

**CIMMYT-ICARDA**

**Results of the Thirteenth International  
Barley Observation Nursery  
(IBON) 1985-86**

**Resultados del 13° Vivero  
Internacional de Observación de Cebada  
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H. Vivar and M. Alcalá

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**GLOSSARY OF ABBREVIATIONS AND UNITS OF MEASURE**  
**GLOSARIO DE ABREVIATURAS Y UNIDADES DE MEDICION**  
**GLOSSAIRE DES ABRÉVIATIONS ET UNITÉS DE MESURE**

Abbreviation	Scientific name	Variable name(scale)	Nombre de la variable (escala)	Nom de la variable (échelle)
AL TOL	—	Aluminum tolerance (0-9 scale)	Tolerancia al aluminio (escala 0-9)	Tolérance à l'aluminium (échelle 0-9)
ALT B	<i>Alternaria triticina</i>	Alternaria leaf blight (0-9 scale)	Tizón por alternaria (escala 0-9)	Alternaria (échelle 0-9)
ANT DMGE	—	Ant damage (percentage)	Porcentaje de daño por hormigas	Dégât du aux fourmis en pourcentage
APHD DMGE	—	Aphid damage (percentage)	Porcentaje de daño por áfidos	Dégât du aux pucerons en pourcentage
ARMY WORM	—	Army worm damage (percentage)	Porcentaje de daño por gusano cogollero	Dégât du aux noctuelles en pourcentage
BAC S	<i>Xanthomonas campestris</i> pv. translucens	Bacterial leaf streak or stripe and black chaff (0-9 scale)	Rayado bacteriano y pajilla negra (escala 0-9)	Rayure bactérienne (échelle 0-9)
BAC SP	—	Bacterial species	Especies bacterianas	Especies bactériennes
BAC B	<i>Pseudomonas syringae</i> pv. striafaciens	Bacterial blight (0-9 scale)	Tizón bacteriano de la hoja (escala 0-9)	Bruñes bactérienne des feuilles (échelle 0-9)
BAR S	<i>Pyrenophora graminea</i> (syn. <i>Drechslera gramineum</i> , syn. <i>Helminthosporium gramineum</i> )	Barley stripe (0-9 scale)	Mancha estriada de la cebada	Taches brunes de l'orge ( <i>Helminthosporium gramineum</i> ) (échelle 0-9)
BIRD DMGE	—	Bird damage (percentage)	Porcentaje de daño por pájaros	Dégât du aux oiseaux en pourcentage
BW	—	Bread wheat	Trigo	Blé
BYDV	—	Barley yellow dwarf virus (0-9 scale)	Virus del enanismo amarillo de la cebada (escala 0-9)	Jaunisse nanisante de l'orge (échelle 0-9)
CHECK MARK	—	Selected for further investigation	Seleccionada para investigación adicional	Selectionnée pour recherche additionnelle
COVD SMUT	<i>Ustilago hordei</i> ( <i>U. kolleni</i> )	Covered smut (percentage)	Porcentaje de carbón cubierto	Charbon couvert en pourcentage
EARS/M2	—	Ears per square meter	Espigas por metro cuadrado	Epis par mètre carré
FALL NO	—	Falling number (seconds)	Actividad alfa amilasa (segundos)	Activité de l'alpha amylase (en secondes)
FERT %	—	Fertility (percentage)	Porcentaje de fertilidad	Fertilité en pourcentage
FRST DMGE	—	Frost damage (percentage)	Porcentaje de daño por heladas	Dégât du au gel en pourcentage
FUS N	<i>Fusarium nivale</i> (syn. <i>Monographella nivalis</i> )	Fusarium leaf blotch (0-9 scale)	Mancha de la hoja y moho névoo (moho blanco) (escala 0-9)	Tache de la feuille ( <i>Fusarium nivale</i> ) (échelle 0-9)
GERM %	—	Germination (percentage)	Porcentaje de germinación	Germination en pourcentage
HAIL DMGE	—	Hail damage (percentage)	Porcentaje de daño por granizo	Dégât du à la grêle en pourcentage
HEAD DAYS	—	Number of days to heading	Número de días al espigamiento	Nombre de jours à l'épiaison
HEL SP	<i>Helminthosporium</i> spp.	Helminthosporium (0-9 scale)	Helminthosporium (escala 0-9)	Helminthosporium (échelle 0-9)
L FIRE	—	Leaf fire (0-9 scale)	Tizón foliar (escala 0-9)	Sécheresse des feuilles (échelle 0-9)
LEAF RUST	<i>Puccinia recondita</i>	Wheat leaf rust (Cobb scale)	Roya de la hoja-trigo (escala de Cobb)	Rouille brune du blé (échelle de Cobb)
LEAF RUST	<i>Puccinia hordei</i>	Barley leaf rust (Cobb scale)	Roya de la hoja-cebada (escala de Cobb)	Rouille brune de l'orge (échelle de Cobb)
LODG %	—	Lodging (percentage)	Porcentaje de acame (vuelco)	Verse en pourcentage
LSE SMUT	<i>Ustilago nuda</i> ( <i>U. tritici</i> )	Loose smut (percentage)	Porcentaje de carbón volador	Charbon nu en pourcentage
MAT DAYS	—	Number of days to maturity	Número de días a la madurez	Nombre de jours à la maturation
MOIST %	—	Moisture (percentage)	Porcentaje de humedad	Humidité en pourcentage
NECK BRK	—	Neck breakage (percentage)	Porcentaje de rotura de cuello	Cassure du pédoncule en pourcentage
NET B	<i>Pyrenophora teres</i> (syn. <i>Drechslera teres</i> , syn. <i>Helminthosporium teres</i> )	Net blotch (0-9 scale)	Mancha reticulada (escala 0-9)	Helminthosporium de l'orge (échelle 0-9)
NOBS	—	Number of observations	Número de observaciones	Nombre d'observations
OFS	—	Free State Streak	Estriado del estado libre	Rayure Free State
PC	—	Percentage	Porcentaje	Pourcentage
PLNT DENS	—	Plant density (stems/m2)	Densidad de plantas (tallos/m2)	Population de plantes (tiges/m2)
PLNT HT	—	Plant height (cm)	Altura de planta (cm)	Hauteur (cm)
POW M	<i>Erysiphe graminis</i>	Powdery mildew (0-9 scale)	Oídio o cenicienta polvorientes (escala 0-9)	Oïdium (échelle 0-9)
PROT %	—	Protein (percentage)	Porcentaje de proteína	Protéine en pourcentage
SCAB %	<i>Fusarium</i> spp.	Head scab (percentage)	Porcentaje de roña	Fusarium de l'épi en pourcentage
SCLD	<i>Rhynchosporium secalis</i>	Scald (0-9 scale)	Escaldadura (escala 0-9)	Rhynchosporium (échelle 0-9)
SDMT INDX	—	Sedimentation index (cc)	Índice de sedimentación (cc)	Indice de sédimentation (cc)
SEP N	<i>Leptosphaeria nodorum</i> (syn. <i>Septoria nodorum</i> )	Septoria glume blotch (0-9 scale)	Tizón de la gluma (escala 0-9)	Septoria nodorum (échelle 0-9)
SEP P	<i>Septoria passerinii</i> sacc.	Septoria leaf blotch (barley)	Mancha foliar (cebada)	Tache septoriennne des feuilles de l'orge
SEP S	<i>Septoria</i> spp.	Septoria glume/leaf blotch (0-9 scale)	Septoria (escala 0-9)	Septoria (échelle 0-9)
SEP T	<i>Mycosphaerella graminicola</i> (syn. <i>Septoria tritici</i> )	Septoria leaf blotch (0-9 scale)	Mancha foliar o tizón foliar (escala 0-9)	Septoria tritici (échelle 0-9)
SHTR %	—	Shattering, head (percentage)	Porcentaje de desgrane (espiga)	Egrenage en pourcentage
SL	—	Sea level	Nivel del mar	Niveau de la mer
SPT B	<i>Cochliobolus sativus</i> (syn. <i>Bipolaris sorokiniana</i> , syn. <i>Helminthosporium sativum</i> )	Spot blotch (0-9 scale)	Tizón foliar (escala 0-9)	Tache de la feuille ( <i>Helminthosporium sativum</i> ) (échelle 0-9)
STEM RUST	<i>Puccinia graminis</i>	Stem rust (Cobb scale)	Roya del tallo (escala de Cobb)	Rouille noire (échelle de Cobb)
STRP RT.H	<i>Puccinia striiformis</i>	Stripe rust, head (percentage)	Porcentaje de roya amarilla (espiga)	Rouille jaune sur épi en pourcentage
STRP RT.L	<i>Puccinia striiformis</i>	Stripe rust, leaf (Cobb scale)	Roya amarilla-hoja (escala de Cobb)	Rouille jaune sur feuilles (échelle de Cobb)
STRP V	—	Barley stripe mosaic virus (scale 0-9)	Virus del mosaico lineal de la cebada (escala 0-9)	Mosaïque striée de l'orge (échelle 0-9)
TAN S	<i>Pyrenophora tritici-repentis</i> (syn. <i>Helminthosporium tritici-repentis</i> )	Tan spot (0-9 scale)	Mancha foliar amarilla (escala 0-9)	Helminthosporium tritici (échelle 0-9)
Tcl	—	Triticale	Triticale	Triticale
TEST WT	—	Test weight (kg/hl)	Peso hectoltrico (kg/hl)	Poids spécifique (kg/hl)
1000 G.W.	—	1000-grain weight (g)	Peso de 1000 granos (g)	Poids de 1000 grains (g)
VAR	—	Variety	Variété	Variété
VTY	—	Variety	Variété	Variété
YELL BERR	—	Yellow berry (percentage)	Porcentaje de panza blanca	Mitadinage en pourcentage
YIELD KG/HA	—	Yield (kg/ha)	Rendimiento (kg/ha)	Rendement (kg/ha)

# Introduction to the Thirteenth International Barley Observation Nursery

Hugo Vivar and Maximino Alcalá<sup>1</sup>

## Methodology

The Thirteenth International Barley Observation Nursery (IBON) was sent in September 1985 to be grown by cooperators in their spring season of 1986. Ninety-nine nurseries went to cooperators in 58 countries. The 100 advanced lines and checks in the nursery had been chosen from among best materials. All had been grown and observed by scientists under a high yield environment with pressure from major diseases on the CIANO Experiment Station in the Yaqui Valley in northwest Mexico. Here, too, seed for this international nursery was multiplied, cleaned and treated with insecticide and organic fungicide before shipment.

