

**RESULTS OF THE FIFTH  
INTERNATIONAL SPRING WHEAT  
YIELD NURSERY, 1968 - 1969**



**CENTRO INTERNACIONAL DE MEJORAMIENTO DE MAIZ Y TRIGO  
INTERNATIONAL MAIZE AND WHEAT IMPROVEMENT CENTER  
MEXICO**

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# RESULTS OF THE FIFTH INTERNATIONAL SPRING WHEAT YIELD NURSERY 1968-1969

## ABSTRACT

The Fifth International Spring Wheat Yield Nursery (ISWYN) was composed of 50 spring wheat varieties representative of the major spring wheat types. Data, received from 63 locations throughout the spring wheat regions of the world, included yield, agronomic traits and disease reactions. Statistical analyses and location summaries are presented for all traits measured at each reporting location.

Over all reporting locations Penjamo 62, Lerma Rojo 64 — Norin 10-Brevor x Andes (3), Pitic 62, Siete Cerros and Sonora 64-Klein Rendidor were the top yielding varieties in that order. Tobari 66 and Huelquen gave the best performance under all three rusts over all locations, but ranked 12 and 16 for yield, respectively.

## INTRODUCTION

The commitment to test internationally promising spring wheat varieties and lines has proven a worthwhile investment. The cooperation received from our collaborators around the world has been the major reason for their success. From these studies it has been possible to identify current varieties and lines which are widely adapted or well suited for production areas where there is interest in increasing yields. In addition, wheat breeders have found this information useful in planning crosses to obtain better varieties.

Another aspect of this project was the systematic assessment of this data for insight into the reasons for good (or bad) performance of varieties across locations and years. This data file is now being prepared for a six-year summary report to the cooperators. We are hopeful that the true potential of this effort will soon be realized.

This report presents the results of the Fifth ISWYN using the same format as the Third and Fourth ISWYN's.

## METHODS AND MATERIALS

Seed for the Fifth ISWYN was produced in increase plots at the Centro de Investigaciones Agrícolas del Noroeste (CIANO) at Ciudad Obregon, Sonora, Mexico, during the 1967-68 growing season. The seed was treated with a Vitavax (registered trademark for 5, 6-dihydro-2-methyl-1, 4-oxathiin-3-carboxanilide) disinfectant prior to packeting. The plots consisted of six, 2.5 meter rows with three replications. Instructions concerning seeding, nursery management and note-taking, as well as data sheets, were included with each set of seed.

The fifty varieties (*Triticum aestivum*) in the nursery represent the principle varietal types of spring wheat grown in many areas of the world.

Some of the varieties had been included in previous international nurseries (1,2,3,4,5,6,7,8,9,10,11) and others were chosen from submissions because they exhibited some outstanding trait in specific regions. An attempt was made to balance previous entries and new entries to keep the nursery current and meaningful.

The varieties entered for testing in the Fifth ISWYN were<sup>1</sup>:

## ARGENTINA

\**Gaboto*: Bagé 2018 x H 44-Sinvalocho MAG/Bagé 1971/37 — One of the most important soft grained varieties in the northern part of the Argentina wheat belt. It is considered resistant to *Septoria* sp., Fusarium and rusts.

\**Sonora 64-Klein Rendidor*: A line of promising yield potential and broad adaptation. It is of intermediate maturity, semi-dwarf and has good disease resistance. It has some cold tolerance and has shown tolerance to *Septoria* in some parts of the world, especially North Africa and the Middle East.

\**Sonora 64 x SK<sub>E</sub>-Lerma Rojo 64A*: A promising semi-dwarf line selected under Argentine conditions.

\**Sonora 64 x Tezanos Pintos Precoz-Nainari 60 (A)*: Sister line of Jaral 66 and the Third ISWYN entry Jaral "S". This line was selected in Argentina and shows promise of a high yield potential, good resistance to stem and stripe rust, strong gluten and early maturity. One defect is low grain test weight.

## AUSTRALIA

\**Gabo*: Bobin<sup>2</sup>-Gaza — An Australian variety of very wide adaptation. It is very susceptible to stripe rust.

*Mengavi*: Gabo<sup>6</sup>-Mentana/Gabo<sup>2</sup> x Eureka-CI 12632 — This variety has good resistance to stem rust, but is susceptible to leaf rust and flag smut.

\**Triple Dirk*: A version of Dirk with additional genes for stem rust resistance. It has been grown commercially in Pakistan and India. It may be the only Australian variety with resistance to stripe rust. It was an entry in the Third ISWYN.

## BRAZIL

\**Carazinho*: Colonista-Frontana — A soft red commercial variety reported to be able to produce relatively good yield on acid soils. It has good stripe rust resistance under most conditions.

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<sup>1</sup> Pedigree notations are: "S" = sib; E = dwarf and superscript numerals = number of backcrosses.

\* An asterisk preceding a variety or cross indicates entry in a previous ISWYN.

## CANADA

\**Selkirk*: McMurachy-Exchange x Redman<sup>3</sup> — Until recently, the most extensively grown variety in the moist parts of the northern hard red spring wheat areas. It is stem rust resistant.

*Manitou*: Thatcher<sup>7</sup>-Frontana x Thatcher<sup>6</sup>-Kenya Farmer/Thatcher<sup>6</sup>-PI 170925 — A tall variety with good resistance to stem rust. It is susceptible to leaf rust.

## CHILE

\**Huelquen*: The most widely grown commercial variety in Chile. It has shown good resistance to all three rusts and high yield potential. It is normal in height.

*Nariño (S)*<sup>2</sup>-*Penjamo (S)*: An experimental semi-dwarf line with soft grain.

## COLOMBIA

\**Bonza 55*: Yanqui 50-Kentana 48 II-2254-2P-111B-4B-1B — An important commercial variety in Colombia and Ecuador which has maintained an effective level of resistance to both stripe and stem rust for 15 years. This is unique with the explosive stripe rust race situation in Colombia.

\**Crespo 63*: [Frocor (Newthatch/Mentana<sup>2</sup>-Kenya x Bagé)] x Gabo II-11263-3T-1B-2T-1B-1T — A commercial variety released jointly by Ecuador and Colombia, having a good level of field resistance to stripe rust.

\**Napo 63*: Frocor-Frontana/Yaqui 48 x Nariño "S" II-9314-22T-1B-1T — An important variety in both Colombia and Ecuador showing very good resistance to stem and stripe rusts.

## EGYPT

*Giza 155*: A white grained variety of high test weight.

## GERMANY

*Kloka WM 1353*: A tall, late maturing variety of unknown adaptability.

## INDIA

\**C-306*: [(Regent 1974 x Chz 3) C-591<sup>2</sup>] x (P 19 x C 281) — This medium tall variety of average straw strength was bred for the central districts of Punjab. It is full bearded with pubescent chaff. It is considered tolerant to the rusts, but is susceptible to loose smut.

\**C-591*: Punjab Type 8B-Punjab Type 9 — Another pre-partition variety released in 1934 and still used in some areas. This high yielding strain has hard, bold, lustrous, amber grains. The glumes are a little less pubescent and the straw is weaker than C-518. It is noted for susceptibility to loose smut, stem and leaf rusts.

*NP-832*: No descriptive information available.

NP-852: An old, tall, weak strained Indian variety with large, white seed. It has limited yield potential, but is resistant to *Alternaria* sp. under Indian conditions. It is susceptible to the rusts.

\*NP-881: A tall variety bred by the Indian Agricultural Research Institute. It was included in the Third ISWYN.

PV-18, INDUS: Penjamo "S"-Gabo 55 8156 selection — A red kernel reselection of the Siete Cerros and Super X cross.

V-878: No descriptive information available.

## ITALY

Victor I: VZ 133 Mara 3 x FN-K58-N — A promising breeding line of late maturity, intermediate habit and good yield potential. It is susceptible to leaf and stem rust, but has moderate resistance to stripe rust. In North Africa, Near and Middle East, it has shown resistance to *Septoria* sp. Defects are low test weight and weak gluten.

## KENYA

(MD-K-Y) (*Wis-Sup*): 4625-HD3 — A new semi-dwarf variety with good resistance to stem rust.

## MEXICO

\*CIANO F67: Pitic 64-Chris "S" x Sonora 64 19957-18m-1y-3m-9y. Named for the "Centro de Investigaciones Agricolas del Noroeste", this variety is early, disease resistant and has good baking qualities. Limited results suggest moderate to good yield potential under some conditions.

\*Inia 66: Lerma Rojo 64-Sonora 64 19008-83M-100Y-100M-100Y-100C — This joint release from CIMMYT and INIA (Instituto Nacional de Investigaciones Agricolas) programs is the earliest semi-dwarf now available and has shown excellent baking qualities, good yield potential, lodging resistance and resistance to many races of stem and stripe rusts. It is susceptible to bunt and barley yellow dwarf. White chaff and red seed characterize this variety.

\*Lerma Rojo 64A: [(Yaqui 50 x Norin 10-Brevor) Lerma 52] Lerma Rojo<sup>2</sup> 8724-8Y-1C-1Y — A semi-dwarf version of the original Lerma Rojo, derived through backcrossing, that has shown good adaptation in the Near East and Mexico. It is resistant to many races of stem and stripe rusts, but susceptible to bunt and powdery mildew.

\*Lerma Rojo 64-Sonora 64: 19008-52M-6Y-7M-101C — A close sister line of Norteño and relative of Inia 66 and Noroeste 66. This promising breeding line has bronze chaff, white seed, but is susceptible to shattering.

\*Nainari 60: [(Supremo-Mentana x Gabo) Thatcher-Queretaro x Kenya-Mentana] Gabo P 4160-6H-3Y-2C — A tall variety now largely replaced by semi-dwarfs in Mexico. This once important commercial variety is still widely used in crossing programs. It has shown good adaptation in several Near Eastern countries and in the Inter-American International Yield Nurseries.



\**Noroeste 66*: Lerma Rojo 64-Sonora 64 19008-52M-4Y-4M-2Y — A sister line of Inia 66 with slightly less yield potential, but good disease resistance. It is susceptible to shattering.

\**Norteño M67*: Lerma Rojo 64-Sonora 64 19008-52M-6Y-3M-2Y — A sister line of Inia 66 and Noroeste 66 entered in this nursery to test suspected high yield potential under some conditions. This bronze chaff, large white seeded variety of good test weight and resistance to the three rusts is also susceptible to shattering.

\**Penjamo 62*: (Frontana x Kenya 58-Newthatch) Norin 10-Brevor 7078-1R-6M-1R-1M — One of the first Mexican semi-dwarfs, this variety is still grown in a number of countries. It has broad adaptation.

\**Pitic 62*: Yaktana 54 x Norin 10-Brevor 26-1C 7064-1Y-1H-1R-2M — First semi-dwarf variety released in Mexico, this high yielding variety has done well in the Inter-American nurseries, all three Near East-American nurseries and the first two ISWYN's. Currently its use is declining in Mexico because of low test weight and susceptibility to current races of stem rust. It is being grown commercially in a number of other countries.

\**Siete Cerros 66*: Penjamo "S"-Gabo 55. 8156-1M-2R-4M — A white grained, dwarf variety of very high yield potential and broad adaptation. This variety and its red seeded sister, Super X, and reselections are referred to under various names including 8156, Kalyansona, S-227, PV-18, Indus 66 and Mexipak 65. These are now grown widely in Pakistan, India and other Near Eastern countries.

\**Sonora 64*: (Yaktana 54 x Norin 10 Brevor) Yaqui 54<sup>2</sup> 8469-2Y-6C-6Y-4C-2Y-1C — Once the most widely grown semi-dwarf wheat in Mexico. It has medium sized red grain of good quality. This lodging resistant variety is awned and has off-white glumes. It is a valuable parent in several breeding programs because of its light insensitivity, earliness, high yield potential and good combining ability. Currently it is recommended only for areas where the rusts are not a problem due to its susceptibility to new races.

*Tezanos Pintos Precoz-Sonora 64/Lerma Rojo 64A-Tezanos Pintos Precoz x Andes (E) (A)*: 22429-11M-1Y-1M-0Y — A new semi-dwarf line with one gene for dwarfing. This line and the next have shown promise in local testing. It has strong gluten.

*Tezanos Pintos Precoz-Sonora 64/Lerma Rojo 64A-Tezanos Pintos Precoz x Andes (E) (B)*: 22429-16M-1Y-1M-0Y — Sister line of the above variety.

\**Tobari 66*: Tezanos Pintos Precoz-Sonora 64A 19021-4M-3Y-102M-100Y-101C — A red seeded dwarf variety with good quality and outstanding disease resistance. The yield potential may not be as high as Siete Cerros. It is widely grown in several countries.

## PAKISTAN

\**C-273*: C591-C209 — A tall, awned, pubescent, white seeded variety grown commercially in the Punjab areas of India and Pakistan.

## SUDAN

*L 1418-3463L 1231 x 23L1274-111 (L)*: No descriptive information available.

*Lerma Rojo 64-Norin 10-Brevor x Andes (3)*: Limited testing suggests a high yield potential for this new semi-dwarf line. It is considered resistant to *Septoria* sp., but is known to be susceptible to stem rust.

*36896-CJ54 (2) x Yaktana 54A (H)*: This semi-dwarf selection has a large head and has some resistance to the three rusts.

## TAIWAN

*Thichung 31*: Included in this experiment as a sample of a different gene pool.

## UNITED STATES OF AMERICA

\**Chris*: CI 13751 Frontana-Thatcher x II-44-29-Thatcher<sup>2</sup> — A variety developed in Minnesota with excellent quality, good disease resistance and acceptable yield potential. It is widely grown in the U.S.A. and Canada. This variety, listed previously as Minn II 53-525, is considered tall and partially light sensitive.

\**Crim*: CI 13465 Klein Titan-Thatcher<sup>3</sup> x II-44-29-Thatcher<sup>2</sup> — This Minnesota variety has good quality, acceptable yield potential and disease resistance. However, it is tall and light sensitive.

\**Justin*: CI 13462 (Thatcher-Kenya Farmer x Lee-Mida) Conley — Developed in North Dakota and grown in North Dakota and Minnesota. This variety has good quality, but low yield. It is considered light sensitive and tall.

\**Thatcher*: Marquis-Iumillo x Kanred-Marquis — A Minnesota variety that was widely grown for many years in the northern United States and Canada and is still grown in the drier areas of that region. It has been used as a standard for spring wheat quality and for that reason has been widely used in the parentage of many of the newer U.S. and Canadian lines. It is extremely day length sensitive.

## DATA SUMMARIZATION

The metric system and percentages were chosen as the units of measurement for presentation. When possible other systems were converted to the appropriate standard before computations were made. Every effort was made to assure the correctness of such conversions as well as the accuracy of translations of terms from other languages and interpretation of supplementary information. CIMMYT, however, takes full responsibility for any errors that may have been made. Data were neither analyzed, nor are presented, for traits when no differential effect was observed.

Yield data were requested from the four center rows of a six-row plot. Yields were converted from the units reported by the cooperator to kilograms per hectare (kg/ha). For readers more accustomed to yield in

bushels per acre, 1,000 kg/ha is approximately 15 bushels per acre for wheat.

Both test weights and 1,000 grain weights were requested because some cooperators do not have test weight equipment. The weights are reported in kilograms per hectoliter (kg/hl) and 1,000 grain weights are reported in grams. For readers more accustomed to test weights expressed in pounds per bushel, 75 kg/hl is roughly equivalent to 60 pounds per bushel.

Disease<sup>1</sup> notes were requested from cooperators when differential reactions were observed. Rust reactions were most commonly recorded with the international rust scale noting the percentage leaf area infected and reaction type (i.e. lesion size). For statistical analyses these rust notes were converted to a coefficient of infection as used by Dr. W. Q. Loegering (U.S.D.A. International Spring Wheat Rust Nursery 1959). This coefficient is calculated by multiplying the percentage of infection by a "response value" assigned to each infection type. Thus, the coefficient combines both the amount of infection and the reaction type. The response values are given in the following table:

Reaction Type	Abbreviation	Response value
0		0.0
Very resistant and resistant	VR and R	0.2
Moderately resistant	MR	0.4
Intermediate	M or X	0.6
Moderately susceptible	MS	0.8
Susceptible	S and VS	1.0

As examples, 20 MS is expressed as  $(20 \times 0.8) = 16.0$  and 10 MR is expressed as  $(10 \times 0.4) = 4.0$ . Ranges of reaction are averaged, such that 5R-15S becomes  $6.0 \left( \frac{5 + 15}{2} = 10 \text{ and } \frac{0.2 + 1.0}{2} = 0.6 \right)$  with 6.0 the product of  $10 \times 0.6$ .

When cooperators reported only percentage of rust, the value was used directly. The occurrence of 0 values, plus the fact that the coefficients do not usually fit a normal distribution, requires that the coefficients be transformed to  $\sqrt{\text{coefficient} + 1.0}$ . The addition of one unit to the coefficient eliminates all zero values and past experience has shown that the square root determination helps to improve the normality of the distributions.

The transformed coefficients can be analyzed statistically as well as correlated with other traits (e.g. yield). However, for tabular presentation in

<sup>1</sup> For simplicity of reporting, all plant diseases are referred to by one common name. The following common names have been selected, followed by the causal agent in parentheses. Stem rust (*Puccinia graminis tritici*); leaf rust (*Puccinia recondita*); stripe rust (*Puccinia striiformis*); mildew (*Erisiphe graminis tritici*) and Septoria (*Septoria* spp.). For this last disease, distinction between the causal species has not always been possible from information supplied by cooperators.

this report, the standard rust scale notes from the first replication at each location are presented since the coefficients are more difficult to use in visualizing the response of a particular variety. The mean rust reaction by location is presented with its related statistics as an index of the amount of rust at that location. Relatively low mean rust values indicate low incidence and/or virulence of the pathogen. Higher means are indicative of a higher incidence and/or virulence. Thus, these means provide a relative location comparison and a reflection of the extent of that pathogen in that nursery under the environmental conditions that existed.

Other indices of varietal performance were analyzed whenever possible and are presented in the tables. Most of these values were percentages. Several indices could be transformed to percent. In those instances where the scale used by the cooperator could not be converted to percent, the scale values are given. The percentage values were not transformed to  $\sqrt{\% + 1}$ , as had been done previously. While some may consider transformation necessary, comprehension of the mean of a transformation is difficult. It was felt that it would be better to present values which were more readily comparable to the field scores used by collaborators.

The grand mean of each trait was calculated and are presented with pertinent statistics in the Tables. Previously, error estimates were calculated indirectly as residuals. Since incomplete data sets are often reported, indirect estimations of the error variance can give biased or even negative values. Therefore, estimated error variances were computed directly for all traits reported. This value was then used to calculate a standard error ratio of the grand mean, a coefficient of variation (the ratio of the standard deviation to the grand mean expressed as a percentage) and the least significant difference (LSD) at the 5% level. The coefficient of variation is useful as a unit basis comparison of variation between locations. The  $LSD_{0.5}$  can be used to compare two variety means at the same locations.

Considerable insight into factors influencing yield can sometimes be gained by correlation studies. Correlations were performed on all possible pairs of factors by location using the mean value for each trait reported. Correlations were computed on the replication means rather than the raw values because some types of data were frequently reported for only one replication. The population size is fairly small for this type of analysis and some spurious correlations may be encountered. Discretion is advised in interpretation of these values. Many workers find correlation analyses interesting and useful and they are presented as part of the summary table for each location with an awareness of their limitations.

The overall location means were computed for each variable and are presented herein when the number of observations justified inclusion. With the exception of the rust data the reported units are those used throughout this report. For arithmetic purposes the mean rust reactions were computed on the transformed values ( $\sqrt{X + 1}$ ) where 1.0 would be no rust and 10. + is complete susceptibility. Relative comparisons are suggested for selecting potentially useful rust resistant varieties. Average values

of less than 2.0 can be considered as quite resistant, while varieties with values greater than 2.5 must be considered as susceptible.

Many problems have been encountered in the analyses and summary of these unique data. It has been our attempt to provide the reader with maximum amount of usable information and yet not confuse the picture with a great deal of computation detail.

## RESULTS AND DISCUSSION

Sixty-three trials were returned for the Fifth ISWYN. Figure 1 presents the reporting location with the corresponding table numbers. The test sites were as varied as previous ISWYN's as indicated by Figure 2.

Inspection of individual locations (Tables 1-63) may offer readers more insight into the suitability of varieties to match specific conditions. The table format selected for the Third ISWYN was used again to assist individuals in variety evaluation at specific locations, and to help identify potentially useful varieties for direct use or as parents in a breeding program.

Table 64 presents the overall mean values of each variety for those variables recorded with sufficient frequency to justify reporting. This table is ranked in descending order for mean yield.

Only two of the new entries in this nursery were ranked in the top 10 for overall yield. These selections, Lerma Rojo 64-N10B x AN (3) and PV 18 Indus ranked second and eighth, respectively. Of the eight previously tested submissions all were in the top ten of the Fourth ISWYN except Lerma Rojo 64A, which ranked 14th for overall yield. All of the top ten of this experiment which were included in the Third were also in the top ten of that report.

This similarity in results of common varieties points out the stability of broad adaptability and invites the question of how best to characterize and capitalize on this trait in an active breeding program.

We at CIMMYT are now investigating the implications of these results and look forward to being able to offer suggestions in the near future. As mentioned previously, a report will be forthcoming dealing with this aspect of the project.

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**F I G U R E S  
A N D  
T A B L E S**

FIGURE 1

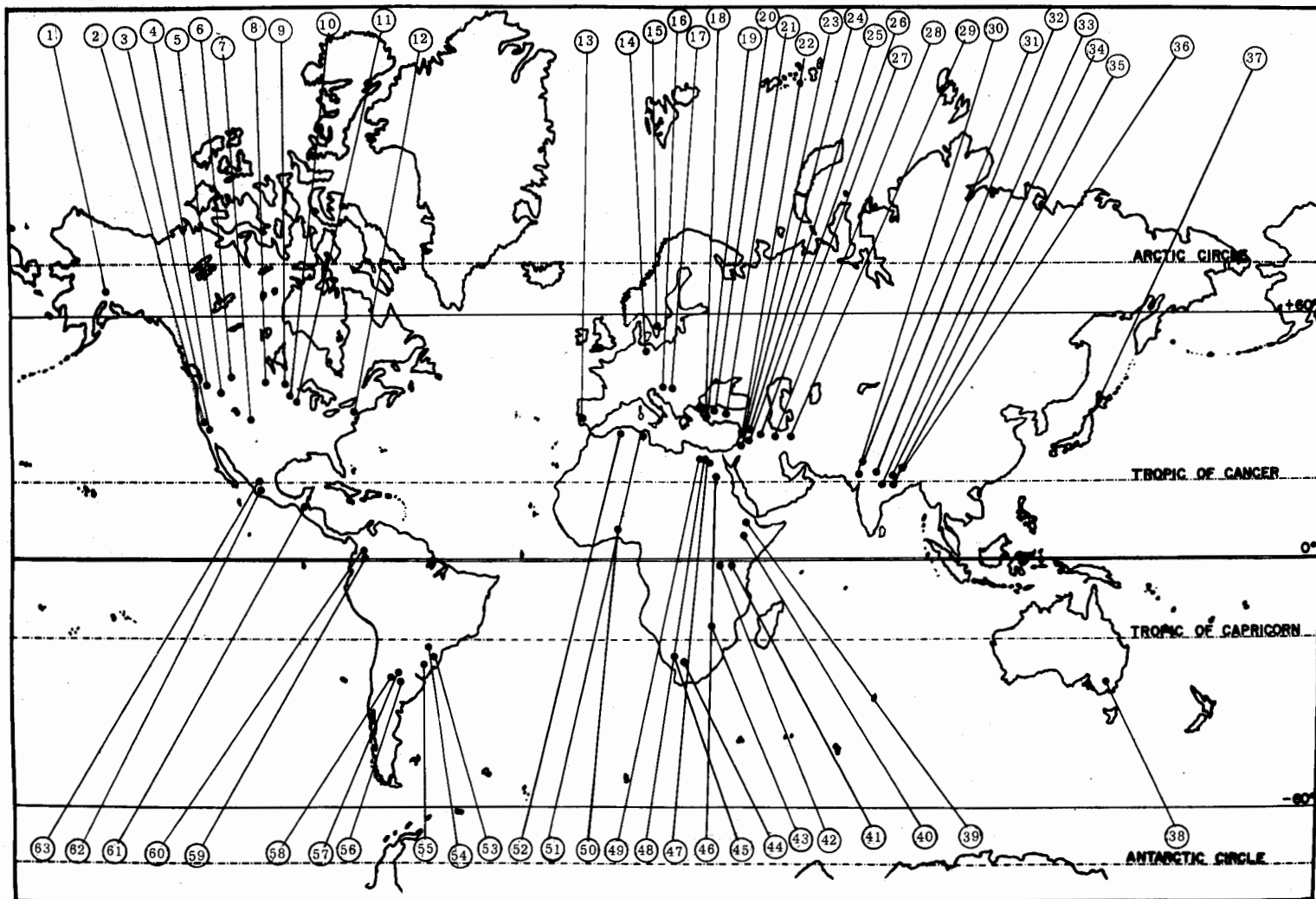






TABLE 1

## NORTH AMERICA

ALASKA (U.S.A.). Palmer. (Alaska Agricultural Experiment Station) Latitude: 61° 34' N. Longitude: 149° 16' W. Elevation: 61 meters above sea level. Cooperator: Roscoe L. Taylor.

Planting Date: 23 May 1969. Precipitation during test: 144.77 mm total from May to September. Irrigation: none. Fertilizer: 18-32-30 Kg./Ha. NPK. General Comments: The weather was extremely dry. No disease development was observed. Weeds were controlled with DNBP.

Variety Number	Variety or cross	Origin	Yield kg/ha	Days to flowering	Days to maturity	Height cms
24	Kloka WM1353	Germany	689	45.0	111.0	54.3
13	Huelquen	Chile	833	45.7	111.3	56.3
1	Pitic 62	Mexico	807	49.7	124.7	66.0
48	PV-18, Indus	India Pak.	798	48.7	115.0	55.0
6	Siete Cerros	Mexico	733	48.3	111.0	52.7
23	LR64 - N10B x AN(3)	Sudan	705	46.3	119.3	48.3
5	Giza 155	Egypt	683	45.3	121.7	57.3
36	Triple Dirk	Australia	668	45.7	116.3	58.3
21	Justin	USA	667	45.0	119.3	62.3
26	Selkirk	Canada	655	45.3	103.3	55.0
9	Bonza 55	Colombia	646	45.3	117.3	65.0
44	36896-CJ54(2) x YT54A (H)	Sudan	642	47.7	122.0	62.3
8	Victor I	Italy	626	52.0	118.0	40.7
15	Taichung 31	Taiwan	625	47.0	104.0	55.7
2	Gabo	Australia	615	48.0	108.7	49.7
30	Nar(S) (2) x PJ(S)	Chile	608	46.7	102.0	50.7
28	Lerma Rojo 64A	Mexico	607	46.0	102.0	55.0
31	L1418-3463L1231 x 23L1274-111(L)	Sudan	592	46.7	123.0	56.7
47	Mengavi	Australia	583	48.7	116.0	45.0
14	Crespo	Colombia	579	45.0	108.0	59.3
45	Norteño 67	Mexico	575	46.3	102.0	52.3
33	Chris	USA	565	45.0	115.7	66.3
39	Napo 63	Colombia	564	45.0	102.0	57.3
16	Son 64A x SK <sub>E</sub> -LR64A	Argentina	549	47.0	107.7	53.3
29	Thatcher	USA	537	45.0	108.7	60.0
18	LR64A-Son 64	Mexico	535	46.7	102.0	54.0
38	Gaboto	Argentina	522	52.3	124.0	77.0
49	(MD-K-Y) (WIS-SUP)	Kenya	517	46.3	109.0	63.3
17	Sonora 64	Mexico	485	48.0	102.7	45.0
25	NP881	India	482	46.3	104.0	53.3
12	Crim	USA	471	46.3	104.0	57.3
37	NP 832	India	462	46.7	107.3	56.7

27	V-878	India	449	47.3	102.0	47.3
10	Carazinho	Brazil	425	52.0	125.0	72.0
42	Manitou	Canada	419	45.3	105.7	56.7
20	C-591	India	415	45.0	106.3	64.3
7	Noroeste 66	Mexico	415	48.3	102.0	49.3
22	Son 64 x TzPP-Nai 60 (A)	Argentina	399	47.7	103.3	50.0
4	Son 64 x Kl. Rend.	Argentina	386	45.3	104.3	48.3
35	Tobari 66	Mexico	368	47.0	103.3	55.0
34	Inia 66	Mexico	336	47.3	102.0	48.3
3	Nainari 60	Mexico	318	46.7	108.7	51.0
19	Ciano 67	Mexico	307	48.7	102.0	45.0
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	304	48.0	102.0	47.3
40	C-306	India	297	45.0	113.7	55.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	296	47.0	102.0	48.0
32	Penjamo 62	Mexico	293	46.3	105.7	52.3
43	C-273	Pakistan	290	45.7	103.3	55.7
11	NP 852	India	149	48.3	102.0	47.3

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Grand mean	524	46.9	109.3	55.0
Standard error of grand mean	10	0.1	0.3	0.3
Coefficient of variation	24.0%	2.4%	3.0%	7.2%
LSD Variety means 5 PC	204	1.9	5.3	6.5

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Correlations

Days to flowering	-0.06		
Days to maturity	0.50**	0.30 *	
Height	0.26	-0.02	0.54**

\* = Significant at the 5% level

\*\* = Significant at the 1% level

TABLE 2

## NORTH AMERICA

UNITED STATES OF AMERICA. Isleton, California. Latitude: 38° 32' N. Longitude: 121° 45' W. Elevation: 6.4 meters below sea level.  
Cooperators: C. O. Qualset, J. A. Rupert, H. E. Vogt and J. T. Feather.

Planting Date: 21 December 1968. Precipitation during test: not stated. Irrigation: none. Fertilizer: none (test followed heavily fertilized tomato crop).

General Comments: There was excessive rain during the winter. Stripe rust infection was severe. No insect, weed or pest problems.

Scoring notes taken: Stripe rust - 26 May.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to Flowering	Stripe rust	Height cms	Lodging (%)	Shattering (%)	Mildew (%)
23	LR64 - N10B x AN(3)	Sudan	7346	79.0	130.7	0	88.3	28.3	6.7	3.7
4	Son 64 x Kl. Rend.	Argentina	6144	75.0	123.3	TR	98.7	86.7	21.7	2.0
28	Lerma Rojo 64A	Mexico	5938	79.0	122.7	10R	104.0	100.0	6.7	16.7
40	C-306	India	5804	79.0	124.7	0	122.0	56.7	5.0	0.0
44	36896-CJ54(2) x YT54A (H)	Sudan	5795	75.0	121.3	TR-R	100.0	91.7	6.7	11.7
30	Nar(S)(2) x PJ(S)	Chile	5759	77.0	120.3	TR	95.7	75.0	10.0	0.3
47	Mengavi	Australia	5705	71.0	127.0	60MS	110.0	51.7	3.3	1.7
32	Penjamo 62	Mexico	5660	78.0	124.7	20R	96.7	81.7	28.3	0.0
5	Giza 155	Egypt	5660	77.0	125.3	0	118.0	50.0	5.0	0.0
18	LR64 - Son 64	Mexico	5490	76.0	122.0	TR	102.0	96.7	55.0	4.0
7	Noroeste 66	Mexico	5454	74.0	122.3	50MS	90.7	96.7	13.3	13.3
20	C-591	India	5436	78.0	123.0	0	122.7	85.0	16.7	0.0
1	Pitic 62	Mexico	5427	68.0	129.7	10R	101.7	90.0	5.0	6.7
31	L1416-3463L1231x23L1274-111(L)	Sudan	5427	77.0	126.0	0	110.7	85.0	10.0	0.0
35	Tobari 66	Mexico	5328	79.0	121.3	0	92.7	61.7	3.3	0.0
3	Nainari 80	Mexico	5310	75.0	125.7	20R	94.7	63.3	8.3	1.7
19	Ciano 67	Mexico	5283	80.0	120.0	TR	91.0	100.0	16.7	0.0
39	Napo 63	Colombia	5247	76.0	120.7	0	111.7	81.7	30.0	0.0
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	5247	80.0	124.0	10R	96.3	51.7	20.0	11.7
45	Norteño 67	Mexico	5176	76.0	121.7	20R	97.3	73.3	58.3	2.0
13	Huelquen	Chile	5149	76.0	127.7	0	116.0	85.0	5.0	0.0
6	Siete Cerros	Mexico	5068	69.0	131.3	50MS	99.3	66.7	16.7	0.0
37	NP 632	India	5032	78.0	129.3	0	124.3	83.3	10.0	0.0
8	Victor I	Italy	5014	73.0	135.3	50MS	101.3	35.0	1.0	3.3
27	V-678	India	4942	78.0	121.3	15R	83.3	58.3	6.7	1.7
34	Inia 66	Mexico	4907	79.0	119.3	10R	89.0	96.7	6.3	3.3
16	Son 64A x SKE-LR64A	Argentina	4853	73.0	127.3	50MS	90.3	18.3	0.0	5.3
14	Crespo	Colombia	4754	75.0	125.7	10R	115.3	75.0	8.3	0.0
12	Crim	USA	4629	76.0	127.7	70MS	124.0	100.0	20.0	0.0
17	Sonora 64	Mexico	4530	74.0	121.0	80S	87.3	71.7	11.7	0.0
10	Carazinho	Brazil	4467	77.0	127.3	30MR	126.3	71.7	8.3	6.7
50	Local Check Variety		4431	74.0	119.0	100S	114.7	91.7	3.0	8.3

11 NP852	India	4413	78.0	120.7	75S	108.0	98.3	21.7	7.0
46 TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	4395	79.0	123.7	5R	99.7	48.3	20.0	5.0
22 Son 64 x TzPP - Nai 60 (A)	Argentina	4386	75.0	121.0	30R	106.0	86.7	35.0	3.3
48 PV-18, Indus	India Pak.	4377	69.0	131.0	70S	92.3	38.3	16.7	0.0
25 NP881	India	4333	77.0	127.0	0	113.0	86.7	23.3	0.0
33 Chris	USA	4306	75.0	127.0	0	126.0	90.0	15.0	0.0
2 Gabo	Australia	4108	70.0	124.7	100S	112.3	91.7	3.3	0.0
21 Justin	USA	4001	75.0	133.7	5R	114.7	86.7	3.3	0.0
9 Bonza 55	Colombia	3884	72.0	126.3	15MR	119.0	96.7	5.0	0.0
38 Gaboto	Argentina	3732	78.0	131.7	5R	123.7	88.3	36.7	6.7
36 Triple Dirk	Australia	3687	74.0	129.0	80S	127.3	90.0	5.0	0.0
43 C-273	Pakistan	3418	78.0	124.7	0	116.7	58.3	15.0	0.0
24 Kloka WM1353	Germany	3418	73.0	135.0	0R	102.7	38.3	21.7	0.0
49 (MD-K-Y)(WIS-SUP)	Kenya	3400	72.0	136.0	5R	120.3	100.0	6.7	0.0
42 Manitou	Canada	3139	74.0	140.0	20R	126.3	90.0	1.7	0.3
29 Thatcher	USA	2969	73.0	141.0	20R	130.0	98.3	0.0	0.3
28 Selkirk	Canada	2897	71.0	142.0	0	126.0	71.7	5.0	0.0
15 Taichung 31	Taiwan	2045	62.0	123.7	100S	100.7	81.7	11.7	33.3

Grand mean	4746	75.1	126.5	3.2	107.7	75.6	13.5	3.2
Standard error of grand mean	54	(only 1 rep.)	0.1	(only 1 rep.)	0.6	1.7	0.9	0.8
Coefficient of variation	14.0%		1.3%		7.3%	27.1%	77.4%	294.6%
LSD Variety means 5 PC	1078		2.7		12.9	33.4	17.1	15.4

#### Correlations

Test wt	0.48**							
Days to flowering	-0.47**	-0.36**						
Stripe rust $\sqrt{X+1}$	-0.27	-0.54**	-0.08					
Height	-0.45**	-0.05	0.47**	-0.09				
Lodging %	-0.21	-0.01	-0.15	-0.01	0.36 *			
Shattering %	0.09	0.20	-0.30 *	-0.17	-0.14	0.15		
Mildew %	-0.12	-0.30 *	-0.24	0.30 *	-0.23	0.10	0.01	

\* = Significant at the 5% level

\*\* = Significant at the 1% level

TABLE 3

## NORTH AMERICA

UNITED STATES OF AMERICA. Davis, California. Latitude: 38° 32' N. Longitude: 121° 45' W. Elevation: 15 meters above sea level.  
Cooperators: C. O. Qualset, J. A. Rupert, H. E. Vogt and J. T. Feather.

Planting Date: 20 March 1969. Precipitation during test: not stated. Irrigation: 2 flood irrigations applied (152.4 mm). Fertilizer: 67.2 Kg./N./Ha. preplant as  $\text{NH}_4\text{NO}_3$  and 67.2 Kg. N/Ha. May 1 as  $(\text{NH}_4)$ .

General Comments: This experiment was planted late. Some Barley Yellow Dwarf Virus was present. No rust development was observed. There was some Greenbug damage.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to flowering	Height cms	1000 grain weight gms	Barley yellow dwarf virus (%)
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	3049	76.0	57.3	87.3	28.3	23.3
34	Inia 66	Mexico	3038	76.0	54.0	81.0	29.7	40.0
32	Penjamo 62	Mexico	3004	76.0	56.0	82.7	31.0	33.3
23	LR64 - N10B x AN(3)	Sudan	2993	73.0	62.3	73.3	23.3	10.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	2926	75.0	56.3	87.0	28.7	36.7
45	Norteno 67	Mexico	2847	74.0	55.0	89.0	32.7	36.7
4	Son 64 x K1. Rend.	Argentina	2797	72.0	55.0	86.0	26.7	36.7
6	Siete Cerros	Mexico	2718	71.0	61.7	82.3	23.0	30.0
39	Napo 63	Colombia	2696	75.0	54.0	98.7	27.3	43.3
11	NP852	India	2685	76.0	53.7	92.7	27.0	43.3
2	Gabo	Australia	2634	71.0	57.0	90.7	28.3	30.0
48	PV-18, Indus	India Pak.	2595	70.0	62.7	81.7	21.3	30.0
7	Noroeste 66	Mexico	2590	74.0	55.7	84.3	29.3	46.7
40	C-306	India	2539	76.0	58.0	112.7	29.7	40.0
28	Lerma Rojo 64A	Mexico	2522	72.0	57.0	89.3	24.3	36.7
18	LR64 - Son 64	Mexico	2500	75.0	56.7	92.0	32.3	46.7
22	Son 64 x TzPP - Nai 60 (A)	Argentina	2461	73.0	53.0	91.7	31.7	46.7
3	Nainari 60	Mexico	2433	70.0	58.3	90.3	29.3	33.3
47	Mengavi	Australia	2433	67.0	60.0	87.3	25.7	33.3
19	Ciano 67	Mexico	2433	74.0	53.7	75.0	27.0	43.3
14	Crespo	Colombia	2393	69.0	58.3	105.7	24.7	30.0
27	V-878	India	2337	73.0	55.3	77.7	22.0	40.0
8	Victor I	Italy	2320	73.0	66.0	66.7	26.3	23.3
30	Nar(S)(2) x PJ(S)	Chile	2236	68.0	55.0	77.3	20.3	50.0
35	Tobari 66	Mexico	2220	71.0	56.3	84.7	21.3	43.3
17	Sonora 64	Mexico	2180	71.0	54.0	74.7	23.3	50.0
15	Taichung 31	Taiwan	2175	69.0	54.3	83.0	22.0	46.7
43	C-273	Pakistan	2141	75.0	55.7	105.7	29.3	56.7
9	Bonza 55	Colombia	2136	66.0	62.0	108.7	23.3	30.0
36	Triple Dirk	Australia	2085	69.0	59.7	112.3	29.3	30.0
50	Ramona 50	USA	1984	69.0	56.0	103.0	27.7	50.0
16	Son 64A x SK <sub>P</sub> - LR64A	Argentina	1945	66.0	58.7	77.3	20.0	40.0

44	36896-CJ54(2) x YT54A (H)	Sudan	1876	86.0	62.3	83.0	24.3	20.0
42	Manitou	Canada	1799	70.0	64.3	98.3	20.7	43.3
10	Carazinho	Brazil	1766	70.0	67.3	95.3	25.0	30.0
13	Huelquen	Chile	1704	67.0	60.3	101.3	23.0	60.0
38	Gaboto	Argentina	1698	71.0	64.7	108.3	19.7	26.7
25	NP881	India	1659	70.0	56.3	89.0	26.3	60.0
24	Kloka WM1353	Germany	1642	65.0	62.7	94.0	22.3	50.0
29	Thatcher	USA	1569	67.0	64.0	110.7	19.3	40.0
49	(MD-K-Y)(WIS-SUP)	Kenya	1558	69.0	64.7	98.3	23.0	20.0
33	Chris	USA	1519	68.0	60.7	114.3	19.0	46.7
12	Crim	USA	1480	67.0	59.0	114.3	22.3	36.7
37	NP 832	India	1463	71.0	58.0	109.0	28.3	70.0
20	C-591	India	1457	1/	58.3	120.7	23.7	56.7
1	Pitic 62	Mexico	1418	62.0	62.0	84.0	21.3	36.7
31	L1418-3463L1231x23L1274-111(L)	Sudan	1379	68.0	60.0	94.7	22.7	43.3
21	Justin	USA	1328	1/	66.0	101.7	24.7	56.7
5	Giza 155	Egypt	1289	67.0	58.0	97.0	22.3	53.3
26	Selkirk	Canada	1205	65.0	66.0	105.3	23.0	30.0

Grand mean			2157	70.6	58.9	93.0	25.2	39.8
Standard error of grand mean			32	(only 1	0.1	0.4	0.2	0.6
Coefficient of variation			18.0%	rep.)	2.4%	5.3%	11.6%	19.1%
LSD Variety means 5 PC			635		2.3	8.1	4.8	12.4

#### Correlations

Test wt	0.45**						
Days to flowering	-0.52**	-0.28 *					
Height	-0.52**	-0.33 *	0.23				
1000 grain weight	0.56**	0.21	-0.48**	-0.07			
Barley yellow dwarf virus %	-0.36**	-0.29 *	-0.38**	0.26	0.04		

\* = Significant at the 5% level

\*\* = Significant at the 1% level

1/ No data available

TABLE 4

## NORTH AMERICA

UNITED STATES OF AMERICA. Pullman, Washington. Latitude: 46° 42' N. Longitude: 117° 8' W. Elevation: 762 meters above sea level.  
Cooperators: C. F. Konzak and Michael Davis.

Planting Date: 20 April 1969. Precipitation during test: 596.9 mm. Irrigation: none. Fertilizer: 67.2 Kg./Ha. NH<sub>4</sub> NO<sub>3</sub>.  
General Comments: Cool spring with average rainfall. Stripe rust and leaf rust were prevalent on all susceptible varieties.

Scoring notes taken: Stripe and leaf rust - 20 June, lodging - 20 July, shattering - 6 August.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to flowering	Days to maturity	Stripe rust	Height cms	Shattering spikelet (%)	Shattering head (%)	1000 grain weight gms
22	Son 64 x TzPP - Nai 60 (A)	Argentina	3992	80.0	53.0	113.0	15MR	81.0	20.0	20.0	42.0
1	Pitic 62	Mexico	3785	76.0	59.0	117.0	5MR	76.0	0.0	0.0	38.0
44	36896-CJ54(2) x YT54A (H)	Sudan	3727	77.0	59.0	118.0	TRR	86.0	0.0	0.0	40.0
3	Nainari 60	Mexico	3667	76.0	55.0	115.0	50MR	89.0	30.0	30.0	43.0
13	Huelquen	Chile	3555	80.0	58.0	117.0	10MR	91.0	40.0	10.0	38.0
31	L1418-3463L1231x23L1274-111(L)	Sudan	3537	80.0	54.0	118.0	TRR	86.0	20.0	20.0	37.0
6	Siete Cerros	Mexico	3507	81.0	58.0	117.0	35MR	74.0	10.0	10.0	36.0
23	LR64 - N10B x AN(3)	Sudan	3397	80.0	59.0	115.0	15MR	63.0	0.0	0.0	36.0
36	Triple Dirk	Australia	3397	78.0	58.0	120.0	100MS	97.0	30.0	30.0	43.0
35	Tobari 66	Mexico	3307	80.0	54.0	114.0	TRMR	74.0	0.0	0.0	38.0
16	Son 64A x SK <sub>E</sub> -LR64A	Argentina	3275	80.0	55.0	116.0	60MR	71.0	10.0	10.0	34.0
14	Crespo	Colombia	3257	80.0	55.0	121.0	15MR	91.0	20.0	20.0	39.0
20	C-591	India	3197	81.0	55.0	120.0	TRR	99.0	0.0	0.0	39.0
5	Giza 155	Egypt	3191	81.0	54.0	117.0	TRR	84.0	20.0	10.0	39.0
19	Ciano 67	Mexico	3189	80.0	53.0	113.0	TRR	69.0	10.0	50.0	38.0
8	Victor I	Italy	3180	78.0	65.0	123.0	40MR	61.0	0.0	0.0	34.0
27	V-878	India	3158	82.0	53.0	112.0	60MR	63.0	10.0	10.0	33.0
9	Bonza 55	Colombia	3143	78.0	58.0	117.0	40MR	91.0	20.0	20.0	37.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	3139	82.0	53.0	113.0	TRR	71.0	10.0	30.0	38.0
17	Sonora 64	Mexico	3102	80.0	53.0	112.0	40MR	66.0	10.0	10.0	35.0
32	Penjamo 62	Mexico	3077	79.0	54.0	112.0	90MR	76.0	10.0	50.0	36.0
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	3064	79.0	56.0	117.0	10MR	71.0	10.0	10.0	36.0
7	Noroeste 66	Mexico	3064	80.0	53.0	113.0	TRR	66.0	30.0	60.0	41.0
42	Manitou	Canada	3003	78.0	54.0	116.0	TRR	99.0	0.0	0.0	30.0
49	(MD-K-Y)(WIS-SUP)	Kenya	2969	78.0	59.0	122.0	5MR	94.0	30.0	40.0	37.0
25	NP881	India	2952	80.0	53.0	112.0	25MR	81.0	30.0	30.0	38.0
30	Nar(S)(2) x PJ(S)	Chile	2941	78.0	54.0	113.0	TRR	74.0	20.0	30.0	34.0
40	C-306	India	2924	82.0	54.0	122.0	TRR	86.0	0.0	0.0	42.0
39	Napo 63	Colombia	2913	81.0	52.0	113.0	TRR	84.0	50.0	20.0	38.0
24	Kloka WM1353	Germany	2894	79.0	59.0	115.0	TRR	84.0	10.0	10.0	31.0
48	PV-18, Indus	India Pak.	2844	81.0	55.0	117.0	60MR	76.0	20.0	10.0	35.0
29	Thatcher	USA	2771	77.0	59.0	115.0	30MR	97.0	30.0	40.0	30.0



33 Chris	USA	2787	79.0	59.0	118.0	TRR	102.0	20.0	30.0	30.0
18 LR64 - Son 64	Mexico	2706	81.0	53.0	113.0	TRMR	76.0	40.0	20.0	42.0
4 Son 64 x Kl. Rend.	Argentina	2685	80.0	53.0	112.0	TRMR	74.0	20.0	50.0	39.0
47 Mengavi	Australia	2637	78.0	55.0	116.0	20MR	76.0	10.0	10.0	36.0
10 Carazinho	Brazil	2579	79.0	71.0	121.0	35MR	97.0	60.0	30.0	41.0
28 Lerma Rojo 64A	Mexico	2577	80.0	54.0	113.0	70MR	84.0	0.0	0.0	38.0
34 Inia 66	Mexico	2556	81.0	52.0	114.0	35MR	69.0	20.0	20.0	38.0
38 Gaboto	Argentina	2536	79.0	59.0	120.0	TRMS-R	99.0	50.0	20.0	33.0
37 NP 832	India	2508	81.0	54.0	117.0	TRR	91.0	10.0	10.0	42.0
45 Norteño 67	Mexico	2489	81.0	53.0	113.0	TRR	74.0	20.0	20.0	42.0
12 Crim	USA	2489	80.0	56.0	117.0	25MR	97.0	20.0	20.0	35.0
15 Taichung 31	Taiwan	2469	80.0	53.0	112.0	100S	69.0	10.0	10.0	30.0
2 Gabo	Australia	2459	79.0	54.0	115.0	15MR	81.0	30.0	10.0	38.0
26 Selkirk	Canada	2452	77.0	59.0	113.0	10MR	94.0	40.0	30.0	36.0
21 Justin	USA	2366	78.0	59.0	117.0	20MR	107.0	50.0	40.0	34.0
43 C-273	Pakistan	2267	82.0	54.0	116.0	10MR	94.0	10.0	20.0	39.0
11 NP852	India	2065	81.0	52.0	112.0	100MR	76.0	30.0	40.0	35.0
Grand mean		2974	79.6	55.8	115.8	2.8	82.3	19.2	19.6	37.0
Standard error of grand mean		47	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)
Coefficient of variation		19.0%								
LSD Variety means 5 PC		922								

#### Correlations

Test wt	-0.22								
Days to flowering	0.07	-0.49**							
Days to maturity	0.16	-0.20	0.62**						
Stripe rust $\sqrt{X+1}$	-0.10	-0.07	0.04	-0.12					
Height	-0.19	-0.29 *	0.33 *	0.47**	-0.15				
Shattering (spikelet)%	-0.32 *	-0.12	0.25	0.01	0.01	0.41**			
Shattering (head)%	-0.24	-0.10	-0.07	-0.28 *	0.04	0.10	0.53**		
1000 grain weight	0.24	0.18	-0.13	0.09	-0.17	-0.01	0.12	0.07	

\* = Significant at the 5% level

\*\* = Significant at the 1% level

TABLE 5

## NORTH AMERICA

UNITED STATES OF AMERICA. Aberdeen, Idaho. Latitude: approximately 42° 56" N. Longitude: approximately 112° 50" W. Elevation: approximately 1341 meters above sea level. Cooperators: Donald W. Sunderman.

Planting Date: 11 April 1969. Precipitation during test: not stated. Irrigation: 5 gravity irrigations of 102 mm each were applied. Fertilizer: 89.6 Kg./Ha. N. General Comments: Weather was dry and warm during the experiment. There was a light infection of stripe rust. No insect, weed or pest problems.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to flowering	Days to maturity	Height cms	Lodging (%)
1	Pitic 62	Mexico	5515	75.7	67.3	114.0	86.0	0.0
13	Huelquen	Chile	4439	78.0	68.0	115.0	96.3	0.0
16	Son 64A x SK <sub>E</sub> -LR64A	Argentina	4173	79.7	64.3	112.0	73.0	0.0
32	Penjamo 62	Mexico	4141	79.0	64.7	113.0	77.0	10.0
3	Nainari 60	Mexico	3980	76.3	62.3	111.0	82.0	0.0
5	Giza 155	Egypt	3945	79.0	62.7	114.0	83.7	0.0
44	36896-CJ54(2) x YT54A (H)	Sudan	3922	76.3	65.3	115.0	83.0	0.0
28	Lerma Rojo 64A	Mexico	3874	78.3	62.0	110.0	82.0	0.0
9	Bonza 55	Colombia	3821	76.0	65.3	113.0	95.7	10.0
31	L1418-3483L1231x23L1274-111(L)	Sudan	3797	78.0	63.0	114.0	80.3	0.0
36	Triple Dirk	Australia	3748	78.0	65.0	114.0	95.7	0.0
22	Son 64 x TzPP - Nai 60 (A)	Argentina	3711	78.0	61.3	113.0	77.0	0.0
6	Siete Cerros	Mexico	3655	79.0	66.0	114.0	77.0	0.0
8	Victor I	Italy	3601	74.0	70.3	115.0	68.0	0.0
24	Kloka WM1353	Germany	3600	77.0	68.7	114.0	87.3	0.0
7	Noroeste 68	Mexico	3591	79.0	62.0	109.0	73.0	0.0
37	NP 832	India	3547	80.0	63.0	115.0	94.0	20.0
17	Sonora 64	Mexico	3534	78.3	62.0	110.0	67.0	0.0
4	Son 64 x Kl. Rend.	Argentina	3528	77.3	61.7	110.0	74.7	0.0
14	Crespo	Colombia	3480	78.3	62.3	113.0	85.3	10.0
40	C-306	India	3478	80.7	62.0	114.0	83.7	10.0
10	Carazinho	Brazil	3477	78.0	68.7	115.0	103.3	10.0
39	Napo 63	Colombia	3470	77.7	60.7	110.0	86.3	0.0
48	PV-18, Indus	India Pak.	3433	79.0	67.0	116.0	73.7	0.0
35	Tobari 66	Mexico	3431	79.0	62.3	112.0	73.0	0.0
12	Crim	USA	3409	78.0	66.3	111.0	96.7	30.0
2	Gabo	Australia	3406	76.0	62.0	111.0	75.3	0.0
42	Manitou	Canada	3353	77.0	69.0	113.0	99.0	10.0
47	Mengavi	Australia	3337	74.7	63.7	114.0	76.3	0.0
50	Local Check Variety		3292	76.0	67.0	112.0	97.3	20.0
23	LR64 - N10B x AN(3)	Sudan	3279	80.0	64.7	114.0	69.7	0.0
20	C-591	India	3271	80.3	62.7	113.0	92.3	20.0

15	Taichung 31	Taiwan	3254	77.0	61.3	112.0	78.0	10.0
38	Gaboto	Argentina	3240	78.0	70.0	114.0	103.7	10.0
25	NP881	India	3224	77.7	62.7	112.0	80.3	30.0
33	Chris	USA	3189	78.0	67.7	115.0	98.3	20.0
34	Inia 66	Mexico	3157	80.0	61.0	113.0	70.3	0.0
27	V-878	India	3140	79.7	61.3	111.0	67.0	0.0
19	Ciano 67	Mexico	3096	80.3	60.0	109.0	67.7	0.0
21	Justin	USA	3046	76.0	72.0	115.0	105.0	0.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	3040	79.3	63.0	113.0	75.3	0.0
49	(MD-K-Y)(WIS-SUP)	Kenya	3035	77.7	70.7	115.0	97.7	0.0
30	Nar(S)(2) x PJ(S)	Chile	2998	76.7	63.0	111.0	73.0	0.0
26	Selkirk	Canada	2948	76.3	69.3	111.0	102.7	0.0
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	2941	79.3	63.0	112.0	69.7	0.0
18	LR64 - Son 64	Mexico	2883	80.0	61.7	110.0	75.3	0.0
43	C-273	Pakistan	2720	80.0	62.0	113.0	86.3	0.0
11	NP852	India	2657	78.0	56.7	109.0	72.0	0.0
29	Thatcher	USA	2650	76.7	70.3	115.0	97.3	10.0
45	Norteño 67	Mexico	2638	79.3	61.7	110.0	74.0	0.0

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Grand mean	3441	76.0	64.4	112.7	83.2	4.6
Standard error of grand mean	38	0.0	0.1	(only 1	0.4	(only 1
Coefficient of variation	14.0%	0.7%	1.3%	rep.)	5.3%	rep.)
LSD Variety means 5 PC	761	0.9	1.3		7.2	

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Correlations

Test wt	-0.20					
Days to flowering	0.12	-0.46**				
Days to maturity	0.23	-0.16	0.65**			
Height	0.03	-0.27	0.66**	0.43**		
Lodging %	-0.09	0.03	0.15	0.13	0.46**	

\* = Significant at the 5% level  
 \*\* = Significant at the 1% level

TABLE 6

## NORTH AMERICA

CANADA. Saskatoon, Saskatchewan. (University of Saskatchewan) Latitude: 52° N. Longitude: 106° W. Elevation: 508 meters above sea level.  
Cooperators: Dr. D. R. Knott.

Planting Date: 9 May 1969. Precipitation during test: 151 mm. Irrigation: not stated. Fertilizer: 65 Kg. /Ha. 11-48-0.

General Comments: Climatic conditions good until heading time, very dry thereafter. No disease development or insect, weed and pest problems.

