	11.5

Fig 1. Plot of 20 yellow hybrids, including 2 check entries planted at 6 locations from Atlantic coast of Colombia, 2001.

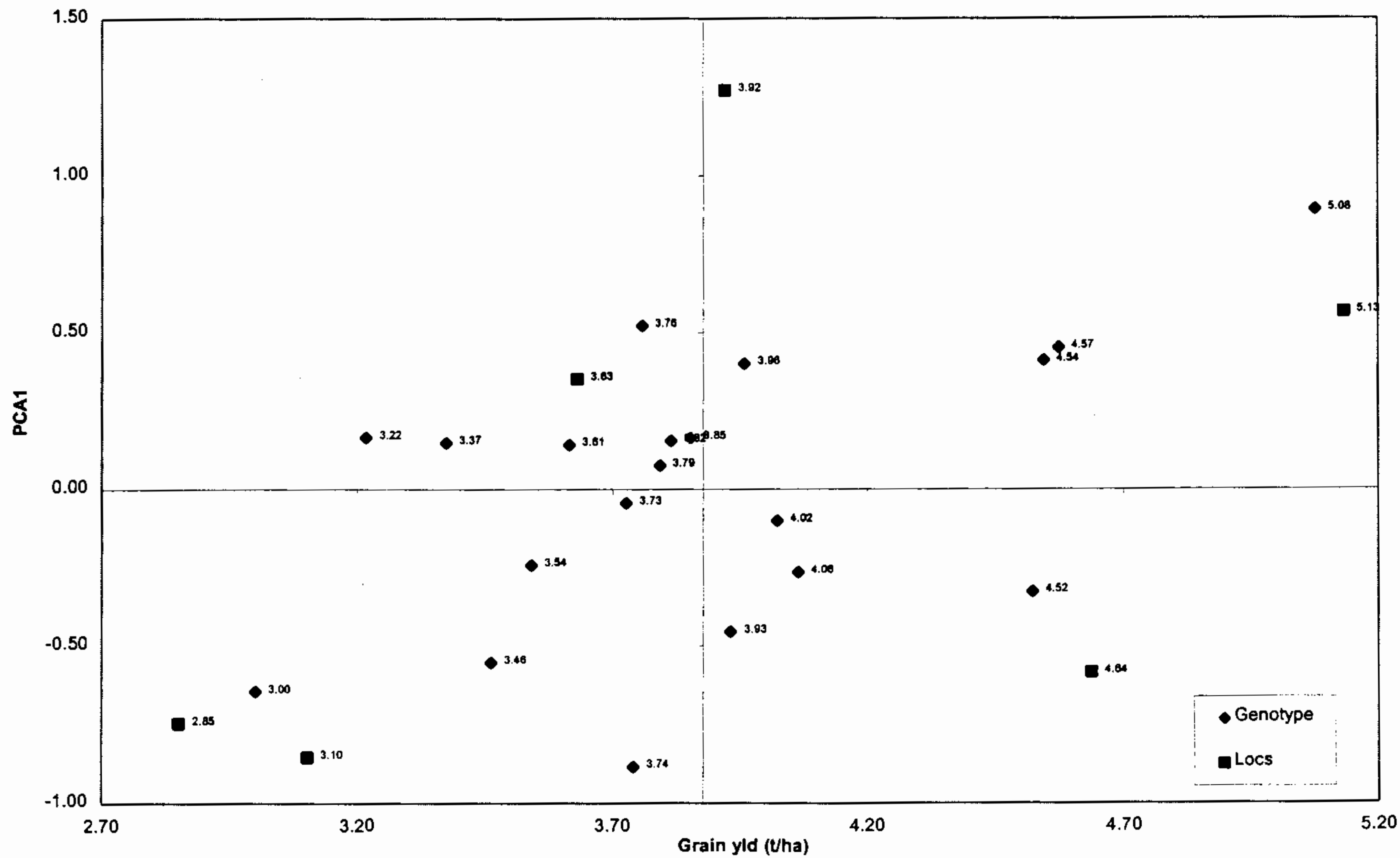

Table 10. Performance of 20 yellow endosperm synthetics including 3 checks, planted in the Atlantic coast of Colombia. 2001B.

Entry	Pedigree	Grain yld (t/ha)					Hgt		Silk	ASI	Lodg		Asp		Ear	End	Husk
			Across 7 locs				Plt	Ear	date		Root	Stalk	Plt	Ear	rot	hard	cov
		Mean	Rank	b	PCA1	PCA2	cm		days	days	%		(1-5)		%	(1-4)	#
1	Iquitos 9328	3.60	3	1.4	0.7	-0.1	219.9	111.9	54.4	2.9	3.1	3.1	2.5	2.2	13.9	1.8	3.5
2	Across S9536	3.61	2	1.1	0.2	0.1	214.1	114.7	53.6	2.0	1.5	5.4	2.0	2.1	7.1	2.2	2.1
3	S96G26 TLYD	3.65	1	1.3	0.4	-0.3	210.3	107.4	54.3	2.2	2.5	2.5	2.4	2.2	8.7	1.8	2.3
4	Tak Fa S9528	3.59	4	1.4	1.0	0.6	228.1	119.7	55.3	2.1	5.3	2.0	1.9	2.1	8.4	2.4	1.7
5	S97 TLY GH "AyB" (1)	3.52	5	1.1	0.5	0.0	206.4	107.0	53.7	1.9	2.2	7.5	2.3	2.3	9.8	1.7	2.3
6	Tak Fa S9536	3.32	7	1.4	0.6	-0.4	201.2	100.0	54.7	3.0	1.3	4.0	2.2	2.2	10.7	2.5	1.3
7	Across 8765	2.76	16	0.8	-0.2	0.4	190.7	90.7	52.1	3.1	0.5	4.4	3.0	2.6	16.0	1.2	2.6
8	Iboperenda 8666	2.74	17	0.8	-0.3	0.6	191.9	94.4	53.2	2.3	3.0	3.4	2.3	2.8	21.4	1.7	2.6
9	S99TLYQ-HG-AB	3.24	11	1.1	0.1	-0.1	199.5	100.7	52.4	2.7	2.2	4.4	2.9	2.5	10.3	1.3	4.1
10	S99TLYQ-AB	3.25	10	1.1	-0.2	0.1	201.6	97.9	52.6	1.9	0.0	3.6	2.2	2.5	11.5	1.5	4.7
11	Cimcali 97BSA3-2	2.71	18	0.7	-0.6	0.4	194.1	96.7	51.8	0.7	5.5	4.5	2.7	2.6	16.3	1.4	4.7
12	Cimcali 97Achap1ASA4	2.66	19	0.8	-0.5	0.1	194.9	85.4	50.9	2.5	1.8	11.9	3.0	2.8			
															15.3	1.6	2.9
13	Cimcali 97ASA3-3	2.45	20	0.8	-0.1	0.0	189.6	86.2	48.4	1.7	0.8	4.7	3.4	2.9	14.5	1.5	2.2
14	Cerrito 97Achap1A	3.08	14	0.8	-0.7	-1.0	197.0	94.5	51.7	2.1	2.7	3.7	2.5	2.6	13.4	1.6	3.1
15	Cap. Miranda 98PhaeoA	3.38	6	1.2	0.2	-0.5	201.2	98.6	51.8	0.3	3.3	8.7	2.9	2.4	12.8	1.6	3.3
16	Chore 98Phaeo1A	2.93	15	0.7	-0.3	-0.1	190.8	94.1	51.2	2.1	3.0	4.3	2.6	2.5	11.7	1.6	3.3
17	Cimcali 97SCMV1A	3.17	12	0.9	-0.3	-0.4	193.1	95.7	51.0	1.8	3.8	5.2	2.7	2.5	13.5	1.5	2.5
18	Corpoica H108 (CK)	3.27	9	1.1	0.2	-0.4	197.4	88.7	48.8	2.4	3.4	4.4	2.2	2.2	5.5	1.5	1.5
19	Local Check1 (ICA V109)	3.30	8	0.9	-0.4	0.2	203.8	101.9	52.9	3.7	4.4	2.5	2.2	2.1	6.4	1.3	2.3
20	Local Check2 (Sequía)	3.17	13	0.8	-0.3	0.7	204.1	98.7	52.7	1.8	4.1	5.4	2.5	2.3	11.2	1.5	1.9
Mean		3.17					201.5	99.2	52.4	2.2	2.7	4.8	2.8	2.4	11.9	1.7	2.8
Max		3.65					228.1	119.7	55.3	3.7	5.5	11.9	4.1	2.9	21.4	2.5	4.7
Min		2.45					189.6	85.4	48.4	0.3	0.0	2.0	1.7	2.1	5.5	1.2	1.3
LSD (0.05)		0.58					9.6	6.4	1.4	1.5	3.3	4.0	0.8	0.3	5.9	0.2	2.2
CV (%)		15.90					5.3	7.9	2.9	88.7	3.7	5.2	14.6	18.9	6.7	15.6	42.7

Fig 2. Plot of 20 yellow endosperm synthetics, including 2 checks planted at 7 locations from Atlantic coast of Colombia, 2001.

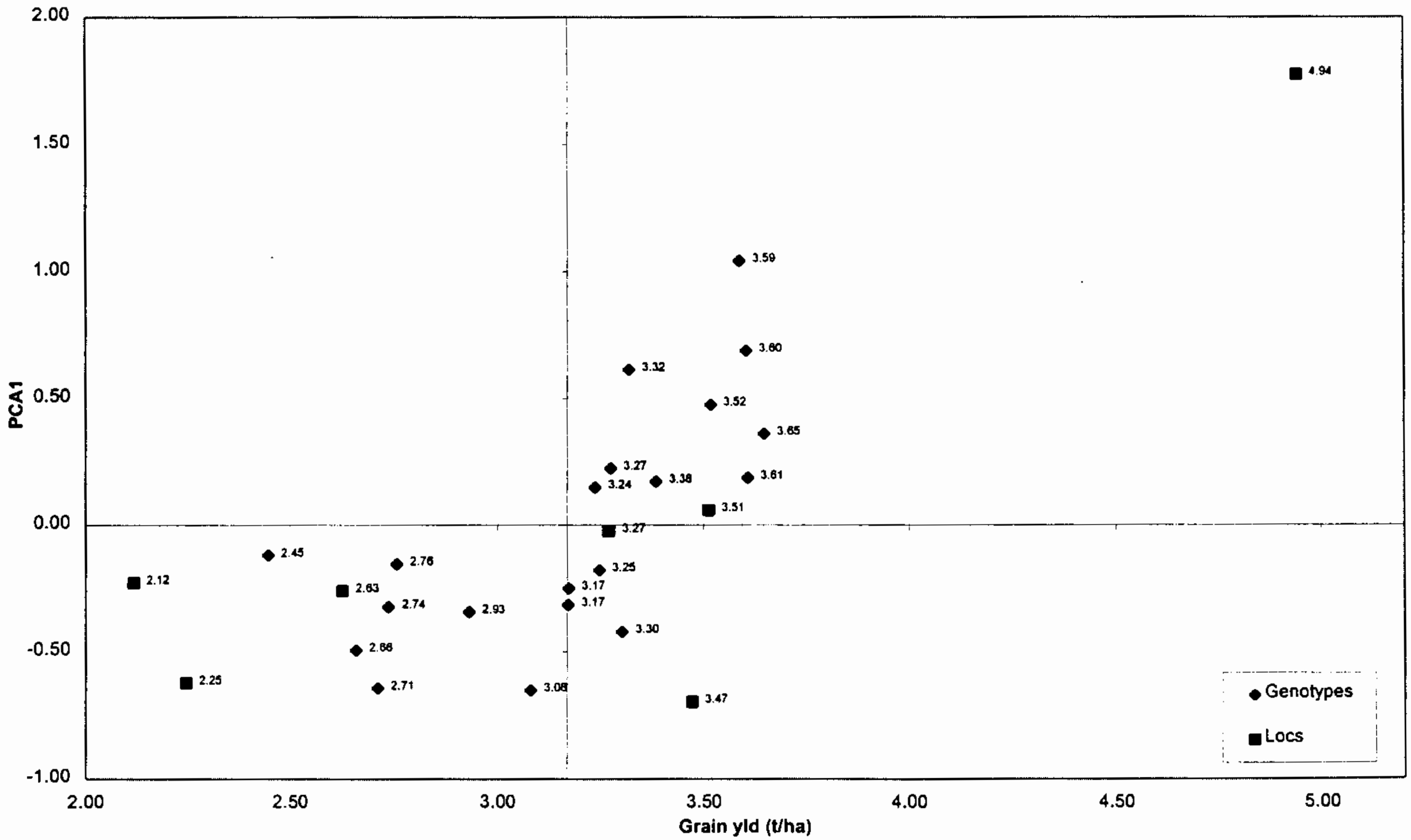

Table 11. Mean performance of 15 white OPVs, including 1 check, in Acid Soil VI White Trial, planted at 22 locations (13 acid and 9 normal soils). 1998-2001.

Entry	Pedigree	Grain yld (t/ha)							Hgt		Silk	Asp		Lodg		End
				Across 22 locs					Plt	Ear	date	Ear	Plt	Root	Stalk	hard
		Acid	No Acid	Mean	Rank	b	PCA1	PCA2	cms		day	(1-5)		%		(1-5)
1	Cimcali 97ASA8-1	2.04	4.13	2.86	13	0.80	-0.32	0.65	174	73	57	3.1	2.9	6	7	2.0
2	Cimcali 97ASA8-2	2.40	5.25	3.57	5	1.10	0.20	1.25	179	78	59	2.6	2.7	4	7	2.1
3	Cimcali 97ASA8-3	2.46	4.89	3.45	6	0.98	-0.30	-0.91	180	81	58	2.5	2.8	4	5	1.6
4	Cimcali 97ASA8-4	2.59	5.20	3.68	3	1.03	-0.37	-0.09	181	83	60	2.6	2.7	2	8	1.7
5	Cimcali 97ASA8-5	2.04	4.27	2.93	12	0.86	-0.82	0.43	170	73	58	2.8	2.8	4	9	1.5
6	Cimcali 97 Achap 2A SA6	2.79	6.08	4.13	1	1.34	1.52	0.76	178	84	60	2.3	2.4	2	5	3.0
7	Cimcali 97 Achap 2A SA7	2.60	5.08	3.61	4	1.14	1.10	0.28	180	81	59	2.4	2.6	1	6	1.2
8	Cimcali 97 Hmaydis 2A SA	2.00	3.95	2.79	14	0.80	0.21	-1.46	152	66	61	3.2	2.6	0	3	2.8
9	Cimcali 97 Hmaydis 2A SA	2.29	4.41	3.15	11	0.92	0.01	-0.37	174	78	59	2.7	2.8	3	5	1.5
10	Cimcali 97 Hmaydis 2A SA	1.60	3.18	2.25	15	0.76	0.03	-1.18	155	57	52	3.4	3.0	1	5	2.3
11	Cimcali 97 SCMV 2A	2.74	5.54	3.88	2	1.19	1.46	0.26	183	79	58	2.3	2.6	2	8	1.5
12	Cimcali 97 Spod 2A	2.29	4.96	3.37	9	1.06	0.23	-0.17	176	83	60	2.5	2.7	5	7	1.2
13	Tuxpeño	2.34	4.91	3.40	7	1.15	0.43	-0.24	171	75	61	2.7	2.5	2	6	2.7
14	Cimcali 96SA6	2.14	5.00	3.38	8	1.01	-1.69	1.34	168	75	60	2.8	3.0	2	5	2.5
15	Cimcali 96SA7	2.23	4.54	3.16	10	0.86	-1.69	-0.54	169	73	59	2.9	2.9	2	9	1.6
Mean		2.30	4.76	3.31					172.5	76.0	58.8	2.7	2.7	2.5	6.3	1.9
Max		2.79	6.08	4.13					183.1	84.2	61.4	3.4	3.0	5.9	9.1	3.0
LSD (0.05)		0.34	0.66	0.36					5.83	3.91	0.98	0.22	0.16	2.00	2.65	0.29
CV (%)		19.92	13.43	16.46					9	13	4	13.9	18.8	4.8	7.1	12.35
Correlation acid vs. non acid soils				0.93												

Fig. 3. Plot of 15 white OPVs, including 1check entry in Acid Soil VI White Trial planted at 22 locations (13 acid and 9 normal soils). 1998-2001.

