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RESULTS OF THE FIRST INTERNATIONAL SPRING WHEAT YIELD NURSERY 1964-1965

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CIMMYT

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

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CIMMYT

CENTRO INTERNACIONAL DE MEJORAMIENTO DE MAIZ Y TRIGO

INTERNATIONAL MAIZE AND WHEAT IMPROVEMENT CENTER

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Results of the First International Spring Wheat Yield Nursery, 1964-1965 [1]

CHARLES F. KRULL, NORMAN E. BORLAUG, CARLOS MEZA, IGNACIO NARVÁEZ [2]

INTRODUCTION

Adaptation is perhaps the most elusive concept in plant breeding. Not only is there surprisingly little information concerning the performance of varieties over a broad range of environments in even the major crop plants, but there is considerable confusion among plant breeders as to whether broad adaptation is desirable or not. Even in wheat, the most extensively seeded crop in the world, there is remarkably little systematic data concerning the adaptation of the major varietal types in different areas of the world.

Adaptation in wheat can be considered from many points of view. It may be measured by e. g. flowering date, maturity date, resistance to important diseases or pests, winter survival and yield. Grain yield is the most comprehensive gauge of adaptation, but it is cumbersome to measure and influenced by many inter-related factors. Yield, however, is the most meaningful measure of adaptation in terms of world food needs.

The United States Department of Agriculture's International Spring Wheat Rust Nursery has obtained a lot of very valuable information concerning resistance to pathogens throughout the world's important wheat regions. Disease losses can lower yields markedly, and if yield is to be used as the measure of adaptation, disease resistance plays a very important role. Disease is, however, only one of the factors affecting yield.

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[1] The distribution and management of the nursery in the Near East is handled cooperatively with the Near and Middle East Wheat and Barley Improvement Project of the Food and Agriculture Organization of the United Nations.

[2] Respectively: Resident Coordinator, CIMMYT Wheat Program; Head, CIMMYT Wheat Program; Head of Biometry Department, Instituto Nacional de Investigaciones Agrícolas (INIA), Secretaria de Agricultura y Ganaderia, Mexico; and Head, INIA Cereals Program. A special acknowledgement is given to the 1964 FAO trainees who helped in the preparation of seed for the nursery. These include: Mohamed Ahmed Khalifa, Salah'el-Dine A. Attia, Mohammad Dadain, Shamoon Issa Bekou, Thul Kife Shihada Ghousha, Cemali Ozer and Mohamed Zeini Juwanah. Also acknowledgement is made to Reyes Vega and Miguel Martinez for their help in preparing the nurseries, to Mrs. Guillermina Hardy in preparation of the tables and to Miss Judith Franco for typing the tables and manuscript.

Beginning in 1960 a series of Inter-American yield trials were conducted to test the main varieties of the hemisphere throughout the principal spring wheat regions of the Americas. The results of these nurseries (1, 2, 3, 8) indicated that certain varieties showed very wide adaptation while others — particularly the North American ones — were very poorly adapted outside their areas of origin. A parallel series of yield nurseries were run in cooperation with the Food and Agriculture Organization throughout the Near East. The results (4, 5, 7) were quite similar to those from the Inter-American series, and many of the same varieties, such as Pitic 62, were high yielding in both sets. It was therefore decided to combine these into a single International Spring Wheat Yield Nursery in order to study adaptation wherever spring wheat is grown. This report covers the first of these combined nurseries.

MATERIALS AND PROCEDURES

General

The trial consisted of 25 varieties representing the principal types seeded throughout the spring wheat regions of the world. Plots consisted of three five-meter rows with four replications arranged in a randomized block design. Seed was packeted for each row using a seeding rate equivalent to 100 kg/ha for the variety Penjamo 62. Adjustments were made for each variety so that the number of seeds per row was approximately the same as for Penjamo 62.

Seed for the nursery was produced in increase plots at the Centro de Investigaciones Agricolas del Noroeste (CIANO) at Ciudad Obregon, Sonora, Mexico. The nursery was prepared as part of the training of a group of FAO trainees under the supervision of Dr. N. E. Borlaug. The seed was treated with an organic mercurial seed disinfectant prior to being packaged. Instructions concerning seeding, nursery management and note taking as well as data sheets were included in each seed box. All nurseries sent out of Mexico were shipped by air.

Data were obtained from 34 locations in 23 countries representing the major wheat regions of the world. These trials were seeded under both dryland and irrigated conditions, both fertilized and unfertilized, from approximately 35°S latitude in Argentina, Chile, South Africa and Australia through 0° in Ecuador to 45°N in the United States and Rumania. They were seeded at elevations from 226 meters below sea level in the Jordan Valley to 3,058 meters above sea level in Ecuador. A list of the cooperating stations and scientists as well as supplementary information are given in the appendix.

Choice of varieties

The twenty-five varieties (*Triticum aestivum*) in the nursery included the principal varietal types that are presently grown in the spring wheat regions of the world. Most of the varieties had been included in previous

nurseries, but some new ones were included in an attempt to keep the nursery as current and meaningful as possible. The varieties included were:

United States and Canadian varieties:

1. Selkirk—a Canadian-developed variety that is still the most extensively grown variety in the mo' parts of the northern hard spring wheat areas.
2. Thatcher—a Minnesota variety that was widely grown for many years in the northern United States and Canada and that is still widely grown in the drier areas of this 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 United States and Canadian lines.
3. Justin—one of the newer, commercial spring wheat varieties of the United States. It was developed in North Dakota.
4. Crim—a new Minnesota variety that is now in commercial production. It was included in the nursery before the variety was named and was carried by its experimental designation of Minn. II-53-404.
5. CT244—a promising new line from Canada that was never released because of quality considerations.

Argentine varieties:

1. Gaboto—one of the most important soft varieties in the northern part of the Argentine wheat belt.
2. Magnif 41—a promising semi-commercial soft variety.
3. Klein Rendidor—the most widely cultivated hard wheat variety in Argentina. It is representative of the long cycle or facultative winter types that are widely grown in Argentina.

Mexican varieties:

1. Nainari 60—an important tall commercial variety in Mexico from 1960 through 1962 and still widely used in crosses. It has also shown good adaptation in several Near Eastern countries as well as in the Near Eastern and Inter-American international yield nurseries.
2. Lerma Rojo 64A—a semi-dwarf version of the original Lerma Rojo, derived through backcrossing. It has shown good adaptation in the Near East as well as Mexico.
3. Pitic 62—the first semi-dwarf variety released in Mexico. It has yielded well in the Inter-American nurseries and was the highest yielder in all three Near East-American nurseries but is currently grown on only a limited commercial average in Mexico because of low test weight and its susceptibility to new races of stem rust.

4. Penjamo 62—one of the first semi-dwarf varieties released in Mexico. It has occupied over half of the Mexican wheat area for the past several years.

5. Sonora 64—the shortest strawed variety that has been commercially released in Mexico to date. It is currently recommended only for areas where leaf rust is not a serious problem.

6. Penjamo sib × Gabo 55 (white grain)—a dwarf Mexican line of very high yield capacity, that was originally entered as (Frontana × Kenya 58-Newthatch) Norin 10-Brevor × Gabo 55. Although it has not been widely grown in Mexico because of partial rust susceptibility, it and its red seeded sister (both with the pedigree of II-8156-1M-2R-4M) have been widely grown under various names including Siete Cerros, Super X, Kalyan, S-227, PV-18, Indus 66 and Mexipak 65.

Colombian varieties:

1. Nariño 59—the most important commercial variety in Colombia from 1960 through 1962 when a new race of stripe rust ended its usefulness in southern Colombia. It is still widely used in the departments (i. e. states) of Cundinamarca and Boyacá and was the highest yielding variety in the first Inter-American Spring Wheat Yield Nursery.

2. Benza 55—an important commercial variety. It has maintained an effective level of field resistance to stripe rust for over 10 years which is almost unique with the explosive race situation of Colombia.

3. Napo 63—presently an important variety in both Colombia and Ecuador. It has very good stripe rust resistance to the extremely virulent races of those two countries.

Australian varieties:

1. Gabo—a variety of very wide adaptation both in Australia and many other countries. It is susceptible to stripe rust.

2. Triple Dirk—a short strawed variety; susceptible to stripe rust.

Egyptian varieties:

1. Giza 144—a widely adapted variety representative of the present commercial varieties used in Egypt.

2. Giza 150—a new representative of the Egyptian wheats.

Brazilian varieties:

1. Carazinho—an important commercial variety reported to be able to produce relatively good yield on acid soils. It has good stripe rust resistance under most conditions.

Indian and Pakistani varieties:

1. C-518—an old, pre-partition Indian white seeded wheat still grown on a substantial acreage.
2. C-271—a tall, awnleted, pubescent white seeded variety grown on a considerable acreage in West Pakistan.
3. C-273—a tall, awned, pubescent white seeded variety grown commercially in the Punjab areas of India and Pakistan.

Data handling and summarization

As far as possible, data were converted to metric units or percentages for presentation in this report. Every effort was made to assure the correctness of such conversions as well as the accuracy of translations of terms from other languages and the interpretation of supplementary information. The authors, however, take full responsibility for any errors that might have been made. Data are not presented in the tables nor were analyses run for traits where no differential varietal effect was observed.

Yield data were requested from the central row of each three-row plot. All three rows were harvested by some cooperators in order to have sufficient grain for test weight and 1000 grain weight. Yields were converted from the units reported by the cooperator to kilograms per hectare. For readers more accustomed to yield in bushels per acre, 1000 kilograms of wheat per hectare is equivalent to approximately 15 bushels per acre.

Both test weight and 1000 grain weight data were requested as a measure of grain quality because some cooperators do not have test weight equipment. In some cases the cooperator had to combine seed from the four replications to have enough seed to take a test weight determination. Test weight is reported in kilograms per hectoliter, and 1000 grain weights are reported in grams. For readers more accustomed to test weight expressed in pounds per bushel, one kilogram per hectoliter = 0.8018 pounds per bushel, i. e. 75 kilograms per hectoliter is approximately 60 pounds per bushel.

For statistical analysis the rust notes were converted to a coefficient of infection as used by Dr. W. Q. Loegering in the United States Department of Agriculture's International Rust Nurseries. This coefficient is calculated by multiplying the percentage of infection by a "response value" for each infection type. Thus, the coefficient combines both the amount of infection and the reaction type. The response values are as follows: 0 = 0; VR (very resistant) and R (resistant) = 0.2; MR (moderately resistant) = 0.4; M (intermediate) = 0.6; MS (moderately susceptible) = 0.8; and S (susceptible) and VS (very susceptible) = 1.0. The coefficients can be analyzed statistically as well as correlated with yield and other traits to estimate the degree of association between rust attack and other traits. To avoid handling of fractional values, coefficients less than 1.0 and more than 0 were rounded to 1.0, and all other values were rounded to the nearest whole number.

In the case of cooperators who reported only percentage of rust, this was used directly as the coefficient, and for the occasional case where only

the infection type was reported, the response value was used as the coefficient. Due to the fact that 0 values were common and that the coefficients do not usually fit a normal distribution, the coefficients were routinely transformed as $\sqrt{\text{coefficient} + 1}$, i. e. $\sqrt{X + 1}$, for analysis. While other transformations may have been more appropriate in specific cases, the $\sqrt{X + 1}$ transformation considerably improved the normality of the distributions. The $\sqrt{X + 1}$ values were the ones used for all statistical analysis and are the ones presented in the tables of results for locations in which data for the trait were reported in more than one replication. Where the rust note was taken in only a single replication, the actual notes are presented in tables, but the coefficients transformed to $\sqrt{X + 1}$ were used for correlations.

Throughout this report, the terms *stripe rust, stem rust* and *leaf rust* are used instead of *yellow rust, black rust* and *brown rust* such as are used in the Near East and instead of the scientific names of the causal organisms. Stripe rust readings are normally taken on the leaves, but under severe conditions an additional note can be taken on the attack in the head or spike. This is usually taken as the average percentage of infected spikelets in the plot. Two locations reported this type of data in addition to the usual leaf note, and these data were also transformed to $\sqrt{\% + 1}$.

Lodging was recorded as percentage of lodged plants, and shattering was recorded as average percentage of shattered spikelets or percentage of yield lost due to shattering. Both lodging and shattering data were transformed into $\sqrt{\% + 1}$ to normalize their distribution. Some data were reported as a score, and these were not converted to percentages nor used in averages with data from other locations. The cooperators were urged to include data for any other factor for which differential data could be recorded, and such additional factors were often the most important ones in influencing yield at that site. These were analyzed and presented wherever available.

Statistical treatment

At any given location, an analysis of variance was performed for all traits on which data were reported from more than one replication. Pertinent information from these analyses of variance are presented for each trait as well as the mean for each variety for each trait in Tables 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 61, 63 and 65.

The information from these analyses includes the mean of the trait, statistical level of significance, coefficient of variation, standard error and the least significant difference at the 5% level.

The statistical level of significance includes from 0.5% to 25% (10) rather than just the usual 5% and 1% levels. "NS" indicates non-significance at even the 25% level. The standard error is the standard error of a plot i. e. $\sqrt{EMS}$ (6).