Variety Number	Variety or cross	Origin	Yield kg/ha	Days to		Height cms	Lodging (%)	1000 grain weight gms
				flowering	maturity			
1	Pitic 62	Mexico	4142	64.0	103.0	78.7	1.0	36.0
13	Huelquen	Chile	4004	63.3	103.7	86.3	1.0	36.0
3	Nainari 60	Mexico	3945	62.0	103.3	78.7	1.0	42.0
23	LR64 - N10B x AN(3)	Sudan	3916	63.0	103.3	64.3	1.0	37.0
44	36896-CJ54(2) x YT54A (H)	Sudan	3737	63.0	102.3	79.7	1.0	37.0
6	Siete Cerros	Mexico	3735	63.3	102.7	70.0	1.0	35.0
18	LR64 - Son 64	Mexico	3620	58.3	100.7	78.7	1.0	43.0
28	Lerma Rojo 64A	Mexico	3561	58.0	101.0	77.0	2.0	43.0
5	Giza 155	Egypt	3504	59.7	103.3	71.0	1.0	40.0
34	Inia 66	Mexico	3480	56.3	101.0	69.7	1.0	45.0
27	V-878	India	3443	58.3	99.0	64.3	1.0	36.0
47	Mengavi	Australia	3437	62.7	103.7	71.3	1.0	37.0
22	Son 64 x TzPP-Nai 60 (A)	Argentina	3401	56.3	102.3	75.3	1.0	42.0
24	Kloka WM1353	Germany	3382	63.0	102.3	77.0	1.0	34.0
36	Triple Dirk	Australia	3362	61.3	102.0	83.7	1.0	43.0
32	Penjamo 62	Mexico	3348	60.0	100.7	66.7	1.0	39.0
2	Gabo	Australia	3337	59.7	102.0	73.0	1.0	38.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	3335	59.0	101.3	73.0	1.0	40.0
25	NP881	India	3296	58.7	100.3	78.7	2.0	40.0
48	PV-18, Indus	India Pak.	3292	63.7	103.7	69.3	1.0	36.0
39	Napo 63	Colombia	3278	56.7	100.0	83.0	1.0	35.0
14	Crespo	Colombia	3276	60.7	101.3	84.7	1.0	37.0
31	L1418-3463L1231x23L1274-111(L)	Sudan	3276	60.3	102.3	76.3	1.0	40.0
10	Carazinho	Brazil	3253	66.7	105.0	100.0	2.0	38.0
15	Taichung 31	Taiwan	3200	58.3	101.0	72.7	2.0	36.0
9	Bonza 55	Colombia	3175	63.3	102.7	88.0	1.0	36.0
50	Manitou	Canada	3159	62.7	103.0	90.3	1.0	32.0
21	Justin	USA	3014	64.3	105.0	94.0	1.0	36.0
42	Manitou	Canada	3009	62.0	102.3	87.3	1.0	31.0
38	Gaboto	Argentina	2992	67.0	105.7	98.3	2.0	30.0
17	Sonora 64	Mexico	2976	58.0	100.0	62.7	1.0	36.0
35	Tobari 66	Mexico	2964	59.7	100.7	67.0	1.0	38.0

45	Norteño 67	Mexico	2948	57.0	100.7	75.3	1.0	44.0
26	Selkirk	Canada	2903	63.3	101.0	89.0	1.0	38.0
16	Son 64A x SK <sub>E</sub> -LR64A	Argentina	2899	60.3	99.7	62.3	1.0	33.0
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	2890	58.7	99.3	71.0	1.0	37.0
33	Chris	USA	2852	63.0	102.0	86.0	1.0	30.0
29	Thatcher	USA	2817	62.0	102.0	85.3	1.0	33.0
12	Crim	USA	2799	62.0	102.0	85.3	2.0	35.0
4	Son 64 x Kl. Rend.	Argentina	2793	57.3	101.0	69.3	2.0	41.0
30	Nar(S)(2) x PJ(S)	Chile	2743	58.0	101.7	65.0	1.0	36.0
7	Noroeste 66	Mexico	2739	58.0	100.3	67.0	1.0	40.0
49	(MD-K-Y)(WIS-SUP)	Kenya	2702	65.0	104.3	88.7	1.0	36.0
20	C-591	India	2662	61.0	102.7	85.3	2.0	40.0
19	Ciano 67	Mexico	2648	56.7	100.0	66.0	1.0	39.0
40	C-306	India	2512	59.7	103.3	75.3	1.0	43.0
43	C-273	Pakistan	2497	58.3	102.7	78.7	1.0	41.0
37	NP 832	India	2465	58.3	103.0	76.0	1.0	45.0
11	NP852	India	2404	55.0	99.7	68.0	1.0	39.0
8	Victor I	Italy	2225	69.3	104.7	54.0	1.0	36.0

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Grand mean	3147	60.7	102.0	76.8	1.2	37.8
Standard error of grand mean	35	0.1	0.1	0.4	(only 1 rep.)	(only 1 rep.)
Coefficient of variation	14.0%	1.4%	1.1%	5.9%		
LSD Variety means 5 PC	703	1.4	1.8	7.5		

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#### Correlations

Days to flowering	0.12					
Days to maturity	0.09	0.77**				
Height	0.08	0.41**	0.46**			
Lodging %	-0.08	0.06	0.09	0.29 *		
1000 grain weight	0.03	-0.54**	-0.18	-0.28	0.01	

\* - Significant at the 5% level  
 \*\* - Significant at the 1% level

TABLE 7

## NORTH AMERICA

UNITED STATES OF AMERICA. Ft. Collins, Colorado. (Cargill, Inc.) Latitude: 40° 35' N. Longitude: 105° 05' E. Elevation: 1524 meters above sea level. Cooperators: B. C. Curtis, B. J. Roberts and D. R. Johnston.

Planting Date: 9 April 1969. Precipitation during test: not stated. Irrigation: 305 mm. Fertilizer: 89.6 Kg./Ha. N, 22.4 Kg./Ha. P<sub>2</sub>O<sub>5</sub> and 22.4 Kg./Ha. K<sub>2</sub>. General Comments: The spring was cool and wet through flowering time, then it turned hot and dry. There was artificial inoculation of stem rust and a natural infection of leaf rust. No insect weed or pest problems.

Scoring notes taken: Shattering - 14 August.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to flowering	Leaf rust	Stem rust
44	36896-CJ54(2) x YT54A (H)	Sudan	5174	76.0	62.7	60MS	TMR
13	Huelquen	Chile	5128	78.0	63.7	40MS-MR	TR
36	Triple Dirk	Australia	4815	76.0	62.3	50MS	0
16	Son 64A x SK <sub>E</sub> -LR64A	Argentina	4762	78.0	62.0	50S	0
32	Penjamo 62	Mexico	4737	78.0	61.0	100S	10MR
1	Pitic 62	Mexico	4724	71.0	64.3	100S	TR
7	Noroeste 66	Mexico	4708	76.0	60.3	TR	0
35	Tobari 66	Mexico	4549	78.0	59.7	0-TR	0
45	Norteño 67	Mexico	4549	77.0	59.7	5R	TR
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	4543	80.0	61.0	50MR-MS	TR
50	68 C II-208		4532	80.0	61.3	TR	0
14	Crespo	Colombia	4506	77.0	60.3	100S	TR
10	Carazinho	Brazil	4484	78.0	64.7	5MS	5MR
3	Nainari 60	Mexico	4393	75.0	61.3	100S	TR
39	Napo 63	Colombia	4374	76.0	60.3	100S	TR
4	Son 64 x Kl. Rend.	Argentina	4368	78.0	60.0	TMR	TR
18	LR64 - Son 64	Mexico	4367	78.0	59.7	40MR	TR
19	Ciano 67	Mexico	4290	78.0	59.3	50MS	TR
28	Lerma Rojo 64A	Mexico	4283	78.0	61.0	50S	TMR
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	4226	79.0	60.7	30MR-MS	0
42	Manitou	Canada	4211	78.0	65.7	50MS	0
38	Gaboto	Argentina	4184	78.0	65.3	TR	TR
33	Chris	USA	4177	78.0	64.3	5R	TR
22	Son 64 x TzPP - Nai 60(A)	Argentina	4141	76.0	59.0	50S	TR
24	Kloka WM1353	Germany	4055	73.0	65.3	100S	5R
23	LR64 - N10B x AN(3)	Sudan	4038	76.0	64.7	100S	5R
9	Bonza 55	Colombia	4013	74.0	62.7	100S	0
17	Sonora 64	Mexico	3987	76.0	58.7	100S	20MR
34	Inia 66	Mexico	3926	79.0	60.3	100S	10R
5	Giza 155	Egypt	3922	76.0	61.7	100S	0
12	Crim	USA	3883	77.0	62.0	100S	TR
21	Justin	USA	3870	78.0	67.7	100S	0

25	NP881	India	3818	76.0	60.3	100S	5R
49	(MD-K-Y) (WIS-SUP)	Kenya	3794	76.0	66.3	50MS	TMR
6	Siete Cerros	Mexico	3752	74.0	64.7	100S	TR
8	Victor I	Italy	3732	71.0	68.0	50MS	5R
48	PV-18, Indus	India Pak.	3706	74.0	65.0	100S	5R
40	C-306	India	3668	80.0	59.7	100S	20MR
20	C-591	India	3666	80.0	60.3	50S	5R
27	V-878	India	3637	78.0	59.0	TR	TR
31	L1418-3463L1231x23L1274-111(L)	Sudan	3545	75.0	61.7	100S	TR
30	Nar(S)(2) x PJ(S)	Chile	3543	75.0	60.0	100S	50S
43	C-273	Pakistan	3365	80.0	59.7	50S	5R
26	Selkirk	Canada	3322	75.0	65.0	100S	TR
47	Mengavi	Australia	3036	70.0	62.3	100S	TR
37	NP 832	India	2988	77.0	61.3	100S	5MR
2	Gabo	Australia	2981	71.0	61.0	100S	0
29	Thatcher	USA	2965	75.0	66.3	100S	TR
11	NP852	India	2943	78.0	58.7	100S	5R
15	Taichung 31	Taiwan	2674	73.0	59.0	100S	40S

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Grand mean	4021	76.4	62.0	7.3	1.4
Standard error of grand mean	26	(only 1 rep.)	0.1	(only 1 rep.)	(only 1 rep.)
Coefficient of variation	8.0%		1.6%		
LSD Variety means 5 PC	515		1.6		

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Correlations

Test wt	0.32 *				
Days to flowering	0.01	-0.33 *			
Leaf rust $\sqrt{X+I}$	-0.45**	-0.44**	0.08		
Stem rust $\sqrt{X+I}$	-0.34 *	-0.12	-0.26	0.26	

\* \* Significant at the 5% level  
 \*\* \* Significant at the 1% level

TABLE 8

## NORTH AMERICA

UNITED STATES OF AMERICA. Casselton, North Dakota. (DeKalb Spring Wheat Station) Latitude: 47° N. Longitude: 97° W. Elevation: 280 meters above sea level. Cooperators: DeKalb Agricultural Research, Inc.

Planting Date: 25 April 1969. Precipitation during test: 507.2 mm total from September 1968 to August 1969. Irrigation: none. Fertilizer: 50.4 Kg./Ha. N (NH<sub>4</sub>NO<sub>3</sub>), 67.2 Kg./Ha. P<sub>2</sub>O<sub>5</sub> and 50.4 Kg./Ha. K.

General Comments: Spring and early summer were cool and wet. August was warm and dry. Both leaf and stem rust infections were late developing. After that a considerable amount of inoculum was present. Septoria level was high. No insect, weed or pest problems.

Variety Number	Variety or cross	Origin	Yield kg/ha	Days to flowering	Leaf rust	Stem rust	Height cms
10	Carazinho	Brazil	4459	73.7	00	10S	115.0
1	Pitic 62	Mexico	4325	68.3	20S	20S	95.0
16	Son 64 A x SK <sub>P</sub> -LR64A	Argentina	4307	66.7	10MR	00	77.0
44	36896-CJ54(2) x YT54A (H)	Sudan	4091	68.3	20-MS-S	TR-MR-MS	95.0
3	Nainari 60	Mexico	4009	68.0	50S	10S	86.0
32	Penjamo 62	Mexico	3881	67.0	10MR-MS	20S	85.0
35	Tobari 66	Mexico	3795	66.0	00	TRMR	85.0
22	Son 64 x TzPP - Nai 60 (A)	Argentina	3770	64.3	20S	5-10S	85.0
28	Lerma Rojo 64A	Mexico	3682	65.7	10S	0	83.0
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	3674	66.3	20S	0	75.0
27	V-878	India	3670	65.0	TR	TR-5S	70.0
36	Triple Dirk	Australia	3638	68.7	40S	20S	107.0
33	Chris	USA	3525	69.7	00	0	100.0
38	Gaboto	Argentina	3525	74.3	00	TRR	110.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	3445	65.7	10S	TR-5S	80.0
4	Son 64 x Kl. Rend.	Argentina	3426	65.0	TRMR	00	77.0
45	Norteño 67	Mexico	3397	64.7	30S	0	85.0
50	Waldron	USA	3378	70.3	30S	0	97.0
34	Inia 66	Mexico	3371	64.7	10S	TRR	75.0
13	Huelquen	Chile	3206	69.3	TRR	00	95.0
18	LR64 - Son 64	Mexico	3203	65.3	TRR	TRR	80.0
7	Noroeste 66	Mexico	3196	65.3	TRR	TRR	75.0
14	Crespo	Colombia	3174	67.3	10MR	00	93.0
39	Napo 63	Colombia	3173	63.0	10MS	0	93.0
25	NP881	India	3171	66.0	60S	0	93.0
17	Sonora 64	Mexico	3143	65.7	20S	10MS-S	73.0
23	LR64 - N10B x AN(3)	Sudan	3132	68.7	30S	20MR-MS	73.0
5	Giza 155	Egypt	3069	65.7	40S	00	87.0
21	Justin	USA	2993	71.7	50S	00	100.0
42	Manitou	Canada	2981	69.7	20S	0	95.0
19	Ciano 67	Mexico	2978	64.7	TRR	TR-5MR	73.0
6	Siete Cerros	Mexico	2904	69.0	30S	00	87.0



48	PV-18, Indus	India Pak.	2859	69.3	30S	0	80.0
49	(MD-K-Y)(WIS-SUP)	Kenya	2857	73.0	40S	0	93.0
12	Crim	USA	2789	68.0	40S	00	110.0
8	Victor I	Italy	2689	73.0	30S	TR-5S	70.0
20	C-591	India	2679	66.3	20S	20S	103.0
26	Selkirk	Canada	2600	73.0	60S	0	95.0
30	Nar(S)(2) x PJ(S)	Chile	2552	65.7	40S	20MS	73.0
11	NP852	India	2479	64.3	40S	00	85.0
9	Bonza 55	Colombia	2407	69.3	40S	00	105.0
31	L1418-3463L1231x23L1274-111(L)	Sudan	2373	66.7	40S	0	90.0
40	C-306	India	2309	66.7	50S	10S	97.0
37	NP 832	India	2226	66.3	30S	30S	103.0
29	Thatcher	USA	2188	70.0	60S	0	100.0
47	Mengavi	Australia	2116	69.3	60S	0	83.0
43	C-273	Pakistan	2093	66.3	50S	5-10S	97.0
2	Gabo	Australia	2042	67.3	30S	TR-5S	83.0
24	Kloka WM1353	Germany	2038	71.3	80S	50S	97.0
15	Taichung 31	Taiwan	1960	66.0	30S	10S	85.0

Grand mean			3099	67.7	4.6	2.0	89.0
Standard error of grand mean			27	0.1	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)
Coefficient of variation			11.0%	1.6%			
LSD Variety means 5 PC			547	1.7			

#### Correlations

Days to flowering			-0.04				
Leaf rust $\sqrt{X+1}$			-0.58**	0.21			
Stem rust $\sqrt{X+1}$			-0.10	0.00	0.24		
Height			-0.06	0.49**	0.20	0.14	

\* = Significant at the 5% level

\*\* = Significant at the 1% level

TABLE 9

## NORTH AMERICA

CANADA. Winnipeg, Manitoba. Latitude: 50° N. Longitude: 97° W. Elevation: 230 meters above sea level.  
Cooperator: A. B. Campbell.

Planting Date: 21 May 1969. Precipitation during test: 235.2 mm total from 21 May to 16 August. Irrigation: none. Fertilizer: 448 Kg./Ha. 27-14-0.

General Comments: The weather was cool and wet during the growing season. Rust infection was heavy on susceptible varieties. Weeds were controlled by spraying.

Scoring notes taken: Leaf rust - 9 August, height - 13 August, days to maturity and lodging - 18 August to 2 September, stem rust - 26 August.

Variety Number	Variety or cross	Origin	Yield kg/ha	Days to maturity	Leaf rust	Stem rust	Height cms	Lodging (scale) 1/
45	Norteño 67	Mexico	3331	94.7	2MS	TR	82.3	3.0
34	Inia 66	Mexico	3281	92.7	3M	TR	77.0	3.0
7	Noroeste 66	Mexico	3009	95.0	TR	TR	77.7	5.0
28	Lerma Rojo 64A	Mexico	2940	94.7	TMS	TR	84.7	4.0
18	LR64 - Son 64	Mexico	2909	95.0	TR	TR	87.0	3.0
39	Napo 63	Colombia	2772	90.7	1R	TR	88.7	3.0
27	V-878	India	2757	94.3	TR	TR	68.7	3.0
4	Son 64 x Kl. Rend.	Argentina	2716	93.7	TR	TR	81.3	4.0
22	Son 64 x TzPP - Nai 60 (A)	Argentina	2685	96.0	1MS	TR	92.3	3.0
16	Son 64A x SK <sub>E</sub> -LR64A	Argentina	2666	96.7	TMS	TR	73.0	3.0
19	Ciano 67	Mexico	2666	91.0	1R	TR	71.0	3.0
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	2637	96.0	TMS	TR	75.7	4.0
35	Tobari 66	Mexico	2607	97.7	TR	TR	80.7	5.0
32	Penjamo 62	Mexico	2587	96.3	TR	1M	82.0	4.0
50	Local Check Variety		2553	96.3	10M	TR	97.3	4.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	2537	97.3	TMS	TR	76.0	4.0
3	Nainari 60	Mexico	2522	97.7	5M	TR	81.7	4.0
42	Manitou	Canada	2505	98.0	5M	TR	100.0	4.0
25	NP881	India	2472	95.3	5M	TR	93.0	6.0
36	Triple Dirk	Australia	2403	98.3	5M	TR	100.3	4.0
33	Chris	USA	2294	99.0	TMS	TR	95.7	5.0
17	Sonora 64	Mexico	2255	92.7	10M	10M	70.3	3.0
21	Justin	USA	2220	98.7	5M	TR	102.0	3.0
14	Crespo	Colombia	2187	97.3	20M	TR	94.0	5.0
1	Pitic 62	Mexico	2148	100.3	5M	1MR	88.0	8.0
26	Selkirk	Canada	2059	95.0	5MR	TR	97.0	4.0
23	LR64 - N10B x AN(3)	Sudan	2053	101.0	50MS	TR	74.0	4.0
30	Nar(S)(2) x PJ(S)	Chile	2050	90.3	1R	10M	72.0	3.0
10	Carazinho	Brazil	2037	103.0	TR	TR	102.0	6.0
5	Giza 155	Egypt	1974	98.0	10M	TR	87.7	3.0
44	36896-CJ54(2) x YT54A (H)	Sudan	1924	98.7	TR	TR	87.7	5.0
24	Kloka WM1353	Germany	1918	98.0	20M	40S	90.3	5.0

38	Gaboto	Argentina	1907	102.7	0	TR	89.3	5.0
8	Victor I	Italy	1807	99.3	2MS	5M	73.0	2.0
49	(MD-K-Y)(WIS-SUP)	Kenya	1729	103.7	TMS	TR	87.7	4.0
48	PV-18, Indus	India Pak.	1713	96.0	3M	TR	76.3	4.0
12	Crim	USA	1694	95.7	20M	TR	104.3	6.0
6	Siete Cerros	Mexico	1666	96.0	5MR	TR	75.3	4.0
47	Mengavi	Australia	1655	98.0	40MS	TR	78.7	4.0
2	Gabo	Australia	1639	95.7	40S	30M	83.0	4.0
13	Huelquen	Chile	1592	91.0	TR	TR	91.3	4.0
29	Thatcher	USA	1581	95.7	80S	5MR	100.0	5.0
31	L1418-3463L1231x23L1274-111(L)	Sudan	1520	96.7	5M	TR	89.7	3.0
9	Bonza 55	Colombia	1474	96.3	3MR	TR	95.0	5.0
11	NP852	India	1446	90.0	0	TR	81.3	4.0
15	Taichung 31	Taiwan	1426	89.0	0	80S	85.3	6.0
20	C-591	India	1228	93.7	1R	TR	111.0	4.0
37	NP 832	India	1118	94.0	60S	10M	90.0	3.0
40	C-306	India	1100	93.0	3M	1R	98.3	5.0
43	C-273	Pakistan	1046	93.0	2M	1R	90.7	5.0

Grand mean	2140	96.0	2.1	1.5	86.6	4.1
Standard error of grand mean	21	0.1	(only 1	(only 1	0.4	(only 1
Coefficient of variation	12.0%	1.2%	rep.)	rep.)	5.1%	rep.)
LSD Variety means 5 PC	418	1.9			7.2	

Correlations

Days to maturity	0.01					
Leaf rust $\sqrt{X+1}$	-0.34 *	0.11				
Stem rust $\sqrt{X+1}$	-0.27	-0.26	0.21			
Height	-0.33 *	0.19	0.11	-0.07		
Lodging (scale)	-0.25	0.24	0.03	0.15	0.39**	

\* = Significant at the 5% level  
 \*\* = Significant at the 1% level

1/ Scale key 1-9 (1 = least lodging)

TABLE 10

## NORTH AMERICA

UNITED STATES OF AMERICA. Eden Prairie, Minnesota. Latitude: 44° 49' 38" N. Longitude: 93° 27' 24" W. Elevation: 277 meters above sea level.  
Cooperators: R. W. Romig and W. Althaus.

Planting Date: 20 April 1969. Precipitation during test: 234 mm. Irrigation: 76.2 mm. Fertilizer: 250 Kg./Ha. 8-16-16 and 100 Kg./Ha. 30-0-0.

General Comments: Mean monthly temperatures were May 15.8°C, June 16.8°C and July 21.1°C. Septoria infection was severe, root rot and scab were prevalent. Leaf and stem rust developed late. There were slight problems with weeds and with wheat stem maggot.

Scoring notes taken: Days to flowering - 15 June, height - 9 July, Septoria - 16 July, leaf rust - 21 July, stem rust and lodging - 4 August.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to flowering	Leaf rust	Stem rust	Height cms	Lodging (scale) <sup>3/</sup>	1000 grain weight gms	Septoria <sup>2/</sup> (scale) <sup>3/</sup>
36	Triple Dirk	Australia	3064	74.0	62.0	60S	40MS	96.0	3.0	39.0	2.0
38	Gaboto	Argentina	3022	71.0	66.0	0	20MR	109.0	3.0	26.0	4.0
14	Crespo	Colombia	2935	74.0	62.0	80S	0	96.0	3.0	29.0	4.0
44	36896-CJ54(2) x YT54A (H)	Sudan	2786	69.0	66.0	10S	10MS	111.0	2.0	27.0	2.0
33	Chris	USA	2766	75.0	62.0	0	5MS	96.0	4.0	30.0	3.0
12	Crim	USA	2622	70.0	60.0	20S	0	106.0	7.0	33.0	6.0
1	Pitic 62	Mexico	2618	62.0	63.0	90S	50S	90.0	2.0	22.0	4.0
35	Tobari 66	Mexico	2613	75.0	60.0	0	0	74.0	1.0	33.0	7.0
10	Carazinho	Brazil	2602	70.0	1/	0	50MS	114.0	7.0	28.0	2.0
28	Lerma Rojo 64A	Mexico	2491	70.0	60.0	0	0	89.0	3.0	37.0	8.0
4	Son 64 x Kl. Rend.	Argentina	2482	67.0	60.0	0	10MR	79.0	2.0	28.0	6.0
42	Manitou	Canada	2469	66.0	64.0	10S	TMS	109.0	4.0	29.0	6.0
18	LR64 - Son 64	Mexico	2460	74.0	60.0	5S	10MR	84.0	2.0	45.0	2.0
16	Son 64A x SK <sub>E</sub> -LR64A	Argentina	2429	67.0	60.0	5MS	0	79.0	2.0	27.0	3.0
6	Siete Cerros	Mexico	2424	64.0	62.0	80S	5MR	84.0	2.0	24.0	7.0
17	Sonora 64	Mexico	2398	70.0	60.0	80S	40S	74.0	2.0	32.0	4.0
20	C-591	India	2344	71.0	62.0	TR	30MS	106.0	3.0	34.0	7.0
22	Son 64 x TzPP - Nai 60 (A)	Argentina	2338	73.0	60.0	10MS	20MS	79.0	3.0	38.0	6.0
37	NP 832	India	2326	1/	1/	1/	1/	1/	1/	1/	1/
39	Napo 63	Colombia	2302	69.0	60.0	60S	5R	89.0	7.0	34.0	6.0
24	Kloka WM1353	Germany	2300	62.0	60.0	90MS	50S	86.0	5.0	20.0	4.0
21	Justin	USA	2293	71.0	65.0	40S	0	101.0	4.0	27.0	5.0
25	NP881	India	2275	69.0	60.0	40MS	0	91.0	5.0	20.0	7.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	2273	67.0	60.0	30S	30MR	79.0	2.0	36.0	1.0
34	Inia 66	Mexico	2231	74.0	60.0	10S	0	71.0	1.0	37.0	8.0
9	Bonza 55	Colombia	2220	66.0	63.0	10MS	TR	104.0	6.0	29.0	3.0
8	Victor I	Italy	2215	69.0	1/	30S	80S	74.0	1.0	24.0	2.0
26	Selkirk	Canada	2204	70.0	60.0	80MS	0	106.0	4.0	31.0	4.0
27	V-878	India	2198	71.0	63.0	0	5MR	71.0	3.0	32.0	5.0
13	Huelquen	Chile	2164	69.0	60.0	0	0	94.0	6.0	28.0	4.0
29	Thatcher	USA	2153	71.0	64.0	99S	10MS	101.0	4.0	25.0	3.0
23	LR64 - N10B x AN(3)	Sudan	2113	70.0	63.0	60S	60MS	76.0	4.0	33.0	6.0

32 Penjamo 82	Mexico	2098	70.0	60.0	20S	30MS	74.0	2.0	28.0	8.0
3 Nainari 60	Mexico	2098	69.0	60.0	60S	50MS	89.0	2.0	34.0	2.0
41 TzPP-Son64/LR64A -TzPPxAN(E)(A)	Mexico	2089	74.0	61.0	40S	60MS	84.0	3.0	27.0	3.0
45 Norteño 67	Mexico	2086	71.0	60.0	5S	TR	89.0	1.0	35.0	2.0
7 Noroeste 66	Mexico	2082	70.0	60.0	TMR	30MS	74.0	2.0	38.0	7.0
15 Taichung 31	Taiwan	2042	69.0	60.0	0	30MS	81.0	5.0	26.0	8.0
5 Giza 155	Egypt	2031	67.0	60.0	80S	0	81.0	2.0	33.0	4.0
49 (MD-K-Y)(WIS-SUP)	Kenya	2029	66.0	65.0	10S	TR	96.0	3.0	28.0	7.0
47 Mengavi	Australia	1889	64.0	63.0	99S	TR	84.0	2.0	26.0	7.0
19 Ciano 67	Mexico	1849	75.0	60.0	TMS	30MS	68.0	3.0	32.0	4.0
2 Gabo	Australia	1840	65.0	60.0	80S	40MS	84.0	3.0	31.0	6.0
48 PV-18, Indus	India Pak.	1818	66.0	64.0	60S	TR	79.0	3.0	19.0	8.0
40 C-306	India	1811	70.0	62.0	0	60S	99.0	5.0	29.0	9.0
50 Waldron	USA	1769	67.0	61.0	0	30M	91.0	2.0	36.0	5.0
30 Nar(S)(2) x PJ(S)	Chile	1742	66.0	60.0	99S	20MS	79.0	2.0	27.0	7.0
43 C-273	Pakistan	1602	75.0	60.0	0	10MR	96.0	3.0	28.0	9.0
31 L1418-3463L1231x23L1274-111(L)	Sudan	1431	61.0	60.0	60S	5R	76.0	2.0	29.0	7.0
11 NP852	India	1033	69.0	60.0	10S	0	81.0	4.0	28.0	9.0

Grand mean	2229	69.3	61.3	4.7	3.2	88.2	3.1	30.0	5.1
Standard error of grand mean	48	(only 1	(only 1	(only 1	(only 1	(only 1	(only 1	(only 1	(only 1
Coefficient of variation	26.0%	rep.)	rep.)	rep.)	rep.)	rep.)	rep.)	rep.)	rep.)
LSD Variety means 5 PC	953								

#### Correlations

Test wt	0.06								
Days to flowering	-0.06	0.54**							
Leaf rust $\sqrt{X+1}$	-0.07	0.01	0.16						
Stem rust $\sqrt{X+1}$	-0.00	0.12	-0.25	0.13					
Height	0.24	0.69**	0.40**	0.02	0.02				
Lodging (scale)	0.05	0.26	0.07	-0.04	-0.01	0.54**			
1000 grain weight	0.08	0.72**	0.45**	-0.10	0.03	0.42**	0.05		
Septoria (scale)	-0.45**	0.25	0.40**	-0.08	-0.18	0.10	0.13	0.07	

\* = Significant at the 5% level

\*\* = Significant at the 1% level

1/ No data available

2/ Septoria sp not known

3/ Scale Key 1-9 (1 = least lodging and Septoria)

TABLE 11

## NORTH AMERICA

UNITED STATES OF AMERICA. St. Paul, Minnesota. Latitude: 45° N. Longitude: 93° 10' W. Elevation: 294 meters above sea level.  
Cooperator: R. E. Heiner.

Planting Date: 30 April 1969. Precipitation during test: 264 mm. Irrigation: none. Fertilizer: 28 Kg./Ha. Amm. Nitrate Actual.

General Comments: April and May were warmer than normal. June was colder than normal and there was below average rainfall. Disease development in general was not too severe. Leaf and stem rust developed late. No insect, weed or pest problems were observed.

Scoring notes taken: Days to flowering - 20 to 26 June, lodging - 11 to 16 July, leaf rust - 14 July, stem rust - 21 July and height - 9 and 10 July.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to flowering	Leaf rust	Stem rust	Height cms	Lodging (%)
35	Tobari 66	Mexico	3005	78.0	52.0	TRR	TRR	81.3	26.7
28	Lerma Rojo 64A	Mexico	3003	76.0	51.0	E	TRR	81.3	33.3
50	II-62-61		2974	80.0	55.0	0	0	83.0	20.0
3	Nainari 60	Mexico	2966	74.0	53.0	60S	5R-MR	86.3	16.7
16	Son64A x SK <sub>2</sub> -LR64A	Argentina	2953	76.0	53.0	60S	5R-MR	73.0	10.0
1	Pitic 62	Mexico	2934	73.0	56.0	40S	5R-S	86.0	43.3
18	LR64 - Son 64	Mexico	2749	78.0	51.0	10S	TRMR	84.7	23.3
34	Inia 66	Mexico	2714	77.0	51.0	E	TRR	77.0	20.0
5	Giza 155	Egypt	2709	75.0	52.0	40S	TRR	86.0	26.7
7	Noroeste 66	Mexico	2707	77.0	51.0	TR5	TRR	77.3	20.0
32	Penjamo 62	Mexico	2701	76.0	53.0	40S	5R	85.3	33.3
23	LR64 - N10B x AN(3)	Sudan	2698	76.0	54.0	40S	10MS	70.3	10.0
14	Crespo	Colombia	2671	78.0	53.0	40S	TRR	91.3	33.3
13	Huelquen	Chile	2659	79.0	53.0	E	0	88.7	30.0
25	Norteno 67	Mexico	2635	76.0	51.0	E	5MR	80.3	20.0
36	Triple Dirk	Australia	2633	77.0	53.0	60S	40S-MS	98.3	26.7
4	Son 64 x Kl. Rend.	Argentina	2551	80.0	52.0	E	TRR	80.3	23.3
38	Gaboto	Argentina	2542	77.0	57.0	TRR-TRS	TRR	103.3	83.3
25	NP881	India	2539	75.0	52.0	20S	5R-MR	87.0	30.0
12	Crim	USA	2517	77.0	52.0	40S	5R-MR	96.3	76.7
24	Kloka WM1353	Germany	2512	72.0	53.0	60S	40MS-S	87.0	20.0
6	Siete Cerros	Mexico	2498	75.0	53.0	60S	5R-MR	77.7	16.7
2	Gabo	Australia	2485	73.0	53.0	40S	60MS-S	85.3	23.3
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	2478	79.0	51.0	20S	TRR	76.3	20.0
47	Mengavi	Australia	2446	72.0	53.0	60S	TRMS	79.7	10.0
22	Son 64 x TzPP - Nai 60 (A)	Argentina	2442	77.0	51.0	20S	20MS	81.3	10.0
17	Sonora 64	Mexico	2426	76.0	51.0	20S	60S	70.3	10.0
44	36896-CJ54(2) x YT54A (H)	Sudan	2399	73.0	52.0	40S	60S	90.7	30.0
48	PV-18, Indus	India Pak.	2387	73.0	53.0	10S	TRR	76.0	16.7
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	2378	79.0	51.0	40S	20R-MR	74.0	20.0
30	Nar(S)(2) x PJ(S)	Chile	2367	75.0	52.0	40S	40MS	72.0	16.7
26	Selkirk	Canada	2359	73.0	54.0	20S	TRR	96.7	40.0

10	Carazinho	Brazil	2335	78.0	57.0	TRR	TRR	107.7	80.0
42	Manitou	Canada	2267	76.0	54.0	40S	0	91.3	66.7
8	Victor I	Italy	2241	72.0	57.0	40S	5S	70.3	10.0
21	Justin	USA	2207	77.0	55.0	60S	TRR	97.0	43.3
29	Thatcher	USA	2203	77.0	54.0	60S	20MS-S	96.7	36.7
27	V-878	India	2198	77.0	52.0	TRS	TRR	65.0	13.3
20	C-591	India	2185	79.0	53.0	40S	20S	100.0	36.7
39	Napo 63	Colombia	2171	75.0	50.0	20S	TRR	85.3	26.7
33	Chris	USA	2160	78.0	54.0	TRS	TRR	101.0	46.7
15	Taichung 31	Taiwan	2159	73.0	50.0	10S	40MS	81.3	30.0
40	C-306	India	2153	77.0	52.0	60S	60S	92.3	43.3
19	Ciano 67	Mexico	2096	77.0	51.0	E	TRMR	70.3	20.0
9	Bonza 55	Colombia	2093	72.0	56.0	20S	TRR	98.3	33.3
49	(MD-K-Y)(WIS-SUP)	Kenya	2078	75.0	54.0	20S	TRR	91.0	53.3
31	L1418-3463L1231x23L1274-111(L)	Sudan	2048	69.0	51.0	40S	10R-MR	83.7	20.0
43	C-273	Pakistan	1878	79.0	57.0	TRS	TRR	89.3	30.0
37	NP 832	India	1816	75.0	52.0	20S	60MR-MS	91.0	30.0
11	NP852	India	1807	78.0	51.0	40S	10R-MR	71.0	20.0

Grand mean	2443	75.9	52.8	4.6	2.5	84.9	29.6
Standard error of grand mean	23	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	0.2	0.6
Coefficient of variation	11.0%					3.4%	25.1%
LSD Variety means 5 PC	456					4.7	12.1

#### Correlations

Test wt	0.13						
Days to flowering	-0.05	-0.04					
Leaf rust $\sqrt{X+1}$	-0.08	-0.41**	0.02				
Stem rust $\sqrt{X+1}$	-0.20	-0.28 *	-0.21	0.42**			
Height	-0.14	0.06	0.47**	0.06	0.02		
Lodging %	-0.14	0.16	0.44**	-0.12	-0.17	0.77**	

\* = Significant at the 5% level

\*\* = Significant at the 1% level

TABLE 12

## NORTH AMERICA

UNITED STATES OF AMERICA. Ithaca, New York. (Cornell University) Latitude: 42.5° N. Longitude: 76.5° W. Elevation: 305 meters above sea level.  
Cooperator: Neal F. Jensen.

Planting Date: 8 May 1969. Precipitation during test: 381 mm total April to May. Average rainfall is 435 mm. Irrigation: none. Fertilizer: 336 Kg./Ha. 10-20-20.  
General Comments: Climatic conditions were normal during the experiment. Some powdery mildew was observed. No insect, weed or pest problems.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to flowering	Days to maturity	Height cms	Mildew (%)
3	Nainari 80	Mexico	1796	68.0	54.0	95.0	70.3	40.0
50	Local Check Variety		1796	70.0	58.0	98.0	83.0	40.0
20	C-591	India	1742	77.0	56.0	99.0	92.3	40.0
13	Huelquen	Chile	1728	74.0	52.0	89.0	78.7	20.0
49	(MD-K-Y) (WIS-SUP)	Kenya	1701	74.0	58.0	101.0	77.0	0.0
14	Crespo	Colombia	1654	76.0	55.0	96.0	85.3	20.0
12	Crim	USA	1621	74.0	55.0	95.0	85.3	40.0
6	Siete Cerros	Mexico	1601	72.0	54.0	92.0	63.3	20.0
48	PV-18, Indus	India Pak.	1574	73.0	54.0	91.0	61.7	20.0
24	Kloka WM1353	Germany	1567	72.0	55.0	95.0	75.3	20.0
22	Son 64 x TzPP-Nai 60 (A)	Argentina	1513	75.0	50.0	89.0	70.7	60.0
25	NP881	India	1480	72.0	52.0	95.0	76.0	0.0
2	Gabo	Australia	1480	68.0	53.0	91.0	68.0	60.0
23	LR64 - N10B x AN (3)	Sudan	1459	75.0	56.0	95.0	60.7	40.0
39	Napo 63	Colombia	1453	71.0	49.0	88.0	72.0	40.0
19	Ciano 67	Mexico	1439	74.0	49.0	88.0	59.7	40.0
45	Norteno 67	Mexico	1439	73.0	50.0	87.0	67.7	40.0
36	Triple Dirk	Australia	1439	75.0	52.0	92.0	81.3	80.0
17	Sonora 64	Mexico	1439	73.0	50.0	89.0	59.0	60.0
26	Selkirk	Canada	1412	72.0	55.0	89.0	79.7	40.0
35	Tobari 66	Mexico	1412	74.0	53.0	92.0	66.7	20.0
32	Penjamo 62	Mexico	1385	74.0	53.0	95.0	66.7	60.0
47	Mengavi	Australia	1372	69.0	55.0	97.0	62.3	20.0
27	V-878	India	1338	76.0	50.0	91.0	58.3	40.0
40	C-306	India	1332	75.0	57.0	97.0	78.7	20.0
18	LR64 - Son 64	Mexico	1325	73.0	50.0	88.0	67.7	80.0
42	Manitou	Canada	1325	75.0	58.0	96.0	79.0	60.0
1	Pitic 62	Mexico	1325	64.0	58.0	96.0	72.0	40.0
7	Noroeste 66	Mexico	1285	70.0	50.0	89.0	64.0	60.0
37	NP 832	India	1285	76.0	50.0	92.0	76.3	40.0
33	Chris	USA	1278	78.0	57.0	96.0	81.3	60.0
4	Son 64 x Kl. Rend.	Argentina	1278	72.0	50.0	88.0	64.3	40.0



43	C-273	Pakistan	1264	78.0	52.0	95.0	79.7	40.0
11	NP852	India	1224	76.0	48.0	87.0	63.3	60.0
5	Giza 155	Egypt	1211	71.0	51.0	96.0	70.0	40.0
16	Son 64A x SK <sub>P</sub> -LR64A	Argentina	1197	72.0	53.0	92.0	60.0	80.0
46	TzPP-Son64/LR64A-TzPPx AN(E)(B)	Mexico	1190	76.0	49.0	89.0	61.7	80.0
31	L1418-3463L1231 x 23L1274-111(L)	Sudan	1184	74.0	52.0	97.0	68.0	40.0
30	Nar(S)(2) x PJ(S)	Chile	1163	73.0	50.0	88.0	58.3	40.0
21	Justin	USA	1143	74.0	60.0	96.0	84.7	40.0
44	36896-CJ54(2) x YT54A (H)	Sudan	1116	67.0	60.0	99.0	73.7	40.0
34	Inia 66	Mexico	1036	73.0	48.0	87.0	57.3	80.0
15	Taichung 31	Taiwan	1022	73.0	51.0	87.0	62.3	80.0
41	TzPP-Son64/LR64A-TzPPx AN(E)(A)	Mexico	1016	75.0	52.0	89.0	61.7	80.0
38	Gaboto	Argentina	1002	74.0	62.0	100.0	78.0	40.0
9	Bonza 55	Colombia	955	69.0	59.0	96.0	80.3	20.0
29	Thatcher	USA	948	77.0	56.0	95.0	78.7	60.0
28	Lerma Rojo 64A	Mexico	948	74.0	51.0	87.0	68.0	60.0
10	Carazinho	Brazil	928	71.0	65.0	103.0	82.7	80.0
8	Victor I	Italy	794	68.0	65.0	99.0	53.0	60.0

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Grand mean	1328	73.0	53.8	93.1	70.9	45.6
Standard error of grand mean	18	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	0.3	(only 1 rep.)
Coefficient of variation	17.0%	rep.)	rep.)	rep.)	4.7%	rep.)
LSD Variety means 5 PC	368				5.5	

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#### Correlations

Test wt	0.03					
Days to flowering	-0.18	-0.29 *				
Days to maturity	0.02	-0.15	0.84**			
Height	0.27	0.20	0.43**	0.52**		
Mildew %	-0.50**	0.11	-0.17	-0.32 *	-0.27	

\* = Significant at the 5% level  
\*\* = Significant at the 1% level

TABLE 13

## EUROPE

PORTUGAL. Elvas. (Estação do Melhoramento do Plantas) Latitude: 38° 53' N. Longitude: 7° 9' W. Elevation: 208 meters above sea level.  
Cooperators: M. T. Barradas and F. Bágulho.

Planting Date: 20 November 1968. Precipitation during test: 645.3 mm from 20 November to 10 June. Irrigation: none. Fertilizer: 126 Kg./Ha. N, 42 Kg./Ha. P<sub>2</sub>O<sub>5</sub> and 48 Kg./Ha. K<sub>2</sub>O.

General Comments: Winter was rainy. Spring was fresh, damp and long. The Septoria epidemic was severe. Stripe rust level was normal and stem rust was below normal. Minor problems were encountered due to cephus and to birds.

Scoring notes taken: Septoria tritici - 24 April, stripe rust - 13 May, stem rust - 9 June, lodging - 2 June, shattering - 26 June.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to flowering	Days to maturity	Stripe rust	Height cms	Lodging (%)	1000 grain weight gms	Septoria tritici (%)
23	LR64 - N10B x AN(3)	Sudan	3363	82.0	143.0	198.7	0	89.7	9.3	42.7	10.0
6	Siete Cerros	Mexico	3357	83.0	142.7	197.7	0	96.7	16.0	38.0	43.3
4	Son 64 x Kl. Rend.	Argentina	3225	83.0	131.0	191.7	0	97.7	17.3	43.3	59.7
24	Kloka WM1353	Germany	3194	80.7	148.0	198.7	0	109.3	9.0	37.3	30.0
22	Son 64 x TzPP - Nai 60 (A)	Argentina	3185	84.3	133.7	195.0	5S	106.7	16.0	47.0	23.3
1	Pitic 62	Mexico	3063	81.0	136.3	195.0	0	98.0	25.7	42.3	56.7
3	Nainari 60	Mexico	2983	81.3	136.0	193.3	10S	111.7	37.7	46.0	36.7
8	Victor I	Italy	2966	81.3	145.0	195.7	10S	88.7	10.3	41.3	23.3
33	Chris	USA	2803	83.0	138.7	196.7	0	129.7	32.0	37.7	10.0
32	Penjamo 62	Mexico	2744	80.7	134.0	192.7	0	101.7	25.7	45.7	50.0
50	Chaimite		2742	82.0	142.7	195.7	40S	101.3	21.0	43.7	30.0
25	NP881	India	2700	82.3	136.3	194.3	0	122.7	32.3	46.3	23.3
2	Gabo	Australia	2661	80.3	135.7	195.0	80S	107.0	26.3	38.7	66.3
16	Son 64A x SK <sub>E</sub> -LR64A	Argentina	2591	84.0	138.0	195.3	5S	92.7	4.7	38.0	30.0
13	Huelquen	Chile	2581	82.3	141.7	196.3	0	107.7	26.3	42.0	36.7
48	PV-18, Indus	India Pak.	2544	83.7	136.3	196.0	0	90.7	16.0	41.7	56.7
37	NP 832	India	2534	85.7	138.3	196.0	0	121.0	50.0	45.0	23.3
5	Giza 155	Egypt	2466	82.7	137.0	198.0	0	110.3	24.7	42.0	56.7
36	Triple Dirk	Australia	2442	81.0	145.3	198.3	90S	124.7	28.0	47.3	16.7
9	Bonza 55	Colombia	2355	79.3	133.7	192.7	0	95.3	39.3	39.0	30.0
10	Carazinho	Brazil	2301	83.0	141.3	198.3	10S	124.7	39.3	46.0	10.0
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	2293	84.0	133.0	191.3	0	85.3	26.7	40.7	16.7
38	Gaboto	Argentina	2273	83.7	141.7	196.0	0	124.0	40.3	34.3	10.0
31	L1418-3463L1231x23L1274-111(L)	Sudan	2254	83.7	138.3	199.3	0	108.7	21.7	43.3	56.7
14	Crespo	Colombia	2251	83.0	137.0	197.3	0	113.3	27.7	41.3	16.7
12	Crim	USA	2233	84.0	146.7	197.3	0	126.0	53.3	37.7	10.0
40	C-306	India	2148	86.0	134.0	196.3	0	110.0	46.7	40.7	82.7
7	Noroeste 66	Mexico	2125	81.7	133.3	192.0	N	90.7	8.0	44.7	59.7
47	Mengavi	Australia	2108	81.3	139.0	196.3	5R	96.0	23.7	40.7	59.7
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	2058	83.0	131.0	190.0	0	99.0	22.7	41.7	36.7
30	Nar(S)(2) x PJ(S)	Chile	2048	79.3	123.0	188.0	0	92.0	17.3	36.7	50.0
21	Justin	USA	1969	84.0	160.0	207.0	0	126.7	32.3	38.3	6.7

34 Inia 66	Mexico	1959	81.7	127.0	189.7	N	95.7	20.7	43.3	70.0
39 Napo 63	Colombia	1958	78.7	127.0	190.0	0	110.7	24.3	39.0	58.7
20 C-591	India	1923	84.3	136.3	197.0	0	115.0	38.3	43.3	50.0
17 Sonora 64	Mexico	1883	80.3	123.7	188.7	N	82.0	20.3	32.7	99.0
11 NP852	India	1843	83.0	129.3	191.7	10S	102.3	29.7	34.0	73.0
44 36896-CJ54(2) x YT54A (H)	Sudan	1841	78.7	128.7	193.0	0	91.0	37.3	45.7	43.3
28 Lerma Rojo 64A	Mexico	1796	81.7	129.0	191.0	0	104.0	24.3	44.3	79.7
35 Tobari 66	Mexico	1765	83.7	125.7	189.7	0	90.0	23.0	43.7	50.0
49 (MD-K-Y)(WIS-SUP)	Kenya	1746	84.7	145.7	201.0	0	115.7	51.7	43.7	10.0
29 Thatcher	USA	1645	83.3	160.0	205.7	0	134.7	31.0	35.3	10.0
26 Selkirk	Canada	1609	83.7	161.3	205.3	0	130.3	37.7	40.3	10.0
18 LR64 - Son 64	Mexico	1605	81.7	131.7	190.7	0	101.7	20.3	47.0	50.0
27 V-878	India	1568	82.0	128.7	190.3	0	81.0	10.0	32.0	58.7
43 C-273	Pakistan	1522	87.0	136.3	197.3	0	108.3	31.7	43.3	58.7
42 Manitou	Canada	1383	83.3	160.7	206.7	0	134.3	31.3	35.0	10.0
45 Norteño 67	Mexico	1301	81.0	130.3	190.3	0	104.3	20.7	44.3	79.7
15 Taichung 31	Taiwan	1187	74.7	130.3	191.0	90S	94.3	23.3	32.3	70.0
19 Ciano 67	Mexico	1085	82.0	126.0	189.3	N	79.7	15.0	39.3	70.0

Grand mean	2244	82.3	137.4	195.2	1.9	105.5	28.4	41.0	41.5
Standard error of grand mean	40	0.1	0.1	0.2	0.0	0.6	0.8	0.1	1.2
Coefficient of variation	22.0%	1.3%	1.3%	1.0%	27.5%	6.5%	38.7%	4.2%	38.0%
LSD Variety means 5 PC	804	1.7	3.0	3.1	0.9	11.3	15.8	2.8	24.3

#### Correlations

Test wt	0.08								
Days to flowering	0.11	0.33 *							
Days to maturity	0.09	0.43**	0.95**						
Stripe rust $\sqrt{X+1}$	0.07	-0.43**	0.02	-0.04					
Height	-0.02	0.35 *	0.69**	0.71**	-0.02				
Lodging %	-0.20	0.30 *	0.27	0.33 *	-0.09	0.63**			
1000 grain weight	0.26	0.19	-0.10	-0.05	-0.04	0.06	0.10		
Septoria tritici %	-0.28	-0.30 *	-0.71**	-0.64**	0.04	-0.57**	-0.31 *	-0.08	

\* = Significant at the 5% level

\*\* = Significant at the 1% level

TABLE 14

## EUROPE

GERMANY. Gatersleben. Latitude: 11° 11' E. Longitude: 51° 49' N. Elevation: 110 mm.  
Cooperators: Institut für Kulturpflanzen forschung.

Planting Date: 30 April 1969. Precipitation during test: 218.9 mm total from April to July. Irrigation: none. Fertilizer: none.

General Comments: April, May and June were cold, but July was dry and hotter than usual. Disease development was generally normal. No insect, weed or pest problems were encountered.

Scoring notes taken: Lodging - 23 June, height - 18 July, diseases - 25 July.

Variety Number	Variety or cross	Origin	Yield kg/ha	Days to flowering	Days to maturity	Stripe rust	Leaf rust	Height cms.	1000 grain weight gms	Mildew <u>1/</u>
1	Pitic 62	Mexico	5503	59.7	97.0	TMR	5R	104.3	39.0	5.0
45	Norteno 67	Mexico	5029	52.7	97.0	TMR	0	88.3	46.0	50.0
3	Nainari 60	Mexico	5022	56.0	99.0	50S	5S	97.7	47.7	5.0
6	Siete Cerros	Mexico	4840	57.0	99.0	30S	30S	88.7	37.7	0.0
7	Noroeste 66	Mexico	4825	53.3	97.0	10MS	2MS	83.7	41.7	40.0
16	Son 64A x SK <sub>E</sub> -LR64A	Argentina	4785	54.0	97.0	TR	TR	83.0	39.3	30.0
28	Lerma Rojo 64A	Mexico	4733	52.7	97.0	5MR	40S	94.0	42.3	30.0
39	Napo 63	Colombia	4637	52.0	97.0	0	30S	106.7	40.7	20.0
23	LR64 - N10B x AN(3)	Sudan	4607	56.7	99.0	R	70S	79.0	36.7	10.0
48	PV-18, Indus	India Pak.	4570	58.7	103.0	10S	0	87.7	37.7	5.0
10	Carazinho	Brazil	4544	61.0	99.0	5MS	0	130.0	45.7	60.0
5	Giza 155	Egypt	4537	54.0	97.0	0	0	99.7	47.0	4.0
14	Crespo	Colombia	4533	56.3	99.0	2R	10S	115.7	45.7	30.0
22	Son 64 x TzPP - Nai 60 (A)	Argentina	4466	52.7	97.0	50S	0	92.0	46.3	20.0
13	Huelquen	Chile	4407	56.3	99.0	TR	TR	110.7	42.3	8.0
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	4348	52.7	97.0	0	TMR	88.0	39.3	70.0
17	Sonora 64	Mexico	4296	52.0	97.0	30S	0	81.3	38.3	30.0
27	V-878	India	4251	52.0	97.0	0	0	73.7	33.0	8.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	4237	52.0	97.0	TR	TR	87.0	41.0	70.0
37	NP 832	India	4192	54.7	97.0	0	70S	117.7	49.3	30.0
32	Penjamo 62	Mexico	4192	55.3	99.0	10MS	0	94.3	44.0	40.0
19	Ciano 67	Mexico	4177	52.0	97.0	0	0	84.0	42.0	10.0
24	Kloka WM1353	Germany	4170	56.7	99.0	0	50S	103.7	35.7	10.0
30	Nar(S)(2) x PJ(S)	Chile	4148	52.0	97.0	TR	10MS	84.3	37.3	5.0
36	Triple Dirk	Australia	4140	56.3	97.0	40S	5S	122.7	51.7	20.0
15	Taichung 31	Taiwan	4126	52.0	97.0	40S	40S	93.3	38.3	20.0
4	Son 64 x Kl. Rend.	Argentina	4118	52.0	97.0	0	0	88.3	43.3	5.0
8	Victor I	Italy	4114	62.7	99.0	10MS	30S	79.0	37.0	30.0
35	Tobari 66	Mexico	4026	56.3	99.0	TR	2R	89.3	40.0	4.0
31	LI418-3463L1231x23L1274-111(L)	Sudan	3992	54.0	99.0	0	0	102.3	47.0	0.0
47	Mengavi	Australia	3881	55.3	99.0	10MS	5S	105.3	42.3	0.0
2	Gabo	Australia	3866	54.0	97.0	70S	0	105.3	43.3	5.0

9 Bonza 55	Colombia	3859	57.0	99.0	AS	2S	128.3	40.0	10.0
18 LR64 - Son 64	Mexico	3807	52.0	97.0	5MR	0	92.3	47.7	40.0
34 Inia 66	Mexico	3674	52.0	97.0	2R	TS	75.3	41.7	20.0
26 Selkirk	Canada	3629	56.0	97.0	5MR	5MR	120.7	40.7	40.0
25 NP881	India	3585	52.0	97.0	5MS	TS	102.3	46.0	0.0
50 Carola		3555	66.0	103.0	0	50S	118.7	38.7	30.0
44 36896-CJ54(2) x YT54A (H)	Sudan	3537	59.7	103.0	0	TR	105.3	40.0	40.0
12 Crim	USA	3414	56.0	99.0	40MR	TR	113.7	43.7	5.0
42 Manitou	Canada	3392	56.0	99.0	2R	TMR	113.3	34.3	40.0
38 Gaboto	Argentina	3385	60.0	101.0	2R	0	127.7	36.0	40.0
43 C-273	Pakistan	3289	53.3	97.0	0	10MR	119.7	48.3	20.0
49 (MD-K-Y)(WIS-SUP)	Kenya	3259	60.3	103.0	2R	2R	120.7	41.7	0.0
33 Chris	USA	3252	56.0	99.0	0	0	128.0	37.3	20.0
21 Justin	USA	3207	58.3	99.0	0	2MS	122.3	40.7	8.0
11 NP852	India	3103	52.0	97.0	60S	5MS	97.3	38.7	35.0
29 Thatcher	USA	2963	56.0	99.0	20MS	50S	118.0	35.3	30.0
20 C-591	India	2822	54.7	99.0	0	5MR	124.0	46.7	10.0
40 C-306	India	2800	54.0	97.0	0	10S	120.7	48.3	30.0

Grand mean		4037	55.3	98.3	2.4	2.5	102.1	41.7	21.8
Standard error of grand mean		36	0.1	(only 1	(only 1	(only 1	0.4	0.1	(only 1
Coefficient of variation		11.0%	1.4%	rep.)	rep.)	rep.)	5.2%	3.0%	rep.)
LSD Variety means 5 PC		726	1.3				8.7	2.0	

#### Correlations

Days to flowering	-0.09							
Days to maturity	-0.24	0.78**						
Stripe rust $\sqrt{\frac{X+1}{}}$	0.08	-0.12	-0.15					
Leaf rust $\sqrt{\frac{X+1}{}}$	0.07	0.19	0.05	0.04				
Height	-0.51**	0.44**	0.32 *	-0.11	0.03			
1000 grain weight	0.02	-0.22	-0.27	0.10	-0.18	0.28		
Mildew	0.01	-0.02	-0.12	-0.11	-0.04	0.02	-0.02	

\* = Significant at the 5% level

\*\* = Significant at the 1% level

1/ Incidence

TABLE 15

## EUROPE

SWEDEN. Weibullsholm, Landskrona. Latitude: 55°55' N. Longitude: 12°50' E. Elevation: 5 meters above sea level.  
Cooperators: Dr. Fajer Fajersson and Mr. Gunnar Svensson.

Planting Date: 24 April 1969. Precipitation during test: 274 mm total from May to August. Irrigation: none. Fertilizer: 600 Kg./Ha. K-P, 100 Kg./Ha. Urea and 300 Kg./Ha. Ca.

General Comments: It was unusually hot and dry during the summer. There was a fairly heavy attack of Powdery mildew during July.

Scoring notes taken: Height and mildew - 28 July.

Variety Number	Variety or cross	Origin	Yield kg/ha	Days to flowering	Height cms	1000 grain weight gms	Mildew (%)
1	Pitic 62	Mexico	1155	63.0	71.7	36.3	30.0
13	Huelquen	Chile	1078	61.3	73.3	44.0	43.3
44	36896-CJ54(2) x YT54A (H)	Sudan	1067	60.7	68.3	42.3	46.7
6	Siete Cerros	Mexico	978	63.0	66.7	36.3	0.0
23	LR64 - N10B x AN(3)	Sudan	955	63.0	60.0	39.3	65.0
47	Mengavi	Australia	944	60.7	61.7	40.3	16.7
10	Carazinho	Brazil	933	63.3	88.3	41.3	63.3
14	Crespo	Colombia	889	59.7	73.3	46.7	40.0
16	Son 64A x SK <sub>E</sub> -LR64A	Argentina	872	59.7	61.7	39.3	56.7
35	Tobari 66	Mexico	861	59.3	63.3	43.0	21.7
38	Gaboto	Argentina	850	63.3	81.7	36.0	43.3
9	Bonza 55	Colombia	844	62.7	81.7	41.7	28.3
36	Triple Dirk	Australia	839	62.0	73.3	50.3	56.7
48	PV-18, Indus	India Pak.	828	63.0	68.3	37.7	3.3
33	Chris	USA	822	61.7	80.0	36.3	40.0
8	Victor I	Italy	817	68.0	53.3	30.3	63.3
31	L1418-3463L1231x23L1274-111(L)	Sudan	805	59.0	66.7	42.7	11.7
5	Giza 155	Egypt	800	59.0	61.7	44.0	13.3
24	Kloka WM1353	Germany	794	62.7	71.7	35.0	28.3
3	Nainari 60	Mexico	767	59.7	66.7	47.3	38.3
32	Penjamo 62	Mexico	761	60.0	66.7	43.7	60.0
12	Crim	USA	733	60.0	81.7	40.3	20.0
42	Manitou	Canada	728	60.0	76.7	37.7	56.7
4	Son 64 x Kl. Rend.	Argentina	728	59.0	66.7	45.3	35.0
20	C-591	India	717	59.7	80.0	44.0	33.3
28	Lerma Rojo 64A	Mexico	678	59.0	65.0	46.0	60.0
21	Justin	USA	678	63.0	83.3	41.3	20.0
43	C-273	Pakistan	655	58.3	70.0	44.0	43.3
2	Gabo	Australia	655	59.0	66.7	39.0	43.3
40	C-306	India	655	59.7	73.3	46.3	46.7
29	Thatcher	USA	639	60.3	81.7	35.3	60.0
25	NP881	India	611	58.7	71.7	45.7	10.0

22	Son 64 x TzPP - Nai 60 (A)	Argentina	611	57.0	63.3	47.0	70.0
37	NP 832	India	605	59.0	73.3	45.7	76.7
49	(MD-K-Y) (WIS-SUP)	Kenya	600	63.7	73.3	44.7	1.7
27	V-878	India	594	58.3	56.7	38.0	53.3
26	Selkirk	Canada	578	61.0	71.7	40.7	40.0
17	Sonora 64	Mexico	533	58.0	55.0	41.7	36.7
30	Nar(S)(2) x PJ(S)	Chile	500	57.7	60.0	36.0	26.7
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	500	59.0	61.7	44.0	70.0
7	Noroeste 66	Mexico	489	59.0	56.7	44.0	48.3
11	NP852	India	467	56.7	63.3	38.0	76.7
15	Taichung 31	Taiwan	461	58.0	65.0	32.0	73.3
34	Inia 66	Mexico	428	57.0	60.0	44.7	60.0
45	Norteno 67	Mexico	400	58.0	61.7	43.3	50.0
39	Napo 63	Colombia	383	57.3	70.0	42.3	40.0
19	Ciano 67	Mexico	378	57.3	58.3	40.7	56.7
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	372	58.7	63.3	39.7	66.7
18	LR64 - Son 64	Mexico	361	58.0	65.0	43.0	83.3

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Grand mean	702	60.1	68.5	41.3	43.0
Standard error of grand mean	8	0.0	0.4	0.2	1.1
Coefficient of variation	14.0%	0.7%	6.5%	4.8%	31.2%
LSD Variety means 5 PC	162	0.7	7.3	3.2	22.0

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Correlations

Days to flowering	0.64**				
Height	0.32 *	0.35 *			
1000 grain weight	-0.09	-0.37**	0.05		
Mildew %	-0.34 *	-0.27	-0.19	-0.01	

\* = Significant at the 5% level  
\*\* = Significant at the 1% level

TABLE 16

## EUROPE

YUGOSLAVIA. Novi Sad. Latitude: 45.5° N. Longitude: 19.8° E. Elevation: 84 meters above sea level.  
Cooperators: Dr. Slavko Borojevic.