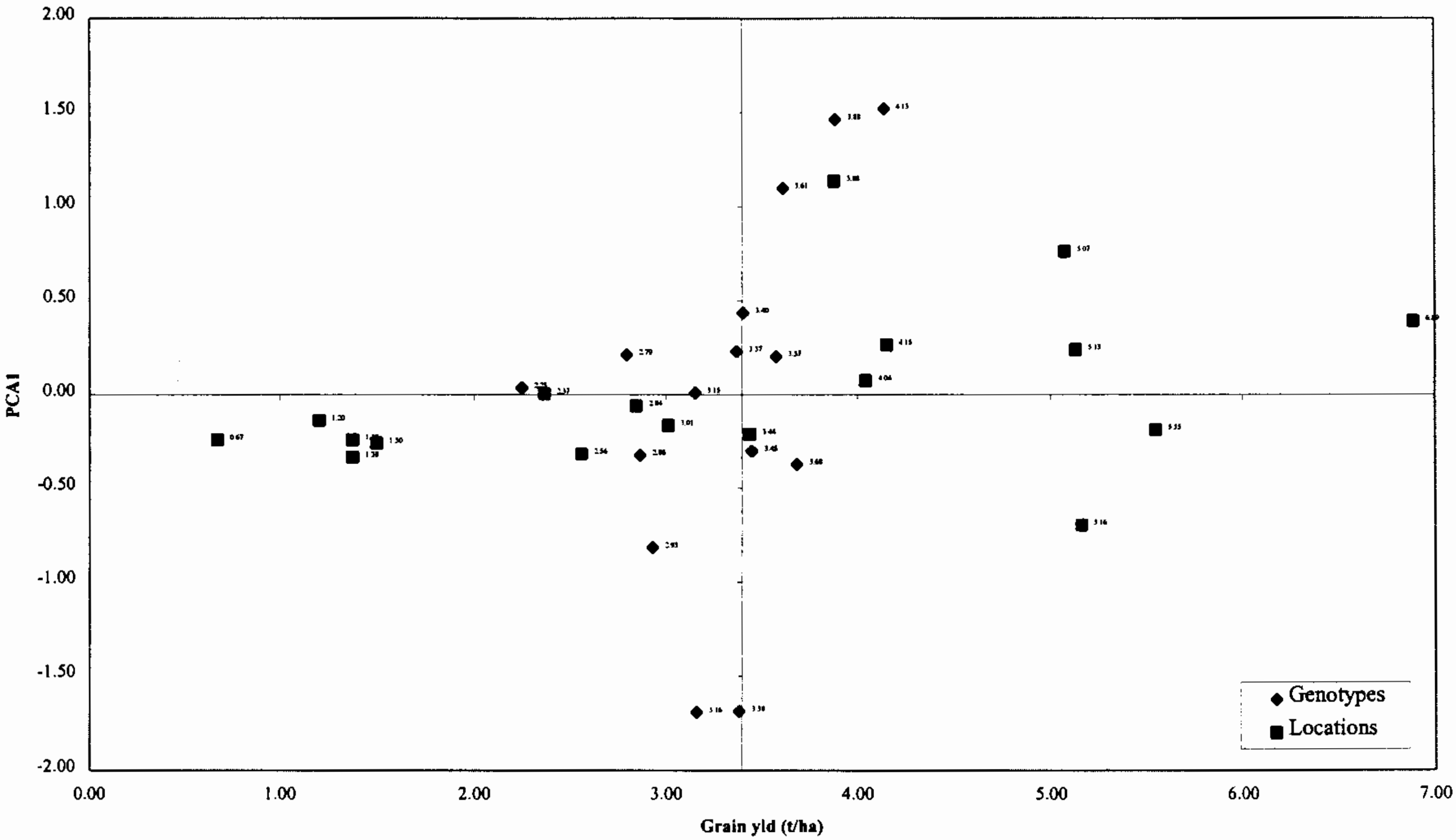

Table 12. Mean performance of 19 yellow OPVs, including 2 checks, in Acid Soil VI Yellow Trial, planted at 27 locations (14 acid and 13 normal soils). 1998-2001.

Entry	Pedigree	Grain yld (t/ha)					Hgt		Silk date	ASI	Lodg		Asp		End	Husk
				Across 27 locs			Plt	Ear			Root	Stalk	Ear	Plt	hard	cover
		Mean	Rank	b	PCA1	PCA2	cms		days	days	%		(1-5)		(1-5)	%
1	Cimcali 97ASA4	3.66	12	1.00	0.65	0.30	186.7	82.9	59.5	1.1	6.0	8.0	2.6	2.4	2.1	8.5
2	Cimcali 97ASA3-1	3.21	18	0.87	-0.08	0.47	182.0	79.0	59.3	1.1	3.3	5.6	2.8	2.5	1.8	5.1
3	Cimcali 97ASA3-2	3.85	7	1.05	0.29	0.25	188.1	85.8	59.5	0.7	3.3	8.0	2.6	2.4	3.0	7.3
4	Cimcali 97ASA3-3	3.63	14	0.95	-0.01	-0.09	184.5	79.6	59.3	0.8	4.8	8.1	2.6	2.4	1.9	4.9
5	Cimcali 97BSA3-1	3.19	19	0.97	0.24	0.57	179.4	80.2	59.2	1.3	4.0	7.3	2.7	2.5	1.8	3.8
6	Cimcali 97BSA3-2	3.40	16	1.02	-0.32	0.25	179.1	83.7	60.3	1.0	3.4	7.7	2.7	2.6	1.4	8.4
7	Cimcali 97BSA4-1	3.71	10	0.89	0.37	0.69	175.9	78.6	59.2	0.6	4.9	6.6	2.7	2.3	2.6	7.3
8	Cimcali 97BSA4-2	3.76	8	1.13	0.07	-0.49	183.5	80.5	58.4	1.0	4.8	6.8	2.7	2.3	1.6	5.4
9	Cimcali 97Achap1ASA3	3.96	5	1.09	0.13	-0.91	196.4	92.2	60.9	0.8	2.6	10.8	2.5	2.3	2.2	4.5
10	Cimcali 97Achap1ASA4	4.32	2	1.23	0.65	-0.50	184.4	86.9	59.9	0.8	4.2	9.3	2.5	2.3	3.0	6.8
11	Cimcali 97Hmaydis1ASA3	3.64	13	1.01	0.32	-0.16	179.1	81.4	58.9	0.7	4.4	7.7	2.6	2.3	1.9	4.4
12	Cimcali 97Hmaydis1ASA4	3.48	15	0.89	0.36	0.61	171.6	80.2	59.6	0.7	2.8	13.8	2.6	2.6	2.8	7.8
13	Cimcali 97Hmaydis1ASA9	3.27	17	0.92	0.76	0.96	174.5	80.1	56.8	0.7	4.7	8.8	2.9	2.7	1.8	7.6
14	Cimcali 97SCMV1A	4.11	4	1.11	0.52	-0.44	189.1	88.9	58.7	0.6	3.3	6.6	2.4	2.2	2.3	9.3
15	Cimcali 97Spod1A	3.74	9	1.01	0.20	0.16	182.2	81.0	60.1	0.9	4.7	8.2	2.5	2.3	1.9	3.5
16	Sikuani	3.66	11	0.79	-0.18	0.93	187.5	89.5	58.7	0.8	3.2	7.9	2.7	2.4	1.5	5.6
17	CLA18xCLA17	4.78	1	1.37	1.08	-1.70	191.9	93.1	59.0	0.7	3.6	7.0	2.4	2.0	2.6	2.9
18	Cimcali 96SA3	3.92	6	0.72	-3.39	0.15	185.5	85.9	59.1	0.8	6.0	7.9	2.5	2.2	2.2	23.3
19	Cimcali 96SA4	4.20	3	1.00	-1.65	-1.05	191.5	87.5	60.3	0.8	2.3	7.5	2.5	2.3	2.3	8.0
Mean		3.76					183.8	84.0	59.3	0.8	4.0	8.1	2.6	2.4	2.1	7.1
Max		4.78					196.4	93.1	60.9	1.3	6.0	13.8	2.9	2.7	3.0	23.3
Min		3.19					171.6	78.6	56.8	0.6	2.3	5.6	2.4	2.0	1.4	2.9
LSD (0.05)		0.28					3.8	3.1	0.6	0.2	1.5	2.5	0.1	0.2	0.2	3.2
CV (%)		13.75					5.6	11.2	2.1	99.9	4.7	6.5	15.3	16.1	17.1	6.0
Correlation acid vs. non acid soiis		0.85														

Fig. 4. Plot of 19 yellow OPVs, including 2 checks, in Acid Soil VI Yellow Trial planted at 27 locations (14 acid and 13 normal soils). 1998-2001.

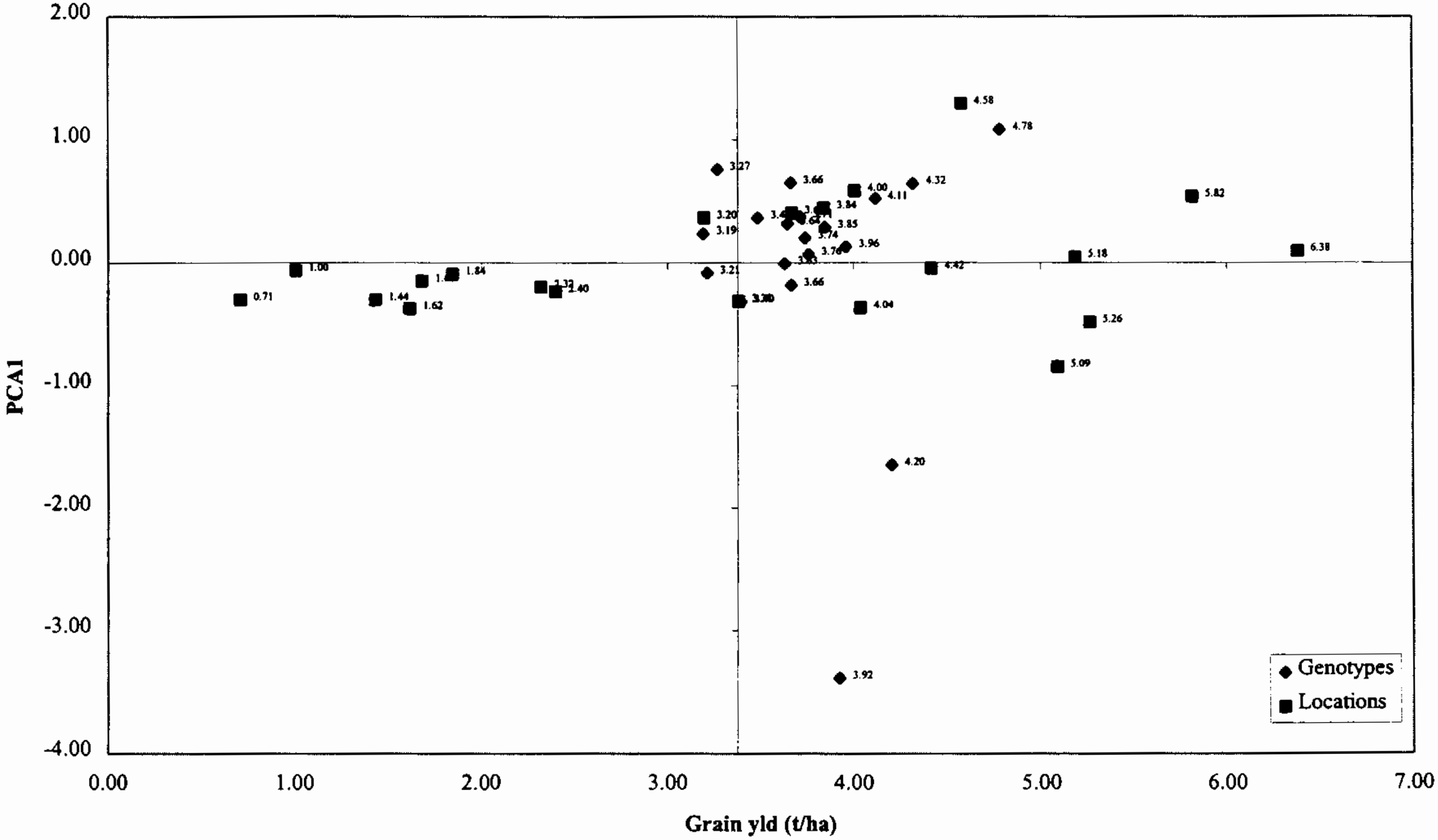

Table 13. Mean performance of 9 white OPVs, including 1 checks, in Acid Soil VII White Trial, planted at 13 locations (5 acid and 8 normal soils). 1998-2001.

Entry	Pedigree	Grain yld (t/ha)							Hgt		Anth	Lodg		End	Stunt	Asp	
						Across 13 Locs			Plt	Ear	date	Root	Stalk	hard		Ear	Plt
		Acid	No Acid	Mean	Rank	b	PCA1	PCA2	cm		d	%		1-5	%	1-5	
1	Cerrito 97Achap2B	3.65	4.79	4.36	2	1.1	-0.29	-0.18	190	92	60.5	2.4	6.2	1.7	12.3	2.5	2.3
2	Cerrito 97SCMV2B(SA6)	2.67	3.85	3.43	7	0.9	-0.25	0.07	174	82	62.8	3.9	8.1	2.2	10.6	2.7	2.7
3	Cerrito 97SCMV2B(SA7)	3.11	3.86	3.60	4	0.9	0.99	0.03	185	88	60.9	1.4	8.5	1.3	8.3	2.7	2.4
4	Cerrito 97SCMV2B(Pob 76)	2.92	4.02	3.63	3	0.8	1.20	-0.18	185	90	61.0	2.4	8.6	2.1	6.0	2.7	2.6
5	Tucuman 97Cog2C	2.48	3.29	3.00	8	0.7	1.03	0.84	172	76	60.5	3.3	7.0	1.7	14.1	2.8	2.8
6	Tucuman 97Cog2D	2.52	3.04	2.88	9	0.9	0.42	0.68	177	79	59.9	1.1	2.0	1.0	23.9	3.2	2.8
7	Tucuman 97Cog2E	2.97	3.81	3.56	6	1.3	-1.90	0.43	176	85	61.1	1.9	8.2	2.2	19.0	2.7	2.8
8	Tuxpeno	3.06	3.85	3.57	5	1.1	-1.16	0.26	189	88	61.6	0.1	8.2	1.4	16.9	2.8	2.5
9	CLA176xCLA215	4.24	4.96	4.73	1	1.0	-0.05	-1.94	185	87	62.8	0.1		2.6	7.7	2.1	
Mean		3.07	3.94	3.64					181.4	85.3	61.24	1.85	7.09	1.82	13.21	2.70	2.63
Max		4.24	4.96	4.73					189.6	91.8	62.84	3.85	8.56	2.64	23.90	3.19	2.81
Min		2.48	3.04	2.88					172.3	76.37	59.91	0.08	2.04	1.05	6.04	2.09	2.34
LSD (0.05)		0.46	0.70	0.48					6.53	4.68	1.47	2.18	3.54	0.35	1.96	0.21	0.26
CV (%)		12.62	10.50	11.42					5.64	11.65	2.61	5.01	6.60	24.28	6.08	17.55	14.75
Correlation acid vs. non acid soil				0.93													

Fig. 5. Plot of 9 white OPVs, including 1 checks, in Acid Soil VII White Trial planted at 13 locations (5 acid and 8 normal soils). 1998-2001.