The least significant difference (LSD) for the 5% level is also presented (10). The disadvantages of this test as compared, for example to the Duncan or other tests as well as the mis-uses that are frequently made

of the LSD are fully appreciated. Nevertheless, LSD values are presented because: it remains the best understood statistical test in many countries, it still serves as a reasonably reliable basis of comparison, and it lends itself to more concise presentation in the tables than the various sequential range tests. Readers wishing to use the Duncan multiple range test, for example, may compute the appropriate standard error from the standard error presented in the tables.

Considerable understanding as to which factors are influencing yield and the interactions between these factors may be gained by studying the correlations presented in Tables 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 62, 64 and 66. The correlations are between the means of all traits for which data were reported. Correlations were calculated between the means rather than using the raw data first because this appeared to be somewhat more meaningful genetically and second because some types of data were frequently reported for only one replication.

The means of each character for each variety were also used to compute a multiple regression for yield considering all other variables for which differential data were reported as "independent" variables. It is realized that many of these variables are not truly independent from etiher a statistical or a biological viewpoint. The multiple regression analyses for each location are presented in the same tables as the correlation values, and both partial regression coefficients and "t" values are presented for each variable. In computing multiple regressions it is often customary to begin with the variable explaining the largest amount of variance of the dependent variable (in this case, yield) and continue adding variables that account for the next most amount of variance until the "t" values for additional variables are no longer significant. When this point is reached, no more additional variables are included. It will be noted, however, that coefficients and "t" values are included for all "independent" variables. This was done partially because the magnitude of the "t" value (sign ignored) may be a measure of the relative importance of a variable in determining yield. Such interpretations should be made with some care, however, particularly when there are two variables that are not truly independent or that may measure much the same thing (e. g. heading date and maturity date).

For readers who have not had much experience with multiple regression, the R^2 value is the amount of the variance for yield that can be accounted for by the regression equation. This regression equation consists of a constant term plus coefficients to be multiplied by the values for each of the independent variables. The equation can be used to calculate an expected yield for each variety based on the values for each of the independent traits that were measured. That is, we may compute an expected yield for a variety on the basis of its maturity, rust reaction, straw strength, etc. For example, the expected yield of variety 16 at Beirut, Lebanon can be calculated as (see data in Table 42 and coefficients and constant term in Table 43): $Y = 16610 - 46.9633(155) - 33.7534(208) - 112.0620\ (1.36) = 2157$.

For the reader's convenience, expected (i. e. calculated) yields using the multiple regression equations are presented in Table 69 for all locations reporting more than one independent variable. The differences between observed and calculated yields are presented in Table 70. In attempting to verify any of the figures in these two tables, it should be remembered that variations may be due to difference in the procedure for rounding off. Incidentally, as Ostle (9, p223) suggests, R (i. e. $\sqrt{R^2}$) may be thought of as a linear correlation between the expected and observed yields. While many workers will find the multiple regression analyses interesting and useful, a full understanding is not essential to the interpretation of the yield data or the factors influencing yield.

The overall summary of the data reported for all varieties is presented in Table 67. These are the means for all traits averaged over all locations from which differential data were reported. As will be noted, the number of locations differs between traits. No combined analysis of variance over all locations was attempted due to some disparity in data recording, heterogeneity of variances and to the fact that the data were incomplete at some locations particularly for varieties that are sensitive to short day lengths.

The correlation values in Table 68 were calculated from the means of the traits averaged over all locations where both traits were measured. These are perhaps the best estimates of the relationship between traits.

Because of the unique nature of the data reported being representative of a diverse group of varieties tested over a sizable part of the world's spring wheat area, the philosophy of the authors has been to try to provide the reader with a maximum amount of usable information. No attempt has been made to "digest" the data and explore all of its ramifications, but it is hoped that students and scientists alike will continue to find applications and interpretations that cannot be visualized today.

RESULTS AND DISCUSSION

As can be seen from Table 67 the highest yielding five varieties over the 34 locations were:

	kg/ha
Pitic 62	3526
Nainari 60	3422
Penjamo 62	3417
Pj sib × Gb 55 (white grain)	3312
Lerma Rojo 64 A	3253

These are to a remarkable degree the same varieties that have perfomed well in the previous Inter-American and Near Eastern yield trials (1, 2, 3, 4, 5, 7, 8). Pitic 62, for example, previously had the highest average yield in all three Near Eastern trials and the highest in two of the three Inter-American nurseries in which it was entered.

The mean yield averaged over such a wide range of environmental conditions might not be too meaningful if the same varieties do not also tend to yield the best at individual sites. Pitic 62, however, was among

the five highest yielding varieties in 23 of the 34 locations reported in this bulletin. Its poor yield in several locations can be accounted for by inadequate disease resistance indicating that its yield potential is indeed impressive. This has also been the tendency in previous nurseries. Nainari 60 and Penjamo 62 were also among the five highest yielding varieties in over half of the locations. Pitic 62, Nainari 60, Penjamo 62, the Penjamo sib × Gabo 55 selection or Lerma Rojo 64A were among the five highest varieties in 33 of the 34 reporting locations.

Thatcher, Justin and Selkirk are just as consistent in their low yield. Thatcher was among the lowest five yielding varieties in 25 out of the 34 locations, and Justin and Selkirk, respectively, were among the five poorest yielding varieties in 20 and 22 locations. This same trend has been noted in previous nurseries (8, p 12).

As in two previous yield trial publications (7, 8), multiple regression analyses were carried out for each location and the resultant equations were used to calculate a predicted or calculated yield for each variety at each location. These predicted yields are reported in Table 69, and the differences between actual and predicted yields are presented in Table 70. The predicted yields may be thought of as what a variety might be expected to yield on the basis of its data for the various independent variables that are known to affect yield under certain conditions. For example, disease resistance is very closely related to yield under severe epiphytotic conditions such as for stripe rust in Ecuador (see Tables 11 and 12). Flowering and maturity are usually inversely related to yield at locations with short daylengths because a number of daylength sensitive varieties are included in the test. Height and lodging are also usually inversely related to yield at locations where fertilization and rainfall are adequate.

The highest yielding varieties in the nursery tended, as would be expected, to have the highest predicted yields. That is, you would expect them to yield well because their maturity, disease resistance, straw strength, height, etc., were adequate at most locations. Thatcher, the lowest yielding variety in the trial, also had the lowest predicted yield due to its heigth, susceptibility to lodging and extreme lateness at locations with short day lengths.

As was suggested previously (7, p13), the difference between actual and predicted yields might be useful in identifying varieties that possess "yield genes" apart from those that can be explained by disease resistance, straw strength, etc. A variety might have a high yield but actually yield very poorly due to e. g. poor straw strength. If, however, such a variety consistently yielded more than its predicted yield, it might suggest that the variety actually had a high yield potential and might be useful as a parent. Lerma Rojo was given as an example of just such a variety.

This point has, however, not been discussed further until more data could be accumulated and it could be seen if given varieties tend to outyield their predicted yields from one year to the next and over a wide range of environments. A multiple regression analysis with so many independent variables would have uncertain value if only taken from a few locations but becomes more meaningful from a large number of locations.

With the data reported herein plus those from previous nurseries (7, 8), multiple regression analyses have been carried out for 65 locations representing the major areas of spring wheat production around the world. In general varieties have behaved consistently in relation to their predicted yield in the three nurseries.

Varieties that had a positive value in Table 70 for the average over 34 locations in this test and that have appeared in at least one of the two other trials (7, 8) in which multiple regression analyses were calculated are as follows:

Variety	Difference between observed and calculated yield (observed-calculated) in kg/ha.		
	1st ISWYN 34 loc.	3rd NE-American (7) 19 loc.	4th Inter-American (8) 12 loc.
Pitic 62	601	293	536
Lerma Rojo 64A	123	341	118
Penjamo 62	219	29	160
Triple Dirk	81	6	[1]
Nainari 60	417	107	144
Gaboto	74	[1]	66
Pj sib × Gb 55	445	154	[1]

[1] Not entered.

As will be noted, the varieties that yielded more than their calculated yield in the trial reported in this bulletin had *all* yielded better than their calculated yields in previous trials. This would seem to indicate that these varieties have a high yield potential apart from what can be explained by resistance, maturity and straw strength. They have in fact all been very useful in crosses in the Mexican-CIMMYT wheat program.

It should be remembered, however, that while the ability to out-yield the calculated or predicted yield implies a good yield potential apart from what can be explained by the independent variables, it does not indicate how easily this yielding ability can be recovered in crosses. Both Pitic 62 and the Penjamo sib × Gabo 55 selection are short, strong strawed varieties that out-yield their calculated yield by a large amount. In hundreds of crosses in the Mexican program, however, the yield potential has been found to be much easier to recover in crosses with Pitic 62 than with the Penjamo sib × Gabo 55 selection. This is apparently due to the fact that the inheritance of the yield potential of the Penjamo sib × Gabo 55 line is controlled by multiple recessives while that of Pitic 62 is more simply inherited. Even the disease resistance of Pitic 62 appears to be more simply inherited thereby allowing the selection of a larger number of desirable types in F_2 populations.

Of the independent variables rust plays a very important role in determining yield. Within recent years there has been considerable interest in tolerance and other non-specific types of rust resistance. Material

with this type of rust resistance yields well despite having a high rust note. This type of resistance is effective against a broad spectrum of rust races and tends to remain effective over a greater number of years than the hyper-sensitive genes commonly employed. Unfortunately the trait is difficult to identify and evaluate. The multiple regression technique might be useful in identifying lines with rust tolerance as they would tend to yield better than you would expect on the basis of their rust notes. Such a technique would not be practical in identifying the trait in segregating populations but would be of interest in identifying fixed lines that carry tolerance. Indeed, several of the above lines that consistently out-yielded their predicted yields have been found to carry such genes.

To make this nursery as useful as possible, suggestions are welcomed concerning improvements in the design and management of the nurseries, number of varieties, plot type, presentation of results, analyses, etc. So that the nursery can be kept as current as possible and thereby of more immediate usefulness, breeders are urged to submit their best new commercial varieties and/or most promising experimental lines for including in the nursery. Seed of such material should arrive in Mexico by September 15 for planting in the seed plots in Ciudad Obregon, Sonora. It is requested that 400-500 grams of seed be sent although less can be used if necessary. Obviously, the total number of entries that can be included in such a test is limited, but it is hoped that the best representative of each of the major spring wheat regions of the world can be included.

SUMMARY

Twenty five wheat varieties representing the major types grown throughout the spring wheat regions of the world were entered into a replicated international yield trial. Results were obtained from 34 locations in 23 countries from Argentina and Chile to the United States and from South Africa through the Near and Middle East to Australia. These included both irrigated and rainfed conditions from 226 meters below sea level in the Jordan valley to 3,058 meters above sea level in Ecuador and from approximately 35°S latitude to 45°N.

In addition to yield, wherever possible data were obtained on disease reaction, height, flowering and maturity date, lodging, shattering, 1000 grain weight and test weight. The data from all traits were analyzed statistically when data were reported on more than one replication, and correlations were calculated between the means of all traits measured at each location. A multiple regression analysis of yield on the other variables was also calculated for each location.

The varieties having the highest average yield over 34 locations were Pitic 62, Nainari 60, Penjamo 62, a Penjamo sib × Gabo 55 selection (grown under several names in the Near East and Mexico) and Lerma Rojo 64A. All five are of Mexican origin and are all dwarf or semi-dwarf in growth habit with the exception of Nainari 60 which is also fairly

strong strawed. As have previous international yield nurseries both in the Americas and through the Near East, the results show that is possible to breed varieties that have a much wider range of adaptation than is usually believed possible. There was a marked tendency for varieties to maintain their relative rankings at all locations whether they were fertilized or not fertilized, irrigated or rainfed and over a wide range of environments.

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Cooperating Stations and Scientists with Supplementary Data as Supplied by the Cooperators

ARGENTINA

Instituto de Fitotecnia, *Castelar*
Cooperators: Hugo P. Cenoz and Noe Horovitz (Jr.)
Latitude: 34° 36′ S
Longitude: 58° 40′ W
Elevation: 24 meters above sea level
Date of planting: August 14, 1964
Fertilizer used: none
General description of weather conditions during time of test: Rainfall was light but well distributed, and there was no damage due to frost or cool spring. It was a good wheat year.
Disease development: very late
The data are presented in Tables 1 and 2.

Marcos Juarez

Cooperators: Benito Petersen and Rogelio Fogante
Latitude: 32° 41′ S
Longitude: 62° 07′ W
Elevation: 110 meters above sea level
Date of planting: August 19, 1964.
Fertilizer used: none
General description of weather conditions during time of test:
August: 36 mm. precipitation, 3 frosts
September: 68 mm. precipitation, 2 frosts
October: 62 mm. precipitation
November: 164 mm. precipitation
December: 123 mm. precipitation
Disease development: good
Weed, insect and pest problems: none
Date when different notes were taken:
Heading: October 16-21
Rust: November 1-12
Height: December 6-10
The data are presented in Tables 3 and 4.

Pergamino, Province of Buenos Aires

Cooperators: Jose Rath and Hector Conta
Latitude: 33° 52′ 58″ S
Longitude: 60° 35′ 15″ W

Elevation: 68 meters above sea level
Date of planting: August 27, 1965
General description of weather conditions during time of test: Climatic conditions were favorable for wheat, and there was no damage due to frosts, high temperature or hail. Rainfall during the vegetative period (July-November) was slightly less than normal.