Planting Date: 3 April 1969. Precipitation during test: 217 mm. Irrigation: 30 mm. Fertilizer: 125 Kg./Ha. N, 93.5 Kg./Ha. P and 80 Kg./Ha. K.  
General Comments: Winter was mild, with snow cover. In general the climatic conditions were not favorable for the experiment. Disease development was medium severe. No insect, weed or pest problems.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to flowering	Leaf rust	Height cms	1000 grain weight gms
24	Kloka WMI353	Germany	2980	73.7	59.0	S-80	78.3	28.7
12	Crim	USA	2833	77.0	58.0	R-10	81.3	35.3
6	Siete Cerros	Mexico	2638	75.7	57.0	S-80	69.0	31.3
1	Pitic 62	Mexico	2638	71.7	58.0	10, R-20	69.3	31.7
49	(MD-K-Y)(WIS-SUP)	Kenya	2590	74.0	60.0	0	76.3	35.0
25	NP881	India	2443	77.7	54.0	MS-10	76.3	36.0
47	Mengavi	Australia	2395	70.3	54.3	S-80	67.0	31.0
3	Nainari 60	Mexico	2263	73.7	56.0	MS-20	69.3	33.7
13	Huelquen	Chile	2247	74.7	59.0	10, S-60	78.7	31.7
16	Son 64A x SK <sub>E</sub> -LR64A	Argentina	2215	78.3	58.0	R-20	63.3	30.7
48	PV-18, Indus	India Pak.	2200	77.7	59.0	R-40	64.7	33.7
50	NS 303	Yugoslavia	2197	73.3	60.0	MS-10	61.0	26.3
26	Selkirk	Canada	2133	73.0	60.0	S-40	88.3	32.7
45	Norteno 67	Mexico	2037	77.0	53.0	MR-20	67.7	38.0
5	Giza 155	Egypt	2035	75.7	56.0	S-60	73.0	36.3
22	Son 64 x TzPP - Nai 60 (A)	Argentina	2020	77.3	54.0	R-40	70.3	35.0
44	36896-CJ54(2) x YT54A (H)	Sudan	1988	74.0	57.0	MR-20	70.0	36.7
35	Tobari 66	Mexico	1953	79.7	56.0	R-20	63.7	34.0
33	Chris	USA	1938	79.0	58.0	R-40	78.7	31.0
2	Gabo	Australia	1937	73.7	58.0	R-40	69.7	34.3
42	Manitou	Canada	1888	77.0	60.0	R-40	81.7	28.7
31	L1418-3463L1231x23L1274-111(L)	Sudan	1857	75.0	57.0	S-40	72.3	36.7
4	Son 64 x Kl. Rend.	Argentina	1825	77.3	54.0	R-40	65.7	35.3
30	Nar(S)(2) x PJ(S)	Chile	1775	75.0	57.0	S-80	62.7	30.7
9	Bonza 55	Colombia	1758	71.3	57.0	MS-5	78.7	29.0
17	Sonora 64	Mexico	1742	76.3	53.0	40, S-80	58.3	32.3
39	Napo 63	Colombia	1725	76.7	57.0	S-80	79.7	32.0
18	LR64 - Son 64	Mexico	1693	75.7	53.0	R-20	71.0	36.0
10	Carazinho	Brazil	1660	77.3	57.0	S-40, 0	80.3	35.3
19	Ciano 67	Mexico	1660	75.3	54.0	R-20	64.3	34.7
14	Crespo	Colombia	1660	76.7	57.0	R-20	74.7	34.7
7	Noroeste 66	Mexico	1660	73.3	54.0	MS-20	63.0	32.7



32	Penjamo 62	Mexico	1645	76.3	57.0	R-40	64.7	38.3
27	V-878	India	1612	77.0	54.0	0	58.0	30.7
38	Gaboto	Argentina	1597	78.3	58.0	R-10	82.3	31.7
8	Victor I	Italy	1597	70.0	58.0	S-80	50.7	26.0
23	LR64 - N10B x AN(3)	Sudan	1580	76.3	59.0	60, MR-40	57.3	29.0
28	Lerma Rojo 64A	Mexico	1578	76.0	53.0	R-60	68.0	38.3
21	Justin	USA	1562	73.3	62.0	MS-40	87.0	29.0
37	NP 832	India	1548	76.0	58.0	S-80	83.7	33.3
34	Inia 66	Mexico	1482	76.0	53.0	R-20	61.0	34.0
36	Triple Dirk	Australia	1482	75.3	61.0	S-60	80.0	36.3
40	C-306	India	1417	76.7	57.0	40, S-80	79.7	35.0
20	C-591	India	1417	79.0	54.0	MR-40	79.3	34.3
29	Thatcher	USA	1383	76.3	59.0	S-100	83.3	26.3
43	C-273	Pakistan	1383	79.0	54.0	S-40	81.3	37.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	1337	78.7	53.7	R-10	67.0	33.3
15	Taichung 31	Taiwan	1335	73.0	54.0	S-60	70.0	30.0
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	1335	78.0	56.0	R-20	62.3	31.7
11	NP852	India	1272	77.0	54.0	R-10	67.0	31.3
Grand mean			1863	75.7	56.6	4.4	71.4	32.9
Standard error of grand mean			22	0.1	0.0	0.1	0.3	0.1
Coefficient of variation			14.0%	1.3%	0.6%	25.4%	4.6%	5.3%
LSD Variety means 5 PC			433	1.6	0.5	1.8	5.4	2.9

#### Correlations

Test wt.	-0.27						
Days to flowering	0.28 *	-0.25					
Leaf rust $\sqrt{X+1}$	-0.06	-0.37**	0.20				
Height	0.08	0.10	0.41**	0.16			
1000 grain weight	-0.01	0.36**	-0.42**	-0.35 *	0.12		

\* = Significant at the 5% level

\*\* = Significant at the 1% level

TABLE 17

## EUROPE

YUGOSLAVIA. Zagreb. Latitude: 45° 45' N. Longitude: 15° 56' E. Elevation: 116 meters above sea level.  
Cooperator: Dr. Z. Martinic.

Planting Date: 25 March 1969. Precipitation during test: 467 mm (approximately 25% more than average). Irrigation: none. Fertilizer: 80 Kg./Ha. N (2 x 40), 150 Kg./Ha. P<sub>2</sub>O<sub>5</sub>, 140 Kg./Ha. K<sub>2</sub>O.

General Comments: March, April, June and July were cooler than normal, which was favorable. May was warmer than usual. Conditions were favorable for leaf rust, mildew, Septoria sp. and Fusarium. Weeds were controlled mechanically. No insect or pest problems.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to flowering	Days to maturity	Leaf rust	Stem rust	Height cms	Lodging (scale) 1/	1000 grain weight gms	Mildew (%)	Septoria nodorum (%)	Fusarium (%)
1	Pitic 62	Mexico	3983	74.7	56.0	99.0	5MR	0	89.0	0.0	38.0	20.0	33.3	20.0
25	NP881	India	3805	77.3	53.0	97.0	5MR	0	92.3	2.0	40.7	20.0	33.3	13.3
12	Crim	USA	3705	77.0	55.3	97.0	0	0-10MR	107.3	1.0	39.7	13.3	20.0	6.7
16	Son 64A x SK <sub>E</sub> -LR64A	Argentina	3605	80.7	55.0	97.7	0	0	74.7	0.0	34.7	33.3	26.7	6.7
14	Crespo	Colombia	3589	80.0	54.3	100.0	0	0	96.3	0.0	40.3	53.3	20.0	6.7
13	Huelquen	Chile	3394	77.3	57.0	97.3	TR	0	100.7	1.0	35.0	46.7	20.0	6.7
6	Siete Cerros	Mexico	3339	79.3	56.0	100.0	5MR40MS	0-25MR	84.0	0.0	34.7	13.3	53.3	66.7
5	Giza 155	Egypt	3311	79.0	52.3	99.7	5MR	0	92.7	0.0	44.7	20.0	20.0	20.0
32	Penjamo 62	Mexico	3294	77.7	54.0	97.7	TR	0	80.0	2.0	39.7	46.7	46.7	13.3
27	V-878	India	3283	79.7	51.3	96.7	0	0	73.3	0.0	32.7	46.7	33.3	20.0
7	Noroeste 66	Mexico	3255	78.0	50.7	92.3	TR	0	73.3	0.0	39.3	73.3	40.0	0.0
3	Nainari 60	Mexico	3242	75.0	53.0	96.7	5MR	0	85.7	0.0	44.3	66.3	53.3	6.7
22	Son64 x TzPP - Nai 60 (A)	Argentina	3233	79.0	51.0	98.3	0	0	84.3	0.0	41.7	66.7	26.7	20.0
26	Selkirk	Canada	3216	78.0	60.7	98.7	30MS	0	110.7	1.0	40.0	53.3	13.3	6.7
44	36896-CJ54(2) xYT54A (H)	Sudan	3205	76.3	54.0	97.3	0	0	81.7	0.0	39.7	46.7	40.0	13.3
48	PV-18, Indus	India Pak.	3177	79.7	56.7	99.7	TR	0	75.7	0.0	38.7	13.3	33.3	66.7
28	Lerma Rojo 64A	Mexico	3166	80.0	51.7	93.3	35MS	0	80.3	0.0	42.0	73.3	33.3	20.0
45	Norteño 67	Mexico	3155	79.3	50.7	93.3	TR	0	79.0	0.0	41.3	86.3	20.0	0.0
49	(MD-K-Y)(WIS-SUP)	Kenya	3144	77.3	62.3	102.3	0	0	96.0	2.0	42.0	0.0	6.7	13.3
10	Carazinho	Brazil	3139	79.3	56.0	99.0	TR	0	103.7	0.0	43.3	73.3	26.7	20.0
18	LR64 - Son 64	Mexico	3133	80.0	51.3	93.7	0	0	80.7	0.0	43.7	86.3	26.7	6.7
42	Manitou	Canada	3116	78.3	59.7	97.3	TR	0	100.7	0.0	33.0	60.0	13.3	13.3
35	Tobari 66	Mexico	3116	80.0	54.0	98.7	0	0	75.7	0.0	36.7	28.7	60.0	26.7
33	Chris	USA	3105	79.0	56.0	98.7	0	0	96.7	2.0	34.3	40.0	20.0	20.0
4	Son 64 x Kl. Rend.	Argentina	3033	77.7	51.0	96.0	0	0	81.0	0.0	38.0	60.0	46.7	6.7
36	Triple Dirk	Australia	2839	79.0	57.0	100.0	60S	0	102.0	1.0	47.0	80.0	26.7	26.7
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	2811	79.7	53.0	97.0	0	0	75.0	0.0	38.0	99.0	33.3	26.7
31	L1418-3463L1231x23L1274-111(L)	Sudan	2789	75.7	53.0	99.7	40S	0-TMR	89.3	0.0	41.3	33.3	33.3	20.0
11	NP852	India	2789	79.0	49.0	94.7	TR	0	84.0	0.0	35.3	99.0	53.3	20.0
19	Ciano 67	Mexico	2761	79.7	51.0	96.7	0	0	71.0	0.0	37.0	73.3	66.7	20.0
9	Bonza 55	Colombia	2742	73.7	55.3	97.3	TR	0	96.0	0.0	35.0	28.7	20.0	20.0
2	Gabo	Australia	2672	72.3	53.0	97.0	5MR	0-TMR	85.3	0.0	38.0	60.0	26.7	13.3

17 Sonora 64	Mexico	2655	77.0	50.7	95.7	TR	0	68.7	0.0	34.0	80.0	53.3	13.3
47 Mengavi	Australia	2650	70.7	55.0	98.3	80S	0-25MR	80.7	0.0	33.3	13.3	20.0	26.7
23 LR64 - N10B x AN(3)	Sudan	2600	77.0	56.7	100.3	50MS	0-25MR	68.3	0.0	32.7	53.3	60.0	26.7
38 Gaboto	Argentina	2516	80.3	56.3	101.3	0	0	100.7	2.0	36.3	46.7	26.7	26.7
39 Napo 63	Colombia	2500	78.0	51.3	93.7	80S	0-T-MR	93.7	0.0	34.7	73.3	26.7	20.0
41 TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	2500	80.0	52.7	96.3	0	0	76.3	0.0	37.7	92.7	46.7	20.0
30 Nar(S)(2) x PJ(S)	Chile	2455	78.0	52.0	94.7	60S	0-TMR	73.0	0.0	33.3	79.7	33.3	13.3
34 Inia 66	Mexico	2433	79.0	49.3	94.3	TR	0	73.3	0.0	35.7	92.7	46.7	13.3
20 C-591	India	2183	80.3	52.7	97.7	30-MS	10-S	102.3	0.0	39.7	99.0	33.3	26.7
24 Kloka WM1353	Germany	2161	69.7	58.7	97.0	100S	40MR	92.0	0.0	25.7	13.3	20.0	6.7
50 Mara	Italy	2150	71.0	58.7	97.3	80S	25SMR	67.3	0.0	24.3	73.3	33.3	20.0
43 C-273	Pakistan	2111	81.0	52.0	97.0	80-S	0-10MR	96.0	0.0	40.0	99.0	26.7	20.0
21 Justin	USA	2100	75.0	60.0	100.7	30-MR	25-MR	100.3	0.0	34.0	20.0	33.3	20.0
40 C-306	India	2055	79.3	52.0	97.7	80S	40-MR	96.3	0.0	43.0	92.7	46.7	20.0
37 NP832	India	2033	79.0	53.3	98.7	80S	25MR	98.3	0.0	37.0	99.0	33.3	13.3
15 Taichung 31	Taiwan	1983	74.0	51.7	92.3	70-S	40-S	82.0	0.0	29.3	92.7	33.3	20.0
29 Thatcher	USA	1916	76.3	59.0	97.3	100S	25MR	98.3	0.0	26.7	40.0	26.7	13.3
8 Victor I	Italy	1444	70.3	60.0	98.7	80-S	45MR	64.0	0.0	27.3	66.7	20.0	28.0
Grand mean		2852	77.5	54.3	97.4	3.4	1.5	86.6	0.3	37.1	56.8	32.9	18.3
Standard error of grand mean		22	0.1	0.1	0.1	0.1	0.1	0.3	(only 1 rep.)	0.1	1.1	1.0	1.0
Coefficient of variation		9.0%	1.6%	1.2%	0.9%	32.4%	51.0%	4.4%		4.0%	23.0%	36.4%	68.7%
LSD Variety means 5 PC		438	2.0	1.1	1.4	1.8	1.3	6.2		2.4	21.3	19.6	20.5

#### Correlations

Test wt	0.33**												
Days to flowering	-0.08	-0.38**											
Days to maturity	0.08	-0.03	0.65**										
Leaf rust $\sqrt{\frac{X+1}{}}$	-0.68**	-0.43**	0.28 *	0.02									
Stem rust $\sqrt{\frac{X+1}{}}$	-0.60**	-0.38**	0.13	-0.02	0.73**								
Height	0.10	0.13	0.36**	0.36**	0.11	0.07							
Lodging (scale)	0.29 *	0.11	0.33 *	0.33 *	-0.20	-0.21	0.37**						
1000 grain weight	0.50**	0.54**	-0.31 *	0.10	-0.45**	-0.42**	0.31 *	0.18					
Mildew %	-0.42**	0.31 *	-0.54**	-0.55**	0.12	0.08	-0.19	-0.32 *	0.10				
Septoria nodorum %	-0.06	0.20	-0.48**	-0.18	-0.17	-0.03	-0.53**	-0.27	-0.00	0.27			
Fusarium %	-0.11	0.10	0.15	0.39**	0.16	0.09	-0.14	-0.09	-0.09	-0.21	0.23		

\* = Significant at the 5% level

\*\* = Significant at the 1% level

1/ Scale key 0-5 (0 = least lodging)

TABLE 18

## MIDDLE EAST

TURKEY. Karsiyaka, Izmir. Latitude: 38° 31' N. Longitude: 27° 03' E. Elevation: 10 meters above sea level.  
Cooperator: N. Sukru Ozsabunca.

Planting Date: 17 November 1968. Precipitation during test: 435.2 mm. Irrigation: not stated. Fertilizer: 120 Kg./Ha. N, 100 Kg./Ha. P<sub>2</sub>O<sub>5</sub> and 60 Kg./Ha. K<sub>2</sub>O.  
General Comments: The winter weather was mild, spring was cool.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to flowering	Height cms	Shattering spikelet (%)	(%)
23	LR64 - N10B x AN(3)	Sudan	2018	78.0	100.0	96.0	7.0	50.0
1	Pitic 62	Mexico	1879	72.0	96.7	114.3	9.0	30.0
30	Nar(S)(2) x PJ(S)	Chile	1837	78.0	93.3	96.0	14.0	90.0
4	Son 64 x Kl. Rend.	Argentina	1778	78.3	94.3	111.7	2.0	10.0
13	Huelquen	Chile	1752	78.7	97.0	123.3	14.0	90.0
8	Victor I	Italy	1741	76.0	104.3	98.3	18.0	90.0
34	Inia 66	Mexico	1726	80.0	93.0	104.7	12.0	60.0
28	Lerma Rojo 64A	Mexico	1686	78.3	94.7	111.7	35.0	80.0
27	V-878	India	1676	79.7	92.3	93.0	6.0	60.0
10	Carazinho	Brazil	1620	78.0	98.7	135.0	22.0	70.0
35	Tobari 66	Mexico	1590	78.3	94.0	99.7	1.0	20.0
3	Nainari 60	Mexico	1586	75.7	97.0	118.3	1.0	10.0
6	Siete Cerros	Mexico	1585	74.0	100.7	111.7	3.0	40.0
32	Penjamo 62	Mexico	1585	78.0	96.0	113.0	3.0	40.0
17	Sonora 64	Mexico	1555	77.7	91.7	100.7	6.0	50.0
25	NP881	India	1539	77.0	99.0	128.0	2.0	30.0
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	1535	78.7	97.3	110.7	24.0	80.0
50	Mentana	Italy	1505	78.0	96.7	123.0	2.0	20.0
38	Gaboto	Argentina	1468	78.3	100.0	137.3	8.0	40.0
39	Napo 63	Colombia	1461	74.7	92.7	116.3	12.0	80.0
5	Giza 155	Egypt	1445	75.3	98.0	120.0	3.0	30.0
36	Triple Dirk	Australia	1445	76.7	105.0	143.7	6.0	70.0
7	Noqoeste 66	Mexico	1421	76.3	94.3	103.0	25.0	70.0
9	Bonza 55	Colombia	1416	74.3	95.3	122.3	4.0	50.0
43	C-273	Pakistan	1404	81.0	100.0	129.0	25.0	90.0
14	Crespo	Colombia	1403	76.0	94.3	114.7	14.0	60.0
49	(MD-K-Y)(WIS-SUP)	Kenya	1395	75.3	108.3	126.0	17.0	90.0
48	PV-18, Indus	India Pak.	1381	73.3	96.7	107.0	17.0	80.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	1338	79.3	94.0	108.7	23.0	100.0
20	C-591	India	1321	80.7	98.7	129.3	14.0	60.0
22	Son 64 x TzPP-Nai 60 (A)	Argentina	1317	78.0	96.7	117.7	20.0	90.0
31	L1418-3463L1231x23L1274-111(L)	Sudan	1282	74.0	98.0	116.0	4.0	60.0

44	36896-CJ54(2) x YT54A (H)	Sudan	1255	74.0	93.0	99.0	3.0	30.0
19	Ciano 67	Mexico	1248	79.7	93.7	96.7	26.0	80.0
37	NP 832	India	1239	78.3	98.0	139.7	9.0	70.0
33	Chris	USA	1235	77.7	98.7	135.0	10.0	70.0
11	NP852	India	1233	78.3	95.3	116.7	9.0	60.0
40	C-306	India	1192	78.0	95.3	122.3	4.0	40.0
24	Kloka WM1353	Germany	1175	70.0	109.7	129.0	10.0	100.0
15	Taichung 31	Taiwan	1172	72.3	94.0	116.7	7.0	50.0
16	Son 64A x SK <sub>D</sub> -LR64A	Argentina	1133	73.3	97.7	105.3	1.0	10.0
45	Norteno 67	Mexico	1128	78.3	93.3	115.0	66.0	100.0
18	LR64 - Son 64	Mexico	1128	79.7	93.3	111.7	52.0	100.0
12	Crim	USA	1125	75.0	106.0	131.7	3.0	30.0
21	Justin	USA	1079	74.3	118.7	154.7	12.0	70.0
47	Mengavi	Australia	1074	70.0	98.7	118.7	7.0	80.0
2	Gabo	Australia	1026	73.0	94.7	121.7	5.0	20.0
42	Manitou	Canada	854	72.3	119.3	153.7	13.0	60.0
29	Thatcher	USA	812	73.0	120.0	152.3	10.0	70.0
26	Selkirk	Canada	800	69.3	120.0	151.3	14.0	90.0

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Grand mean	1392	76.3	99.0	119.0	12.7	60.4
Standard error of grand mean	18	0.1	0.1	0.4	(only 1 rep.)	(only 1 rep.)
Coefficient of variation	15.0%	2.1%	1.8%	4.2%		
LSD Variety means 5 PC	352	2.6	2.9	8.2		

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#### Correlations

Test wt	0.46**					
Days to flowering	-0.50**	-0.50**				
Height	-0.57**	-0.31 *	0.75**			
Shattering (spikelet)%	-0.12	0.31 *	-0.10	-0.08		
Shattering %	-0.16	0.10	0.18	0.09	0.68**	

\* = Significant at the 5% level  
 \*\* = Significant at the 1% level

TABLE 19

## MIDDLE EAST

TURKEY. Adapazari. (Regional Agricultural Experiment Station) Latitude: 40° 47' N. Longitude: 29° 38' E. Elevation: 33 meters above sea level. Cooperator: Sadettin Demiröz.

Planting Date: 4 January 1969. Precipitation during test: 669.9 mm total from 4 December 1968 to 3 July 1969. Irrigation: none. Fertilizer: 140 Kg./Ha. N, 70 Kg./Ha. P and 40 Kg./Ha. K.

General Comments: Climatic conditions were usually rainy. There were natural epiphytotic of stripe, leaf and stem rusts. No insect, weed or pest problems.

Scoring notes taken: Days to flowering - 14 to 21 May, rusts - 19 May to 24 June, height - 30 May, lodging - 8 to 30 June, shattering - 17 June to 2 July, days to maturity - 20 June to 2 July.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to flowering	Days to maturity	Stripe rust	Leaf rust	Height cms	Lodging (%)	1000grain weight gms
6	Siete Cerros	Mexico	4611	73.3	140.0	175.3	5MR	25S	95.0	0.0	35.7
48	PV-18, Indus	India Pak.	4555	75.3	137.7	174.0	0	0	95.0	0.0	37.0
1	Pitic 62	Mexico	4355	72.0	138.0	176.7	0	0	100.7	30.0	36.7
32	Penjamo 62	Mexico	4266	74.3	137.3	175.3	10MS	0	89.7	0.0	39.7
10	Carazinho	Brazil	4177	76.0	137.0	176.0	5MR	0	120.0	31.7	39.3
5	Giza 155	Egypt	4155	73.0	138.0	175.0	0	0	110.3	6.7	41.7
37	NP 832	India	4122	76.7	138.0	175.7	25S	75S	118.7	55.0	40.7
24	Kloka WM1353	Germany	4022	75.0	136.7	175.7	0	5MR	106.0	0.0	33.3
36	Triple Dirk	Australia	3944	76.0	135.0	174.7	5MR	0	125.3	53.3	43.7
4	Son 64 x Kl. Rend.	Argentina	3922	76.7	140.7	174.7	0	0	96.7	0.0	39.3
12	Crim	USA	3866	74.3	137.7	174.3	0	0	131.7	83.3	33.3
23	LR64 - N10B x AN(3)	Sudan	3866	75.3	135.7	174.7	10MS	10MS	81.3	0.0	36.0
50	Local Check Variety		3866	74.7	136.7	173.3	30S	70S	113.0	63.3	40.7
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	3855	78.3	137.0	172.3	0	0	88.3	30.0	35.7
39	Napo 63	Colombia	3811	72.0	135.0	175.0	30S	15S	117.7	65.0	34.7
3	Nainari 60	Mexico	3800	71.3	140.0	175.0	0	0	103.3	16.7	39.7
17	Sonora 64	Mexico	3766	75.0	136.7	175.3	5MR	0	90.0	31.7	32.3
30	Nar(S)(2) x PJ(S)	Chile	3744	73.3	136.0	174.7	0	5MR	88.0	8.3	32.3
9	Bonza 55	Colombia	3711	72.7	135.7	175.0	20S	0	114.3	85.0	35.0
38	Gaboto	Argentina	3677	76.3	137.7	176.7	0	0	121.0	33.3	31.3
34	Inia 66	Mexico	3666	76.7	136.0	173.3	0	0	91.7	0.0	37.3
31	L1418-3463L1231x23L1274-111(L)	Sudan	3666	74.7	138.0	175.7	0	5MR	104.0	0.0	40.3
13	Huelquen	Chile	3666	74.3	136.0	176.3	0	0	110.0	23.3	35.7
16	Son 64A x SK <sub>E</sub> -LR64A	Argentina	3644	76.7	137.0	174.7	0	0	87.7	0.0	33.0
7	Noroeste 66	Mexico	3589	76.3	137.3	174.3	5MR	0	85.3	0.0	38.3
40	C-306	India	3555	76.7	137.3	174.7	60S	25S	121.0	31.7	43.0
22	Son 64 x TzPP - Nai 60 (A)	Argentina	3544	76.0	137.7	174.3	0	0	110.0	1.7	38.7
35	Tobari 66	Mexico	3522	78.3	137.0	175.7	5MR	0	88.3	0.0	37.3
8	Victor I	Italy	3455	73.3	136.7	174.0	10MS	0	79.7	0.0	33.0
14	Crespo	Colombia	3444	75.7	135.3	173.7	0	0	107.7	33.3	35.7
27	V-878	India	3377	77.0	138.0	172.3	25S	0	80.0	0.0	31.0
19	Ciano 67	Mexico	3377	77.7	137.0	175.7	0	0	83.7	1.7	35.7

45 Norteño 67	Mexico	3366	74.0	134.7	174.7	10MS	0	96.7	10.0	39.7
43 C-273	Pakistan	3366	80.3	138.0	174.3	50S	50S	118.0	10.0	42.3
25 NP881	India	3311	74.0	136.3	176.0	0	0	114.3	33.3	37.3
26 Selkirk	Canada	3255	74.7	140.0	174.3	5MR	0	112.0	60.0	32.3
28 Lerma Rojo 64A	Mexico	3244	76.3	133.0	175.3	0	0	100.0	5.0	41.3
47 Mengavi	Australia	3244	69.0	138.0	174.0	0	0	100.7	20.0	34.3
21 Justin	USA	3233	76.7	139.3	177.7	0	0	127.0	15.0	32.7
42 Manitou	Canada	3222	76.3	140.0	175.0	0	0	130.0	25.0	29.0
18 LR64 - Son 64	Mexico	3211	73.7	134.7	173.0	0	0	98.3	30.0	39.7
11 NP852	India	3166	75.0	138.0	174.7	5MR	0	105.3	40.0	32.7
46 TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	3155	79.0	136.0	173.0	0	0	87.7	0.0	35.3
2 Gabo	Australia	3122	68.7	140.0	173.7	0	0	106.7	56.7	32.0
33 Chris	USA	3033	76.3	137.0	174.3	15S	0	122.3	21.7	30.0
15 Taichung 31	Taiwan	3033	74.3	137.0	173.3	50S	5MR	97.7	63.3	28.0
20 C-591	India	3011	78.7	138.0	175.0	0	0	125.0	16.7	41.0
49 (MD-K-Y)(WIS-SUP)	Kenya	2877	77.0	137.0	173.0	0	0	125.7	60.0	38.3
29 Thatcher	USA	2866	76.7	140.0	175.0	20S	0	125.0	26.7	29.0
44 36896-CJ54(2) x YT54A (H)	Sudan	2533	72.3	137.7	175.7	0	0	88.3	8.3	38.7

Grand mean		3577	75.2	137.2	174.7	2.4	2.0	104.7	23.7	36.2
Standard error of grand mean		37	0.1	0.0	0.1	0.1	0.1	0.5	2.1	0.1
Coefficient of variation		13.0%	1.3%	0.3%	1.0%	75.6%	67.9%	6.4%	109.6%	2.5%
LSD Variety means 5 PC		748	1.6	0.7	2.9	3.0	2.2	11.0	42.5	1.5

#### Correlations

Test wt	-0.11									
Days to flowering	0.01	-0.08								
Days to maturity	0.21	-0.08	0.14							
Stripe rust	-0.01	0.04	0.01	-0.15						
Leaf rust	0.22	0.05	0.05	-0.04	0.55**					
Height	-0.12	0.07	0.19	0.27	0.20	0.25				
Lodging %	-0.09	-0.26	-0.04	-0.11	0.35 *	0.36 *	0.58**			
1000 grain weight	0.27	0.14	-0.25	0.06	0.17	0.26	0.05	-0.15		

\* = Significant at the 5% level

\*\* = Significant at the 1% level

TABLE 20

## MIDDLE EAST

TURKEY. Eskisehir. (Plant Improvement Station) Latitude: 36° 45' N. Longitude: 30° 95' E. Elevation: 789 meters above sea level.  
Cooperators: Mr. T. Atay and Mr. F. Altay

Planting Date: 3 April 1969. Precipitation during test: 457.4 mm total from 1 September to 30 August. Irrigation: approximately 180 mm. Fertilizer: 60 Kg./Ha. P<sub>2</sub>O<sub>5</sub> as Superphosphate.

General Comments: There was a rainy fall, winter and spring, favorable for rust development. Stripe rust infection was severe.

Scoring notes taken: Stripe rust - 8 June, leaf rust - 28 June, stem rust - 3 July, height - 2 August, lodging and shattering - 7 August.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to		Stripe rust	Leaf rust	Height cms	Lodging (scale) 1/	Shattering (%)	1000grain weight gms
					flowering	maturity						
1	Pitic 62	Mexico	3933	78.0	79.0	124.3	00-10S	10S	73.3	1.0	0.0	40.3
32	Penjamo 62	Mexico	3466	77.0	77.3	120.0	5MS	00	60.0	1.0	0.0	37.7
9	Bonza 55	Colombia	3200	74.0	77.3	121.0	00	00	73.3	2.0	0.0	34.7
50	Sünter		3177	81.0	85.3	127.7	10MS	40S	93.3	5.0	0.0	34.0
23	LR64 - N10B x AN(3)	Sudan	3000	79.0	84.3	126.0	00	65S	53.3	1.0	0.0	38.3
16	Son 64A x SK <sub>E</sub> -LR64A	Argentina	2733	79.0	75.3	118.0	40S	00	61.7	1.0	0.0	30.0
33	Chris	USA	2733	79.0	80.0	123.7	25MS	00	88.3	4.0	1.7	32.3
44	36896-CJ54(2) x YT54A (H)	Sudan	2711	76.0	73.7	118.0	25S	00	56.7	1.0	0.0	40.3
35	Tobari 66	Mexico	2622	78.0	75.0	122.7	00	00	61.7	1.0	0.0	34.7
4	Son 64 x Kl. Rend.	Argentina	2600	79.0	72.7	120.7	00	00	55.0	1.0	0.0	32.7
30	Nar(S)(2) x PJ(S)	Chile	2533	77.0	73.7	119.0	00	00	60.0	1.0	0.0	34.7
49	(MD-K-Y) (WIS-SUP)	Kenya	2489	77.0	86.0	130.0	00	00	76.7	1.0	10.0	42.0
22	Son 64 x TzPP - Nai 60 (A)	Argentina	2444	77.0	74.0	118.0	10MS	00	63.3	1.0	0.0	37.7
3	Nainari 60	Mexico	2444	74.0	75.7	119.0	10S	00	60.0	1.0	0.0	37.7
25	NP881	India	2422	77.0	75.3	121.0	2MS	00	71.7	1.0	0.0	33.7
39	Napo 63	Colombia	2422	78.0	73.3	119.0	00	40S	75.0	1.0	6.7	37.3
12	Crim	USA	2311	74.0	79.0	120.0	00	00	81.7	2.0	3.3	33.3
24	Kloka WM1353	Germany	2266	79.0	84.0	125.3	00	65S	78.3	1.0	1.7	35.0
36	Triple Dirk	Australia	2200	77.0	80.3	126.0	25MS	00	85.0	1.0	3.3	44.3
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	2133	79.0	74.7	118.0	00	00	71.7	1.0	0.0	36.7
14	Crespo	Colombia	2133	78.0	76.7	126.7	00	2S	80.0	1.0	13.3	37.3
28	Lerma Rojo 64A	Mexico	2111	79.0	73.7	119.0	00	00	66.7	1.0	0.0	41.3
19	Ciano 67	Mexico	2089	78.0	72.7	120.0	5MR	00	58.3	1.0	0.0	33.3
17	Sonora 64	Mexico	2066	76.0	74.7	118.0	5MR	00	53.3	1.0	0.0	28.3
13	Huelquen	Chile	2044	75.0	81.3	121.7	00	00	76.7	1.0	5.0	38.7
6	Siete Cerros	Mexico	2044	76.0	83.0	126.7	00	40S	55.0	1.0	0.0	35.3
34	Inia 66	Mexico	2000	78.0	73.7	119.0	00	00	51.7	1.0	0.0	35.3
48	PV-18, Indus	India Pak.	1978	78.0	82.3	126.7	00	00	58.3	1.0	0.0	35.7
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	1933	78.0	78.0	121.7	00	00	60.0	1.0	0.0	36.7
18	LR64 - Son 64	Mexico	1889	79.0	73.3	118.0	25S	00	66.7	1.0	0.0	38.3
10	Carazinho	Brazil	1889	75.0	80.0	126.7	00	00	83.3	1.0	8.3	41.0
7	Noroeste 66	Mexico	1866	75.0	72.7	118.0	00	00	61.7	1.0	0.0	34.7



8 Victor I	Italy	1866	74.0	88.0	131.0	00	65S	58.3	1.0	5.0	39.3
31 L1418-3463L1231x23L1274-111(L)	Sudan	1866	75.0	74.0	126.0	10MS	00	63.3	1.0	0.0	39.3
38 Gaboto	Argentina	1822	76.0	84.0	127.7	00	00	83.3	2.0	0.0	33.3
45 Norteño 67	Mexico	1822	78.0	73.0	118.0	10MR	00	58.3	1.0	0.0	38.0
5 Giza 155	Egypt	1778	79.0	72.7	126.0	00	2S	58.3	1.0	0.0	39.7
20 C-591	India	1711	80.0	72.7	126.0	00	65S	76.7	3.0	0.0	31.7
27 V-878	India	1711	79.0	73.3	119.0	10S	00	53.3	1.0	0.0	29.7
42 Manitou	Canada	1644	77.0	86.0	127.3	00	00	88.3	1.0	8.3	31.0
37 NP832	India	1555	78.0	75.0	126.7	00	65S	71.7	2.0	0.0	42.7
26 Selkirk	Canada	1555	76.0	86.0	122.7	10MS	00	90.0	2.0	5.0	36.3
43 C-273	Pakistan	1533	80.0	72.7	126.0	00	65S	75.0	2.0	0.0	34.0
40 C-306	India	1511	77.0	74.7	127.7	00	65S	71.7	2.0	0.0	40.0
47 Mengavi	Australia	1467	74.0	78.3	120.7	25S	00	56.7	1.0	0.0	33.0
11 NP852	India	1444	75.0	73.3	118.0	10S	00	61.7	1.0	0.0	28.0
29 Thatcher	USA	1400	77.0	86.0	126.7	10MS	40S	80.0	3.0	11.7	30.0
2 Gabo	Australia	1311	71.0	74.3	118.0	65S	00	58.3	1.0	0.0	30.7
21 Justin	USA	1244	74.0	86.0	128.0	00	25MS	83.3	1.0	15.0	37.0
15 Taichung 31	Taiwan	1089	74.0	73.7	118.0	100S	00	63.3	1.0	0.0	25.0

Grand mean		2124	77.0	77.6	122.7	2.4	2.5	68.5	1.4	2.0	35.6
Standard error of grand mean		44	(only 1	0.2	0.2	0.1	0.1	0.5	(only 1	0.3	0.1
Coefficient of variation		25.0%	rep.)	2.5%	1.7%	32.0%	38.1%	8.9%	rep.)	212.7%	5.1%
LSD Variety means 5 PC		883		3.2	3.4	1.2	1.5	9.9		6.8	3.0

#### Correlations

Test wt	0.30 *										
Days to flowering	0.05	-0.10									
Days to maturity	-0.08	0.14	0.67**								
Stripe rust $\sqrt{\frac{X+1}{X}}$	-0.22	-0.41**	-0.20	-0.40**							
Leaf rust $\sqrt{\frac{X+1}{X}}$	-0.04	0.28	0.26	0.54**	-0.32 *						
Height	-0.00	0.07	0.52**	0.47**	-0.15	0.20					
Lodging (scale)	0.10	0.29 *	0.26	0.32 *	-0.03	0.43**	0.57**				
Shattering %	-0.22	-0.19	0.54**	0.46**	-0.22	0.04	0.54**	0.01			
1000 grain weight	0.25	0.10	0.12	0.34 *	-0.42**	0.12	0.12	-0.19	0.14		

\* = Significant at the 5% level

\*\* = Significant at the 1% level

1/ Scale key 1-5 (1 = least lodging)

TABLE 21

## MIDDLE EAST

TURKEY. Ankara Agricultural Research Institute. Latitude: 29° 57' N. Longitude: 32° 53' E. Elevation: 860 meters above sea level. Cooperators: Dr. Ahmet Demirliçakmak.

Planting Date: not stated. Precipitation during test: not stated. Irrigation: 189 mm. Fertilizer: 60 Kg./Ha. P<sub>2</sub>O<sub>5</sub> and 20 Kg./Ha. N. General Comments: none.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to		Stripe rust	Leaf rust	Stem rust	Height cms	1000 grain weight gms
					flowering	maturity					
4	Son 64 x Kl. Rend.	Argentina	1589	78.3	84.0	124.0	2MS	0E	0E	69.0	33.0
14	Crespo	Colombia	1383	79.7	85.0	124.0	2MR	0E	0E	80.0	33.0
7	Noroeste 66	Mexico	1372	79.3	85.0	124.0	5MS	0E	0E	64.0	34.0
6	Siete Cerros	Mexico	1367	79.7	88.0	127.0	5MR	2MR	3MS	53.0	31.0
3	Nainari 60	Mexico	1361	77.0	85.0	124.0	20MS	2MR	0E	67.0	34.0
44	36896-CJ54(2) x YT54A (H)	Sudan	1381	78.7	85.0	124.0	15MS	0E	0E	66.0	37.0
34	Inia 66	Mexico	1344	81.0	86.0	124.0	5MS	2MR	0E	50.0	37.0
16	Son 64A x SK <sub>E</sub> - LR64A	Argentina	1333	79.0	84.0	124.0	20S	1MR	0E	60.0	28.0
32	Penjamo 62	Mexico	1317	79.7	85.0	124.0	5MS	10S	0E	75.0	38.0
50	Local Check Variety		1283	78.7	85.0	124.0	4MR	20S	25S	80.0	34.0
28	Lerma Rojo 64A	Mexico	1278	80.3	85.0	124.0	5MS	1MR	0E	80.0	38.0
30	Nar(S)(2) x PJ(S)	Chile	1228	78.3	84.0	124.0	TR	10S	1MR	68.0	31.0
39	Napo 63	Colombia	1205	78.7	85.0	124.0	TR	4MS	0E	80.0	32.0
27	V-878	India	1133	80.0	85.0	124.0	10MS	1MR	5S	66.0	30.0
12	Crim	USA	1111	78.7	83.0	124.0	40S	0E	1MR	80.0	30.0
1	Pitic 62	Mexico	1094	76.0	85.0	134.0	1MR	1MR	2MS	58.0	31.0
24	Kloka WM1353	Germany	1094	77.3	86.0	124.0	0E	2MR	2MS	75.0	30.0
13	Huelquen	Chile	1089	77.3	86.0	125.0	7MR	0E	0E	75.0	34.0
47	Mengavi	Australia	1067	77.0	85.0	124.0	50S	3MS	5MS	57.0	31.0
22	Son 64 x TzPP - Nai 60 (A)	Argentina	1061	78.7	82.0	123.0	15MS	0E	0E	43.0	35.0
29	Thatcher	USA	1055	78.3	84.0	124.0	20S	10S	2MR	56.0	25.0
17	Sonora 64	Mexico	1044	77.3	84.0	124.0	15MS	0E	0E	69.0	27.0
48	PV-18, Indus	India Pak.	1039	80.3	88.0	127.0	3MS	2MR	0E	67.0	32.0
18	LR64 - Son 64	Mexico	1028	78.0	84.0	124.0	5MS	2MR	0E	67.0	38.0
35	Tobari 66	Mexico	994	80.0	86.0	124.0	2MR	0E	0E	75.0	34.0
10	Carazinho	Brazil	994	79.0	85.0	124.0	2MR	0E	0E	70.0	33.0
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	989	81.0	85.0	124.0	5MS	0E	0E	75.0	33.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	989	80.7	85.0	124.0	5MS	2MR	0E	54.0	34.0
9	Bonza 55	Colombia	983	77.0	85.0	124.0	30S	2MR	3MS	81.0	30.0
45	Norteno 67	Mexico	983	80.0	85.0	124.0	25S	1MR	0E	56.0	36.0
40	C-306	India	955	82.0	85.0	124.0	2MR	5MS	10S	49.0	35.0
33	Chris	USA	939	78.3	84.0	124.0	30S	1MR	0E	59.0	27.0

19 Ciano 67	Mexico	928	76.3	84.0	124.0	2MR	0E	0E	91.0	30.0
37 NP 832	India	889	80.0	85.0	124.0	2MS	10MS	15S	67.0	33.0
26 Selkirk	Canada	889	76.3	85.0	124.0	10MS	15S	2MR	51.0	29.0
15 Taichung 31	Taiwan	867	75.0	83.0	124.0	70S	2MR	2MS	68.0	24.0
38 Gaboto	Argentina	839	79.0	85.0	124.0	3MR	1MR	0E	78.0	28.0
23 LR64 - N10B x AN(3)	Sudan	822	79.0	85.0	124.0	0E	5MS	5MS	75.0	32.0
20 C-591	India	817	79.3	83.0	124.0	0E	10MS	15S	75.0	31.0
11 NP852	India	800	77.3	84.0	124.0	20S	2MR	0E	66.0	30.0
36 Triple Dirk	Australia	794	78.3	86.0	125.0	40S	0E	0E	78.0	38.0
31 L1418-3463L1231x23L1274-111(L)	Sudan	794	78.0	84.0	124.0	20S	10S	5MS	53.0	33.0
49 (MD-K-Y)(WIS-SUP)	Kenya	783	78.7	86.0	125.0	5MS	2MS	2MR	70.0	31.0
5 Giza 155	Egypt	761	76.7	84.0	124.0	10MS	0E	1MS	80.0	33.0
2 Gabo	Australia	733	73.3	85.0	134.0	30S	1MR	0E	62.0	28.0
25 NP881	India	722	74.3	84.0	124.0	MR	1MR	2MS	75.0	29.0
42 Manitou	Canada	667	78.3	84.0	124.0	40S	TR	0E	75.0	25.0
43 C-273	Pakistan	594	78.7	85.0	124.0	5MR	20S	30S	60.0	31.0
8 Victor I	Italy	500	76.0	87.0	127.0	0E	5MS	1MR	46.0	30.0
21 Justin	USA	444	74.7	88.0	127.0	7MR	1MR	0E	70.0	27.0

Grand mean	1014	78.3	84.9	124.7	3.0	1.7	1.6	66.9	31.7
Standard error of grand mean	19	0.0	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)
Coefficient of variation	23.0%	0.6%	rep.)	rep.)	rep.)	rep.)	rep.)	rep.)	rep.)
LSD Variety means 5 PC	384	0.8							

#### Correlations

Test wt	0.42**								
Days to flowering	-0.06	0.09							
Days to maturity	-0.18	-0.44**	0.34 *						
Stripe rust $\sqrt{\frac{X+1}{}}$	-0.11	-0.26	-0.34 *	-0.04					
Leaf rust $\sqrt{\frac{X+1}{}}$	-0.17	0.03	0.02	-0.13	-0.20				
Stem rust $\sqrt{\frac{X+1}{}}$	-0.18	0.13	-0.07	-0.08	-0.18	0.67**			
Height	0.01	-0.09	-0.07	-0.17	-0.07	-0.19	-0.02		
1000 grain weight	0.40**	0.51**	0.14	-0.17	-0.29 *	-0.03	-0.01	-0.00	

\* = Significant at the 5% level  
 \*\* = Significant at the 1% level

TABLE 22

## MIDDLE EAST

LEBANON. Tel-Amara. Latitude: 33° 55' N. Longitude: 35° 28' E. Elevation: 950 meters above sea level.  
Cooperator: Michel Abi-Antoun.

Planting Date: 17 November 1968. Precipitation during test: 902 mm. Irrigation: none. Fertilizer: 150 Kg./Ha. N and 75 Kg./Ha. P<sub>2</sub>O<sub>5</sub>.  
General Comments: An extremely wet growing season. Heavy development of rusts. No insect, weed or pest problems.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to flowering	Days to maturity	Stripe rust	Stem rust	Height cms	1000grain weight gms
48	PV-18, Indus	India Pak.	5055	80.0	164.0	198.7	30MS	20MR	91.7	32.7
6	Siete Cerros	Mexico	4405	79.7	163.3	196.3	50S	20MR	94.0	33.3
50	Local Check Variety		4294	79.3	164.3	194.0	60S	40S	132.3	44.0
8	Victor I	Italy	4272	80.0	164.3	197.0	100S	30MS	85.7	33.3
40	C-306	India	4222	83.0	157.3	199.0	20MR	50S	105.0	36.3
39	Napo 63	Colombia	3955	79.7	154.3	194.3	TR	30MS	106.0	36.3
41	TzPP-Son64/LR64A-TzPPxAN(E)A	Mexico	3922	83.0	157.3	193.0	60S	0	93.3	32.3
14	Crespo	Colombia	3833	73.7	158.7	196.3	30MS	0	109.0	31.0
37	NP 832	India	3766	83.3	158.0	198.3	0	50MS	116.7	36.0
20	C-591	India	3689	84.0	156.3	197.7	20MR	50S	110.0	38.3
46	TzPP-Son64/LR64A-TzPPxAN(E)B	Mexico	3594	83.0	154.0	192.0	30MS	0	90.0	34.0
1	Pitic 62	Mexico	3569	73.3	161.3	194.0	50S	30MS	92.3	30.3
25	NP881	India	3516	79.0	155.7	194.3	100S	5R	115.0	34.3
13	Huelquen	Chile	3461	78.7	163.7	196.3	0	0	110.0	32.0
23	LR64 - N10B x AN(3)	Sudan	3416	82.0	164.7	196.0	5R	50S	82.3	32.0
4	Son 64 x Kl. Rend.	Argentina	3405	78.7	154.7	191.3	100S	0	88.7	29.0
38	Gaboto	Argentina	3394	82.7	165.3	198.0	30MS	0	120.0	31.3
35	Tobari 66	Mexico	3261	82.0	151.0	192.0	50S	0	90.0	35.0
24	Kloka WM1353	Germany	3194	74.7	169.7	202.3	0	20MR	101.7	28.3
34	Inia 66	Mexico	3150	76.3	149.7	191.0	30MS	TR	86.0	36.0
30	Nar(S)(2) x PJ(S)	Chile	3077	79.7	150.3	194.0	20MS	TR	77.0	31.0
32	Penjamo 62	Mexico	3077	79.7	155.7	193.7	100S	0	89.3	33.0
49	(MD-K-Y)(WIS-SUP)	Kenya	2950	77.7	166.0	197.7	100S	TR	106.7	32.0
5	Giza 155	Egypt	2894	79.0	158.7	196.0	100S	TR	110.0	34.0
43	C-273	Pakistan	2889	83.7	157.3	198.7	50S	30MS	103.3	39.0
28	Lerma Rojo 64A	Mexico	2750	81.0	154.0	192.0	100S	0	97.3	34.7
36	Triple Dirk	Australia	2739	77.0	164.3	196.3	100S	0	117.3	33.7
11	NP852	India	2700	80.3	152.3	192.7	100S	0	100.0	29.7
9	Bonza 55	Colombia	2672	75.3	157.0	194.3	100S	30MS	108.7	32.0
10	Carazinho	Brazil	2511	79.3	162.7	194.0	100S	0	115.0	36.7
27	V-878	India	2483	80.0	151.7	190.7	40S	0	77.3	33.0
18	LR64 - Son 64	Mexico	2416	76.0	155.0	194.0	100S	0	97.0	32.3

21 Justin	USA	2366	78.0	183.7	201.3	100S	TR	130.7	30.7
45 Norteño 67	Mexico	2205	79.0	152.7	187.0	100S	0	93.3	33.0
19 Ciano 67	Mexico	2155	79.3	149.7	187.0	50S	0	81.7	30.7
3 Nainari 60	Mexico	2044	71.3	155.0	191.3	100S	0	101.7	30.0
31 L1418-3463L1231x23L1274-111(L)	Sudan	1983	77.0	157.3	197.3	100S	0	109.0	30.0
7 Noroeste 66	Mexico	1900	76.0	155.3	186.7	100S	0	82.7	30.7
26 Selki rk	Canada	1828	73.3	160.0	201.3	100S	0	119.0	26.7
42 Manitou	Canada	1805	77.0	178.0	200.7	100S	0	112.3	22.7
12 Crim	USA	1783	75.0	162.0	194.0	100S	0	113.3	26.0
33 Chris	USA	1683	78.3	159.7	193.7	100S	0	110.7	26.3
17 Sonora 64	Mexico	1567	73.7	149.0	188.3	100S	0	80.0	33.7
29 Thatcher	USA	1328	76.7	177.3	201.0	100S	5R	110.7	22.7
22 Son 64 x TzPP - Nai 60 (A)	Argentina	1178	73.0	154.0	189.7	100S	0	88.0	28.0
15 Taichung 31	Taiwan	1061	70.3	152.0	185.3	100S	0	87.7	24.3
47 Mengavi	Australia	933	64.7	159.0	192.0	100S	0	80.7	21.3
44 36896-CJ54(2) x YT54A (H)	Sudan	761	68.3	153.7	192.3	100S	0	74.3	35.7
2 Gabo	Australia	444	63.3	158.0	190.0	100S	0	71.7	21.3
16 Son 64A x SK <sub>E</sub> -LR64A	Argentina	294	57.3	156.3	188.3	100S	0	73.3	17.3

Grand mean	2717	77.1	158.9	194.3	7.4	2.4	98.8	31.4
Standard error of grand mean	32	0.3	0.4	0.1	0.1	0.1	0.3	0.3
Coefficient of variation	14.0%	4.0%	3.2%	0.9%	20.0%	65.2%	4.2%	12.1%
LSD Variety means 5 PC	631	5.1	6.3	2.8	2.4	2.6	6.8	6.2

#### Correlations

Test wt	0.73**							
Days to flowering	0.08	0.05						
Days to maturity	0.40**	0.35 *	0.72**					
Stripe rust $\sqrt{\frac{X+1}{X+1}}$	-0.61**	-0.40**	-0.04	-0.37**				
Stem rust $\sqrt{\frac{X+1}{X+1}}$	0.33 *	0.27	0.07	0.29 *	-0.34 *			
Height	0.30 *	0.38**	0.55**	0.63**	-0.12	0.16		
1000 grain weight	0.66**	0.68**	-0.23	0.10	-0.39**	0.35 *	0.26	

\* = Significant at the 5% level

\*\* = Significant at the 1% level

TABLE 23

## MIDDLE EAST

LEBANON. AUB, Beqa'a Plain. (Agricultural Research and Education Center) Latitude: 33° 55.5' N. Longitude: 36° 4.5' E. Elevation: 995 meters above sea level. Cooperator: W. W. Worzella.

Planting Date: 20 November 1969. Precipitation during test: 891 mm. Irrigation: none. Fertilizer: Superphosphate (20%) and Amm. Sulphate (20%).

General Comments: Conditions were not favorable for the experiment. Rainfall during the growing season was double the normal amount. The stripe rust epidemic was severe. Hail damaged the earlier varieties to a greater extent than the later varieties. No insect, weed or pest problems.

Variety Number	Variety or cross	Origin	Yield kg/ha	Days to flowering	Stripe rust (%)	Height cms	Hail damage (%)
23	LR64 - N10B x AN(3)	Sudan	3663	170.0	2.4	75.0	0.0
37	NP 832	India	3610	161.0	2.4	108.0	0.0
1	Pitic 62	Mexico	3523	164.0	2.4	90.0	5.0
6	Siete Cerros	Mexico	3437	170.0	1.0	85.0	5.0
40	C-306	India	3100	159.0	3.3	105.0	5.0
28	Lerma Rojo 64A	Mexico	3073	158.0	1.0	85.0	0.0
9	Bonza 55	Colombia	3063	161.0	1.0	110.0	5.0
32	Penjamo 62	Mexico	3023	160.0	5.6	90.0	5.0
48	FV-18, Indus	India Pak.	2953	170.0	5.6	80.0	20.0
14	Crespo	Colombia	2940	185.0	1.0	110.0	5.0
8	Victor I	Italy	2907	171.0	3.3	80.0	5.0
4	Son 64 x Kl. Rend.	Argentina	2903	158.0	1.0	85.0	10.0
38	Gaboto	Argentina	2853	170.0	3.3	108.0	5.0
24	Kloka WM1353	Germany	2823	175.0	2.4	95.0	0.0
43	C-273	Pakistan	2823	159.0	3.3	108.0	0.0
36	Triple Dirk	Australia	2813	170.0	2.4	114.0	5.0
39	Napo 63	Colombia	2797	157.0	3.3	100.0	5.0
50	Najah	Lebanon	2787	158.0	1.0	100.0	20.0
20	C-591	India	2763	161.0	3.3	100.0	5.0
35	Tobari 66	Mexico	2753	157.0	4.6	91.0	5.0
31	L1418-3463L1231x23L1274-111(L)	Sudan	2633	161.0	5.6	100.0	5.0
21	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	2433	160.0	1.0	90.0	20.0
45	NP881	India	2413	160.0	1.0	100.0	0.0
5	Giza 155	Egypt	2400	160.0	7.1	95.0	5.0
13	Huelquen	Chile	2367	170.0	2.4	108.0	5.0
30	Nar(S)(2) x PJ(S)	Chile	2350	153.0	1.0	70.0	30.0
27	V-878	India	2300	158.0	1.0	77.0	10.0
3	Nainari 60	Mexico	2297	159.0	8.4	100.0	5.0
16	Son 64A x SK <sub>E</sub> -LR64A	Argentina	2287	160.0	7.1	80.0	5.0
10	Carazinho	Brazil	2237	169.0	1.0	114.0	5.0
34	Inia 66	Mexico	2200	161.0	1.0	90.0	30.0
7	Noroeste 66	Mexico	2103	158.0	7.1	75.0	5.0

49	(MD-K-Y)(WIS-SUP)	Kenya	2067	172.0	3.3	69.0	0.0
11	NP852	India	2047	153.0	1.0	95.0	5.0
17	Sonora 64	Mexico	2033	149.0	1.0	78.0	10.0
18	LR64 - Son 64	Mexico	2010	158.0	4.6	85.0	5.0
15	Taichung 31	Taiwan	1893	155.0	7.1	88.0	10.0
45	Norteflo 67	Mexico	1793	158.0	6.4	85.0	30.0
12	Crim	USA	1760	168.0	5.6	110.0	5.0
33	Chris	USA	1707	169.0	5.6	110.0	10.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	1683	159.0	1.0	80.0	10.0
42	Manitou	Canada	1620	179.0	4.6	115.0	0.0
22	Son 64 x TzPP - Nai 60 (A)	Argentina	1597	157.0	4.6	90.0	5.0
44	36896-CJ54(2) x YT54A (H)	Sudan	1490	158.0	9.5	87.0	5.0
26	Selkirk	Canada	1437	179.0	1.0	107.0	5.0
19	Ciano 67	Mexico	1403	149.0	2.4	83.0	20.0
47	Mengavi	Australia	1393	161.0	9.0	90.0	10.0
29	Thatcher	USA	1327	179.0	4.6	108.0	5.0
21	Justin	USA	1253	178.0	2.4	110.0	5.0
2	Gabo	Australia	1203	158.0	9.0	89.0	5.0

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Grand mean	2367	162.8	3.6	93.9	7.6
Standard error of grand mean	31	(only 1	(only 1	(only 1	(only 1
Coefficient of variation	16.0%	rep.)	rep.)	rep.)	rep.)
LSD Variety means 5 PC	620				

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Correlations

Days to flowering	-0.02				
Stripe rust %	-0.38**	-0.08			
Height	-0.01	0.42**	-0.08		
Haildamage %	-0.19	-0.33 *	-0.09	-0.32 *	

\* = Significant at the 5% level

\*\* = Significant at the 1% level

TABLE 24

## MIDDLE EAST

SYRIA. Karahta, Damascus. Latitude: 29° N. Longitude: 16° E. Elevation: 620 meters above sea level.  
Cooperator: A. K. Kaeider.

Planting Date: 3 December 1968. Precipitation during test: not stated. Irrigation: 6 irrigations applied. Fertilizer: 800 and 600 Kg./Ha. (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>S. Phos.