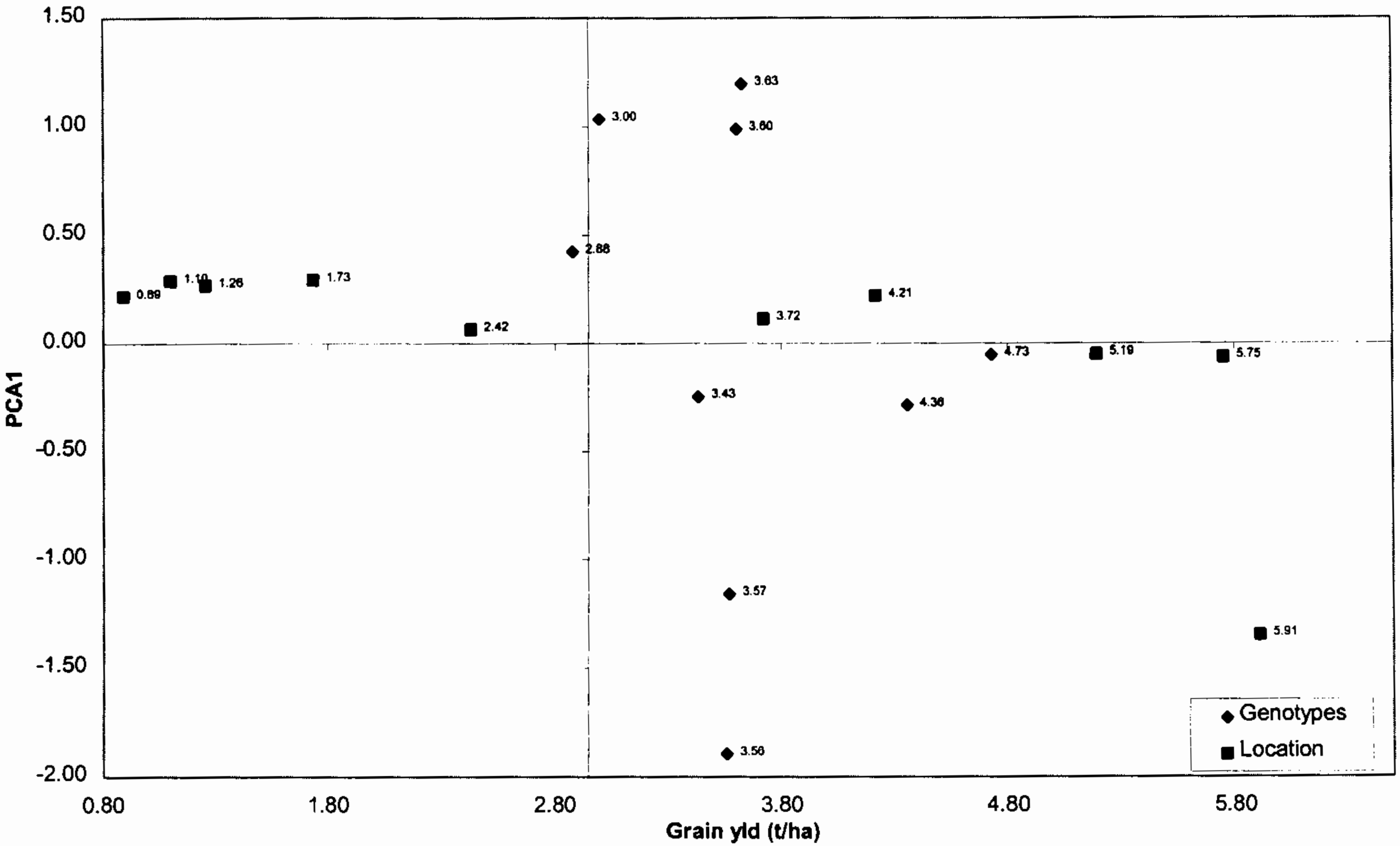

Table 14. Mean performance of 18 yellow OPVs, including 3 checks, in Acid Soil VII Yellow Trial, planted at 17 locations (8 acid and 9 normal soils). 1998-2001.

Entry	Pedigree	Grain yld							Ears/	Hgt		Asp		Silk	Lodging		End
						Across 17 Locs			plt	Plt	Ear	Plt	Ear	date	root	stem	hard
		Acid	No Acid	Mean	Rank	b	PCA1	PCA2		cm		1-5		d	%		1-5
1	Chore 97 Phaeo 1A	3.03	3.99	3.54	4	1.12	-0.28	-1.14	0.9	175.6	88.0	2.3	2.3	59.6	3.2	5.0	1.6
2	Chore 97 Phaeo 1C	2.03	2.88	2.48	18	0.97	1.11	-0.41	0.9	171.5	83.7	2.7	2.9	56.2	3.2	5.7	1.3
3	Cap. Miranda 97 Phaeo	2.99	3.92	3.48	6	1.06	-1.51	0.26	1.0	173.3	85.6	2.4	2.4	60.3	3.3	4.5	1.4
4	Capinopolis 97 Polyso 1C	2.46	3.33	2.92	12	1.10	-0.25	0.23	0.9	170.9	86.3	2.4	2.5	59.9	4.0	5.4	1.3
5	Capinopolis 97 Physo 1C	2.48	3.53	3.03	10	1.11	0.38	-0.12	1.0	168.4	83.5	2.6	2.8	60.8	3.8	3.6	1.3
6	Cerrito 97 Achap 2A	3.08	4.04	3.59	3	0.98	-0.78	0.14	1.0	173.6	84.9	2.4	2.4	59.1	3.1	6.3	1.5
7	Cerrito 97 SCMV	3.13	3.80	3.49	5	1.06	0.26	0.28	1.0	173.6	87.7	2.6	2.4	59.3	3.4	3.7	1.3
8	Cerrito 97 SCMV	2.98	3.53	3.27	7	0.75	0.21	0.56	1.0	174.1	83.5	2.6	2.4	60.6	5.2	5.7	1.5
9	Cerrito 97 SCMV	2.53	3.64	3.12	9	0.97	-0.47	-0.21	1.0	171.2	83.1	2.6	2.5	60.8	3.2	5.3	1.6
10	Tucuman 97 Cog 1C	2.31	3.12	2.74	15	0.92	0.78	0.20	0.9	171.2	83.9	2.4	2.8	60.7	6.2	3.8	1.8
11	Tucuman 97 Cog 1E	2.57	2.55	2.56	17	0.79	0.80	0.33	0.9	170.2	80.9	2.5	2.9	58.0	3.5	5.9	1.8
12	Precoz Amarillo 97B	2.63	3.15	2.90	13	0.78	0.06	0.73	0.9	166.5	76.8	2.4	2.6	57.0	4.2	8.5	1.2
13	Cap. Miranda 97 Achap	2.30	3.02	2.68	16	0.91	-0.06	0.12	0.9	165.9	81.4	2.4	2.6	60.2	4.1	4.1	1.5
14	Cap. Miranda 97 Phaeo	2.46	3.48	3.00	11	1.04	-0.48	-0.51	0.9	172.8	83.1	2.5	2.4	60.1	5.4	5.4	1.4
15	Capinopolis 97 Phaeo 1C	2.40	3.79	3.14	8	1.16	0.29	-1.08	0.9	169.1	84.4	2.6	2.7	59.7	2.3	3.8	1.3
16	Sikuani	2.67	3.09	2.89	14	0.72	0.06	0.79	0.9	172.8	86.1	2.7	2.6	59.1	4.1	5.9	1.5
17	CLA18xCLA17	3.78	4.52	4.17	2	0.96	-0.12	-0.18	1.1	174.3	81.7	2.3	1.7	57.4	3.5	5.1	1.1
18	Local check	3.46	5.33	4.46	1				1.0	182.0	91.2	2.3	1.8	59.4	2.9	3.8	1.2
Mean		2.74	3.49	3.19					0.9	171.5	83.8	2.5	2.5	59.3	3.9	5.2	1.4
Max		3.78	4.52	4.14					1.1	182.0	91.2	2.7	2.9	60.8	6.2	8.5	1.8
Min		2.03	2.55	2.35					0.9	165.9	76.8	2.3	1.7	56.2	2.3	3.6	1.1
LSD (0.05)		0.35	0.59	0.43					0.1	4.1	4.0	0.2	0.3	1.8	1.8	1.8	0.2
CV (%)		16.06	16.42	16.43					18.5	6.5	11.4	13.8	16.6	6.5	3.7	4.1	12.8
Correlation acid vs. non acid soils				0.8													

Fig. 6. Plot of 18 yellow OPVs, including 3 checks, in Acid Soil VII Yellow Trial planted at 17 locations (8 acid and 9 normal soils). 1998-2001.

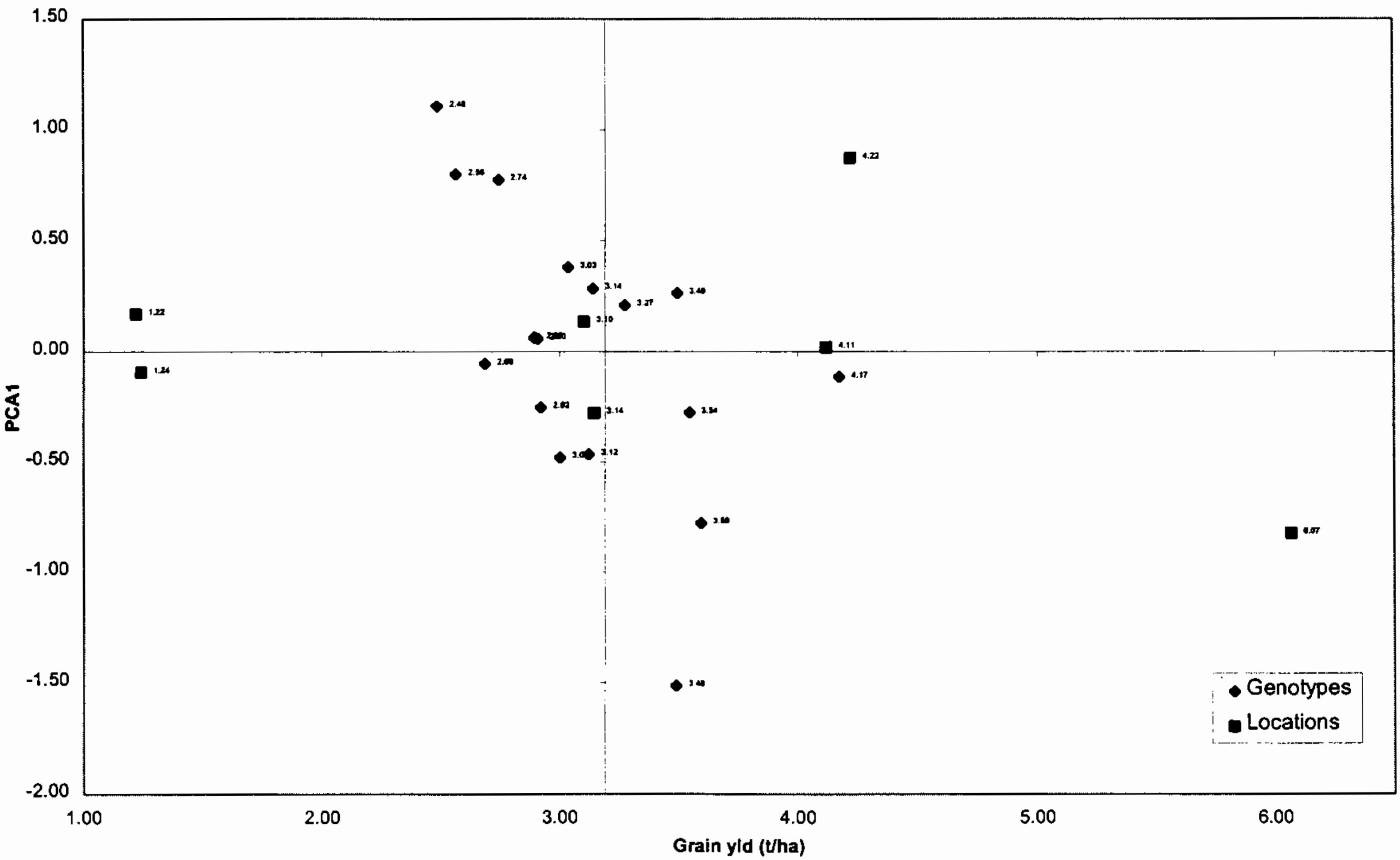

Table 15. Mean performance of 28 white hybrids including 4 checks, in Acid Soil VIII White Trial, planted at 7 locations (4 acid and 3 normal soils). 1998-2001.