Precipitation:

January	7.9 mm.	July	8.3 mm.
February	239.9 mm.	August	49.4 mm.
March	201.0 mm.	September	60.2 mm.
April	108.7 mm.	October	24.1 mm.
May	92.4 mm.	November	61.0 mm.
June	19.6 mm.	December	42.8 mm.

The data are presented in Tables 5 and 6.

Estación Experimental Agropecuaria, *Parana* (E. R.)
Cooperators: A. L. Chabrillon and V. Ramos
Latitude: 31° 50′ S
Longitude: 60° 31′ W
Elevation: 110 meters above sea level
Date of planting: July 29, 1964 (germination August 6, 1964)

Precipitation:

January	40 mm.	July	0 mm.
February	60 mm.	August	16 mm.
March	286 mm.	September	81 mm.
April	192 mm.	October	19 mm.
May	14 mm.	November	52 mm.
June	18 mm.	December	103 mm.

Yearly totals:	1964	886.7 mm.
	1963	863.1 mm.
	1962	531.7 mm.
Long time average		950 (approx.)

To insure good germination, a light irrigation equivalent to 5 to 10 mm. was applied at seeding time.
The data are presented in Tables 7 and 8.

CHILE

Estación Experimental Central, *"La Platina"*, Santiago
Cooperators: Cereals program
Latitude: 33° 34′ S
Longitude: 70° 38′ W
Elevation: 629 meters above sea level
Date of planting: August 10, 1964
Precipitation: 65.8 mm. plus 5 irrigations

General description of weather conditions during time of test: It was a dry year with low humidity and relatively high temperatures during the spring.

Fertilizer used: 128 kg/ha of N and 160 kg/ha of P applied as sodium nitrate (salitre) and triple superphosphate

Disease development: There was a heavy stripe rust attack and also good development of leaf and stem rust

Weed, insect and pest problems: none. Weeds were controlled with 2, 4-D.

Dates when different notes were taken:

Stripe rust: October 27, 1964
Leaf rust: November 27, 1964
Stem rust: January 1, 1965
Lodging and shattering (none encountered): January 1, 1965
Flowering: October 20 to November 9, 1964
Height: January 12, 1965

The data are presented in Tables 9 and 10.

ECUADOR

"Santa Catalina", *Quito*

Cooperators: Department of Cereals, INIAP

Latitude: 0° 22′ S

Longitude: 78° 33′ W

Elevation: 3,058 meters above sea level

Date of planting: February 22, 1965 (effective germination March 1, 1965)

Precipitation during cycle of test: 722 mm. (February 22 to September 20, 1965)

General description of weather during time of test: It was a year of average climatic conditions.

Fertilizer used: 30 kg/ha of N, 120 kg/ha of P_2O_5 and 30 kg/ha of K_2O applied as 10-30-10 fórmula

Disease development: average with light attack of stem rust

Weed, insect and pest problems: none of importance

Dates in which different notes were taken:

Stripe rust, first note: May 21, 1965 (not analized nor presented in tables)
Stripe rust, second note: June 28, 1965
Stripe rust in the head: June 28, 1965
Leaf rust: June 28, 1965
Stem rust: June 28, 1965

The data are presented in Tables 11 and 12.

COLOMBIA

Tibaitata, Sabana de Bogota
Cooperators: Mario Zapata B., Rafael Lopez O., Daniel Varela M.
Latitude: 4° 35′ N
Longitude: 74° W
Elevation: 2,600 meters above sea level
Date of planting: April 22, 1965
Precipitation during cycle of test: 300 mm.
General description of weather conditions during time of test: very wet during harvest time
Fertilizer used: 25 kg/ha of N, 75 kg/ha of P_2O_5 and 25 kg/ha of K_2O applied on a 10-30-10 formula
Disease development: good
Weed, insect and pest problems: none
Dates when different notes were taken:
- Heading: June 27 through August, 1965
- Stripe rust, leaf: July and August 1965
- Stripe rust, head: October, 1965
- Leaf rust: August and September, 1965
- Stem rust: October, 1965
- Lodging and shattering: October, 1965

(The above notes were taken on different dates according to growth stage of the variety)

The data are presented in Tables 13 and 14.

GUATEMALA

Labor Ovalle, *Quezaltenango,* Guatemala, C. A.
Cooperators: Astolfo Fumagalli, Salvador Cruz and Jorge Luis Juarez
Latitude: 14° 52′ N
Longitude: 91° 30′ W
Elevation: 2,380 meters above sea level
Date of planting: August 10, 1964
Precipitation during cycle of test: 411 mm
General description of weather conditions during time of test: There was a constant high humidity due to frequent rains thus favoring the development of diseases particularly stripe rust and Septoria.
Disease development: severe
Weed, insect and pest problems: none. Weeds were controlled by 2, 4-D and by hand weeding.
Dates when different notes were taken:
- Stripe rust: October 7, 1964
- Leaf rust: October 7, 1964
- Septoria: October 21, 1964
- Heading: beginning October 5, 1964
- Maturity: beginning December 21, 1964

The data are presented in Tables 15 and 16.

MEXICO

Centro de Investigaciones Agricolas del Bajio (*CIAB*), El Roque, Guanajuato. (Two nurseries were seeded at this location with a difference of approximately one month in planting date)
Cooperators: Gregorio Vázquez, Ricardo Urbina, Rodolfo Moreno G.
Latitude: 20° 34′ N
Longitude: 100° 28′ W
Elevation: 1,650 meters above sea level
Irrigation: yes
Date of planting:
Early: November 17, 1964
Late: December 16, 1964

Fertilizer used: Early planting date 120 kg/ha of N and 60 kg/ha of P_2O_5 were applied at planting, and another 60 kg/ha of N were applied in the first irrigation after seeding. Despite the application of a total of 180 kg/ha of N, the plots appeared to be short of nitrogen judging by the appearance and height of the ends of the rows as compared with the central part of each plot. The previous crop was maize

Late planting date — an application of 80-60-0 kg/ha, respectively, of N, P_2O_5 and K_2O was made at planting, and an additional 60 kg/ha of N were applied in the first irrigation. The previous crop was alfalfa

Notes: Early planting — The stem rust arrived too late to take good differential notes. Two notes were taken for stripe rust, but only the second (generally the more severe) was analyzed and presented in the tables.

Late planting — Two notes were taken for stripe rust but only the second (and more severe) was analyzed and presented in the tables. It was difficult to take meaningful notes in leaf rust in some varieties as the leaf had been killed by stripe rust. Stem rust arrived too late to lower yields appreciably.

The data for the early planting are presented in Tables 17 and 18 and for the late planting in Tables 19 and 20.

Campo Agricola Experimental "El Horno" *Chapingo*, Mexico
Cooperators: Jose Luis Maya, Marco Quiñones, Rodolfo Moreno G.
Latitude: 19° 31′ N
Longitude: 98° 53′ W
Elevation: 2,249 meters above sea level
Irrigation: no
Fertilizer used: A total of 120-60-0 kg/ha of N, P_2O_5 and K_2O were applied
The data are presented in Tables 21 and 22.

UNITED STATES

University of California, *Davis*, California
Cooperators: J. C. Williams and John D. Prato

Latitude: 38° 32′ N
Longitude: 121° 45′ W
Elevation: 15 meters above sea level
Date of planting: December 26, 1964
Precipitation during cycle of the test: 330 mm.
General description of weather conditions during time of test: It was wet during first 6 weeks (254 mm.) but becoming very dry before an additional 76 mm of rain fell at early flowering. Hot, dry winds occurred during and after flowering.
Fertilizer used: none
Disease development: moderately severe stripe rust and traces of stem rust and barley yellow dwarf
Weed, insect and pest problems: none
Dates when different notes were taken:
Stripe rust: May 10, 1965
Lodging: June 1, 1965
Harvested: June 10, 1965
Shattering (on border rows): June 21, 1965
The data are presented in Tables 23 and 24.

Minnesota Agricultural Experiment Station, *St. Paul Minnesota*
Cooperators: D. R. Johnston, E. C. Gilmore, E. R. Ausemus
Latitude: 45° 0′ N
Longitude: 93° 10′ W
Elevation: 273 meters above sea level
Date of planting: May 6, 1965 (emerged May 13, 1965)
Irrigation: no
The data are presented in Tables 25 and 26.

SOUTH AFRICA

Stellenbosch, South Africa
Cooperators: . X. Laubscher, F. Gillie and Johanna Theron
Latitude: 33° 56′ S
Longitude: 18° 51′ E
Elevation: 91 meters above sea level
Date of planting: May 12, 1965
Precipitation during cycle of test:

	1965	5 yr. ave.
May	71.5	
June	62.0	157.8
July	48.0	92.9
August	126.5	110.7
September	39.0	47.4
October	34.0	54.9
Total	381.0	463.7 (5 months)

(Test not irrigated)

Weed, insect and pest problems: slight bird damage
Dates when different notes were taken:
Heading: January, 1965
Maturity: February and March, 1965
Harvest and threshing: March and April, 1965
Weighing of grain: May, 1965
The data are presented in Tables 31 and 32.

LIBYA

Sidi Mesri, Tripoli
Cooperators: A. Najar and H. A. Al-Jibouri
Latitude: 32° 53′ N
Longitude: 13° 11′ E
Elevation: 19 meters above sea level
Date of planting: November 29, 1964
Irrigation: Plots were irrigated 13 times during the growing season
Fertilizer used: "3 quintals/hectare of 12/24/8 NPK" (36-72-24 kg/ha of N - P_2O_5 - K_2O)
General description of weather conditions during time of test: normal
Disease development: only leaf rust
Weed, insect and pest problems: plots were weeded 7 times during the growing season
The data are presented in Table 33.

CYPRUS

Prastio
Cooperators: Department of Agriculture, Cyprus
Latitude: 35° 6′ N
Longitude: 32° 25′ E
Elevation: 152 meters above sea level
Date of planting: December 15, 1964
Precipitation during cycle of test: 380 mm
General description of weather conditions during time of trial: generally favorable for cereal development
Fertilizer used: 192 kg/ha each of ammonium sulphate and super phosphate (40-31-0 kg/ha of N - P_2O_5 - K_2O?)
Disease development: slight attack of stem rust
Weed, insect and pest problems: Birds attacked the trial at ripening. Wild oats were a problem but were removed.
The data are presented in Tables 34 and 35.

SAUDI ARABIA

Kharj
Cooperator: Mohamed Zeini Jowana
Latitude: 24° 15′ N
Longitude: 47° 15′ E

General description of weather conditions during time of test: Less than normal rainfall
Disease development: Slight except for some *Septoria nodorum* on some Indian and Pakistani varieties
Weed, insect and pest problems: none
Dates when different notes were taken:

Leaf rust	October 27, 1965
Stem rust	October 27, 1965
Stem rust (artificial inoculation)	October 19, 1965
Septoria tritici	October 13, 1965
Septoria nodorum	October 28, 1965
Lodging	October 28, 1965
Height	October 28, 1965

The data are presented in Tables 27 and 28.

ETHIOPIA

Central Agricultural Experiment Station, *Debre Zeit*
Cooperators: Tesfaye Tesemma and Dagnatchew Yirgou
Latitude: 8° 55′ N
Longitude: 38° 58′ E
Elevation: 1,894 meters above sea level
Date of planting: July 27, 1965
Precipitation during cycle of test: 410 mm
General description of weather conditions during time of test: The weather was excellent for wheat. The rainfall was adequate throughout the growing season, and there was plenty of sunshine toward the time of maturity.
Disease development: Stem and leaf rust were the major diseases observed
Dates when different notes were taken:
Germination: August 3, 1965
Heading: September 10 through November 30, 1965
Lodging, height and maturity: November 11 through December 12, 1965
Diseases: October 19, 1965
The data are presented in Tables 29 and 30.

SUDAN

Hudeiba Agricultural Research Station, *Ed Damer*
Cooperators: George Ishag George and Mahgoub Mohd. Mahgoub
Latitude: 17° 35′ N
Longitude: 33° 27′ E
Elevation: 107 meters above sea level
Date of planting: November 28, 1964
Irrigations: 8. November 28, December 3, December 10, December 12 (1964) and January 3, January 15, January 29 and February 8 (1965)
Fertilizer used: 70 kg/ha of N applied as 333 kg/ha of ammonium sulphate (21% N)

Elevation: 430 meters above sea level
Date of planting: December 31, 1964
Irrigation: The experiment was irrigated every 10-13 days
General description of the weather conditions during time of test: normal and without frost
Fertilizer used: 50 kg/dunum of 13-13-21 (26-26-42 kg/ha of N - P_2O_5 K_2O? Editor's note: The dunum is a unit of land measure that may be 2,500 m^2 or 1,000 m^2 depending on the area. The 2,500 m^2 figure was used for the above calculation).
Weed, insect and pest problems: none
The data are presented in Tables 36 and 37.