Instruction on nursery management accompanied the mailing of seeds to each cooperator. Enough seed from each line was provided for a single row, unreplicated, of at least 2 m in length. A field book was included with each nursery set, providing a standard format for recording data desired by CIMMYT-ICARDA. In receiving and processing the data returned by cooperators, CIMMYT-ICARDA assumes that the nursery was properly handled and that accurate results were reported. We cannot, however, attest to the rigor with which the trials were grown and results were obtained.

Forty of the cooperators receiving the nursery returned field books with performance data at their locations in time to be included in this report. The choice of variables measured and the data returned rest with the individual cooperator. We have included in this summary selected variables reported to us. The number of observations differs from variable to variable. The reader is urged to note the number of observations at the head of each variable column in the summary table (Table 2); this may be an important indicator of the level of credibility that should be inferred. The reader should also bear in mind that the yield reported is from a single plot, essentially grown for observation rather than as a rigorous, replicated yield trial.

**Presentation of results**—So that data in this report will be of optimal use to the reader, we present the results in three forms:

1. One international summary, listing the sites from which data were returned, with notations of all variables recorded and reported.
2. A table reporting the means of all observations from sites with uniform and discrete data for each variable measured for each line in the nursery.
3. Selected tables reporting the best performance by individual lines on major variables, usually the top 5 to 10 percent. The table of contents lists all variables reported in this way.

Cooperators were asked to use agronomic and disease reporting methodology as described in the "Instructions for the Management and Reporting of Results for the CIMMYT Wheat Program International Nurseries." Data reported are simple means computed from those supplied by the cooperators. Data on rusts recorded by the modified Cobb scale were converted to average coefficients of infection (ACI) as explained below.

**Cooperator participation**—Feedback information of two kinds from cooperators is vital to the quality of this and other CIMMYT-ICARDA international nursery reports: first, the prompt return of carefully recorded data from each and every trial site; second, identification of environmental and management factors (e.g., moisture problems, birds, etc.) that become part of our cooperator's station file. We ask for feedback of both kinds.

<sup>1</sup> Head, ICARDA barley program, and head, international nurseries.

**Rust scoring**—Disease scores for stem, leaf and stripe rust infections recorded in the manner recommended by Dr. W.Q. Loegering (USDA International Spring Wheat Rust Nursery, 1959) are converted to a numeric coefficient of infection (CI) prior to being used in any calculations. Each original reading recorded in this manner consists of severity (percentage of rust infection on the plants) and response (kind of infection) scores. Severity is recorded as percent of infection according to the modified Cobb scale. If only a trace is visible, T or TR may be reported and is given the value of 1%.

Responses may be recorded by using one of the following codes. The numeric values assigned to these codes are shown at the right.

Response	Equivalent numeric value
VR	0.2
R	0.2
MR	0.4
M or X	0.6
MS	0.8
S	1.0
VS	1.0

Severity and response are recorded together, with severity first (for example, 5MR). The equivalent coefficient of infection is calculated by multiplying the numeric equivalents of each part. For example:

Disease score	Coefficient of infection
5MR	$5(0.4) = 2.0$
TR	$1(0.2) = 0.2$
TRR	$1(0.2) = 0.2$
60S	$60(1.0) = 60.0$
0*	$(0)(0) = 0.0$

\* If there is no visible infection on the plant, only a zero is reported.

Reactions may be more variable than can be represented by a single severity and response reading. This variability may be recorded in two ways: 1) A comma or slash indicates plants have segregated into clear-cut classes. The first rating reported is included in the computations. 2) If a range of reactions is recorded, it is denoted by a dash. In these cases, the coefficient of infection is the average of the two scores. Examples of these situations are given below:

Disease score	Coefficient of infection
5R,40S	The first rating $5R = 5(0.2) = 1.0$ is used in all computations
40M/60S	The first rating $40M = 40(0.6) = 24.0$ is used in all computations
15R-5S	$[15(0.2) + 5(1.0)] / 2 = 4.0$

A range may be reported for severity only or response only. In each of these cases the average severity or average response is calculated before multiplying the two together. For example:

Disease score	Coefficient of infection
10-20MS	$[(10+20)/2]0.8 = 12.0$
40MR-MS	$40[(0.4+0.8)/2] = 24.0$
5-10MR-R	$[(5+10)/2][(0.4+0.2)/2] = 2.25$

In most tables only average coefficients of infection (ACI) are reported. However, in some tables the highest rust readings (HR) may be reported as severity/response scores.

# Introducción al 13<sup>o</sup> Vivero Internacional de Observación de Cebada

Hugo Vivar y Maximino Alcalá<sup>1</sup>

## Metodología

En septiembre de 1985, se distribuyó el 13<sup>o</sup> Vivero Internacional de Observación de Cebada para que los colaboradores lo cultivaran en sus temporadas de primavera de 1986. Se enviaron 99 viveros a colaboradores de 58 países. Las 100 líneas avanzadas y testigos incluidos en el vivero habían sido seleccionados entre los mejores materiales; todas las líneas fueron cultivadas y observadas por científicos en un ambiente de alto rendimiento, sometidas a la presión de las principales enfermedades en la estación experimental del CIANO en el valle del Yaqui, al noroeste de México. También se multiplicó allí la semilla para este vivero internacional y se la limpió y trató con insecticidas y fungicidas orgánicos antes del envío.

A cada colaborador se le despachó por correo la semilla, acompañada de instrucciones acerca del manejo del vivero. Se proporcionó semilla de cada línea en cantidad suficiente para sembrar un surco doble, sin repeticiones, de por lo menos 2 m de longitud. Cada conjunto del vivero incluía un libro de campo con un formato uniforme para registrar los datos solicitados por CIMMYT-ICARDA. Al recibir y procesar los datos devueltos por los colaboradores, CIMMYT-ICARDA dan por sentado que se manejó apropiadamente el vivero y que se comunicaron resultados cabales. No obstante, no podemos dar fe de la rigurosidad con que se sembraron los ensayos y se obtuvieron los resultados.

Cuarenta de los colaboradores que recibieron el vivero devolvieron sus libros de campo con datos acerca del comportamiento de las líneas en sus localidades, a tiempo para incluir esos datos en este informe. La elección de las variables evaluadas y la información enviada depende de cada colaborador. En este informe hemos incluido algunas variables sobre las cuales recibimos información. El número de observaciones difiere de una variable a otra. Se recomienda al lector fijarse en el número de observaciones señalado en el encabezamiento de las columnas correspondientes a cada variable en el cuadro resumen (cuadro 2); esto puede ser un indicador importante del grado de credibilidad atribuible. El lector también debe tener en cuenta

que el rendimiento comunicado corresponde a una sola parcela, esencialmente cultivada con propósitos de observación y no como un ensayo riguroso del rendimiento con repeticiones.

**Presentación de los resultados.** Para que los datos de este informe sean de utilidad óptima para el lector, presentamos los resultados en tres formas:

1. Un resumen internacional que enumera las localidades desde las cuales se envió información, con anotaciones sobre todas las variables registradas y comunicadas.
2. Un cuadro que muestra las medias de todas las observaciones efectuadas en las localidades, con datos discretos y uniformes para cada variable medida en cada línea del vivero.
3. Cuadros que muestran el comportamiento más sobresaliente de líneas individuales, generalmente el 5 a 10% que son las mejores en relación con las variables principales. En el índice se enumeran todas las variables incluidas en esos cuadros.

Se pidió a los colaboradores que usaran la metodología para informar sobre el comportamiento agronómico y las enfermedades que se describe en el "Instructivo para el manejo y registro de resultados de los ensayos internacionales del Programa de Trigo del CIMMYT". Los datos presentados son simples medias calculadas a partir de los datos proporcionados por los colaboradores. Los datos sobre las royas, registrados mediante la escala modificada de Cobb, se convirtieron en coeficientes medios de infección (CMI), como se indica más adelante.

**Participación de los colaboradores.** Para la calidad de éste y otros informes del CIMMYT-ICARDA sobre viveros internacionales, es vital la retroalimentación de información de dos tipos proporcionada por los colaboradores: en primer

<sup>1</sup> Jefe del Programa de Cebada del ICARDA; Jefe de los Ensayos Internacionales.



término, el envío rápido de datos cuidadosamente registrados en todos y cada uno de los sitios de las pruebas; en segundo, la identificación de factores ambientales y del manejo (por ejemplo, problemas relacionados con la humedad, los pájaros, etc.) que pasan a formar parte de los archivos de las estaciones colaboradoras. Solicitamos información de ambos tipos.

**Evaluación de las royas.** Las calificaciones asignadas a las infecciones por las royas lineal, del tallo y de la hoja, registradas en la forma recomendada por el Dr. W. Q. Loegering (Vivero Internacional para Identificación de Royas en el Trigo de Primavera, Departamento de Agricultura de los Estados Unidos de América, 1959), se convierten en un coeficiente numérico de infección (CI) antes de su empleo en cualquier cálculo. Cada lectura original registrada en esta forma incluye calificaciones de la severidad (porcentaje de infección por la roya en las plantas y de la respuesta (tipo de infección). Se registra la severidad como porcentaje de infección de acuerdo con la escala modificada de Cobb. Si sólo se ven trazas, se registra la severidad como T o TR y se le asigna un valor del 1%.

Se pueden registrar las respuestas usando uno de los códigos siguientes, cuyos valores numéricos se muestran a la derecha.