Entry	Pedigree	Grain yld (t/ha)				Across 7 locs			Hgt		Asp		Anth	Lodg		Ear	Grain
									Plt	Ear	Plt	Ear	Date	Root	Stalk	rot	tex
		Acid	No Acid	Mean	Rank	b	PCA1	PCA2	cm		(1-5)		d	%		(1-5)	
1	CLA173/CLA215	3.60	4.84	4.16	14	0.9	0.3	-0.2	170.8	73.3	2.5	2.2	61.4	2.5	1.3	2.0	2.6
2	CLA174/CLA216	3.36	4.47	3.77	24	1.2	-0.5	0.0	169.1	73.0	2.4	1.9	61.9	5.8	2.7	2.4	2.8
3	CLA218/CLA211	3.66	5.13	4.33	10	1.0	0.2	-0.1	182.5	76.9	2.5	2.1	60.1	0.4	1.9	2.0	2.6
4	CLA170/CLA198	3.48	4.43	3.93	21	0.9	0.3	-0.5	194.5	97.2	2.6	2.1	61.3	0.3	7.4	1.9	1.8
5	CLA179/CLA200	3.53	5.16	4.25	12	0.9	0.5	0.5	172.7	85.5	2.6	1.8	59.3	0.8	3.5	1.5	1.4
6	CLA189/CLA211	3.44	4.25	3.79	22	0.5	1.0	-0.3	198.2	95.6	2.6	2.4	60.4	0.9	4.8	2.5	2.2
7	CLA217/CLA205	3.11	4.09	3.48	26	1.1	-0.3	0.0	167.5	73.0	2.7	2.2	60.2	1.8	3.1	1.4	2.3
8	CLA183/CLA212	3.98	5.57	4.67	4	0.9	0.8	0.3	186.0	88.6	2.3	1.9	60.4	3.6	2.5	2.2	2.5
9	CLA190/CLA212	3.58	6.17	4.75	3	1.3	-0.3	0.8	189.0	85.6	2.7	2.0	60.1	2.8	4.9	2.4	2.6
10	CLA176/CLA215	3.54	6.66	4.88	1	1.5	-0.5	0.9	176.9	78.7	2.4	2.1	60.4	1.6	4.9	1.6	2.5
11	CLA191/CLA211	3.52	4.95	4.16	13	0.9	-0.3	-0.4	195.7	90.3	2.3	2.2	60.4	3.4	5.4	2.5	2.9
12	CLA183/CLA196	3.68	5.80	4.58	7	1.0	-0.2	0.7	177.3	88.5	2.3	1.8	60.6	0.9	5.0	1.7	2.1
13	CLA171/CLA204	4.00	5.47	4.66	5	1.1	-0.2	-0.1	177.5	84.0	2.5	2.0	62.3	1.2	2.4	2.2	2.3
14	CLA187/CLA195	3.36	5.05	4.14	15	1.1	-0.2	0.1	182.0	86.1	2.1	2.2	61.8	0.0	3.7	2.4	1.9
15	CLA185/CLA193	3.95	5.22	4.51	8	1.1	0.1	-0.3	183.2	95.7	2.0	2.0	62.6	0.9	2.0	1.8	1.8
16	CLA185/CLA194	3.96	6.00	4.83	2	1.4	-0.4	0.3	186.1	87.9	1.9	1.6	62.4	2.4	1.9	1.6	1.3
17	CLA220/CLA207	3.63	4.50	3.98	19	1.1	0.0	0.0	171.1	79.0	2.2	1.8	60.4	0.9	3.7	1.6	1.5
18	CLA175/CLA214	3.31	3.91	3.42	27	1.0	-0.9	-0.5	182.2	80.4	2.5	2.2	61.8	10.0	3.9	3.5	3.2
19	CLA175/CLA199	3.39	4.77	3.96	20	0.9	0.0	0.0	178.0	75.5	2.5	2.1	61.9	3.0	5.1	1.8	2.2
20	CLA222/CLA207	3.66	4.84	4.10	17	1.0	0.3	0.4	166.0	77.8	2.5	1.9	60.3	0.6	3.1	1.6	1.8
21	CLA184/CLA209	3.39	5.08	4.13	16	0.9	0.4	0.4	161.8	73.4	2.4	1.9	59.5	0.5	3.9	1.5	2.4
22	CLA178/CLA203	3.85	4.88	4.28	11	0.6	0.3	-0.4	185.8	90.6	2.2	1.9	60.0	1.3	4.6	2.3	2.7
23	CLA186/CLA197	3.47	4.25	3.77	23	0.9	0.0	-0.3	177.0	79.7	2.2	2.1	60.7	1.3	2.4	2.2	2.1
24	CLA188/CLA197	3.29	4.24	3.64	25	1.1	-0.7	-0.4	174.4	80.1	2.0	2.0	61.0	0.3	6.6	1.7	2.1
25	Local Check1 Tuxpeño Seq	2.85	3.53	3.16	28	0.8	0.3	-0.4	172.7	80.6	2.6	2.3	61.2	2.8	6.6	1.6	1.5
26	Local Check2	4.22	5.03	4.60	6	0.9	0.3	-0.2	167.4	81.2	1.9		64.3	0.7	2.5	1.6	3.5
	(CML247xCML254)											1.8					
27	Local Check3	3.52	5.49	4.41	9	1.0	0.2	0.4	177.2	82.1	2.3	2.3	60.8	0.5	5.0	2.4	3.4
28	Local Check4	3.83	4.31	4.08	18	1.1	-0.1	-0.5	176.9	79.4	1.8	1.9	62.5	1.4	4.3	2.6	2.8
Mean		3.58	4.93	4.16					178.6	82.8	2.3	2.0	61.1	1.9	3.9	2.0	2.3
Max		4.22	6.66	4.88					198.2	97.2	2.7	2.4	64.3	10.0	7.4	3.5	3.5
Min		2.85	3.53	3.16					161.8	73.0	1.8	1.6	59.3	0.0	1.3	1.4	1.3
SD (0.05)		0.55	1.16	0.65					6.5	6.1	0.5	0.4	1.0	2.7	2.8	4.0	0.8
CV (%)		12.86	17.36	16.00					5.0	10.0	17.7	15.2	1.8	2.9	3.8	7.2	9.5
cid vs. non acid soil				0.56													

Fig. 7. Plot of 28 white hybrids, including 4 checks, in Acid Soil VIII White Trial planted at 7 locations (4 acid and 3 normal soils). 1998-2001.

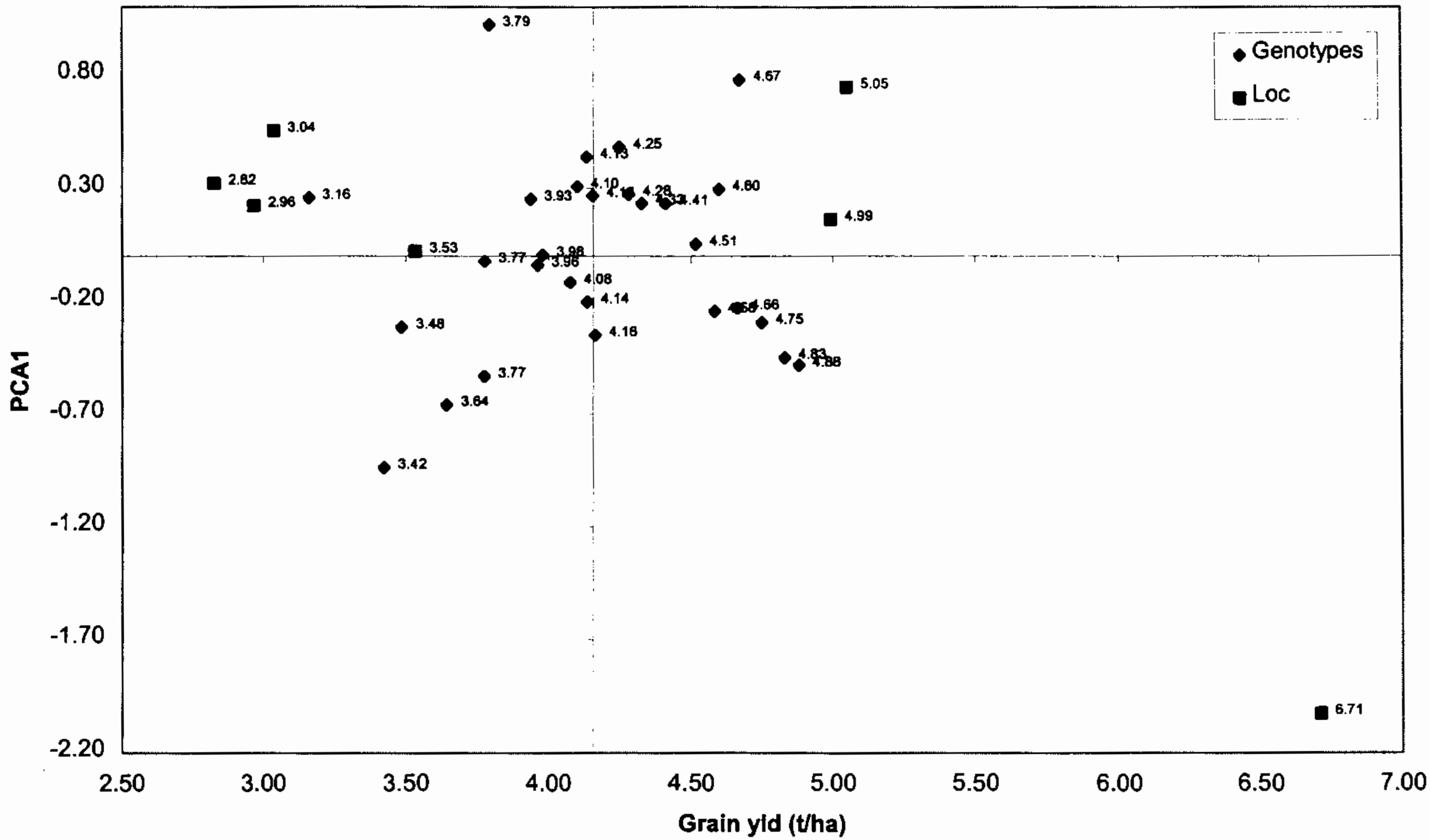

Table 16. Mean performance of 32 yellow hybrids, including 4 checks, in Acid Soil VIII Yellow Trial, planted at 8 locations (4 acid and 4 normal soils). 1998-2001.

Entry	Pedigree	Grain yld (t/ha)				Across 8 locs			Hgt		Asp		Silk date	Lodg		End hard
									Plt	Ear	Ear	Plt		Root	Stalk	
		Acid	No Acid	Mean	Rank	b	PCA1	PCA2	cms		(1-5)		days	%		(1-5)
1	CLA149/CLA162	3.97	4.99	4.49	1	1.2	-0.6	0.3	189.8	78.3	2.2	1.9	58.2	0.2	4.4	1.9
2	CLA151/CLA169	3.99	4.73	4.31	6	0.9	0.1	-0.5	189.8	77.7	1.9	1.6	58.2	0.9	2.3	1.1
3	CLA152/CLA168	3.64	4.76	4.21	12	1.0	-0.2	-0.6	185.8	73.7	1.8	1.9	57.6	0.7	6.4	1.1
4	CLA152/CLA169	3.49	4.48	3.95	20	0.9	0.4	0.1	186.7	75.4	1.9	1.7	58.6	0.9	4.1	1.2
5	CLA153/CLA166	2.93	4.08	3.50	29	1.0	-0.1	-0.2	183.8	76.4	2.1	1.9	58.4	0.3	2.2	1.2
6	CLA153/CLA167	3.75	4.62	4.16	15	0.9	0.2	-0.1	186.5	77.9	2.0	1.5	58.3	1.1	5.9	1.2
7	CLA155/CLA137	3.82	4.82	4.25	10	0.8	0.4	-0.4	190.2	84.2	1.9	1.8	59.1	1.9	4.7	1.2
8	CLA157/CLA143	3.61	3.70	3.66	28	0.8	0.2	0.2	177.3	80.7	2.3	2.6	59.5	1.4	4.1	1.1
9	CLA157/CLA145	3.33	4.03	3.69	25	1.0	0.0	0.3	175.5	79.4	2.0	1.8	58.4	0.8	5.4	1.2
10	CLA158/CLA144	3.64	4.39	3.99	18	1.0	0.3	0.2	185.4	82.8	2.2	2.0	58.3	0.8	7.3	1.4
11	CLA147/CLA161	3.53	4.81	4.18	14	1.2	-0.3	0.6	201.3	95.3	2.0	1.7	57.6	0.4	10.2	1.7
12	CLA148/CLA161	4.00	4.85	4.43	2	1.3	-0.5	0.7	193.1	80.6	2.2	2.1	58.4	0.9	5.0	1.7
13	CLA148/CLA162	3.83	4.72	4.27	9	1.2	-0.7	0.4	189.1	83.5	2.0	1.7	59.4	0.9	4.6	1.9
14	CLA154/CLA139	3.80	4.66	4.19	13	0.7	0.9	-0.2	188.5	91.8	1.8	1.7	58.8	1.7	5.4	1.7
15	CLA157/CLA141	3.29	3.52	3.40	30	0.9	0.2	0.5	171.9	74.9	2.3	1.8	57.9	0.1	4.1	1.3
16	CLA158/CLA141	3.26	3.47	3.34	31	0.8	0.3	0.1	182.4	77.3	2.4	2.0	57.8	2.1	6.3	1.3
17	CLA158/CLA143	3.51	3.91	3.69	26	0.9	0.0	0.5	180.9	82.0	2.4	2.3	59.6	0.9	4.5	1.3
18	CLA146/CLA164	3.14	4.71	3.88	21	1.2	-0.6	0.0	202.4	87.5	2.0	1.8	59.3	0.4	7.7	1.2
19	CLA146/CLA165	3.28	4.71	4.00	17	1.2	0.0	0.0	203.8	87.1	2.0	1.7	58.8	1.7	8.1	1.2
20	CLA150/CLA163	3.82	4.76	4.33	5	1.1	-0.3	0.1	195.6	86.5	2.0	1.9	58.6	0.0	3.0	2.0
21	CLA151/CLA167	3.93	4.93	4.43	3	0.9	-0.1	-0.1	190.8	77.9	1.8	1.7	58.1	0.4	5.5	1.1
22	CLA152/CLA166	3.07	4.40	3.80	22	0.9	0.1	-0.5	184.4	78.5	1.9	1.9	58.5	0.4	4.0	1.2
23	CLA153/CLA169	3.82	4.52	4.23	11	0.8	0.4	-0.3	189.4	75.4	1.9	1.8	57.9	0.9	4.2	1.2
24	CLA155/CLA138	3.71	4.88	4.28	8	1.1	-0.1	-0.1	193.8	91.1	2.0	1.6	59.6	2.7	6.5	1.3
25	CLA156/CLA138	3.68	5.05	4.41	4	1.2	-0.3	0.1	183.0	81.0	1.7	1.8	58.2	1.6	5.4	1.5
26	CLA159/CLA142	3.01	4.16	3.67	27	1.0	-0.1	-0.2	187.3	87.3	2.0	1.7	58.3	0.1	5.1	1.5
27	CLA159/CLA145	3.27	4.34	3.80	23	1.2	-0.4	-0.1	187.9	88.1	2.2	1.7	58.8	1.4	6.3	1.7
28	CLA160/CLA142	3.14	4.47	3.71	24	1.0	0.1	0.0	179.9	86.0	2.1	1.8	58.6	0.6	6.8	1.1
29	Local Check1 Sikuani	2.65	3.48	3.11	32	0.7	1.0	0.5	186.4	86.8	2.4	1.9	58.7	5.4	5.5	1.3
30	Local Check2 CORPOICA H108	3.80	4.86	4.31	7	1.0	0.3	0.1	190.6	86.1	1.9	1.7	56.8	2.1	4.8	1.2
31	Local Check3	2.95	4.92	3.98	19	1.2	-0.5	-0.7	190.6	88.8	2.4	2.1	57.9	2.1	8.0	1.8
32	Local Check4	3.35	4.76	4.11	16	1.1	-0.4	-0.6	197.7	98.3	2.0	1.8	58.7	3.7	6.2	1.1
Mean		3.50	4.48	3.99					188.2	83.1	2.1	1.8	58.5	1.2	5.4	1.4
Max		4.00	5.05	4.49					203.8	98.3	2.4	2.6	59.6	5.4	10.2	2.0
Min		2.65	3.47	3.11					171.9	73.7	1.7	1.5	56.8	0.0	2.2	1.1
LSD (0.05)		0.47	0.71	0.45					6.58	5.98	0.29	0.42	1.10	1.59	3.15	0.26
CV (%)		11.99	12.28	12.99					5.1	10.4	16.2	27.2	4.8	3.0	4.7	11.5
Correlation acid vs. non acid soils				0.64												

Fig. 8. Plot of 32 yellow hybrids, including 4 checks, in Acid Soil VIII Yellow Trial planted at 8 locations (4 acid and 4 normal soils). 1998-2001.