JORDAN

Deir Alla Research Station
Cooperators: Z. Ghosheh and J. A. Quliziwi
Latitude: 32° 11′ N
Longitude: 35° 50′ E
Elevation: 226 meters *below* sea level
Date of planting: December 5, 1964 (germination December 17, 1964)
Precipitation during the cycle of the test: 298.9 mm. plus 4 irrigations.
General description of the weather conditions during time of test: normal with some eastern winds
Fertilizer used: none
Weed, insect and pest problems: hand weeded 2-3 times. Precautions were taken to prevent bird injury by planting early plots.
Dates when different notes were taken:
Diseases: January 10-April 20, 1965
Heading: April, 1965
Harvesting: May 29-30, 1965
The data are presented in Tables 38 and 39.

SYRIA

Kjarabo (near Damascus)
Cooperators: A. K. Koueider and G. S. Murty
Latitude: 33° 20′ N
Longitude: 36° 28′ E
Elevation: 617 meters above sea level
Date of planting: November 30, 1964
Precipitation during the cycle of the test: 150 mm plus 6 irrigations
General conditions of weather during time of test: "During the early part of the growing season the weather was good, later it was windy with frost; in the end was normal."
Fertilizer used: 500 kg/ha each of ammonium nitrate and super phosphate (105-80-0 kg/ha of N - P_2O_5 - K_2O?)
Disease development: "There was infection with different diseases like rust and bunt"
Weed, insect and pest problems: Field was hand worked 3 times. No other problem
Dates when different notes were taken:

Flowering: April 15 to May 6, 1965
Maturity: June 1 to 18, 1965
Height: May 28, 1965
Lodging: May 28, 1965
Harvesting: June 6 to 24, 1965
The data are presented in Tables 40 and 41.

LEBANON

Faculty of Agricultural Sciences, American University of Beirut, *Beirut*
Cooperator: W. W. Worzella
Latitude: 33° 28′ E
Longitude: 35° 28′ E
Elevation: 950 meters above sea level
Precipitation during time of test: 517 mm. (about 100 mm. above normal)
General description of weather conditions during time of test: "A late spring frost (March 31, 1965) injured a few of the early strains that were in the boot stage, greatly affecting the final yields.
Disease development: a very slight infection of rust making note taking not worthwhile
The data are found in Tables 42 and 43.

TURKEY

Plant Improvement Station, *Eskisehir*
Cooperators: Hüseyin Kutlak and Erol Karma
Latitude: 36° 45′ N
Longitude: 30° 95′ E
Elevation: 789 meters above sea level
Date of planting: November 6, 1964
General description of weather conditions during time of test: rainy spring and cool summer
Fertilizer used: 6 kg/decare of P_2O_5 applied as superphosphate (60 kg/ha of P_2O_5?)
Disease development: rather severe stripe rust
Dates when different notes were taken:
Frost damage: March 15, 1965
Height: July 1, 1965
Stripe rust: May 15, 1965
Leaf rust: May 30, 1965
Stem rust: June 15, 1965
The data are presented in Tables 44 and 45.

RUMANIA

The *Brasov* Agricultural Experiment Station of the Research Institute for Cereals and Industrial Plants
Cooperators: Balasoiu Alexandru and Stefanescu Adrian
Latitude: 45° 42′ N
Longitude: 25° 33′ E

Elevation: 496 meters above sea level
Date of planting: April 7, 1965 (emergence April 21-23)
Precipitation during the cycle of the test: 280.6 mm. "Although the precipitation quantity recorded during the April-July period was by 92.9 mm below the 49 year average recorded in this locality, the plants did not suffer from lack of water due to the moisture accumulated into the soil in autumn and winter and to a better distribution of rainfall during the growing period."
General description of weather conditions during time of test: early, cool spring followed by a normal summer favoring the growth of spring wheat.
Disease development: severe leaf rust, considerable stem rust and light stripe rust
Weed, insect and pest problems: weed eradication by hand
Dates when different notes were taken:
Heading: June 1-25, 1965
Maturity: July 15-31, 1965
Stripe rust: July 5 and 15, 1965
Leaf rust: June 25 and July 15, 1965
Stem rust: July 15 and 28, 1965
Powdery mildew: June 4 and 16, 1965
Lodging: July 28 and August 4, 1965
Shattering: August 19 and 26, 1965
The data are presented in Tables 46 and 47.

IRAQ

Abu-Ghraib Experiment Station, *Baghdad*
Cooperator: Omar Ali Ameen
Latitude: 33° 20′ N
Longitude: 44° 24′ E
Elevation: 34.1 meters above sea level
Date of planting: November 23, 1964 (germination December 7, 1964)
Precipitation during the cycle of test: 60 mm plus 4 irrigations
Fertilizer used: none
Weed, insect and pest problems: "Varieties C-271 and Napo were little sensitive to the birds." Plots were hand weeded 10 times.
Dates when different notes were taken:
Heading: March 6-April 15, 1965
Maturity: May 2-18, 1965
Height: April 28, 1965
Harvest: May 10-18, 1965
The data are presented in Tables 48 and 49.

IRAN

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

Date of planting: November 6, 1964
Precipitation during cycle of the test: 125 mm plus 6 irrigations of approximately 100 mm each
General description of weather conditions during time of test: normal
Fertilizer used: none
Disease development: some
Weed, insect and pest problems: none
Dates when different notes were taken:
Stripe rust: March 15, 1965
Leaf and stem rust: March 30, 1965
Height, lodging and shattering: May 15, 1965
Harvest: May 17, 1965
The data are presented in Tables 50 and 51.

PAKISTAN

Agricultural Research Institute, *Tandojam*
Cooperators: Z. A. Munshi and wheat staff
Latitude: 25° 2′ N
Longitude: 63° 38′ E
Elevation: 191 meters above sea level
Irrigated: yes
The data are presented in Tables 52 and 53.

Ayub Agricultural Research Institute, *Lyallpur*
Cooperator: M. A. Aziz
Latitude: 31° 30′ N
Longitude: 73° 10′ E
Elevation: 213 meters above sea level
Date of planting: November 16, 1964
Precipitation during cycle of the test: 76 mm plus 5 irrigations of approximately 75 mm each
General description of the weather conditions during time of test: generally dry with light showers
Fertilizer used: 53 kg/ha of both N and P_2O_5 (i. e. 60 lb./A.) applied as ammonia sulphate and superphosphate, respectively
Disease development: some infection of stripe, leaf and stem rusts but not enough to cause low yields
Weed, insect and pest problems: no noticeable bird damage. "Wheat weevil caused small damage at germination stage and was controlled by dusting". Weeds controlled by hand
Dates when different notes were taken:
Stripe rust: February 28 and March 5, 1965
Leaf rust: March 18 and 31, 1965
Stem rust: March 31 and April 8, 1965
Frost damage (not analyzed): February 28, 1965
Height: April 12, 1965
Lodging: March 31, 1965
Shattering: May 8, 1965
The data are presented in Tables 54 and 55.

Agricultural Research Institute, *Tarnab*
Cooperator: Economic Botanist
Latitude: 33° 34′ N
Longitude: 67° 34′ E
Elevation: 338 meters above sea level
Date of planting: November 20, 1964 (germination November 30)
Precipitation during cycle of the test: heavy
General description of weather conditions during time of test: heavy rain delayed maturity
Fertilizer used: 18 kg/ha (i. e. 20 lb./A.) N and 27 kg/ha (i. e. 30 lb./A.) of P_2O_5 applied at sowing. An additional 18 kg/ha of N were applied later.
Disease development: abundant stripe and leaf rust
Weed, insect and pest problems: none
Dates when different notes were taken:
Yellow rust: March 10, 1965
Leaf and stem rust: May 8, 1965
Lodging: April 3 and 20, 1965
Harvesting and threshing: May 9-10, 1965
The data are presented in Tables 56 and 57

INDIA

Botanical Sub-Station, *Pusa, Bihar*
Cooperators: P. N. Narula and cooperators
Latitude: 25° 59′ N
Longitude: 85° 40′
Elevation: 165.7 meters above sea level
Date of planting: November 16, 1964 (germination November 22, 1964)
Precipitation during cycle of test: 25 mm plus 3 irrigations
General description of weather conditions during time of test:

Temperature

	Morning		Evening	
	Max.	Min.	Max.	Min.
November	80.0°	50.5°	88.0°	59.0°
December	80.0°	41.0°	80.0°	46.0°
January	80.0°	43.0°	80.0°	45.0°
February	85.0°	43.5°	85.0°	48.0°
March	95.0°	47.0°	94.0°	55.0°

Disease development: severe leaf and stem rust. Alternaria blight less severe than last year
Fertilizer used: 53 kg/ha (i. e. 60 lb./A.) N applied as ammonium sulphate and 36 kg/ha (i. e. 40 lb./A.) of P_2O_5 applied as superphosphate
Weed, insect and pest problems: severe bird damage in late varieties
Dates when notes were taken:
Leaf rust: first week on February
Stem rust: first week of March
Agronomical performance: middle of January and final week of March

The data are presented in Tables 58 and 59.
New Pusa (Delhi)
Cooperators: S. P. Kohli and staff
Latitude: 28° 24′
Longitude: 77° E
Elevation: 229 meters above sea level
Irrigations: 5 after planting
Fertilizer used: approximately 107-53-36 kg/ha of N - P_2O_5 - K_2O applied at planting and an additional 18 kg/ha of N later.
The data are presented in Table 60
College of Agriculture, Punjab Agricultural University, *Ludhiana*
Cooperators: D. S. Athwal and staff
Latitude: 30° 33′ N
Longitude: 75° 24′ E
Elevation: 242 meters above sea level
Irrigations: 8
Fertilizer used: approximately 143 kg/ha of N and 32 kg/ha of P_2O_5
The data are presented in Tables 61 and 62.

AUSTRALIA

Agricultural Research Institute, *Wagga Wagga, N.S.W.*
Coopeartors: A. T. Pugsley and J. R. Syme
Latitude: 35° S
Longitude: 148° E
Elevation: 197 meters above sea level
Date of planting: June 28, 1965
Precipitation during cycle of the tests: 267 mm
General description of weather conditions during time of test: "Sown later than normal due to dry conditions, thereafter rainfall poor to medium
Fertilizer used: 17.6 kg/ha of P_2O_5 applied as 90 lb./A. of 22% superphosphate
Disease development: none
Weed, insect and pest problems: none
Dates when different notes were taken: straw strength and height taken at harvest on December 14, 1965
The data are presented in Tables 63 and 64.
Waite Agricultural Research Institute
Cooperators: K. W. Finlay and A. Rathjem
Latitude: 34° 58′ S
Longitude: 138° 38′ S
Elevation: 122 meters above sea level
Date of planting: August 14, 1966 (approximately 2 months later than average for this location because of dry weather)
Precipitation during cycle of the test: 178 mm
General description of weather conditions during time of test: no spring rains (causing late planting), soil dried out, unfavorable conditions.
Fertilizer used: 27 kg/ha (?) P_2O_5 applied as 140 lb./A. superphosphate (22% ?)
The data are presented in Tables 65 and 66.

TABLES

TABLE 1. Yield, agronomic and disease data of the 25 varieties in the "1st International Spring Wheat Yield Nursery" grown at Castelar, ARGENTINA, 1964-65.

Variety or cross	Origin	Variety number	Yield kg/ha	Test wt. kg/hl	Days to flowering	Stripe rust $\sqrt{X+1}$	Leaf rust $\sqrt{X+1}$	Stem rust $\sqrt{X+1}$	Height cms.	1000 grain weight gms.
Pitic 62	Mexico	2	4316	78.3	75	1.10	3.45	3.00	86	36.5
Penjamo 62	Mexico	6	3949	81.1	69	1.00	1.47	1.00	76	39.7
Nainari 60	Mexico	19	3733	78.5	72	2.54	3.47	1.00	91	43.1
Pj sib x Gb 55 (White grain)	Mexico	24	3691	80.6	74	1.90	7.25	1.00	79	31.9
Giza 144	Egypt	9	3624	83.0	75	1.58	4.11	1.10	101	39.7
Narino 59	Colombia	11	3558	82.4	69	1.00	8.52	5.19	98	38.9
Napo 63	Colombia	16	3508	80.3	65	1.00	6.70	1.00	95	37.9
CT-244	Canada	25	3474	81.0	83	1.10	1.00	1.00	108	36.0
Gaboto	Argentina	21	3358	82.4	77	1.00	1.00	1.46	106	32.2
Klein Rendidor	Argentina	17	3324	81.4	81	1.10	2.20	1.10	105	36.2
Giza 150	Egypt	5	3316	84.0	75	2.70	1.41	1.00	94	40.3
C-273	Pakistan	14	3299	84.4	68	1.00	7.79	5.59	103	42.5
Carazinho	Brazil	12	3241	81.7	75	1.36	2.96	3.80	108	38.8
Gabo	Australia	20	3191	77.8	69	8.84	1.00	1.00	89	38.7
Triple Dirk	Australia	8	3183	81.2	75	9.10	2.04	1.58	103	45.0
Crim	U.S.A.	22	3116	81.2	79	1.00	1.00	1.00	111	35.8
Sonora 64	Mexico	10	3049	79.8	63	1.58	1.00	1.00	73	35.7
Lerma Rojo 64 A	Mexico	4	3024	80.7	68	1.10	9.53	3.28	85	37.1
Bonza 55	Colombia	18	2983	78.7	71	1.10	7.46	1.90	96	35.6
C-518	India	13	2974	84.1	70	1.00	8.97	6.26	94	38.4
Magnif 41	Argentina	1	2958	80.9	68	1.00	1.00	1.00	111	44.5
C-271	Pakistan	3	2783	79.8	67	1.00	8.75	7.46	86	39.8
Justin	U.S.A.	15	248[illegible]	78.3	86	1.00	6.98	1.00	106	32.4
Selkirk	Canada	7	2366	75.0	87	1.00	2.31	1.21	115	35.7
Thatcher	U.S.A.	23	1999	76.3	88	1.00	7.12	3.13	114	25.5
Mean			3220	80.5	74	1.88	4.34	2.28	97	37.5
Statistical level of significance			0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
Coefficient of variation			10.8%	0.7%	1.8%	56.0%	34.3%	80.7%	4.7%	3.7%
Standard error			346	.60	1.36	1.05	1.49	1.84	4.6	1.4
Least significant difference, 5%			488	.85	1.92	1.48	2.10	2.59	6.5	2.0

TABLE 2. Correlations between the means of 8 variables and the multiple regression of yield on the means of 7 variables for the "1st International Spring Wheat Yield Nursery" grown at Castelar, ARGENTINA, 1964-65.