General Comments: Climatic conditions were normal and good.- General infection of stripe rust.

Scoring notes taken: Days to flowering - 24 March to 29 April, rusts - 24 March to 11 May, lodging - 13 May, days to maturity - 13 May to 2 June, height - 15 to 20 May, shattering - 15 to 18 June.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to flowering	Days to maturity	Stripe rust	Leaf rust	Stem rust	Height cms	Lodging (%)	Shattering (%)	1000 grain weight gms
1	Pitic 62	Mexico	7716	77.7	124.3	173.7	VR	MS	S	110.0	0.0	21.7	44.3
23	LR64 - N10B x AN(3)	Sudan	7349	81.7	124.0	174.7	MR	VS	MR	95.0	0.0	10.0	37.7
6	Siete Cerros	Mexico	7310	81.0	129.3	176.7	VR	S	S	116.7	0.0	66.7	38.0
48	PV-18, Indus	India Pak.	7044	81.3	126.0	177.0	VR	MR	S	111.7	0.0	88.3	41.3
13	Huelquen	Chile	6910	77.3	126.0	174.7	VS	MR	MS	118.3	8.3	31.7	40.7
8	Victor I	Italy	6683	80.3	132.7	176.0	S	MS	S	98.3	0.0	96.7	40.3
28	Lerma Rojo 64A	Mexico	6610	80.3	118.0	171.0	VR	MS	VS	115.0	0.0	13.3	46.0
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	6410	81.3	118.3	171.7	VR	MR	S	103.3	0.0	40.0	40.0
39	Napo 63	Colombia	6338	80.3	114.7	170.0	VR	VS	S	118.3	0.0	46.7	39.7
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	6222	81.3	118.3	171.7	VR	VR	S	106.7	0.0	58.3	39.3
5	Giza 155	Egypt	6049	79.0	121.7	177.0	MR	MS	S	113.3	0.0	0.0	45.7
30	Nar(S)(2) x PJ(S)	Chile	6033	79.7	112.7	169.0	MR	MS	S	96.7	0.0	10.0	38.0
14	Crespo	Colombia	6016	80.0	118.0	171.0	VR	MS	S	111.7	0.0	10.0	40.0
24	Kloka WM1353	Germany	5999	78.7	133.0	177.7	S	VS	R	116.7	0.0	31.7	35.7
35	Tobari 66	Mexico	5949	81.3	113.7	169.0	VR	VR	R	100.0	0.0	5.0	42.7
27	V-878	India	5877	82.0	114.3	169.3	VR	VR	R	90.0	0.0	11.7	34.7
36	Triple Dirk	Australia	5772	78.3	130.0	175.0	VR	VR	S	130.0	0.0	0.0	45.7
31	L1418-3463L1231x23L1274-111(L)	Sudan	5655	79.0	120.0	178.0	VR	MR	S	115.0	3.3	8.3	45.7
37	NP 832	India	5644	82.0	122.0	177.0	MS	VS	R	128.3	0.0	3.3	45.7
40	C-306	India	5527	80.7	118.0	176.7	MS	S	S	121.7	0.0	6.7	45.3
32	Penjamo 62	Mexico	5361	79.0	117.7	170.7	MR	MR	S	105.0	0.0	13.3	41.0
25	NP881	India	5261	76.7	119.3	172.0	VR	VR	VS	116.7	1.7	33.3	38.3
4	Son 64 x Kl. Rend.	Argentina	5255	78.0	116.0	171.0	VR	VR	VS	103.3	0.0	50.0	40.3
9	Bonza 55	Colombia	5222	78.0	119.3	171.3	MR	VS	VS	123.3	0.0	0.0	41.7
34	Inia 66	Mexico	5166	81.3	112.7	168.3	VR	VR	MS	103.3	0.0	13.3	48.0
50	Local Check Variety		5144	80.3	125.7	176.7	VR	MR	MR	131.7	0.0	21.7	47.7
21	Justin	USA	5033	75.7	142.7	181.0	MR	MS	VS	135.0	0.0	16.7	33.7
43	C-273	Pakistan	4950	80.7	117.3	171.3	VS	S	MS	121.7	0.0	0.0	43.0
38	Gaboto	Argentina	4877	80.3	128.3	176.3	VR	VR	S	126.7	61.7	18.3	33.7
7	Noroeste 66	Mexico	4872	77.0	118.0	170.7	VR	VR	VS	101.7	0.0	75.0	37.0
49	(MD-K-Y)(WIS-SUP)	Kenya	4861	79.3	135.7	180.7	VR	VR	MS	126.7	8.3	11.7	36.3
17	Sonora 64	Mexico	4816	80.7	112.7	169.7	VR	VR	S	88.3	0.0	50.0	41.0



11 NP852	India	4761	78.7	118.0	171.0	MS	S	VS	111.7	0.0	13.3	35.0
20 C-591	India	4572	80.7	118.0	175.0	S	VS	R	125.0	0.0	0.0	44.0
10 Carazinho	Brazil	4444	77.3	129.3	175.7	MR	MS	VS	125.0	10.0	21.7	36.3
18 LR64 - Son 64	Mexico	4355	79.0	116.3	170.7	VR	VR	VS	113.3	3.3	88.3	45.3
22 Son 64 x TzPP - Nai 60 (A)	Argentina	4338	77.0	114.3	170.7	VR	VR	VS	106.7	0.0	18.3	39.3
33 Chris	USA	3872	76.7	125.7	175.7	VR	VR	VS	130.0	8.3	8.3	25.7
19 Ciano 67	Mexico	3811	79.3	112.0	168.3	VR	VR	VS	91.7	0.0	66.7	40.3
15 Taichung 31	Taiwan	3755	73.3	115.3	170.7	VR	VR	VS	105.0	0.0	80.0	30.7
45 Norteño 67	Mexico	3744	78.7	115.7	171.0	VR	VR	VS	108.3	0.0	88.3	41.3
3 Nainari 60	Mexico	3533	69.7	117.3	170.7	VR	VR	VS	110.0	0.0	11.7	34.3
42 Manitou	Canada	3227	76.0	147.0	181.0	VR	VR	VS	131.7	18.3	0.0	24.7
26 Selkirk	Canada	2811	75.7	143.0	180.7	VR	VR	VS	131.7	0.0	5.0	28.7
29 Thatcher	USA	2650	76.7	145.0	181.7	MR	MR	VS	131.7	0.0	0.0	24.7
44 36896-CJ54(2) x YT54A (H)	Sudan	2394	65.3	116.0	171.0	VR	VR	VS	108.3	0.0	6.7	26.0
12 Crim	USA	2261	65.3	126.7	173.7	VR	VR	VS	120.0	26.7	11.7	22.3
16 Son 64A x SK <sub>E</sub> -LR64A	Argentina	1572	62.7	123.3	170.7	VR	VR	VS	93.3	0.0	25.0	19.3
2 Gabo	Australia	1328	50.7	114.3	171.7	VR	VR	VS	106.7	0.0	20.0	17.3
47 Mengavi	Australia	1289	47.3	117.3	170.7	VR	VR	VS	106.7	0.0	13.3	14.7

Grand mean		4933	76.8	122.2	173.5	1.1	1.2	1.4	113.1	3.0	26.8	37.2
Standard error of grand mean		43	0.2	0.1	0.1	0.0	0.0	0.0	0.4	0.5	0.6	0.2
Coefficient of variation		11.0%	3.1%	1.0%	0.8%	9.9%	9.7%	5.0%	3.9%	216.0%	29.0%	7.9%
LSD Variety means 5 PC		853	3.9	2.0	2.2	0.2	0.2	0.1	7.2	10.6	12.7	4.8

#### Correlations

Test wt	0.76**											
Days to flowering	-0.07	0.04										
Days to maturity	0.04	0.12	0.89**									
Stripe rust $\sqrt{\frac{X+1}{}}$	0.23	0.23	0.03	0.20								
Leaf rust $\sqrt{\frac{X+1}{}}$	0.52**	0.35 *	0.05	0.19	0.63**							
Stem rust $\sqrt{\frac{X+1}{}}$	-0.23	-0.25	0.06	-0.02	-0.26	-0.20						
Height	-0.08	0.08	0.65**	0.73**	0.15	0.17	0.07					
Lodging %	-0.14	-0.02	0.27	0.24	-0.16	-0.22	0.13	0.30 *				
Shattering %	0.17	0.13	-0.17	-0.22	-0.02	-0.11	0.22	-0.39**			-0.12	
1000 grain weight	0.76**	0.79**	-0.28	-0.10	0.25	0.38**	-0.21	-0.01			-0.22	0.14

\* = Significant at the 5% level

\*\* = Significant at the 1% level

TABLE 25

## MIDDLE EAST

ISRAEL. Mivhor Farm. (Hazera Seeds, Ltd., Breeding Department) Latitude: 31° 37' N. Longitude: 34° 47' E. Elevation: 120 meters above sea level.  
Cooperators: Sem Y. Atsmon.

Planting Date: 15 December 1969. Precipitation during test: 357.1 mm total from October to April. Irrigation: Three applications totaling 1800 m<sup>3</sup>/Ha.  
Fertilizer: Preplanting application of 12-12-0 plus Urea topdress of 60 Kg./Ha.

General Comments: There was a prolonged dry spell lasting from 29 January to 10 March. The average temperatures during that period were from 1-3°C above average. Septoria, stripe and leaf rusts were heavy. Stem rust infection was moderate.

Scoring notes taken: Stripe rust, leaf rust and lodging - 8 April, stem rust and height - 27 April.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to flowering	Stripe rust	Leaf rust	Stem rust	Height cms	Lodging (%)	1000 grain weight gms
50 N-46			6476	78.7	85.7	0	5S	15S	81.7	0.0	44.3
23 LR64 - N10B x AN(3)		Sudan	6265	84.0	96.0	0	5S	0	95.0	0.0	39.7
1 Pitic 62		Mexico	5914	78.0	86.7	0	5S	0	106.7	60.0	45.3
45 Norteño 67		Mexico	5724	82.7	82.0	TR	0	0	111.7	36.7	47.0
46 TzPP-Son64/LR64A-TzPPxAN(E)(B)		Mexico	5516	83.3	84.3	0	0	0	103.3	53.3	41.3
16 Son 64A x SK <sub>E</sub> -LR64A		Argentina	5443	81.7	94.0	5R	0	20S	100.0	0.0	38.7
7 Noroeste 66		Mexico	5436	80.3	84.7	0	0	0	98.3	36.7	44.7
22 Son 64 x TzPP - Nai 60 (A)		Argentina	5377	81.7	87.7	10MS	0	0	118.3	20.0	48.3
4 Son 64 x Kl. Rend.		Argentina	5366	81.7	84.3	0	0	0	101.7	16.7	44.0
8 Victor I		Italy	5339	80.7	104.3	0	0	10S	91.7	0.0	55.3
17 Sonora 64		Mexico	5222	81.3	73.3	0	0	0	98.3	33.3	43.0
27 V-878		India	5205	82.7	76.3	0	0	0	96.7	30.0	36.0
34 Inia 66		Mexico	5165	83.3	76.3	0	0	0	101.7	10.0	46.7
18 LR64 - Son 64		Mexico	5136	81.7	84.7	TR	0	0	113.3	66.7	50.0
35 Tobari 66		Mexico	5127	83.7	82.3	0	0	0	100.0	26.7	40.7
44 36896-CJ54(2) x YT54A (H)		Sudan	5074	79.3	83.3	10MS	0	0	110.0	40.0	47.0
32 Penjamo 62		Mexico	5043	82.3	85.3	0	TR	0	115.0	83.3	45.7
19 Ciano 67		Mexico	5012	83.3	72.7	0	TR	5S	96.7	73.3	42.7
6 Siete Cerros		Mexico	4967	81.0	94.3	10S	15S	0	100.0	16.7	38.0
3 Nainari 60		Mexico	4944	79.0	95.7	5MR	TS	0	113.3	46.7	49.3
28 Lerma Rojo 64A		Mexico	4833	82.0	83.3	0	0	10MR	108.3	66.7	43.7
48 PV-18, Indus		India Pak.	4560	80.7	92.3	10MR	5S	0	96.7	13.3	40.0
14 Crespo		Colombia	4506	82.3	86.3	0	TMR	0	116.7	70.0	42.0
30 Nar(S)(2) x PJ(S)		Chile	4482	82.0	74.3	0	40S	TS	100.0	43.3	37.3
41 TzPP-Son64/LR64A-TzPPxAN(E)(A)		Mexico	4471	83.0	84.3	0	0	0	108.3	53.3	39.7
13 Hueiquen		Chile	4418	81.3	93.0	0	0	0	113.3	60.0	44.0
15 Taichung 31		Taiwan	4371	79.0	79.7	10MS	100VS	40S	101.7	23.3	33.7
39 Napo 63		Colombia	4351	82.3	82.3	0	15R	15R	116.7	86.7	40.7
25 NP881		India	4342	81.0	90.3	0	5S	0	121.7	76.7	46.0
38 Triple Dirk		Australia	4148	82.0	96.7	TR	0	0	123.3	16.7	56.0
5 Giza 155		Egypt	4015	81.0	91.3	0	40S	0	113.3	56.7	48.7
24 Kloka WM1353		Germany	4007	79.7	97.3	0	5MS	TS	116.7	0.0	36.3

47 Mengavi	Australia	3876	77.0	94.7	30S	5S	0	103.3	16.7	41.3
10 Carazinho	Brazil	3811	81.7	96.0	0	0	0.30S	121.7	90.0	44.7
11 NP852	India	3643	82.3	84.0	0	40S	0	115.0	86.7	41.0
49 (MD-K-Y)(WIS-SUP)	Kenya	3630	82.0	103.0	TMR	TS	0	116.7	10.0	45.0
9 Bonza 55	Colombia	3533	80.0	93.3	0	TR	0.30S	118.3	80.0	40.3
43 C-273	Pakistan	3317	83.7	90.7	0	TS	0	125.0	100.0	49.0
31 LI418-3463L1231x23L1274-111(L)	Sudan	3292	80.7	91.3	TR	10S	0	118.3	50.0	46.3
37 NP 832	India	3181	82.0	92.0	0	100S	100S	123.3	90.0	46.3
38 Gaboto	Argentina	3151	82.3	96.3	0	0	0	113.3	73.3	36.0
20 C-591	India	3090	82.3	91.3	0	10S	5S	118.7	86.7	47.7
2 Gabo	Australia	3044	77.3	93.0	30S	5S	0	105.0	46.7	39.7
33 Chris	USA	2995	82.3	94.3	0	0	0	128.3	100.0	38.0
40 C-306	India	2857	84.0	91.7	0	10S	10S	120.0	70.0	46.0
12 Crim	USA	2780	80.3	102.7	TMR	TS	0	121.7	50.0	38.3
21 Justin	USA	2236	74.7	105.0	0	TR	0	138.3	0.0	32.3
42 Manitou	Canada	1327	75.0	105.0	0	0	0	140.0	0.0	26.0
26 Selkirk	Canada	821	64.7	105.0	10MR	20S	TS	140.0	0.0	25.3
29 Thatcher	USA	607	78.0	105.0	5S	100S	0	150.0	0.0	27.3

Grand mean	4229	80.7	90.0	1.6	2.5	1.6	112.1	43.3	42.1
Standard error of grand mean	61	0.1	0.1	0.1	0.1	0.1	0.6	1.4	0.3
Coefficient of variation	18.0%	1.4%	1.6%	54.5%	36.4%	64.2%	6.7%	40.1%	8.7%
LSD Variety means 5 PC	1219	1.9	2.4	1.4	1.5	1.7	12.3	28.4	6.0

#### Correlations

Test wt	0.51**								
Days to flowering	-0.61**	-0.48**							
Stripe rust	-0.07	-0.36**	-0.01						
Leaf rust $\sqrt{\frac{X+1}{X+1}}$	-0.39**	-0.17	0.06	0.21					
Stem rust $\sqrt{\frac{X+1}{X+1}}$	0.12	0.09	-0.07	0.10	0.33 *				
Height	-0.83**	-0.40**	0.57**	-0.14	0.23	-0.25			
Lodging %	-0.07	0.41**	-0.28 *	-0.23	0.02	0.01	0.17		
1000 grain weight	0.54**	0.53**	-0.24	-0.17	-0.26	0.10	-0.33 *	0.30 *	

\* = Significant at the 5% level  
\*\* = Significant at the 1% level

TABLE 26

## MIDDLE EAST

JORDAN. Deir Alla. Latitude: 35° 37' N. Longitude: 32° 12' E. Elevation: -226 meters above sea level.  
Cooperators: Z. Ghosheh, A. Masadh, M. A. Aziz and E. Jaber.

Planting Date: 25 November 1968. Precipitation during test: +272 mm. Irrigation: 4 irrigations applied. Fertilizer: 50 Kg./Ha. N and 40 Kg./Ha. P<sub>2</sub>O<sub>5</sub>.  
General Comments: Climatic conditions were normal with good distribution of rain. Leaf rust development was strong. Some bird problems were encountered.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to flowering maturity		Stripe rust	Leaf rust	Stem rust	Height cms	Lodging (%)	Shattering (%)	1000 grain weight gms
23	LR64 - N10B x AN(3)	Sudan	5555	85.0	93.7	148.0	0	S	0	88.3	6.7	0.0	34.0
1	Pitic 62	Mexico	5494	82.0	86.3	143.3	0	VR	0	98.3	66.7	0.0	42.0
22	Son 64 x TzPP - Nai 60 (A)	Argentina	5433	83.0	83.7	148.0	MR	VR	0	106.7	26.7	0.0	46.0
16	Son 64A x SK <sub>E</sub> -LR64A	Argentina	5386	84.0	94.7	146.0	VR	VR	0	86.7	0.0	0.0	38.0
48	PV-18, Indus	India Pak.	5122	83.0	83.0	143.3	MS	0	0	85.0	63.3	0.0	37.0
11	NP852	India	5088	85.0	84.3	144.7	VR	VR	0	98.7	66.7	0.0	39.0
3	Nainari 60	Mexico	5005	81.0	97.0	150.7	M	MR	0	113.3	56.7	0.0	45.0
47	Mengavi	Australia	4722	80.0	95.7	151.3	MS	VR	0	108.3	76.7	0.0	39.0
6	Siete Cerros	Mexico	4700	85.0	87.7	143.3	0	MR	0	90.0	23.3	1.7	39.0
5	Giza 155	Egypt	4622	84.0	86.3	148.7	MR	VR	0	110.0	36.7	0.0	48.0
44	36896-CJ54(2) x YT54A (H)	Sudan	4472	83.0	84.7	145.3	VR	VR	0	105.0	88.7	0.0	44.0
40	C-306	India	4461	85.0	95.0	150.0	MS	0	0	115.0	100.0	0.0	47.0
37	NP 832	India	4438	86.0	87.3	150.0	VR	S	0	115.0	80.0	0.0	47.0
8	Victor I	Italy	4405	83.0	91.0	149.7	MR	MR	0	88.3	10.0	0.0	42.0
25	NP881	India	4361	83.0	90.3	147.3	VR	VR	0	110.0	90.0	0.0	38.0
7	Noroeste 66	Mexico	4338	83.0	76.0	142.0	MR	VR	0	90.0	43.3	0.0	43.0
2	Gabo	Australia	4327	80.0	94.0	153.7	MS	0	0	113.3	50.0	0.0	39.0
32	Penjamo 62	Mexico	4277	84.0	86.3	154.0	0	0	0	96.7	76.7	0.0	44.0
4	Son 64 x Kl. Rend.	Argentina	4227	84.0	73.7	142.7	VR	0	0	88.3	26.7	5.0	41.0
20	C-591	India	4216	86.0	97.3	147.7	MR	MR	0	123.3	93.3	0.0	44.0
31	L1418-3483L1231x23L1274-111(L)	Sudan	4186	83.0	84.3	149.3	0	MS	0	108.3	46.7	0.0	49.0
14	Crespo	Colombia	4161	84.0	84.0	145.3	0	M	0	108.3	43.3	0.0	47.0
43	C-273	Pakistan	4127	85.0	93.0	151.7	MR	MS	0	115.0	66.7	0.0	47.0
30	Nar(S)(2) x PJ(S)	Chile	4066	83.0	69.3	142.0	0	M	0	80.0	10.0	1.7	36.3
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	4022	86.0	78.0	142.0	0	0	0	91.7	80.0	10.0	38.0
34	Inia 86	Mexico	3977	86.0	78.0	145.3	0	0	0	91.7	0.0	3.3	47.0
36	Triple Dirk	Australia	3844	82.0	94.3	151.0	MR	0	0	121.7	93.3	0.0	42.0
50	Deir Alla I		3739	83.0	103.0	167.3	VR	MR	0	115.0	36.7	0.0	43.0
10	Carazinho	Brazil	3477	82.0	96.0	154.3	VR	VR	0	121.7	83.3	0.0	43.0
28	Lerma Rojo 64A	Mexico	3450	85.0	79.3	140.7	0	VR	0	93.3	83.3	15.0	47.0
33	Chris	USA	3444	84.0	93.3	151.7	0	0	0	120.0	100.0	0.0	33.0
35	Tobari 66	Mexico	3422	85.0	76.3	143.3	M	0	0	81.7	26.7	0.0	40.0

17 Sonora 64	Mexico	3339	85.0	67.7	140.7	VR	0	0	80.0	16.7	1.7	37.0
18 LR64 - Son 64	Mexico	3327	85.0	79.0	141.3	0	0	0	98.3	30.0	5.0	45.0
46 TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	3233	86.0	76.0	144.0	0	0	0	86.7	50.0	8.3	42.0
38 Gaboto	Argentina	3211	82.0	98.7	149.3	0	0	0	121.7	90.0	0.0	34.0
27 V-878	India	3077	85.0	67.7	142.7	0	0	0	75.0	3.3	10.0	36.0
15 Taichung 31	Taiwan	3016	85.0	72.3	143.3	MS	0	0	91.7	13.3	8.3	40.0
49 (MD-K-Y)(WIS-SUP)	Kenya	2989	82.0	101.0	156.0	0	M	VR	110.0	90.0	0.0	48.0
9 Bonza 55	Colombia	2761	80.0	92.7	144.7	0	VR	MS	115.0	80.0	1.7	38.0
13 Huelquen	Chile	2705	84.0	75.7	142.0	0	VR	0	103.3	63.3	13.3	44.0
24 Kloka WM1353	Germany	2356	80.0	95.3	156.0	0	MR	VR	111.7	40.0	0.0	36.0
12 Crim	USA	2278	81.0	126.7	169.0	VR	VR	0	126.7	90.0	0.0	38.0
39 Napo 63	Colombia	2094	84.0	77.3	142.7	0	VR	0	105.0	50.0	11.7	40.0
19 Ciano 67	Mexico	2089	85.0	68.0	145.3	0	0	0	78.3	3.3	21.7	41.3
45 Norteño 67	Mexico	1972	85.0	77.0	141.3	0	0	0	93.3	6.7	20.0	46.0
29 Thatcher	USA	1183	73.0	126.0	172.0	0	MS	0	125.0	83.3	0.0	25.0
21 Justin	USA	1155	77.0	125.0	164.3	VR	0	0	128.3	73.3	0.0	32.0
42 Manitou	Canada	1105	73.0	119.3	176.0	0	0	0	123.3	76.7	0.0	23.0
26 Selkirk	Canada	1067	75.0	124.7	172.7	0	VR	0	128.3	70.0	0.0	33.0

Grand mean		3670	82.9	89.3	149.5	1.0	1.1	1.0	103.6	53.2	2.8	40.5
Standard error of grand mean		52	(only 1	0.2	0.4	0.0	0.0	0.0	0.4	1.8	0.6	0.0
Coefficient of variation		17.0%	rep.)	2.5%	3.1%	8.7%	13.1%	3.4%	4.7%	36.3%	281.5%	0.3%
LSD Variety means 5 PC		1039		3.7	7.5	0.1	0.2	0.1	7.9	31.5	12.7	0.2

#### Correlations

Test wt	0.53**											
Days to flowering	-0.37**	-0.77**										
Days to maturity	-0.50**	-0.79**	0.90**									
Stripe rust	0.21	-0.11	0.02	-0.00								
Leaf rust	-0.06	-0.26	0.29 *	0.30 *	-0.02							
Stem rust	-0.11	-0.14	0.03	-0.08	-0.06	0.11						
Height	-0.32 *	-0.59**	0.80**	0.71**	-0.01	0.27	0.11					
Lodging %	-0.13	-0.34 *	0.53**	0.39**	0.08	0.17	0.12	0.73**				
Shattering %	-0.36**	0.34 *	-0.50**	-0.40**	-0.15	-0.28	-0.03	-0.44**	-0.34 *			
1000 grain weight	0.45**	0.65**	-0.46**	-0.48**	0.02	-0.09	-0.06	-0.15	-0.08	0.15		

\* = Significant at the 5% level

\*\* = Significant at the 1% level

TABLE 27

## MIDDLE EAST

IRAQ. Abu-Ghraib. Latitude: 33° 20' N. Longitude: 44° 24' E. Elevation: 34 meters above sea level.  
Cooperator: Dr. Raja Mohi Abo Al-Eis.

Planting Date: 14 November 1968. Precipitation during test: not stated. Irrigation: 4 irrigations applied. Fertilizer: N<sub>80</sub> P<sub>40</sub> K<sub>0</sub> Kg./Ha.

General Comments: Some leaf rust, and very little stem and stripe rust. No other insect, weed or pest problems.

Scoring notes taken: Days to flowering - 22 March; rusts, lodging and height - 25 April.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to flowering	Height cms	Lodging (%)	1000 grain weight gms
32	Penjamo 62	Mexico	6244	76.0	109.0	135.0	0.0	30.0
16	Son 64A x SK <sub>E</sub> -LR64A	Argentina	6094	78.0	112.0	107.0	0.0	32.0
48	PV-18, Indus	India Pak.	5999	78.0	112.0	119.0	23.3	1/
8	Victor I	Italy	5838	78.0	117.0	97.0	0.0	34.0
50	Local Check Variety		5822	80.0	107.0	115.0	3.3	1/
4	Son 64 x Kl. Rend.	Argentina	5599	79.0	108.0	129.0	6.7	35.0
7	Noroeste 66	Mexico	5527	76.0	106.0	115.0	6.7	33.0
23	LR64 - N10B x AN(3)	Sudan	5438	79.0	114.0	104.0	0.0	30.0
6	Siete Cerros	Mexico	5394	76.0	111.0	116.0	0.0	32.0
1	Pitic 62	Mexico	5283	71.0	109.0	127.0	46.7	32.0
44	36896-CJ54(2) x YT54A (H)	Sudan	5283	75.0	109.0	127.0	0.0	38.0
3	Nainari 60	Mexico	5133	75.0	109.0	120.0	30.0	35.0
5	Giza 155	Egypt	5099	79.0	109.0	123.0	20.0	46.0
31	L1418-3463L1231x23L1274-111(L)	Sudan	5094	79.0	109.0	126.0	0.0	40.0
35	Tobari 66	Mexico	4950	80.0	102.0	113.0	0.0	33.0
47	Mengavi	Australia	4905	73.0	112.0	134.0	3.3	1/
28	Lerma Rojo 64A	Mexico	4891	78.0	115.0	124.0	26.7	32.0
22	Son 64 x TzPP - Nai 60 (A)	Argentina	4877	76.0	107.0	112.0	6.7	40.0
17	Sonora 64	Mexico	4822	78.0	98.0	101.0	0.0	37.0
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	4777	78.0	109.0	122.0	10.0	32.0
34	Inia 66	Mexico	4705	81.0	98.0	114.0	3.3	40.0
2	Gabo	Australia	4666	76.0	109.0	119.0	10.0	25.0
39	Napo 63	Colombia	4666	76.0	102.0	126.0	26.7	33.0
15	Taichung 31	Taiwan	4655	76.0	103.0	116.0	0.0	28.0
11	NP852	India	4594	79.0	107.0	125.0	26.7	33.0
18	LR64 - Son 64	Mexico	4588	76.0	107.0	116.0	0.0	36.0
19	Ciano 67	Mexico	4572	80.0	103.0	119.0	6.7	39.0
13	Huelquen	Chile	4566	79.0	107.0	130.0	43.3	36.0
30	Nar(S)(2) x PJ(S)	Chile	4561	75.0	102.0	98.0	0.0	32.0
40	C-306	India	4544	79.0	109.0	126.0	56.7	40.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	4505	80.0	108.0	112.0	36.7	1/
14	Crespo	Colombia	4488	76.0	107.0	127.0	40.0	32.0

27	V-878	India	4388	78.0	103.0	100.0	0.0	28.0
45	Norteno 67	Mexico	4300	78.0	102.0	121.0	0.0	1/
37	NP 832	India	4233	79.0	108.0	135.0	20.0	38.0
20	C-591	India	4161	80.0	111.0	130.0	26.7	38.0
43	C-273	Pakistan	4127	81.0	110.0	127.0	20.0	38.0
25	NP881	India	4122	76.0	108.0	126.0	70.0	34.0
36	Triple Dirk	Australia	4055	78.0	116.0	125.0	30.0	39.0
10	Carazinho	Brazil	3877	78.0	112.0	132.0	53.3	35.0
38	Gaboto	Argentina	3766	76.0	115.0	125.0	60.0	34.0
24	Kloka WM1353	Germany	3483	75.0	114.0	117.0	0.0	28.0
9	Bonza 55	Colombia	3444	73.0	111.0	119.0	63.3	32.0
33	Chris	USA	3411	79.0	112.0	134.0	60.0	29.0
49	(MD-K-Y)(WIS-SUP)	Kenya	3216	78.0	122.0	134.0	46.7	1/
12	Crim	USA	3077	78.0	119.0	134.0	50.0	33.0
21	Justin	USA	1144	73.0	118.0	134.0	18.7	26.0
42	Manitou	Canada	1072	67.0	138.0	127.0	40.0	23.0
26	Selkirk	Canada	978	66.0	114.0	144.0	16.7	24.0
29	Thatcher	USA	917	71.0	138.0	124.0	0.0	21.0

Grand mean	4399	76.7	110.3	121.6	20.1	33.3
Standard error of grand mean	38	(only 1	(only 1	(only 1	1.8	(only 1
Coefficient of variation	11.0%	rep.)	rep.)	rep.)	107.7%	rep.)
LSD Variety means 5 PC	755				35.4	

#### Correlations

Test wt	0.58**					
Days to flowering	-0.61**	-0.50**				
Height	-0.43**	-0.27	0.32 *			
Lodging %	-0.31 *	-0.09	0.23	0.47**		
1000 grain weight	-0.25	-0.01	0.08	0.10	0.12	

\* = Significant at the 5% level

\*\* = Significant at the 1% level

1/ No data available

TABLE 28

## MIDDLE EAST

IRAN. Ahwaz, Khuzistan. Latitude: 31° 20' N. Longitude: 48° 40' E. Elevation: 20 meters above sea level.  
Cooperator: M. Dadain.

Planting Date: 24 November 1968. Precipitation during test: 294 mm. Irrigation: 5 irrigations applied. Fertilizer: 60 Kg./Ha. N as Urea, 30 Kg./Ha. P<sub>2</sub>O<sub>5</sub> as Superphosphate.

General Comments: Temperature varied between 2.4°C and 43°C during the test. Strong development of leaf rust. No insect, weed or pest problems.

Variety Number	Variety or cross	Origin	Yield kg/ha	Days to flowering maturity		Leaf rust	Height cms	Lodging (%)	Shattering (%)	1000 grain weight gms
48	PV-18, Indus	India Pak.	4700	88.0	133.0	20S	101.7	10.0	20.0	42.0
32	Penjamo 62	Mexico	4544	82.0	130.0	10S	105.0	6.7	20.0	40.0
6	Siete Cerros	Mexico	4388	88.0	133.0	50S	106.7	3.3	30.0	39.0
28	Lerma Rojo 64A	Mexico	4066	79.0	125.0	0	115.0	40.0	20.0	41.0
18	LR64 - Son 64	Mexico	3955	79.0	122.0	0	110.0	0.0	30.0	43.0
34	Inia 66	Mexico	3922	73.3	115.0	0	110.0	0.0	10.0	43.0
36	Triple Dirk	Australia	3866	90.0	134.0	10S	138.3	30.0	0.0	43.0
22	Son 64 x TzPP - Nai 60 (A)	Argentina	3755	77.0	133.0	0	115.0	13.3	10.0	39.0
7	Noroeste 66	Mexico	3744	82.0	125.0	0	100.0	0.0	30.0	39.0
5	Giza 155	Egypt	3677	82.0	133.0	30S	121.7	13.3	0.0	44.0
23	LR64 - N10B x AN(3)	Sudan	3677	92.3	133.0	50S	86.7	0.0	20.0	33.0
4	Son 64 x Kl. Rend.	Argentina	3622	79.0	120.0	10MS	106.7	0.0	5.0	38.0
16	Son 64A x SK <sub>P</sub> - LR64A	Argentina	3600	88.3	134.0	10MS	91.7	0.0	5.0	34.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	3566	77.0	125.0	0	111.7	16.7	30.0	33.0
2	Gabo	Australia	3533	88.0	133.0	30MS	115.0	36.7	5.0	38.0
3	Nainari 60	Mexico	3489	90.0	133.0	20S	116.7	23.3	0.0	40.0
37	NP 832	India	3466	82.0	133.0	80S	133.3	30.0	0.0	43.0
27	V-878	India	3377	72.0	118.0	0	98.3	13.3	5.0	35.0
35	Tobari 66	Mexico	3377	77.0	120.0	0	103.3	0.0	0.0	38.0
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	3289	82.0	120.0	30S	100.0	10.0	30.0	33.0
1	Pitic 62	Mexico	3277	88.0	128.0	20S	103.3	13.3	0.0	32.0
30	Nar(S)(2) x PJ(S)	Chile	3266	79.3	125.0	20S	100.0	10.0	10.0	36.0
39	Napo 63	Colombia	3211	72.7	117.0	50S	116.7	30.0	10.0	36.0
50	Local Check Variety		3155	93.0	133.0	100S	123.3	26.7	0.0	34.0
31	L1418-3463L1231x23L1274-111(L)	Sudan	3122	84.0	133.0	40S	125.0	10.0	0.0	41.0
8	Victor 1	Italy	3100	97.0	140.0	30S	85.0	0.0	20.0	38.0
13	Huelquen	Chile	3077	82.0	122.0	0	116.7	40.0	10.0	41.0
14	Crespo	Colombia	3022	82.0	128.0	20S	121.7	10.0	5.0	27.0
45	Norteño 67	Mexico	3000	79.0	120.0	0	110.0	0.0	0.0	40.0
15	Taichung 31	Taiwan	2977	77.0	115.0	80S	115.0	0.0	10.0	33.0
44	36896-CJ54(2) x YT54A (H)	Sudan	2933	88.0	133.0	0	110.0	10.0	0.0	41.0
17	Sonora 64	Mexico	2811	69.7	125.0	10MS	90.0	0.0	10.0	38.0



43 C-273	Pakistan	2811	82.0	133.0	30S	131.7	20.0	0.0	41.0
10 Carazinho	Brazil	2789	93.0	140.0	0	128.3	40.0	10.0	43.0
47 Mengavi	Australia	2755	88.0	133.0	30S	106.7	6.7	0.0	40.0
9 Bonza 55	Colombia	2711	90.3	130.0	50S	121.7	30.0	0.0	31.0
40 C-306	India	2711	93.3	134.0	30S	120.0	46.7	10.0	36.0
11 NP852	India	2678	77.0	125.0	30S	113.3	10.0	0.0	35.0
20 C-591	India	2611	88.0	133.0	40S	133.3	30.0	0.0	21.0
33 Chris	USA	2500	88.3	133.0	0	130.0	50.0	0.0	31.0
25 NP881	India	2478	82.7	133.0	30S	123.3	33.3	5.0	39.0
38 Gaboto	Argentina	2444	94.0	140.0	0	126.7	46.7	5.0	31.0
49 (MD-K-Y)(WIS-SUP)	Kenya	2400	95.3	140.0	20S	120.0	23.3	0.0	33.0
24 Kloka WM1353	Germany	2322	91.3	140.0	80S	110.0	10.0	10.0	41.0
12 Crim	USA	2266	97.7	138.0	20MS	121.7	20.0	0.0	32.0
19 Ciano 67	Mexico	2133	69.0	115.0	0	100.0	0.0	20.0	42.0
21 Justin	USA	1533	110.7	142.7	40S	120.0	3.3	5.0	26.0
26 Selkirk	Canada	1389	110.7	148.0	60S	120.0	6.7	5.0	28.0
42 Manitou	Canada	1222	114.0	157.0	0	126.7	26.7	0.0	23.0
29 Thatcher	USA	789	114.3	151.0	100S	121.7	10.0	10.0	22.0

Grand mean		3062	86.4	130.7	4.4	113.6	16.2	8.5	36.2
Standard error of grand mean		30	0.2	0.1	0.1	0.2	0.4	0.2	(only 1 rep.)
Coefficient of variation		12.0%	3.3%	0.6%	14.3%	2.7%	27.6%	28.8%	
LSD Variety means 5 PC		602	4.7	1.3	1.0	4.9	7.3	4.0	

#### Correlations

Days to flowering	-0.60**							
Days to maturity	-0.53**	0.90**						
Leaf rust $\sqrt{X + 1}$	-0.22	0.38**	0.31 *					
Height	-0.33 *	0.30 *	0.36**	0.18				
Lodging %	-0.15	0.18	0.26	-0.05	0.66**			
Shattering %	0.40**	-0.21	-0.26	-0.16	-0.51**	-0.30 *		
1000 grain weight	0.62**	-0.56**	-0.42**	-0.26	-0.18	-0.09	0.18	

\* = Significant at the 5% level

\*\* = Significant at the 1% level

TABLE 29

## MIDDLE EAST

IRAN. Gorgan. Latitude: 36° 51' N. Longitude: 54° 28' E. Elevation: 50 meters above sea level.  
Cooperator: Behrooz Sadri.

Planting Date: 10 January 1969. Precipitation during test: 50 mm rain and 1200 mm snow. Irrigation: not stated. Fertilizer: 180 Kg./Ha. Urea and 100 Kg./Ha. Amm. Nitrate.

General Comments: The winter was very cold - the temperature fell to -13°C. There was a severe epidemic of leaf rust. No insect, weed or pest problems.

Variety Number	Variety or cross	Origin	Yield kg/ha	Days to flowering	Days to maturity	Stripe rust	Leaf rust	Height cms	Lodging (%)	1000 grain weight gms
4	Son 64 x Kl. Rend.	Argentina	5216	110.0	145.0	0	0	95.3	0.0	42.0
48	PV-18, Indus	India Pak.	4777	118.0	150.0	0	0	90.0	0.0	37.0
13	Huelquen	Chile	4766	118.0	150.0	0	0	106.0	0.0	40.0
7	Noroeste 66	Mexico	4722	115.0	147.0	5MR-MS	0	77.0	0.0	38.0
1	Pitic 62	Mexico	4694	118.0	150.0	0	0	95.0	0.0	33.0
5	Giza 155	Egypt	4466	113.3	146.3	0	50S	102.7	0.0	41.0
16	Son 64A x SK <sub>E</sub> -LR64A	Argentina	4466	115.0	147.0	10MR-MS	0	77.0	0.0	36.0
3	Nainari 60	Mexico	4450	110.0	145.0	20S	0	102.0	0.0	43.0
45	Norteno 67	Mexico	4400	115.0	145.0	50MS	0	84.0	0.0	43.0
32	Penjamo 62	Mexico	4388	115.0	145.0	0	0	86.0	0.0	42.0
28	Lerma Rojo 64A	Mexico	4383	115.0	145.0	0	0	91.0	0.0	42.0
23	LR64 - N10B x AN(3)	Sudan	4200	120.0	155.0	0	80S	73.0	0.0	36.0
14	Crespo	Colombia	4077	115.0	147.0	0	0	102.0	0.0	41.0
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	3888	116.0	147.0	0	0	81.0	0.0	38.0
11	NP852	India	3805	115.0	145.0	5MS	20S	97.3	0.0	38.0
36	Triple Dirk	Australia	3805	120.0	155.0	0	0	107.0	0.0	45.0
18	LR64 - Son 64	Mexico	3794	115.0	145.0	0	0	86.0	0.0	44.0
22	Son 64 x TzPP - Nai 60 (A)	Argentina	3750	115.0	145.0	5MR-MS	0	89.0	0.0	45.0
17	Sonora 64	Mexico	3744	115.0	145.0	10MS	0	74.7	0.0	36.0
34	Inia 66	Mexico	3716	115.0	145.0	0	0	73.0	0.0	43.0
25	NP881	India	3705	115.0	145.0	0	10S	102.0	75.0	38.0
31	L1418-3463L1231x23L1274-111(L)	Sudan	3705	116.0	146.0	0	10S	99.0	0.0	40.0
6	Siete Cerros	Mexico	3644	120.0	155.0	0	80S	83.0	0.0	33.0
19	Ciano 67	Mexico	3627	115.0	145.0	0	0	84.0	0.0	40.0
43	C-273	Pakistan	3622	115.0	145.0	0	0	92.0	0.0	40.0
10	Carazinho	Brazil	3577	116.0	148.0	10MS	0	126.0	66.0	43.0
47	Mengavi	Australia	3550	116.0	147.0	80S	0	87.0	0.0	38.0
12	Crim	USA	3522	116.0	148.0	0	0	116.0	99.0	35.0
44	36896-CJ54(2) x YT54A (H)	Sudan	3477	115.0	145.0	80S	0	93.0	0.0	40.0
2	Gabo	Australia	3455	115.0	147.0	80S	0	104.7	0.0	38.0
38	Gaboto	Argentina	3305	118.0	150.0	0	0	122.0	0.0	37.0
39	Napo 63	Colombia	3266	115.0	143.0	0	80S	90.0	0.0	38.0

8 Victor I	Italy	3266	120.0	155.0	0	50S	69.0	0.0	34.0
35 Tobari 66	Mexico	3222	115.0	145.0	0	0	78.0	0.0	41.0
40 C-306	India	3216	115.0	145.0	0	80S	101.0	0.0	35.0
30 Nar(S)(2) x PJ(S)	Chile	3166	115.0	145.0	0	20S	80.0	0.0	33.0
33 Chris	USA	2989	118.0	150.0	0	0	101.0	0.0	35.0
20 C-591	India	2977	115.0	145.0	0	50S	108.0	0.0	38.0
21 Justin	USA	2916	120.0	155.0	0	0	112.0	0.0	37.0
46 TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	2822	115.0	145.0	0	0	79.0	0.0	38.0
9 Bonza 55	Colombia	2805	116.0	148.0	0	0	106.0	0.0	37.0
27 V-878	India	2800	115.0	145.0	0	0	72.0	0.0	33.0
42 Manitou	Canada	2689	120.0	152.0	0	0	114.0	0.0	30.0
49 (MD-K-Y) (WIS-SUP)	Kenya	2661	122.0	155.0	0	0	76.0	0.0	38.0
50 Akova		2544	116.0	147.0	0	0	110.0	0.0	45.0
24 Kloka WM1353	Germany	2394	120.0	155.0	0	80S	105.0	0.0	32.0
26 Selkirk	Canada	2278	120.0	155.0	0	0	110.3	0.0	33.0
37 NP832	India	2083	118.0	150.0	0	80S	114.0	0.0	38.0
15 Taichung 31	Taiwan	2011	110.0	145.0	0	80S	82.0	0.0	29.0
29 Thatcher	USA	1605	120.0	155.0	0	0	122.0	0.0	25.0
Grand mean		3528	116.2	148.0	1.9	2.8	94.5	4.8	37.9
Standard error of grand mean		58	0.0	0.0	0.0	0.1	0.1	0.7	(only 1 rep.)
Coefficient of variation		20.0%	0.4%	0.3%	15.7%	33.1%	1.5%	168.4%	
LSD Variety means 5 PC		1153	0.7	0.8	0.5	1.5	2.4	13.2	

#### Correlations

Days to flowering	-0.34 *							
Days to maturity	-0.30 *	0.87**						
Stripe rust $\sqrt{\frac{X+1}{X+1}}$	0.15	-0.23	-0.22					
Leaf rust $\sqrt{\frac{X+1}{X+1}}$	-0.30 *	0.10	0.17	-0.22				
Height	-0.27	0.18	0.24	-0.03	-0.07			
Lodging %	0.02	-0.05	-0.06	-0.04	-0.09	0.34 *		
1000 grain weight	0.51**	-0.35 *	-0.43**	0.18	-0.37**	-0.05	0.01	

\* = Significant at the 5% level

\*\* = Significant at the 1% level

TABLE 30

## ASIA

AFGHANISTAN. Darul Aman Experiment Station. Latitude: 34° 33' N. Longitude: 69° 11' E. Elevation: 1803 meters above sea level.  
Cooperators: Atif Hakim and E. V. Staker.

Planting Date: 25 and 26 September 1968. Precipitation during test: Practically no rain during period May-August. Average annual precipitation for Kabul (8 years) is 358.5 mm. Irrigation: 5 irrigations of 76.2 mm each were applied. Fertilizer: 100 Kg./Ha. N as Urea in fall broadcast; 100 Kg./Ha. N as Urea in spring, banded 100 Kg./Ha. P<sub>2</sub>O<sub>5</sub> as 18% Superphosphate in fall, banded; and 50 Kg./Ha. K<sub>2</sub>O as Potassium Chloride in fall broadcast.

General Comments: Practically no rain fell during the growing season. Temperatures were above normal. Late December was very cold with no snow cover. Stripe rust attacked most varieties, but only a few were susceptible to leaf and stem rust. There was minor damage from Army Worm, but no other insect, weed or pest problems.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to flowering	Days to maturity	Stripe rust	Height cms	Shattering (%)	1000 grain weight gms	Frost damage (%)
1	Pitic 62	Mexico	5306	74.0	126.7	170.3	1.0	93.3	10.7	31.7	50.0
8	Victor I	Italy	5002	79.7	128.3	175.0	2.7	72.7	41.0	33.7	33.3
6	Siete Cerros	Mexico	4824	79.3	127.0	175.0	1.1	79.0	0.0	34.3	50.0
13	Huelquen	Chile	4807	79.7	127.0	175.0	1.0	99.3	18.0	35.0	50.0
14	Crespo	Colombia	4682	81.7	120.7	172.0	1.0	93.7	10.7	34.3	50.0
10	Carazinho	Brazil	4605	80.7	125.0	172.3	1.5	108.7	40.3	36.7	25.0
48	PV-18, Indus	India Pak.	4403	80.3	125.3	172.0	1.0	75.3	0.0	35.3	58.3
44	36896-CJ54(2) x YT54A (H)	Sudan	4398	78.3	123.7	172.0	5.8	93.7	0.0	38.7	41.7
9	Bonza 55	Colombia	4340	78.7	125.0	170.0	3.3	99.0	9.0	35.3	58.3
24	Kloka WM1353	Germany	4227	78.3	131.0	178.3	1.1	87.3	10.3	27.7	50.0
36	Triple Dirk	Australia	4215	79.0	124.7	170.0	2.3	103.0	0.0	40.3	50.0
45	Norteño 67	Mexico	4200	80.3	118.7	169.3	1.0	89.0	45.3	42.0	50.0
4	Son 64 x Kl. Rend.	Argentina	3993	81.3	120.7	172.0	2.3	83.3	15.3	38.0	58.3
12	Crim	USA	3976	79.7	119.0	169.7	6.4	99.0	17.0	33.7	50.0
3	Nainari 60	Mexico	3952	79.7	121.3	171.3	8.1	88.3	0.0	41.3	50.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	3937	81.7	127.3	176.3	3.7	81.0	48.0	34.0	66.7
23	LR64 - N10B x AN(3)	Sudan	3888	81.7	121.3	172.7	1.0	73.0	26.7	36.7	50.0
33	Chris	USA	3874	80.0	124.3	168.3	3.7	104.3	13.0	30.7	25.0
38	Gaboto	Argentina	3869	80.3	126.3	168.3	4.2	104.0	0.0	30.3	25.0
50	Local Check Variety		3810	78.3	140.0	184.7	7.1	111.3	0.0	35.3	0.0
29	Thatcher	USA	3789	78.7	128.7	171.7	1.5	107.7	0.0	25.0	25.0
21	Justin	USA	3601	77.7	130.7	171.7	2.0	103.7	0.0	30.3	50.0
30	Nar(S)(2) x PJ(S)	Chile	3556	80.0	119.0	170.7	4.2	77.3	17.0	32.3	50.0
28	Lerma Rojo 64A	Mexico	3550	80.7	119.3	167.3	1.0	92.0	14.3	43.3	50.0
26	Selkirk	Canada	3506	76.3	131.0	172.0	7.4	102.7	10.3	30.0	50.0
40	C-306	India	3485	82.3	119.7	177.7	1.0	86.7	6.3	41.3	50.0
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	3442	81.0	127.7	175.3	5.2	80.0	20.0	31.7	75.0
32	Penjamo 62	Mexico	3392	79.3	121.3	170.7	1.5	76.7	59.0	39.3	58.3
42	Manitou	Canada	3376	76.7	132.0	171.3	3.0	106.3	0.0	25.0	25.0
7	Noroeste 66	Mexico	3350	80.0	124.3	169.3	1.0	75.7	0.0	39.0	75.0
25	NP881	India	3196	80.3	124.0	171.0	3.5	87.0	11.7	37.0	66.7
16	Son 64A x SK <sub>E</sub> -LR64A	Argentina	3180	77.7	126.3	174.7	8.0	74.7	5.3	30.7	66.7

31 L1418-3463L1231x23L1274-111(L)	Sudan	3164	79.3	121.3	174.3	7.1	78.0	0.0	35.3	75.0
39 Napo 63	Colombia	3123	78.7	117.0	169.0	3.0	89.0	45.0	35.0	58.3
20 C-591	India	2990	82.7	126.0	174.7	1.0	90.7	31.3	38.3	58.3
35 Tobari 66	Mexico	2983	81.0	123.7	172.0	2.7	74.7	0.0	37.3	75.0
47 Mengavi	Australia	2982	73.0	126.7	175.0	8.2	76.7	25.7	31.3	75.0
5 Giza 155	Egypt	2971	79.0	119.7	177.0	8.0	78.3	5.0	38.0	75.0
18 LR64 - Son 64	Mexico	2893	82.0	123.3	171.3	1.0	79.0	9.3	41.3	50.0
27 V-878	India	2887	81.0	123.3	171.0	2.4	73.3	23.3	31.0	50.0
49 (MD-K-Y)(WIS-SUP)	Kenya	2883	79.0	127.3	171.3	1.0	97.7	10.3	33.0	25.0
37 NP 832	India	2815	81.7	125.3	178.7	1.0	86.0	0.0	40.0	75.0
34 Inia 66	Mexico	2631	82.3	118.0	171.3	2.8	67.7	56.3	39.3	66.7
15 Taichung 31	Taiwan	2574	76.0	119.3	172.0	8.1	78.3	65.0	29.7	66.7
2 Gabo	Australia	2421	73.3	123.0	174.7	9.9	77.3	6.7	32.0	83.0
11 NP852	India	2268	77.0	126.7	181.7	5.1	80.3	26.0	38.3	91.0
19 Ciano 67	Mexico	2020	80.0	124.7	180.3	1.0	63.3	55.0	32.7	83.0
43 C-273	Pakistan	2003	81.3	130.7	187.3	2.0	78.7	0.0	38.7	99.0
22 Son 64 x TzPP - Nai 60 (A)	Argentina	1675	78.0	127.3	178.7	7.1	67.3	0.0	33.3	91.0
17 Sonora 64	Mexico	1641	76.3	132.0	184.3	3.3	61.7	0.0	31.0	99.0

Grand mean		3493	79.3	124.9	173.7	3.5	86.1	16.2	34.9	56.6
Standard error of grand mean		66	0.1	0.2	0.3	0.1	0.5	0.7	0.2	0.7
Coefficient of variation		23.0%	2.1%	2.2%	2.0%	27.5%	7.2%	52.8%	5.7%	14.7%
LSD Variety means 5 PC		1310	2.7	4.6	5.8	1.6	10.1	13.9	3.3	13.6

#### Correlations

Test wt	0.10									
Days to flowering	-0.01	-0.31 *								
Days to maturity	-0.44**	-0.08	0.54**							
Stripe rust %	-0.29 *	-0.54**	0.03	0.14						
Height	0.51**	-0.06	0.27	-0.32 *	-0.08					
Shattering %	-0.06	0.11	-0.38**	-0.11	-0.10	-0.26				
1000 grain weight	0.00	0.51**	-0.45**	-0.02	-0.22	-0.16	0.08			
Frost damage %	-0.63**	-0.11	-0.18	0.42**	0.20	-0.74**	0.06	0.19		

\* = Significant at the 5% level  
 \*\* = Significant at the 1% level

TABLE 31

## ASIA

WEST PAKISTAN. Lyallpur. (Ayub Agricultural Research Institute) Latitude: 31° 30' N. Longitude: 73° 10' E. Elevation: 213 meters above sea level. Cooperators: Ayub Agricultural Research Institute.

Planting Date: 22 November 1968. Precipitation during test: not stated. Irrigation: 6 irrigations applied (76.2 mm each). Fertilizer: 120-80-0 Amount and type not stated.

General Comments: During the first and second week of March there was a heat shock and wind storm. Poor disease development in general. There was a Jasad and an Aphid attack.

Scoring notes taken: Days to flowering and stripe rust - 18 February, leaf rust and lodging - 8 April.

Variety Number	Variety or cross	Origin	Yield kg/ha	Days to flowering	Days to maturity	Stripe rust	Leaf rust	Height cms	Lodging (%)
34	Inia 66	Mexico	4290	95.0	147.7	0	0	112.3	41.7
22	Son 64 x TzPP - Nai 60 (A)	Argentina	4174	102.7	147.3	MR	0	122.0	33.3
45	Norteño 67	Mexico	4160	102.0	147.7	0	0	118.3	74.7
6	Siete Cerros	Mexico	3681	113.0	151.3	MR	MS	109.3	74.3
50	Local Check Variety		3623	108.0	159.0	0	R	135.3	25.0
19	Ciano 67	Mexico	3391	94.0	145.0	0	0	105.3	33.3
11	NP852	India	3304	98.0	147.7	0	0	136.3	99.0
17	Sonora 64	Mexico	3290	96.7	146.3	0	0	100.0	25.0
47	Mengavi	Australia	3247	113.0	154.7	MS	MS	126.3	66.0
8	Victor I	Italy	3232	117.0	159.0	MR	MS	106.0	49.7
36	Triple Dirk	Australia	3232	112.3	155.7	0	0	135.3	91.0
32	Penjamo 62	Mexico	3174	105.0	148.7	0	0	110.0	74.3
5	Giza 155	Egypt	3145	108.0	150.0	S	0	134.7	66.0
23	LR64 - N10B x AN(3)	Sudan	3131	115.0	158.0	MR	MR	93.0	0.0
39	Napo 63	Colombia	3087	120.0	145.3	MR	MR	131.3	25.0
15	Taichung 31	Taiwan	3073	108.0	145.7	MS	MS	109.3	0.0
30	Nar(S)(2) x PJ(S)	Chile	3029	98.0	147.0	0	0	106.7	50.0
37	NP 832	India	3000	108.0	156.0	MS	S	146.7	99.0
7	Noroeste 66	Mexico	3000	110.0	149.0	0	0	101.0	33.0
1	Pitic 62	Mexico	2942	110.0	150.3	0	0	105.0	83.0
13	Huelquen	Chile	2884	107.3	149.7	0	0	140.3	82.7
27	V-878	India	2855	98.0	145.7	0	0	96.7	25.0
28	Lerma Rojo 64A	Mexico	2812	103.0	150.0	R	0	117.0	74.7
16	Son 64 A x SK <sub>E</sub> -LR64A	Argentina	2768	116.0	154.0	0	0	98.3	16.7
20	C-591	India	2768	107.0	151.0	0	MR	154.0	91.0
18	LR64 - Son 64	Mexico	2739	104.7	147.0	0	0	110.0	49.7
48	PV-18, Indus	India Pak.	2696	110.0	156.0	0	0	111.7	58.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	2623	105.0	151.3	0	0	107.7	41.3
40	C-306	India	2580	110.0	147.0	MS	S	144.7	99.0
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	2565	104.0	151.3	0	0	108.3	33.0
35	Tobari 66	Mexico	2551	103.3	148.3	0	0	104.3	33.3
31	L1418-3463L1231x23L1274-111(L)	Sudan	2551	111.0	154.0	MR	0	136.3	99.0

43	C-273	Pakistan	<b>2836</b>	<b>110.0</b>	<b>186.3</b>	<b>0</b>	<b>R</b>	<b>140.7</b>	<b>66.0</b>
38	Gaboto	Argentina	2493	114.0	156.3	0	0	135.3	82.7
10	Carazinho	Brazil	2406	108.0	151.7	0	0	143.7	74.3
44	36896-CJ54(2) x YT54A (H)	Sudan	2391	104.0	156.7	MS	R	116.0	58.0
14	Crespo	Colombia	2362	108.0	150.0	0	0	134.0	99.0
21	Justin	USA	2232	126.0	160.0	0	MR	142.3	75.0
4	Son 64 x Kl. Rend.	Argentina	2203	110.0	148.7	0	0	115.0	99.0
2	Gabo	Australia	2145	107.0	148.3	S	0	132.0	66.0
3	Nainari 60	Mexico	2145	108.0	150.7	0	0	129.7	91.0
49	(MD-K-Y)(WIS-SUP)	Kenya	1986	112.0	159.0	0	0	133.7	99.0
24	Kloka WM1353	Germany	1971	111.0	158.7	MR	MS	131.3	8.3
25	NP881	India	1928	107.0	149.7	0	0	136.3	66.3
33	Chris	USA	1831	109.0	155.7	0	0	146.7	91.0
26	Selkirk	Canada	1797	113.3	163.0	MR	MR	139.0	66.7
12	Crim	USA	1580	109.0	153.0	0	0	150.7	91.0
42	Manitou	Canada	1522	113.0	161.0	0	0	133.0	83.0
9	Bonza 55	Colombia	1333	107.0	149.0	0	0	143.7	66.0
29	Thatcher	USA	841	114.0	162.0	MR	S	136.3	74.7

Grand mean	2706	108.1	152.0	1.0	1.1	124.3	62.1
Standard error of grand mean	55	0.3	0.3	0.0	0.0	0.6	2.8
Coefficient of variation	25.0%	3.2%	2.2%	10.7%	16.3%	6.1%	55.9%
LSD Variety means 5 PC	1097	5.6	5.5	0.2	0.3	12.5	56.6

#### Correlations

Days to flowering	-0.36**						
Days to maturity	-0.43**	0.62**					
Stripe rust $\sqrt{X+1}$	-0.11	0.09	0.06				
Leaf rust $\sqrt{X+1}$	0.06	0.23	0.21	0.53**			
Height	-0.44**	0.30 *	0.30 *	0.13	-0.08		
Lodging %	-0.31 *	0.14	0.16	-0.05	-0.09	0.64**	

\* = Significant at the 5% level  
 \*\* = Significant at the 1% level

TABLE 32

## ASIA

INDIA. New Delhi. (Indian Agricultural Research Institute, Division of Genetics) Latitude: 28.4° N. Longitude: 76° E. Elevation: 229 meters above sea level. Cooperators: J. S. Amawate, K. P. Sharma and R. K. Miri.