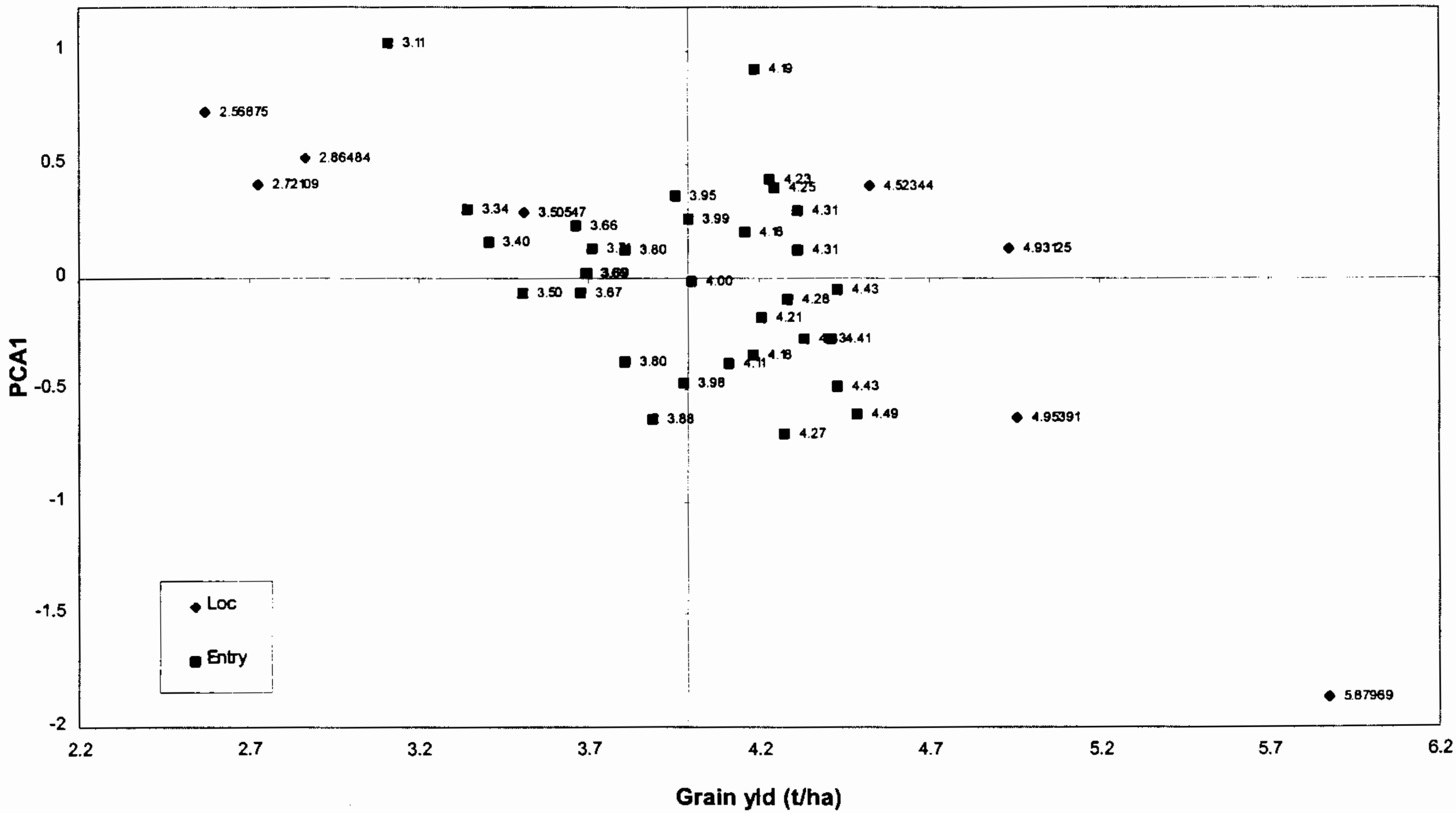

Table 17. Mean performance of 20 white OPVs, including 4 checks, in Acid Soil X White Trial, planted at 12 locations (4 acid and 8 normal soils). 2000-2001.

Entry	Pedigree	Grain yld (t/ha)				Across 12 locs			Hgt		Asp		Silk	ASI	Lodg		Ear	End
									Plt	Ear	Ear	Plt	date		Root	Stalk	rot	hard
		Acid	No acid	Mean	Rank	b	PCA1	PCA2	cm		1-5		d		%		%	1-5
1	Cimcali 99SCMVSA6A	3.22	3.74	3.57	7	1.04	-0.37	-0.26	171.0	85.8	2.1	2.5	65.5	1.3	5.7	3.2	10.6	2.3
2	Cimcali 99SCMVSA6N	3.11	3.76	3.53	8	1.09	0.00	-0.19	170.4	83.0	2.3	2.7	64.9	0.7	6.3	5.2	8.7	2.7
3	Cimcali 99SCMVSA7A	3.26	3.39	3.36	11	0.81	0.03	0.62	184.1	88.7	1.9	2.8	62.8	0.9	9.3	2.8	9.7	1.7
4	Cimcali 99SCMVSA7N	2.95	3.50	3.32	12	1.18	-0.19	-0.72	182.5	85.9	2.1	2.9	62.5	1.0	11.3	5.5	10.2	1.7
5	Cimcali 99SA6A1	2.64	3.50	3.24	13	1.16	0.09	0.06	170.4	80.5	2.2	2.8	64.5	1.1	8.7	2.7	8.2	2.2
6	Cimcali 99SA7A1	2.67	2.94	2.85	17	0.92	-0.29	-0.23	172.8	84.8	2.2	2.9	62.4	0.7	10.0	6.2	9.2	1.6
7	Cimcali 99SA6N1	3.14	3.82	3.60	6	1.10	0.02	-0.19	178.1	87.2	2.2	2.5	65.5	0.6	4.4	4.1	9.5	3.1
8	Cimcali 99SA7N1	3.21	4.24	3.90	4	1.27	0.19	-0.65	182.5	90.4	1.9	2.5	64.1	0.8	10.6	3.1	9.2	1.6
9	Cimcali 99SA6A2	2.55	2.97	2.83	18	0.79	-0.21	0.22	168.9	77.5	2.5	2.8	64.1	0.3	4.1	4.1	8.5	2.5
10	Cimcali 99SA7A2	2.70	3.13	2.99	15	0.76	-0.13	0.46	178.5	84.8	2.5	2.8	64.5	1.0	11.4	5.9	12.8	1.9
11	Cimcali 99SA6N2	2.83	3.06	2.98	16	0.75	-0.36	0.13	171.6	82.9	2.6	2.9	64.7	0.6	5.0	2.8	9.8	2.8
12	Cimcali 99SA7N2	2.43	2.34	2.36	20	0.45	-0.84	0.95	184.6	88.3	2.9	3.0	64.9	0.8	13.8	3.9	15.0	1.4
13	Cimcali 99SA7-1	2.92	3.79	3.50	9	1.16	-0.15	-0.46	176.4	87.9	2.1	2.7	62.4	0.6	14.1	2.7	10.1	1.3
14	Cimcali 99SA6-1	2.81	3.30	3.14	14	0.71	-0.28	0.21	173.6	86.0	2.5	2.8	65.9	1.0	5.7	5.0	11.9	2.6
15	Cimcali 99SA7	2.31	2.68	2.55	19	0.74	-0.45	0.52	185.0	86.4	2.9	3.0	64.4	0.8	17.8	5.4	13.7	1.5
16	Cimcali 99Achap2A	3.16	3.55	3.41	10	0.89	-0.13	0.20	171.2	80.5	2.3	2.7	63.6	0.9	4.4	5.0	8.7	2.1
17	Cimcali 97Achap2ASA6	3.44	3.88	3.73	5	1.24	0.02	-0.62	179.9	88.2	2.1	2.6	64.7	1.1	8.0	4.8	8.7	2.4
18	CLA185 x CLA194	4.18	4.71	4.53	3	0.98	-0.44	0.07	187.2	96.3	1.5	2.2	64.7	0.8	12.5	1.4	6.5	1.5
19	CORPOICA H108	3.61	6.00	5.21	1	1.40	2.67	0.62	186.4	93.2	1.6	2.2	63.8	1.4	7.4	2.3	6.0	2.2
20	Local Check1	4.10	5.06	4.72	2	1.57	0.81	-0.75	191.3	94.1	1.6	2.3	65.1	1.4	9.2	2.9	7.4	1.6
Mean		3.06	3.67	3.47					178.3	86.6	2.2	2.7	64.3	0.9	9.0	4.0	9.7	2.0
Max		4.18	6.00	5.21					191.3	96.3	2.9	3.0	65.9	1.4	17.8	6.2	15.0	3.1
Min		2.312	2.34	2.36					168.9	77.5	1.5	2.2	62.4	0.3	4.1	1.4	6.0	1.3
LSD (0.05)		0.437	0.83	0.59					5.4	4.7	0.3	0.3	0.7	0.5	4.7	1.8	3.0	0.3
CV (%)		15.8	17.35	17.04					6.567802	10.8	21.1	16.9	2.0	131.9	7.7	4.0	6.4	19.4
Correlation Acid Vs No Acid soil				0.84														

Fig. 9. AMMI of 20 white OPVs, including 4 checks, in Acid Soil X White Trial planted at 12 locations (4 acid and 8 normal soils). 2000-2001.

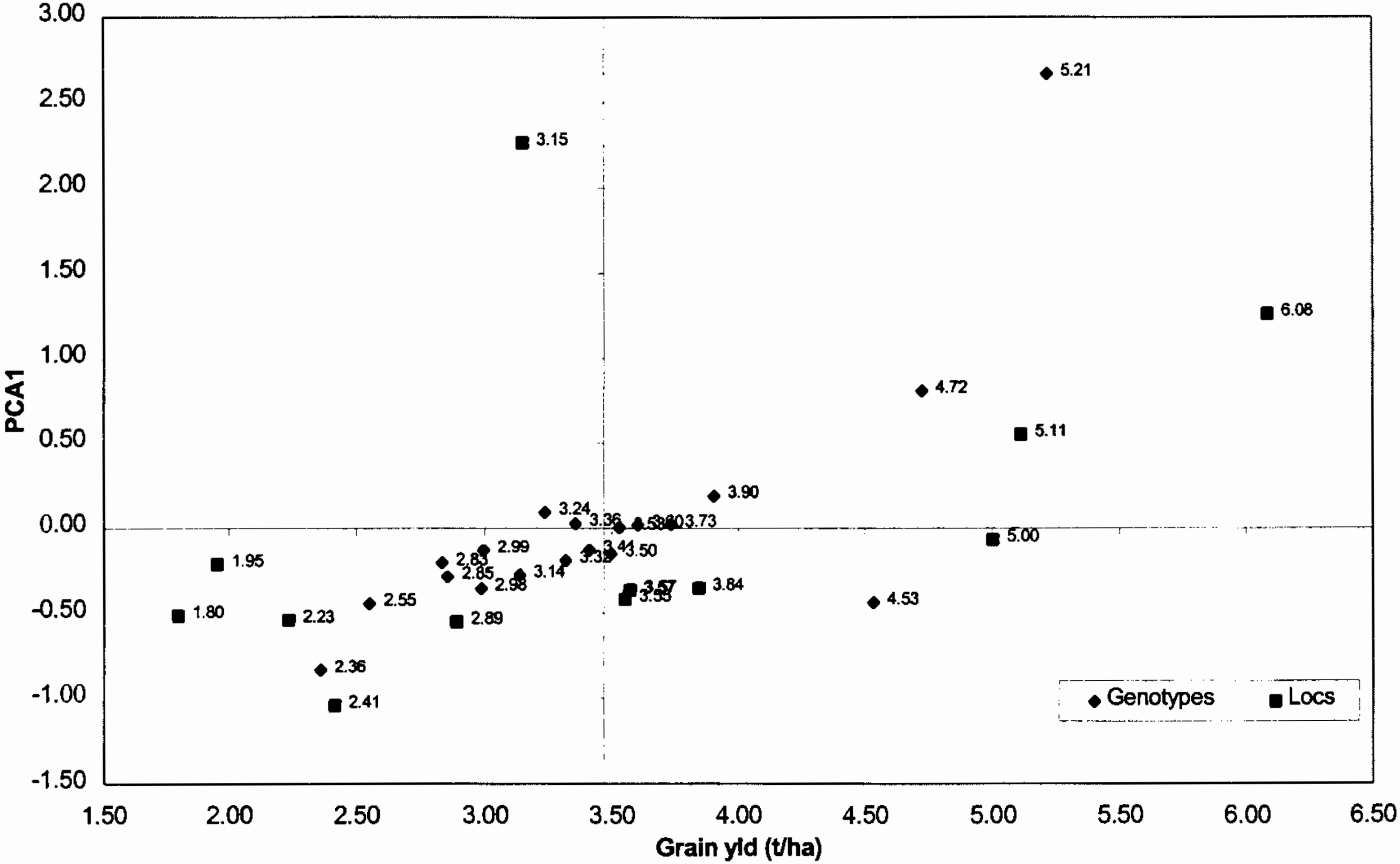

Table 18. Mean performance of 15 yellow OPVs, including 5 checks, in Acid Soil X Yellow Trial, planted at 6 locations (1 acid and 5 normal soils). 1999-2001.