Correlations (r); d.f. = 23

	Yield	Test wt.	Days to flowering	Stripe rust $\sqrt{X+1}$	Leaf rust $\sqrt{X+1}$	Stem rust $\sqrt{X+1}$	Height
Test wt.	.40*						
Days to flowering	-.39	-.39					
Stripe rust $\sqrt{X+1}$	.04	.10	-.11				
Leaf rust $\sqrt{X+1}$	-.22	.06	-.18	-.31			
Stem rust $\sqrt{X+1}$	-.15	.27	-.28	-.22	.67**		
Height	-.48*	-.07	.66**	-.10	-.16	-.07	
1000 grain wt.	.38	.42*	-.56**	.35	-.18	.12	-.13

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

Multiple regression
$R^2 = .528$
7 "independent" variables
constant term = -2834.014

Partial regression coef. (b)	"t" d.f. = n-k-1 = 17
73.5104	1.736
19.6432	.846
-39.6049	-.900
-24.4594	-.623
-48.4525	-.771
-26.6477	-2.530*
41.7710	1.404

TABLE 3. Yield, agronomic and disease data for the 25 varieties in the "1st International Spring Wheat Yield Nursery" grown at Marcos Juarez, ARGENTINA, 1964-65.

Variety or cross	Origin	Variety number	Yield kg/ha	Test weight kg/hl	Days to: flowering	Days to: maturity	Stripe rust	Leaf rust	Stem rust	Height cms.	Lodging %	1000 grain weight gms.
Penjamo 62	Mexico	6	3333	75.0	61	107	0	5 MS	0	65	10	36.0
Crim	U.S.A.	22	3199	79.9	71	108	5 S	T S	0	100	10	33.6
Nariño 59	Colombia	11	3133	77.7	68	102	0	20 S	T	80	20	35.2
Nainari 50	Mexico	19	3116	72.5	68	110	5 S	5 S	T S	70	10	39.5
Pitic 62	Mexico	2	3083	66.0	66	105	0	100 S	0	70	0	28.4
Carazinho	Brazil	12	3058	78.2	68	108	5 S	30 S	50 S	80	30	35.6
Gaboto	Argentina	21	3050	80.4	69	106	0	5 S	T	85	25	31.4
CT-244	Canada	25	3000	79.0	72	105	10 S	0	0	90	5	31.4
Pj sib x Gb 55 (White grain)	Mexico	24	2983	73.7	70	112	10 S	30 S	5 S	60	0	27.0
Napo 63	Colombia	16	2924	78.2	58	108	0	50 S	0	75	0	31.6
Magnif 41	Argentina	1	2850	75.9	64	106	0	0	0	85	50	42.2
Triple Dirk	Australia	8	2849	78.4	70	108	80 S	20 S	0	95	20	36.0
Sonora 64	Mexico	10	2833	78.2	53	100	5 S	0	0	60	0	31.9
Gabo	Australia	20	2724	70.1	61	106	60 S	20 S	T	70	15	31.6
Giza 144	Egypt	9	2699	75.9	66	106	30 S	80 S	0	90	20	34.0
Giza 150	Egypt	5	2683	78.2	60	104	20 S	100 S	0	70	15	31.3
Bonza 55	Colombia	18	2408	70.8	68	110	0	50 MS-S	T	75	0	27.5
C-273	Pakistan	14	2333	80.8	61	109	0	15 S	10 S	85	40	37.2
Lerma Rojo 64 A	Mexico	4	2324	74.1	61	106	0	100 S	0	75	20	32.0
C-271	Pakistan	3	2316	69.6	61	106	0	80 S	40 S	80	50	30.0
Selkirk	Canada	7	2308	72.8	73	108	10 S	30 S	0	90	0	30.5
Justin	U.S.A.	15	2191	77.9	74	109	0	40 S	0	90	15	25.6
Klein Rendidor	Argentina	17	2041	73.2	71	108	5 S	90 S	15 S	80	30	25.4
C-518	India	13	2033	77.7	66	108	0	20 MS	20 S	60	40	30.8
Thatcher	U.S.A.	23	1666	70.3	76	110	0	100 S	30 S	105	0	19.0
Mean			2685	75.4	66	107	2.48[1/]	5.51[1/]	2.14[1/]	79	3.72[1/]	31.8
Statistical level of significance			0.5%	(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			8.3%									
Standard error			224									
Least significant difference, 5%			316									

[1/] Mean of coefficient or percentage transformed to $\sqrt{X+1}$

TABLE 4. Correlations between the means of 10 variables and the multiple regression of yield on the means of 9 variables for the "1st International Spring Wheat Yield Nursery" grown at Marcos Juarez, ARGENTINA, 1964-65.

Correlations (r); d.f. = 23

	Yield	Test wt.	Days to flowering	Days to maturity	Stripe rust $\sqrt{X+1}$	Leaf rust $\sqrt{X+1}$	Stem rust $\sqrt{X+1}$	Height	Lodging $\sqrt{\%+1}$
Test wt.	.24								
Days to flowering	-.22	-.06							
Days to maturity	-.28	-.17	.49*						
Stripe rust $\sqrt{X+1}$	.15	.03	.03	-.05					
Leaf rust $\sqrt{X+1}$	-.52**	-.51**	.02	.13	-.02				
Stem rust $\sqrt{X+1}$	-.44*	-.15	.13	.27	-.23	.28			
Height	-.23	.18	.60**	.19	.11	.05	.06		
Lodging $\sqrt{\%+1}$	-.13	.30	-.16	-.09	-.02	-.07	.37	.09	
1000 grain wt.	.60**	.40*	-.40*	-.24	.14	-.58**	-.27	-.11	.45*

Multiple regression
$R^2 = .623$
9 "independent" variables
constant term = 3182.514

Partial regression coef. (b)	"t" d.f. = n-k-1 = 15
7.9828	.351
22.0013	1.010
-35.5113	-1.099
7.1089	.215
-4.6483	-.139
4.0314	.081
-8.2790	-1.058
-99.2033	-1.996
71.2945	2.798*

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

TABLE 5. Yield, agronomic and disease data of the 25 varieties in the "1st International Spring Wheat Yield Nursery" grown at Pergamino, ARGENTINA, 1964.

Variety or Cross	Origin	Variety number	Yield kg/ha	Days to flowering	Stripe rust	Leaf rust	Stem rust	Height cms.	1000 grain weight gms.	Septoria %
Sonora 64	Mexico	10	5249	83	10	0	0	85	34.0	20
Pitic 62	Mexico	2	5241	92	5	20	0	90	36.8	40
Pj sib x Gb 55 (White grain)	Mexico	24	4957	94	0	10	0	85	36.0	40
Napo 63	Colombia	16	4783	79	0	60	20	105	32.0	20
Nainari 60	Mexico	19	4616	92	10	0	0	110	40.0	30
Penjamo 62	Mexico	6	4316	89	10 R	5 R	0	90	39.6	20
Gabo	Australia	20	4232	90	60	VR	0	105	40.0	20
Triple Dirk	Australia	8	3982	95	60	10	5	120	38.0	20
Nariño 59	Colombia	11	3958	91	0	20	0	105	40.0	10
Bonza 55	Colombia	18	3841	93	20	80	0	115	36.0	5
Carazinho	Brazil	12	3716	97	20	20	80	115	36.0	10
Klein Rendidor	Argentina	17	3674	98	5	40	60	110	34.0	20
Gaboto	Argentina	21	3606	96	0	0	20	110	32.0	20
Giza 150	Egypt	5	3616	92	0	20	0	100	38.0	20
Crim	U.S.A.	22	3458	97	10	5 R	0	115	34.0	10
CT-244	Canada	25	3458	102	0	0	0	115	28.0	40
Giza 144	Egypt	9	3449	94	0	60	0	120	37.6	20
Lerma Rojo 64 A	Mexico	4	3433	85	0	80	0	95	30.8	30
Magnif 41	Argentina	1	3250	86	0	0	0	100	40.2	40
C-273	Pakistan	14	3216	88	0	10	80	115	38.0	10
C-271	Pakistan	3	3174	86	0	10	80	100	36.0	20
C-518	India	13	2641	91	10	30	80	100	32.4	30
Selkirk	Canada	7	2533	106	0	10	0	120	32.0	30
Justin	U.S.A.	15	2375	106	10	40	0	120	30.0	10
Thatcher	U.S.A.	23	2341	102	0	80	0	125	28.0	10
Mean			3727	93	2.44 1/	4.20 1/	2.89 1/	107	35.2	4.64 1/
Statistical level of significance			0.5%	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)
Coefficient of variation			13.1%							
Standard error			487							
Least significant difference, 5%			686							

1/ Mean of coefficients or percentages transformed to $\sqrt{X+1}$

TABLE 6. Correlations between the means of 8 variables and the multiple regression of yield on the means of 7 variables for the "1st Internationl Spring Wheat Yield Nursery" grown at Pergamino, ARGENTINA, 1964.

	Correlations (r); d.f. = 23							Multiple regression $R^2 = .572$ 7 "independent" variables constant term = 9322.747	
	Yield	Days to flowering	Stripe rust $\sqrt{X+1}$	Leaf rust $\sqrt{X+1}$	Stem rust $\sqrt{X+1}$	Height	Septoria $\sqrt{\%+1}$	Partial regression coef. (b)	"t" d.f. = n-k-1 = 17
Days to flowering	-.56**							-31.9121	-1.130
Stripe rust $\sqrt{X+1}$	.19	.04						95.7563	1.349
Leaf rust $\sqrt{X+1}$	-.28	.10	-.13					-19.3711	-.349
Stem rust $\sqrt{X+1}$	-.22	-.17	-.01	.07				-57.8746	-1.309
Height	-.63**	.65**	.17	.26	.08			-30.3943	-1.713
Septoria $\sqrt{\%+1}$	.26	-.16	-.23	-.34	-.18	-.49*		1.3004	.009
1000 grain wt.	.43*	-.46*	.27	-.35	-.05	-.28	.00	18.0197	.403

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

TABLE 7. Yield, agronomic and disease data of the 25 varieties in the "1st International Spring Wheat Yield Nursery" grown at Parana, ARGENTINA, 1964.