Planting Date: 2 December 1968. Precipitation during test: not stated. Irrigation: 4 irrigations applied. Fertilizer: 134.4 Kg./Ha. N as Amm. Sulphate. General Comments: There was good disease development in general. Birds caused 50% damage to the local check in the first replication.

Variety Number	Variety or cross	Origin	Yield kg/ha	Height cms	Lodging (%)	Shattering (%)	1000 grain weight gms
34	Inia 66	Mexico	4890	89.0	1/	1/	37.3
7	Noroeste 66	Mexico	4666	98.0	1/	1/	34.7
37	NP 832	India	4610	118.0	80.0	1/	41.3
32	Penjamo 62	Mexico	4556	101.0	1/	1/	34.0
19	Ciano 67	Mexico	4443	87.0	1/	5.0	37.3
6	Siete Cerros	Mexico	4333	92.0	50.0	10.0	28.7
22	Son 64 x TzPP - Nai 60 (A)	Argentina	4333	114.0	40.0	1/	42.0
28	Lerma Rojo 64A	Mexico	4223	117.0	40.0	1/	35.0
50	Local Check Variety		4223	97.0	1/	1/	38.0
17	Sonora 64	Mexico	4000	81.0	1/	1/	28.0
4	Son 64 x Kl. Rend.	Argentina	3890	92.0	1/	1/	32.7
5	Giza 155	Egypt	3890	110.0	50.0	1/	32.7
40	C-306	India	3890	110.0	80.0	1/	36.7
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	3890	102.0	10.0	35.0	31.3
30	Nar(S)(2) x PJ(S)	Chile	3666	109.0	20.0	1/	27.3
27	V-878	India	3666	88.0	1/	1/	29.3
11	NP852	India	3556	108.0	1/	1/	30.7
47	Mengavi	Australia	3556	99.0	1/	30.0	35.3
3	Nainari 60	Mexico	3500	93.0	30.0	1/	34.0
15	Taichung 31	Taiwan	3443	97.0	20.0	1/	30.7
36	Triple Dirk	Australia	3443	127.0	40.0	1/	37.3
18	LR64 - Son 64	Mexico	3443	107.0	1/	10.0	38.7
39	Napo 63	Colombia	3443	111.0	1/	1/	32.7
45	Nortefo 67	Mexico	3336	105.0	1/	2.0	41.3
43	C-273	Pakistan	3333	119.0	70.0	1/	36.0
35	Tobari 66	Mexico	3223	99.0	1/	1/	31.0
8	Victor I	Italy	3223	95.0	1/	1/	32.3
1	Pitic 62	Mexico	3223	103.0	70.0	1/	30.7
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	3223	96.0	60.0	5.0	30.7
13	Huelquen	Chile	3110	108.0	60.0	1/	32.0
2	Gabo	Australia	3110	117.0	20.0	1/	33.3
48	PV-18, Indus	India Pak.	3110	100.0	30.0	10.0	30.0



31	L1418-3463L1231x23L1274-111(L)	Sudan	3058	104.0	30.0	1/	35.3
14	Crespo	Colombia	3000	114.0	40.0	1/	35.3
44	36896-CJ54(2) x YT54A (H)	Sudan	2890	115.0	1/	1/	32.7
20	C-591	India	2777	121.0	95.0	1/	32.7
25	NP881	India	2776	120.0	1/	40.0	32.0
16	Son 64A x SK <sub>D</sub> -LR64A	Argentina	2776	88.0	1/	1/	31.3
23	LR64 - N10B x AN(3)	Sudan	2666	89.0	1/	1/	25.3
12	Crim	USA	2500	123.0	50.0	1/	31.3
49	(MD-K-Y)(WIS-SUP)	Kenya	2167	117.0	40.0	1/	33.3
9	Bonza 55	Colombia	2167	123.0	90.0	1/	30.7
38	Gaboto	Argentina	2000	121.0	40.0	1/	31.3
24	Kloka WM1353	Germany	1890	108.0	60.0	5.0	30.7
10	Carazinho	Brazil	1890	124.0	90.0	1/	32.0
33	Chris	USA	1777	120.0	90.0	1/	28.7
42	Manitou	Canada	1277	122.0	30.0	1/	22.0
29	Thatcher	USA	1167	119.0	10.0	1/	26.0
26	Selkirk	Canada	1110	110.0	30.0	1/	27.3
21	Justin	USA	1000	120.0	10.0	1/	24.3

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Grand mean	3187	106.9	29.5	3.0	32.5
Standard error of grand mean	70	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	0.4
Coefficient of variation	27.0%				15.3%
LSD Variety means 5 PC	1395				8.1

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#### Correlations

Height	-0.51**			
Lodging %	-0.24	0.53**		
Shattering %	0.08	-0.05	-0.21	
1000 grain weight	0.61**	0.00	0.03	0.03

\* = Significant at the 5% level  
 \*\* = Significant at the 1% level

1/ No data available

TABLE 33

## ASIA

INDIA. Niphad. (Nasik) Maharashtra. Latitude: 20.6° N. Longitude: 74.7° E. Elevation: 449 meters above sea level.  
Cooperators: Dr. R. A. Sangave.

Planting Date: 28 November 1968. Precipitation during test: not stated. Irrigation: 5 irrigations applied. Fertilizer: 134 Kg./Ha. N + 68 Kg./Ha. P<sub>2</sub>O<sub>5</sub>.  
General Comments: Only stem rust was observed.

Variety Number	Variety or cross	Origin	Yield kg/ha	Days to flowering	Days to maturity	Stem rust	Height cms	1000 grain weight gms
37	NP 832	India	2493	66.7	115.0	TR	106.3	36.7
40	C-306	India	2453	72.7	117.3	0	102.7	36.3
4	Son 64 x Kl. Rend.	Argentina	2385	57.7	111.3	10MS	72.3	34.0
32	Penjamo 62	Mexico	2265	63.0	107.3	TR	73.3	32.7
28	Lerma Rojo 64A	Mexico	2164	65.3	109.3	TR	79.3	31.3
6	Siete Cerros	Mexico	2097	65.0	110.0	5MS	89.7	28.7
44	36896-CJ54(2) x YT54A (H)	Sudan	2056	73.3	121.3	TR	83.3	27.0
31	L1418-3463L1231x23L1274-111(L)	Sudan	2029	69.7	121.0	TR	95.0	31.3
22	Son 64 x TzPP - Nai 60 (A)	Argentina	2029	63.3	113.7	0	80.7	35.3
8	Victor I	Italy	2003	112.7	140.0	TR	71.3	29.3
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	1982	85.0	114.7	TR	72.3	31.3
34	Inia 66	Mexico	1949	55.3	111.3	TR	68.0	36.0
20	C-591	India	1929	79.0	118.7	0	108.3	31.7
23	LR64 - N10B x AN(3)	Sudan	1908	75.0	115.7	5TR.	71.3	29.3
48	PV-18, Indus	India Pak.	1875	64.3	114.0	5MR	69.0	28.7
5	Giza 155	Egypt	1835	70.3	119.3	0	94.7	31.0
43	C-273	Pakistan	1814	71.0	115.0	0	92.3	32.0
45	Norteño 87	Mexico	1814	60.3	111.3	0	77.0	39.3
11	NP852	India	1794	61.7	112.0	0	83.3	29.3
1	Pitic 62	Mexico	1788	75.3	123.0	0	82.7	24.7
13	Huelquen	Chile	1781	66.0	112.7	0	87.0	32.0
30	Nar(S)(2) xPJ(S)	Chile	1774	64.3	111.3	5TR	68.0	25.3
3	Nainari 60	Mexico	1774	74.7	124.7	5MR	84.3	28.0
27	V-878	India	1720	55.0	111.3	TR	65.0	28.7
50	Sonalika	India	1700	51.7	106.3	TR	73.7	43.0
16	Son 64A x SK <sub>F</sub> -LR64A	Argentina	1652	73.3	112.0	5MR	69.7	25.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	1633	62.3	112.0	TR	74.0	29.3
47	Mengavi	Australia	1633	80.7	114.3	0	79.7	28.7
9	Bonza 55	Colombia	1626	70.7	112.0	0	97.3	25.3
7	Noroeste 66	Mexico	1559	63.7	109.3	TR	69.7	32.0
39	Napo 63	Colombia	1532	58.3	113.3	TR	85.7	28.7
2	Gabo	Australia	1532	75.7	122.7	STR	82.0	29.3

36	Triple Dirk	Australia	1505	72.3	115.3	TR	98.0	32.3
14	Crespo	Colombia	1505	65.7	113.3	0	88.0	28.0
18	LR64 - Son 64	Mexico	1492	63.0	112.3	TR	77.3	38.0
35	Tobari 68	Mexico	1458	61.7	111.3	TR	69.0	28.7
33	Chris	USA	1398	70.7	115.0	TR	104.3	23.0
17	Sonora 64	Mexico	1384	51.7	113.0	5MR	58.3	30.0
25	NP881	India	1357	72.3	122.3	0	91.3	26.3
49	(MD-K-Y)(WIS-SUP)	Kenya	1310	77.0	117.3	0	93.0	24.0
12	Crim	USA	1297	85.3	123.7	0	111.3	26.3
38	Gaboto	Argentina	1286	76.0	122.7	TR	106.7	25.7
15	Taichung 31	Taiwan	1216	62.3	109.3	10S	73.3	25.7
10	Carazinho	Brazil	1189	86.0	124.7	0	106.7	30.7
29	Thatcher	USA	1183	110.0	144.3	0	100.7	19.3
19	Ciano 67	Mexico	1163	53.0	110.7	0	58.3	32.0
24	Kloka WM1353	Germany	1035	86.0	121.3	5TR	87.7	24.0
21	Justin	USA	746	101.0	141.7	0	85.3	25.3
26	Selkirk	Canada	706	95.3	140.7	0	90.0	28.0
42	Manitou	Canada	484	106.0	144.3	0	84.3	18.3

Grand mean	1645	71.6	117.7	1.3	83.5	29.5
Standard error of grand mean	29	0.2	0.1	0.0	0.4	0.1
Coefficient of variation	22.0%	3.0%	1.2%	24.4%	6.2%	6.1%
LSD Variety means 5 PC	581	3.5	2.4	0.5	8.4	2.9

#### Correlations

Days to flowering	-0.45**				
Days to maturity	-0.52**	0.92**			
Stem rust $\sqrt{X+1}$	0.08	-0.20	-0.21		
Height	-0.11	0.44**	0.37**	-0.42**	
1000 grain weight	0.56**	-0.56**	-0.52**	-0.10	-0.17

\* = Significant at the 5% level  
 \*\* = Significant at the 1% level

TABLE 34

ASIA

INDIA. Durgapura, (Jaipur) Rajasthan. Latitude: 26° 51' N. Longitude: 75° 47' E. Elevation: approximately 390 meters above sea level.  
Cooperators: Dr. S. M. Gandhi.

Planting Date: 19 November 1968. Precipitation during test: not stated. Irrigation: 7 irrigations applied. Fertilizer: 137 Kg./Ha. N as Amm. Sulphate, 50 Kg./Ha. P<sub>2</sub>O<sub>5</sub> as Superphosphate.

General Comments: There was no rainfall during the experiment. High temperatures prevailed at maturity. No disease, insect, weed or pest problems.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to flowering	Days to maturity	Height cms	1000 grain weight gms
32	Penjamo 62	Mexico	3349	82.0	84.3	123.7	84.3	33.0
22	Son 64 x TzPP - Nai 60 (A)	Argentina	3243	81.0	79.0	122.0	93.3	35.0
4	Son 64 x Kl. Rend.	Argentina	3201	79.0	78.3	120.0	79.7	30.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	3180	81.0	84.3	123.3	87.3	29.0
23	LR64 - N10B x AN(3)	Sudan	3173	76.0	97.0	132.0	81.7	25.0
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	3047	77.0	87.3	123.7	85.7	29.0
17	Sonora 64	Mexico	2981	79.0	75.3	120.0	72.7	32.0
48	PV-18, Indus	India Pak.	2912	80.0	91.0	124.7	76.0	29.0
43	C-273	Pakistan	2909	82.0	86.7	125.3	112.0	32.0
6	Siete Cerros	Mexico	2875	79.0	91.3	124.7	75.0	29.0
2	Gabo	Australia	2812	75.0	90.3	126.3	90.3	32.0
34	Inia 66	Mexico	2791	82.0	77.3	119.7	78.7	39.0
50	Sonauca	India	2755	83.0	74.0	119.3	82.0	42.0
28	Lerma Rojo 64A	Mexico	2750	77.0	87.0	123.0	92.7	32.0
40	C-306	India	2729	81.0	95.0	129.7	118.3	30.0
15	Taichung 31	Taiwan	2720	77.0	78.7	122.0	82.3	30.0
47	Mengavi	Australia	2683	74.0	95.3	128.7	90.3	30.0
30	Nar(S)(2) x PJ(S)	Chile	2668	77.0	77.0	121.3	74.0	26.0
11	NP852	India	2666	81.0	79.0	122.0	92.3	33.0
14	Crespo	Colombia	2652	79.0	84.7	124.3	108.3	31.0
18	LR64 - Son 64	Mexico	2638	76.0	86.0	121.0	92.7	37.0
13	Huelquen	Chile	2638	76.0	90.7	125.7	100.7	30.0
5	Giza 155	Egypt	2625	80.0	89.3	128.7	97.0	26.0
39	Napo 63	Colombia	2590	76.0	78.3	119.0	98.3	30.0
25	NP881	India	2555	76.0	94.0	128.3	115.0	27.0
37	NP 832	India	2479	80.0	85.0	126.3	110.3	37.0
45	Norteno 67	Mexico	2468	80.0	83.3	120.0	84.7	36.0
31	L1418-3463L1231x23L1274-111(L)	Sudan	2444	76.0	91.7	128.0	121.0	30.0
36	Triple Dirk	Australia	2430	73.0	88.7	126.3	113.0	36.0
8	Victor I	Italy	2395	71.0	103.3	132.0	81.3	23.0
19	Ciano 67	Mexico	2389	89.0	74.7	117.3	67.0	33.0
35	Tobari 66	Mexico	2382	76.0	86.0	124.0	79.0	25.0

7	Noroeste 66	Mexico	2354	74.0	82.3	121.3	81.7	25.0
12	Crim	USA	2229	72.0	100.3	130.0	124.7	22.0
9	Bonza 55	Colombia	2187	67.0	97.0	126.3	111.7	25.0
3	Nainari 60	Mexico	2187	69.0	95.7	128.0	93.0	27.0
44	36896-CJ54(2) x YT54A (H)	Sudan	2176	68.0	97.7	132.0	102.7	22.0
20	C-591	India	2114	79.0	97.3	128.7	111.3	29.0
16	Son 64A x SK <sub>E</sub> -LR64A	Argentina	2097	67.0	95.3	127.0	81.0	20.0
27	V-878	India	2072	80.0	74.3	119.0	63.7	30.0
38	Gaboto	Argentina	2041	76.0	116.7	130.0	118.3	22.0
49	(MD-K-Y)(WIS-SUP)	Kenya	1891	73.0	102.7	136.0	113.0	24.0
33	Chris	USA	1854	73.0	98.3	128.7	119.7	25.0
10	Carazinho	Brazil	1604	73.0	118.7	134.3	113.3	26.0
1	Pitic 62	Mexico	1589	63.0	116.0	127.0	85.7	19.0
24	Kloka WM1353	Germany	1583	69.0	99.0	132.0	95.3	19.0
21	Justin	USA	1118	72.0	107.0	133.0	106.7	23.0
29	Thatcher	USA	875	1/	97.7	126.3	101.3	18.0
42	Manitou	Canada	875	82.0	108.0	135.3	106.3	20.0
26	Selkirk	Canada	750	1/	94.3	133.0	100.3	22.0

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Grand mean	2394	76.4	90.8	126.0	94.9	28.3
Standard error of grand mean	39	(only 1 rep.)	0.7	0.5	0.6	(only 1 rep.)
Coefficient of variation	20.0%		9.8%	4.6%	8.2%	
LSD Variety means 5 PC	780		14.5	9.4	12.8	

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#### Correlations

Test wt	0.62**				
Days to flowering	-0.60**	-0.27			
Days to maturity	-0.57**	-0.29 *	0.85**		
Height	-0.35 *	-0.15	0.54**	0.60**	
1000 grain weight	0.65**	0.50**	-0.69**	-0.65**	-0.21

\* = Significant at the 5% level  
 \*\* = Significant at the 1% level

1/ No data available

TABLE 35

## ASIA

NEPAL. Khumal, Kathmandu. Latitude: 27° 40' N. Longitude: 85° 20' E. Elevation: 1360 meters above sea level.  
Cooperators: H. B. Shrestha, R. M. Joshi and M. P. Panth.

Planting Date: 13 November 1968. Precipitation during test: 105.2 mm. Irrigation: 4 irrigations applied (flooding). Fertilizer: 90 Kg./Ha. N as Amm. Sulphate, 60 Kg./Ha. Single Superphosphate and 30 Kg./Ha. Muriate of Potash.

General Comments: The climatic conditions were favorable for the experiment. The maximum rainfall was at heading time, the second highest at maturity. Temperatures ranged between 30°C in April and 2.5°C in January. Stripe, leaf and stem rust were present, but not severe. No serious insect, weed or pest problems.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to flowering	Days to maturity	Stripe rust	Leaf rust	Stem rust	Height cms	Lodging (%)	Shattering spikelet (%)	1000grain weight gms	
30	Nar(S)(2) x PJ(S)	Chile	5965	74.0	111.0	156.0	0	25S	10MS	87.3	0.0	4.3	6.0	34.3
15	Taichung 31	Taiwan	5905	74.3	111.3	155.7	0	45S	45S	102.7	3.3	3.3	5.3	28.7
34	Inia 66	Mexico	5898	80.0	110.0	156.7	10S	0	25MS	97.7	3.3	5.0	7.0	42.0
17	Sonora 64	Mexico	5818	75.3	110.7	158.7	0	10MS	25S	86.0	16.7	1.7	5.0	33.7
3	Nainari 60	Mexico	5737	77.3	115.0	157.7	0	0	0	115.0	10.0	1.3	4.0	41.0
1	Pittic 62	Mexico	5627	82.3	123.3	165.7	0	0	25R	97.7	13.3	1.0	4.0	34.3
16	Son 64A x SK <sub>E</sub> - LR64A	Argentina	5601	79.7	117.0	161.7	0	0	0	88.3	0.0	0.7	2.7	32.7
4	Son 64 x Kl. Rend.	Argentina	5519	78.0	112.7	155.7	0	0	0	97.7	3.3	2.3	6.7	39.3
22	Son 64 x TzPP - Nai 60 (A)	Argentina	5337	78.7	111.0	159.7	0	0	10R	97.7	16.7	1.7	5.0	41.0
10	Carazinho	Brazil	5314	73.0	125.7	163.0	0	0	25R	128.3	36.7	4.0	5.0	41.0
31	L1418-3463L1231x23L1274-111(L)	Sudan	5241	78.3	115.3	161.0	0	10R	25S	114.7	13.3	2.7	6.0	41.0
27	V-878	India	5159	78.0	114.7	159.0	0	0	10S	90.3	3.3	4.0	6.7	29.3
28	Lerma Rojo 64A	Mexico	5095	78.7	113.3	157.0	0	0	10S	107.3	16.7	2.7	5.0	37.7
6	Siete Cerros	Mexico	5083	76.7	127.7	165.3	0	25MS	0	79.3	0.0	1.3	3.3	33.7
39	Napo 63	Colombia	4962	76.7	111.0	156.0	0	0	40S	100.0	6.7	2.3	6.7	33.3
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	4952	81.7	113.7	160.3	0	0	25S	91.3	3.3	1.7	7.7	35.0
5	Giza 155	Egypt	4930	77.0	114.7	158.3	0	25R	10R	111.7	10.0	3.0	6.3	45.0
23	LR64 - N10B x AN(3)	Sudan	4903	79.0	123.3	168.7	0	45MS	10R	73.3	0.0	1.3	4.0	36.0
32	Penjamo 62	Mexico	4868	78.0	114.0	159.0	0	0	0	90.7	0.0	3.7	5.0	40.3
45	Norteño 67	Mexico	4825	78.3	112.7	155.7	0	0	10S	97.0	33.3	3.3	8.0	40.3
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	4821	80.0	118.0	159.0	0	0	10S	95.3	0.0	3.3	7.3	35.0
7	Noroeste 66	Mexico	4807	79.3	115.3	159.7	0	0	0	93.3	3.3	1.3	4.7	38.7
19	Ciano 67	Mexico	4805	77.7	108.7	154.0	0	0	0	86.0	3.3	3.0	5.3	38.0
36	Triple Dirk	Australia	4756	78.7	117.3	160.3	45S	0	10S	117.3	6.7	3.0	7.0	45.0
13	Huelquen	Chile	4753	77.7	117.3	160.7	0	0	0	118.3	6.7	3.3	6.0	33.3
40	C-306	India	4716	81.0	117.0	161.0	0	25S	40S	117.3	63.3	2.7	4.7	40.3
37	NP 832	India	4680	80.0	115.3	161.0	0	25S	25S	127.0	13.3	3.3	8.0	43.0
14	Crespo	Colombia	4560	79.3	113.3	157.7	0	0	25R	119.7	6.7	2.3	3.3	37.7
24	Kloka WM1353	Germany	4543	76.7	127.3	167.0	0	45S	25S	113.0	0.0	2.0	5.0	31.0
48	PV-18, Indus.	India Pak.	4496	78.7	127.3	165.3	0	0	0	75.3	0.0	3.0	4.7	33.7
38	Gaboto	Argentina	4433	81.0	126.0	163.0	0	0	25S	127.0	20.0	1.7	4.7	31.0
18	LR64 - Son 64	Mexico	4294	78.3	116.0	157.0	0	0	0	102.3	23.3	2.0	4.3	37.7

8 Victor I	Italy	4253	74.3	128.7	167.3	0	45MS	25R	87.3	0.0	1.3	3.3	32.0
20 C-591	India	4231	82.7	115.3	159.7	45S	45MS	45S	126.0	56.7	1.3	4.0	41.0
11 NP852	India	4165	80.7	111.0	156.7	0	25S	25MS	112.0	30.0	1.3	3.7	36.0
29 Thatcher	USA	4087	76.0	131.3	169.7	10S	45S	0	134.0	30.0	3.3	6.0	28.3
35 Tobari 66	Mexico	4036	79.7	111.7	160.7	0	0	25MS	91.3	0.0	1.3	4.7	34.7
49 (MD-K-Y)(WIS-SUP)	Kenya	3905	79.0	127.3	165.3	0	0	0	120.3	13.3	3.7	8.3	37.0
43 C-273	Pakistan	3876	82.7	111.3	157.7	0	10S	25S	109.7	43.3	1.7	4.0	44.3
44 36896-CJ54(2) x YT54A (H)	Sudan	3671	76.0	117.0	161.0	0	0	0	96.0	0.0	0.3	2.7	38.7
12 Crim	USA	3639	77.3	113.7	159.0	0	0	0	122.3	43.3	3.0	5.7	35.0
25 NP881	India	3484	78.3	116.0	160.3	0	0	0	124.3	26.7	2.3	5.0	37.0
9 Bonza 55	Colombia	3477	74.7	119.3	160.3	0	0	45MS	123.3	26.7	3.0	6.3	33.7
21 Justin	USA	3411	73.7	130.7	166.3	0	0	0	125.3	13.3	5.0	6.0	30.0
33 Chris	USA	3355	77.0	122.0	161.0	0	0	10R	128.7	33.3	6.3	4.3	31.0
50 Local Check Variety		3107	80.3	128.7	161.0	10S	25S	25S	121.3	73.3	1.3	4.7	27.0
2 Gabo	Australia	2564	75.7	115.0	157.3	0	0	10MR	103.7	20.0	3.7	6.0	37.7
26 Selkirk	Canada	2530	74.3	130.0	165.3	25S	10R	25S	127.7	50.0	5.0	6.0	31.7
47 Mengavi	Australia	2505	75.0	118.7	160.7	0	40S	25S	94.3	0.0	3.3	7.3	36.7
42 Manitou	Canada	1996	75.0	134.0	170.7	25S	25R	10R	134.0	43.3	5.7	8.7	28.7
Grand mean		4494	77.5	118.2	160.7	1.4	2.5	3.0	106.6	16.8	2.7	5.4	36.1
Standard error of grand mean		62	0.1	0.2	0.2	0.1	0.1	0.1	0.5	1.0	0.2	0.3	0.2
Coefficient of variation		17.0%	2.1%	1.7%	1.8%	46.9%	29.1%	20.9%	6.1%	71.6%	75.4%	57.3%	6.8%
LSD Variety means 5 PC		1246	2.6	3.2	4.7	1.1	1.2	1.0	10.6	19.6	3.3	5.1	4.0

#### Correlations

Test wt	-0.01												
Days to flowering	-0.47**	-0.31**											
Days to maturity	-0.36**	-0.28	0.90**										
Stripe rust $\sqrt{X+1}$	-0.31 *	-0.01	0.30 *	0.25									
Leaf rust $\sqrt{X+1}$	-0.10	0.04	0.23	0.29 *	0.02								
Stem rust $\sqrt{X+1}$	0.02	0.20	-0.19	-0.22	0.16	0.41**							
Height	-0.45**	0.02	0.33 *	0.21	0.36**	0.04	0.19						
Lodging %	-0.46**	0.14	0.22	0.08	0.33 *	0.20	0.29 *	0.64**					
Shattering (spikelet) %	-0.28 *	-0.18	0.20	0.07	0.33 *	-0.18	-0.03	0.36**	0.14				
Shattering %	-0.15	0.01	0.01	-0.03	0.28 *	-0.12	0.15	0.21	-0.01	0.60**			
1000 grain weight	0.27	0.29 *	-0.53**	-0.43**	-0.04	-0.17	-0.06	-0.05	-0.05	-0.15	0.04		

\* = Significant at the 5% level

\*\* = Significant at the 1% level

TABLE 36

## ASIA

INDIA. Indore. Latitude: 23° N. Longitude: 76° E. Elevation: 600 meters above sea level.  
Cooperators: Dr. Y. M. Upadhyaya.

Planting Date: 2 December 1968. Precipitation during the test: 10 mm. Irrigation: 450 mm in 6 irrigations. Fertilizer: 130 Kg./Ha. N as Urea, 60 Kg./Ha. P<sub>2</sub>O<sub>5</sub> as Superphosphate, and 20 Kg./Ha. K as Muriate of Potash.

General Comments: Generally low temperatures with low to moderate humidity. There was 80-100% stem rust infection on susceptible varieties. Birds caused about 5% damage on late varieties.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to flowering	Days to maturity	Leaf rust	Stem rust	Height cms	Lodging (%)	Shattering (%)	1000grain weight gms	Plant stand (%)
6	Siete Cerros	Mexico	5671	82.5	77.0	102.0	MR	MS	92.0	8.0	2.0	34.0	97.7
28	Lerma Rojo 64A	Mexico	5601	85.5	75.0	104.0	0	R	110.0	8.0	5.0	36.0	94.3
50	Sonalika		5552	85.2	56.0	95.0	R	R	98.0	8.0	2.0	46.0	95.0
22	Son 64 x TzPP - Nai 60 (A)	Argentina	5515	83.5	64.0	105.0	R	0	124.0	8.5	2.0	42.0	95.7
4	Son 64 x Kl. Rend.	Argentina	5461	81.8	61.0	97.0	0	0	97.0	7.5	0.0	38.0	98.0
32	Penjamo 62	Mexico	5450	82.7	66.0	96.0	0	0	100.0	8.0	7.0	38.0	82.3
48	PV-18, Indus	India Pak.	5214	83.2	75.0	106.0	MS	MS	95.0	8.0	2.0	32.0	93.3
23	LR64 - N10B x AN(3)	Sudan	4993	80.8	83.0	114.0	R	0	90.0	8.0	2.0	33.0	94.0
5	Giza 155	Egypt	4934	83.8	71.0	100.0	0	0	135.0	6.5	3.0	46.0	95.7
7	Noroeste 66	Mexico	4838	79.5	72.0	102.0	R	0	96.0	7.5	0.0	32.0	89.3
31	L1418-3463L1231x23L1274-111(L)	Sudan	4741	83.5	74.0	106.0	0	0	132.0	8.5	4.0	42.0	95.3
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	4676	84.0	72.0	101.0	MR-MS	MS	102.0	7.5	5.0	34.0	94.0
3	Nainari 60	Mexico	4580	79.3	78.0	112.0	0	R	130.0	8.5	2.0	38.0	96.3
47	Mengavi	Australia	4520	78.7	81.0	118.0	MS	0	118.0	6.5	6.0	35.0	94.7
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	4434	84.0	65.0	101.0	MR	MS	100.0	7.5	5.0	32.0	97.7
18	Son 64A x SK <sub>2</sub> -LR64A	Argentina	4424	79.2	77.0	112.0	0	0	89.0	7.5	5.0	30.0	86.7
34	Inia 66	Mexico	4365	85.5	62.0	94.0	0	R	97.0	7.5	4.0	38.0	91.0
17	Sonora 64	Mexico	4348	82.0	61.0	97.0	0	0	86.0	8.0	2.0	38.0	90.7
40	C-306	India	4262	84.0	81.0	118.0	0	MS-S	138.0	2.5	15.0	41.0	97.7
2	Gabo	Australia	4155	81.3	75.0	102.0	0	0	128.0	8.0	5.0	38.0	97.0
18	LR64 - Son 64	Mexico	4155	84.8	72.0	107.0	MS	0	110.0	7.5	2.0	43.0	87.0
1	Pittic 62	Mexico	3988	77.0	81.0	109.0	0	0	95.0	7.5	7.0	34.0	96.7
30	Nar(S)(2) x PJ(S)	Chile	3983	80.5	63.0	96.0	R	MS	85.0	8.0	0.0	32.0	93.7
37	NP 832	India	3983	84.5	74.0	104.0	0	S	148.0	5.0	8.0	45.0	97.7
27	V-878	India	3935	82.5	63.0	92.0	0	R	86.0	8.5	0.0	31.0	98.3
11	NP852	India	3827	84.3	63.0	99.0	0	MS	124.0	8.5	4.0	38.0	94.7
35	Tobari 66	Mexico	3811	78.5	67.0	98.0	0	0	98.0	7.5	3.0	33.0	95.3
39	Napo 63	Colombia	3784	81.7	60.0	94.0	0	0	122.0	8.0	6.0	39.0	92.0
20	C-591	India	3714	84.3	83.0	115.0	0	MS	145.0	4.5	12.0	40.0	93.7
13	Huelquen	Chile	3655	81.0	71.0	112.0	0	0	129.0	7.5	8.0	38.0	93.3
44	36896-CJ54(2) x YT54A (H)	Sudan	3531	77.5	81.0	125.0	R	0	108.0	7.0	4.0	32.0	95.3
19	Ciano 67	Mexico	3478	84.5	60.0	99.0	0	R	90.0	7.5	3.0	38.0	90.0



25 NP881	India	3381	79.0	76.0	108.0	0	0	115.0	6.5	2.0	36.0	60.7
45 Norteño 67	Mexico	3370	82.5	66.0	101.0	R	0	105.0	8.0	3.0	42.0	92.0
6 Victor I	Italy	3327	75.7	87.0	121.0	R	0	93.0	8.5	2.0	30.0	89.3
43 C-273	Pakistan	3241	84.7	73.0	108.0	MS	MS-S	142.0	5.5	7.0	39.0	97.3
15 Taichung 31	Taiwan	3058	71.0	67.0	102.0	S	S	100.0	7.0	18.0	23.0	95.7
12 Crim	USA	2795	81.5	84.0	115.0	0	0	148.0	8.0	0.0	34.0	97.0
38 Gaboto	Argentina	2741	83.0	91.0	125.0	R	0	145.0	7.5	10.0	30.0	95.0
9 Bonza 55	Colombia	2709	80.0	75.0	107.0	0	0	145.0	8.0	6.0	35.0	96.7
49 (MD-K-Y)(WIS-SUP)	Kenya	2628	80.5	82.0	122.0	0	0	130.0	7.5	8.0	31.0	89.3
14 Crespo	Colombia	2591	82.8	68.0	105.0	R	MS	132.0	6.0	15.0	37.0	95.7
33 Chris	USA	2435	81.7	79.0	114.0	0	0	142.0	4.5	12.0	30.0	95.3
24 Kloka WM1353	Germany	1940	77.0	79.0	89.0	R	0	105.0	7.5	2.0	42.0	86.7
10 Carazinho	Brazil	1790	86.0	85.0	123.0	R	0	126.0	5.5	35.0	38.0	92.0
29 Thatcher	USA	1693	75.0	97.0	135.0	0	0	135.0	7.5	3.0	20.0	94.7
36 Triple Dirk	Australia	1672	83.5	75.0	109.0	R	MS-S	148.0	7.0	5.0	40.0	96.0
21 Justin	USA	1618	78.5	92.0	133.0	0	0	134.0	8.0	7.0	24.0	96.7
26 Selkirk	Canada	1408	76.0	87.0	130.0	0	0	135.0	7.5	4.0	28.0	92.7
42 Manitou	Canada	1252	72.5	93.0	132.0	0	0	128.0	3.5	20.0	20.0	95.3

Grand mean		3745	81.2	74.4	108.1	1.0	1.1	116.1	7.2	5.9	35.3	93.6
Standard error of grand mean		49	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	0.0	0.0	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	0.4
Coefficient of variation		16.0%				10.2%	11.0%					4.8%
LSD Variety means 5 PC		980				0.2	0.2					7.3

#### Correlations

Test wt	0.43**											
Days to flowering	-0.55**	-0.44**										
Days to maturity	-0.19	-0.38**	0.23									
Leaf rust $\frac{\sqrt{X+1}}{\sqrt{X+1}}$	0.15	-0.13	-0.07	0.10								
Stem rust	-0.01	0.08	-0.03	-0.15	0.42**							
Height	-0.49**	0.09	0.46**	-0.08	-0.18	0.15						
Lodging %	-0.00	-0.06	0.05	0.04	-0.11	-0.28 *	-0.07					
Shattering %	-0.44**	-0.05	0.31 *	0.10	0.07	0.19	0.35 *	-0.14				
1000 grain weight	0.45**	0.69**	-0.52**	-0.34 *	-0.13	0.01	0.09	-0.03	-0.16			
Plant stand %	0.01	0.08	0.05	-0.08	0.10	0.31 *	0.31 *	-0.18	0.09	-0.07		

\* = Significant at the 5% level

\*\* = Significant at the 1% level

TABLE 37

## ASIA

JAPAN. Kunneppu, Tokoro-gun, Hokkaido. (Kitami Agricultural Experiment Station) Latitude: 43° 47' N. Longitude: 143° 12' E. Elevation: 196 meters above sea level. Cooperators: Shiro Okabe and Sachio Ozeki and staff.

Planting Date: 9 May 1969. Precipitation during test: 346.3 mm from 1 May to 5 September. Irrigation: none. Fertilizer: 36 Kg./Ha. N, 60 Kg./Ha. P<sub>2</sub>O<sub>5</sub>, 30 Kg./Ha. K<sub>2</sub>O and 18 Kg./Ha. M<sub>g</sub>O.

General Comments: May and July were warm. The rest of the growing period was cool and wet. The heavy attack of mildew may have reduced the yield of many susceptible varieties. No rust infection was observed. No major insect, weed or pest problems.

Scoring notes taken: Mildew - 26 July, lodging - 10 to 25 August.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to flowering	Days to maturity	Height cms	Lodging (%)	Shattering (%)	1000 grain weight gms	Mildew (%)
50	Haruminori	Japan	2250	77.0	72.0	108.7	108.0	6.7	1.0	27.7	6.7
25	NP881	India	2211	71.0	68.0	106.7	102.7	6.7	3.7	29.3	6.7
14	Crespo	Colombia	2133	72.7	70.0	116.3	104.7	3.3	3.3	30.3	6.7
5	Giza 155	Egypt	2044	72.7	68.0	112.0	97.3	0.0	1.0	33.0	1.7
17	Sonora 64	Mexico	2005	67.3	67.3	107.0	86.3	0.0	5.0	22.7	10.0
35	Tobari 66	Mexico	2000	71.3	68.0	106.3	93.3	3.3	1.7	24.3	13.3
5	Siete Cerros	Mexico	1961	66.7	75.0	109.3	89.0	0.0	3.3	21.3	10.0
44	36896-CJ54(2) x YT54A (H)	Sudan	1944	69.7	70.0	109.7	94.0	3.3	0.0	32.0	10.0
24	Kloka WM1353	Germany	1894	68.0	75.0	110.0	104.3	0.0	2.7	24.3	6.7
23	LR64 - N10B x AN(3)	Sudan	1889	70.3	74.0	116.3	78.7	0.0	1.7	24.0	8.3
42	Manitou	Canada	1889	74.7	72.3	107.7	106.7	10.0	3.3	26.3	26.7
4	Son 64 x Kl. Rend.	Argentina	1866	70.7	68.3	102.7	91.3	0.0	3.3	26.7	8.3
3	Nainari 60	Mexico	1839	67.3	71.0	109.0	97.3	3.3	1.0	28.0	10.0
32	Penjamo 62	Mexico	1800	72.0	70.3	108.7	93.7	0.0	2.7	29.0	26.7
36	Triple Dirk	Australia	1800	71.0	73.0	117.3	107.7	10.0	1.0	35.0	23.3
19	Ciano 67	Mexico	1789	69.7	66.3	99.7	87.3	0.0	6.0	24.0	30.0
31	L1418-3463L1231x23L1274-111(L)	Sudan	1778	69.7	69.0	113.3	95.3	0.0	1.0	30.3	5.0
22	Son 64 x TzPP - Nai 60 (A)	Argentina	1733	69.7	66.3	103.3	93.0	0.0	1.0	29.0	36.7
33	Chris	USA	1722	73.0	73.7	112.0	111.0	23.3	3.3	24.0	8.3
29	Thatcher	USA	1655	74.0	74.0	111.0	105.0	10.0	1.0	23.0	46.7
45	Norteno 67	Mexico	1628	69.7	67.7	101.3	90.0	0.0	5.0	28.3	33.3
39	Napo 63	Colombia	1567	67.0	64.7	99.7	101.7	3.3	4.3	22.7	46.7
2	Gabo	Australia	1550	63.3	69.3	105.0	96.0	0.0	1.0	28.7	13.3
18	LR64 - Son 64	Mexico	1533	71.3	68.3	101.7	91.0	0.0	6.0	29.3	26.7
7	Noroeste 66	Mexico	1517	64.7	68.0	100.0	85.7	0.0	3.3	23.3	23.3
27	V-878	India	1489	70.0	67.0	104.3	81.3	0.0	0.0	21.0	16.7
30	Nar(S)(2) x PJ(S)	Chile	1489	66.7	66.3	101.7	83.7	0.0	2.7	23.3	33.3
34	Inia 66	Mexico	1461	72.0	65.7	100.7	91.0	0.0	2.0	26.3	50.0
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	1444	75.3	69.7	105.3	80.0	0.0	2.3	23.7	40.0
48	PV-18, Indus	India Pak.	1417	67.7	75.3	109.3	81.0	0.0	4.0	22.3	6.7
26	Selkirk	Canada	1411	64.7	74.7	105.0	109.0	43.3	3.0	24.0	5.0
47	Mengavi	Australia	1383	64.3	72.3	111.3	87.3	0.0	1.0	26.7	5.0

8 Victor I	Italy	1372	65.3	75.3	116.0	77.7	6.0	6.0	29.7	13.3
16 Son 64A x SK <sub>E</sub> -LR64A	Argentina	1333	68.0	72.0	104.0	80.3	0.0	0.0	20.7	16.7
10 Carazinho	Brazil	1322	68.3	75.0	110.7	108.7	73.3	0.0	26.0	33.3
15 Taichung 31	Taiwan	1283	71.3	68.0	104.3	90.3	0.0	1.7	23.3	56.7
49 (MD-K-Y)(WIS-SUP)	Kenya	1261	67.3	78.0	124.7	101.3	70.0	0.0	28.3	1.7
21 Justin	USA	1239	68.0	75.0	108.0	104.3	6.7	2.0	28.0	10.0
43 C-273	Pakistan	1233	73.3	67.3	105.0	102.0	6.7	1.0	28.7	56.7
46 TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	1222	72.7	68.7	104.7	81.0	0.0	2.0	24.0	46.7
11 NP852	India	1194	70.3	65.7	101.0	93.0	0.0	2.7	22.0	53.3
20 C-591	India	1183	69.7	69.0	104.3	107.3	20.0	2.7	25.0	50.0
37 NP 832	India	1117	68.7	70.3	107.7	102.3	0.0	1.0	27.3	46.7
13 Huelquen	Chile	1050	65.0	74.0	102.0	107.3	13.3	1.7	20.7	46.7
28 Lerma Rojo 64A	Mexico	1033	69.3	68.3	99.7	92.0	3.3	2.0	23.7	56.7
38 Gaboto	Argentina	1017	70.7	76.3	104.0	104.7	6.7	0.0	20.0	46.7
1 Pitic 62	Mexico	972	60.3	75.7	106.7	98.0	93.3	0.0	20.3	5.0
9 Bonza 55	Colombia	917	59.7	73.7	104.7	111.0	20.0	4.3	21.3	8.3
12 Crim	USA	911	64.7	72.3	103.3	111.3	36.7	4.3	20.7	31.7
40 C-306	India	850	68.0	69.3	102.7	100.7	10.0	1.7	25.0	56.7
Grand mean		1532	69.1	70.8	106.9	96.0	9.7	2.3	25.6	24.8
Standard error of grand mean		19	0.1	0.1	0.2	0.3	0.9	0.2	0.1	0.8
Coefficient of variation		15.0%	2.4%	1.2%	2.7%	3.5%	117.7%	102.1%	7.0%	40.8%
LSD Variety means 5 PC		375	2.7	1.4	4.8	5.6	18.7	3.8	2.9	16.5

#### Correlations

Test wt	0.46**								
Days to flowering	-0.19	-0.29 *							
Days to maturity	0.32 *	0.10	0.60**						
Height	-0.09	-0.01	0.27	0.13					
Lodging %	-0.36 *	-0.37**	0.49**	0.26	0.45**				
Shattering %	0.13	-0.10	-0.16	-0.26	-0.13	-0.26			
1000 grain weight	0.46**	0.32 *	-0.11	0.46**	0.12	-0.16	-0.07		
Mildew %	-0.52**	0.24	-0.40**	-0.55**	0.03	-0.15	-0.04	-0.24	

\* = Significant at the 5% level  
 \*\* = Significant at the 1% level

TABLE 38

## AUSTRALIA

AUSTRALIA. Adelaide. (Waite Agricultural Research Institute) Latitude: 34° 58' S. Longitude: 138° 38' E. Elevation: 123 meters above sea level.  
Cooperators: A. J. Rathjen and J. Chigwidden.

Planting Date: 3 March 1969. Precipitation during test: not stated. Irrigation: not stated. Fertilizer: 179.2 Kg./Ha. Superphosphate and 89.6 Kg./Ha. Amm. Sulphate.

General Comments: It was cool, damp and cloudy until 26 September, then it was dry and sunny.

Scoring notes taken: Mildew - 6 September, days to flowering - 10 to 27 October.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to flowering	Height cms	1000 grain weight gms	Mildew (scale) 1/
32	Penjamo 62	Mexico	4902	79.3	102.0	80.0	37.0	1.0
4	Son 64 x Kl. Rend.	Argentina	4783	77.7	99.3	78.7	35.3	1.0
45	Norteño 67	Mexico	4783	79.3	100.0	80.0	37.3	4.0
28	Lerma Rojo 64A	Mexico	4764	78.7	101.7	84.0	37.7	4.0
39	Napo 63	Colombia	4740	76.0	100.0	96.3	36.7	2.0
23	LR64 - N10B x AN(3)	Sudan	4686	79.7	106.0	67.3	34.0	2.0
7	Noroeste 66	Mexico	4576	78.7	101.3	74.3	36.7	2.0
35	Tobari 66	Mexico	4495	78.0	99.7	82.0	37.0	2.0
48	PV-18, Indus	India Pak.	4412	80.0	105.7	71.7	35.0	1.0
18	LR64 - Son 64	Mexico	4382	76.3	101.7	83.3	40.0	3.0
34	Inia 68	Mexico	4354	78.3	99.0	73.3	38.3	5.0
30	Nar(S)(2) x PJ(S)	Chile	4303	76.7	99.0	72.0	35.7	3.0
2	Gabo	Australia	4282	76.7	103.0	86.7	38.0	3.0
17	Sonora 64	Mexico	4257	78.3	99.0	77.3	38.0	3.0
1	Pitic 62	Mexico	4223	76.0	104.0	76.3	35.7	1.0
27	V-878	India	4203	78.3	99.0	69.0	35.7	3.0
6	Siete Cerros	Mexico	4177	78.7	106.3	81.0	35.0	2.0
36	Triple Dirk	Australia	4154	78.7	106.0	91.7	42.0	4.0
14	Crespo	Colombia	4152	74.3	103.3	100.3	36.0	3.0
47	Mengavi	Australia	4074	75.0	104.7	84.0	36.7	1.0
11	NP852	India	4002	77.3	102.7	88.7	37.0	5.0
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	3957	77.3	101.7	75.7	37.0	1.0
3	Nainari 60	Mexico	3924	78.0	103.7	88.7	39.3	1.0
5	Giza 155	Egypt	3916	79.3	103.0	85.7	39.3	1.0
19	Ciano 67	Mexico	3840	78.7	102.3	77.0	38.3	1.0
22	Son 64 x TzPP-Nai 60 (A)	Argentina	3763	79.7	101.3	85.7	38.0	1.0
40	C-306	India	3755	81.7	103.0	97.3	38.3	1.0
43	C-273	Pakistan	3695	78.7	101.7	90.0	37.0	3.0
24	Kloka WM1353	Germany	3647	79.3	107.7	83.0	34.0	2.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	3642	80.0	100.0	77.3	33.7	4.0
13	Huelquen	Chile	3582	78.0	103.7	105.3	34.7	2.0
25	NP881	India	3499	76.3	102.7	87.3	35.7	1.0

15	Taichung 31	Taiwan	3454	78.3	99.0	74.3	31.0	5.0
49	(MD-K-Y)(WIS-SUP)	Kenya	3353	76.3	110.7	83.0	37.0	0.0
16	Son 64A x SK <sub>E</sub> -LR64A	Argentina	3274	76.0	105.0	79.0	31.7	2.0
9	Bonza 55	Colombia	3254	74.3	105.0	93.7	38.0	2.0
20	C-591	India	3181	81.7	104.7	100.7	37.0	1.0
38	Gaboto	Argentina	3106	77.7	108.0	106.7	34.3	3.0
12	Crim	USA	2996	78.3	110.0	104.3	37.7	2.0
31	L1418-3463L1231x23L1274-111(L)	Sudan	2983	78.3	104.3	93.3	35.7	1.0
37	NP 832	India	2947	78.0	103.7	100.7	36.3	2.0
44	36896-CJ54(2) x YT54A (H)	Sudan	2736	73.7	101.7	83.7	37.3	4.0
33	Chris	USA	2596	76.7	106.7	97.0	36.3	2.0
50	Seewari		2516	76.7	106.7	82.0	38.7	5.0
8	Victor I	Italy	2084	77.0	108.3	74.0	35.7	2.0
10	Carazinho	Brazil	1884	78.7	107.7	96.0	39.0	5.0
26	Selkirk	Canada	1333	76.7	117.7	72.3	37.3	5.0
21	Justin	USA	653	78.0	118.0	93.0	34.0	1.0
29	Thatcher	USA	642	75.0	118.3	82.7	31.0	4.0
42	Manitou	Canada	549	76.0	120.3	88.7	29.3	1.0

Grand mean	3549	77.7	104.6	85.1	36.3	2.4
Standard error of grand mean	68	0.1	0.2	0.7	0.2	(only 1 rep.)
Coefficient of variation	24.0%	2.3%	1.9%	9.8%	6.2%	
LSD Variety means 5 PC	1366	2.9	3.2	13.6	3.7	

Correlations

Test wt.	0.27					
Days to flowering	-0.83**	-0.22				
Height	-0.25	-0.03	0.19			
1000 grain weight	0.38**	0.15	-0.36**	0.14		
Mildew (scale)	-0.10	-0.12	-0.07	-0.13	0.09	

\* = Significant at the 5% level  
 \*\* = Significant at the 1% level

1/ Scale key 1-5 (1 = least mildew)

TABLE 39

## AFRICA

SUDAN. Ed Damer. (Hudeiba Agricultural Research Station) Latitude: 17° 35' N. Longitude: 33° 27' E. Elevation: 353 meters above sea level.  
Cooperators: Dr. Abdel Galil Ibrahim Imam.

Planting Date: not stated. Precipitation during test: not stated. Irrigation: not stated. Fertilizer: 55 Kg./Ha. Amm. Sulphate (21%).  
General Comments: No disease development.

Variety Number	Variety or cross	Origin	Yield kg/ha	Days to flowering	Days to maturity	Height cms	1000 grain weight gms
23	LR64 - N10B x AN(3)	Sudan	7108	50.3	107.7	70.0	38.3
22	Son 64 x TzPP-Nai 60 (A)	Argentina	5917	50.7	110.3	79.3	45.3
44	36896-CJ54(2) x YT54A (H)	Sudan	5500	57.3	115.3	78.0	39.7
31	L1418-3463L1231x23L1274-111(L)	Sudan	5467	62.7	118.0	100.7	37.0
47	Mengavi	Australia	5350	66.7	113.3	80.7	33.3
34	Inia 66	Mexico	5325	46.0	97.0	85.0	42.3
25	NP881	India	5267	69.3	112.3	94.7	34.7
35	Tobari 66	Mexico	5133	50.7	96.7	69.3	40.0
1	Pitic 62	Mexico	5033	64.7	129.0	89.3	40.7
40	C-306	India	4767	58.3	111.0	105.0	41.0
28	Lerma Rojo 64A	Mexico	4725	48.0	96.3	74.7	41.0
50	Hindi 62		4700	63.3	117.7	92.0	30.0
32	Penjamo 62	Mexico	4550	47.0	94.7	68.7	39.7
17	Sonora 64	Mexico	4483	39.3	87.3	56.3	38.0
16	Son 64A x SK <sub>E</sub> -LR64A	Argentina	4425	48.7	103.0	66.7	31.3
15	Taichung 31	Taiwan	4292	42.7	91.0	70.0	35.0
43	C-273	Pakistan	4258	56.3	110.0	101.3	36.0
5	Giza 155	Egypt	4242	61.7	116.0	92.3	38.3
36	Triple Dirk	Australia	4217	60.3	118.3	109.0	40.7
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	4100	44.7	88.3	63.0	33.3
30	Nar(S)(2) x PJ(S)	Chile	3967	42.0	95.3	64.0	34.3
13	Huelquen	Chile	3808	41.7	87.3	74.7	38.0
6	Siete Cerros	Mexico	3642	45.3	97.0	61.3	37.0
49	(MD-K-Y)(WIS-SUP)	Kenya	3592	69.0	130.3	99.3	28.7
48	PV-18, Indus	India Pak.	3583	44.0	93.3	73.3	36.3
20	C-591	India	3558	68.0	115.7	110.0	33.0
3	Nainari 60	Mexico	3517	60.7	108.0	89.3	33.0
2	Gabo	Australia	3492	62.0	122.0	88.7	36.3
19	Ciano 67	Mexico	3450	39.3	86.3	56.3	34.7
18	LR64 - Son64	Mexico	3442	49.3	97.0	79.0	44.0
27	V-878	India	3358	45.0	94.0	63.7	29.7
39	Napo 63	Colombia	3342	39.3	89.7	73.7	35.0

9	Bonza 55	Colombia	3308	56.0	111.0	90.3	29.7
46	TzPP -Son64/LR64A -TzPPxAN(E)(B)	Mexico	3308	41.3	66.7	67.0	35.3
14	Crespo	Colombia	3275	45.3	91.7	88.0	39.0
7	Noroeste 66	Mexico	3087	46.3	93.3	67.0	39.3
37	NP 832	India	3050	48.7	102.0	88.0	45.0
33	Chris	USA	2992	51.0	96.3	98.0	29.0
11	NP852	India	2867	48.7	97.0	76.0	33.0
12	Crim	USA	2825	61.0	99.0	99.0	28.3
45	Norteño 67	Mexico	2700	43.3	90.0	67.0	42.7
24	Kloka WML353	Germany	2467	53.3	111.3	89.7	31.0
38	Gaboto	Argentina	2433	70.3	120.0	114.7	25.3
10	Carazinho	Brazil	2250	71.7	119.0	108.3	35.3
8	Victor I	Italy	2100	68.7	114.7	74.7	35.0
4	Son 64 x Kl. Rend.	Argentina	2042	58.0	100.0	61.3	39.3
26	Selkirk	Canada	1258	95.3	142.3	108.0	28.7
21	Justin	USA	700	97.0	132.3	105.3	23.0
42	Manitou	Canada	667	100.0	141.3	101.3	19.0
29	Thatcher	USA	625	87.7	134.7	108.7	19.7

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Grand mean	3671	56.6	106.7	83.8	35.0
Standard error of grand mean	118	0.6	0.8	1.0	0.1
Coefficient of variation	39.0%	13.3%	9.1%	15.1%	3.8%
LSD Variety means 5 PC	2367	12.3	15.9	20.6	2.2

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#### Correlations

Days to flowering	-0.51**				
Days to maturity	-0.29 *	0.92**			
Height	-0.29 *	0.73**	0.75**		
1000 grain weight	0.61**	-0.64**	-0.49**	-0.41**	

\* = Significant at the 5% level  
 \*\* = Significant at the 1% level

TABLE 40

## AFRICA

ETHIOPIA. Debre Zeit. Latitude: 08° 55' N. Longitude: 38° 58' E. Elevation: 1860 meters above sea level.  
Cooperators: Ato Tesfaye Tessema, Ato Zewdu Omer and Tareka Berhe.

Planting Date: 15 July 1969. Precipitation during test: 390.7 mm. Irrigation: none. Fertilizer: 60-60-0 N-P-K.

General Comments: Rain stopped at heading time and strong winds followed. Disease development was not severe, perhaps due to the low rainfall. There were some bird problems encountered, but no insect or weed problems.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to flowering	Days to maturity	Leaf rust	Stem rust	Height cms	Shattering (%)	Septoria 2/ (%)
4	Son 64 x Kl. Rend.	Argentina	3957	75.0	55.0	112.3	0	0	88.3	0.0	20.0
28	Lerma Rojo 64A	Mexico	3617	78.3	55.0	111.0	0	T	93.3	0.0	20.0
13	Huelquen	Chile	3593	74.0	56.3	111.0	0	0	110.0	0.0	40.0
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	3455	79.0	55.0	111.0	5MS	15R	78.3	0.0	40.0
22	Son 64 x TzPP - Nai 60 (A)	Argentina	3392	73.3	55.0	115.7	0	0	101.7	0.0	40.0
6	Siete Cerros	Mexico	3240	72.7	61.0	112.3	5MR	T	80.0	0.0	40.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	3210	79.0	53.7	111.0	5R	25R	85.0	0.0	40.0
39	Napo 63	Colombia	3170	75.0	50.0	108.7	25MS	0	100.0	1.7	40.0
45	Norteño 67	Mexico	3157	76.3	55.0	111.0	0	10R	90.0	0.0	40.0
18	LR64 - Son 64	Mexico	3040	79.0	62.0	112.3	0	5R	93.3	1.7	20.0
2	Gabo	Australia	3035	72.0	65.7	121.0	2R	2MR	106.7	3.3	20.0
5	Giza 155	Egypt	3020	74.3	62.0	121.0	T	0	116.7	0.0	20.0
36	Triple Dirk	Australia	3020	69.7	64.0	121.0	0	T	128.3	0.0	30.0
7	Noroeste 66	Mexico	2907	73.7	58.7	108.7	0	0	80.0	0.0	60.0
3	Nainari 60	Mexico	2857	71.7	68.0	130.3	T	T	106.7	0.0	0.0
30	Nar(S)(2) x PJ(S)	Chile	2830	73.3	51.0	108.7	T	0	73.3	0.0	20.0
48	PV-18, Indus	India Pak.	2797	73.0	62.0	111.0	T	25S	80.0	0.0	60.0
25	NP881	India	2745	74.7	62.0	121.0	0	0	113.3	6.7	20.0
14	Crespo	Colombia	2742	75.0	62.0	121.0	T	T	128.3	10.0	20.0
23	LR64 - N10B x AN(3)	Sudan	2737	75.3	64.0	121.0	15MR	5S	78.3	0.0	10.0
32	Penjamo 62	Mexico	2730	75.7	61.0	111.0	0	T	85.0	0.0	40.0
34	Inia 66	Mexico	2685	76.0	55.0	111.0	0	0	88.3	0.0	20.0
16	Son 64A x SK <sub>E</sub> -LR64A	Argentina	2638	68.0	62.0	115.7	T	T	80.0	0.0	40.0
40	C-306	India	2608	78.3	68.0	135.0	35MS	10S	116.7	0.0	20.0
1	Pitic 62	Mexico	2593	68.7	69.0	135.0	0	25S	90.0	0.0	20.0
19	Ciano 67	Mexico	2583	78.3	51.0	104.0	0	0	78.3	0.0	60.0
17	Sonora 64	Mexico	2557	70.0	51.0	108.7	0	T	81.7	0.0	60.0
47	Mengavi	Australia	2550	72.3	66.3	125.7	25MR	T	91.7	0.0	20.0
44	36896-CJ54(2) x YT54A (H)	Sudan	2445	72.7	67.0	121.0	2R	T	96.7	0.0	60.0
8	Victor I	Italy	2417	74.3	69.3	135.0	25MS	5S	81.7	0.0	20.0
50	Local Check Variety		2340	74.0	66.3	125.7	25MS	5S	116.7	0.0	20.0
9	Bonza 55	Colombia	2275	70.3	68.0	130.3	T	T	115.0	0.0	20.0



11 NP852	India	2255	78.0	53.7	114.3	T	10R	100.0	5.0	40.0
37 NP 832	India	2253	75.0	57.7	121.0	45MS	5MR	120.0	0.0	40.0
33 Chris	USA	2167	72.7	64.0	121.0	T	T	120.0	6.7	10.0
35 Tobari 66	Mexico	2112	74.7	55.0	111.0	0	0	88.3	0.0	60.0
10 Cara zinho	Brazil	2107	73.7	72.0	135.0	T	2R	123.3	3.3	20.0
38 Gaboto	Argentina	2032	76.0	71.0	135.0	0	T	121.7	5.0	0.0
26 Selkirk	Canada	1967	72.7	76.0	135.0	2MR	0	115.0	6.7	20.0
27 V-878	India	1910	75.7	51.0	106.3	0	0	70.0	0.0	40.0
12 Crim	USA	1897	76.0	71.0	135.0	0	0	123.3	26.7	20.0
49 (MD-K-Y)(WIS-SUP)	Kenya	1895	74.0	69.0	135.0	0	0	100.0	1.7	0.0
21 Justin	USA	1788	70.0	74.0	135.0	5MR	0	108.3	1.7	0.0
43 C-273	Pakistan	1768	76.0	62.0	125.7	25MS	85S	118.3	0.0	20.0
31 L1418-3463L1231x23L1274-111(L)	Sudan	1640	74.0	62.0	121.0	0	0	106.7	0.0	20.0
15 Taichung 31	Taiwan	1605	70.7	55.0	104.0	25S	100S	90.0	0.0	10.0
24 Kloka WM1353	Germany	1387	67.0	66.3	121.0	5MS	50S	100.0	0.0	10.0
42 Manitou	Canada	1371	73.0	76.0	142.3	0	T	113.3	0.0	0.0
29 Thatcher	USA	1273	74.0	76.0	138.7	15MS	2S	106.7	0.0	0.0
20 C-591	India	262	1/	70.0	125.7	5MS	100S	118.3	0.0	10.0

Grand mean		2493	74.0	62.3	120.4	1.8	2.1	99.9	1.6	26.4
Standard error of grand mean		46	0.2	0.1	0.3	(only 1 rep.)	(only 1 rep.)	0.5	0.2	(only 1 rep.)
Coefficient of variation		23.0%	2.6%	2.5%	3.0%			5.5%	161.4%	
LSD Variety means 5 PC		930	3.1	2.6	5.9			9.0	4.2	

#### Correlations

Test wt	0.51**									
Days to flowering	-0.52**	-0.23								
Days to maturity	-0.49**	-0.13	0.92**							
Leaf rust $\sqrt{\frac{X+1}{X+1}}$	-0.22	-0.02	0.06	0.15						
Stem rust $\sqrt{\frac{X+1}{X+1}}$	-0.47**	-0.52**	0.07	0.01	0.44**					
Height	-0.33 *	-0.18	0.54**	0.61**	0.13	0.04				
Shattering %	-0.14	0.09	0.25	0.28	-0.18	-0.16	0.42**			
Septoria %	0.40**	0.17	-0.62**	-0.66**	-0.15	-0.18	-0.47**	-0.16		

\* = Significant at the 5% level

\*\* = Significant at the 1% level

1/ No data available

2/ Septoria sp not known

TABLE 41

## AFRICA

KENYA. Molo. (Grasslands Research Station) Latitude: 0° 22' S. Longitude: 35° 37' E. Elevation: 2804 meters above sea level.  
Cooperator: V. P. Patel.