Respuesta	Valor numérico equivalente
VR	0.2
R	0.2
MR	0.4
M or X	0.6
MS	0.8
S	1.0
VS	1.0

Se registran juntas la severidad y la respuesta, colocando la severidad en primer término (por ejemplo 5MR). Se calcula el coeficiente de infección correspondiente multiplicando los equivalentes numéricos de cada parte. Por ejemplo:

Calificación de la enfermedad	Coeficiente de infección
5MR	$5(0.4) = 2.0$
TR	$1(0.2) = 0.2$

TRR	$1(0.2) = 0.2$
60S	$60(1.0) = 60.0$
0*	$(0)(0) = 0.0$

\*Si no hay infección visible en la planta, sólo se registra un cero.

Tal vez las reacciones sean más variables de lo que se puede representar mediante una sola lectura de la severidad y la respuesta. Se puede registrar esa variabilidad en dos formas: 1) una coma o una diagonal indican que se ha producido una segregación de las plantas en clases bien definidas y entonces se incluye en los cálculos la primera evaluación comunicada; 2) cuando se registra una gama de reacciones, se indica esto mediante un guión y, en estos casos, el coeficiente de infección es el promedio de las dos calificaciones. A continuación se presentan ejemplos de ambas situaciones:

Calificación de la enfermedad	Coeficiente de infección
5R,40S	La primera evaluación $5R = 5(0.2) = 1.0$ que se usa en todos los cálculos
40M/60S	La primera evaluación $40M = 40(0.6) = 24.0$ , que se usa en todos los cálculos
15R-5S	$[15(0.2) + 5(1.0)]/2 = 4.0$

Es posible que se comunique un rango sólo de la severidad, o únicamente de la respuesta. En estos casos se calcula la severidad media o la respuesta media antes de multiplicar ambas. Por ejemplo:

Calificación de la enfermedad	Coeficiente de infección
10-20MS	$[(10+20)/2]0.8 = 12.0$
40MR-MS	$40[(0.4+0.8)/2] = 24.0$
5-10MR-R	$[(5+10)/2][(0.4+0.2)/2] = 2.25$

En la mayoría de los cuadros se informan sólo coeficientes medios de infección (CMI); no obstante, en algunos cuadros se indica como calificaciones de la severidad y la respuesta la lectura más alta (HR) de la enfermedad.

**Table 1. Locations from which data were reported, with variables included.**

LOCS.	CONTINENT	COUNTRY	AREA	VARIABLES INCLUDED
1	AFRICA	ETHIOPIA	SHEWA, AMBO	1 3 7 68 69
2	AFRICA	MOROCCO	SETTAT	3 50 61 66
3	AFRICA	NIGERIA	KANO	1 3
4	AFRICA	SOUTH AFRICA	CAPE PROVINCE-TYGERHOEK	7 66
5	AFRICA	ZIMBABWE	HARARE-GWEBI	1 50
6	AFRICA	ZIMBABWE	HARARE-UNIV. OF ZIMBABWE	1
7	ASIA	KOREA (SOUTH)	SUMON GYEONGGI PROV.	1 3 50
8	ASIA	P.R. OF CHINA	HEILONGJIANG	1 66 68 77
9	ASIA	P.R. OF CHINA	QINGHAI	1 4 9 13
10	ASIA	P.R. OF CHINA	SICHUAN	1 3
11	ASIA	PAKISTAN	BALUCHISTAN	1 3 9
12	ASIA	PAKISTAN	NWFP-PIRSABAK	1 3 5 50
13	ASIA	PAKISTAN	PUNJAB-ISLARABAD	50
14	ASIA	PAKISTAN	PUNJAB-NIAB	3 4 5 9 50
15	ASIA	PAKISTAN	SIND	1
16	ASIA	TAIWAN	TAICHUNG	1 3
17	ASIA	THAILAND	NAKHON RATCHASIMA	50
18	CENTRAL AMERICA	COSTA RICA	ALAJUELA-PRAIJAMES	1 3 9 50
19	EUROPE	CZECHOSLOVAKIA	CZECHIA	3 61
20	EUROPE	GERMANY, DEM. REP.	MAGDEBURG-MADNERSLEBEN	7 61
21	EUROPE	GREECE	EPANONI (THESSALONIKI)	1 9 61
22	EUROPE	ITALY	POGGIA	1 61
23	EUROPE	ITALY	NACERATA	3 10 50
24	EUROPE	NORWAY	AAS	3 50 61
25	EUROPE	PORTUGAL	ELVAS	66 69
26	EUROPE	SPAIN	GRAMADA	50
27	EUROPE	SPAIN	LLEIDA	3 50 61 77
28	EUROPE	SPAIN	MAORIO-ENCIN	50
29	EUROPE	SPAIN	ZARAGOZA-MONTANANA	3 50
30	MIDDLE EAST	CTPRUS	ATHALASSA	1 3 7 9 61 66 68
31	MIDDLE EAST	IRAN	GORGAN	50
32	MIDDLE EAST	IRAN	TEHRAN	1 3 66
33	MIDDLE EAST	JORDAN	IRBID-RANHA	1 9
34	MIDDLE EAST	QATAR	BARADA	3 4 9 50 66
35	NORTH AMERICA	MEXICO	EL BATAN	3 7 9 69
36	NORTH AMERICA	MEXICO	HIDALGO	7 66 69
37	NORTH AMERICA	MEXICO	SONORA-CIANO	3 7 8
38	NORTH AMERICA	MEXICO	TOLUCA	3 9 69 77
39	NORTH AMERICA	U.S.A.	MONTANA	69 74
40	SOUTH AMERICA	BRAZIL	SAO PAULO-CAPAO BONITO	1 3 50 66 68

**VARIABLE IDENTIFICATIONS**

1	YIELD	KG/HA	3	HEAD	DAYS	4	HAT	DAYS	5	STRP	RT-L	7	LEAF	RUST
8	STEM	RUST	9	PLNT	HT	10	LOGG	%	13	1000	G.W.	50	CHECK	MARK
61	PUM M	0-9	66	NET B	0-9	68	SPT B	0-9	69	SCLD	0-9	74	BAC S	0-9
77	BYDV	0-9												

Table 2. Summary of means of all variables.

VTT NO.	VARIETY OR CROSS AND PEDIGREE	NUMBER OF OBSERVATIONS:						
		( 19 )	( 22 )	( 3 )	( 2 )	( 7 )	( 1 )	( 10 )
		YIELD KG/HA	HEAD DAYS	MAT DAYS	STRP RT-L	LEAF RUST	STEM RUST	PLNT HT
1	RUMOROSA	4391.4	98.2	116.3	52.5	39.4	24.0	78.4
2	TRUMPILLO	4209.8	97.6	111.7	22.5	61.0	30.0	78.7
3	PISTACHO	3996.7	97.4	113.7	22.5	21.5	30.0	76.1
4	78W40785	3478.7	100.8	121.0	52.5	19.9	4.0	62.1
5	ALAMO <sup>S</sup>	4080.8	93.2	117.3	27.5	25.5	20.0	75.6
6	COM <sup>S</sup> /GLOA <sup>S</sup> CMB01A-52-18-1Y-2M-1Y-0M	3691.8	96.5	118.3	12.5	18.0	8.0	77.6
7	CORCHO <sup>S</sup> //EMBB/F4EL 6L CMB01A-314-10B-1Y-2M-6Y-0M	3692.4	98.4	116.0	4.0	24.6	20.0	85.3
8	GLORIA <sup>S</sup> /COM <sup>S</sup> CMB01-294-5B-4Y-8M-1Y-0M	3079.8	103.1	117.3	4.0	8.8	8.8	78.1
9	GLORIA <sup>S</sup> /COM <sup>S</sup> CMB01-294-5B-5Y-1M-1Y-0M	3231.5	103.6	118.0	4.0	9.0	35.0	76.8
10	GLORIA <sup>S</sup> /COM <sup>S</sup> CMB01-294-6B-1Y-1M-2Y-0M	3830.1	99.8	118.7	0.0	12.5	15.0	74.9
11	GLORIA <sup>S</sup> /COM <sup>S</sup> CMB01-294-6B-1Y-2M-1Y-0M	3628.1	100.5	119.7	0.0	14.4	20.8	77.7
12	GLORIA <sup>S</sup> /COPAL <sup>S</sup> CMB01-295-30B-2Y-2M-1Y-0M	3170.7	100.5	119.7	0.0	14.4	10.8	78.2
13	GLORIA <sup>S</sup> /COPAL <sup>S</sup> CMB01-295-30B-3Y-1M-1Y-0M	4102.5	101.8	121.7	0.0	17.2	38.8	77.3
14	GLORIA <sup>S</sup> /COPAL <sup>S</sup> CMB01-295-30B-4Y-1M-1Y-0M	3728.7	98.6	117.3	0.0	17.4	8.0	72.9
15	GLORIA <sup>S</sup> /COPAL <sup>S</sup> CMB01-295-30B-4Y-9M-1Y-0M	4514.3	100.0	117.7	0.0	14.2	10.8	69.9
16	GLORIA <sup>S</sup> /COPAL <sup>S</sup> CMB01-295-30B-4Y-18M-1Y-0M	4008.2	98.3	117.7	0.0	14.8	6.8	75.9
17	GLORIA <sup>S</sup> /COPAL <sup>S</sup> CMB01-295-30B-4Y-19M-1Y-0M	3861.9	101.5	118.0	0.0	14.4	28.8	75.8
18	GLORIA <sup>S</sup> /COPAL <sup>S</sup> CMB01-295-30B-4Y-20M-1Y-0M	4237.5	100.5	117.7	0.0	14.0	18.0	75.3
19	GLORIA <sup>S</sup> /COPAL <sup>S</sup> CMB01-295-30B-4Y-22M-1Y-0M	3735.9	100.5	117.0	0.0	14.6	8.8	74.8
20	KY63/1794//B1 -1B-2Y-2M-1Y-0M	3516.2	98.9	110.0	0.0	16.0	28.0	74.7
21	GLORIA <sup>S</sup> /COM <sup>S</sup> CMB01-294-5B-4Y-1M-1Y-0M	3552.2	98.1	110.3	0.0	15.0	35.0	72.4
22	GLORIA <sup>S</sup> /COM <sup>S</sup> CMB01-294-5B-5Y-4M-2Y-0M	3125.3	104.1	117.3	0.0	16.2	28.8	75.7
23	GLORIA <sup>S</sup> /COPAL <sup>S</sup> CMB01-295-6B-3Y-3M-2Y-0M	3371.6	102.3	117.3	0.0	12.2	16.8	81.6
24	GLORIA <sup>S</sup> /COPAL <sup>S</sup> CMB01-295-30B-1Y-2M-1Y-0M	4393.6	98.1	117.3	0.0	14.0	18.0	75.9
25	GLORIA <sup>S</sup> /COPAL <sup>S</sup> CMB01-295-30B-1Y-2M-2Y-0M	4040.5	100.1	119.0	0.0	12.5	8.0	75.6
26	GLORIA <sup>S</sup> /COPAL <sup>S</sup> CMB01-295-30B-2Y-1M-2Y-0M	3639.8	97.0	112.0	0.0	17.0	8.8	76.1
27	GLORIA <sup>S</sup> /COPAL <sup>S</sup> CMB01-295-30B-2Y-2M-2Y-0M	3964.7	97.8	114.7	0.0	14.4	6.0	78.1
28	GLORIA <sup>S</sup> /COPAL <sup>S</sup> CMB01-295-30B-4Y-16M-1Y-0M	4652.5	100.2	118.0	0.0	16.6	20.0	78.0