Variety or cross	Origin	Variety number	Yield kg/ha	Test wt. kg/hl	Days to: flowering	Days to: maturity	Stripe rust	Leaf rust	Stem rust %	Height cms.	1000 grain weight gms.
Nainari 60	Mexico	19	2999	73.0	70	110	10 S	0	4	85	40.0
Triple Dirk	Australia	8	2725	78.4	72	120	60 S	0	1	95	39.5
Pitic 62	Mexico	2	2599	72.5	71	111	5 S	60 S	1	81	29.6
Magnif 41	Argentina	1	2541	77.0	67	110	5 S	0	1	96	40.1
Gaboto	Argentina	21	2458	79.5	73	114	0	0	40	93	32.3
Giza 150	Egypt	5	2449	79.7	67	114	10 S	20 MS	5	74	33.0
C-273	Pakistan	14	2366	82.0	71	114	0	40 S	30	93	34.5
Gabo	Australia	20	2350	71.2	69	112	40 S	T S	10	80	31.2
CT-244	Canada	25	2316	80.2	84	122	T R	0	1	83	30.4
Nariño 59	Colombia	11	2308	77.0	68	110	0	20 MS	0	85	35.2
Giza 144	Egypt	9	2249	80.8	73	120	10 S	10 S	5	85	38.7
Penjamo 62	Mexico	6	2233	74.6	68	110	20 S	0	0	74	36.0
Pj sib x Gb 55 (White grain)	Mexico	24	2216	74.8	71	111	5 R-5S	20 S	1	78	29.5
Lerma Rojo 64A	Mexico	4	2158	77.3	64	110	0	60 S	0	76	30.1
Carazinho	Brazil	12	2158	78.2	75	120	0	5 MS	10	89	37.5
Sonora 64	Mexico	10	2149	75.9	62	108	5 S	0	1	60	30.1
Napo 63	Colombia	16	2149	76.1	60	108	0	40 S	0	84	33.7
Crim	U.S.A.	22	2141	79.3	77	114	0	5 MS	0	94	33.7
Klein Rendidor	Argentina	17	1858	78.2	79	122	5 S	30 S	80	78	31.6
C-518	India	13	1816	78.4	72	114	0	5 MR	30	76	30.0
C-271	Pakistan	3	1808	74.8	67	114	0	60 S	50	76	35.1
Bonza 55	Colombia	18	1766	72.5	71	111	0	15 S	2	90	29.7
Justin	U.S.A.	15	1724	77.7	92	125	0	5 MR	0	85	30.1
Selkirk	Canada	7	1641	73.7	92	125	0	10 MS	0	88	32.5
Thatcher	U.S.A.	23	1449	74.3	90	125	0	50 S	20	104	22.1
Mean			2185	76.7	73.0	114.9	2.2 1/	3.7 1/	2.8 1/	84	33.0
Statistical level of significance			0.5%	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	0.5%	(only 1 rep.)
Coefficient of variation			17.0							9.1%	
Standard error			372							7.6	
Least significant difference, 5%			524								

1/ Mean of data transformed $\sqrt{X+1}$

TABLE 8. Correlations between the means of 9 variables and the multiple regression of yield on the means of 8 variables for the "1st International Spring Wheat Yield Nursery" grown at Parana, ARGENTINA, 1964

Correlations (r); d.f. = 23

	Yield	Test wt.	Days to flowering	Days to maturity	Stripe rust $\sqrt{X+1}$	Leaf rust $\sqrt{X+1}$	Stem rust $\sqrt{X+1}$	Height
Test wt.	.14							
Days to flowering	-.50*	.05						
Days to maturity	-.46*	.26	.89**					
Stripe rust $\sqrt{X+1}$	.52**	.17	-.22	-.06				
Leaf rust $\sqrt{X+1}$	-.30	-.13	-.15	-.09	-.38			
Stem rust $\sqrt{X+1}$	-.25	.20	.08	.23	-.14	.20		
Height	-.02	.13	.44*	.39*	-.10	.00	.03	
1000 grain wt.	.62**	.26	-.36	-.19	.38	-.35	-.13	.09

Multiple regression
$R^2 = .709$
10 "independent" variables
constant term=2606.269

Partial regression coef. (b)	"t" d.f. = n-k-1=16
52.1198	2.160
30.4238	1.361
-71.5681	-2.321
118.9120	2.910
17.2640	.639
-3.8655	-.160
2.7936	.431
31.4273	1.873

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

TABLE 9. Yield, agronomic and disease data for the 25 varieties in the "1st International Spring Wheat Yield Nursery" grown at "La Platina", Santiago, CHILE, 1964-65.

Variety or cross	Origin	Variety number	Yield kg/ha	Days to flowering	Stripe rust %	Leaf rust	Stem rust	Height cms.	Lodging %
Lerma Rojo 64A	Mexico	4	7878	87	5	0	T R	92	20
Nainari 60	Mexico	19	7124	87	10	0	0	104	5
Napo 63	Colombia	16	6887	84	10	90 S	0	104	10
Bonza 55	Colombia	18	6670	87	0	10 S	0	116	30
Nariño 59	Colombia	11	6615	86	0	0	T R	107	15
Giza 144	Egypt	9	6445	87	20	60 S	0	114	10
Penjamo 62	Mexico	6	6328	86	10	40 S	0	92	10
Klein Rendidor	Argentina	17	6253	93	T	0	5 MS-MR	114	20
Carazinho	Brazil	12	6083	91	10	0	30 MS-MR	114	50
CT-244	Canada	25	5007	95	10	0	0	120	15
Magnif 41	Argentina	1	5841	82	15	0	0	115	15
Gaboto	Argentina	21	5558	94	15	0	T MS	113	50
Crim	U.S.A.	22	5528	88	60	0	0	121	30
C-273	Pakistan	14	5437	84	0	0	90 S	115	10
Justin	U.S.A.	15	5245	100	0	0	15 MS	125	0
C-518	India	13	5216	85	0	15 S	60 S	101	5
Pj sib x Gb 55 (White grain)	Mexico	24	5182	88	50	30 S	0	98	5
Selkirk	Canada	7	5178	99	0	30 S	0	130	5
Giza 150	Egypt	5	5032	86	70	100 S	0	105	15
Pitic 62	Mexico	2	4978	89	80	30 S	0	90	10
Sonora 64	Mexico	10	4832	86	50	30 S	0	80	5
Triple Dirk	Australia	8	4549	87	80	0	0	120	5
Gabo	Australia	20	4307	86	90	0	T MS	102	15
Thatcher	U.S.A.	23	4107	100	20	90 S	T MS	125	15
C-271	Pakistan	3	3912	85	0	80 S	80 S	89	10
Mean			5656	89	4.10 1/	3.79 1/	2.29 1/	108	3.76 1/
Statistical level of significance			0.5%	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)
Coefficient of variation			13.3%						
Standard error			751						
Least significant difference, 5%			1058						

1/ Mean of data transformed $\sqrt{X+1}$

TABLE 10. Correlations between the means of 7 variables and the multiple regression of yield on 6 variables for the "1st International Spring Wheat Yield Nursery" grown at "La Platina", Santiago, CHILE, 1964-65.

Correlations (r); d.f. = 23

	Yield	Days to flowering	Stripe rust $\sqrt{X+1}$	Leaf rust $\sqrt{X+1}$	Stem rust $\sqrt{X+1}$	Height
Days to flowering	-.20					
Stripe rust $\sqrt{X+1}$	-.40*	-.18				
Leaf rust $\sqrt{X+1}$	-.29	-.05	.13			
Stem rust $\sqrt{X+1}$	-.29	-.18	-.47*	-.01		
Height	-.03	.58**	-.22	-.28	-.10	
Lodging $\sqrt{\%+1}$	.22	.01	.00	-.25	-.11	.15

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

Multiple regression
R^2 = .715
6 "independent" variables
constant term = 15865.000

Partial regression coef. (b)	"t" d.f. = n-k-1 = 18
-84.1827	-2.656**
-277.7083	-5.392**
-66.3076	-1.628
-287.4489	-4.941**
-8.8959	-.698
75.7943	.832

TABLE 11. Yield, agronomic and disease data of the 25 varieties in the "1st International Spring Wheat Yield Nursery" grown at Quito, ECUADOR, 1965.

Variety or cross	Origin	Variety number	Yield kg/ha	Test wt. kg/hl	Days to: flowering	Days to: maturity	Stripe rust[1/] Leaf $\sqrt{X+1}$	Stripe rust[1/] head $\sqrt{\%+1}$	Leaf rust $\sqrt{X+1}$	Stem rust $\sqrt{X+1}$	Height cms.	Lodging $\sqrt{\%+1}$	1000 grain weight gms.
Napo 53	Colombia	16	6138	75.1	70	190	1.41	1.00	2.23	1.00	115	1.00	44.4
Justin	U.S.A.	15	4103	75.0	108	211	1.41	2.62	1.00	1.10	141	1.72	34.1
Bonza 55	Colombia	18	3852	77.1	100	199	1.82	1.41	1.00	1.00	144	3.09	42.2
Nariño 59	Colombia	11	3816	74.0	79	191	3.80	1.41	1.00	2.23	118	1.00	39.3
Pitic 62	Mexico	2	3791	68.4	102	209	6.23	5.07	1.41	1.10	122	4.19	37.5
Gaboto	Argentina	21	2838	67.4	106	199	2.90	7.46	1.00	1.82	152	6.59	27.5
C-271	Pakistan	3	2451	77.8	86	184	2.23	1.41	1.31	7.64	119	1.00	36.3
Nainari 60	Mexico	19	2206	69.2	99	195	6.77	7.25	1.00	3.84	128	1.00	38.3
Selkirk	Canada	7	2108	77.9	106	205	1.00	1.00	1.31	1.00	150	2.88	37.1
CT-244	Canada	25	1920	73.7	106	209	3.35	6.38	1.00	2.03	125	1.72	33.4
C-518	India	13	1531	81.4	88	199	1.00	1.41	1.00	5.63	120	1.00	37.3
C-273	Pakistan	14	1482	80.7	88	195	1.21	1.41	1.10	4.71	115	1.00	42.4
Magnif 41	Argentina	1	1383	68.1	86	186	2.90	6.54	1.00	1.00	140	1.00	35.9
Penjamo 62	Mexico	6	1290	66.1	86	180	7.80	9.13	1.00	1.31	99	1.00	31.3
Klein Rendidor	Argentina	17	955	69.7	124	217	5.32	6.59	1.00	2.51	130	1.00	34.3
Thatcher	U.S.A.	23	928	67.1	113	211	5.67	7.80	1.00	1.41	137	1.00	25.2
Lerma Rojo 64A	Mexico	4	582	51.6	86	180	8.85	9.65	1.00	1.00	102	1.00	19.6
Pj sib x Gb 55 (White grain)	Mexico	24	560	57.0	97	197	6.19	9.40	1.00	1.41	94	1.00	25.3
Giza 144	Egypt	9	523	60.8	95	205	3.31	9.40	1.00	1.00	143	1.58	26.5
Giza 150	Egypt	5	475	58.2	88	186	4.83	8.99	1.00	1.21	120	1.00	25.7
Carazinho	Brazil	12	413	63.9	106	215	7.96	8.55	1.00	1.41	145	3.87	26.4
Gabo	Australia	20	340	60.3	89	195	7.95	9.53	1.00	1.82	105	1.00	24.0
Triple Dirk	Australia	8	201	52.9	93	211	8.09	9.76	1.00	1.00	136	1.00	18.4
Sonora 64	Mexico	10	122	55.2	78	186	8.85	9.99	1.00	1.00	91	1.00	17.6
Crim	U.S.A.	22	82	57.5	88	201	6.19	8.73	1.00	1.00	127	1.00	22.5
Mean			1763	67.4	95	198	4.68	6.07	1.09	2.01	124	1.71	31.3
Statistical level of significance			0.5%	0.5%	(only 1	(only 1	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
Coefficient of variation			18.7%	2.9%	rep.)	rep.)	11.9%	9.2%	6.6%	26.7%	4.5%	34.5%	7.7%
Standard error			329	2.0			.56	.56	.07	.54	5.6	.59	2.4
Least significant difference, 5%			464	2.8			.79	.79	.10	.76	7.9	.83	3.4

1/ Two notes were taken, but only the second was used for analysis.

TABLE 12. Correlations between the means of 11 variables and the multiple regression of yield on the means of 10 variables for the "1st International Spring Wheat Yield Nursery" grown at Quito, ECUADOR, 1965.

Correlations (r); d.f. = 23

	Yield	Test wt.	Days to flowering	Days to maturity	Stripe rust, leaf $\sqrt{X+1}$	Stripe rust, head $\sqrt{\%+1}$	Leaf rust $\sqrt{X+1}$	Stem rust $\sqrt{X+1}$	Height	Lodging $\sqrt{\%+1}$
Test wt.	.65**									
Days to flowering	-.10	.12								
Days to maturity	-.02	.12	.79**							
Stripe rust, leaf $\sqrt{X+1}$	-.59**	-.82**	-.03	.08						
Stripe rust, head $\sqrt{\%+1}$	-.74**	-.91**	.08	-.02	.83**					
Leaf rust $\sqrt{X+1}$	.65**	.31	-.35	-.12	-.33	-.46*				
Stem rust $\sqrt{X+1}$	.05	.53**	-.10	-.17	-.34	-.45*	.00			
Height	.20	.31	.56**	.59**	-.44*	-.24	-.07	-.13		
Lodging $\sqrt{\%+1}$	.28	.13	.41*	.33	-.14	-.07	.03	-.19	.54**	
1000 grain wt.	.76**	.90**	-.01	-.01	-.73**	-.86**	.46*	.38	.22	.07

Multiple regression
$R^2 = .811$
10 "independent" variables
constant term = 2641.393

Partial regression coef. (b)	"t" d.f. = n-k-1 = 14
-23.4270	-.275
5.4464	.178
-12.3218	-.392
38.0062	.256
-238.5594	-1.483
1644.9984	1.680
-209.4184	-1.374
-4.6848	-.258
257.0980	1.534
85.1896	1.328

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

TABLE 13. Yield, agronomic and disease data of the 25 varieties in the "1st International Spring Wheat Yield Nursery" grown at Tibaitata, COLOMBIA 1965.