Planting Date: 9 July 1969. Precipitation during test: 330.2 mm. Irrigation: none. Fertilizer: 16.8 Kg./Ha. N<sub>2</sub> and 67.2 Kg./Ha. P<sub>2</sub>O<sub>5</sub>.  
General Comments: The growing season was drier than normal. Stem rust level was normal, stripe rust slightly higher and leaf rust very low. Other diseases were slight. The plot was hand weeded twice.  
Scoring notes taken: Stripe and leaf rust - 7 October, stem rust - 26 October, height - 3 November, lodging - 16 December.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to flowering	Days to maturity	Stripe rust leaf	rust head (%)	Leaf rust	Stem rust	Height cms	Lodging (%)	Shatter-1000 ing (%)	grain weight gms	Neck break (%)
35	Tobari 66	Mexico	5433	81.0	86.3	150.3	10MS	3.2	TMR	30MR-MS	98.3	6.7	0.7	31.7	0.7
45	Nortefio 67	Mexico	5104	79.0	85.0	145.7	30MS	2.3	TMR	20MR-MS	103.3	16.7	6.7	43.7	1.7
50	Bounty		4576	78.0	89.0	158.0	2MS	2.0	10MS	5S	133.7	21.7	8.3	31.7	4.0
	5 Giza 155	Egypt	4248	75.3	87.0	146.0	15MS	5.5	40S	20MS-S	121.7	20.0	0.0	34.0	3.0
49	(MD-K-Y)(WIS-SUP)	Kenya	3984	80.0	101.7	174.0	2MS	1.7	20S	10MS-20S	126.7	25.3	10.0	47.7	1.3
25	NP861	India	3774	76.0	88.7	148.0	20MS	5.8	10S	15MS	126.0	30.0	0.7	40.7	2.3
39	Napo 63	Colombia	3747	75.0	84.7	145.7	5MS	1.7	50S	40MS-S	110.3	6.7	1.3	30.0	1.0
31	L1418-3463L1231x23L1274-111(L)	Sudan	3579	76.0	87.3	154.3	40S	5.8	50S	5MS	121.0	20.0	0.0	35.0	8.7
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	3462	74.0	87.3	148.3	50S	3.6	0	50S	95.7	20.0	1.0	30.0	0.0
18	LR64 - Son 64	Mexico	3451	75.7	86.0	143.0	30MS	4.9	2MR	30MS	104.0	6.7	3.0	37.3	1.3
34	Inia 66	Mexico	3311	77.7	84.7	145.3	70MS-S	3.0	0	30MR-MS	96.7	13.3	1.3	38.0	0.7
40	C-306	India	3311	80.0	90.3	153.0	2MS	7.3	60S	40S	136.0	53.3	0.0	38.7	3.7
9	Bonza 55	Colombia	3026	74.7	96.3	162.0	30MS	3.0	30S	50S	147.3	43.3	0.0	30.3	2.0
12	Crim	USA	2891	69.3	87.0	157.0	60MS	5.2	TMS	10MS	134.7	30.0	0.0	29.7	0.7
27	V-878	India	2854	75.7	84.7	142.3	50S	3.0	2MR	40MS-S	81.3	0.0	1.3	28.7	0.0
3	Nainari 60	Mexico	2816	72.0	90.0	153.3	70MS-S	5.3	0	70MS-S	120.7	13.3	0.0	35.7	7.0
7	Noroeste 66	Mexico	2783	68.3	85.3	141.7	40MS-S	4.6	0	30MS	90.0	13.3	1.0	25.7	5.7
4	Son 64 x Kl. Rend.	Argentina	2687	68.0	85.3	140.7	60MS-S	5.4	T	40MS	90.7	13.3	2.3	30.3	0.7
37	NP 832	India	2547	74.3	92.0	151.0	5MS	6.1	70S	50S	145.0	36.7	0.0	29.0	5.7
21	Justin	USA	2493	73.0	99.7	173.3	2MS	3.7	TMS	50MR-MS	135.3	20.0	1.0	24.0	0.0
30	Nar(S)(2) x PJ(S)	Chile	2477	70.0	85.0	140.3	15MS	3.5	20MS	30S	88.3	10.0	2.0	26.3	1.0
26	Selkirk	Canada	2412	72.0	100.7	175.0	50S	7.8	40S	5S	141.7	23.3	0.7	31.7	3.3
33	Chris	USA	2407	75.3	88.3	159.3	15MS-S	3.4	0	50S	141.3	36.7	0.0	25.0	1.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	2251	71.0	86.7	147.7	80S	4.1	TMS	70S	97.3	16.7	0.7	23.7	0.7
13	Huelquen	Chile	2191	69.0	88.3	149.0	40MS	2.0	0	70S	113.3	10.0	0.7	30.3	0.7
47	Mengavi	Australia	2170	71.3	87.3	155.0	60MS	7.8	20MS	70S	112.7	16.7	1.7	27.3	0.0
19	Ciano 67	Mexico	2057	68.3	83.7	138.7	40S	6.1	0	80S	93.0	10.0	0.7	27.3	0.0
32	Penjamo 62	Mexico	1604	63.3	86.7	147.0	40S	2.0	2MS	70S	101.7	20.0	0.3	22.3	0.3
6	Siete Cerros	Mexico	1486	61.3	90.7	149.0	60MS-S	7.1	20S	50S	88.3	10.0	0.3	25.0	0.7
2	Gabo	Australia	1289	62.0	86.7	143.7	70MS	7.6	0	90MS-S	108.3	3.3	0.7	26.0	5.3
20	C-591	India	1249	68.7	90.0	146.3	R	4.2	20S	50S	137.7	26.7	0.0	23.7	0.7
48	PV-18, Indus	India Pak.	1141	64.3	85.7	146.0	60S	6.2	10MS	40S	90.0	6.7	0.7	18.7	5.0

14 Crespo	Colombia	1050	52.7	91.7	146.0	5MS	3.8	10MS	100S	127.0	3.3	0.0	13.7	0.3
36 Triple Dirk	Australia	883	63.7	91.3	157.3	90S	6.1	10MS	70S	125.0	20.0	0.3	25.7	0.7
24 Kloka WM1353	Germany	883	49.3	94.3	142.0	15MR-MS	3.4	60S	90MS-S	101.3	0.0	0.3	13.0	3.0
11 NP852	India	700	55.7	86.3	141.0	80S	9.0	0	80S	114.3	13.3	0.7	16.7	0.3
22 Son 64 x TzPP - Nai 60 (A)	Argentina	662	58.0	85.3	139.3	80S	6.6	0	80S	100.3	6.7	0.7	19.3	2.0
8 Victor I	Italy	651	50.0	103.0	145.0	40S	2.2	10MS	100VS	86.3	0.0	2.0	11.0	0.0
43 C-273	Pakistan	646	57.3	86.7	146.0	2MS	6.1	20S	70S	121.7	23.3	0.0	14.7	7.7
17 Sonora 64	Mexico	636	52.0	84.0	140.7	90S	5.8	0	90S	85.0	3.3	1.3	17.0	0.0
28 Lerma Rojo 64A	Mexico	576	48.0	85.3	136.7	70MS-S	4.9	0	70S	97.3	30.0	0.0	13.3	7.3
38 Gaboto	Argentina	496	66.0	100.3	170.3	50S	7.1	0	70S	143.3	40.0	0.0	17.0	1.0
23 LR64 - N10B x AN(3)	Sudan	490	42.7	88.7	137.0	15MS	4.6	20MS	100S	90.0	0.0	0.0	9.0	20.3
42 Manitou	Canada	355	64.0	107.0	166.3	40S	8.0	2MR	90S	133.3	30.0	0.7	14.3	6.7
10 Carazinho	Brazil	318	1/	101.7	162.0	15MS-S	6.7	0	80S	146.0	53.3	0.0	14.0	3.3
44 36896-CJ54(2) x YT54A (H)	Sudan	188	1/	92.0	141.3	70S	5.2	TMS	80S	105.0	23.3	0.3	15.3	28.3
1 Pitic 62	Mexico	172	1/	97.0	139.3	30MS	5.7	10MS	100S	105.0	20.0	0.0	7.7	33.3
29 Thatcher	USA	151	1/	105.7	156.3	30MS	6.2	70S	80S	121.0	26.7	0.0	13.7	13.7
16 Son 64A x SK <sub>E</sub> -LR64A	Argentina	54	1/	87.3	133.0	30MS	4.5	0	90S	84.7	20.0	0.0	6.3	20.7
15 Taichung 31	Taiwan	48	1/	85.0	132.0	100S	6.0	20S	90S	86.0	23.3	0.0	29.0	90.0

Grand mean	2035	67.7	90.2	149.2	5.8	4.9	3.1	7.3	112.1	18.7	1.1	25.0	6.1
Standard error of grand mean	29	0.3	0.2	0.5	0.1	0.1	0.0	0.1	0.4	0.9	0.1	0.3	0.7
Coefficient of variation	17.0%	4.2%	2.5%	4.3%	17.8%	25.6%	18.1%	9.2%	4.4%	56.0%	146.4%	16.2%	148.0%
LSD Variety means 5 PC	580	4.7	3.7	10.5	1.7	2.1	0.9	1.1	8.1	17.1	2.6	6.6	14.9

#### Correlations

Test wt	0.72**													
Days to flowering	-0.29 *	-0.26												
Days to maturity	0.23	0.33 *	0.67**											
Stripe rust (leaf) $\sqrt{X+1}$	-0.36**	-0.22	-0.18	-0.23										
Stripe rust (head) %	-0.43**	-0.20	0.12	0.05	0.34 *									
Leaf rust $\sqrt{X+1}$	0.07	0.02	0.25	-0.15	-0.55**	0.06								
Stem rust $\sqrt{X+1}$	-0.84**	-0.58**	0.18	-0.36 *	0.27	0.24	-0.10							
Height	0.13	0.21	0.52**	0.76**	-0.44**	0.17	0.32 *	-0.24						
Lodging %	0.00	-0.08	0.39**	0.50**	-0.15	0.23	0.19	-0.10	0.72**					
Shattering %	0.48**	0.28 *	0.04	0.22	-0.23	-0.44**	-0.11	-0.47**	-0.02	-0.11				
1000 grain weight	0.85**	0.64**	-0.26	0.28	-0.16	-0.23	0.11	-0.78**	0.18	0.12	0.47**			
Neck break %	-0.38**	-0.62**	-0.01	-0.34 *	0.21	0.15	0.14	0.31 *	-0.22	0.08	-0.16	-0.19		

\* = Significant at the 5% level

\*\* = Significant at the 1% level

1/ No data available

TABLE 42

## AFRICA

KENYA. Njoro. Latitude: 0° 18' S. Longitude: 35° 50' E. Elevation: 2164 meters above sea level.  
Cooperator: V. P. Patel.

Planting Date: 9 May 1969. Precipitation during test: 327 mm. Irrigation: none. Fertilizer: 16.8 Kg./Ha. N<sub>2</sub> and 67.2 Kg./Ha. P<sub>2</sub>O<sub>5</sub>.  
General Comments: Climatic conditions were drier than normal. Stem and stripe rust levels were slightly below normal. Leaf rust level was a little higher. The plot was hand weeded twice.

Scoring notes taken: Stripe and leaf rust - 16 and 23 July, stem rust - 26 and 27 August, height - 5 and 6 September, lodging - 8 September, shattering - 8 September and 2 October.

Variety Number	Variety or cross	Origin	Yield kg/ha	Days to flowering	Days to maturity	Stripe rust	Leaf rust	Stem rust	Height cms	Lodging (%)	Shatter-ing (%)	1000grain weight gms	Neck break (%)
4	Son 64 x Kl. Rend.	Argentina	2422	57.3	107.7	10MS	10MS	30MS	79.0	2.0	20.0	32.7	1/
5	Giza 155	Egypt	2314	65.7	119.0	2MS	60MS	30MS-S	93.7	6.7	2.0	30.0	1/
50	Trophy		2309	63.3	114.7	2MS	30MS	10MR-60S	94.7	12.0	6.7	37.7	1/
9	Bonza 55	Colombia	2260	73.0	123.7	5MS	20S	60S	107.0	46.7	1/	28.0	5.0
12	Crim	USA	2217	71.3	120.7	10MS	5MS	20S	107.3	5.7	10.0	30.0	1/
35	Tobari 66	Mexico	2201	64.0	113.3	TMR-C	10MR	10S-30MS	75.3	10.0	23.3	34.0	1/
31	L1418-3463L1231x23L1274-111(L)	Sudan	2153	67.3	121.7	2MS	70S	20S	88.0	10.0	2.0	32.3	1/
25	NP881	India	2099	65.0	113.3	2MS	20S	30S	89.0	15.0	7.3	39.3	3.7
3	Nainari 60	Mexico	2024	70.3	118.3	30MS	2MR	70VS	87.3	2.0	12.3	27.3	1/
34	Inia 66	Mexico	1970	58.7	110.3	40S	2MS	30MS	76.0	2.0	36.7	37.0	1/
6	Siete Cerros	Mexico	1959	68.0	114.7	30S	30S	40VS	77.3	11.7	23.3	20.7	10.0
36	Triple Dirk	Australia	1797	68.0	119.0	30S	5MR	60VS	103.3	12.3	2.0	28.7	1/
49	(MD-K-Y)(WIS-SUP)	Kenya	1792	74.7	130.0	10S	20S	20S	95.0	33.3	4.0	36.0	1/
40	C-306	India	1641	71.7	127.0	TMS	80S	40VS	97.7	43.3	1/	28.0	2.0
39	Napo 63	Colombia	1636	58.3	104.7	TMS-C	20S	40S	88.3	9.0	20.0	27.3	2.0
47	Mengavi	Australia	1561	69.0	117.7	2MS	30MS	70VS	80.3	6.3	2.0	23.0	2.0
13	Huelquen	Chile	1545	63.7	112.0	10MS	2MR	50VS	88.3	5.7	3.0	24.7	1/
18	LR64 - Son 64	Mexico	1496	65.3	110.3	10MS	10MR	10S-40MS	88.7	2.0	56.7	38.7	2.0
26	Selkirk	Canada	1491	78.7	122.7	2MS	40MS	10S-50MS	110.7	31.7	5.0	28.7	2.0
21	Justin	USA	1388	80.3	131.7	2MS	5MS	30S	111.3	7.3	1/	22.0	2.0
22	Son 64 x TzPP - Nai 60 (A)	Argentina	1378	57.7	109.7	15S	2MS	70S	85.0	2.0	35.0	29.0	1/
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	1351	61.7	112.3	5MS	5MS	50S	75.0	2.0	30.0	31.7	1/
27	V-878	India	1329	54.0	106.3	2MS	10MR	30MS	63.3	10.0	35.0	28.7	1/
33	Chris	USA	1313	67.7	118.7	5MS	2MR	50VS	100.0	16.7	2.0	19.7	1/
48	PV-18, Indus	India Pak.	1238	68.3	111.7	15MS	15MS	80VS	71.3	8.3	16.7	26.0	3.0
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	1211	63.7	111.0	TMS-C	5MR	20S-40MS	67.0	1/	33.3	31.3	1/
37	NP 832	India	1205	68.3	117.3	TMS	80S	60S	103.3	43.3	1/	30.0	5.0
7	Noroeste 66	Mexico	1189	64.3	104.7	15MS	2MR	40MS	68.3	1/	56.7	32.7	1/
14	Crespo	Colombia	1179	66.3	111.0	TMS	15MS	90VS	101.3	31.7	2.0	18.0	13.3
17	Sonora 64	Mexico	1033	55.0	106.3	30S	2MS	40S	67.3	1/	56.7	27.7	1/
19	Ciano 67	Mexico	942	56.0	107.3	50S	2MS	50VS	69.7	2.0	46.7	29.0	1/
32	Penjamo 62	Mexico	936	63.0	108.7	20MS	10MS	50VS	74.7	33.3	6.0	14.7	6.7

2 Gabo	Australia	926	65.7	111.7	50S	2MS	60S	87.3	20.0	2.0	19.7	10.0
30 Nar(S)(2) x PJ(S)	Chile	901	58.0	108.7	5MS-C	50MS	40S	66.0	5.0	46.7	24.3	1.0
38 Gaboto	Argentina	861	80.7	126.3	2MS-C	5MR	60VS	114.7	56.7	1/	16.7	1/
11 NP852	India	829	58.3	107.3	70S	TMS	60S	85.3	3.0	19.0	20.7	1/
23 LR64 - N10B x AN(3)	Sudan	673	67.7	111.3	2MS	30S	90S	68.0	12.3	2.0	10.7	3.7
24 Kloka WM1353	Germany	624	68.3	118.3	TMR	50MS	80S	81.0	7.7	2.0	13.7	24.0
16 Son 64A x SK <sub>E</sub> -LR64A	Argentina	560	64.3	107.3	40S	5MR	90S-VS	67.7	5.0	2.0	12.0	1.0
45 Norteño 67	Mexico	544	62.7	109.0	10MS	5MR	10S-30MS	75.7	1.0	63.3	41.7	1/
20 C-591	India	544	76.0	123.0	TMR	50S	60VS	116.3	31.7	1/	14.3	7.7
10 Carazinho	Brazil	522	78.7	127.7	5MS	5MR	80VS	111.0	31.7	1/	12.7	5.0
8 Victor I	Italy	517	79.3	124.7	2MS	20MS	90VS	69.0	1/	1/	11.3	1/
28 Lerma Rojo 64A	Mexico	490	64.3	108.3	60S	2MS	70S	82.0	43.3	2.0	13.7	11.7
43 C-273	Pakistan	339	65.7	111.3	2MS	50S	60VS	99.3	35.0	1.0	18.0	8.3
1 Pitic 62	Mexico	217	76.7	113.0	2MR	20S	90VS	83.0	50.0	2.0	10.7	75.0
44 36896-CJ54(2) x YT54A (H)	Sudan	210	75.3	112.7	5MS	5MS	80S	76.7	6.3	2.0	13.7	3.0
29 Thatcher	USA	145	83.7	120.7	5MS-C	70S	60S	102.7	90.0	1/	19.7	80.0
15 Taichung 31	Taiwan	124	57.0	103.7	80S	30S	80VS	80.3	10.0	3.0	9.0	90.0
42 Manitou	Canada	91	82.3	119.7	5MS	10MR	60VS	96.3	40.0	1/	13.3	30.0
Grand mean		1234	67.3	114.8	2.9	4.0	7.1	86.9	17.5	14.1	24.4	8.2
Standard error of grand mean		23	0.1	0.2	0.1	0.1	0.0	0.4	0.8	0.6	0.3	0.3
Coefficient of variation		23.0%	2.0%	2.1%	27.5%	17.8%	8.5%	6.1%	53.5%	55.3%	12.9%	43.7%
LSD Variety means 5 PC		467	2.2	4.0	1.3	1.2	1.0	8.6	15.3	12.7	5.1	5.8

#### Correlations

Days to flowering	-0.24											
Days to maturity	0.15	0.81**										
Stripe rust $\sqrt{\frac{X+1}{}}$	-0.15	-0.34 *	-0.42**									
Leaf rust $\sqrt{\frac{X+1}{}}$	-0.05	0.25	0.30 *	-0.40**								
Stem rust $\sqrt{\frac{X+1}{}}$	-0.63**	0.25	0.00	0.24	0.05							
Height	0.11	0.81**	0.70**	-0.29 *	0.23	0.02						
Lodging %	-0.31 *	0.59**	0.41**	-0.24	0.38**	0.26	0.56**					
Shattering %	0.09	-0.60**	-0.56**	0.15	-0.38**	-0.49**	-0.56**	-0.52**				
1000 grain weight	0.72**	-0.36**	-0.07	-0.18	-0.13	-0.83**	-0.05	-0.33 *	0.55**			
Neck break %	-0.51**	0.23	-0.07	0.15	0.35 *	0.36**	0.07	0.49**	-0.26	-0.45**		

\* = Significant at the 5% level  
 \*\* = Significant at the 1% level

1/ No data available

TABLE 43

## AFRICA

RHODESIA. Salisbury Research Station. Latitude: 17° 48' S. Longitude: 31° 05' E. Elevation: 1495 meters above sea level.  
Cooperator: Ian B. Edwards.

Planting Date: 20 December 1968. Precipitation during test: total 272.5 mm. Irrigation: 38.1 mm. Fertilizer: 336 Kg./Ha. Ca. Amm. Nitrate (26%N), 224 Kg./Ha. Single Superphosphate (19% P<sub>2</sub>O<sub>5</sub>) and 112 Kg./Ha. Muriate of Potash (60% K<sub>2</sub>O).

General Comments: Rainfall was well distributed. Temperatures ranged between 78.5°F and 60.0°F. Stem rust spread rapidly and became quite severe. No insect, weed or pest problems.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to flowering	Days to maturity	Stem rust	Height cms	Lodging (%)	1000 grain weight gms
45	Norteno 67	Mexico	4085	76.0	47.3	88.0	0	81.3	10.0	31.0
	4 Son 84 x Kl. Rend.	Argentina	3591	77.0	45.7	78.3	R	89.7	13.3	29.0
17	Sonora 64	Mexico	3441	75.0	45.0	77.7	0	86.3	46.7	25.0
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	3370	78.0	48.7	82.7	0	78.0	40.0	29.0
18	LR64 - Son 64	Mexico	3305	73.0	54.3	85.7	TR.MR	91.0	31.7	32.0
50	Zambesi II	Rhodesia	3267	77.0	47.7	83.3	0	76.0	13.3	29.0
34	Inia 66	Mexico	3264	76.0	48.7	83.7	TR.R.	83.0	6.7	28.0
39	Napo 63	Colombia	3249	70.0	44.3	78.3	TR.R.	93.0	93.3	28.0
	8 Siete Cerros	Mexico	3249	75.0	54.0	84.7	TR.S	83.0	31.7	25.0
19	Ciano 67	Mexico	3176	75.0	44.7	77.7	0	88.0	51.7	29.0
22	Son 64 x TzPP - Nai 60 (A)	Argentina	3152	75.0	48.0	82.0	TR-MR	96.3	6.7	30.0
30	Nar(S)(2) x PJ(S)	Chile	3143	69.0	44.3	80.7	TR.R.	73.0	40.0	21.0
13	Huelquen	Chile	3139	71.0	46.0	79.7	TR.R	96.7	90.0	29.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	3082	74.0	45.7	83.3	0	79.7	46.7	27.0
	7 Noroeste 66	Mexico	2844	73.0	54.0	84.0	0	83.7	73.3	26.0
15	Taichung 31	Taiwan	2820	70.0	47.3	77.7	0	87.0	90.0	26.0
48	PV-18, Indus	India Pak.	2760	71.0	53.3	88.0	10S	77.7	3.3	25.0
37	NP 832	India	2629	74.0	51.3	84.7	40S	104.3	43.3	35.0
36	Triple Dirk	Australia	2593	71.0	54.7	91.0	10S.MS.	106.7	73.3	36.0
32	Penjamo 62	Mexico	2573	70.0	48.7	82.3	TR.VR.	81.0	78.3	24.0
27	V-878	India	2492	72.0	44.3	80.0	TR.R	73.0	0.0	23.0
35	Tobari 66	Mexico	2421	72.0	47.7	82.7	0	87.0	20.0	24.0
14	Crespo	Colombia	2179	72.0	53.0	83.0	TR.VR	107.0	93.3	24.0
23	LR64 - N10B x AN(3)	Sudan	2129	70.0	54.3	86.7	TR.MR	74.7	33.3	21.0
47	Mengavi	Australia	2129	66.0	62.7	93.7	0	96.0	23.3	29.0
11	NP852	India	2110	74.0	46.7	78.3	TR-S	96.3	11.7	26.0
25	NP881	India	2059	70.0	50.7	84.0	TR.MS.MR	99.0	76.7	25.0
16	Son 64A x SK <sub>E</sub> -LR64A	Argentina	2018	68.0	52.7	82.7	TR-R	79.7	0.0	18.0
	2 Gabo	Australia	1972	64.0	58.0	90.3	40S	91.0	36.7	22.0
28	Lerma Rojo 64A	Mexico	1821	72.0	49.7	81.7	TR.VR	90.7	73.3	23.0
	5 Giza 155	Egypt	1741	65.0	55.7	92.0	TR.MS	101.7	56.7	29.0
49	(MD-K-Y)(WIS-SUP)	Kenya	1664	71.0	64.3	102.7	0	103.3	86.7	27.0

20 C-591	India	1660	69.0	68.0	108.7	TR-S	107.7	76.7	29.0
43 C-273	Pakistan	1654	75.0	56.0	91.0	TR.S.	111.7	70.0	29.0
24 Kloka WM1353	Germany	1614	68.0	56.0	84.3	TR.S.MR.	90.3	30.0	22.0
29 Thatcher	USA	1604	68.0	68.7	103.7	TR.R.	103.3	53.3	20.0
33 Chris	USA	1564	72.0	57.3	88.3	0	105.3	83.3	22.0
40 C-306	India	1403	65.0	66.7	102.3	R.	101.7	63.3	29.0
1 Pitic 62	Mexico	1382	54.0	69.0	101.3	TR.MS	84.7	76.7	18.0
8 Victor I	Italy	1265	63.0	81.0	110.3	TR-S	67.0	0.0	24.0
12 Crim	USA	1174	68.0	63.0	92.7	TR.R	105.0	86.7	22.0
3 Nainari 60	Mexico	1155	62.0	68.3	104.7	TR-S	94.7	8.3	27.0
31 L1418-3463L1231x23L1274-111(L)	Sudan	1150	63.0	53.7	92.3	TR.MS.S	95.3	13.3	24.0
42 Manitou	Canada	1120	66.0	66.0	100.7	0	100.0	66.7	21.0
38 Gaboto	Argentina	1074	67.0	83.3	124.3	TR.MS	99.0	73.3	22.0
26 Selkirk	Canada	933	65.0	65.7	98.7	TR.VR.MR	102.0	36.7	30.0
21 Justin	USA	913	68.0	65.7	100.3	0	101.7	76.7	24.0
9 Bonza 55	Colombia	898	60.0	66.0	102.3	TR-S	101.0	53.3	23.0
44 36896-CJ54(2) x YT54A (H)	Sudan	893	57.0	63.7	91.7	0	93.3	50.0	17.0
10 Carazinho	Brazil	892	67.0	73.0	107.0	0	102.7	85.0	27.0

Grand mean		2196	69.7	56.0	89.9	2.1	92.0	48.0	25.7
Standard error of grand mean		40	(only 1	0.1	0.2	0.1	0.5	1.6	(only 1
Coefficient of variation		22.0%	rep.)	2.2%	2.6%	69.8%	6.3%	40.2%	rep.)
LSD Variety means 5 PC		798		2.1	3.7	2.4	9.5	31.5	

#### Correlations

Test wt	0.76**								
Days to flowering	-0.80**	-0.66**							
Days to maturity	-0.73**	-0.59**	0.96**						
Stem rust $\sqrt{X+1}$	-0.16	-0.08	0.18	0.13					
Height	-0.48**	-0.16	0.35 *	0.36**	0.15				
Lodging %	-0.25	-0.14	0.19	0.17	-0.17	0.55**			
1000 grain weight	0.44**	0.50**	-0.26	-0.15	0.23	0.23	-0.04		

\* = Significant at the 5% level

\*\* = Significant at the 1% level

TABLE 44

## AFRICA

REPUBLIC OF SOUTH AFRICA. Groblersdal. Latitude: 25° 2' S. Longitude: 29° E. Elevation: 948 meters above sea level.  
Cooperators: D. J. Rossouw.

Planting Date: 24 April 1969. Precipitation during test: not stated. Irrigation: 375 mm. Fertilizer: 134.4 Kg./Ha. N as Amm. Sulphate, 44.8 Kg./Ha. P as Superphosphate and 44.8 Kg./Ha. K as KCL.

General Comments: Climatic conditions were dry until just before harvest, when a severe hail storm occurred. No disease development was observed. The temperature and humidity during the winter in this area are too low for stem and leaf rust development. No insect, weed or pest problems.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to flowering	Days to maturity	Height cms	Lodging (%)	1000 grain weight gms
5	Giza 155	Egypt	5899	81.0	72.0	131.0	109.0	5.0	53.0
31	L1418-3463L1231x23L1274-111(L)	Sudan	5556	81.0	72.0	131.0	122.0	1.0	46.0
28	Lerma Rojo 64A	Mexico	5138	83.0	72.0	131.0	97.0	10.0	46.0
1	Pitic 62	Mexico	5026	76.0	106.0	140.0	102.0	15.0	40.0
16	Son 64A x SK <sub>E</sub> -LR64A	Argentina	4932	82.0	74.7	131.0	81.0	0.0	41.0
14	Crespo	Colombia	4931	82.0	72.0	131.0	107.0	5.0	44.0
23	LR64 - N10B x AN(3)	Sudan	4767	82.0	88.0	140.0	84.0	0.0	42.0
47	Mengavi	Australia	4725	80.0	82.7	140.0	114.0	2.0	41.0
37	NP 832	India	4671	82.0	72.0	131.0	112.0	20.0	49.0
44	36896-CJ54(2) x YT54A (H)	Sudan	4505	80.0	88.0	140.0	112.0	0.0	44.0
13	Huelquen	Chile	4477	81.0	72.0	131.0	109.0	5.0	44.0
32	Penjamo 62	Mexico	4455	80.0	72.0	131.0	91.0	2.0	48.0
3	Nainari 60	Mexico	4453	80.0	80.0	140.0	112.0	0.0	49.0
34	Inia 66	Mexico	4421	83.0	66.0	126.0	91.0	0.0	49.0
48	PV-18, Indus	India Pak.	4415	82.0	72.0	131.0	86.0	0.0	44.0
2	Gabo	Australia	4346	79.0	74.7	131.0	104.0	0.0	48.0
18	LR64 - Son 64	Mexico	4157	81.0	72.0	131.0	109.0	2.0	51.0
8	Victor I	Italy	4056	78.0	113.0	160.0	84.0	0.0	39.0
50	Losper	S. Africa	4031	83.0	82.7	140.0	132.0	90.0	41.0
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	4012	82.0	70.0	131.0	102.0	5.0	41.0
20	C-591	India	4000	83.0	80.0	140.0	112.0	40.0	44.0
6	Siete Cerros	Mexico	3973	81.0	72.0	131.0	89.0	0.0	41.0
45	Norteno 67	Mexico	3937	81.0	72.0	131.0	102.0	0.0	49.0
25	NP881	India	3884	81.0	72.0	131.0	114.0	80.0	47.0
40	C-306	India	3861	82.0	82.7	140.0	132.0	60.0	47.0
39	Napo 63	Colombia	3724	79.0	60.0	118.0	107.0	0.0	45.0
30	Nar(S)(2) x PJ(S)	Chile	3713	80.0	62.0	126.0	86.0	0.0	42.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	3705	82.0	72.0	131.0	91.0	0.0	43.0
10	Carazinho	Brazil	3670	80.0	97.0	160.0	132.0	75.0	41.0
9	Bonza 35	Colombia	3660	79.0	82.7	140.0	127.0	50.0	42.0
43	C-273	Pakistan	3520	83.0	72.0	131.0	122.0	0.0	50.0
24	Kloka WM1353	Germany	3479	77.0	82.7	140.0	102.0	0.0	39.0



22	Son 64 x TzPP - Nai 60 (A)	Argentina	3422	80.0	66.0	123.0	107.0	0.0	46.0
38	Gaboto	Argentina	3412	79.0	88.0	140.0	122.0	100.0	33.0
35	Tobari 66	Mexico	3390	82.0	72.0	131.0	84.0	0.0	46.0
7	Noroeste 66	Mexico	3295	80.0	72.0	131.0	84.0	0.0	44.0
49	(MD-K-Y)(WIS-SUP)	Kenya	3175	78.0	88.0	140.0	132.0	5.0	40.0
15	Taichung 31	Taiwan	3167	80.0	66.0	123.0	91.0	0.0	38.0
36	Triple Dirk	Australia	2986	80.0	72.0	131.0	114.0	15.0	50.0
12	Crim	USA	2955	78.0	88.0	140.0	119.0	95.0	38.0
33	Chris	USA	2895	79.0	85.3	140.0	107.0	95.0	34.0
27	V-878	India	2862	80.0	60.0	123.0	81.0	0.0	38.0
4	Son 64 x Kl. Rend.	Argentina	2845	80.0	66.0	131.0	91.0	0.0	42.0
26	Selkirk	Canada	2494	78.0	100.7	160.0	135.0	95.0	36.0
11	NP852	India	2491	81.0	60.0	123.0	107.0	10.0	37.0
21	Justin	USA	2433	78.0	118.0	150.0	127.0	30.0	35.0
29	Thatcher	USA	2174	74.0	126.0	160.0	122.0	95.0	28.0
42	Manitou	Canada	2152	73.0	123.0	160.0	142.0	40.0	28.0
19	Ciano 67	Mexico	2046	78.0	60.0	118.0	91.0	0.0	38.0
17	Sonora 64	Mexico	1654	76.0	60.0	126.0	81.0	0.0	38.0

Grand mean	3759	80.0	79.0	135.3	106.3	20.9	42.4
Standard error of grand mean	51	(only 1	0.3	(only 1	(only 1	(only 1	(only 1
Coefficient of variation	17.0%	rep.)	4.9%	rep.)	rep.)	rep.)	rep.)
LSD Variety means 5 PC	1017		6.4				

#### Correlations

Test wt	0.56**						
Days to flowering	-0.16	-0.58**					
Days to maturity	-0.15	-0.46**	0.93**				
Height	-0.12	-0.23	0.51**	0.55**			
Lodging %	-0.31 *	-0.24	0.50**	0.56**	0.62**		
1000 grain weight	0.63**	0.67**	-0.56**	-0.48**	-0.17	-0.46**	

\* = Significant at the 5% level  
 \*\* = Significant at the 1% level

TABLE 45

## AFRICA

REPUBLIC OF SOUTH AFRICA. Stellenbosch. Latitude: 33° 56' S. Longitude: 18° 51' E. Elevation: 91 meters above sea level.  
Cooperators: P. du Toit and T. Paxton.

Planting Date: 4 November 1968. Precipitation during test: not stated. Irrigation: 25.4 mm each week. Fertilizer: 10 Kg./Ha. N, 5 Kg./Ha. P and 10 Kg./Ha. K.  
General Comments: Experiment was planted out of season. Dry, warm summer conditions prevailed. Stem rust level was high. Disease development was good, in general. There were no insect, weed or pest problems.

Scoring notes taken: Leaf rust, stem rust and height - 10 December, lodging and shattering - 6 January, Septoria nodorum - 31 December.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to flowering	Days to maturity	Leaf rust	Stem rust	Height cms	Lodging (%)	Septoria nodorum (%)
42	Manitou	Canada	3642	74.0	63.0	97.3	0	0	104.0	5.7	1.7
23	LR64 - N10B x AN(3)	Sudan	3205	73.0	55.7	94.0	15S	5S	73.7	0.0	15.0
33	Chris	USA	3195	75.3	60.0	97.3	0	0	107.0	8.7	1.7
7	Noroeste 66	Mexico	3132	70.0	55.7	89.7	0	10S	73.7	0.0	33.3
49	(MD-K-Y)(WIS-SUP)	Kenya	3024	74.0	63.0	100.0	10S	0	96.3	5.3	1.7
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	2862	75.3	52.7	92.7	0	20S	73.7	0.0	30.0
47	Mengavi	Australia	2852	67.0	55.7	95.7	20S	10MR	81.3	0.0	6.7
1	Pitic 62	Mexico	2782	65.0	60.0	96.7	20S	5S	89.0	2.7	1.7
34	Inia 66	Mexico	2748	73.0	53.3	94.7	0	30S	73.7	0.0	56.7
38	Gaboto	Argentina	2716	73.7	63.0	99.0	0	10S	104.3	33.3	0.0
28	Lerma Rojo 64A	Mexico	2711	70.3	52.0	94.3	0	20S	86.3	0.3	60.0
14	Crespo	Colombia	2589	73.3	55.7	96.7	0	5S	94.0	1.7	5.0
22	Son 64 x TzPP - Nai 60 (A)	Argentina	2496	70.3	52.3	95.7	0	70S	81.3	0.0	6.7
26	Selkirk	Canada	2474	68.0	49.0	92.3	5S	20S	109.3	5.7	18.3
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	2415	73.7	55.3	94.0	0	20S	71.3	0.0	23.3
30	Nar(S)(2) x PJ(S)	Chile	2355	70.7	49.3	93.7	0	TS	66.3	0.0	40.0
16	Son64A x SK <sub>E</sub> -LR64A	Argentina	2339	68.3	55.7	88.3	5S	50S	73.7	0.0	5.0
32	Penjamo 62	Mexico	2330	70.0	55.7	93.3	0	TS	73.7	0.0	8.3
35	Tobari 66	Mexico	2320	73.3	54.0	93.3	0	TS	76.3	0.0	8.3
19	Ciano 67	Mexico	2280	73.7	47.7	89.7	0	0	71.3	0.0	16.7
45	Norteno 67	Mexico	2279	70.7	50.7	93.3	0	50S	76.3	0.0	15.0
10	Carazinho	Brazil	2256	67.0	66.0	103.0	0	30S	104.3	28.3	1.7
25	NP881	India	2245	69.3	47.3	94.3	0	30S	86.3	0.0	13.3
17	Sonora 64	Mexico	2231	68.3	51.7	90.7	10S	20S	63.7	0.0	10.0
12	Crim	USA	2169	66.7	60.0	89.0	20S	10S	104.3	15.7	5.0
27	V-878	India	2091	72.7	47.0	94.3	0	5S	63.7	0.0	36.7
40	C-306	India	2082	75.3	55.7	98.7	20S	10S	96.3	1.0	8.3
4	Son 64 x Kl. Rend.	Argentina	2014	69.0	49.7	89.7	0	60S	74.0	0.0	6.7
13	Huelquen	Chile	1981	72.0	60.0	95.3	0-R	5S	78.7	0.7	56.7
9	Bonza 55	Colombia	1935	66.7	63.0	97.0	0	10S	101.7	4.0	16.7
44	36896-CJ54(2) x YT54A (H)	Sudan	1898	66.3	60.7	99.0	20S	5S	81.3	1.7	5.0
21	Justin	USA	1859	72.3	66.0	99.7	TS	10S	101.7	1.0	1.7

8 Victor I	Italy	1803	83.3	65.7	102.3	10S	50S	61.0	0.0	1.7
5 Giza 155	Egypt	1540	71.3	56.0	91.7	0	30S	88.7	0.0	13.3
31 L1418-3463L1231x23L1274-111(L)	Sudan	1503	66.0	55.7	94.7	0	20S	91.3	0.3	13.3
29 Thatcher	USA	1485	70.3	66.0	97.7	50S	20MR	111.7	4.0	0.0
18 LR64 - Son 64	Mexico	1450	71.0	49.3	88.7	0	80S	78.7	0.0	23.3
36 Triple Dirk	Australia	1368	63.3	56.0	90.7	30S	80S	96.7	3.7	1.7
3 Nainari 60	Mexico	1367	52.7	60.0	89.7	25	70S	88.7	0.3	1.7
20 C-591	India	1209	69.0	55.7	97.3	10S	50S	101.7	0.0	10.0
43 C-273	Pakistan	1015	70.0	55.7	80.3	0	20S	86.0	0.3	16.7
39 Napo 63	Colombia	1004	69.0	47.0	93.3	20S	0	84.0	1.0	60.0
50 Skemer		971	65.0	53.7	91.7	5S	80S	96.3	0.7	13.3
24 Kloka WM1353	Germany	813	56.0	55.7	74.7	10S	60S	91.3	3.7	0.0
6 Siete Cerros	Mexico	682	53.7	60.0	79.7	20S	50S	73.7	2.3	5.0
11 NP852	India	668	61.0	47.3	79.3	80S	90S	76.0	0.0	15.0
48 PV-18, Indus	India Pak.	649	54.0	53.3	80.3	2S	100S	69.0	0.7	6.7
37 NP 832	India	456	1/	55.3	79.7	20S	70S	83.7	0.3	3.3
2 Gabo	Australia	244	1/	55.7	80.3	50S	70S	78.7	2.7	3.3
15 Taichung 31	Taiwan	233	1/	49.3	96.7	70S	90S	79.0	0.7	23.3

Grand mean		1955	68.6	55.7	92.4	2.7	5.2	85.0	2.7	14.6
Standard error of grand mean		36	0.2	0.0	0.1	0.1	0.1	0.5	0.8	0.7
Coefficient of variation		23.0%	3.0%	0.8%	1.2%	34.7%	23.8%	7.1%	266.9%	59.7%
LSD Variety means 5 PC		727	3.4	0.7	1.8	1.5	2.0	9.9	11.9	14.2

#### Correlations

Test wt	0.65**									
Days to flowering	0.15	0.08								
Days to maturity	0.57**	0.41**	0.37**							
Leaf rust $\sqrt{\frac{X+1}{X}}$	-0.57**	-0.61**	0.05	-0.27						
Stem rust $\sqrt{\frac{X+1}{X}}$	-0.69**	-0.51**	-0.16	-0.47**	0.30 *					
Height	0.09	0.12	0.49**	-0.29 *	0.07	-0.15				
Lodging %	0.19	0.08	0.46**	0.25	-0.00	-0.10	0.53**			
Septoria nodorum %	0.09	0.14	-0.47**	0.05	-0.26	-0.10	-0.34 *	-0.28 *		

\* = Significant at the 5% level  
 \*\* = Significant at the 1% level

1/ No data available

TABLE 46

## AFRICA

SUDAN. Khashm El Girba. (Research Substation) Latitude: 15° 08' N. Longitude: 35° 4' E. Elevation: 440 meters above sea level.  
Cooperator: Dafalla Ahmed Dafalla.

Planting Date: 16 November 1969. Precipitation during test: not stated. Irrigation: 7 to 8 irrigations applied at 12 day intervals. Fertilizer: 49 Kg./Ha. Urea.  
General Comments: The winter was short with intermittent hot spells. A late outbreak of stem rust occurred. An aphid infestation was controlled by spraying Roger and Ekatin.

Variety Number	Variety or cross	Origin	Yield kg/ha	Days to flowering	Days to maturity	Stem rust	Height cms	1000 grain weight gms
23	LR64 - N10B x AN(3)	Sudan	4545	47.7	88.7	0	55.7	31.7
35	Tobari 66	Mexico	4325	42.3	82.7	0	60.0	30.3
44	36896-CJ54(2) x YT54A (H)	Sudan	4110	47.7	90.7	0	64.7	33.0
34	Inia 66	Mexico	3823	41.7	81.0	0	59.0	36.0
22	Son 64 x TzPP-Nai 60 (A)	Argentina	3790	43.7	83.3	0	62.7	35.7
28	Lerma Rojo 64A	Mexico	3780	43.3	84.0	0	67.7	28.7
4	Son 64 x Kl. Rend.	Argentina	3765	42.0	81.0	0	63.3	35.0
31	L1418-3463L1231x23L1274-111(L)	Sudan	3722	50.3	93.7	0	82.0	31.7
5	Giza 155	Egypt	3718	53.7	96.3	0	83.0	31.7
2	Gabo	Australia	3622	58.7	97.0	TR	70.0	31.3
32	Penjamo 82	Mexico	3540	42.7	81.7	0	60.3	33.7
47	Mengavi	Australia	3512	62.0	96.7	0	63.3	31.3
43	C-273	Pakistan	3415	55.0	95.0	TR	84.0	33.0
27	V-878	India	3413	37.0	78.3	0	49.7	32.7
16	Son 84A x SK <sub>E</sub> -LR64A	Argentina	3383	51.3	92.0	0	55.0	22.3
13	Huelquen	Chile	3377	41.0	80.7	0	69.0	34.7
37	NP 832	India	3353	43.7	84.7	TR	75.3	35.0
11	NP852	India	3330	43.7	85.3	TR	67.3	28.0
40	C-308	India	3255	58.7	98.3	TR	80.3	34.3
36	Triple Dirk	Australia	3163	50.3	92.3	0	80.3	36.3
25	NP881	India	3115	49.7	91.0	0	76.0	28.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	3055	42.0	81.0	0	60.0	32.7
20	C-591	India	2988	81.7	100.3	0	83.3	32.7
30	Nar(S)(2) x PJ(S)	Chile	2945	41.0	80.3	0	57.3	26.7
14	Crespo	Colombia	2873	42.3	83.7	0	74.0	33.3
48	PV-18, Indus	India Pak.	2850	41.7	82.7	0	60.3	30.7
7	Norceste 66	Mexico	2828	43.3	81.3	0	55.3	31.7
6	Siete Cerros	Mexico	2823	41.3	81.0	0	60.7	31.0
18	LR64 - Son 64	Mexico	2703	43.7	83.7	0	68.3	36.3
41	TzPP <sup>+</sup> Son64/LR64A-TzPPxAN(E)(A)	Mexico	2672	41.7	80.7	0	54.3	32.3
3	Nainari 60	Mexico	2670	64.7	103.3	TR	67.0	33.3
8	Victor I	Italy	2637	67.3	101.0	0	57.0	30.3

33	Chris	USA	2630	47.7	89.3	0	78.0	25.3
9	Bonza 55	Colombia	2598	54.7	94.3	TR	83.3	27.0
19	Ciano 67	Mexico	2590	37.0	77.7	0	45.0	35.3
17	Sonora 64	Mexico	2460	37.3	78.3	0	45.3	34.7
1	Pitic 62	Mexico	2263	75.0	113.7	0	64.7	28.7
49	(MD-K-Y)(WIS-SUP)	Kenya	2217	61.0	97.3	0	75.7	28.3
39	Napo 63	Colombia	2110	38.7	79.0	0	65.3	30.7
45	Norteno 67	Mexico	2003	42.0	81.0	0	66.3	35.0
50	Giza 144		1850	77.0	106.3	0	77.7	36.3
12	Crim	USA	1773	81.0	105.7	0	85.7	26.3
15	Taichung 31	Taiwan	1738	40.3	80.7	TR	62.3	31.7
10	Carazinho	Brazil	1527	76.7	106.3	TR	84.7	32.7
24	Kloka WM1353	Germany	1280	53.3	95.0	0	70.3	27.0
26	Selkirk	Canada	1148	83.7	120.7	5MR	74.3	26.0
38	Gaboto	Argentina	808	78.0	106.3	0	83.7	27.0
21	Justin	USA	765	88.0	120.3	0	88.3	14.7
29	Thatcher	USA	462	86.3	116.0	0	72.3	13.7
42	Manitou	Canada	282	87.3	121.3	0	64.7	13.0
Grand mean			2752	53.6	92.1	1.0	67.9	30.4
Standard error of grand mean			39	0.1	0.3	0.0	0.3	0.1
Coefficient of variation			17.0%	3.1%	3.9%	10.2%	5.6%	4.2%
LSD Variety means 5 PC			780	2.7	5.8	0.2	6.2	2.1

#### Correlations

Days to flowering	-0.67**					
Days to maturity	-0.61**	0.98**				
Stem rust $\sqrt{X+1}$	-0.13	0.22	0.27			
Height	-0.21	0.48**	0.50**	0.18		
1000 grain weight	0.60**	-0.60**	-0.62**	-0.00	-0.10	

\* = Significant at the 5% level  
 \*\* = Significant at the 1% level

TABLE 47

## AFRICA

U.A.R. (EGYPT), Shandaweil. Latitude: not specific. Longitude: not specific. Elevation: not specific.  
Cooperators: Dr. S. M. Dessouki and staff.

Planting Date: 11 November 1968. Precipitation during test: not stated. Irrigation: six irrigations applied. Fertilizer: 40 Kg./Ha. N.  
General Comments: Normal climatic conditions prevailed during the experiment. No rust infection was observed. There were no other insect, weed or pest problems.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to flowering	Height cms	Lodging (%)	Shattering 1/	1000 grain weight gms
6	Siete Cerros	Mexico	3883	79.0	90.3	93.3	0.0	1.0	40.0
1	Pitic 62	Mexico	3539	77.0	96.0	96.7	0.0	1.0	40.0
23	LR64 - N10B x AN(3)	Sudan	3533	79.0	96.7	90.0	0.0	1.0	37.0
34	Inia 66	Mexico	3377	79.0	85.0	101.7	0.0	1.0	44.0
2	Gabo	Australia	3355	77.0	91.3	120.0	0.0	1.0	41.0
8	Victor I	Italy	3355	80.0	105.0	91.7	0.0	1.0	39.0
32	Penjamo 62	Mexico	3316	75.0	87.7	95.0	0.0	1.0	45.0
7	Noroeste 66	Mexico	3311	76.0	91.0	95.0	0.0	1.0	42.0
22	Son 64 x TzPP - Nai 60 (A)	Argentina	3250	78.0	76.3	105.0	0.0	1.0	47.0
48	PV-18, Indus	India Pak.	3239	79.0	92.3	86.7	0.0	1.0	40.0
37	NP 832	India	3222	80.0	90.7	148.3	83.3	0.0	45.0
16	Son 64A x SK <sub>E</sub> -LR64A	Argentina	3211	79.0	93.3	86.7	0.0	1.0	37.0
17	Sonora 64	Mexico	3122	76.0	75.3	88.3	0.0	1.0	40.0
15	Taichung 31	Taiwan	3083	77.0	84.3	95.0	15.0	1.0	40.0
31	L1418-3463L1231x23L1274-111(L)	Sudan	3083	78.0	90.7	123.3	13.3	0.0	45.0
3	Nainari 60	Mexico	3055	77.0	94.3	116.7	25.0	0.0	41.0
18	LR64 - Son 64	Mexico	3016	76.0	92.0	106.7	0.0	1.0	44.0
5	Giza 155	Egypt	2994	78.0	88.0	115.0	0.0	0.0	45.0
47	Mengavi	Australia	2950	76.0	96.0	108.3	16.7	1.0	39.0
40	C-306	India	2944	81.0	94.7	135.0	100.0	0.0	45.0
50	Giza 155	Egypt	2939	76.0	88.0	120.0	26.7	0.0	51.0
39	Napo 63	Colombia	2922	76.0	81.3	115.0	26.7	1.0	38.0
43	C-273	Pakistan	2922	82.0	90.3	128.3	31.7	0.0	46.0
45	Norteño 67	Mexico	2861	75.0	88.0	98.3	0.0	1.0	44.0
13	Huelquen	Chile	2844	76.0	92.0	121.7	6.7	1.0	40.0
4	Son 64 x Kl. Rend.	Argentina	2844	78.0	87.0	90.0	0.0	1.0	40.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	2800	79.0	86.7	93.3	0.0	1.0	39.0
27	V-878	India	2744	77.0	78.0	88.3	0.0	1.0	33.0
30	Nar(S)(2) x PJ(S)	Chile	2716	74.0	78.0	81.7	0.0	1.0	34.0
11	NP852	India	2689	80.0	82.0	120.0	0.0	1.0	39.0
10	Carazinho	Brazil	2678	80.0	105.0	136.7	83.3	1.0	41.0
28	Lerma Rojo 64A	Mexico	2666	77.0	87.0	95.0	0.0	1.0	40.0

14	Crespo	Colombia	2633	78.0	90.3	128.3	43.3	1.0	36.0
38	Gaboto	Argentina	2622	81.0	106.0	130.0	36.7	1.0	34.0
41	TzPP -Son64/LR64A -TzPPxAN(E)(A)	Mexico	2611	79.0	89.3	93.3	0.0	1.0	36.0
44	36896-CJ54(2) x YT54A (H)	Sudan	2600	78.0	94.7	100.0	0.0	0.0	42.0
36	Triple Dirk	Australia	2555	79.0	92.3	138.3	35.0	1.0	47.0
19	Ciano 67	Mexico	2539	78.0	72.3	96.7	0.0	1.0	46.0
25	NP881	India	2416	77.0	89.3	126.7	51.7	0.0	40.0
12	Crim	USA	2372	79.0	96.3	143.3	0.0	1.0	36.0
9	Bonza 55	Colombia	2366	78.0	94.0	126.7	90.0	0.0	36.0
35	Tobari 66	Mexico	2322	79.0	84.3	93.3	0.0	1.0	42.0
24	Kloka WM1353	Germany	2300	77.0	96.7	115.0	0.0	1.0	38.0
33	Chris	USA	2294	77.0	94.3	135.0	18.3	1.0	34.0
20	C-591	India	2205	83.0	96.3	143.3	40.0	0.0	41.0
49	(MD-K-Y)(WIS-SUP)	Kenya	2183	81.0	104.0	125.0	36.7	0.3	37.0
21	Justin	USA	1994	79.0	112.3	131.7	35.0	1.0	35.0
29	Thatcher	USA	1900	80.0	113.7	123.3	33.3	1.0	32.0
42	Manitou	Canada	1744	78.0	116.3	136.7	83.3	1.0	28.0
26	Selkirk	Canada	1622	78.0	114.3	130.0	100.0	1.0	36.0

Grand mean	2795	78.1	92.2	112.1	20.6	0.8	39.9
Standard error of grand mean	33	(only 1 rep.)	0.1	0.5	1.8	0.0	(only 1 rep.)
Coefficient of variation	15.0%		1.9%	5.6%	104.7%	10.6%	
LSD Variety means 5 PC	669		2.9	10.2	35.3	0.1	

#### Correlations

Test wt	-0.19						
Days to flowering	-0.46**	0.38**					
Height	-0.50**	0.42**	0.49**				
Lodging %	-0.47**	0.34 *	0.52**	0.71**			
Shattering	0.04	-0.28	-0.02	-0.41**	-0.40**		
1000 grain weight	0.48**	-0.04	-0.46**	-0.03	-0.15	-0.38**	

\* = Significant at the 5% level

\*\* = Significant at the 1% level

1/ Incidence

TABLE 48

## AFRICA

U.A.R. (EGYPT). Giza. Latitude: 31° N. Longitude: 30° E. Elevation: 21 meters above sea level.  
Cooperators: Dr. S. M. Dessouki and staff.