VTY	LOGG %	1000 G.W.	CHECK MARK	POW M 0-9	NET B 0-9	SPT B 0-9	SCLD 0-9	BAC S 0-9	BYDV 0-9
	( 1)	( 1)	( 17)	( 8)	( 9)	( 4)	( 6)	( 1)	( 3)
1	10.0	45.0	29.4	5.6	3.3	1.5	5.0	7.0	4.3
2	10.0	40.0	29.4	6.7	4.4	4.8	4.0	8.0	4.3
3	10.0	46.0	11.8	6.1	4.4	4.3	5.6	6.0	4.7
4	0.0	46.0	11.8	6.1	3.7	4.5	5.0	6.0	4.7
5	10.0	50.0	29.4	5.9	3.9	4.3	6.4	6.0	4.3
6	10.0	39.0	5.9	4.6	4.6	6.0	1.7	6.0	5.0
7	10.0	40.0	11.8	5.7	5.0	3.5	2.6	6.0	4.7
8	0.0	40.0	11.8	5.9	5.1	5.0	0.8	6.0	5.0
9	0.0	42.0	17.6	5.7	4.9	3.0	1.0	6.0	5.3
10	0.0	44.0	29.4	4.9	5.7	6.0	0.7	5.0	5.0
11	0.0	50.0	23.5	5.1	5.0	4.8	1.8	4.0	4.3
12	30.0	40.0	5.9	4.9	5.6	5.5	0.3	4.0	4.7
13	10.0	44.0	35.3	3.7	4.8	5.0	0.2	3.0	4.3
14	10.0	47.0	11.8	3.7	4.3	5.0	0.3	2.0	5.0
15	10.0	46.0	29.4	4.6	4.8	5.0	0.2	4.0	4.7
16	10.0	49.0	11.8	4.9	4.9	5.5	0.0	4.0	4.3
17	10.0	51.0	17.6	4.7	4.9	5.5	0.0	2.0	4.7
18	30.0	44.0	23.5	4.7	4.4	5.5	0.5	5.0	4.7
19	30.0	52.0	17.6	3.6	4.3	5.8	0.7	2.0	5.0
20	30.0	43.0	5.9	6.0	4.2	6.3	0.7	2.0	5.3
21	0.0	44.0	11.8	6.3	4.6	6.3	0.6	6.0	5.0
22	0.0	42.0	35.3	5.9	4.4	5.5	0.7	2.0	5.7
23	20.0	44.0	5.9	5.0	4.4	5.3	1.3	3.0	5.3
24	30.0	48.0	11.8	5.7	4.9	5.8	0.8	3.0	4.0
25	20.0	44.0	5.9	5.0	4.6	5.5	0.6	4.0	5.0
26	10.0	48.0	11.8	4.1	4.8	6.0	0.8	4.0	5.3
27	10.0	45.0	0.0	4.6	4.3	6.0	0.0	2.0	5.7
28	10.0	48.0	11.8	3.7	5.0	5.5	0.2	2.0	5.3

Table 2. (continued)

VTY NO.	VARIETY OR CROSS AND PEDIGREE	NUMBER OF OBSERVATIONS:							
		( 19 )	( 22 )	( 3 )	( 2 )	( 7 )	( 1 )	( 10 )	
29	GLORIA <sup>S</sup> /COPAL <sup>S</sup> CMB81-295-308-4Y-9M-3Y-0M	3886.1	96.5	112.3	0.0	15.2	30.0	70.5	
30	GLORIA <sup>S</sup> /COPAL <sup>S</sup> CMB81-295-308-4Y-22M-2Y-0M	4136.9	100.1	118.3	0.0	14.0	20.0	74.1	
31	GLORIA <sup>S</sup> /COPAL <sup>S</sup> CMB81-295-308-4Y-24M-1Y-0M	4908.3	101.3	118.3	20.0	14.0	16.0	71.7	
32	GLORIA <sup>S</sup> /COPAL <sup>S</sup> CMB81-295-308-4Y-24M-2Y-0M	4634.5	99.5	119.0	0.0	8.0	8.0	75.9	
33	AGER/3/C13909.2//M66.151/WANKER/4/ BREA <sup>S</sup> /CEL/5/SGOD <sup>S</sup> CMB82-682-11Y-18-3Y-0M	3670.4	95.5	111.7	16.0	24.7	8.0	74.5	
34	DIEPROPETROBSK2 HS/BFL <sup>S</sup> CMSMB81A-163-11Y-18-1Y-0M	3289.7	106.5	123.0	12.5	25.9	20.0	86.2	
35	DIEPROPETROBSK2 HS/BFL <sup>S</sup> CMSMB81A-163-26Y-38-1Y-0M	3358.5	104.3	121.3	0.0	9.9	8.0	93.9	
36	GLORIA <sup>S</sup> /COME <sup>S</sup> CMB81-294-25Y-48-1Y-0M	4079.7	97.7	113.0	0.0	3.0	40.0	82.9	
37	GLORIA <sup>S</sup> /COME <sup>S</sup> CMB81-294-25Y-68-2Y-0M	3752.2	101.4	116.7	0.0	2.5	40.0	86.6	
38	OKSANUT/CRZO <sup>S</sup> CMSMB81A-290-17Y-28-2Y-0M	3027.3	98.1	110.7	20.0	33.3	40.0	85.3	
39	PI329037/BREA <sup>S</sup> CMSMB81A-329-12Y-28-1Y-0M	3369.4	99.6	126.0	35.0	13.3	35.0	83.2	
40	GLORIA <sup>S</sup> /COME <sup>S</sup> CMB81-294-58-4Y-11M-2Y-0M	3026.9	101.8	116.0	6.0	21.7	40.0	81.8	
41	GLORIA <sup>S</sup> /COME <sup>S</sup> CMB81-294-48-3Y-4M-1Y-0M	3432.3	98.9	111.7	5.0	15.6	40.0	79.9	
42	GLORIA <sup>S</sup> /COME <sup>S</sup> CMB81-294-48-5Y-7M-1Y-0M	3752.8	98.1	112.0	0.0	19.3	40.0	79.9	
43	GLORIA <sup>S</sup> /COME <sup>S</sup> CMB81-294-48-5Y-7M-2Y-0M	3610.9	98.5	114.0	0.0	12.0	12.0	80.6	
44	GLORIA <sup>S</sup> /COME <sup>S</sup> CMB81-294-58-3Y-3M-1Y-0M	3498.1	98.0	113.0	0.0	13.0	8.0	74.5	
45	GLORIA <sup>S</sup> /COME <sup>S</sup> CMB81-294-58-6Y-1M-1Y-0M	3250.6	98.4	110.7	0.0	13.4	15.0	80.6	
46	SI <sup>S</sup> /3/BRA/TRY//GAL/4/EN/5/GYO <sup>S</sup> / 6/CORCHO <sup>S</sup> //OS/APRO CMB81A-2311-D-38-5Y-3M-1Y-0M	3974.0	92.2	106.3	0.0	21.2	12.0	75.7	
47	CACO <sup>S</sup> /3/API/CN67//1594 CMB81-168-6Y-1Y-1M-2Y-0M	3246.8	98.3	110.7	0.0	10.7	8.0	78.6	
48	CACO <sup>S</sup> /3/API/CN67//1594 CMB81-168-6Y-2Y-1M-2Y-0M	3433.7	98.0	109.3	0.0	15.8	30.0	76.2	
49	GLORIA <sup>S</sup> /CELO <sup>S</sup> CMB81A-614-48-3Y-5M-1Y-0M	3143.2	99.3	109.3	0.0	12.3	30.0	79.0	
50	GLORIA <sup>S</sup> /COME <sup>S</sup> CMB81-294-58-4Y-15M-1Y-0M	3975.5	95.8	108.7	0.0	10.0	16.0	76.7	
51	CACO <sup>S</sup> /3/API/CN67//1594 CMB81-168-6Y-1Y-6M-1Y-0M	3975.3	98.0	111.3	0.0	14.8	40.0	77.2	
52	CACO <sup>S</sup> /3/API/CN67//1594 CMB81-168-6Y-1Y-7M-1Y-0M	3284.7	98.9	110.0	1.0	12.3	20.8	74.6	
53	CACO <sup>S</sup> /3/API/CN67//1594 CMB81-168-6Y-2Y-2M-1Y-0M	3109.8	96.3	108.7	0.5	8.6	35.0	75.9	
54	CACO <sup>S</sup> /3/API/CN67//1594 CMB81-168-6Y-2Y-14M-1Y-0M	3248.7	93.7	108.7	0.5	8.4	40.0	76.8	
55	CACO <sup>S</sup> /3/API/CN67//1594 CMB81-168-6Y-2Y-14M-2Y-0M	3371.3	94.1	108.7	0.0	14.4	15.0	72.9	