Variety or cross	Origin	Variety number	Yield kg/ha	Days to flowering	Root rot (scale)	Stripe rust Leaf $\sqrt{X+1}$	Stripe rust Head $\sqrt{\%+1}$	Stem rust $\sqrt{X+1}$	Bird damage $\sqrt{\%+1}$	Height cms.	Lodging $\sqrt{\%+1}$	Shattering $\sqrt{\%+1}$	1000 grain wt. gms.
Napo 62	Colombia	16	4283	70	1.75	1.21	1.00	1.41	1.36	93	2.62	1.00	43.9
Lerma Rojo 64A	Mexico	4	4212	75	2.25	6.33	4.96	1.31	1.36	89	5.86	1.00	40.0
Penjamo 62	Mexico	6	3995	77	1.25	2.13	2.57	1.21	2.08	81	4.18	1.08	42.5
Nainari 60	Mexico	19	3795	83	2.25	4.26	5.21	3.45	1.00	98	4.69	1.06	43.9
C-273	Pakistan	14	2916	74	2.50	1.31	3.27	2.36	1.36	95	6.20	1.00	43.1
Pj sib x Gb 55	Mexico	24	2708	83	2.00	3.74	6.73	1.00	1.72	76	1.72	1.03	34.4
Bonza 55	Colombia	18	2453	86	2.00	1.31	1.67	1.21	5.17	110	6.84	1.00	42.6
C-271	Pakistan	3	2066	72	2.50	1.21	5.56	5.28	1.36	84	2.50	1.00	44.8
Gaboto	Argentina	21	1904	94	2.00	2.91	4.29	2.41	7.49	119	9.23	1.00	33.4
C-518	India	13	1762	77	3.50	1.10	2.44	2.60	1.94	86	6.25	1.00	33.4
Pitic 62	Mexico	2	1737	88	3.25	8.11	6.38	1.41	1.36	93	8.97	1.03	28.5
Nariño 59	Colombia	11	1683	71	2.25	1.00	1.00	3.49	3.61	93	3.85	1.23	41.4
CT-244	Canada	25	1600	89	2.00	2.57	3.58	2.25	4.22	100	6.42	1.03	35.5
Selkirk	Canada	7	1562	93	2.00	5.10	3.04	1.00	4.41	115	4.36	1.00	37.9
Gabo	Australia	20	1466	77	4.50	8.27	7.71	1.86	1.00	83	1.00	1.00	31.0
Carazinho	Brazil	12	1412	101	2.50	2.84	3.30	3.73	5.07	119	8.61	1.00	39.9
Giza 14a	Egypt	9	1124	83	2.75	2.95	7.49	1.10	2.08	86	2.47	1.00	38.1
Magnif 41	Argentina	1	1029	75	3.25	7.18	9.88	1.10	1.00	95	1.90	1.00	31.6
Justin	U.S.A.	15	787	101	1.75	1.76	1.10	1.10	9.18	111	6.27	1.00	35.6
Giza 150	Egypt	5	770	80	4.00	5.77	9.13	1.21	1.00	86	1.94	1.00	35.6
Klein Rendidor	Argentina	17	629	118	2.75	2.08	1.00	7.51	5.86	98	8.70	1.00	36.5
Thatcher	U.S.A.	23	541	103	2.00	3.47	1.36	1.31	9.25	110	5.32	1.00	30.4
Sonora 64	Mexico	10	241	72	5.00	8.85	10.00	1.70	1.00	69	1.00	1.00	23.8
Crim	U.S.A.	22	233	82	5.00	8.28	9.88	1.00	1.00	98	2.86	1.00	27.4
Triple Dirk	Australia	8	162	81	5.00	9.26	10.00	1.21	1.00	88	1.00	1.00	30.5
Mean			1803	84	2.80	4.12	4.90	2.13	3.04	95	4.59	1.02	36.2
Statistical level of significance			0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	25.0%	0.5%
Coefficient of variation			37.4%	2.4%	17.0%	28.2%	21.7%	27.8%	41.3%	8.6%	39.4%	8.1%	8.5%
Standard error			674	2.04	.48	1.16	1.06	.59	1.25	8.2	1.81	.08	3.09
Least significant difference, 5%			950	2.87	.68	1.63	1.41	.83	1.76	11.6	2.55	.11	4.35

TABLE 14. Correlations between the means of 11 variables and the multiple regression of yield on the means of 10 variables for the "1st International Spring Wheat Yield Nursery" grown at Tibaitata, COLOMBIA, 1965.

Correlations (r); d.f. = 23

	Yield	Days to flowering	Root rot	Stripe rust, leaf $\sqrt{X+1}$	Stripe rust, head $\sqrt{\%+1}$	Stem rust $\sqrt{X+1}$	Bird damage $\sqrt{\%+1}$	Height	Lodging $\sqrt{\%+1}$	Shattering $\sqrt{\%+1}$
Days to flowering	-.38									
Root rot	-.61**	-.24								
Stripe rust, leaf $\sqrt{X+1}$	-.39	-.16	.76**							
Stripe rust, head $\sqrt{\%+1}$	-.38	-.38	.78**	.82**						
Stem rust $\sqrt{X+1}$	-.04	.34	-.10	-.39	-.33					
Bird damage $\sqrt{\%+1}$	-.25	.77**	-.49*	-.43*	-.63**	.14				
Height	-.10	.64**	-.43*	-.30	-.49*	.07	.74**			
Lodging $\sqrt{\%+1}$	.13	.62**	-.46*	-.41*	-.61**	.36	.58**	.66**		
Shattering $\sqrt{\%+1}$	.19	-.26	-.24	-.25	-.28	.15	-.03	-.12	-.04	
1000 grain wt.	.71**	-.14	-.69**	-.72**	-.57**	.31	.00	.17	.17	-.28

Multiple regression

$R^2 = .898$

10 "independent" variables

constant term = 11322.000

Partial regression coef. (b)	"t" d.f. = n-k-1 = 14
-40.1504	-1.963
-805.4787	-3.502**
242.6621	2.610*
-168.8282	-2.075
-25.8220	-.229
-170.1711	-1.379
-19.2741	-1.105
130.2162	1.767
-4979.3320	-1.778
77.3889	1.596

* = Significant at the 5% level

** = Significant at the 1% level

TABLE 15. Yield, agronomic and disease data for the 25 varieties in the "1st International Spring Wheat Yield Nursery" grown at Quezaltenango, GUATEMALA, 1964.

Variety or cross	Origin	Variety number	Yield kg/ha	Days to: flowering	Days to: maturity	Stripe rust $\sqrt{X+1}$	Leaf rust $\sqrt{X+1}$	Height cms.	Lodging %	Shattering %	1000 grain wt. gms.	Septoria	Frost	"Raquis" %
Napo 63	Colombia	16	3093	56	120	1.00	7.64	95	5	5	29	2.00	1	0
Nariño 59	Colombia	11	2735	59	135	1.00	1.00	110	10	25	30	0	2	10
Lerma Rojo 64 A	Mexico	4	2274	60	125	5.74	1.21	90	0	5	27	1.75	2	1
Penajmo 62	Mexico	6	1929	63	130	1.00	1.00	85	0	5	23	2.00	1	0
Nainari 60	Mexico	19	1712	73	140	4.83	1.00	105	5	0	20	2.00	2	0
C-273	Pakistan	14	1552	64	140	1.00	1.00	115	20	0	23	2.00	3	5
Magnif 41	Argentina	1	1242	66	135	4.19	1.00	110	10	0	25	2.00	2	25
C-271	Pakistan	3	1222	67	145	1.10	1.21	115	5	0	20	1.75	4	5
Pitic 62	Mexico	2	1214	81	157	1.00	1.00	105	0	0	16	0	3	0
Pj sib x Gb 55 (White grain)	Mexico	24	1014	69	145	6.75	1.00	70	0	0	14	2.00	2	0
Selkirk	Canada	7	880	87	150	1.00	1.00	125	10	0	18	0	4	0
Crim	U.S.A.	22	838	74	145	5.32	1.00	120	30	0	16	2.00	3	1
Giza 150	Egypt	5	843	67	140	7.48	1.00	115	35	0	21	2.00	2	0
Giza 144	Egypt	9	788	78	150	4.57	1.00	120	10	1	21	1.25	3	0
Sonora 64	Mexico	10	749	56	120	9.65	1.00	80	0	1	16	2.00	1	0
Bonza 55	Colombia	18	738	77	145	1.00	1.00	125	60	1	13	1.50	3	0
Gabo	Australia	20	709	68	145	8.53	1.00	85	0	0	15	2.00	2	0
Triple Dirk	Australia	8	639	69	145	9.99	1.00	110	25	1	17	2.00	3	0
C-518	India	13	593	71	145	1.31	1.10	110	0	0	19	2.00	3	0
Gaboto	Argentina	21	544	86	155	8.41	1.00	125	20	0	13	1.25	2	0
Carazinho	Brazil	12	425	88	160	6.35	1.00	125	80	0	15	1.00	3	1
CT-244	Canada	25	416	83	155	3.07	1.00	105	10	0	15	2.00	3	0
Justin	U.S.A.	15	274	92	160	1.00	1.00	115	5	0	12	2.00	4	1
Thatcher	U.S.A.	23	104	94	160	3.37	7.94	110	0	0	8	1.25	4	0
Klein Rendidor	Argentina	17	(No data available)			—	—	—	—	—	—	—	—	—
Mean			1105	73	144	4.11	1.58	107	3.20[1]	1.42[1]	18.6	1.57	2.58	1.46[1]
Statistical level of significance			0.5%	0.5%	(only 1 rep.)	0.5%	0.5%	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	0.5%	(only 1 rep.)	(only 1 rep.)
Coefficient of variation			17.2%	1.6%		20.2%	11.8%					19.8%		
Standard error			190	1.1		.83	.19					.31		
Least significant difference, 5%			268	1.6		1.17	.26					.44		

[1] Mean of data transformed $\sqrt{\%+1}$

TABLE 16. Correlations between the means of 12 variables and the multiple regression of yield on 11 variables for the "1st International Spring Wheat Yield Nursery" grown at Quezaltenango, GUATEMALA, 1964.[1/]

Correlations (r); d.f. = 23

	Yield	Septoria	Days to flowering	Days to maturity	Stripe rust $\sqrt{X+1}$	Leaf rust $\sqrt{X+1}$	"Raquis" $\sqrt{\%+1}$	Height	Lodging $\sqrt{\%+1}$	Shattering $\sqrt{\%+1}$	1000 grain wt.
Septoria	-.09										
Days to flowering	-.71**	-.33									
Days to maturity	-.73**	-.33	.92**								
Stripe rust $\sqrt{X+1}$	-.33	.31	-.10	-.07							
Leaf rust $\sqrt{X+1}$	.19	.02	.06	-.09	-.19						
"Raquis" $\sqrt{\%+1}$	.29	-.05	-.28	-.20	-.21	-.14					
Height	-.32	-.36	.55**	.54**	-.25	-.09	.15				
Lodging $\sqrt{\%+1}$	-.22	-.08	.23	.27	.12	-.21	.07	.69**			
Shattering $\sqrt{\%+1}$	.73**	-.33	-.50*	-.49*	-.24	.10	.26	-.18	-.11		
1000 grain wt.	.88**	-.03	-.74**	-.72**	-.26	-.01	.48	-.14	-.11	.66**	
Frost damage	-.56**	-.29	.71**	.76**	-.34	-.01	-.02	.63**	.20	-.40*	-.48

Multiple regression
$R^2 = .905$
11 "independent" variables
constant term = 1706.438

Partial regression coef. (b)	"t" d.f. = n-k-1 = 13
-139.4451	-.980
-4.0623	-.204
-1.7690	-.099
-52.5591	-1.788
57.5700	1.419
-61.4114	-.725
-11.3919	-1.048
38.4845	.722
77.4721	.639
88.8241	3.076**
-109.2671	-.732

* = Significant at the 5% level
** = Significant at the 1% level
1/ Variety 17, Kelin Rendidor, was not used in any of the correlations or the multiple regression.

TABLE 17. Yield, agronomic and disease data of the 25 varieties in the "1st International Spring Wheat Yield Nursery" grown at El Roque (CIAB), Guanajuato, MEXICO, 1964-65 (early planting).

Variety or cross	Origin	Variety number	Yield kg/ha	Days to: flowering	Days to: maturity	Stripe[1] rust	Height cms.	Lodging %
Nariño 59	Colombia	11	5574	91	140	5 R	120	100
Pitic 62	Mexico	2	5391	101	147	100 S	100	0
Bonza 55	Colombia	18	5249	102	145	20 MR	135	100
Napo 63	Colombia	16	5066	80	132	5 R	110	0
C-273	Pakistan	14	4857	97	141	5 R	120	100
C-518	India	13	4666	97	147	T R	110	100
C-271	Pakistan	3	4307	90	135	20 MR	105	100
Nainari 60	Mexico	19	4099	99	145	100 S	110	0
Gaboto	Argentina	21	4049	106	155	100 S	135	50
CT-244	Canada	25	3866	115	157	40 MR	135	0
Crim	U.S.A.	22	3749	103	149	80 S	140	100
Giza 144	Egypt	9	3741	100	147	80 S	125	100
Pj sib x Gb 55 (White grain)	Mexico	24	3707	102	151	80 MS	85	0
Magnif 41	Argentina	1	3507	93	137	40 MS	125	100
Penjamo 62	Mexico	6	3483	89	135	100 S	95	0
Giza 150	Egypt	5	3441	93	137	100 S	105	0
Thatcher	U.S.A.	23	3008	125	159	30 MR	140	60
Justin	U.S.A.	15	2816	122	158	T R	135	0
Gabo	Australia	20	2616	93	140	100 S	100	0
Sonora 64	Mexico	10	2583	78	130	100 S	75	0
Klein Rendidor	Argentina	17	2474	122	160	100 S	125	100
Carazinho	Brazil	12	2349	106	153	100 S	110	100
Selkirk	Canada	7	2333	120	155	T R	135	0
Lerma Rojo 64A	Mexico	4	2225	92	137	100 S	95	0
Triple Dirk	Australia	8	2158	100	147	100 S	115	0
Mean			3652	101	146	6.44[2]	115	5.11[2]
Statistical level of significance			0.5%	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)
Coefficient of variation			11.0					
Standard error			401					
Least significant difference, 5%			565					

[1] Two notes were taken, but only the second was used for analysis.