Planting Date: 14 November 1968. Precipitation during test: not stated. Irrigation: 5 irrigations applied. Fertilizer: 16.2 Kg./Ha. N.  
General Comments: Climatic conditions were normal. There was a natural infection of stripe, leaf and stem rust.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to flowering	Days to maturity	Stripe rust	Leaf rust	Stem rust	Height cms	Lodging (%)	Shattering (%)	1000 grain weight gms	Bird damage (%)
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	4933	81.0	87.7	143.7	10MS	R	R	100.0	35.0	81.7	32.0	1/
48	PV-18, Indus	India Pak.	4838	78.0	93.7	145.3	5MS	5S	R	99.0	1.7	75.0	32.0	1/
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	4727	83.0	90.3	142.3	R	TR-R	R	103.0	53.3	30.0	33.0	1/
27	V-878	India	4683	81.0	83.3	134.0	15MS	TR-R	R	91.7	0.0	23.3	29.0	1/
35	Tobari 66	Mexico	4544	82.0	88.0	135.0	TR-MS	R	R	105.3	0.0	73.3	32.0	1/
44	36896-CJ54(2) x YT54A (H)	Sudan	4527	79.0	96.0	143.0	10MS	10MR	R	111.7	30.0	61.7	36.0	1/
17	Sonora 64	Mexico	4488	80.0	80.7	128.3	R	TRR	R	93.3	0.0	63.3	34.0	1/
22	Son64 x TzPP - Nai 60 (A)	Argentina	4405	80.0	88.7	134.0	R	TR-MR	R	104.0	0.0	65.0	37.0	1/
28	Lerma Rojo 64A	Mexico	4361	81.0	88.0	134.3	TR-MS	TR-R	R	113.3	30.0	15.0	31.0	1/
7	Noroeste 66	Mexico	4305	76.0	92.0	130.3	5MS	TR-R	R	92.3	0.0	76.7	28.0	1/
6	Siete Cerros	Mexico	4255	79.0	94.3	134.0	TR-S	TR-MS	R	97.3	0.0	70.0	32.0	1/
47	Mengavi	Australia	4205	77.0	94.0	142.7	TR-R	20S	5MS	111.7	10.0	56.7	32.0	1/
34	Inia 66	Mexico	4166	81.0	85.0	132.0	R	R	R	107.7	0.0	31.7	32.0	1.7
5	Giza 155	Egypt	4122	80.0	91.3	137.7	5MR	TR-MR	R	116.7	8.3	6.7	31.0	1/
39	Napo 63	Colombia	4122	80.0	83.0	132.0	R	TR-R	R	106.0	23.3	68.3	34.0	1/
40	C-306	India	4066	81.0	92.0	145.7	10S	15S	R	110.7	23.3	31.7	37.0	1/
11	NP852	India	4033	83.0	87.0	133.3	5MS	TR-MS	R	119.7	43.3	23.3	34.0	1/
32	Penjamo 62	Mexico	3961	78.0	91.7	137.0	TR-MR	TR-MR	R	106.7	46.7	31.7	30.0	5.0
30	Nar(S)(2) x PJ(S)	Chile	3888	80.0	85.3	132.7	TR-R	20MS	R	96.7	23.3	60.0	31.0	1/
19	Ciano 67	Mexico	3800	82.0	80.0	128.3	R	TRR	R	93.3	0.0	55.0	38.0	1/
43	C-273	Pakistan	3755	84.0	89.3	143.7	10S	15S	R	119.0	25.0	20.0	44.0	1/
25	NP881	India	3733	81.0	92.0	119.0	R	5MR	R	123.3	26.7	18.3	42.0	3.3
23	LR64 - N10B x AN(3)	Sudan	3650	78.0	96.0	133.7	TR-MR	20S	R	90.0	1.7	16.7	23.0	1/
18	LR64 - Son 64	Mexico	3650	77.0	92.0	145.0	R	TRR	R	112.3	26.7	73.3	36.0	3.3
4	Son 64 x Kl. Rend.	Argentina	3605	82.0	91.3	134.0	R	TR-R	R	104.3	25.0	43.3	35.0	6.7
16	Son 64A x SK <sub>E</sub> -LR64A	Argentina	3472	73.0	95.3	131.3	R	TRR	R	88.3	0.0	53.3	23.0	1/
15	Taichung 31	Taiwan	3422	77.0	85.3	129.0	10MR	30MS	R	104.0	0.0	66.7	28.0	1/
31	L1418-3463L1231x23L1274-111(L)	Sudan	3255	79.0	91.0	143.3	5MS	5MR	R	111.7	3.3	5.0	34.0	1/
36	Triple Dirk	Australia	3116	78.0	97.3	143.7	R	R	R	132.3	20.0	15.0	37.0	1.7
1	Pitic 62	Mexico	3066	74.0	97.7	141.3	R	40S	5S	112.3	83.3	71.7	28.0	26.7
13	Huelquen	Chile	3061	78.0	92.3	136.7	R	R	R	112.7	0.0	28.3	28.0	1/
8	Victor I	Italy	2977	78.0	103.7	144.0	R	TR-MS	R	84.3	0.0	80.0	33.0	1/



45 Norteño 67	Mexico	2705	81.0	88.7	143.3	10MS	TR-MR	R	113.0	0.0	66.7	40.0	30.0
3 Nainari 60	Mexico	2694	74.0	100.7	143.3	R	5S	5MS	126.0	48.3	31.7	27.0	1/
50 Giza 156		2694	82.0	95.0	146.7	R	R	R	130.7	50.0	8.3	51.0	16.7
14 Crespo	Colombia	2516	78.0	89.7	138.0	R	R	R	110.0	33.3	50.0	26.0	1/
20 C-591	India	2500	83.0	95.7	145.0	5MR	5MR	R	119.3	13.3	10.0	30.0	1/
37 NP 832	India	2472	80.0	89.7	146.3	TR-MR	70S	R	128.3	35.0	45.0	36.0	1/
49 (MD-K-Y)(WIS-SUP)	Kenya	2433	82.0	103.3	144.7	TR-MR	TR-MS	R	129.3	86.7	56.7	34.0	1/
2 Gabo	Australia	2361	75.0	93.7	138.0	15MS	10S	TR-MR	116.0	40.0	50.0	30.0	61.7
38 Gaboto	Argentina	2144	74.0	101.3	145.3	TR-MR	TR-MR	R	125.3	33.3	21.7	18.0	1/
33 Chris	USA	1772	73.0	97.3	140.3	5MS	R	R	130.0	31.7	25.0	20.0	1.7
9 Bonza 55	Colombia	1766	74.0	97.3	138.7	R	TR-MR	R	130.7	50.0	75.0	29.0	1/
24 Kloka WM1353	Germany	1678	65.0	102.0	143.0	R	R	R	112.3	0.0	38.3	21.0	1/
10 Carazinho	Brazil	1667	67.0	101.7	146.0	R	TRR	R	131.7	16.7	31.7	20.0	1/
12 Crim	USA	1078	70.0	103.0	136.3	R	R	R	122.3	35.0	70.0	20.0	30.0
26 Selkirk	Canada	350	1/	121.7	161.7	R	15MS	R	107.7	3.3	30.0	1/	30.0
21 Justin	USA	191	1/	114.0	163.7	R	R	R	115.0	1.7	28.3	1/	65.0
29 Thatcher	USA	92	1/	125.7	153.0	TR-MS	100S	R	106.7	26.7	1/	1/	95.0
42 Manitou	Canada	26	1/	119.3	158.7	R	TR-R	R	112.3	10.0	1/	1/	63.3

Grand mean		3167	78.2	94.7	140.0	1.5	2.2	1.0	110.8	21.1	42.6	31.5	8.8
Standard error of grand mean		68	(only 1	0.3	0.5	0.1	0.1	0.0	0.6	2.1	1.0	(only 1	1.6
Coefficient of variation		26.0%	rep.)	3.9%	4.5%	49.4%	44.8%	18.1%	6.2%	123.9%	27.9%	rep.)	223.6%
LSD Variety means 5 PC		1364		6.1	10.4	1.2	1.6	0.3	11.3	42.7	19.4		32.3

#### Correlations

Test wt	0.73**												
Days to flowering	-0.82**	-0.81**											
Days to maturity	-0.64**	-0.68**	0.75**										
Stripe rust $\sqrt{X+1}$	0.33 *	0.19	-0.27	-0.08									
Leaf rust $\sqrt{X+1}$	-0.15	-0.16	0.15	0.10	0.16								
Stem rust $\sqrt{X+1}$	0.03	0.03	0.07	0.07	-0.07	0.25							
Height	-0.44**	-0.03	0.24	0.31 *	-0.16	0.06	0.11						
Lodging %	-0.11	0.14	0.09	0.11	-0.18	0.28 *	0.33 *	0.53**					
Shattering %	0.32 *	0.31 *	-0.31 *	-0.28	0.06	-0.07	0.12	-0.36**	-0.01				
1000 grain weight	0.71**	0.90**	-0.77**	-0.59**	0.16	-0.12	-0.00	0.01	0.15	0.28 *			
Bird damage %	-0.68**	-0.77**	0.68**	0.53**	-0.14	0.27	0.01	0.08	0.06	-0.24	-0.63**		

\* = Significant at the 5% level

\*\* = Significant at the 1% level

1/ No data available

TABLE 49

## AFRICA

U.A.R. (EGYPT). Sakha. Latitude: 31° N. Longitude: 30° E. Elevation: 21 meters above sea level.  
Cooperators: Dr. S. M. Dessouki and staff.

Planting Date: 22 November 1968. Precipitation during test: not stated. Irrigation: 5 irrigations applied. Fertilizer: 40 Kg./Ha. N as Amm. Sulphate.  
General Comments: Climatic conditions were normal. The nursery was grown under natural infection. The leaf rust epidemic was satisfactory, but the distribution of stripe rust was irregular. No stem rust was observed. No major insect, weed or pest problems.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to flowering	Days to maturity	Stripe rust	Stem rust	Height cms	Lodging 1/	Shattering 1/	1000 grain weight gms
45	Norteflo 67	Mexico	4999	81.0	92.7	145.3	0	TR	124.7	0.4	1.0	46.0
13	Huelquen	Chile	4944	79.0	93.0	143.7	0	TR	126.3	0.5	0.4	43.0
16	Sonora 64A x SK <sub>E</sub> - LR64A	Argentina	4911	82.0	95.7	147.0	0	TR	103.3	0.2	0.8	39.0
7	Noroeste 66	Mexico	4833	81.0	94.7	142.7	TMR	0	107.7	0.2	1.0	42.0
48	PV-18, Indus	India Pak.	4733	80.0	95.7	149.3	0	50S	108.0	0.2	0.4	41.0
34	Inia 66	Mexico	4677	83.0	86.0	140.3	0	TR	113.3	0.2	1.0	47.0
18	LR64 - Son 64	Mexico	4505	83.0	93.0	144.0	0	TR	123.0	0.3	1.0	45.0
44	36896-CJ54(2) x YT54A (H)	Sudan	4472	79.0	95.3	148.7	10S	TMR	128.7	0.7	0.4	48.0
22	Son 64 x TzPP - Nai 60 (A)	Argentina	4361	81.0	92.0	143.3	5S	TMR	117.3	0.2	1.0	45.0
30	Nar(S)(2) x PJ(S)	Chile	4255	80.0	82.7	140.3	0	80S	101.0	0.2	1.0	38.0
17	Sonora 64	Mexico	4211	82.0	82.0	138.7	0	TMS	95.7	0.2	1.0	41.0
19	Ciano 67	Mexico	4088	83.0	83.0	140.0	0	TR	110.3	0.3	1.0	43.0
8	Victor I	Italy	4077	80.0	106.0	155.7	0	10S	96.3	0.2	1.0	39.0
27	V-878	India	4050	82.0	86.0	143.3	0	0	103.3	0.2	0.8	33.0
28	Lerma Rojo 64A	Mexico	4050	81.0	87.7	140.7	0	TR	124.3	0.3	0.2	44.0
4	Son 64 x Kl. Rend.	Argentina	4044	81.0	93.7	144.3	0	0	115.7	0.2	1.0	42.0
6	Siete Cerros	Mexico	4044	77.0	97.0	151.0	0	80S	116.0	0.2	1.0	35.0
23	LR64 - N10B x AN(3)	Sudan	4016	80.0	98.3	153.7	0	40S	101.7	0.3	0.4	36.0
32	Penjamo 62	Mexico	4011	79.0	93.3	146.3	0	10S	114.7	0.3	1.0	43.0
5	Giza 155	Egypt	3839	81.0	92.7	143.7	0	40S	122.3	0.3	0.2	42.0
47	Mengavi	Australia	3800	77.0	93.3	147.0	10S	60S	123.3	0.3	0.2	40.0
1	Pitic 62	Mexico	3739	75.0	96.0	147.3	0	15MS	124.7	0.5	0.8	36.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	3711	82.0	93.3	146.3	0	0	115.0	0.5	1.0	38.0
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	3705	82.0	95.3	145.3	0	0	115.7	0.5	1.0	40.0
2	Gabo	Australia	3633	80.0	95.7	147.3	5MS	30MS	133.7	0.5	0.4	40.0
31	L1418-3463L1231x23L1274-111(L)	Sudan	3611	79.0	94.0	144.7	0	50S	128.0	0.3	0.2	44.0
3	Nainari 60	Mexico	3539	81.0	97.0	148.0	0	30S	131.0	0.3	0.4	45.0
35	Tobari 66	Mexico	3505	82.0	90.3	143.3	0	TR	111.7	0.2	0.2	40.0
38	Gaboto	Argentina	3472	80.0	103.3	148.0	TR	0	139.7	1.0	0.2	34.0
37	NP 832	India	3444	82.0	94.0	149.3	0	70S	143.3	0.3	0.2	39.0
40	C-306	India	3294	82.0	92.7	146.3	0	30S	128.7	0.6	0.2	46.0
14	Cespa	Colombia	3261	81.0	91.3	144.7	0	TR	123.0	0.5	0.2	38.0

36 Triple Dirk	Australia	3250	79.0	97.0	148.3	0	TR	144.7	0.6	0.2	38.0
11 NP852	India	3239	82.0	91.0	140.7	0	90S	119.0	0.5	1.0	37.0
10 Carazinho	Brazil	3194	80.0	104.7	152.3	0	0	145.3	0.9	0.2	45.0
15 Taichung 31	Taiwan	3105	78.0	90.3	144.0	0	90VS	126.7	0.3	1.0	34.0
50 Giza 156	Egypt	3072	81.0	96.3	147.3	5MS	TR	141.7	0.5	0.2	54.0
39 Napo 63	Colombia	2972	78.0	86.3	143.3	0	80S	122.0	0.6	0.4	38.0
43 C-273	Pakistan	2789	83.0	94.7	145.3	0	15S	134.0	0.5	0.2	45.0
12 Crim	USA	2694	78.0	102.3	151.0	TMS	50S	138.3	0.9	0.2	36.0
25 NP881	India	2644	79.0	94.7	143.7	0	40S	139.7	0.6	0.2	43.0
20 C-591	India	2578	82.0	94.7	147.0	0	5S	126.7	0.7	0.2	45.0
24 Kloka WM1353	Germany	2483	77.0	100.3	153.7	0	60S	121.7	0.2	0.2	43.0
49 (MD-K-Y)(WIS-SUP)	Kenya	2450	79.0	106.0	152.3	0	10MS	131.0	0.8	0.2	37.0
9 Bonza 55	Colombia	2372	76.0	96.3	149.0	0	60S	137.7	0.7	0.2	35.0
33 Chris	USA	2128	78.0	97.3	148.3	0	0	138.7	0.7	0.2	31.0
21 Justin	USA	789	76.0	124.0	163.3	0	10MS	134.7	0.2	0.2	29.0
26 Selkirk	Canada	672	74.0	125.3	164.7	0	80S	136.3	0.2	0.8	31.0
42 Manitou	Canada	500	75.0	129.0	165.7	0	0	133.7	0.3	0.4	27.0
29 Thatcher	USA	350	0.0	128.7	166.7	0	80S	130.7	0.2	0.2	25.0

Grand mean	3422	79.9	96.7	147.7	1.2	4.0	123.5	0.2	0.4	39.7
Standard error of grand mean	59	(only 1 rep.)	0.2	0.2	0.0	0.1	0.7	0.0	(only 1 rep.)	(only 1 rep.)
Coefficient of variation	21.0%	rep.)	2.1%	1.8%	44.2%	17.3%	7.1%	157.0%	rep.)	rep.)
LSD Variety means 5 PC	1171		3.3	4.8	0.9	1.1	14.3	0.6		

#### Correlations

Test wt	0.49**									
Days to flowering	-0.77**	-0.54**								
Days to maturity	-0.74**	-0.53**	0.96**							
Stripe rust $\sqrt{X+1}$	0.05	0.01	0.00	0.02						
Leaf rust $\sqrt{X+1}$	-0.30 *	-0.31 *	0.10	0.19	0.08					
Height	-0.55**	-0.15	0.41**	0.34 *	0.12	0.10				
Lodging	-0.16	0.09	0.04	0.00	-0.06	-0.11	0.54**			
Shattering	0.40**	0.15	-0.26	-0.28 *	-0.18	-0.12	-0.60**	-0.39**		
1000 grain weight	0.60**	0.47**	-0.58**	-0.59**	0.04	-0.29 *	-0.06	0.03	-0.00	

\* = Significant at the 5% level  
 \*\* = Significant at the 1% level

1/ Incidence

TABLE 50

## AFRICA

NIGERIA. Gaboru, N.E. Latitude: 12° 30' N. Longitude: 14° E. Elevation: 310 meters above sea level.  
Cooperators: Ministry of Natural Resources.

Planting Date: 3 December 1968. Precipitation during test: not stated. Irrigation: 13 irrigations, 50.8 mm Delta at 7 day intervals. Fertilizer: Amm. Sulphate applied 3 times.

General Comments: Climatic conditions were very dry, with low humidity. Night temperatures low (55° F). No disease was observed. There were no insect, weed or pest problems.

Variety Number	Variety or cross	Origin	Yield kg/ha	Days to flowering	Days to maturity	Height cms
4	Son 64 x Kl. Rend.	Argentina	3193	51.0	85.0	75.7
28	Lerma Rojo 64A	Mexico	2784	56.0	88.3	80.3
45	Norteno 67	Mexico	2663	52.3	84.3	72.0
30	Nar(S) (2) x PJ(S)	Chile	2572	49.0	86.0	71.3
14	Crespo	Colombia	2557	57.0	89.0	88.0
7	Noroeste 66	Mexico	2527	55.3	85.3	70.3
46	TzPP-Son64/LR64A-TzPP x AN(E)(B)	Mexico	2527	51.0	87.0	74.3
48	PV-18, Indus	India Pak.	2497	55.0	86.7	69.0
39	Napo 63	Colombia	2482	47.0	85.3	87.0
27	V-878	India	2467	46.0	84.7	65.7
15	Taichung 31	Taiwan	2406	48.7	84.3	74.7
6	Siete Cerros	Mexico	2376	52.7	84.7	69.3
17	Sonora 64	Mexico	2340	46.3	85.0	70.3
19	Ciano 67	Mexico	2315	46.0	84.3	67.3
32	Penjamo 62	Mexico	2285	57.0	87.3	72.7
41	TzPP-Son 64/LR64A-TzPP x AN(E)(A)	Mexico	2209	53.3	85.7	73.7
23	LR64 - N10B x AN(3)	Sudan	2149	60.7	90.3	59.3
22	Son64 x TzPP-Nai 60 (A)	Argentina	2119	49.7	85.7	83.7
37	NP 832	India	2103	52.0	88.0	89.7
31	L1418-3463L1231 x 23L1274-111(L)	Sudan	2103	61.3	91.7	88.0
34	Inia 66	Mexico	2073	52.7	85.0	73.0
13	Huelquen	Chile	2028	51.3	87.0	83.0
35	Tobari 66	Mexico	1937	53.7	88.0	74.7
36	Triple Dirk	Australia	1922	62.3	91.7	87.0
11	NP 852	India	1922	49.0	85.0	82.3
5	Giza 155	Egypt	1892	60.7	89.7	78.7
43	C-273	Pakistan	1846	61.3	89.7	89.7
47	Mengavi	Australia	1725	62.0	90.7	68.0
2	Gabo	Australia	1695	62.0	91.0	75.7
18	LR64 - Son64	Mexico	1634	52.7	85.7	72.3
40	C-306	India	1589	71.0	93.0	86.3
25	NP881	India	1498	60.7	89.0	74.7

33	Chris	USA	1468	67.0	91.7	83.0
16	Son 64A x SK <sub>E</sub> -LR64A	Argentina	1407	60.0	89.0	63.7
24	Kloka WM1353	Germany	1317	69.0	91.0	73.0
50	Florence Aurore 8193		1301	56.3	89.0	84.7
9	Bonza 55	Colombia	1180	70.0	92.0	81.3
20	C-591	India	1044	70.0	91.7	83.0
1	Pitic 62	Mexico	968	69.3	93.0	73.0
10	Carazinho	Brazil	953	67.7	96.7	81.3
3	Nainari 60	Mexico	908	63.0	91.3	73.7
49	(MD-K-Y) (WIS-SUP)	Kenya	908	71.3	94.0	82.0
8	Victor 1	Italy	878	65.7	93.3	61.3
12	Crim	USA	863	72.0	98.0	84.3
38	Gaboto	Argentina	847	72.0	93.3	85.3
44	36896-CJ54(2) x YT54A (H)	Sudan	772	71.7	91.0	70.3
21	Justin	USA	1/	1/	101.0	69.7
29	Thatcher	USA	1/	1/	1/	74.0
26	Selkirk	Canada	1/	74.7	102.0	78.0
42	Manitou	Canada	1/	1/	1/	67.0
Grand mean			1541	58.9	89.4	76.3
Standard error of grand mean			54	0.3	0.1	0.5
Coefficient of variation			31.0%	5.4%	1.6%	8.3%
LSD Variety means 5 PC			1003	5.2	2.3	10.4

#### Correlations

Days to flowering	0.34 *		
Days to maturity	0.38**	0.74**	
Height	0.02	0.28	0.19

\* = Significant at the 5% level

\*\* = Significant at the 1% level

1/ No data available

TABLE 51

## AFRICA

TUNISIA. Tunis. (I.N.R.A.T.) Latitude: 37°  
Cooperators: Accelerated Cereal Production Project.

Planting Date: 3 December 1968. Precipitation during test: 300 mm. Irrigation: none. Fertilizer: 100 Kg./Ha. Amm. Nitrate and 45 Kg./Ha. Superphosphate.  
General Comments: Moderate temperatures with occasional wind. Some days of strong winds prior to heading and maturity. Good distribution of rainfall except during the period prior to maturity. Good development of Powdery mildew and some Septoria infection. Stripe, leaf and stem rust developed late. Birds were a problem.

Scoring notes taken: Mildew - 1 to 15 May, rusts - 1 to 15 June, Septoria - 1 to 15 June, lodging and shattering - 20 June.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to flowering	Stripe rust 1/	Leaf rust 1/	Stem rust 1/	Height cms	Lodging 1/	1000 grain weight gms	Mildew 1/	Septoria 2/ 1/
30	Nar(S)(2) x PJ(S)	Chile	3873	79.0	106.7	1.0	1.0	1.0	89.7	0.0	33.0	5.0	30.0
35	Tobari 66	Mexico	3463	82.0	109.7	1.0	1.0	1.0	96.3	0.0	38.0	0.3	0.0
27	V-878	India	3460	81.0	108.0	1.0	1.0	1.0	84.7	0.0	36.0	5.3	6.7
	4 Son 64 x Kl. Rend.	Argentina	3351	80.0	112.0	1.0	1.0	1.0	98.7	0.0	35.0	6.7	0.0
19	Ciano 67	Mexico	3211	82.0	108.0	1.0	1.0	1.0	88.3	0.0	34.0	5.7	0.0
34	Inia 66	Mexico	3201	81.0	110.0	1.0	1.0	1.0	101.7	0.0	40.0	8.7	0.0
	6 Siete Cerros	Mexico	3179	80.0	119.7	1.0	2.5	1.0	102.3	0.0	33.0	3.7	56.7
48	PV-18, Indus	India Pak.	3152	80.0	119.3	1.0	1.0	1.0	103.3	0.0	34.0	2.7	23.3
28	Lerma Rojo 64A	Mexico	3099	79.0	112.0	1.0	1.0	1.0	106.0	0.0	34.0	5.7	6.7
23	LR64 - N10B x AN(3)	Sudan	3091	73.0	120.0	1.0	3.3	1.0	93.0	0.0	27.0	7.3	0.0
44	36896-CJ54(2) x YT54A (H)	Sudan	3040	79.0	110.0	1.0	1.0	1.0	102.0	0.0	36.0	7.0	6.7
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	3037	82.0	116.0	1.0	1.0	1.0	104.7	0.0	33.0	9.0	3.3
47	Mengavi	Australia	3031	78.0	118.0	1.0	2.2	1.0	104.3	0.0	33.0	1.7	46.7
18	LR64 - Son 64	Mexico	2979	80.0	112.0	1.0	1.0	1.0	99.3	0.0	39.0	6.7	10.0
	1 Pitic 62	Mexico	2963	75.0	117.0	1.0	1.0	1.0	102.0	0.0	35.0	7.7	0.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	2929	82.0	112.3	1.0	1.0	1.0	104.0	0.0	34.0	7.3	0.0
17	Sonora 64	Mexico	2925	79.0	108.3	2.5	1.0	1.0	90.3	0.0	33.0	6.3	13.3
45	Norteño 67	Mexico	2872	80.0	112.0	1.8	1.0	1.0	103.3	0.0	38.0	2.0	6.7
22	Son 64 x TzPP - Nai 60 (A)	Argentina	2860	81.0	113.3	1.0	1.0	1.0	99.7	0.0	37.0	8.0	0.0
32	Penjamo 62	Mexico	2840	81.0	117.3	1.0	1.0	1.0	102.7	0.0	32.0	3.0	0.0
13	Huelquen	Chile	2821	82.0	116.3	1.0	1.0	1.0	107.7	0.3	36.0	7.7	0.0
	7 Noroeste 66	Mexico	2805	78.0	114.3	1.0	1.0	1.0	95.3	0.0	34.0	6.7	0.0
	2 Gabo	Australia	2773	78.0	115.0	1.0	1.0	1.0	103.3	0.0	33.0	5.7	56.7
31	L1418-3463L1231x23L1274-111(L)	Sudan	2712	82.0	118.0	1.0	1.0	1.0	107.3	0.0	37.0	3.7	13.3
	5 Giza 155	Egypt	2583	82.0	117.7	1.0	1.0	1.0	103.3	0.0	42.0	2.0	10.0
	8 Victor I	Italy	2551	80.0	126.3	1.0	3.0	1.0	91.0	0.0	36.0	8.3	0.0
14	Crespo	Colombia	2516	79.0	115.3	1.0	1.0	1.0	112.0	0.0	30.0	5.3	0.0
40	C-306	India	2488	82.0	116.0	1.0	1.0	1.0	106.0	0.0	36.0	7.0	56.7
33	Chris	USA	2471	83.0	120.0	1.0	1.0	1.0	123.0	0.0	30.0	3.7	0.0
16	Son 64A x SK <sub>E</sub> -LR64A	Argentina	2453	76.0	117.0	1.0	1.0	1.0	90.7	0.0	27.0	9.0	20.0
25	NP881	India	2447	80.0	118.3	1.0	1.0	1.0	110.3	0.0	34.0	2.3	0.0
38	Gaboto	Argentina	2437	82.0	124.0	1.0	1.0	1.0	119.0	0.0	27.0	7.3	0.0

3 Nainari 60	Mexico	2415	78.0	117.0	1.0	1.0	1.0	107.7	0.0	35.0	6.7	10.0
39 Napo 63	Colombia	2372	78.0	111.0	1.0	1.0	1.0	103.3	0.0	33.0	7.3	13.3
15 Taichung 31	Taiwan	2369	78.0	110.7	1.0	1.8	1.0	102.7	0.0	29.0	7.3	0.0
20 C-591	India	2289	84.0	116.3	1.0	3.4	1.0	109.0	0.0	38.0	5.7	23.3
11 NP852	India	2095	83.0	111.3	1.0	1.0	1.0	99.0	0.0	32.0	5.7	53.3
24 Kloka WM1353	Germany	2063	80.0	126.0	1.0	4.6	1.0	108.3	0.0	25.0	1.3	0.0
43 C-273	Pakistan	2004	84.0	117.0	1.0	1.0	1.0	113.3	0.0	41.0	5.7	20.0
36 Triple Dirk	Australia	1981	78.0	124.0	1.8	1.0	1.0	118.3	0.0	31.0	6.7	0.0
9 Bonza 55	Colombia	1947	76.0	118.7	1.0	1.7	1.0	119.0	0.0	31.0	7.7	0.0
50 Florence Aurore		1944	83.0	114.7	1.0	1.0	1.0	109.3	0.0	33.0	3.0	6.7
37 NP 832	India	1931	78.0	117.3	1.0	1.7	1.0	118.0	0.0	30.0	7.3	6.7
12 Crim	USA	1761	77.0	126.7	1.0	1.0	1.0	117.0	0.3	27.0	2.0	0.0
21 Justin	USA	1481	79.0	143.7	1.0	1.8	1.0	115.0	0.0	30.0	4.0	0.0
42 Manitou	Canada	1471	75.0	143.3	2.8	1.0	1.0	111.3	0.0	24.0	2.3	0.0
10 Carazinho	Brazil	1455	79.0	122.3	1.0	1.8	1.0	119.7	0.0	28.0	9.0	0.0
26 Selkirk	Canada	1253	72.0	136.0	1.0	2.9	1.0	112.3	0.0	27.0	3.0	13.3
29 Thatcher	USA	1164	76.0	133.7	3.0	3.7	1.0	110.7	0.0	23.0	6.3	0.0
49 (MD-K-Y)(WIS-SUP)	Kenya	1076	76.0	130.7	1.0	1.0	1.0	107.3	0.0	26.0	0.0	0.0
Grand mean		2530	79.4	118.0	1.1	1.4	1.0	104.9	0.0	32.8	5.4	10.3
Standard error of grand mean		26	(only 1	0.3	0.1	0.1	(only 1	0.3	0.0	(only 1	0.2	1.0
Coefficient of variation		13.0%	rep.)	3.2%	60.4%	67.4%	rep.)	4.0%	866.0%	rep.)	36.3%	122.4%
LSD Variety means 5 PC		526		6.2	1.1	1.6		6.8	0.2		3.2	20.5

#### Correlations

Test wt	0.33 *											
Days to flowering	-0.75**	-0.44**										
Stripe rust	-0.30 *	-0.27	0.34 *									
Leaf rust	-0.30 *	-0.26	0.41**	0.13								
Stem rust	0.00	0.00	0.00	0.00	0.00							
Height	-0.86**	-0.03	0.52**	0.05	0.07	0.00						
Lodging	-0.08	0.00	0.09	-0.06	-0.10	0.00	0.17					
1000 grain weight	0.59**	0.60**	-0.61**	-0.33 *	-0.38**	0.00	-0.33 *	-0.06				
Mildew	0.15	-0.02	-0.29 *	-0.07	-0.06	0.00	-0.13	-0.05	0.09			
Septoria	0.16	0.14	-0.18	-0.12	0.01	0.00	-0.17	-0.13	0.17			-0.08

\* = Significant at the 5% level

\*\* = Significant at the 1% level

1/ Incidence

2/ Septoria sp not known

TABLE 52

## AFRICA

ALGERIA. Tessala, Sidi Bel-Abbee. Latitude: 0° 45' W. Longitude: 35° 20' N. Elevation: 650 meters above sea level.  
Cooperator: Ante Golusic.

Planting Date: 15 November 1969. Precipitation during test: 550 mm. Irrigation: not stated. Fertilizer: 22 units N as 22% Amm. Nitrate and 32 units P<sub>2</sub>O<sub>5</sub> as 16% Superphosphate.

General Comments: This was an extremely rainy growing season.

Variety Number	Variety or cross	Origin	Yield kg/ka	Days to maturity	Height cms
8	Victor I	Italy	6530	181.0	80.0
16	Sonora 64A x SK <sub>E</sub> -LR64A	Argentina	5466	181.0	70.0
23	LR64 - N10B x AN(3)	Sudan	5408	181.0	77.0
10	Carazinbo	Brazil	5342	168.0	110.0
36	Triple Dirk	Australia	5108	168.0	90.0
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	4633	181.0	95.0
12	Crim	USA	4583	168.0	95.0
24	Kloka WM1353	Germany	4550	168.0	75.0
7	Noroeste 66	Mexico	4483	181.0	75.0
38	Gaboto	Argentina	4466	168.0	90.0
6	Siete Cerros	Mexico	4455	181.0	80.0
22	Son64 x TzPP-Nai 60 (A)	Argentina	4425	181.0	92.0
32	Penjamo 62	Mexico	4333	168.0	80.0
30	Nar(S)(2) x PJ(S)	Chile	4325	181.0	70.0
35	Tobari 66	Mexico	4275	181.0	78.0
1	Pitic 62	Mexico	4216	181.0	80.0
3	Nainari 60	Mexico	4175	181.0	100.0
25	NP881	India	3983	181.0	110.0
14	Crespo	Colombia	3983	168.0	95.0
33	Chris	USA	3966	168.0	95.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	3958	168.0	88.0
17	Sonora 64	Mexico	3910	181.0	70.0
13	Huelquen	Chile	3900	168.0	95.0
15	Taichung 31	Taiwan	3775	181.0	85.0
34	Inia 66	Mexico	3742	181.0	78.0
18	LR64 - Son64	Mexico	3650	181.0	86.0
37	NP 832	India	3608	168.0	115.0
44	36896-CJ54(2) x YT54A (H)	Sudan	3592	181.0	86.0
50	(Baroota)		3575	168.0	135.0
4	Son 64 x Kl. Rend.	Argentina	3508	181.0	75.0
39	Napo 63	Colombia	3483	181.0	80.0
9	Bonza 55	Colombia	3425	181.0	95.0



48	PV-18, Indus	India Pak.	3408	168.0	80.0
45	Nortefo 67	Mexico	3158	181.0	90.0
20	C-591	India	3092	168.0	107.0
21	Justin	USA	3025	168.0	109.0
31	L1418-3463L1231x23L1274-111(L)	Sudan	2966	168.0	108.0
47	Mengavi	Australia	2966	181.0	95.0
19	Ciano 67	Mexico	2913	181.0	70.0
29	Thatcher	USA	2908	168.0	100.0
42	Manitou	Canada	2825	168.0	118.0
27	V-878	India	2783	181.0	70.0
26	Selkirk	Canada	2750	168.0	100.0
28	Lerma Rojo 64A	Mexico	2742	181.0	83.0
2	Gabo	Australia	2508	181.0	82.0
5	Giza 155	Egypt	2466	181.0	84.0
43	C-273	Pakistan	2358	168.0	105.0
49	(MD-K-Y) (WIS-SUP)	Kenya	2133	168.0	105.0
11	NP852	India	2066	181.0	90.0
40	C-306	India	1758	168.0	95.0

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Grand mean	3713	175.3	90.3
Standard error of grand mean	(only 1	(only 1	(only 1
Coefficient of variation	rep.)	rep.)	rep.)
LSD Variety means 5 PC			

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Correlations

Days to maturity	0.13	
Height	-0.26	-0.58**

\* = Significant at the 5% level  
 \*\* = Significant at the 1% level

TABLE 53

## SOUTH AMERICA

BRAZIL. Passo Fundo. Latitude: 28° 16' 39" S. Longitude: 52° 24' 33" W. Elevation: 709 meters above sea level.  
Cooperator: Luiz Ricardo Pereira and staff.

Planting Date: 8 July 1969. Precipitation during test: not stated. Irrigation: not stated. Fertilizer: 120-120-0 Amm. Sulphate.  
General Comments: Strong infection of leaf rust was observed.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Leaf rust	1000 grain weight gms
3	Nainari 60	Mexico	2222	71.0	TMR/MS	29.0
2	Gabo	Australia	2160	70.0	TR	28.0
1	Pitic 62	Mexico	2024	73.0	5S	31.0
25	NP881	India	1889	73.0	0	28.0
47	Mengavi	Australia	1728	71.0	TMS	30.0
38	Gaboto	Argentina	1666	79.0	0/10MS	28.0
24	Kloka WM1353	Germany	1654	67.0	30S	20.0
48	PV-18, Indus	India Pak.	1654	74.0	TR	26.0
6	Siete Cerros	Mexico	1629	73.0	70S	24.0
31	L1418-3463L1231 x 23L1274-111(L)	Sudan	1555	74.0	TR/MS	31.0
5	Giza 155	Egypt	1543	73.0	0	30.0
36	Triple Dirk	Australia	1518	73.0	20S	32.0
35	Tobari 66	Mexico	1494	77.0	15S	26.0
13	Huelquen	Chile	1469	77.0	TMR/10MS	29.0
10	Carazinho	Brazil	1407	75.0	40S	27.0
33	Chris	USA	1395	76.0	5MR	24.0
4	Son 64 x Kl. Rend.	Argentina	1382	73.0	0	29.0
14	Crespo	Colombia	1382	73.0	5S	26.0
9	Bonza 55	Colombia	1382	68.0	10MR/MS	24.0
17	Sonora 64	Mexico	1345	74.0	0	27.0
44	36896-CJ54(2) x YT54A (H)	Sudan	1345	71.0	TR/10S	27.0
12	Crim	USA	1296	70.0	0	23.0
22	Son 64 x TzPP-Nai 60 (A)	Argentina	1292	74.0	0	30.0
27	V-878	India	1247	77.0	30S	27.0
50	IAS-50 Alvorada		1222	68.0	30S	22.0
49	(MD-K-Y) (WIS-SUP)	Kenya	1210	69.0	0	23.0
16	Son 64A x SK <sub>E</sub> -LR64A	Argentina	1197	66.0	0	20.0
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	1185	79.0	5S	26.0
32	Penjamo 62	Mexico	1173	71.0	0	28.0
18	LR64-Son 64	Mexico	1173	76.0	TMR	34.0
11	NP852	India	1123	71.0	30S	24.0
20	C-591	India	1123	74.0	10S	24.0

7	Noroeste 66	Mexico	1062	73.0	0	23.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	1062	79.0	10MR/MS	30.0
30	Nar(S)(2) x PJ(S)	Chile	1062	70.0	R	26.0
19	Ciano 67	Mexico	1037	75.0	0	28.0
43	C-273	Pakistan	1024	75.0	40S	27.0
8	Victor 1	Italy	1024	70.0	30S	20.0
40	C-306	India	1012	68.0	100S	23.0
34	Inia 66	Mexico	1012	81.0	15S	37.0
45	Norteno 67	Mexico	938	73.0	TR	33.0
23	LR64 - N10B x AN(3)	Sudan	901	71.0	100S	20.0
28	Lerma Rojo 64A	Mexico	839	70.0	100S	26.0
39	Napo 63	Colombia	827	67.0	20S	25.0
37	NP 832	India	667	66.0	100S	20.0
15	Taichung 31	Taiwan	531	66.0	100S	26.0
26	Selkirk	Canada	518	66.0	0	20.0
21	Justin	USA	494	66.0	0	20.0
42	Manitou	Canada	370	66.0	5R	20.0
29	Thatcher	USA	309	66.0	10MS/S	20.0

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Grand mean	1235	72.0	3.4	26.0
Standard error of grand mean	23.0	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)
Coefficient of variation	22.0%			
LSD Variety means 5 PC	452			

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#### Correlations

Test wt	0.39**		
Leaf rust $\sqrt{X+1}$	-0.29 *	-0.18	
1000 grain weight	0.44**	0.68**	-0.29 *

\* = Significant at the 5% level

\*\* = Significant at the 1% level

TABLE 54

## SOUTH AMERICA

BRAZIL. Pedras Altas, Municipio de Herval. Latitude: 31° 40' 5" S. Longitude: 53° 35' W. Elevation: 300 meters above sea level.  
Cooperators: Joao Moreira, Milton Medeiros and A. M. Schlehber.

Planting Date: 2 October 1968 (very late planting). Precipitation during test: 471 mm total from July to December. Irrigation: none. Fertilizer: NPK  
120-120-100 N top-dressed on October 31.

General Comments: The experiment was planted extremely late. There was below average rainfall and above average temperatures. Stem rust development was very light. There were no important insect, weed or pest problems.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to flowering	Stem rust (%)	Lodging (%)	Shattering (%)	Plant stand (scale) <sup>2</sup>
18	LR64 - Son 64	Mexico	1144	67.0	51.0	1.0	0.0	5.0	5.0
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	1100	72.0	56.0	1.0	0.0	20.0	5.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	1000	73.0	51.0	1.0	0.0	0.0	4.7
45	Norteno 67	Mexico	955	64.0	50.0	1.0	16.7	80.0	5.0
48	PV-18, Indus	India Pak.	833	63.0	54.0	1.0	0.0	5.0	5.0
4	Son 64 x Kl. Rend.	Argentina	822	67.0	47.0	1.0	10.0	0.0	5.0
50	(Pel A 506 - 64)		789	64.0	54.0	5.6	0.0	10.0	5.0
34	Inia 66	Mexico	755	65.0	47.0	1.0	0.0	5.0	5.0
35	Tobari 66	Mexico	744	68.0	49.0	1.0	0.0	0.0	5.0
39	Napo 63	Colombia	722	66.0	46.0	1.0	20.0	5.0	5.0
3	Nainari 60	Mexico	711	59.0	60.0	1.0	0.0	0.0	5.0
7	Noroeste 66	Mexico	711	63.0	49.0	1.0	31.7	0.0	5.0
17	Sonora 64	Mexico	700	65.0	46.0	1.0	0.0	10.0	5.0
27	V-878	India	689	66.0	45.0	1.0	0.0	0.0	5.0
32	Penjamo 62	Mexico	655	63.0	52.0	1.0	0.0	0.0	5.0
19	Ciano 67	Mexico	644	61.0	49.0	1.0	0.0	5.0	5.0
22	Son 64 x TzPP - Nai 60 (A)	Argentina	644	65.0	48.0	1.0	0.0	0.0	5.0
28	Lerma Rojo 64A	Mexico	644	66.0	48.0	1.0	16.7	5.0	5.0
11	NP852	India	633	65.0	48.0	1.0	10.0	0.0	5.0
25	NP881	India	622	65.0	54.0	1.0	0.0	0.0	5.0
47	Mengavi	Australia	611	62.0	56.0	1.0	0.0	0.0	5.0
13	Huelquen	Chile	578	68.0	51.0	1.0	1.7	10.0	5.0
42	Manitou	Canada	578	61.0	62.0	1.0	0.0	0.0	5.0
20	C-591	India	555	73.0	56.0	4.6	0.0	0.0	5.0
14	Crespo	Colombia	555	65.0	52.0	1.0	26.7	5.0	5.0
44	36896-CJ54(2) x YT54A (H)	Sudan	555	63.0	54.0	1.4	0.0	0.0	5.0
30	Nar(S)(2) x PJ(S)	Chile	522	60.0	48.0	1.0	0.0	40.0	5.0
21	Justin	USA	500	60.0	61.0	1.0	0.0	0.0	5.0
2	Gabo	Australia	489	59.0	57.0	3.3	0.0	0.0	5.0
36	Triple Dirk	Australia	478	66.0	54.0	3.3	0.0	5.0	5.0
43	C-273	Pakistan	478	71.0	54.0	7.8	0.0	0.0	5.0
6	Siete Cerros	Mexico	478	62.0	54.0	1.0	1.7	5.0	5.0

16	Son 64A x SK <sub>P</sub> -LR64A	Argentina	467	62.0	54.0	1.0	0.0	0.0	5.0
23	LR64 - N10B x AN(3)	Sudan	400	67.0	57.0	1.0	0.0	0.0	5.0
49	(MD-K-Y)(WIS-SUP)	Kenya	400	66.0	58.0	1.0	0.0	0.0	5.0
40	C-306	India	389	69.0	56.0	3.3	0.0	5.0	5.0
15	Taichung 31	Taiwan	367	62.0	49.0	3.3	56.7	0.0	5.0
12	Crim	USA	344	63.0	62.0	1.0	0.0	5.0	5.0
24	Kloka WM1 353	Germany	333	58.0	59.0	3.3	0.0	0.0	5.0
1	Pitic 62	Mexico	322	62.0	59.0	4.6	0.0	0.0	5.0
9	Bonza 55	Colombia	311	59.0	57.0	1.0	0.0	0.0	5.0
31	L1418-3463L1231x23L1274-111(L)	Sudan	300	65.0	54.0	6.4	0.0	0.0	5.0
37	NP 832	India	289	64.0	53.0	3.3	0.0	0.0	5.0
33	Chris	USA	289	57.0	54.0	1.0	3.3	0.0	5.0
5	Giza 155	Egypt	278	65.0	53.0	1.0	10.0	0.0	5.0
38	Gaboto	Argentina	278	66.0	61.0	4.6	0.0	0.0	5.0
8	Victor I	Italy	256	1/	60.0	6.4	0.0	0.0	5.0
29	Thatcher	USA	233	1/	65.0	1.0	0.0	0.0	4.3
26	Selkirk	Canada	222	59.0	10.0	1.0	0.0	0.0	5.0
10	Carazinho	Brazil	156	1/	65.0	6.4	0.0	0.0	5.0

Grand mean	551	64.3	53.0	2.1	4.1	4.5	5.0
Standard error of grand mean	20	(only 1	(only 1	(only 1	1.2	(only 1	0.0
Coefficient of variation	44.0%	rep.)	rep.)	rep.)	353.3%	rep.)	2.3%
LSD Variety means 5 PC	397				23.7		0.2

#### Correlations

Test wt	0.44**						
Days to flowering	-0.17	-0.30 *					
Stem rust %	-0.40**	-0.29 *	0.28 *				
Lodging %	0.05	0.08	-0.18	-0.09			
Shattering %	0.35 *	0.09	-0.10	-0.14	0.12		
Plant stand	0.05	0.43**	-0.18	0.11	0.08	0.07	

\* = Significant at the 5% level  
 \*\* = Significant at the 1% level

1/ No data available

2/ Scale key 1-5 (1 = least plant stand)

TABLE 55

## SOUTH AMERICA

BRAZIL. Pelotas (Pedras Altas). Latitude: 31° 41' S. Longitude: 53° 45' W. Elevation: approx. 250 meters above sea level.  
Cooperators: Joao Carlos Soares Moreira, Milton Costa Medeiros and Eduardo Allgayer Osorio.

Planting Date: 2 August 1970. Precipitation during test: not stated. Irrigation: none. Fertilizer: 100 Kg./Ha. N and 90 Kg./Ha. P.  
General Comments: Very good weather throughout the experiment. Disease development was light. No lodging or shattering were observed. No insect, weed or pest problems were encountered.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Leaf rust (%)	Height cms	1000 grain weight gms
3	Nainari 60	Mexico	4271	79.0	2.4	75.0	43.0
47	Mengavi	Australia	4136	79.0	1.4	85.0	43.0
48	PV-18, Indus	India Pak.	3988	81.0	3.3	80.0	38.0
45	Norteno 67	Mexico	3790	80.0	2.4	80.0	46.0
2	Gabo	Australia	3778	78.0	2.4	85.0	43.0
16	Son 64A x SK <sub>E</sub> -LR64A	Argentina	3716	82.0	1.4	75.0	30.0
22	Son 64 x TzPP - Nai 60 (A)	Argentina	3704	82.0	2.4	85.0	45.0
4	Son 64 x Kl. Rend.	Argentina	3679	81.0	1.4	80.0	38.0
6	Siete Cerros	Mexico	3666	79.0	7.8	80.0	36.0
1	Pitic 62	Mexico	3654	78.0	7.1	75.0	35.0
50	IAS-50 Alvorada		3629	82.0	7.8	100.0	42.0
7	Noroeste 66	Mexico	3580	79.0	1.0	70.0	40.0
32	Penjamo 62	Mexico	3580	80.0	7.1	80.0	40.0
12	Crim	USA	3555	83.0	1.4	97.0	37.0
28	Lerma Rojo 64A	Mexico	3432	80.0	9.0	85.0	36.0
44	36896-CJ54(2) x YT54A (H)	Sudan	3432	79.0	9.0	80.0	39.0
36	Triple Dirk	Australia	3407	80.0	4.6	100.0	47.0
19	Ciano 67	Mexico	3370	83.0	1.0	78.0	37.0
25	NP881	India	3370	80.0	3.3	90.0	39.0
18	LR64 - Son 64	Mexico	3346	81.0	1.0	83.0	45.0
34	Inia 66	Mexico	3345	82.0	8.4	80.0	36.0
30	Nar(S)(2) x PJ(S)	Chile	3321	79.0	3.3	78.0	34.0
13	Huelquen	Chile	3321	81.0	2.4	87.0	40.0
8	Victor I	Italy	3247	77.0	5.6	70.0	29.0
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	3234	82.0	3.3	72.0	34.0
27	V-878	India	3210	81.0	4.6	70.0	30.0
17	Sonora 64	Mexico	3148	80.0	5.6	70.0	38.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	3074	84.0	4.6	80.0	37.0
33	Chris	USA	3062	83.0	1.4	100.0	33.0
24	Kloka WM1353	Germany	3049	76.0	2.4	85.0	31.0
35	Tobari 66	Mexico	3037	81.0	2.4	75.0	33.0
11	NP852	India	2963	83.0	3.3	82.0	35.0

10	Carazinho	Brazil	2938	82.0	5.6	100.0	42.0
14	Crespo	Colombia	2913	80.0	9.0	90.0	33.0
38	Gaboto	Argentina	2877	83.0	2.4	100.0	31.0
5	Giza 155	Egypt	2840	80.0	9.0	93.0	37.0
23	LR64 -N10B x AN(3)	Sudan	2815	80.0	9.0	75.0	27.0
9	Bonza 55	Colombia	2753	77.0	6.4	93.0	33.0
20	C-591	India	2691	84.0	7.1	95.0	39.0
39	Napo 63	Colombia	2654	79.0	1.0	90.0	33.0
42	Manitou	Canada	2642	80.0	2.4	105.0	31.0
43	C-273	Pakistan	2605	84.0	9.0	100.0	38.0
21	Justin	USA	2444	80.0	1.0	105.0	36.0
26	Selkirk	Canada	2395	77.0	2.4	100.0	38.0
49	(MD-K-Y)(WIS-SUP)	Kenya	2383	80.0	4.6	90.0	34.0
37	NP 832	India	2259	81.0	9.0	95.0	37.0
31	L1418-3463L1231x23L1274-111(L)	Sudan	2259	76.0	9.5	90.0	34.0
40	C-306	India	2086	81.0	1.0	90.0	36.0
15	Taichung 31	Taiwan	2000	75.0	1.0	80.0	28.0
29	Thatcher	USA	1654	80.0	9.0	107.0	27.0

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Grand mean	3126	80.3	4.5	86.2	36.5
Standard error of grand mean	26	(only 1	(only 1	(only 1	(only 1
Coefficient of variation	10.0%	rep.)	rep.)	rep.)	rep.)
LSD Variety means 5 PC	522				

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Correlations

Test wt	0.12				
Leaf rust %	-0.21	-0.03			
Height	-0.49**	0.17	0.11		
1000 grain weight	0.53**	0.19	-0.14	0.06	

\* = Significant at the 5% level  
\*\* = Significant at the 1% level

TABLE 56

## SOUTH AMERICA

ARGENTINA. Pergamino. Latitude: 33° 52' 58" S. Longitude: 60° 35' 15" W. Elevation: 68 meters above sea level.  
Cooperators: Jose Rath and Hector C. Conta.

Planting Date: 30 July 1969. Precipitation during test: 302.7 mm total from July to December. Irrigation: not stated. Fertilizer: 100 Kg./Ha. Nitrogen and 45% Urea.

General Comments: Conditions were not favorable for stem rust development. Leaf rust was observed in mid-November. Some insect and weed problems were noted.

Variety Number	Variety or cross	Origin	Yield kg/ha	Days to flowering	Days to maturity	Leaf rust (%)	Height cms	1000 grain weight gms
17	Sonora 64	Mexico	617	83.0	130.0	1.0	60.0	22.0
27	V-878	India	602	81.0	130.0	3.3	60.0	22.0
48	PV-18, Indus	India Pak.	546	96.0	137.0	1.0	60.0	23.0
18	LR64 - Son 64	Mexico	510	87.0	133.0	1.0	70.0	28.0
14	Crespo	Colombia	474	90.0	133.0	3.3	65.0	20.0
20	C-591	India	462	90.0	134.0	6.4	75.0	28.0
34	Inia 66	Mexico	462	81.0	129.0	3.3	60.0	26.0
2	Gabo	Australia	444	87.0	136.0	3.3	55.0	26.0
19	Ciano 67	Mexico	442	79.0	128.0	1.0	60.0	24.0
40	C-306	India	422	92.0	136.0	9.0	70.0	28.0
22	Son 64 x TzPP - Nai 60 (A)	Argentina	416	83.0	132.0	1.0	60.0	28.0
23	LR64 - N10B x AN(3)	Sudan	401	93.0	137.0	9.0	55.0	23.0
4	Son 64 x Kl. Rend.	Argentina	397	84.0	133.0	1.0	60.0	24.0
11	NP852	India	396	84.0	133.0	1.0	55.0	24.0
47	Mengavi	Australia	382	94.0	137.0	1.0	55.0	24.0
28	Lerma Rojo 64A	Mexico	381	83.0	132.0	8.1	60.0	26.0
45	Norteño 87	Mexico	377	87.0	101.0	1.0	65.0	28.0
38	Gaboto	Argentina	362	98.0	137.0	1.0	75.0	20.0
30	Nar(S)(2) x PJ(S)	Chile	360	86.0	133.0	1.0	60.0	20.0
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	350	87.0	132.0	1.0	60.0	22.0
32	Penjamo 62	Mexico	338	88.0	133.0	2.4	60.0	24.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	323	87.0	101.0	2.4	60.0	24.0
3	Nainari 60	Mexico	323	94.0	134.0	1.0	55.0	26.0
6	Siete Cerros	Mexico	321	96.0	139.0	6.4	60.0	25.0
7	Noroeste 66	Mexico	320	88.0	131.0	1.0	55.0	26.0
50	Pinzon INTA	Argentina	311	98.0	137.0	1.0	65.0	26.0
16	Son 64A x SK <sub>E</sub> -LR64A	Argentina	304	96.0	137.0	1.0	60.0	21.0
26	Selkirk	Canada	289	113.0	1/	1.0	75.0	24.0
43	C-273	Pakistan	280	91.0	135.0	3.3	70.0	26.0
33	Chris	USA	270	95.0	136.0	1.0	80.0	18.0
39	Napo 63	Colombia	270	81.0	129.0	1.0	70.0	20.0
5	Giza 155	Egypt	266	87.0	137.0	6.4	90.0	24.0



31	L1418-3463L1231x23L1274-111(L)	Sudan	246	95.0	136.0	7.1	65.0	26.0
44	36896-CJ54(2) x YT54A (H)	Sudan	246	95.0	135.0	6.4	60.0	26.0
1	Pitic 62	Mexico	244	87.0	138.0	2.4	60.0	28.0
25	NP881	India	241	94.0	139.0	2.4	70.0	20.0
36	Triple Dirk	Australia	238	93.0	136.0	1.0	70.0	30.0
29	Thatcher	USA	230	115.0	1/	3.3	70.0	14.0
35	Tobari 66	Mexico	229	85.0	129.0	1.0	60.0	20.0
10	Carazinho	Brazil	223	98.0	139.0	2.4	80.0	24.0
37	NP 832	India	220	91.0	137.0	6.4	75.0	24.0
9	Bonza 55	Colombia	199	94.0	134.0	3.3	65.0	21.0
12	Crim	USA	170	102.0	140.0	1.0	70.0	24.0
13	Huelquen	Chile	162	95.0	135.0	2.4	60.0	23.0
24	Kloka WM1353	Germany	153	102.0	142.0	4.6	70.0	16.0
15	Taichung 31	Taiwan	150	85.0	129.0	2.4	65.0	22.0
8	Victor I	Italy	90	99.0	135.0	3.3	30.0	18.0
49	(MD-K-Y) (WIS-SUP)	Kenya	80	101.0	139.0	2.4	60.0	24.0
42	Manitou	Canada	1/	117.0	1/	1.0	70.0	1/
21	Justin	USA	1/	112.0	1/	1.0	70.0	24.0

Grand mean	324	92.4	133.2	2.8	64.2	23.6
Standard error of grand mean	10	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)
Coefficient of variation	36.0%					
LSD Variety means 5 PC	193					

#### Correlations

Days to flowering	-0.62**					
Days to maturity	0.37**	-0.64**				
Leaf rust %	0.04	-0.04	0.18			
Height	-0.12	0.23	-0.20	0.09		
1000 grain weight	0.39**	-0.48**	0.46**	0.18	-0.06	

\* = Significant at the 5% level

\*\* = Significant at the 1% level

1/ No data available

TABLE 57

## SOUTH AMERICA

ARGENTINA. Paraná, E.R. Latitude: 31° 50' S. Longitude: 60° 31' W. Elevation: 110 meters above sea level.  
Cooperators: A. L. Chabrillon.

Planting Date: 27 June 1969. Precipitation during test: 683 mm total from January to December. Irrigation: none. Fertilizer: none.

General Comments: Between May and October there was a severe drought. There was an accumulation of moisture before the plot was sown. Only leaf rust and stem rust were observed. No insect, weed or pest problems.