VTY	LDUG %	1000 G.W.	CHECK MARK	POW M 0-9	NET B 0-9	SPT B 0-9	SCLD 0-9	BAC S 0-9	BYDV 0-9
	( 1 )	( 1 )	( 17 )	( 8 )	( 9 )	( 4 )	( 6 )	( 1 )	( 3 )
29	10.0	44.0	23.5	4.0	5.1	6.0	0.0	3.0	5.3
30	10.0	40.0	5.9	3.9	5.4	5.8	0.3	2.0	5.7
31	0.0	47.0	17.6	5.1	5.1	5.5	0.3	4.0	4.7
32	0.0	40.0	5.9	5.3	4.6	5.5	0.5	2.0	5.0
33	10.0	43.0	17.6	5.3	4.9	5.5	1.4	5.0	4.5
34	10.0	43.0	11.8	4.1	3.4	5.3	1.0	4.0	4.3
35	0.0	40.0	11.8	3.9	4.1	5.5	1.0	2.0	4.7
36	20.0	42.0	29.4	5.9	5.0	5.0	1.0	5.0	5.0
37	20.0	41.0	23.5	5.6	5.0	5.0	1.5	3.0	5.0
38	30.0	43.0	0.0	5.7	3.6	2.5	1.8	6.0	5.7
39	0.0	-----	11.8	5.9	4.8	5.0	0.8	5.0	5.0
40	0.0	43.0	17.6	6.0	4.5	5.3	1.2	4.0	5.3
41	0.0	25.0	0.0	4.7	5.0	4.3	0.5	4.0	5.0
42	10.0	38.0	17.6	4.7	5.3	4.5	0.3	4.0	5.7
43	10.0	37.0	5.9	4.6	4.8	3.8	1.0	3.0	5.3
44	0.0	52.0	41.2	5.3	3.9	3.8	0.7	3.0	5.7
45	0.0	37.0	17.6	5.9	4.5	3.0	1.0	4.0	5.0
46	10.0	43.0	29.4	5.6	3.9	3.5	3.6	4.0	5.3
47	10.0	41.0	11.8	5.0	4.5	5.5	0.5	4.0	5.3
48	10.0	37.0	17.6	5.3	5.4	5.5	1.7	3.0	5.3
49	0.0	43.0	0.0	5.9	5.3	4.0	1.2	5.0	5.0
50	0.0	40.0	17.6	6.1	4.9	3.5	1.5	4.0	5.3
51	0.0	40.0	17.6	5.6	5.3	4.5	0.5	3.0	5.7
52	0.0	40.0	11.8	6.3	5.1	4.8	0.5	5.0	5.3
53	10.0	42.0	0.0	5.6	5.6	5.5	0.8	3.0	5.3
54	10.0	41.0	11.8	6.4	5.6	5.5	0.2	4.0	5.0
55	10.0	40.0	23.5	5.7	5.0	5.8	0.8	4.0	5.0

Table 2. (continued)

YTY NO.	VARIETY OR CROSS AND PEDIGREE	YIELD KG/HA	HEAD DAYS	MAT DAYS	STRP RT-L	LEAF RUST	STEM RUST	PLNT HT	NUMBER OF OBSERVATIONS:									
									( 19 )	( 22 )	( 3 )	( 2 )	( 7 )	( 1 )	( 10 )			
56	CACD <sup>S</sup> /3/API/CM67//1594 CMB81-168-6Y-2Y-15M-1Y-0M	3059.1	98.8	110.7	11.0	14.4	20.0	76.8										
57	CACD <sup>S</sup> /3/API/CM67//1594 CMB81-168-6Y-2Y-16M-1Y-0M	2987.5	97.3	113.7	0.0	20.4	9.0	73.9										
58	CACD <sup>S</sup> /3/API/CM67//1594 CMB81-168-6Y-2Y-18M-1Y-0M	3561.9	97.0	111.3	0.0	9.6	8.0	73.9										
59	CACD <sup>S</sup> /3/API/CM67//1594 CMB81-168-6Y-3Y-1M-1Y-0M	3229.5	95.9	111.3	0.0	8.4	20.0	71.5										
60	CACD <sup>S</sup> /3/API/CM67//1594 CMB81-168-6Y-4Y-2M-1Y-0M	3680.7	97.7	113.3	30.0	8.4	12.0	75.0										
61	HZQ//MASWI/BON CMB81-1289-1Y-2Y-2M-1Y-0M	3219.1	96.3	108.7	90.0	16.4	25.0	81.4										
62	CON <sup>S</sup> /COLLO <sup>S</sup> CMB80A-56-2Y-1Y-1M-2Y-0M	3709.1	94.1	107.3	82.5	16.4	8.0	76.3										
63	CON <sup>S</sup> /COLLO <sup>S</sup> CMB80A-56-2Y-1Y-2M-1Y-0M	3772.2	100.9	112.3	70.0	17.2	30.0	78.4										
64	CON <sup>S</sup> /COLLO <sup>S</sup> CMB80A-56-2Y-2Y-1M-1Y-0M	3636.1	91.4	106.3	82.5	13.0	20.0	75.3										
65	CON <sup>S</sup> /COLLO <sup>S</sup> CMB80A-56-2Y-2Y-1M-2Y-0M	4219.4	92.0	106.0	70.0	12.2	15.0	74.1										
66	RILLO <sup>S</sup> /ANAPA <sup>S</sup> CMB82-189-4Y-2B-2Y-0M	3236.4	98.1	109.3	20.0	27.7	1.0	82.2										
67	BREA <sup>S</sup> /DL70//HOZDOSKY/3/NOPAL/4/ CELO <sup>S</sup> CMB82-818-3Y-4B-2Y-0M	3611.9	97.8	112.0	5.0	26.0	4.0	69.7										
68	BREA <sup>S</sup> /DL70//HOZDOSKY/3/NOPAL/4/ CELO <sup>S</sup> CMB82-818-3Y-4B-1Y-0M	3315.3	93.4	111.0	25.0	22.9	16.0	67.1										
69	GLORIA <sup>S</sup> /CELO <sup>S</sup> CMB81A-614-16Y-3B-1Y-0M	3542.0	98.6	111.0	12.5	21.0	3.0	77.6										
70	GLORIA <sup>S</sup> /CELO <sup>S</sup> CMB81A-614-20Y-2B-2Y-0M	3064.9	98.8	111.3	0.0	17.6	1.0	76.1										
71	GLORIA <sup>S</sup> /COMES <sup>S</sup> CMB81-294-23Y-1B-1Y-0M	3287.0	97.8	111.0	0.0	13.0	15.0	75.9										
72	GLORIA <sup>S</sup> /COPAL <sup>S</sup> CMB81-295-12Y-2B-1Y-0M	3119.9	97.0	111.7	5.0	24.8	0.0	78.1										
73	DRE <sup>S</sup> //33.4/BAMY10/3/SELECCION 9 AULA DEI/4/383059 CMB82-1374-A-2Y-1B-1Y-0M	3144.5	101.4	117.7	20.0	23.1	20.0	78.1										
74	GLORIA <sup>S</sup> /COMES <sup>S</sup> CMB81-294-17Y-1B-1Y-0M	3633.4	98.1	113.0	0.0	21.6	8.0	77.2										
75	GLORIA <sup>S</sup> /COMES <sup>S</sup> CMB81-294-25Y-3B-1Y-0M	3182.9	99.3	114.0	5.0	17.7	8.0	75.1										
76	CACD <sup>S</sup> /3/API/CM67//1594 CMB81-168-6Y-3Y-0M	3329.4	96.4	113.3	5.0	20.8	30.0	76.5										
77	CACD <sup>S</sup> /3/API/CM67//1594 CMB81-168-6Y-4Y-0M	3870.1	97.7	113.3	0.0	20.8	30.0	73.8										
78	GLORIA <sup>S</sup> /COMES <sup>S</sup> CMB81-294-4Y-1M-4Y-1M-1Y-0B	3591.1	98.6	113.3	0.0	26.3	4.0	76.5										
79	GLORIA <sup>S</sup> /COMES <sup>S</sup> CMB81-294-4Y-1M-4Y-2M-1Y-0B	3469.2	98.6	113.0	0.0	14.4	12.0	78.1										
80	GLORIA <sup>S</sup> /COMES <sup>S</sup> CMB81-294-4Y-1M-5Y-2M-1Y-0B	3759.5	98.7	115.3	0.0	19.0	15.0	84.0										
81	GLORIA <sup>S</sup> /COMES <sup>S</sup> CMB81-294-4Y-1M-6Y-2M-1Y-0B	3694.6	97.9	113.3	10.0	20.8	25.0	75.5										
82	GLORIA <sup>S</sup> /COMES <sup>S</sup> CMB81-294-4Y-1M-6Y-6M-1Y-0B	4111.2	98.9	114.3	11.0	20.8	12.0	72.8										