Entry	Pedigree	Grain yld (t/ha)							Hgt		Asp		Silk	ASI	Lodg		Ear	Disease	Insects
							Across 6 locs		Plt	Ear	Plt	Ear	date		root	stem	rot		
		Acid	No Acid	Mean	Rank	b	PCA1	PCA2	cm		1-5		d		%		%	%	1-5
1	Cimcali 99 SCMV SA3A	2.66	4.00	3.78	3	1.0	-0.05	0.22	181.2	87.8	2.7	2.1	61.0	1.8	10.3	8.2	8.3	13.9	2.0
2	Cimcali 99 SCMV SA3N	2.47	3.78	3.55	7	1.0	-0.29	0.52	180.2	81.7	2.8	1.9	60.2	1.7	11.0	7.6	7.8	13.8	2.3
3	Cimcali 99 SCMV SA4A	2.43	3.87	3.62	5	1.0	0.58	0.55	174.4	80.1	2.9	2.0	60.3	1.9	11.6	9.7	9.6	14.2	2.1
4	Cimcali 99 SCMV SA4N	2.47	3.90	3.67	4	1.0	0.42	-0.47	182.9	82.7	2.9	2.3	60.3	1.8	13.6	9.0	12.9	15.8	2.1
5	Cimcali 99 SA3A	1.31	2.02	1.91	14	0.8	0.08	0.37	152.1	65.7	3.8	3.3	61.1	2.3	14.0	5.5	16.3	13.8	2.1
6	Cimcali 99 SA4A	1.85	2.96	2.78	12	0.9	0.00	-0.74	167.2	77.1	3.1	2.5	62.8	1.9	9.9	11.9	14.8	14.7	2.0
7	Cimcali 99 SA3N	1.43	1.96	1.86	15	0.7	-0.03	0.48	152.9	63.2	3.6	3.1	60.8	2.1	13.3	5.3	14.5	13.8	2.4
8	Cimcali 99 SA4N	1.49	2.78	2.57	13	0.8	-0.08	-0.14	173.4	73.3	3.2	2.4	61.0	1.8	10.4	14.3	14.6	14.5	1.9
9	Sete Lagoas 97A Phaeo 1A	1.22	3.62	3.22	9	1.0	-1.09	0.02	166.5	78.4	2.9	2.3	61.2	1.8	8.0	5.9	19.0	14.9	2.1
10	Sete Lagoas 97A Polys 1A	1.21	3.43	3.07	10	1.3	-0.65	-0.14	172.8	82.4	3.1	2.7	62.1	2.1	5.7	7.7	21.3	14.8	2.2
11	Saracura	2.35	3.84	3.59	6	0.7	-0.57	-0.58	174.2	86.8	2.2	1.8	61.0	1.9	7.4	8.9	9.4	13.4	1.6
12	Cimcali 97 Achap 1A	2.64	3.71	3.52	8	1.0	0.17	0.13	170.4	80.4	2.8	2.0	60.2	1.4	11.0	5.0	6.5	15.1	2.6
13	Sikuani	1.99	3.12	2.94	11	0.9	0.33	-0.16	178.3	87.7	3.3	2.4	61.0	1.7	18.4	9.0	13.9	13.7	2.2
14	CORPOICA H108	2.43	4.18	3.90	2	1.4	0.20	0.38	177.6	80.8	2.8	1.7	60.0	1.5	13.7	6.1	9.7	14.5	1.9
15	Local Check1	2.50	4.38	4.06	1	1.5	0.98	-0.43	183.6	90.8	2.3	1.9	61.1	1.9	10.1	6.3	9.6	14.6	1.4
Mean		2.0	3.4	3.20					172.5	79.9	3.0	2.3	60.9	1.8	11.2	8.0	12.5	14.4	2.1
Max		2.7	4.4	4.06					183.6	90.8	3.8	3.3	62.8	2.3	18.4	14.3	21.3	15.8	2.6
Min		1.2	2.0	1.86					152.1	63.2	2.2	1.7	60.0	1.4	5.7	5.0	6.5	13.4	1.4
LSD(0.05)		0.0	0.7	0.62					7.8	6.4	0.5	0.4	1.0	0.5	6.5	4.7	6.1	1.2	0.0
CV (%)		15.2	15.0	15.20					6.6	12.1	18.8	20.8	2.1	37.8	8.7	5.5	8.2	11.3	29.5
Correlation acid vs. non acid soil				0.73															

Fig. 10. Plot of 15 yellow OPVs, including 5 checks, in Acid Soil X Yellow Trial planted at 7 locations (4 acid and 3 normal soils). 1999-2001.

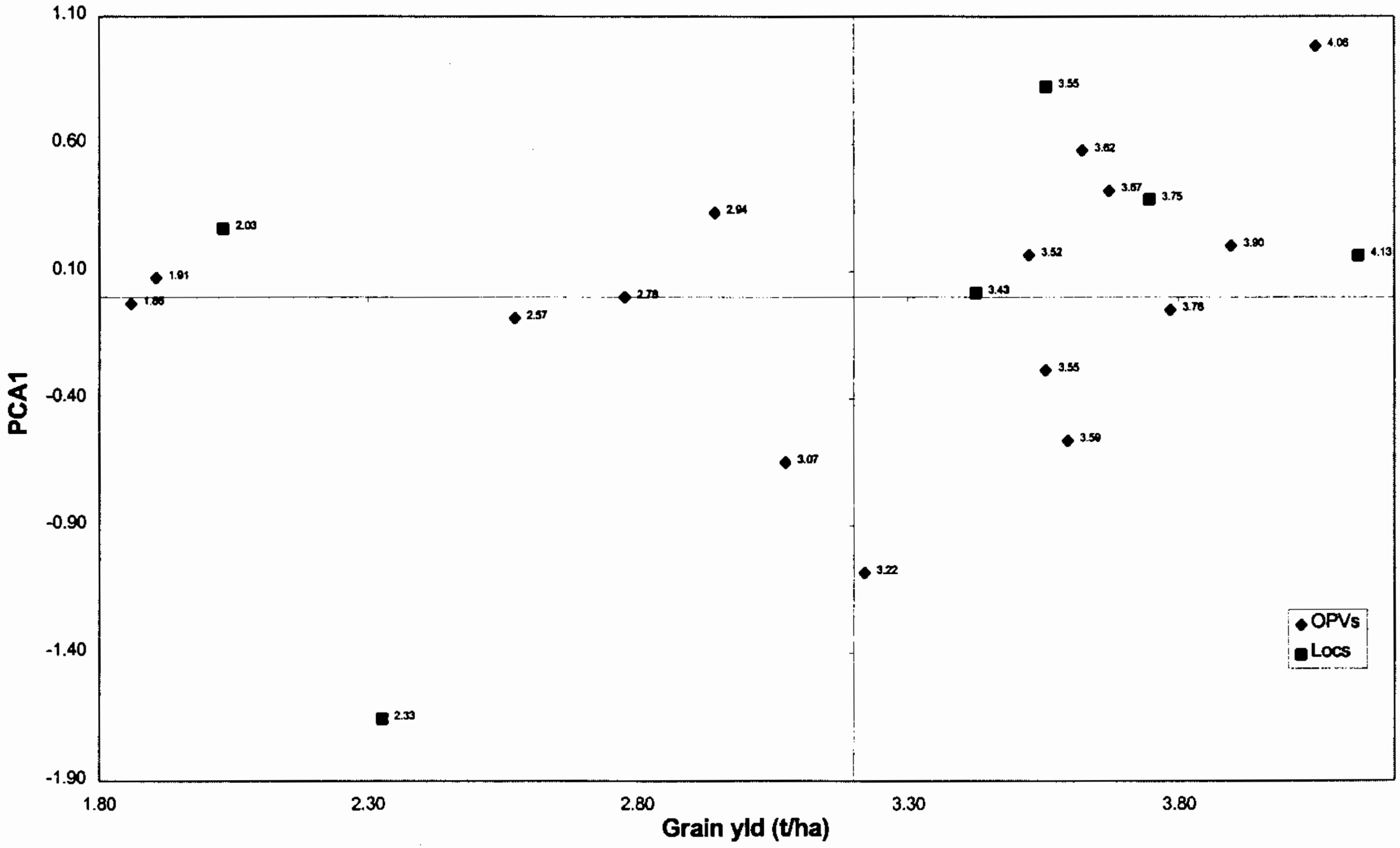

Table 19. Grain yield of 10 selected yellow hybrids, including 6 QPM, 1 normal and 3 checks, planted in validation trial at Santa Cruz, Bolivia. 2001A, B.

Entry	Hybrid	Mairana 1	Mairana 2	Charagua 1	Charagua 2	Promedio
1	CML164 x CML161	4.621	7.533	5.327	3.58	5.269
2	CML164 x CML172	3.639	7.481	5.438	3.33	4.972
3	CML165 x CML161	8.195	9.124	7.733	4.713	7.441
4	CML170 x CML 161	5.561	6.522	6.097	3.3	5.370
5	CLQ6601 x CML172	6.317	7.227	6.197	4.712	6.363
6	CLQ6601 x CLQ6502	4.756	7.09	5.42	4.255	5.380
7	CLO2450 x CML451	7.51	8.202	7.796	5.878	7.346
8	AG612 (CK)	6.207	9.109	6.103	6.128	6.886
9	AG4890 (CK)	8.376	7.877	6.983	6.502	7.434
10	CH36 (CK)	5.567	7.138	3.695	4.308	5.177
Mean		**6.074**	**7.830**	**6.078**	**4.672**	**6.164**

Table 20. Mean performance of 12 yellow OPVs, including 2 checks, planted of 6 locations in Bolivia. 2001 B.

Entry	Pedigree	Grain yld (t/ha)							Silk	Hgt		Lodg		Asp		Husk	End
									Date	Plt	Ear	Root	Stalk	Ear	Plt	cover	hard
		San Pedro	Saavedra	Mairana	Cbaragua	San Julian	Cañada Larga	Combinado									
		Loc 1	Loc 2	Loc 3	Loc 4	Loc 5	Loc 6		d	cm		(%)					
1	Iquitos 9328	4.3	3.3	6.1	4.2	3.7	1.3	4.6	61.0	191.8	100.2	2.6	7.1	1.6	1.2	14.8	3.0
2	Tak Fa S 9536	4.2	2.6	7.3	6.6	3.2	1.2	5.3	62.2	177.5	89.5	1.7	7.1	2.2	1.6	13.9	3.0
3	Tak Fa S 9528	5.3	3.5	6.6	5.9	4.5	1.1	5.6	63.8	206.2	110.0	4.8	3.0	1.5	1.3	10.8	3.0
4	Iboperenda 8666	4.4	2.3	6.4	4.5	2.5	0.6	5.5	60.1	176.3	83.2	0.4	2.5	2.3	2.1	17.4	3.0
5	Across 8765	3.9	2.2	6.6	5.3	2.6	0.6	4.6	58.3	173.4	86.3	1.4	5.0	2.4	2.0	22.5	1.8
6	Across S 9536	4.6	3.0	7.3	5.8	3.8	1.1	5.4	61.9	188.8	100.4	1.4	8.2	1.8	1.8	8.3	3.0
7	S99 TLYQ-AB	3.9	2.4	6.2	4.7	3.4	1.1	4.6	60.4	181.7	95.7	0.4	5.9	2.0	1.7	20.1	2.1
8	S99 TLYQ-HG-AB	4.1	2.3	6.6	4.8	3.2	1.5	4.7	60.4	175.7	91.4	0.7	6.6	2.1	2.0	19.6	1.9
9	S97 "TLYGH "A y B" (1)	4.1	2.7	7.4	6.4	3.5	1.3	4.4	62.3	184.7	98.8	0.4	6.2	2.0	1.6	16.7	2.9
10	S96 G26 TLYD	4.7	2.9	6.6	7.1	3.9	1.0	5.5	62.6	193.4	95.3	1.6	5.1	1.6	1.4	14.3	3.0
11	Suwan Saavedra (local check	4.5	3.4	6.0	4.3	3.7	0.7	4.6	61.2	191.3	102.8	3.2	5.0	1.7	1.8	12.9	1.0
12	Chiriguano 36 (local check)	4.6	2.5	6.0	5.1	4.6	1.4	5.0	60.1	181.9	92.9	1.9	6.6	1.8	1.8	8.0	3.1
Mean		4.4	2.8	6.6	5.4	3.6	1.1	5.0	61.2	185.2	95.5	1.7	5.7	1.9	1.7	14.9	2.6
Min		3.9	2.2	6.0	4.2	2.5	0.6	4.5	58.3	173.4	83.2	0.4	2.5	1.5	1.2	8.0	1.0
Max		5.3	3.5	7.4	7.1	4.6	1.5	5.6	63.8	206.2	110.0	4.8	8.2	2.4	2.1	22.5	3.1
LSD (0.05)		0.8	1.3	0.9	1.0	1.1	0.6	0.8	2.1	9.5	5.8	2.7	3.9	0.6	0.6	10.0	0.2
CV (%)		10.4	27.5	7.7	11.7	17.3	35.4	11.2	2.1	5.7	10.2	3.0	3.2	21.7	16.1	10.0	5.1

Tabla 21. QPM and normal yellow hybrids in Validation Test. TP 01A, 01B.

Entry	Pedigree	Grain yld (t/ha)											Silk	ASI	Hgt		Asp		Lodg		Ear	End	Husk
		Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank	b	date		Plt	Ear	Plt	Ear	Root	Stalk	rot	hard	cover
		TP 01B		San Antonio		TP 01A		Tierra Alta		Combined 4 Locs			days		cm		1-5		%		%	1-5	%
1	H7Q	4.70	3	5.56	5	5.42	4	3.76	4	4.85	5	0.9	48.3	-0.1	217.3	123.9	2.2	1.8	6.1	4.6	3.2	1.5	1.5
2	H6Q	4.00	6	5.97	3	6.04	2	3.40	6	4.88	4	1.5	50.8	0.6	235.6	120.4	2.0	2.0	8.7	7.3	9.0	1.0	1.6
3	H9ANS	5.43	1	7.28	1	6.34	1	5.11	1	6.07	1	1.1	50.2	-0.4	242.8	130.0	2.3	1.7	10.7	1.6	2.9	1.6	1.8
4	H10ANS	4.55	5	5.44	6	4.38	6	3.50	5	4.37	6	0.8	51.9	0.7	244.3	130.4	2.6	2.6	14.5	2.9	3.4	2.8	1.6
5	H8ANS	4.85	2	6.37	2	5.61	3	4.88	2	5.35	2	0.8	50.5	-0.1	261.6	131.9	2.7	2.1	36.9	1.8	3.1	3.0	1.9
6	P3018	4.64	4	5.72	4	5.28	5	4.21	3	5.10	3	0.8	49.2	0.1	243.5	120.7	2.2	1.9	10.3	7.3	4.2	1.6	1.6
Mean		4.70		6.06		5.51		4.14		5.10			50.1	0.1	240.8	126.2	2.3	2.0	14.5	4.3	4.3	1.9	1.7
Max		5.43		7.28		6.34		5.11		6.07			51.9	0.7	261.6	131.9	2.7	2.6	36.9	7.3	9.0	3.0	1.9
Min		4.00		5.44		4.38		3.40		4.37			48.3	-0.4	217.3	120.4	2.0	1.7	6.1	1.6	2.9	1.0	1.5
LSD (0.05)		0.57		0.44		0.43		0.62		0.58			1.7	0.7	7.8	7.2	0.7	0.5	17.3	4.1	2.3	0.2	0.2
CV (%)		7.95		4.75		5.15		9.86		6.94			2.6	802.1	2.8	5.3	20.8	18.7	12.0	3.3	3.4	12.0	19.0

Tabla 22. Mean performance of 20 QPM and normal white hybrids, including 3 checks, planted at 4 location in Valle del Cauca. Colombia.2001B.