Scoring notes taken: Leaf rust - 9 October, stem rust - 28 October.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to flowering	Days to maturity	Leaf rust (%)	Stem rust (%)	Height cms	Lodging (%)	Shattering (%)	1000grain weight gms
17	Sonora 64	Mexico	2111	80.0	72.0	118.0	1.0	1.0	60.0	0.0	20.0	31.0
22	Son 64 x TzPP - Nai 60 (A)	Argentina	2011	79.0	74.0	123.0	1.0	1.0	80.0	0.0	10.0	32.0
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	1978	83.0	77.0	122.0	3.3	1.0	80.0	10.0	10.0	27.0
27	V-878	India	1944	79.0	73.0	119.0	2.4	1.0	60.0	5.0	0.0	24.0
4	Son 64 x Kl. Rend.	Argentina	1922	81.0	75.0	118.0	1.0	1.0	65.0	10.0	10.0	31.0
30	Nar(S)(2) x PJ(S)	Chile	1900	80.0	74.0	118.0	1.0	1.0	65.0	0.0	0.0	27.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	1900	83.0	77.0	120.0	6.4	1.0	70.0	10.0	10.0	29.0
5	Giza 155	Egypt	1889	78.0	78.0	121.0	8.4	1.0	80.0	10.0	0.0	31.0
45	Norteño 67	Mexico	1866	82.0	77.0	120.0	1.0	1.0	75.0	0.0	10.0	34.0
31	L1418-3463L1231x23L1274-111(L)	Sudan	1844	77.0	82.0	123.0	9.5	2.4	85.0	10.0	0.0	28.0
36	Triple Dirk	Australia	1844	78.0	84.0	132.0	1.0	1.0	90.0	10.0	0.0	35.0
19	Ciano 67	Mexico	1822	82.0	72.0	118.0	1.0	1.0	65.0	10.0	30.0	31.0
2	Gabo	Australia	1822	79.0	79.0	122.0	1.0	1.0	70.0	0.0	0.0	29.0
40	C-306	India	1800	81.0	80.0	123.0	8.4	2.4	80.0	10.0	0.0	38.0
39	Napo 63	Colombia	1789	80.0	73.0	119.0	7.1	1.0	80.0	20.0	10.0	29.0
48	PV-18, Indus	India Pak.	1744	78.0	83.0	125.0	1.0	3.3	70.0	0.0	5.0	27.0
18	LR64 - Son 64	Mexico	1700	83.0	79.0	122.0	1.0	1.0	75.0	5.0	10.0	34.0
1	Pitic 62	Mexico	1678	73.0	81.0	124.0	3.3	1.0	65.0	10.0	0.0	28.0
6	Siete Cerros	Mexico	1666	78.0	82.0	124.0	5.8	1.0	70.0	0.0	0.0	26.0
28	Lerma Rojo 64A	Mexico	1611	82.0	78.0	122.0	9.0	1.0	70.0	10.0	0.0	28.0
32	Penjamo 62	Mexico	1611	81.0	78.0	121.0	1.0	1.0	80.0	10.0	5.0	31.0
47	Mengavi	Australia	1589	77.0	81.0	127.0	1.0	1.0	75.0	0.0	0.0	28.0
20	C-591	India	1533	82.0	83.0	124.0	9.5	2.4	85.0	0.0	0.0	31.0
11	NP852	India	1533	84.0	74.0	119.0	1.0	3.3	65.0	10.0	5.0	34.0
7	Noroeste 66	Mexico	1522	82.0	78.0	121.0	1.0	1.0	65.0	0.0	30.0	30.0
43	C-273	Pakistan	1511	82.0	80.0	127.0	9.0	2.4	80.0	10.0	0.0	31.0
34	Inia 66	Mexico	1500	83.0	74.0	120.0	9.0	1.0	75.0	0.0	0.0	29.0
3	Nainari 60	Mexico	1478	77.0	81.0	124.0	1.0	1.0	70.0	0.0	5.0	32.0
13	Huelquen	Chile	1433	77.0	83.0	124.0	4.6	1.0	70.0	0.0	0.0	29.0
25	NP881	India	1400	80.0	83.0	123.0	1.4	1.0	70.0	0.0	0.0	28.0
33	Chris	USA	1333	78.0	85.0	127.0	1.0	1.0	85.0	10.0	0.0	23.0
15	Taiwan 31	Taiwan	1311	79.0	74.0	119.0	9.5	1.0	70.0	20.0	10.0	28.0

35 Tobari 66	Mexico	1267	80.0	75.0	123.0	4.6	1.0	70.0	0.0	0.0	29.0
16 Son 64A x SK <sub>P</sub> -LR64A	Argentina	1255	77.0	83.0	124.0	1.0	1.0	55.0	0.0	0.0	23.0
50 Local Check Variety		1255	80.0	79.0	123.0	1.4	1.0	60.0	0.0	0.0	17.0
9 Bonza 55	Colombia	1233	76.0	84.0	128.0	7.1	1.0	95.0	10.0	0.0	24.0
12 Crim	USA	1233	81.0	96.0	103.0	1.0	1.0	70.0	20.0	0.0	27.0
14 Crespo	Colombia	1222	79.0	83.0	124.0	8.4	2.4	80.0	30.0	0.0	28.0
10 Carazinho	Brazil	1200	78.0	90.0	130.0	4.6	4.0	90.0	20.0	0.0	34.0
38 Gaboto	Argentina	1167	77.0	85.0	128.0	1.0	2.4	80.0	20.0	0.0	21.0
37 NP 832	India	1167	78.0	76.0	123.0	9.5	1.0	80.0	0.0	10.0	28.0
8 Victor I	Italy	1144	77.0	91.0	132.0	4.6	1.0	60.0	0.0	0.0	27.0
23 LR64 - N10B x AN(3)	Sudan	1133	78.0	84.0	123.0	9.0	1.0	70.0	0.0	0.0	24.0
24 Kloka WM1353	Germany	1111	77.0	86.0	128.0	4.6	4.0	70.0	0.0	0.0	25.0
49 (MD-K-Y-Y)(WIS-SUP)	Kenya	978	80.0	92.0	130.0	1.4	1.0	85.0	10.0	0.0	28.0
44 36896-CJ54(2) x YT54A (H)	Sudan	833	75.0	81.0	128.0	6.4	1.0	80.0	0.0	0.0	28.0
26 Selkirk	Canada	789	72.0	107.0	148.0	1.0	1.0	70.0	0.0	0.0	29.0
21 Justin	USA	278	73.0	102.0	150.0	1.0	1.0	90.0	0.0	0.0	24.0
42 Manitou	Canada	256	56.0	114.0	152.0	3.3	1.0	70.0	0.0	0.0	20.0
29 Thatcher	USA	244	72.0	115.0	152.0	7.1	1.0	75.0	0.0	0.0	18.0

Grand mean		1447	78.5	82.5	125.2	4.0	1.4	73.9	6.0	3.8	28.1
Standard error of grand mean		23	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)
Coefficient of variation		20.0%									
LSD Variety means 5 PC		469									

#### Correlations

Test wt	0.65**										
Days to flowering	-0.82**	-0.73**									
Days to maturity	-0.74**	-0.75**	0.81**								
Leaf rust %	-0.09	0.03	-0.06	-0.01							
Stem rust %	-0.02	0.09	0.03	0.02	0.16						
Height	-0.16	-0.04	0.18	0.26	0.30 *	0.20					
Lodging %	0.12	0.21	-0.11	-0.28	0.21	0.27	0.33 *				
Shattering %	0.36**	0.32 *	-0.40**	-0.31 *	-0.22	-0.17	-0.24	0.00			
1000 grain weight	0.56**	0.49**	-0.45**	-0.37**	-0.01	0.17	0.18	0.12	0.31 *		

\* = Significant at the 5% level

\*\* = Significant at the 1% level

TABLE 58

## SOUTH AMERICA

ARGENTINA. Marcos Juarez. Latitude: 32° 42' S. Longitude: 62° 07' W. Elevation: 110 meters above sea level.  
Cooperators: I. N. T. A.

Planting Date: 12 July 1969. Precipitation during test: 103 mm from July to November. Irrigation: not stated. Fertilizer: not stated.  
General Comments: Extremely dry winter, and rainy spring. Only leaf rust attacked the Argentine varieties.  
Scoring notes taken: Leaf rust - 20 October and 8 November, height - 10 November.

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to flowering	Days to maturity	Leaf rust	Height cms	1000grain weight gms
40	C-306	India	2290	80.0	81.0	124.0	80S	65.0	37.0
36	Triple Dirk	Australia	2000	79.0	88.0	136.0	TMS	80.0	37.0
3	Nainari 60	Mexico	1890	75.0	83.0	123.0	0	55.0	40.0
23	LR64 - N10B x AN(3)	Sudan	1890	81.0	86.0	134.0	80S	55.0	32.0
1	Pitic 62	Mexico	1877	75.0	81.0	124.0	5S	60.0	35.0
47	Mengavi	Australia	1877	75.0	83.0	124.0	10S	58.0	33.0
6	Siete Cerros	Mexico	1867	78.0	85.0	124.0	10S	50.0	32.0
30	Nar(S)(2) x PJ(S)	Chile	1833	77.0	80.0	124.0	TS	60.0	29.0
33	Chris	USA	1833	77.0	86.0	131.0	0	80.0	24.0
2	Gabo	Australia	1833	75.0	81.0	124.0	0	53.0	34.0
13	Huelquen	Chile	1823	78.0	80.0	123.0	10S	70.0	33.0
38	Gaboto	Argentina	1823	79.0	88.0	135.0	0	70.0	27.0
5	Giza 155	Egypt	1810	78.0	81.0	125.0	5S	58.0	35.0
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	1810	79.0	79.0	125.0	TMS	58.0	33.0
16	Son 64A x SK <sub>E</sub> -LR64A	Argentina	1790	77.0	81.0	124.0	0	58.0	28.0
48	PV-18, Indus	India Pak.	1767	78.0	86.0	125.0	TMS	58.0	30.0
32	Penjamo 62	Mexico	1757	76.0	80.0	123.0	TS	60.0	35.0
12	Crim	USA	1757	78.0	98.0	143.0	0	70.0	27.0
31	L1418-3463L1231x23L1274-111(L)	Sudan	1743	77.0	81.0	125.0	20S	63.0	35.0
20	C-591	India	1657	81.0	81.0	126.0	30S	65.0	32.0
10	Carazinho	Brazil	1643	79.0	86.0	134.0	TS	68.0	34.0
34	Inia 66	Mexico	1633	80.0	74.0	123.0	80S	55.0	37.0
44	36896-CJ54(2) x YT54A (H)	Sudan	1633	76.0	80.0	124.0	40S	63.0	35.0
8	Victor I	Italy	1600	76.0	93.0	141.0	50S	45.0	30.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	1590	79.0	80.0	127.0	10S	63.0	33.0
28	Lerma Rojo 64A	Mexico	1577	78.0	77.0	124.0	90S	65.0	36.0
43	C-273	Pakistan	1510	79.0	81.0	129.0	30S	65.0	33.0
14	Crespo	Colombia	1500	79.0	79.0	123.0	30S	60.0	35.0
49	(MD-K-Y)(WIS-SUP)	Kenya	1467	78.0	93.0	141.0	10S	63.0	28.0
39	Napo 63	Colombia	1457	80.0	77.0	123.0	10S	65.0	29.0
22	Son 64 x TzPP - Nai 60 (A)	Argentina	1443	77.0	80.0	126.0	0	53.0	35.0
25	NP881	India	1443	79.0	83.0	124.0	TS	73.0	31.0

7	Noroeste 66	Mexico	1433	77.0	80.0	124.0	0	48.0	37.0
37	NP 832	India	1410	80.0	86.0	131.0	40S	70.0	32.0
27	V-878	India	1410	77.0	77.0	122.0	10S	50.0	28.0
18	LR64 - Son 64	Mexico	1400	77.0	81.0	123.0	TS	55.0	38.0
24	Kloka WM1353	Germany	1400	74.0	93.0	141.0	TMS-S	70.0	26.0
11	NP852	India	1400	79.0	81.0	124.0	0	55.0	33.0
9	Bonza 55	Colombia	1400	74.0	80.0	124.0	5S	65.0	29.0
50	Klein Toledo	Argentina	1377	79.0	80.0	124.0	10S	58.0	36.0
4	Son 64 x Kl. Rend.	Argentina	1357	78.0	77.0	123.0	5S	53.0	40.0
15	Taichung 31	Taiwan	1333	76.0	79.0	123.0	80S	58.0	28.0
35	Tobari 66	Mexico	1277	79.0	76.0	124.0	TS	50.0	35.0
17	Sonora 64	Mexico	1210	77.0	77.0	123.0	TMS	40.0	33.0
45	Norteño 67	Mexico	1190	76.0	77.0	126.0	TS	58.0	37.0
19	Ciano 67	Mexico	1043	78.0	76.0	123.0	TMR-MS	50.0	34.0
21	Justin	USA	867	73.0	105.0	129.0	0	63.0	24.0
42	Manitou	Canada	823	68.0	112.0	146.0	TMS	73.0	23.0
29	Thatcher	USA	743	70.0	110.0	129.0	30S-MS	65.0	19.0
26	Selkirk	Canada	543	66.0	110.0	130.0	TMS	60.0	24.0

Grand mean			1541	77.0	84.2	127.4	3.0	60.5	32.0
Standard error of grand mean			16	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)
Coefficient of variation			13.0%						
LSD Variety means 5 PC			328						

#### Correlations

Test wt	0.60**							
Days to flowering	-0.47**	-0.70**						
Days to maturity	-0.12	-0.23	0.70**					
Leaf rust $\sqrt{X+1}$	0.14	0.25	-0.15	-0.07				
Height	0.12	-0.04	0.35 *	0.43**	-0.02			
1000 grain weight	0.43**	0.52**	-0.72**	-0.49**	0.10	-0.34 *		

\* = Significant at the 5% level  
 \*\* = Significant at the 1% level

TABLE 59

## SOUTH AMERICA

ECUADOR. Santa Catalina. Latitude: 0° 22' S. Longitude: 78° 33' W. Elevation: 3058 meters above sea level.  
Cooperators: I.N.I.A.P. - Cereals Department.

Planting Date: 24 January 1969. Precipitation during test: 927.8 mm total from January to August. Irrigation: none. Fertilizer: 300 Kg./Ha. 10-40-10.

General Comments: Disease development was normal. No insect, weed or pest problems were observed.

Scoring notes taken: Stripe rust (leaf and head), leaf rust, stem rust and Septoria - 30 June; height - 20 August.

Variety Number	Variety or cross	Origin	Yield kg/ha	Days to flowering	Stripe rust leaf	Stripe rust head (%)	Leaf rust	Stem rust	Height cms	Lodging (%)	1000grain weight gms	Septoria/ (%)	Brown necrosis 2/
19	Ciano 67	Mexico	1703	66.0	OMS-20MS	2.1	0	0	86.7	0.0	31.3	13.3	0.0
24	Kloka WM1353	Germany	1545	90.0	0-0	1.1	20MS	TMS	110.0	0.0	22.3	5.0	0.0
39	Napo 63	Colombia	1484	70.0	TMR-TMR	1.0	10MS	0	110.0	0.0	26.7	15.0	0.0
35	Tobari 66	Mexico	1389	72.0	OMS-10MS	1.5	0	0	100.0	0.0	29.7	10.0	0.0
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	1356	76.0	20S-20S	1.5	0	0	103.3	0.0	29.7	16.7	0.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	1345	72.0	20S-20S	1.5	0	TR	103.3	0.0	30.3	11.7	0.0
8	Victor I	Italy	1314	89.0	10S-20S	1.0	0	TMS	90.0	0.0	28.7	13.3	1.0
1	Pitic 62	Mexico	1211	88.0	OMS-10MS	1.5	0	TMS	110.0	10.0	28.3	11.7	0.0
49	(MD-K-Y)(WIS-SUP)	Kenya	1156	90.0	TMS-5MS	1.1	0	0	133.3	33.3	41.7	11.7	1.0
50	Local Check Variety		1120	89.0	-5MS	1.0	0	0	110.0	0.0	29.0	11.7	0.0
14	Crespo	Colombia	984	76.0	OMS-15MS	1.1	0	15MS	120.0	0.0	22.0	10.0	0.0
23	LR64 - N10B x AN(3)	Sudan	917	71.0	5MS-10MS	2.0	0	20MS	83.3	0.0	16.3	16.7	0.0
9	Bonza 55	Colombia	903	72.0	OMS-15MS	1.5	0	0	130.0	5.3	26.3	23.3	1.0
38	Gaboto	Argentina	892	83.0	TMS-5MS	1.5	0	TMS	143.3	53.3	26.7	10.0	0.0
45	Norteflo 67	Mexico	822	72.0	OMS-30MS	1.8	0	0	103.3	0.0	27.7	30.0	1.0
3	Nainari 60	Mexico	820	72.0	30S-40S	2.0	0	TR	116.7	0.0	24.3	16.7	0.0
25	NP881	India	814	74.0	OMS-15MS	1.8	0	0	123.3	3.7	29.3	16.7	0.0
42	Manitou	Canada	814	76.0	5MS-10MS	1.8	TMS	TR	143.3	3.3	23.7	16.7	1.0
44	36896-CJ54(2) x YT54A (H)	Sudan	803	79.0	OMS-20MS	1.1	0	0	100.0	0.0	29.0	18.3	0.0
18	LR64 - Son 64	Mexico	781	73.0	OMS-40MS	2.7	0	0	106.7	0.0	26.3	26.7	0.0
26	Selkirk	Canada	750	98.0	0-0	1.0	TMR	0	150.0	1.7	24.3	13.3	1.0
33	Chris	USA	750	80.0	TMS-5MS	1.1	0	TR	150.0	53.7	26.0	15.0	0.0
30	Nar(S)(2) x PJ(S)	Chile	747	65.0	TMS-10MS	1.1	0	0	86.7	0.0	19.3	21.7	1.0
34	Inia 66	Mexico	745	66.0	70S-80S	3.9	0	0	93.3	0.0	28.0	23.3	0.0
27	V-878	India	711	66.0	30S-40S	2.5	0	0	83.3	0.0	21.7	26.7	0.0
21	Justin	USA	692	95.0	0-0	1.0	0	0	136.7	1.7	21.0	16.7	0.0
47	Mengavi	Australia	642	79.0	OMS-50MS	2.5	0	0	106.7	0.0	22.7	26.7	0.0
29	Thatcher	USA	589	98.0	OMS-20MS	2.5	15MS	5MS	140.0	5.3	22.0	18.3	0.0
37	NP 832	India	539	77.0	0-0	1.0	10MS	TMS	136.7	5.3	24.3	11.7	1.0
7	Noroeste 66	Mexico	475	74.0	30S-60S	3.7	0	0	90.0	0.0	19.3	20.0	1.0
31	L1418-3463L1231x23L1274-111(L)	Sudan	461	76.0	60S-80S	1.1	10MS	TR	106.7	20.0	23.7	20.0	0.0
32	Penjamo 62	Mexico	450	74.0	0-0	1.9	0	0	103.3	0.0	22.3	16.7	1.0

13 Huelquen	Chile	447	88.0	OMS-20MS	1.0	0	0	113.3	0.0	20.3	26.7	1.0
5 Giza 155	Egypt	356	76.0	0-0	1.1	TMS	0	123.3	0.0	28.0	33.3	1.0
40 C-306	India	225	77.0	0-0	1.0	0	0	123.3	8.7	19.3	23.3	1.0
22 Son 64 x TzPP - Nai 60 (A)	Argentina	208	79.0	60S-80S	4.3	0	TR	103.3	0.0	20.7	23.3	0.0
20 C-591	India	200	79.0	0-0	1.1	0	5MR	133.3	20.0	15.3	26.7	1.0
10 Carazinho	Brazil	200	93.0	OMS-30MS	1.5	0	5MR	140.0	80.0	25.7	10.0	0.0
43 C-273	Pakistan	197	76.0	0-0	1.0	0	5MS	116.7	0.7	18.3	30.0	1.0
4 Son 64 x Kl. Rend.	Argentina	161	70.0	OMS-50MS	3.7	0	0	96.7	0.0	17.7	23.3	1.0
28 Lerma Rojo 64A	Mexico	147	131.0	70S-100S	5.3	0	0	100.0	0.3	13.0	20.0	1.0
6 Siete Cerros	Mexico	136	79.0	40S-70S	3.5	0	0	83.3	0.0	14.3	20.0	0.0
11 NP852	India	128	66.0	30S-80S	5.2	0	0	100.0	0.0	14.7	30.0	1.0
48 PV-18, Indus	India Pak.	119	79.0	50S-80S	3.5	0	0	83.3	0.0	11.0	23.3	1.0
36 Triple Dirk	Australia	114	82.0	70S-80S	3.7	0	0	126.7	0.0	20.7	13.3	1.0
12 Crim	USA	97	72.0	OMS-40MS	2.5	0	0	130.0	0.0	12.7	16.7	0.0
17 Sonora 64	Mexico	86	68.0	60S-80S	4.6	0	0	86.7	0.0	13.7	20.0	0.0
2 Gabo	Australia	75	79.0	80S-100S	3.7	0	0	93.3	0.0	12.3	20.0	0.0
16 Son 64A x SK <sub>E</sub> -LR64A	Argentina	36	78.0	40S-80S	4.0	0	0	86.7	0.0	13.0	15.0	1.0
15 Taichung 31	Taiwan	8	69.0	90S-100S	5.3	0	10MS	90.0	0.0	10.3	13.3	1.0

Grand mean		653	78.8	4.5	2.2	1.1	1.1	110.8	6.1	22.5	18.5	0.4
Standard error of grand mean		15	(only 1	0.1	0.2	0.0	0.0	0.6	0.9	0.2	0.5	(only 1
Coefficient of variation		28.0%	rep.)	26.4%	110.1%	29.5%	37.6%	6.5%	180.9%	11.1%	32.0%	rep.)
LSD Variety means 5 PC		300		1.9	4.0	0.6	0.7	11.7	18.1	4.1	9.7	

#### Correlations

Days to flowering		-0.05										
Stripe rust (leaf) $\sqrt{X+1}$		-0.49**	-0.06									
Stripe rust (head) %		-0.57**	-0.04	0.88**								
Leaf rust $\sqrt{X+1}$		0.31 *	0.09	-0.34 *	-0.24							
Stem rust $\sqrt{X+1}$		-0.06	-0.05	-0.01	0.01	-0.04						
Height		0.04	0.35 *	-0.55**	-0.49**	0.14	-0.03					
Lodging %		-0.03	0.22	-0.19	-0.26	-0.04	0.02	0.52**				
1000 grain weight		0.76**	0.00	-0.49**	-0.60**	0.09	-0.25	0.31 *	0.25			
Septoria %		-0.47**	-0.25	0.14	0.23	-0.32 *	-0.11	-0.21	-0.28	-0.29 *		
Brown necrosis		-0.38**	0.09	-0.02	0.10	-0.15	-0.07	0.05	-0.14	-0.22	0.32 *	

\* = Significant at the 5% level

\*\* = Significant at the 1% level

1/ Septoria sp not known

2/ Incidence

TABLE 60

## SOUTH AMERICA

COLOMBIA. Tibaitata. Latitude: 4° 30' S. Longitude: 74° 05' W. Elevation: 2650 meters above sea level.  
Cooperators: Mario Zapata, Daniel Vasela, R. Lopez and Obed Ramirez.

Planting Date: 9 November 1968. Precipitation during test: not stated. Irrigation: not stated. Fertilizer: 250 Kg./Ha. 10-30-10.  
General Comments: During the growing season there were severe frosts, which severely reduced some of the yields.

Scoring notes taken: Stripe rust (leaf) - 12 December, stripe rust (head) - 15 January, days to maturity - 28 February, stem rust - 6 March, root rot - 10 March.

Variety Number	Variety or cross	Origin	Yield kg/ha	Days to flowering	Days to maturity	Stripe rust leaf	Stripe rust head	Leaf rust	Stem rust	Height cms	Lodging (%)	1000 grain weight gms	Root rot (%)
45	Norteño 67	Mexico	1872	76.0	98.0	20MS-MR	40MS	0	0	90.0	0.0	25.3	36.7
18	LR64 - Son 64	Mexico	1272	75.3	98.7	30MR-MS	5MR-MS	0	0	85.0	0.0	23.7	33.3
39	Napo 63	Colombia	1250	71.3	97.3	15MR	TR-MR	20MS	0	93.3	10.7	23.7	50.0
28	Lerma Rojo 64A	Mexico	1044	74.3	96.3	40MS	40MS	0	0	83.3	1.7	22.3	46.7
19	Ciano 67	Mexico	983	68.7	100.7	70S-MS	90S	0	0	76.7	0.0	21.3	53.3
34	Inia 66	Mexico	978	71.3	92.3	90S	0	0	0	75.0	0.0	23.3	53.3
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	950	77.0	103.7	60MS-S	50MS	0	-TR	85.0	0.7	18.3	33.3
	4 Son 64 x Kl. Rend.	Argentina	928	72.7	98.0	40MS-S	80S	0	5R	78.3	0.0	19.3	61.7
	7 Noroeste 66	Mexico	872	76.7	93.0	70MS-S	70S	0	0	73.3	0.0	19.0	46.7
30	Nar(S)(2) x PJ(S)	Chile	844	68.3	100.0	60S-MS	30MS	0	0	65.0	0.0	21.0	46.7
32	Penjamo 62	Mexico	800	76.0	102.0	40MR-MS	15MS	TR-R	0	75.0	0.0	20.0	30.0
	9 Bonza 55	Colombia	800	81.3	103.7	TR-MR	10MS	0	0	113.3	5.0	22.7	56.7
37	NP 832	India	767	74.7	107.0	5MR	0	10MR	40MS-S	108.3	3.3	23.0	68.3
50	Zipa 68		744	78.0	112.7	10R	5MS	0	0	93.3	0.0	17.3	46.7
47	Mengavi	Australia	722	76.0	107.0	30MR-MS	50S-MS	TR	0	83.3	0.0	20.7	46.7
27	V-878	India	705	71.3	97.3	50MS-MR	80MS	0	0	85.0	0.7	16.7	40.0
23	LR64 - N10B x AN(3)	Sudan	678	80.7	113.0	20MR-MS	5MS	10MS-MR	TMR	70.0	0.0	17.7	30.0
	3 Nainari 60	Mexico	672	82.3	110.0	15MR-R	30MS	0	30MS-S	96.3	0.0	19.7	50.0
14	Crespo	Colombia	650	75.7	107.0	TR-R	5MS	0	0	90.0	0.7	17.7	36.7
35	Tobari 66	Mexico	622	74.3	102.3	10MR	5MS	0	0	78.3	0.0	18.7	63.3
	1 Pitic 62	Mexico	617	86.0	113.0	80S	90S	0	TR	91.7	0.7	19.0	36.7
33	Chris	USA	600	79.7	106.3	10R-MR	5MS-S	0	0	110.0	23.3	19.3	53.3
13	Huelquen	Chile	578	80.3	105.3	10MR	0	0	0	91.7	0.0	19.3	99.0
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	533	75.3	98.0	40MS-S	60MS-S	0	0	80.0	0.7	17.7	50.0
	5 Giza 155	Egypt	472	74.0	102.7	TR	0	0	0	91.7	0.0	22.3	60.0
44	36896-CJ54(2) x YT54A (H)	Sudan	456	85.7	102.3	40MS-S	5MS-MR	0	0	95.0	0.0	18.3	33.3
25	NP881	India	439	74.7	100.7	5R-MR	40MS-S	0	0	85.0	1.3	21.0	50.0
40	C-306	India	422	75.3	98.3	10MR	0	0	10MR	100.0	31.7	22.0	71.7
31	L1418-3463L1231x23L1274-111(L)	Sudan	417	74.3	102.3	5R	0	0	0	88.3	0.0	21.0	70.0
43	C-273	Pakistan	411	75.3	95.3	15MR-MS	0	0	TR	95.0	1.7	19.0	63.3
48	PV-18, Indus	India Pak.	406	79.0	105.7	80MS	60S	0	0	68.3	0.0	17.3	60.0
20	C-501	India	389	75.0	102.0	5R-MR	0	0	5R-MR	101.7	3.3	19.7	60.0



38 Gaboto	Argentina	367	80.3	108.7	40MS	WUS	0	10MR	108.3	8.3	16.0	46.7
2 Gabo	Australia	367	79.3	105.3	50MS	50S	0	10MR-MS	73.3	0.0	16.0	60.0
6 Siete Cerros	Mexico	294	81.0	103.0	70S-MS	80S	0	0	68.3	0.0	15.7	46.7
24 Kloka WM1353	Germany	289	90.7	113.3	0	0	60S	TMR	83.3	0.0	16.7	66.7
8 Victor I	Italy	244	96.0	107.3	20MR-MS	0	TR-R	0	70.0	0.0	16.7	43.3
12 Crim	USA	239	83.0	103.3	80S-MS	90S	0	0	100.0	4.0	17.0	53.3
49 (MD-K-Y)(WIS-SUP)	Kenya	228	86.0	111.3	15MR-MS	5MS	0	0	103.3	13.3	20.0	50.0
16 Son 64A x SK <sub>E</sub> -LR64A	Argentina	228	78.0	95.7	90S	100S	0	0	61.7	0.0	14.3	53.3
22 Son 64 x TzPP - Nai 60 (A)	Argentina	226	72.7	93.7	100S	100S	0	0	68.3	0.0	17.7	56.7
11 NP852	India	189	71.0	92.7	90S	100S	0	0	78.3	1.7	17.7	70.0
10 Carazinho	Brazil	156	94.0	99.3	10MR-MS	70S	0	TR	110.0	60.0	17.3	66.7
36 Triple Dirk	Australia	156	82.0	110.0	90S	80S	0	0	83.3	0.0	18.0	70.0
26 Selkirk	Canada	89	98.7	99.0	100S	40S-50S	0	0	98.3	1.7	19.7	46.7
17 Sonora 64	Mexico	50	72.3	112.3	100S	100S	0	0	60.0	0.0	1/	71.7
21 Justin	USA	44	99.7	94.7	TR-R	5MS	0	T-MR	106.7	0.7	1/	30.0
29 Thatcher	USA	28	100.0	97.0	80S	60S	20MS	0	95.0	3.3	1/	30.0
42 Manitou	Canada	22	99.7	95.0	70S	60S	0	0	108.3	1.7	1/	50.0
15 Taichung 31	Taiwan	17	73.0	109.7	100S	100S	0	0	58.3	0.0	1/	70.0
Grand mean		542	79.7	102.5	4.9	5.0	1.2	1.4	86.3	3.6	19.3	52.4
Standard error of grand mean		14	0.2	0.4	0.1	0.1	0.1	0.0	0.6	0.8	0.2	0.8
Coefficient of variation		32.0%	2.6%	5.1%	24.9%	17.1%	49.4%	28.5%	8.3%	285.1%	9.8%	19.5%
LSD Variety means 5 PC		287	3.3	8.5	2.0	1.4	1.0	0.6	11.7	16.8	3.1	16.7

#### Correlations

Days to flowering		-0.51**										
Days to maturity		-0.14	0.12									
Stripe rust (leaf)	$\sqrt{X+1}$	-0.21	-0.18	-0.20								
Stripe (head)	$\sqrt{X+1}$	-0.23	-0.05	-0.08	0.79**							
Leaf rust	$\sqrt{X+1}$	-0.06	0.23	0.21	-0.24	-0.21						
Stem rust	$\sqrt{X+1}$	0.01	0.04	0.23	-0.26	-0.11	0.29 *					
Height		-0.03	0.47**	0.03	-0.59**	-0.39**	0.09	0.30 *				
Lodging %		-0.14	0.21	-0.06	-0.24	-0.09	-0.03	0.14	0.45**			
1000 grain weight		0.60**	-0.33 *	-0.14	-0.38**	-0.38**	-0.11	0.11	0.20	0.07		
Root rot %		-0.28 *	-0.25	0.09	0.05	0.04	0.06	0.19	-0.01	0.20	-0.07	

\* = Significant at the 5% level

\*\* = Significant at the 1% level

1/ No data available

TABLE 61

## MESOAMERICA

GUATEMALA. Labor Ovalle. Latitude: 14° 52' N. Longitude: 91° 33' 14" W. Elevation: 2380 meters above sea level.  
Cooperators: Ing. Astolfo Fumagalli and Salvador Cruz.

Planting Date: 15 June 1969. Precipitation during test: 795 mm. Irrigation: not stated. Fertilizer: 127-79 Kg./Ha. Nitrogen-Phosphate.

General Comments: There was a very good Septoria tritici infection. No insect, weed or pest problems.

Scoring notes taken: Stripe and leaf rust - 8 September, stem rust and Septoria sp. - 9 September, height and lodging - 20 September, Septoria tritici - 3 November, days to maturity - 10 November, shattering - 17 November.

Variety Number	Variety or cross	Origin	Yield kg/ha	Days to flowering	Stripe rust	Leaf rust	Stem rust	Height cms	Lodging (%)	Shattering (%)	1000 grain weight gms	Septoria tritici (%)
35	Tobari 66	Mexico	2145	142.0	30MR	1/	1/	98.3	0.0	26.7	19.3	73.3
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	2083	145.3	20R	1/	1/	93.3	33.3	26.7	21.7	73.3
32	Penjamo 62	Mexico	2063	140.0	40MR	20R	1/	98.3	1.7	26.7	19.0	73.3
34	Inia 66	Mexico	2005	142.0	TR	1/	T. R.	100.0	0.0	30.0	26.3	73.3
27	V-878	India	1988	140.7	30MR	1/	1/	81.7	0.0	26.7	19.3	80.0
3	Nainari 60	Mexico	1958	145.0	30-MR	1/	1/	115.0	20.0	28.3	23.0	56.7
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	1953	142.0	40MR	1/	1/	91.7	43.3	30.0	22.0	76.7
28	Lerma Rojo 64A	Mexico	1842	139.3	30MR	10R	30MR	105.0	46.7	10.0	21.0	70.0
14	Crespo	Colombia	1789	148.7	10-R	10R	T. R.	117.0	60.0	26.7	18.7	56.7
22	Son 64 x TzPP-Nai 60 (A)	Argentina	1703	137.0	50MS	T. R.	10R	101.7	5.0	28.3	23.0	83.3
4	Son 64 x Kl. Rend.	Argentina	1631	135.3	40-MR	1/	1/	105.0	1.7	16.7	20.0	76.7
19	Ciano 67	Mexico	1558	136.0	0R	1/	1/	93.3	0.0	31.7	24.7	86.7
30	Nar(S)(2) x PJ(S)	Chile	1552	130.0	40MR	T. R.	10R	90.0	0.0	36.7	18.0	86.7
5	Giza 155	Egypt	1444	137.3	10-R	30MR	10R	113.3	3.3	6.7	23.7	63.3
45	Norteño 67	Mexico	1423	141.3	0R	1/	1/	98.3	18.3	40.0	21.7	76.7
7	Noroeste 66	Mexico	1371	136.7	10-R	1/	1/	95.0	6.7	30.0	19.0	90.0
18	LR64 - Son 64	Mexico	1365	143.3	20R	1/	1/	105.0	38.3	33.3	22.3	73.3
23	LR64 - N10B x AN(3)	Sudan	1355	144.0	20MR	10R	30MR	83.3	0.0	13.3	12.3	76.7
31	L1418-3463L1231x23L1274-111(L)	Sudan	1339	140.0	TR	10R	20MR	116.7	6.7	15.0	27.7	60.0
25	NP881	India	1314	138.3	30MR	1/	20MR	110.0	80.0	13.3	18.7	70.0
24	Kloka WM1353	Germany	1303	144.3	0R	60S	60S	103.3	0.0	30.0	16.3	73.3
17	Sonora 64	Mexico	1231	130.0	60MS	40MS	20MS	88.3	8.3	33.3	17.0	76.7
49	(MD-K-Y)(WIS-SUP)	Kenya	1138	149.3	T. R.	1/	1/	120.0	86.7	23.3	25.0	63.3
38	Gaboto	Argentina	1112	152.7	60MS	1/	1/	130.0	86.7	16.7	19.0	56.7
13	Huelquen	Chile	1105	137.7	0R	1/	1/	113.3	23.3	16.7	17.3	83.3
48	PV-18, Indus	India Pak.	1071	140.7	40MR	1/	10R	86.7	0.0	26.7	14.0	83.3
47	Mengavi	Australia	1065	149.3	40MR	1/	10R	111.7	20.0	6.7	18.3	80.0
16	Son 64A x SK <sub>E</sub> -LR64A	Argentina	1064	131.7	100S	30MS	10R	86.7	0.0	13.3	13.3	76.7
39	Napo 63	Colombia	999	135.0	N	100S	100S	108.3	33.3	36.7	15.7	76.7
6	Siete Cerros	Mexico	953	140.0	40-MS	40MS	20M.S.	85.0	0.0	18.3	14.0	86.7
8	Victor I	Italy	937	155.7	20-R	20MR	10R	88.3	0.0	30.0	24.0	73.3
10	Carazinho	Brazil	927	153.0	TR	10MR	10R	123.3	83.3	18.3	26.7	46.7

44 36896-CJ54(2) x YT54A (H)	Sudan	919	150.3	OR	40MR	40MR	106.7	1.7	3.3	14.3	63.3
33 Chris	USA	857	144.0	30MR	1/	1/	128.3	96.7	13.3	18.0	56.7
1 Pitic 62	Mexico	807	148.7	T-R	30MR	10MR	106.7	90.0	6.7	14.7	73.3
42 Manitou	Canada	790	146.3	60MS	10R	20R	125.0	86.7	8.3	16.0	60.0
37 NP 832	India	787	135.0	OC	70S	90S	126.7	76.7	23.3	19.0	83.3
9 Bonza 55	Colombia	705	147.7	10-R	20MR	10MR	118.3	80.0	0.0	13.7	63.3
36 Triple Dirk	Australia	698	147.7	80R	1/	20R	126.7	60.0	3.3	19.7	73.3
11 NP852	India	690	130.0	100-S	20MS	10MR	110.0	43.3	23.3	14.3	66.7
2 Gabo	Australia	671	145.7	100-S	1/	1/	111.7	0.0	10.0	16.0	70.0
29 Thatcher	USA	628	149.3	10R	40MS	80S	130.0	60.0	10.0	13.3	70.0
43 C-273	Pakistan	534	136.0	OC	30MS	10MR	123.3	90.0	13.3	16.7	83.3
12 Crim	USA	531	138.7	30MR	10R	20MS	123.3	96.7	13.3	14.0	66.7
26 Selkirk	Canada	353	143.3	0R	50MR	20R	130.0	90.0	10.0	17.3	73.3
21 Justin	USA	343	149.0	10R	1/	10R	123.3	83.3	18.3	14.0	73.3
20 C-591	India	246	137.0	30MR	10R	20MS	128.3	100.0	10.0	12.3	70.0
15 Taichung 31	Taiwan	239	131.7	100-S	N	100S	96.7	33.3	25.0	13.7	90.0
40 C-306	India	72	133.3	OC	80S	80S	118.3	100.0	20.0	10.0	70.0

Grand mean		1156	141.6	2.9	2.6	2.8	108.0	38.7	20.0	18.3	72.7
Standard error of grand mean		23	0.3	0.1	0.1	0.1	0.3	1.3	1.1	0.1	0.8
Coefficient of variation		24.0%	2.6%	58.7%	56.0%	54.1%	3.3%	41.8%	66.9%	8.8%	14.0%
LSD Variety means 5 PC		451	6.0	2.8	2.4	2.5	5.7	26.4	21.8	2.6	16.6

#### Correlations

Days to maturity	-0.01										
Stripe rust $\sqrt{X+I}$	-0.16	-0.22									
Leaf rust $\sqrt{X+I}$	-0.38**	-0.16	-0.05								
Stem rust $\sqrt{X+I}$	-0.41**	-0.23	0.02	0.89**							
Height	-0.52**	0.30 *	-0.14	0.05	0.12						
Lodging %	-0.58**	0.22	-0.13	0.04	0.08	0.78**					
Shattering %	0.47**	-0.31 *	-0.04	-0.00	0.07	-0.52**	-0.41**				
1000 grain weight	0.60**	0.21	-0.21	-0.35 *	-0.34 *	-0.06	-0.24	0.34 *			
Septoria tritici %	0.04	-0.53**	0.17	0.08	0.17	-0.56**	-0.42**	0.35 *	-0.20		

\* = Significant at the 5% level

\*\* = Significant at the 1% level

1/ No data available

TABLE 62

## MESOAMERICA

MEXICO. Doña Rosa, Toluca. Latitude: 19° 25' N. Longitude: 99° 5' E. Elevation: 2675 meters above sea level.  
Cooperators: CIMMYT.

Planting Date: 9 May 1969. Precipitation during test: not stated. Irrigation: not stated. Fertilizer: 2 applications of fertilizer as 40-40-17 and 40-40-0 Kg./Ha.  
General Comments: Some weed problems encountered.

Variety Number	Variety or cross	Origin	Yield kg/ha	Days to flowering	Stripe rust	Stem rust	Height cms	Lodging (%)
18	LR64 - Son 64	Mexico	5038	66.7	T	0	108.3	3.3
14	Crespo	Colombia	4494	67.7	0	5S	113.3	0.0
32	Penjamo 62	Mexico	4277	68.3	T	30S	100.0	33.3
34	Inia 66	Mexico	4144	63.7	0	0	96.7	0.0
4	Son 64 x Kl. Rend.	Argentina	4094	64.7	50S	0	100.0	3.3
45	Norteno 67	Mexico	4061	65.7	0	0	103.3	0.0
39	Napo 63	Colombia	4038	61.7	0	T	115.0	0.0
30	Nar(S)(2) x PJ(S)	Chile	3994	64.0	0	TMS	90.0	0.0
19	Ciano 67	Mexico	3866	62.0	0	0	100.0	0.0
28	Lerma Rojo 64A	Mexico	3855	66.3	5S	0	108.3	31.7
46	TzPP -Son64/LR64A -TzPPxAN(E)(B)	Mexico	3850	66.3	0	0	95.0	18.7
24	Kloka WM1353	Germany	3777	76.7	0	TS	110.0	0.0
35	Tobari 66	Mexico	3716	67.0	0	0	101.7	0.0
17	Sonora 64	Mexico	3594	62.3	40S	0	95.0	0.0
7	Noroeste 66	Mexico	3461	66.3	5S	0	100.0	0.0
16	Son 64A x SK <sub>E</sub> -LR64A	Argentina	3327	71.7	30S	0	90.0	0.0
5	Giza 155	Egypt	3077	68.3	0	TS	115.0	1.7
41	TzPP -Son64/LR64A -TzPPxAN(E)(A)	Mexico	2905	67.0	0	0	93.3	66.7
25	NP881	India	2792	68.0	T	0	120.0	76.7
23	LR64 - N10B x AN(3)	Sudan	2750	74.3	T	TS	85.0	0.0
47	Mengavi	Australia	2722	78.7	10S	TS	116.7	0.0
3	Nainari 60	Mexico	2678	79.7	20S	T	120.0	61.7
27	V-878	India	2505	61.3	0	TS	83.3	0.0
22	Son 64 x TzPP - Nai 60 (A)	Argentina	2439	65.0	20S	80S	110.0	0.0
11	NP852	India	2300	63.3	30S	100S	110.0	1.7
48	PV-18, Indus	India Pak.	2272	72.0	50S	10S	90.0	0.0
6	Siete Cerros	Mexico	2255	71.3	30S	0	93.3	0.0
2	Gabo	Australia	2211	72.7	90S	0	111.7	1.7
31	L1418-3463L1231x23L1274-111(L)	Sudan	2166	68.7	0	15S	115.0	0.0
44	36896-CJ54(2) x YT54A (H)	Sudan	1900	87.0	0	TS	110.0	30.0
29	Thatcher	USA	1855	86.0	T	30S	138.3	56.7
36	Triple Dirk	Australia	1800	73.3	80S	60S	131.7	1.7

40	C-308	India	1781	78.3	0	T	128.3	90.0
43	C-273	Pakistan	1555	70.0	0	60S	133.3	6.7
13	Huelquen	Chile	1511	72.0	0	0	115.0	0.0
49	(MD-K-Y)(WIS-SUP)	Kenya	1489	80.0	20S	0	120.0	96.7
37	NP 832	India	1411	70.3	0	80S	128.3	81.7
42	Manitou	Canada	1405	86.3	T	0	135.0	55.0
9	Bonza 55	Colombia	1378	80.7	0	0	133.3	91.7
12	Crim	USA	1344	73.3	0	0	131.7	86.7
33	Chris	USA	1072	73.3	0	0	128.3	95.0
1	Pitic 82	Mexico	1000	82.7	40S	20S	115.0	96.7
50	Local Check Variety		955	82.0	TR	TMS	133.3	86.7
26	Selkirk	Canada	955	83.3	0	0	125.0	68.3
21	Justin	USA	855	84.0	0	T	128.3	86.7
38	Gaboto	Argentina	772	92.0	0	0	126.7	98.3
10	Carazinho	Brazil	728	93.0	5S	20S	136.7	98.3
20	C-591	India	700	78.7	0	TS	135.0	93.3
15	Taichung 31	Taiwan	661	64.7	40S	100S	106.7	26.7
8	Victor I	Italy	650	90.3	20S	T	90.0	0.0

Grand mean	2448	73.1	2.2	2.3	112.4	32.9
Standard error of grand mean	51	0.1	0.1	0.1	0.5	1.4
Coefficient of variation	26.0%	1.4%	70.0%	47.6%	5.4%	51.3%
LSD Variety means 5 PC	1024	1.7	2.5	1.8	9.9	27.5

#### Correlations

Days to flowering	-0.69**					
Stripe rust $\sqrt{X+1}$	-0.22	0.07				
Stem rust $\sqrt{X+1}$	-0.28 *	-0.06	0.38**			
Height	-0.58**	0.54**	-0.02	0.16		
Lodging %	-0.63**	0.60**	-0.17	-0.02	0.67**	

\* = Significant at the 5% level

\*\* = Significant at the 1% level

TABLE 63

## MESOAMERICA

MEXICO. Roque, Guanajuato. (CIAB) Latitude: 20° 32' N. Longitude: 10° 49' W. Elevation: 1765 meters above sea level.  
Cooperators: Ing. Ricardo Urbina Amador and Ing. Felix Ramirez.

Planting Date: 27 December 1968. Precipitation during test: not stated. Irrigation: none. Fertilizer: 160-60-0.

General Comments: There was not enough rain at certain times during the growing season. Experiment should have been given more fertilizer and more water. The climatic conditions were not favorable for disease development.

Variety Number	Variety or cross	Origin	Yield kg/ha	Days to maturity	Stripe rust	Leaf rust	Stem rust	Height cms
1	Pitic 62	Mexico	3468	120.0	TR	0	0	85.0
31	L1418-3463L1231x23L1274-111(L)	Sudan	3277	122.0	0	TR	5MR	96.7
40	C-306	India	3185	122.0	0	20S	10S	98.3
5	Giza 155	Egypt	3049	112.0	0	0	0	81.7
32	Penjamo 62	Mexico	3043	118.0	50S	0	0	73.3
37	NP 832	India	3030	122.0	0	20S	TR	96.7
7	Noroeste 66	Mexico	3024	108.0	5MS	0	0	71.7
30	Nar(S)(2) x PJ(S)	Chile	2944	118.0	TR	0	0	73.3
48	PV-18, Indus	India Pak.	2944	122.0	10MS	0	0	71.7
34	Inia 66	Mexico	2919	108.0	20S	0	0	76.7
16	Son 64A x SK <sub>P</sub> -LR64A	Argentina	2901	120.0	40S	0	0	70.0
18	LR64 - Son 64	Mexico	2888	111.0	10MR	0	0	80.0
13	Huelquen	Chile	2876	113.0	10R	0	0	95.0
39	Napo 63	Colombia	2851	110.0	0	0	0	86.7
22	Son 64 x TzPP - Nai 60 (A)	Argentina	2833	110.0	5MR	0	0	81.7
27	V-878	India	2796	111.0	TR	0	0	68.3
28	Lerma Rojo 64A	Mexico	2783	118.0	30S	0	0	80.0
8	Victor I	Italy	2777	118.0	5MS	0	0	63.3
38	Gaboto	Argentina	2777	122.0	0	TR	0	111.7
25	NP881	India	2697	118.0	TR	0	0	93.3
3	Nainari 60	Mexico	2697	118.0	20MS	0	0	85.0
23	LR64 - N10B x AN(3)	Sudan	2691	124.0	10S	5S	5S	65.0
14	Crespo	Colombia	2660	113.0	0	0	0	88.3
4	Son 64 x Kl. Rend.	Argentina	2611	102.0	TR	0	0	68.3
33	Chris	USA	2592	121.0	30S	0	0	118.3
49	(MD-K-Y)(WIS-SUP)	Kenya	2512	1/	20S	0	0	98.3
2	Gabo	Australia	2506	116.0	40MS	0	0	78.3
45	Norteno 67	Mexico	2487	103.0	5MS	0	0	75.0
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	2469	116.0	5R	0	0	73.3
20	C-591	India	2444	121.0	0	30S	TR	103.3
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	2382	103.0	0	0	0	75.0
6	Siete Cerros	Mexico	2358	118.0	5MS	0	0	58.3

43	C-273	Pakistan	2302	110.0	0	0	0	86.7
9	Bonza 55	Colombia	2296	119.0	0	0	0	95.0
19	Ciano 67	Mexico	2203	104.0	0	0	0	71.7
12	Crim	USA	2191	119.0	40S	0	0	103.3
26	Selkirk	Canada	2154	111.0	0	0	0	106.7
17	Sonora 64	Mexico	2142	101.0	40S	0	0	61.7
21	Justin	USA	2105	112.0	5MR	0	0	105.0
35	Tobari 66	Mexico	2018	120.0	0	0	0	76.7
38	Triple Dirk	Australia	1993	120.0	80S	0	0	98.3
24	Kloka WM1353	Germany	1956	124.0	0	0	0	91.7
11	NP852	India	1944	108.0	80S	0	0	85.0
47	Mengavi	Australia	1870	121.0	5MS	0	0	58.3
10	Carazinho	Brazil	1833	122.0	40S	0	0	100.0
44	36896-CJ54(2) x YT54A (H)	Sudan	1543	120.0	5MS	0	0	76.7
42	Manitou	Canada	1457	1/	0	0	0	98.3
15	Taichung 31	Taiwan	1450	108.0	80S	0	0	73.3
29	Thatcher	USA	1222	1/	60S	30S	0	86.7
Grand mean			2493	115.2	3.0	1.4	1.1	84.0
Standard error of grand mean			48	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	1.0
Coefficient of variation			23.0%					14.3%
LSD Variety means 5 PC			949					19.6

#### Correlations

Days to maturity	0.25					
Stripe rust $\sqrt{X+1}$	-0.35 *	0.02				
Leaf rust $\sqrt{X+1}$	-0.05	0.16	-0.01			
Stem rust $\sqrt{X+1}$	0.26	0.12	-0.12	0.40**		
Height	-0.05	-0.12	-0.03	0.21	0.05	

\* = Significant at the 5% level

\*\* = Significant at the 1% level

1/ No data available

TABLE 64

Means over all locations for yield, agronomic and disease data for the Fifth International Spring Wheat Yield Nursery (1968-1969). The means presented represent only those locations reporting that variable. Average rust values are numerically converted and transformed means where 1.0 is no disease and 10.0 represents 99S reaction. (See text for further explanation).

Variety Number	Variety or cross	Origin	Yield kg/ha	Test wt kg/hl	Days to flowering	Days to maturity	Stripe rust		Leaf Stem rust		Height cms	Lodging (%)	Shatter-ing (%)	1000grain weight gms	Mildew (%)	Septoria tritici (%)	Septoria spp (%)
							leaf $\sqrt{X+1}$	head $\sqrt{X+1}$	rust $\sqrt{X+1}$	rust $\sqrt{X+1}$							
32	Penjamo 62	Mexico	3055	76.9	81.5	126.7	2.6	2.2	1.9	2.1	86.2	21.5	13.4	34.8	28.3	29.4	32.6
23	LR 64 - N10B x AN(3)	Sudan	3055	76.7	86.6	131.6	1.7	2.8	4.5	2.6	76.5	3.9	7.0	29.9	25.8	12.2	35.7
1	Pitic 62	Mexico	3032	72.3	88.8	133.0	2.1	5.2	2.9	2.6	91.6	36.6	8.0	31.1	14.1	29.8	26.5
6	Siete Cerros	Mexico	3016	75.5	85.4	128.5	3.1	6.4	4.2	2.4	82.8	10.8	15.1	30.9	5.7	28.1	49.6
4	Son 64 x Kl. Rend.	Argentina	3011	77.3	79.1	124.7	2.4	6.2	1.1	1.9	85.3	13.6	12.6	34.6	21.2	36.7	31.5
34	Inia 66	Mexico	2937	78.9	77.2	124.4	2.6	2.6	1.6	1.7	82.9	8.9	13.8	37.5	41.6	41.1	42.3
28	Lerma Rojo 64A	Mexico	2917	76.9	80.3	124.9	2.9	5.5	1.9	2.2	91.0	27.2	7.9	34.5	40.6	43.8	40.7
48	PV-18, Indus	India Pak.	2892	76.1	84.7	128.9	2.7	5.8	2.1	2.4	81.6	10.1	17.1	31.5	5.7	35.4	38.4
22	Son64 x TzPP - Nai 60 (A)	Argentina	2867	76.5	79.1	126.6	3.7	6.9	1.4	2.5	90.8	10.9	14.1	36.4	35.2	20.8	30.0
7	Noroeste 66	Mexico	2853	76.1	80.8	124.1	3.1	5.4	1.1	1.7	80.8	14.3	20.3	34.2	33.1	35.1	42.3
5	Giza 155	Egypt	2849	77.0	82.7	130.7	2.3	2.5	3.4	1.8	97.9	16.5	2.7	37.0	8.6	39.1	26.1
35	Tobari 66	Mexico	2849	78.9	79.6	126.6	1.8	2.4	1.2	1.4	63.8	9.8	8.6	33.9	11.7	26.7	37.3
41	TzPP-Son64/LR64A-TzPPxAN(E)(A)	Mexico	2843	79.5	81.1	126.4	2.4	3.6	1.6	2.0	83.3	20.4	15.8	33.0	45.6	14.7	37.6
50	Local Check Variety		2836	77.0	87.3	132.4	2.7	1.7	3.3	2.5	103.0	21.9	4.1	35.4	23.2	18.5	18.0
3	Nainari 60	Mexico	2833	73.7	85.6	131.2	3.7	3.9	2.0	2.5	95.9	21.6	6.6	35.9	23.0	23.1	28.0
13	Huelquen	Chile	2804	76.5	83.4	126.9	1.6	1.3	1.3	1.7	100.1	23.7	10.5	33.5	25.7	27.7	40.0
30	Nar(S)(2) x PJ(S)	Chile	2772	75.9	76.8	124.0	2.0	3.2	3.5	2.1	78.4	11.6	15.1	30.4	26.8	31.7	45.3
46	TzPP-Son64/LR64A-TzPPxAN(E)(B)	Mexico	2765	79.4	79.8	125.8	2.3	4.2	1.4	2.0	84.5	16.9	22.0	33.4	46.0	20.8	34.6
45	Norteño 67	Mexico	2761	77.8	79.0	124.6	2.5	3.0	1.2	1.5	88.1	12.4	27.9	38.4	34.1	47.2	30.3
14	Crespo	Colombia	2743	76.6	81.9	128.5	1.3	2.2	2.2	1.9	102.0	26.9	10.4	32.8	20.5	12.0	20.3
39	Napo 63	Colombia	2733	76.4	77.2	123.5	1.4	1.2	4.4	2.2	96.6	23.4	19.4	33.0	31.3	31.5	43.8
18	LR64 - Son 64	Mexico	2732	77.8	80.5	125.7	2.3	3.3	1.2	1.7	90.4	17.1	24.5	38.6	38.0	33.1	32.3
16	Son 64A x SK <sub>E</sub> - LR64A	Argentina	2713	74.8	84.3	126.9	3.9	5.9	1.4	2.2	78.3	4.2	6.8	27.2	26.3	19.7	32.6
27	V-878	India	2670	78.3	76.5	124.1	2.5	3.5	1.2	1.8	74.3	7.0	10.2	29.9	23.4	36.4	39.2
25	NP881	India	2626	76.7	82.7	128.2	2.0	4.7	2.5	1.6	100.9	36.5	9.5	34.9	6.5	18.1	28.4
17	Sonora 64	Mexico	2612	75.3	75.9	124.1	3.8	6.8	2.1	2.6	75.6	10.5	15.9	31.8	27.3	51.5	40.0
31	L1418-3463L1231x23L1274-111(L)	Sudan	2608	76.1	83.3	131.8	2.3	2.6	3.5	2.2	98.5	16.4	4.4	36.1	11.2	33.8	29.2
36	Triple Dirk	Australia	2602	76.0	86.3	132.2	4.9	6.4	2.4	2.9	109.2	24.9	4.3	38.3	33.5	13.1	25.7
44	36896-CJ54(2) x YT54A (H)	Sudan	2564	74.0	85.1	131.1	3.2	2.9	2.1	2.1	91.0	18.3	5.5	33.6	25.0	26.7	31.1
47	Mengavi	Australia	2537	71.7	86.1	131.7	4.0	5.5	3.4	2.1	89.5	14.1	9.4	31.5	7.5	38.0	36.9
8	Victor I	Italy	2521	73.9	94.5	136.3	2.6	1.4	3.9	3.1	75.7	5.7	18.6	31.3	30.9	16.0	23.4
40	C-306	India	2519	79.3	84.8	131.8	1.6	3.0	4.5	3.1	104.2	41.7	6.2	36.5	36.6	46.7	43.4



19 Ciano 67	Mexico	2519	78.1	75.4	122.9	2.3	5.9	1.2	1.8	78.3	12.6	22.6	34.5	30.4	36.2	43.8
37 NP 832	India	2438	78.6	82.7	129.8	1.4	2.7	6.0	4.1	107.9	34.8	7.2	37.1	42.2	15.0	32.3
2 Gabo	Australia	2307	71.9	83.9	129.4	5.5	5.9	2.3	2.8	92.6	19.2	7.1	31.2	24.1	37.8	37.6
9 Bonza 55	Colombia	2301	73.6	86.2	131.1	2.1	2.3	2.8	2.1	106.8	39.9	7.4	31.5	13.6	23.2	24.6
24 Kloka WM1353	Germany	2281	72.7	89.4	132.1	1.2	1.8	5.1	3.5	96.0	7.9	11.3	28.4	10.0	15.5	22.3
38 Gaboto	Argentina	2264	77.7	92.2	136.1	2.1	6.0	1.1	2.1	111.5	44.6	7.7	28.5	29.7	9.1	19.2
11 NP852	India	2251	76.8	78.1	124.3	4.1	8.0	2.9	2.7	92.0	23.6	10.4	30.7	45.8	45.4	46.5
10 Carazinho	Brazil	2246	76.9	92.2	135.9	2.4	5.0	1.4	2.6	112.3	50.3	11.3	34.1	39.0	8.8	18.8
33 Chris	USA	2244	77.4	86.1	130.9	2.3	2.0	1.1	1.7	111.0	41.9	7.7	28.5	19.8	11.1	18.8
20 C-591	India	2229	79.4	85.6	131.4	1.3	2.1	3.7	3.2	109.8	36.7	5.8	33.3	34.1	33.8	32.3
49 (MD-K-Y)(WIS-SUP)	Kenya	2216	76.9	91.9	137.1	1.7	1.7	2.1	1.4	103.1	40.6	11.1	34.7	0.5	10.2	16.5
43 C-273	Pakistan	2190	79.1	82.8	129.0	1.9	2.8	3.6	3.2	103.3	27.5	5.4	35.3	37.6	38.4	35.3
12 Crim	USA	2169	75.3	89.5	131.4	3.2	5.7	2.0	1.5	110.3	43.4	11.8	30.2	13.7	12.2	22.6
15 Taichung 31	Taiwan	2063	74.4	78.1	123.3	5.8	7.1	4.6	4.3	86.0	18.3	18.1	28.1	49.7	36.8	34.6
21 Justin	USA	1729	74.8	99.4	139.3	1.6	2.0	2.2	1.7	109.5	24.6	8.0	28.5	11.7	10.7	25.0
26 Selkirk	Canada	1628	73.0	96.5	138.2	2.8	5.3	3.4	1.9	108.8	31.2	7.9	29.9	21.6	10.5	28.8
42 Manitou	Canada	1627	74.4	99.8	141.0	2.8	5.0	1.5	1.8	108.3	32.5	3.4	24.8	29.9	12.2	17.3
29 Thatcher	USA	1410	75.4	99.7	139.8	2.7	4.8	5.7	2.6	108.2	28.9	4.5	24.3	30.7	12.5	22.3
Summary means over varieties		2546	76.3	84.5	129.6	2.6	4.0	2.6	2.3	94.1	22.4	11.1	32.7	26.0	26.4	31.9