VTY	LDDG %	1000 G.W.	CHECK MARK	POM M 0-9	NET B 0-9	SPT B 0-9	SCLD 0-9	BAC S 0-9	BYDV 0-9
	( 1)	( 1)	( 17)	( 8)	( 9)	( 4)	( 6)	( 1)	( 3)
56	0.0	37.0	11.8	5.4	5.0	5.3	1.0	4.0	5.0
57	0.0	35.0	5.9	6.3	4.9	5.0	2.0	5.0	5.3
58	10.0	42.0	23.5	5.9	5.0	5.5	1.8	4.0	5.7
59	10.0	46.0	17.6	5.1	5.4	3.8	0.8	6.0	5.0
60	0.0	47.0	11.8	5.1	5.3	5.5	1.3	4.0	5.0
61	30.0	41.0	17.6	6.6	4.6	4.3	1.6	6.0	5.0
62	30.0	44.0	17.6	6.0	4.4	4.8	1.6	6.0	5.0
63	10.0	44.0	11.8	5.4	4.4	4.8	1.0	6.0	5.3
64	20.0	40.0	5.9	5.1	4.5	5.7	1.4	6.0	4.7
65	20.0	40.0	35.3	5.0	4.0	5.3	1.4	7.0	4.3
66	10.0	44.0	5.9	5.0	4.5	3.5	1.4	5.0	3.7
67	0.0	38.0	0.0	4.3	5.0	3.3	1.2	6.0	4.7
68	0.0	36.0	5.9	4.9	5.1	5.3	1.2	6.0	5.0
69	40.0	40.0	11.8	4.4	5.6	5.0	0.4	4.0	4.7
70	30.0	41.0	0.0	6.0	4.1	4.5	1.5	6.0	5.3
71	30.0	40.0	11.8	5.5	4.8	5.0	1.2	6.0	4.7
72	20.0	42.0	0.0	3.9	4.8	4.3	2.8	4.0	4.3
73	30.0	53.0	11.8	4.9	4.6	5.5	0.2	6.0	4.3
74	30.0	42.0	11.8	5.3	4.8	4.3	1.0	4.0	5.0
75	20.0	42.0	23.5	6.1	4.1	5.5	0.2	4.0	4.7
76	10.0	41.0	11.8	5.3	5.9	5.8	0.7	4.0	3.0
77	20.0	45.0	11.8	5.4	6.0	5.0	2.0	4.0	4.3
78	30.0	36.0	11.8	4.6	5.6	5.7	2.2	3.0	4.7
79	40.0	36.0	23.5	4.3	5.8	4.3	2.0	3.0	3.3
80	30.0	44.0	11.8	4.9	5.1	5.0	2.2	2.0	5.0
81	40.0	38.0	17.6	5.3	4.8	4.0	1.8	5.0	4.7
82	40.0	40.0	11.8	5.7	4.4	4.5	2.2	5.0	5.3



Table 2. (continued)

VTY NO.	VARIETY OR CROSS AND PEDIGREE	NUMBER OF OBSERVATIONS:							
		YIELD KG/HA	HEAD DAYS	MAT DAYS	STRP RT-L	LEAF RUST	STEM RUST	PLNT HT	
		( 19 )	( 22 )	( 3 )	( 2 )	( 7 )	( 1 )	( 10 )	
83	GLORIA <sup>SS</sup> /COME <sup>SS</sup> CMB81-294-4Y-1M-6Y-7M-1Y-08	3778.6	99.8	114.3	10.0	21.6	16.0	75.4	
84	GLORIA <sup>SS</sup> /COME <sup>SS</sup> CMB81-294-4Y-1M-6Y-8M-1Y-08	3784.6	99.0	114.3	0.0	22.0	20.0	71.9	
85	GLORIA <sup>SS</sup> /COME <sup>SS</sup> CMB81-294-4Y-1M-6Y-8M-2Y-08	4132.4	100.5	114.7	0.0	19.0	25.0	72.7	
86	GLORIA <sup>SS</sup> /COME <sup>SS</sup> CMB81-294-4Y-1M-6Y-8M-3Y-08	3731.3	99.3	114.3	1.0	22.4	20.0	72.2	
87	GLORIA <sup>SS</sup> /COME <sup>SS</sup> CMB81-294-4Y-1M-6Y-9M-1Y-08	3555.1	99.4	113.7	0.0	20.8	20.0	72.9	
88	GLORIA <sup>SS</sup> /COME <sup>SS</sup> CMB81-294-4Y-1M-6Y-9M-2Y-08	3723.3	98.2	114.3	0.0	20.4	20.0	74.4	
89	GLORIA <sup>SS</sup> /COME <sup>SS</sup> CMB81-294-4Y-1M-6Y-9M-3Y-08	3706.8	93.0	110.0	0.0	20.8	30.0	72.1	
90	GLORIA <sup>SS</sup> /COME <sup>SS</sup> CMB81-294-4Y-1M-6Y-11M-1Y-08	3646.4	95.2	110.0	10.0	20.8	12.0	70.4	
91	GLORIA <sup>SS</sup> /COME <sup>SS</sup> CMB81-294-4Y-1M-6Y-12M-1Y-08	3810.8	97.9	113.3	0.0	21.8	9.0	77.2	
92	GLORIA <sup>SS</sup> /COME <sup>SS</sup> CMB81-294-4Y-1M-6Y-13M-1Y-08	3713.7	99.0	112.7	0.0	26.5	40.0	73.5	
93	GLORIA <sup>SS</sup> /COME <sup>SS</sup> CMB81-294-4Y-1M-6Y-14M-1Y-08	3556.2	98.6	112.3	0.0	28.0	25.0	74.6	
94	GLORIA <sup>SS</sup> /COME <sup>SS</sup> CMB81-294-4Y-1M-7Y-1M-1Y-08	3433.3	94.8	108.3	5.0	21.0	30.0	74.4	
95	GLORIA <sup>SS</sup> /COME <sup>SS</sup> CMB81-294-4Y-1M-7Y-3M-1Y-08	3402.9	92.9	108.7	5.0	27.5	50.0	69.8	
96	HALVA <sup>SS</sup> /B/M64.69/M65.211//XY2240 CMB81-512-3Y-1M-1Y-1M-1Y-08	4065.7	95.9	112.0	15.0	35.0	3.0	65.7	
97	CRZO <sup>SS</sup> /P.CSLA <sup>SS</sup> CMB81-769-7Y-1M-7Y-1M-1Y-08	3930.9	93.6	110.7	20.0	30.5	16.0	75.1	
98	CRZO <sup>SS</sup> /P.CSLA <sup>SS</sup> CMB81-769-7Y-1M-7Y-1M-2Y-08	4045.2	93.5	110.7	40.0	28.8	20.0	75.2	
99	ASE/2CM/B.6.5.B.8/3/API/CM67//ORE CMB80A-887-1B-1Y-3M-0Y	4495.8	90.6	106.7	100.0	25.6	1.0	74.9	
100	GLORIA <sup>SS</sup> /COPAL <sup>SS</sup> CMB81-295-308-4Y-5M-2Y-0M	4527.9	100.1	120.3	60.0	14.8	15.0	78.2	

VTY	LOAD E	1000 L. Mo.	CHECK MARK	POM M 0-9	NET B 0-9	SPT B 0-9	SCLD 0-9	BAG S 0-9	BYOV 0-9
	( 1)	( 1)	( 17)	( 8)	( 9)	( 4)	( 6)	( 1)	( 3)
83	40.0	41.0	23.5	4.7	4.8	6.0	2.2	6.0	4.3
84	10.0	38.0	0.0	5.1	4.6	4.8	2.2	6.0	4.7
85	10.0	39.0	5.9	5.3	3.6	4.3	2.5	4.0	4.0
86	10.0	37.0	23.5	5.1	4.1	4.0	2.2	6.0	4.0
87	20.0	43.0	0.0	5.4	4.3	4.3	2.2	5.0	5.3
88	20.0	42.0	5.9	5.9	4.3	3.8	1.8	6.0	5.0
89	20.0	39.0	17.6	5.5	4.4	6.0	2.6	4.0	5.0
90	0.0	38.0	0.0	4.9	4.5	6.3	0.2	5.0	5.0
91	0.0	43.0	17.6	5.1	4.4	5.3	2.5	4.0	5.7
92	38.0	40.0	0.0	5.1	4.6	5.3	3.6	2.0	5.7
93	38.0	42.0	0.0	5.4	4.3	5.3	2.2	4.0	5.0
94	38.0	35.0	17.6	5.4	4.4	5.3	3.0	6.0	6.0
95	38.0	41.0	11.8	5.9	4.4	5.8	1.4	5.0	5.7
96	18.0	40.0	5.9	5.1	3.3	5.7	6.4	5.0	5.0
97	0.0	37.0	5.9	5.6	3.4	4.0	5.8	6.0	5.0
98	0.0	37.0	17.6	5.3	3.9	3.8	2.7	6.0	4.3
99	18.0	43.0	11.8	5.0	4.5	4.0	4.4	6.0	5.3
100	0.0	41.0	17.6	4.1	5.4	5.3	0.7	4.0	5.3

**Table 3. Resistance to leaf rust.**

LOCS.	CONTINENT	COUNTRY	AREA	VARIABLES INCLUDED
1	AFRICA	ETHIOPIA	SHEWA, AMBO	7
4	AFRICA	SOUTH AFRICA	CAPE PROVINCE-TYGERHOEK	7
20	EUROPE	GERMANY, DEM. REP.	MAGDEBURG-HAOMERSLEBEN	7
30	MIDDLE EAST	CYPRUS	ATHALASSA	7
35	NORTH AMERICA	MEXICO	EL BATAN	7
36	NORTH AMERICA	MEXICO	HIDALGO	7
37	NORTH AMERICA	MEXICO	SONORA-CIANO	7