Entry	Pedigree	Grain yld (t/ha)				Mean	Rank	%	b	PCA1	PCA2
		Buga	Obando	Palmira	Roldanillo	Across 4 locations					
1	HE2052	10.67	10.51	10.08	10.17	10.43	1	8	0.1	-0.3	0.1
2	HE2051	11.41	11.31	9.22	9.09	10.21	2	6	0.8	0.3	-0.7
3	HE2059	10.12	10.61	7.57	10.11	9.66	3	0	1.0	0.2	0.3
4	HE2062	9.88	10.52	9.39	9.18	9.66	4	0	0.5	-0.4	0.0
5	SV1127 (CK)	9.91	10.87	10.04	8.04	9.65	5	0	0.2	1.0	-0.1
6	HE2057	10.26	10.58	7.80	8.88	9.41	6	-3	1.0	-0.3	0.6
7	HEQ2055	9.91	9.60	6.56	11.19	9.32	7	-3	1.1	-0.1	-0.1
8	HEQ2052	9.33	11.62	7.58	8.54	9.20	8	-5	1.4	-0.6	-0.4
9	HE2061	9.23	10.56	6.47	9.80	8.98	9	-7	1.1	-0.7	0.2
10	Nakar (CK)	8.72	9.86	7.67	9.15	8.88	10	-8	0.8	-0.8	-0.6
11	HEQ2053	9.66	10.08	5.53	10.25	8.86	11	-8	1.6	-1.0	0.0
12	DK7712 (CK)	10.30	8.98	6.92	9.28	8.81	12	-9	0.8	-0.5	0.2
13	HE2054	8.61	11.17	7.18	8.38	8.72	13	-10	1.4	-0.2	1.2
14	HE2053	8.83	10.78	7.40	8.40	8.72	14	-10	1.2	-0.7	0.1
15	HEQ2054	9.26	10.48	6.06	8.43	8.62	15	-11	1.3	-0.1	-0.4
16	HE2055	9.47	11.20	5.87	8.32	8.59	16	-11	2.0	-0.1	0.2
17	HE2060	8.13	10.38	6.00	8.90	8.40	17	-13	1.2	0.7	0.4
18	HE2056	8.46	10.87	6.94	6.41	8.31	18	-14	1.2	0.4	0.6
19	HE2058	8.07	9.19	6.41	7.29	7.98	19	-17	0.3	0.0	0.0
20	HEQ2051	8.17	8.31	5.28	7.79	7.43	20	-23	1.1	-0.5	0.7
Mean		9.42	10.37	7.30	8.88	8.99					
Max		11.41	11.62	10.08	11.19	10.43					
Min		8.07	8.31	5.28	6.41	7.43					
LSD (0.05)		1.54	1.22	1.07	1.73	1.11					
CV (%)		9.80	7.03	8.76	11.63	9.72					

Fig 11. Plot of 20 normal and QPM white hybrids, including 3 checks, planted at 4 locations en Valle del Cauca, Colombia. 2001B.

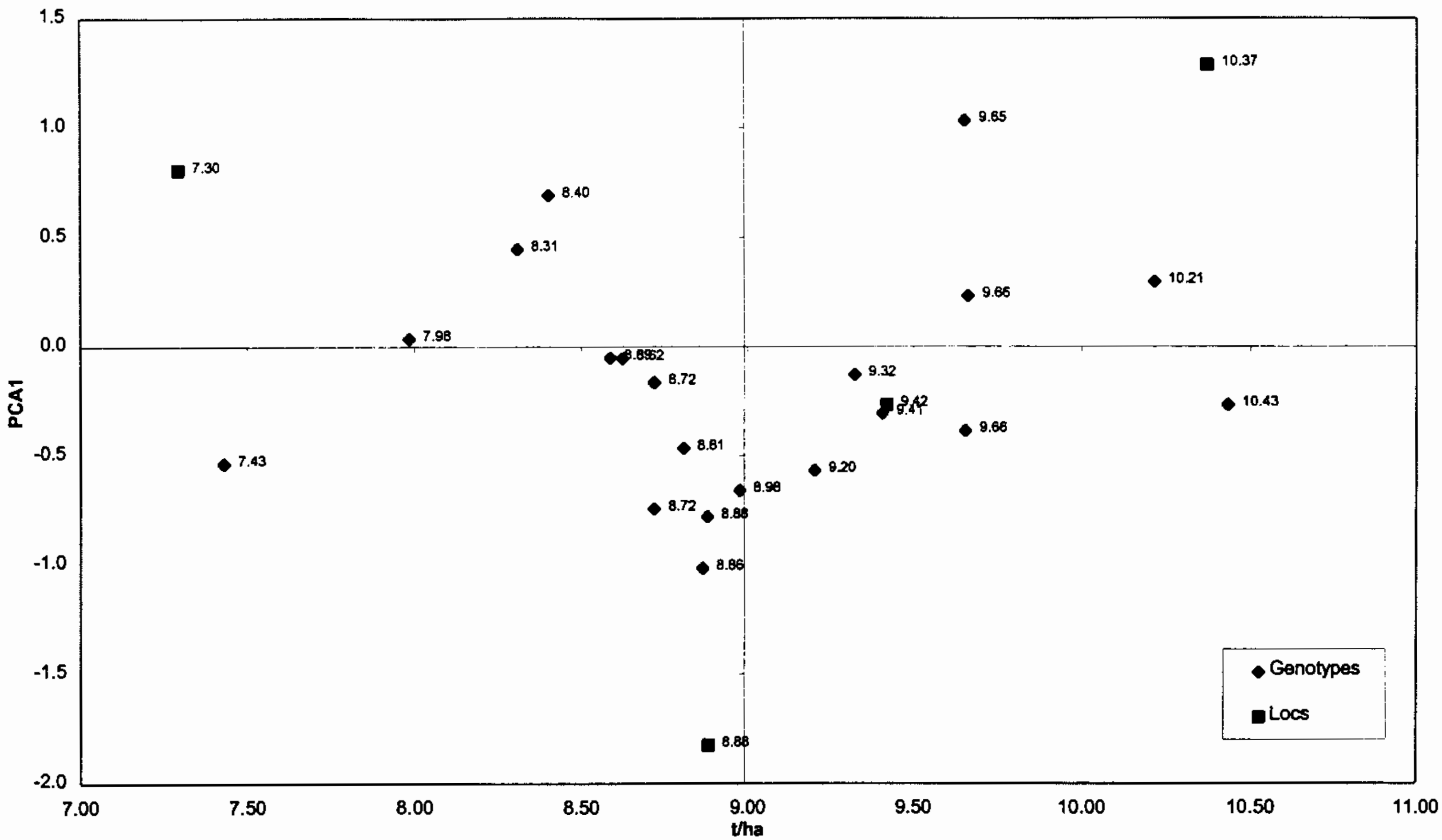

Tabla 23. Mean performance of 20 QPM and normal yellow hybrids, including 3 checks, planted at 4 locations in Valle del Cauca, Colombia. 2001B.

Entry	Pedigree	Grain yld (t/ha)									
		Locations				Mean	Rank	%	b	PCA1	PCA2
		Buga	Obando	Palmira	Roldanillo	Across 4 locations					
1	HE2001	11.91	14.35	10.09	10.71	11.66	1	10	1.4	0.3	-0.5
2	HE2005	11.17	12.99	9.65	11.33	11.30	2	6	1.1	-0.2	0.8
3	HE2002	11.62	13.35	7.85	9.94	10.75	3	1	1.7	1.0	0.0
4	SV1031(CK)	8.88	12.53	10.33	10.79	10.64	4	0	0.7	-0.8	0.1
5	C4004 (CK)	10.91	10.86	8.54	9.84	10.05	5	-6	0.8	0.1	-0.6
6	Master (CK)	10.15	11.66	7.12	9.55	9.64	6	-9	1.5	0.5	0.8
7	HEQ2005	10.32	10.78	8.50	8.60	9.51	7	-11	0.7	-0.5	-0.1
8	HEQ2004	9.96	11.59	7.75	7.56	9.21	8	-13	1.1	0.2	-0.1
9	HEQ2002	9.35	11.25	6.68	9.43	9.18	9	-14	1.5	0.3	0.1
10	HE2003	9.50	10.66	6.47	9.93	9.15	10	-14	1.4	0.4	0.0
11	HE2004	8.56	10.53	7.15	10.16	9.13	11	-14	1.3	-0.1	1.0
12	HE2006	10.07	10.05	7.53	8.16	8.95	12	-16	0.9	0.0	-0.2
13	HEQ2001	9.69	11.57	6.77	7.82	8.82	13	-17	1.5	0.6	-0.5
14	HE2007	9.19	10.58	5.64	8.10	8.43	14	-21	1.6	0.7	0.3
15	HE2012	7.82	9.21	8.42	7.86	8.36	15	-21	0.2	-0.6	-0.1
16	HE2008	8.56	8.66	7.42	8.52	8.34	16	-22	0.5	-0.4	-0.4
17	HE2009	9.04	8.93	7.45	7.17	8.16	17	-23	0.4	-0.3	-0.2
18	HE2011	6.86	9.37	7.05	8.55	8.03	18	-25	0.8	-0.3	0.3
19	HEQ2003	8.04	9.81	7.06	6.63	7.92	19	-26	0.8	0.0	-0.6
20	HE2010	7.16	6.90	6.93	7.56	7.03	20	-34	0.0	-0.9	0.0
Mean		9.44	10.78	7.72	8.91	9.21					
Max		11.91	14.35	10.33	11.33	11.66					
Min		6.86	6.90	5.64	6.63	7.03					
LSD (0.05)		1.29	1.37	1.50	1.41	1.21					
CV (%)		8.18	7.60	11.62	9.47	9.11					
Correlation acid vs. non acid soils											

Fig 12. AMMI of 20 QPM and normal yellow hybrids, including 3 checks, planted at 4 locations in Valle del Cauca, Colombia. 2001B

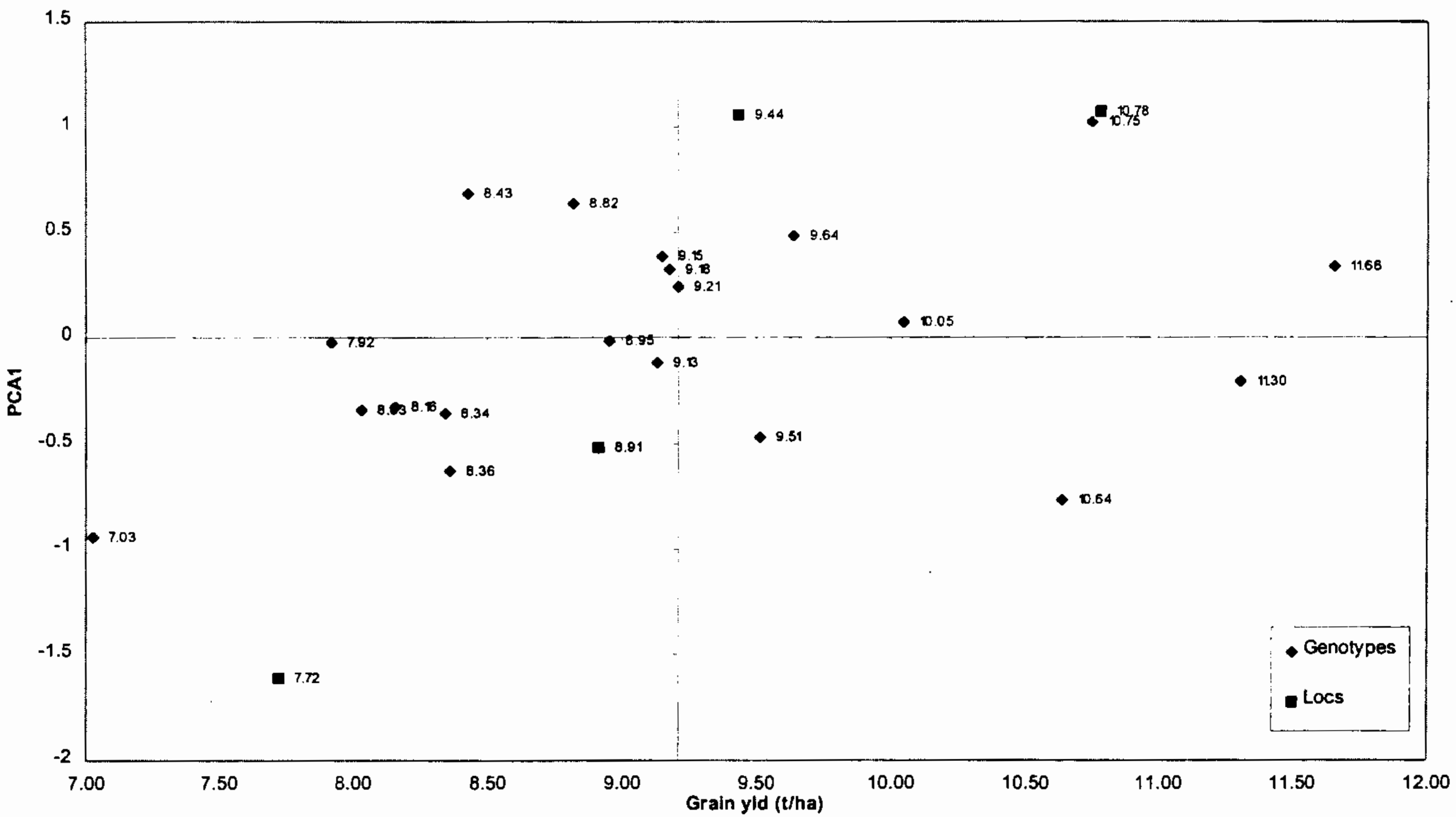

Table 24. Mean grain yield (t/ha) of 3 yellow normal hard endosperm experimental and 2 commercial maize hybrids planted in 7 locations in the Peruvian coast. 2001A, B.

Season	Locations	HE1	HE2	HE3	T1	T2	Mean
2001 A	Humay	7.74	7.45	10.17	8.89	-	**8.56**
	Huascar	8.08	7.06	10.71	9.82	9.83	**9.10**
	Chinchaysuyo	6.45	8.59	9.42	8.06	-	**8.13**
	Pachacamac	8.50	8.94	7.72	5.85	-	**7.75**
	Vilcahuara	7.54	7.06	7.70	9.03	8.26	**7.91**
	Chacaca	7.69	6.15	7.95	8.20	6.30	**7.25**
	Araya Grande	10.52	8.69	11.04	9.77	9.15	**9.83**
	Portao	7.06	7.64	8.25	6.48	7.06	**7.30**
	Viru	6.90	5.75	8.25	7.65	-	**7.13**
	Simbal	12.15	8.40	11.13	10.70	-	**10.59**
	Ascope	7.74	6.25	7.47	8.61	-	**7.52**
	Motupe 1	7.46	6.62	8.48	7.95	6.55	**7.41**
	Motupe 2	7.16	5.86	8.04	7.32	-	**7.09**
	Motupe 3	10.58	9.91	11.22	8.93	9.10	**9.95**
	Illimo	4.45	3.98	4.48	3.44	3.95	**4.06**
	Mochumi	4.92	3.20	5.77	5.13	3.84	**4.57**
	Mean	**7.81**	**6.97**	**8.61**	**7.86**	**7.11**	**7.67**
2001 B	Ascope	9.29	8.43	11.72	9.39	8.03	**9.37**
	Viru	8.27	8.12	8.71	7.30	-	**8.10**
	Sullana	9.77	7.87	9.33	8.65	-	**8.90**
	Motupe	8.91	8.46	9.55	8.79	-	**8.93**
	Mocan	8.64	9.64	9.60	9.22	-	**9.28**
	Illimo	8.23	7.45	8.35	7.53	-	**7.89**
	Huaura	9.37	8.41	9.73	7.70	9.62	**8.97**
	Mean	**8.93**	**8.34**	**9.57**	**8.37**	**8.83**	**8.78**
Mean		**8.15**	**7.39**	**8.90**	**8.02**	**7.42**	**8.04**

Table 25. Grain yield (t/ha) of three experimental yellow QPM hybrids and one normal check planted at 7 locations in the Peruvian coast. 2001B.