\*VARIABLE IDENTIFICATIONS  
 7 LEAF RUST

VIT. VARIETY OR CROSS AND PLOIDY LEVEL	LOCATIONS								MEAN
	1	4	20	30	35	36	37		
37 GLORIA'S*/COMES* CM881-294-25Y-49-2Y-0M	0	TMS	30MR	TMR	10R	-----	0	2.3	
36 GLORIA'S*/COMES* CM881-294-25Y-48-1Y-0M	0	0	30MR	5MR	-----	-----	TMS	3.0	
32 GLORIA'S*/CUPAL'S* CM881-294-30A-4Y-24M-2Y-0M	TR	0	50MS	TMR	-----	-----	TMR	8.0	
54 CACU'S*/3/API/CM67//1594 CM881-168-6Y-2Y-14M-1Y-0M	0	0	50MS	5MR	-----	-----	0	8.4	
59 CACU'S*/3/API/CM67//1594 CM881-168-6Y-3Y-1M-1Y-0M	0	TR	50MS	5MR	-----	-----	0	8.4	
60 CACU'S*/3/API/CM67//1594 CM881-168-6Y-4Y-2M-1Y-0M	0	0	50MS	5MR	-----	-----	0	8.4	
53 CACU'S*/3/API/CM67//1594 CM881-168-6Y-2Y-2M-1Y-0M	0	TMS	50MS	5MR	-----	-----	0	8.6	
8 GLORIA'S*/COMES* CM881-294-5B-4Y-8M-1Y-0M	ZMR	10MS-S	50MS	TMR	15R	-----	0	8.8	
7 GLORIA'S*/COMES* CM881-294-5B-5Y-1M-1Y-0M	TR	TS	50MS	10MR	-----	-----	0	9.0	
38 CACU'S*/3/API/CM67//1594 CM881-168-6Y-2Y-19M-1Y-0M	0	TMR	50MS	10MS	-----	-----	0	9.6	
50 GLORIA'S*/COMES* CM881-294-5B-4Y-15M-1Y-0M	0	10R	50MS	10MS	-----	-----	TMR	10.0	
23 GLORIA'S*/CUPAL'S* CM881-294-08-3Y-3M-2Y-0M	TR	5R	50MS	5MR	-----	-----	30M	12.2	
47 GLORIA'S*/LLEDS* CM881A-614-4B-3Y-5M-1Y-0M	0	0	70S	10MS	20R	10MR	TMR	12.3	
52 CALU'S*/3/API/CM67//1594 CM881-168-6Y-1Y-7M-1Y-0M	0	TR	70S	5MR	10R	-----	0	12.3	
10 GLORIA'S*/COMES* CM881-294-6B-1Y-1M-2Y-0M	ZMR	TMR	70S	5MR	10R	-----	0	12.5	

**Leaf Rust**

Scores were reported from seven locations, two from Africa, one from Europe, and one from Middle East. The three Mexican locations were in three different states. Race identification in previous years by the USDA Rust Laboratory (Minnesota) indicates the existence of races 8, 9, 19, and 30 in Mexico, with race 19 being predominant. All 15 entries were resistant across locations with exception to the virulence present in Germany.

**Table 4. Resistance to powdery mildew.**

LUCS.	CONTINENT	COUNTRY	AREA	VARIABLES INCLUDED
19	EUROPE	CZECHOSLOVAKIA	CZECHIA	61
20	EUROPE	GERMANY, DEM. REP.	MAGDEBURG-HADMERSLEBEN	61
21	EUROPE	GREECE	EPANOMI (THESSALONIKI)	61
22	EUROPE	ITALY	FUGGIA	61
24	EUROPE	NORWAY	AAS	61
27	EUROPE	SPAIN	LLEIDA	61
30	MIDDLE EAST	CYPRUS	ATHALASSA	61

\*VARIABLE IDENTIFICATIONS  
61 PUM M 0-9

VITY NO.	VARIETY OR CROSS AND PEDIGREE	LOCATIONS							MEAN
		19	20	21	22	24	27	30	
19	GLORIA*S*/COPAL*S* CMB81-295-308-4Y-22M-1Y-0M	5	4	6	1	3	5	1	3.6
13	GLORIA*S*/COPAL*S* CMB81-295-308-3Y-1M-1Y-0M	5	4	6	2	3	5	1	3.7
14	GLORIA*S*/COPAL*S* CMB81-295-308-4Y-1M-1Y-0M	4	4	6	3	3	5	1	3.7
24	GLORIA*S*/COPAL*S* CMB81-295-308-4Y-16M-1Y-0M	4	4	6	2	4	5	1	3.7
30	GLORIA*S*/COPAL*S* CMB81-295-308-4Y-22M-2Y-0M	4	4	6	3	4	5	1	3.9
72	GLORIA*S*/COPAL*S* CMB81-295-12Y-2B-1Y-0M	5	3	6	2	3	5	2	3.9
29	GLORIA*S*/COPAL*S* CMB81-295-308-4Y-9M-3Y-0M	4	6	6	3	3	5	1	4.0
100	GLORIA*S*/COPAL*S* CMB81-295-308-4Y-5M-2Y-0M	5	6	6	2	2	5	3	4.1
67	BREA*S*/DL70//HD200SKY/3/NOPAL/4/ CELO*S* CMB82-818-3Y-4B-2Y-0M	5	3	5	4	6	6	1	4.3
69	GLORIA*S*/CELO*S* CMB81A-614-16Y-3B-1Y-0M	6	4	5	3	4	6	3	4.4

### Powdery Mildew

Powdery mildew scores presented for the top 10 entries were relatively higher than values reported in previous years. Mexico is not conducive for powdery mildew screening, since the disease only occasionally appears in barley plots. By contrast, European scores clearly indicate the importance of powdery mildew on that continent.

**Table 5. Resistance to spot blotch.**

LOCS.	CONTINENT	COUNTRY	AREA	VARIABLES INCLUDED
1	AFRICA	ETHIOPIA	SHEWA, AMBO	68
8	ASIA	P.R. OF CHINA	HEILONGJIANG	68
30	MIDDLE EAST	CYPRUS	ATHALASSA	68
40	SOUTH AMERICA	BRAZIL	SAD PAULO-CAPAO BONITO	68

\*VARIABLE IDENTIFICATIONS  
68 SPT B 0-9

VTY NO.	VARIETY OR CROSS AND PEDIGREE	LOCATIONS				MEAN
		1	8	30	40	
1	RUMOROSA	0	0	1	5	1.5
38	OKSAMUT/CRZO <sup>MS</sup> CNSMB81A-290-17Y-2B-2Y-0M	1	2	1	6	2.5
9	GLORIA <sup>MS</sup> /CONE <sup>MS</sup> CMB81-294-5B-5Y-1M-1Y-0M	1	2	1	8	3.0
45	GLORIA <sup>MS</sup> /CONE <sup>MS</sup> CMB81-294-5B-6Y-1M-1Y-0M	2	1	1	8	3.0
67	BREA <sup>MS</sup> /DL70//MOZDOSKY/3/NOPAL/4/ CELO <sup>MS</sup> CMB82-818-3Y-4B-2Y-0M	2	2	1	8	3.3
7	CORCHO <sup>MS</sup> //EHB8/F4EL 6L CMB81A-314-10B-1Y-2M-6Y-0M	3	3	1	7	3.5
46	SI <sup>MS</sup> /3/BRA/TRY//GAL/4/EN/5/GYO <sup>MS</sup> / 6/CORCHO <sup>MS</sup> //OS/APRO CMB81A-2311-0-3B-5Y-3M-1Y-0M	3	3	1	7	3.5
50	GLORIA <sup>MS</sup> /CONE <sup>MS</sup> CMB81-294-5B-4Y-15M-1Y-0M	2	3	1	8	3.5
66	RILLO <sup>MS</sup> /ANAPA <sup>MS</sup> CMB82-189-4Y-2B-2Y-0M	3	2	1	8	3.5
43	GLORIA <sup>MS</sup> /CONE <sup>MS</sup> CMB81-294-4B-5Y-7M-2Y-0M	3	3	1	8	3.8

### Spot Blotch

Scores from four different countries were reported. Virulence from races present in Brazil was able to infect all entries in the IBON. No screening for spot blotch is conducted in Mexico. Use caution for interpretation of data, since a form of *Pyrenophora teres* produces symptoms similar to those caused by *Cochiobolus sativus*.

**Table 6. Resistance to net blotch.**

LOCS.	CONTINENT	COUNTRY	AREA	VARIABLES INCLUDED
2	AFRICA	MOROCCO	SETTAT	66
4	AFRICA	SOUTH AFRICA	CAPE PROVINCE-TYGERHDEK	66
8	ASIA	P.R. OF CHINA	HEILONGJIANG	66
25	EUROPE	PORTUGAL	ELVAS	66
30	MIDDLE EAST	CYPRUS	ATHALASSA	66
34	MIDDLE EAST	QATAR	BARADA	66
36	NORTH AMERICA	MEXICO	NIDALGO	66
40	SOUTH AMERICA	BRAZIL	SAD PAULO-CAPAO BONITO	66

\*VARIABLE IDENTIFICATIONS  
 66 NET B 0-9

VITY NO.	VARIETY OR CROSS AND PEDIGREE	LOCATIONS								MEAN
		2	4	8	25	30	34	36	40	
1	RUMOROSA	7	3	2	6	3	0	0	5	3.3
96	MALVA <sup>S</sup> /3/M64.69/M65.211//XV2240 CMB81-512-3Y-1H-1Y-1H-1Y-0H	7	1	2	4	1	5	0	6	3.3
34	DIEPROPETROBSK2 MS/BFL <sup>S</sup> CMSWB81A-163-11Y-1B-1Y-0H	7	1	2	2	4	0	3	8	3.4
97	CRZO <sup>S</sup> /P.CSLA <sup>S</sup> CMB81-769-7Y-1H-7Y-1H-1Y-0H	7	0	2	5	4	3	0	6	3.4
38	OKSAMUT/CRZO <sup>S</sup> CMSWB81A-290-17Y-2B-2Y-0H	7	1	3	2	1	5	3	7	3.6
85	GLDRIA <sup>S</sup> /CONE <sup>S</sup> CMB81-294-4Y-1H-6Y-8H-2Y-0H	7	1	1	3	3	3	3	8	3.6
44	GLORIA <sup>S</sup> /CONE <sup>S</sup> CMB81-294-5B-3Y-3H-1Y-0H	7	2	2	2	4	3	3	8	3.9
46	SI <sup>S</sup> /3/BRA/TRY//GAL/4/EN/5/GYO <sup>S</sup> / 6/CDRCHD <sup>S</sup> //05/APRQ CMB81A-2311-0-3B-3Y-3H-1Y-0H	7	2	2	3	4	3	3	7	3.9
65	LON <sup>S</sup> /COLLO <sup>S</sup> CMB80A-56-2Y-2Y-1H-2Y-0H	7	3	2	5	3	0	5	7	4.0
70	GLORIA <sup>S</sup> /CELO <sup>S</sup> CMB81A-614-20Y-2B-2Y-0H	7	2	2	3	4	3	5	7	4.1
75	GLORIA <sup>S</sup> /CONE <sup>S</sup> CMB81-294-25Y-3B-2Y-0H	7	2	1	4	4	3	5	7	4.1

**Net Blotch**

Net blotch scores were reported from eight locations, each representing a different country. Scores from Morocco and Brazil were high and no resistant entries to races present in both countries were found in the IBON. Screening for net blotch resistance in Mexico is conducted under natural field conditions without inoculations. An attempt to type the virulence spectrum present in Mexico was made by Brian J. Steffenson as part of his Ph. D. thesis at the University of Davis, California, USA.

**Table 7. Resistance to stripe rust.**

LOCS.	CONTINENT	COUNTRY	AREA	VARIABLES INCLUDED
12	ASIA	PAKISTAN	NWFP-PIRSABAR	5
VARIABLE IDENTIFICATIONS 5 STRP RT.L				

VITY NU.	VARIETY OR CROSS AND PEDIGREE	LOCATION 12	MEAN
10	GLORIA*S*/COME*S* CN881-294-68-1Y-1M-2Y-0M	0	0.0
11	GLORIA*S*/COME*S* CN881-294-68-1Y-2M-1Y-0M	0	0.0
12	GLORIA*S*/COPAL*S* CN881-295-308-2Y-2M-1Y-0M	0	0.0
13	GLORIA*S*/COPAL*S* CN881-295-308-3Y-1M-1Y-0M	0	0.0
14	GLORIA*S*/COPAL*S* CN881-295-308-4Y-1M-1Y-0M	0	0.0
15	GLORIA*S*/COPAL*S* CN881-295-308-4Y-9M-1Y-0M	0	0.0
16	GLORIA*S*/COPAL*S* CN881-295-308-4Y-18M-1Y-0M	0	0.0
17	GLORIA*S*/COPAL*S* CN881-295-308-4Y-19M-1Y-0M	0	0.0
18	GLORIA*S*/COPAL*S* CN881-295-308-4Y-20M-1Y-0M	0	0.0
19	GLORIA*S*/COPAL*S* CN881-295-308-4Y-22M-1Y-0M	0	0.0
20	KY63/1794//81 -1B-2Y-2M-1Y-0M	0	0.0
21	GLORIA*S*/COME*S* CN881-294-58-4Y-1M-1Y-0M	0	0.0
22	GLORIA*S*/COME*S* CN881-294-58-5Y-4M-2Y-0M	0	0.0
23	GLORIA*S*/COPAL*S* CN881-295-68-3Y-3M-2Y-0M	0	0.0
24	GLORIA*S*/COPAL*S* CN881-295-308-1Y-2M-1Y-0M	0	0.0

**Stripe Rust**

Scores for stripe rust were reported from one location in Pakistan. The two genotypes (Gloria/Copal, Gloria/Come) are known to have some sister lines resistant to race 24 of *Puccinia striiformis* prevalent in South America.

**Table 8. Resistance to scald.**

LOCS.	CONTINENT	COUNTRY	AREA	VARIABLES INCLUDED
1	AFRICA	ETHIOPIA	SHEWA, AMBO	69
25	EUROPE	PORTUGAL	ELVAS	69
35	NORTH AMERICA	MEXICO	EL BATAN	69
36	NORTH AMERICA	MEXICO	HIDALGO	69
38	NORTH AMERICA	MEXICO	TOLUCA	69
39	NORTH AMERICA	U.S.A.	MONTANA	69

\*VARIABLE IDENTIFICATIONS  
69 SCLD 0-9

VTY NO.	VARIETY OR CROSS AND PEDIGREE	LOCATIONS						MEAN
		1	25	35	36	38	39	
16	GLORIA <sup>SM</sup> /COPAL <sup>SM</sup> CMB01-295-308-4Y-18N-1Y-0M	0	0	0	0	0	0	0.0
17	GLORIA <sup>SM</sup> /COPAL <sup>SM</sup> CMB01-295-308-4Y-19N-1Y-0M	0	0	0	0	0	0	0.0
27	GLORIA <sup>SM</sup> /COPAL <sup>SM</sup> CMB01-295-308-2Y-2M-2Y-0M	0	0	0	0	0	0	0.0
29	GLORIA <sup>SM</sup> /COPAL <sup>SM</sup> CMB01-295-308-4Y-9M-3Y-0M	0	0	---	0	0	0	0.0
13	GLORIA <sup>SM</sup> /COPAL <sup>SM</sup> CMB01-295-308-3Y-1M-1Y-0M	1	0	0	0	0	0	0.2
15	GLORIA <sup>SM</sup> /COPAL <sup>SM</sup> CMB01-295-308-4Y-9M-1Y-0M	0	0	0	0	1	0	0.2
28	GLORIA <sup>SM</sup> /COPAL <sup>SM</sup> CMB01-295-308-4Y-16N-1Y-0M	1	0	0	0	0	0	0.2
54	CACO <sup>SM</sup> /3/API/CM67//1594 CMB01-168-6Y-2Y-14M-1Y-0M	1	0	---	0	0	0	0.2
73	DRE <sup>SM</sup> //33.4/BAHTIM10/3/SELECCION 9 AULA DEI/4/383059 CMB02-1374-A-2Y-18-1Y-0M	1	0	0	0	0	0	0.2
75	GLORIA <sup>SM</sup> /CONE <sup>SM</sup> CMB01-294-25Y-38-1Y-0M	1	0	0	0	0	0	0.2
90	GLORIA <sup>SM</sup> /CONE <sup>SM</sup> CMB01-294-4Y-1M-6Y-11M-1Y-0B	1	0	---	0	0	0	0.2
12	GLORIA <sup>SM</sup> /COPAL <sup>SM</sup> CMB01-295-308-2Y-2M-1Y-0M	0	2	0	0	0	0	0.3
14	GLORIA <sup>SM</sup> /COPAL <sup>SM</sup> CMB01-295-308-4Y-1M-1Y-0M	1	0	0	0	1	0	0.3
30	GLORIA <sup>SM</sup> /COPAL <sup>SM</sup> CMB01-295-308-4Y-22M-2Y-0M	2	0	0	0	0	0	0.3
31	GLORIA <sup>SM</sup> /COPAL <sup>SM</sup> CMB01-295-308-4Y-24M-1Y-0M	0	2	0	0	0	0	0.3

**Scald**

Scores were sent from six locations in four countries. The high level of scald resistance among the top 15 entries is remarkable, considering that scores came from one Mexican location (Toluca) where nurseries were artificially inoculated and from Ethiopia. Ethiopia is considered a hot-spot for scald because of the unusual severity of natural epidemics that traditionally had rendered entries completely susceptible in previous IBONs.



**Table 9. Resistance to stem rust.**

LOCS.	CONTINENT	COUNTRY	AREA	VARIABLES INCLUDED
37	NORTH AMERICA	MEXICO	SONORA-CIANO	

\*VARIABLE IDENTIFICATIONS  
8 STEM RUST

VTY NU.	VARIETY OR CROSS AND PEDIGREE	LOCATIONS 37	MEAN
72	GLORIA <sup>S</sup> /COPAL <sup>S</sup> CM881-295-12Y-28-1Y-0M	THR	0.0
66	RILLO <sup>S</sup> /AMAPA <sup>S</sup> CM882-189-4Y-28-2Y-0M	TM	1.0
70	GLORIA <sup>S</sup> /CELO <sup>S</sup> CM881A-614-20Y-28-2Y-0M	TM	1.0
99	ASE/2CN//H.6.5.B.8/3/API/CM67//ORE CM880A-887-18-1Y-3H-0Y	TM	1.0
69	GLORIA <sup>S</sup> /CELO <sup>S</sup> CM881A-614-16Y-38-1Y-0M	5M	3.0
96	MALVA <sup>S</sup> /3/M64.69/M65.211//XY2240 CM881-512-3Y-1H-1Y-1M-1Y-08	5M	3.0
4	78W40785	5MS	4.0
67	BREA <sup>S</sup> /DL70//MOZDOSKY/3/NOPAL/4/ CELO <sup>S</sup> CM882-818-3Y-48-2Y-0M	5MS	4.0
78	GLORIA <sup>S</sup> /COME <sup>S</sup> CM881-294-4Y-1H-4Y-1M-1Y-08	5MS	4.0
16	GLORIA <sup>S</sup> /COPAL <sup>S</sup> CM881-295-30B-4Y-18M-1Y-0M	10M	6.0
27	GLORIA <sup>S</sup> /COPAL <sup>S</sup> CM881-295-30B-2Y-2H-2Y-0M	10M	6.0
6	CON <sup>S</sup> /GLDA <sup>S</sup> CM881A-52-18-1Y-2M-1Y-0M	10MS	8.0
4	GLORIA <sup>S</sup> /COME <sup>S</sup> CM881-294-5B-4Y-8M-1Y-0M	10MS	8.0
14	GLORIA <sup>S</sup> /COPAL <sup>S</sup> CM881-295-30B-4Y-1H-1Y-0M	10MS	8.0
19	GLORIA <sup>S</sup> /COPAL <sup>S</sup> CM881-295-30B-4Y-22M-1Y-0M	10MS	8.0

**Stem Rust**

Scores for stem rust were sent from one location in the northwestern Mexico (Sonora) where nurseries were artificially inoculated with spores of *Puccinia graminis*. The top 15 entries with low scores show a good degree of resistance.



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