Locations	HQ1	HQ2	HQ3	T1	Mean
Viru	9.12	9.00	6.78	7.30	8.05
Motupe	10.89	11.85	-	8.79	10.51
Mocan	9.81	10.28	9.44	9.22	9.69
Illimo	11.93	7.86	7.74	7.53	8.76
Huaura	9.18	9.47	12.53	7.70	9.72
Mean	**10.19**	**9.69**	**9.12**	**8.11**	**9.32**

Fig. 13. Grain yield (t/ha) of 3 experimental and 2 commercial normal yellow hybrids averaged across 7 locations in two growing seasons. Perú. 2001 A, B.

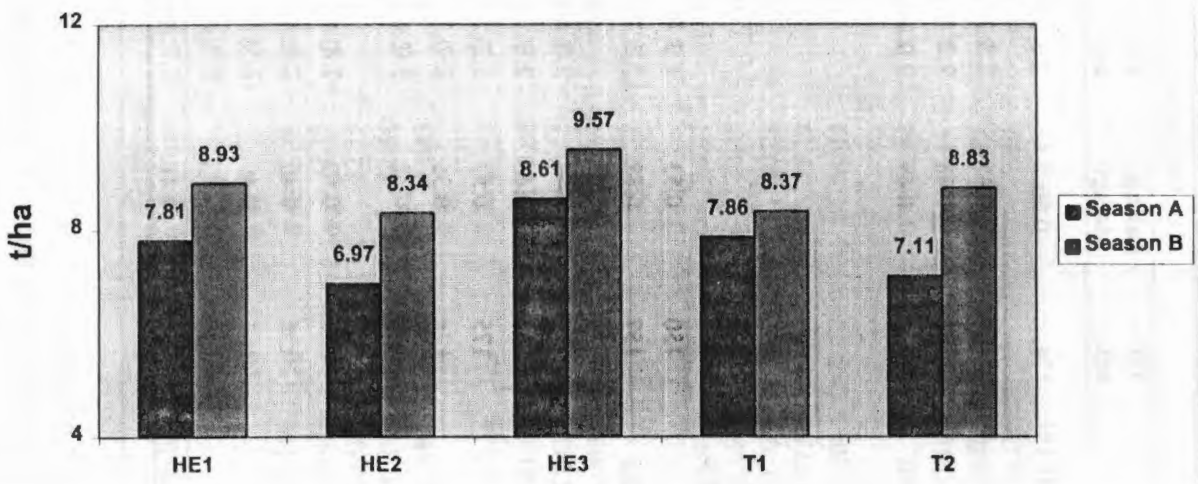

Table 26. Mean performance of parental inbred lines planted at four different plant densities. Viru, 2001.

		SEASON A				SEASON B			
Entry	Treatment	Plt hgt	Ear hgt/ pta hgt	Ear asp	Grain yld (t/ha)	Plt hgt	Ear hgt/ pta hgt	Ear asp	Grain yld (t/ha)
1	CML287-0.15	174	0.50	2.5	8.05	128	0.34	2.5	4.70
2	CML287-0.20	166	0.45	2.3	8.47	132	0.33	2.5	4.20
3	CML287-0.25	153	0.48	2.2	8.94	135	0.36	2.7	3.51
4	CML287-0.30	169	0.49	2.0	7.11	128	0.32	2.5	3.31
5	CML 297-0.15	-	-	-	-	113	0.37	2.2	3.56
6	CML 297-0.20	-	-	-	-	120	0.38	2.0	3.33
7	CML 297-0.25	-	-	-	-	114	0.35	2.2	3.14
8	CML 297-0.30	-	-	-	-	109	0.38	2.3	2.66
9	CML413-0.15	150	0.53	3.0	5.17	94	0.39	2.2	3.17
10	CML413-0.20	157	0.52	2.7	6.01	102	0.40	2.3	3.31
11	CML413-0.25	156	0.54	3.0	5.21	96	0.35	2.5	2.62
12	CML413-0.30	159	0.48	2.8	4.85	95	0.36	2.5	2.70
13	CL00368-0.15	175	0.57	3.2	4.62	135	0.46	2.8	3.25
14	CL00368-0.20	174	0.56	2.7	3.56	136	0.50	3.2	2.52
15	CL00368-0.25	178	0.52	3.0	4.35	130	0.44	2.8	2.49
16	CL00368-0.30	178	0.52	2.8	3.68	131	0.44	3.0	2.14
17	CL02410-0.15	156	0.46	2.5	5.17	93	0.45	3.2	2.71
18	CL02410-0.20	164	0.48	2.5	4.81	82	0.37	3.0	1.88
19	CL02410-0.25	140	0.42	3.0	4.41	85	0.41	3.0	1.62
20	CL02410-0.30	154	0.48	2.7	4.71	90	0.44	3.2	1.33

Table 27. Mean performance of 20 yellow QPM experimental hybrids, planted at 3 locations in the Coast of Peru. Vista Florida, Viru, and Huacho, 2001B

Entry	Hybrid	Grain yld (t/ha)	Rank	Anthesis	ASI	Plt hgt	Ear hgt/ plt hgt	Plt asp	No. plt	No. ears	Ear asp	Ear rot
				(days)			(cm)	(1-5)			(1-5)	(%)
2	CML172 x CML166	12.94	1	105	2.5	239	0.54	3.0	76	76	2.3	0.7
4	CML172 x CLQ6601	12.29	2	103	2.8	234	0.51	2.3	75	95	2.8	0.0
10	CLQG2509 x CML165	12.19	3	108	2.0	235	0.58	2.8	77	105	3.3	0.3
3	CML169 x CML172	11.56	4	108	2.3	244	0.58	2.8	75	86	3.0	0.5
15	CML161/CML165 x CML172	11.43	5	107	3.3	245	0.54	3.0	77	89	3.5	0.5
16	CML161 x CML165	11.13	6	107	2.3	228	0.56	2.8	78	100	3.0	0.5
11	CLQ6602 x CML161	10.86	7	108	2.3	228	0.54	2.5	78	100	3.2	0.2
9	CLQG2508 x CML161	10.85	8	107	2.3	227	0.55	3.0	76	82	2.8	0.0
19	CML 287 x CL00368	10.82	9	109	2.3	239	0.56	2.8	79	77	2.8	0.5
18	CML 287 x CML 413	10.70	10	109	2.8	244	0.58	2.8	75	79	2.9	0.2
17	CML451 x CL02450	10.31	11	112	2.0	209	0.51	2.3	78	82	2.7	0.0
1	CMl172 x CML164	10.30	12	102	1.3	221	0.55	3.3	77	84	3.4	1.7
14	CML161/CML170 x CML165	10.29	13	108	2.3	212	0.54	3.0	76	86	3.0	0.5
12	CML164/CML172 x CML161	10.19	14	103	3.3	214	0.57	3.3	75	81.	3.1	0.2
13	CML172/CLQ6601 x CML161	10.12	15	104	2.8	235	0.54	3.0	76	81	3.2	0.8
20	CL 02410 x CML 297	10.04	16	109	2.3	222	0.55	2.8	78	80	2.7	0.0
8	CML164 x CML161	9.14	17	104	2.5	209	0.58	3.3	76	77	3.1	0.0
6	CLQG2602 x CML161	8.98	18	108	2.0	211	0.59	3.0	76	78	3.2	0.8
5	CLQG2602 x CLQ6502	8.79	19	106	2.5	220	0.62	3.0	75	79	3.0	0.0
7	CML170 x CML161	8.57	20	104	2.0	194	0.56	2.8	77	75	3.0	0.2
Gral mean		10.57		107	2.4	225	0.56	2.9	76	85	3.0	0.4
Mean QPM		10.60		106	2.4	225	0.56	2.9	76	86	3.0	0.4
Mean normal		10.47		110	2.3	228	0.55	2.6	77	80	2.8	0.2

Table 28. Mean performance of 12 white QPM entries, including 4 checks, planted at 18 locations in Venezuela. 2001A, 2001B.

Description	Grain yld	Days to tassel	Days to silk	Pta Hgt	Ear hgt	Plt asp	Lodg	Open husk	Ear rot	Ear asp	Endosp hard
	(t/ha)			cm				(%)			
INIAHQ-3	7.1	54	54	239	127	2.6	23	3	11	2.7	2.6
INIAHQ-1	7.1	55	56	236	120	2.4	23	3	7	2.4	2.2
INIAHQ-2	6.9	55	55	238	122	2.5	21	4	8	2.5	2.4
INIAHQ-11	6.8	55	55	242	142	2.8	22	4	8	2.5	2.0
INIAHQ-10	6.6	54	55	231	120	2.5	13	3	10	2.6	3.0
INIAHQ-9 (CK)	6.4	55	55	221	112	2.4	23	4	8	2.7	3.3
FONAIAP-2004 (CK)	6.4	56	58	250	146	2.9	18	3	8	2.6	2.1
INIAHQ-7	6.0	55	55	230	135	2.7	35	3	8	2.4	1.9
HIMECA-2000	6.1	56	57	247	145	3.0	24	7	11	3.0	2.8
CARGILL-114 (CK)	5.6	55	57	213	117	2.7	21	4	8	2.9	2.7
INIA-4	5.6	55	57	241	133	3.0	35	6	13	2.9	2.1
PIONEER-30F94 (CK)	5.0	56	57	243	139	2.6	17	10	9	2.6	2.4
Mean	6.3	55	56	236	130	2.7	23	4	9	2.7	2.5

Table 29. Heterotic pattern of yellow lines and OPVs supplied by NARS. 2001.

Group A (CML287) Pedigree	Group B (CML413) Pedigree
BR-105/25-B-B-B-B	BR-105/30-B-B-B-B
BR-105/49-B-B-B-B	BR-105/62-B-B-B-B
BR-105/58-B-B-B-B	BR-201/20-B-B-B-B
BR-105/67-B-B-B-B	ICA V-109/23-B-B-B-B
BR-106/37-B-B-B-B	ICA V-109/39-B-B-B
ICA V-109/6-B-B-B	ICA V-109/48-B-B-B
ICA V-109/38-B-B-B-B	ICA V-109/71-B-B-B-B
ICA V-109/39-B-B-B	Br-1/60-B-B-B-B
ICA V-109/71-B-B-B-B	Br-1/85-B-B-B-B
Br-1/6-B-B-B-B	Br-2/5-B-B-B-B
Br-1/59-B-B-B-B	Guarani V-312/18-B-B-B
Br-2/65-B-B-B-B	Guarani V-312/55-B-B-B-B
Guarani V-312/18-B-B-B	Sint. Dent. Pai.-101/50-B-B-B-B
Guarani V-312/57-B-B-B	CML27
PIMLE 88(Rep. Dom. 7)/25-B-B-B	CML318
BOZM 1168 x Suwan/42-2-1-B-B-B	Lin. Promisoria-B-B-B-B
Sint. Dent. Pai.-101/54-B-B-B	Br-2/79-B-B-B-B
CML282-B	Sint. Dent. Pai.-101/16-B-B-B-B
CML289-B-B-B	Sint. Dent. Pai.-101/22-B-B-B-B
Br-2/79-B-B-B-B	CLA44SA3-C4HC(16x25)-2-4-3-6-B-B-B-B-B-B-B-B-B
Sint. Dent. PAI-101/35-B-B-B-B	
CLA16SA3-C4HC(19x25)-2-6-4-5-B-B-B-B-B-B-B-B	

Table 30. Maize germoplasm distribuited from SARMP during 2001.

No Shimpts	Germplasm	Entries	Countries	Institutions	Collaborators
A. Trials					
1	Acid Soil V Yellow	28	1	1	1
11	Acid Soil VI Yellow	20	7	7	7
2	Acid Soil VI White	16	2	2	2
13	Acid Soil VII Yellow	18	8	8	8
2	Acid Soil VII White	12	2	2	2
4	Acid Soil VIII Yellow	32	3	3	3
3	Acid Soil VIII White	28	2	2	2
4	Acid Soil IX Yellow	24	3	3	3
1	Acid Soil IX White	15	1	1	1
16	Acid Soil X Yellow	15	10	10	10
13	Acid Soil X White	20	9	9	9
2	Acid Soil XI Yellow	20	1	1	1
5	Hybrids Trial Yellow	20	1	1	1
11	Hybrids Trial Yellow for Caribbean	20	1	1	1
5	Hybrids Trial Yellow	20	1	1	1
11	Yellow Varts. Trial for Caribbean	20	1	1	1
B. Nurseries					
9	CML Acid soil tolerant	2,6,12 or 16	5	6	8
10	CLA Yellow	4,11 or 90	9	7	10
3	CLA White	54	3	3	3
3	S1 Sweet Corn Yellow	16	1	3	3
1	S1 Sweet Corn White	9	1	1	1
3	S1 SRRC2 SA3	272	1	1	3
3	S1 SRRC2 SA4	188	1	1	3
6	S2 SRR-C1 Am	100	5	5	5
1	S2 SRR-C1 Bl	140	1	1	1
1	S2 SRR-C1 SA3	70	1	1	1
1	S2 SRR-C1 SA4	30	1	1	1
1	S2 SRR-C1 SA6	42	1	1	1
1	S2 SRR-C1 SA7	99	1	1	1
1	S2 Acid Soil Maps	180	1	1	1
3	S3 CLA27xCML357	114	1	1	3
1	S8 Isogenic	10	1	1	1
5	Sn Acid soil tol. Yellow	311	1	3	4
5	Sn Acid soil tol. White	60	1	3	4
9	S1 Stunt tol. Yellow	70	6	6	6
2	S1 Stunt tol. White	48	2	2	2
3	S1 Cercospora tol. Yellow	121	2	2	2
1	S1 Phaeosphaeria tol.Yellow	14	1	1	1
1	S1 SCMV tol. Yellow	144	1	1	1
1	S1 Hmaydis tol. Yellow	180	1	1	1
7	S2 Phaeosphaeria tol. Yellow	36	6	6	6

Table 30. Continued...

2	S2 Phaeosphaeria tol. White	20	2	2	2
1	S3 Stunt tol. Yellow	270	1	1	1
5	S3 Phaeosphaeria tol. Yellow	52/41	1	1	1
1	S3 Polysora tol. Yellow	16	1	1	1
4	S3 Phaeosphaeria tol. White	41	1	1	1
2	Sn DMR	160/23	1	1	1
10	S1 FAW tol. Yellow	55	8	8	8
6	S1 FAW tol. White	52	5	5	5
12	S2 FAW tol. Yellow	40	7	7	7
3	S3 FAW tol. Yellow	79	1	1	1
6	S3 FAW tol. White	83/16	1	1	1
1	Line Hi Oil D5005	1	1	1	1
14	Exptl Varieties	2/4/8	5	6	7
C. Others					
1	CHTTW	25	1	1	1
1	CHTTY	25	1	1	1
1	QPM Trials	8	1	1	1
1	QPM Trials (Selected)	7	1	1	1
1	EVT14ACOL01	16	1	1	1
1	EVT14BCOL01	16	1	1	1
1	TSCEWCOL01A	16	1	1	1
1	TSCEYCOL01A	16	1	1	1