[2] Mean of coefficient or percentage transformed $\sqrt{X+1}$

TABLE 18. Correlations between the means of 6 variables and the multiple regression of yield on the means of 5 variables for the "1st International Spring Wheat Yield Nursery" grown at El Roque (CIAB), Guanajuato, MEXICO, 1964-65 (early planting).

Correlations (r); d.f. = 23

	Yield	Days to flowering	Days to maturity	Stripe rust, $\sqrt{X+1}$	Height
Days to flowering	-.30				
Days to maturity	-.23	.95**			
Stripe rust, $\sqrt{X+1}$	-.45*	-.17	-.10		
Height	.09	.68**	.63**	-.46	
Lodging, $\sqrt{X+1}$	.30	.11	.14	-.28	.44**

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

Multiple regression
R^2 = .476
5 "independent" variables
constant term = -541.4648

Partial regression coef. (b)	"t" d.f. = n-k-1 = 19
-118.2767	-2.314*
105.8638	1.588
-136.0502	-2.429*
12.4420	.725
25.0271	.530

TABLE 19. Yield, agronomic and disease data of the 25 varieties in the "1st International Spring Wheat Yield Nursery" grown at El Roque (CIAB), Guanajuato, MEXICO, 1964-65 (late planting).

Variety or cross	Origin	Variety number	Yield kg/ha	Days to flowering	Stripe rust	Leaf rust	Stem rust	Height cms.	Lodging %
C-271	Pakistan	3	5641	88	T R	60 S	70 S	130	50
Napo 63	Colombia	16	5349	80	5 R	30 S	0	120	0
C-518	India	13	4849	89	5 R	40 S	50 S	130	80
Penjamo 62	Mexico	6	4716	86	90 S	0	20 S	105	0
Sonora 64	Mexico	10	4541	79	80 S	30 S	70 S	90	0
Magnif 41	Argentina	1	4407	94	30 MR	10 MR	T R	145	90
C-273	Pakistan	14	4324	88	T R	60 S	50 S	145	80
Pitic 62	Mexico	2	4299	99	40 MS	40 S	20 S	105	40
Bonza 55	Colombia	18	4291	94	5 R	0	20 S	135	60
Gaboto	Argentina	21	4174	104	10 R	0	0	135	99
Giza 150	Egypt	5	4108	88	80 S	30 S	20 MR	130	70
Pj sib x Gb 55 (White grain)	Mexico	24	4108	96	80 S	0	10 S	90	0
Nainari 60	Mexico	19	4083	90	100 S	0	40 S	125	30
Giza 144	Egypt	9	4049	93	30 MR-100 S	20 S	T R	145	99
Gabo	Australia	20	3782	92	100 S	0	70 S	125	30
Nariño 59	Colombia	11	3749	88	5 R	T R	T R	135	60
Lerma Rojo 64 A	Mexico	4	3691	88	100 S	0	T R	110	0
Selkirk	Canada	7	3199	106	T R	40 S	0	140	90
CT-244	Canada	25	3149	101	30 MR	0	0	135	90
Carazinho	Brazil	12	2958	101	90 S	0	0	140	90
Triple Dirk	Australia	8	2924	91	100 S	0	10 MR	150	0
Crim	U.S.A.	22	2841	91	40 MR-MS	0	T R	145	99
Justin	U.S.A.	15	2575	109	T R	5 S	5 R	140	90
Klein Rendidor	Argentina	17	2316	116	80 S	0	T R	105	99
Thatcher	U.S.A.	23	2099	116	40 MR-MS	30 S	0	135	90
Mean			3849	95	5.64 1/	3.19 1/	3.38 1/	128	6.79 1/
Statistical level of significance			0.5%	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)
Coefficient of variation			17.7%						
Standard error			679						
Least significant difference, 5%			957						

1/ Mean of data transformed $\sqrt{X+1}$

TABLE 20. Correlations between the means of 7 variables and the multiple regression of yield on the means of 6 variables for the "1st International Spring Wheat Yield Nursery" grown at El Roque (CIAB), Guanajuato, MEXICO, 1964-65 (late planting).

Correlations (r); d.f. = 23

	Yield	Days to flowering	Stripe rust $\sqrt{X+1}$	Leaf rust $\sqrt{X+1}$	Stem rust $\sqrt{X+1}$	Height
Days to flowering	-.74**					
Stripe rust $\sqrt{X+1}$	-.21	-.07				
Leaf rust $\sqrt{X+1}$	.40*	-.16	-.38			
Stem rust $\sqrt{X+1}$	.55**	-.49*	.09	.36		
Height	-.26	.17	-.43*	.03	-.30	
Lodging $\sqrt{\%+1}$	-.36	.57**	-.43*	.13	-.26	.62**

* = Significant at the 5% level

Multiple regression

R^2 = .742

6 "independent" variables

constant term 11915.000

Partial regression coef.(b)	"t" d.f. = n-k-1 = 18
-63.5022	-3.759**
-80.5559	-2.145*
40.2819	.799
47.1928	.914
-16.2455	1.785
27.2492	.510

TABLE 21. Yield, agronomic and disease data of the 25 varieties in the "1st International Spring Wheat Yield Nursery" grown at Chapingo, MEXICO, 1965.

Variety or cross	Origin	Variety number	Yield kg/ha	Test wt. kg/hl	Days to: flowering	Days to: maturity	Stripe rust	Stem rust $\sqrt{X+1}$	Height cms.	Lodging %	1000 grain weight gms.
Lerma Rojo 64A	Mexico	4	4042	76.2	57	110	0	2.37	98	0	41.0
Nariño 59	Colombia	11	3846	74.9	55	109	0	2.16	112	30	35.4
Penjamo 62	Mexico	6	3638	76.0	59	113	0	9.74	94	0	35.5
Nainari 60	Mexico	19	3603	68.0	67	125	40 MR	9.99	116	0	32.3
Pj sib x Gb 55 (White grain)	Mexico	24	3486	67.7	66	132	90 S	9.76	83	0	24.7
Magnif 41	Argentina	1	3011	75.4	59	110	10 MS	1.00	124	0	39.7
Napo 63	Colombia	16	2996	74.4	52	95	0	1.00	96	0	56.2
Crim	U.S.A.	22	2891	72.3	66	124	30 MR	1.99	125	90	34.1
Bonza 55	Colombia	18	2744	68.0	73	128	0	2.49	126	90	28.0
Pitic 62	Mexico	2	2661	61.6	73	130	0	6.44	107	50	24.1
C-273	Pakistan	14	2496	79.0	60	114	T R	6.98	118	0	35.2
Justin	U.S.A.	15	2425	70.8	70	129	5 MR	6.74	124	0	25.8
Selkirk	Canada	7	2419	71.7	70	119	0	5.90	130	0	33.4
Sonora 64	Mexico	10	2358	72.8	50	90	100 S	3.11	77	0	30.8
CT-244	Canada	25	2323	70.3	67	123	80 S	1.70	120	15	28.4
Gaboto	Argentina	21	2281	62.5	85	132	0	5.18	132	90	27.1
Carazinho	Brazil	12	2034	69.2	82	134	80 S	9.99	130	90	29.9
Thatcher	U.S.A.	23	1866	69.2	76	124	50 S	5.70	131	80	22.3
Giza 150	Egypt	5	1859	70.5	61	113	100 S	9.99	111	0	28.0
Giza 144	Egypt	9	1840	72.6	67	124	100 S	3.11	125	10	28.3
C-271	Pakistan	3	1798	70.0	62	117	T R	9.88	106	0	26.9
Triple Dirk	Australia	8	1591	66.8	62	115	100 S	9.09	121	0	27.3
Gabo	Australia	20	1526	62.4	65	114	100 S	9.63	104	0	22.7
C-518	India	13	1173	60.2	68	115	T R	9.74	114	0	21.4
Klein Rendidor	Argentina	17	(No data available)			—	—	—	—	—	—
Mean			2538	70.4	66	118	4.54 1/	5.99	113	3.42 1/	29.9
Statistical level of significance			0.5%	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	0.5%	0.5%	(only 1 rep.)	(only 1 rep.)
Coefficient of variation			20.2%					15.0%	4.6%		
Standard error			514					.90	5.23		
Least significant difference, 5%			724					1.27	7.37		

1/ Mean of data transformed $\sqrt{X+1}$

TABLE 22. Correlations between the means of 9 variables and the multiple regression of yield on the means of 8 variables for the "1st International Spring Wheat Yield Nursery" grown at Chapingo, MEXICO, 1965.

Correlations (r); d.f. = 23

	Yield	Test wt.	Days to flowering	Days to maturity	Stripe rust $\sqrt{X+1}$	Stem rust $\sqrt{X+1}$	Height	Lodging $\sqrt{\%+1}$
Test wt.	.46*							
Days to flowering	-.34	-.63**						
Days to maturity	-.10	-.51**	.87**					
Stripe rust $\sqrt{X+1}$	-.41*	-.22	.00	.02				
Stem rust $\sqrt{X+1}$	-.34	-.40*	.25	.30	-.22			
Height	-.34	-.15	.66**	.55**	-.12	-.10		
Lodging $\sqrt{\%+1}$	-.04	-.32	.67**	.54**	-.07	-.26	.52**	
1000 grain wt.	.69**	.79**	-.53**	-.45*	-.37	-.50*	-.11	-.19

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

Multiple regression
R^2 = .847
8 "independent" variables
constant term = -136.102

Partial regression coef. (b)	"t" d.f. = n-k-1 = 16
-22.0925	-.672
-37.9950	-1.291
57.8954	3.889**
-37.4390	-1.696
-26.1735	-.780
-29.0974	-3.570**
35.7909	.950
112.6484	4.254**

TABLE 23. Yield, agronomic and disease data of the 25 varieties in the "1st International Spring Wheat Yield Nursery" grown at Davis, California, U.S.A., 1964-65. (Data from only two replications.)

Variety or cross	Origin	Variety number	Yield kg/ha	Test weight kg/hl	Days to: flowering	Days to: maturity	Stripe rust $\sqrt{X+1}$	Height cms.	Lodging $\sqrt{X+1}$	1000 grain weight gms.
Sonora 64	Mexico	10	6057	76.5	112	149	3.90	99	1.00	38.7
Penjamo 62	Mexico	6	5941	76.7	120	157	1.82	113	1.00	39.6
Pitic 62	Mexico	2	5374	71.6	121	156	1.41	118	1.00	32.5
Pj sib x Gb 55 (White grain)	Mexico	24	5349	74.4	125	160	4.28	110	1.00	35.2
C-271	Pakistan	3	5008	75.2	117	151	1.21	115	2.16	40.2
Lerma Rojo 64 A	Mexico	4	4807	76.3	121	154	1.21	119	1.00	41.6
Triple Dirk	Australia	8	4583	76.2	126	159	9.49	144	1.00	42.7
Gabo	Australia	20	4558	71.2	120	154	9.99	122	2.50	37.6
Giza 150	Egypt	5	4374	78.0	121	157	6.27	130	4.22	42.3
Nainari 60	Mexico	19	4316	71.7	122	153	2.36	122	2.88	38.4
Carazinho	Brazil	12	4282	73.8	126	159	1.57	137	1.00	34.3
Napo 63	Colombia	16	4258	73.6	119	151	1.00	127	1.00	39.1
Crim	U.S.A.	22	4216	75.4	121	150	1.57	135	1.86	33.2
Justin	U.S.A.	15	4208	74.1	133	164	1.00	136	1.00	31.3
Bonza 55	Colombia	18	3983	72.1	121	156	1.62	138	1.21	30.4
C-273	Pakistan	14	3566	76.6	121	154	1.00	131	2.50	43.8
Klein Rendidor	Argentina	17	3458	75.2	121	151	1.73	129	1.00	31.0
Magnif 41	Argentina	1	3291	75.2	120	146	1.82	140	1.00	37.4
Nariño 59	Colombia	11	3266	71.2	121	156	1.00	136	1.93	28.6
Gaboto	Argentina	21	3091	75.0	124	157	1.41	135	1.00	30.4
C-518	India	13	3058	75.6	120	151	1.00	122	1.50	34.5
Giza 144	Egypt	9	3016	74.4	124	157	6.77	131	2.82	30.0
CT-244	Canada	25	2841	71.5	130	161	2.56	132	4.07	32.8
Thatcher	U.S.A.	23	2249	71.4	133	164	1.37	135	1.00	24.3
Selkirk	Canada	7	1900	68.4	133	158	1.41	126	1.00	29.0
Mean			4042	74.0	123	155	2.75	127	1.66	35.1
Statistical level of significance			0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	10.0%	0.5%
Coefficient of variation			15.6%	1.8%	1.2%	1.9%	45.5%	3.3%	66.5%	9.6%
Standard error			632	1.4	1.4	3.0	1.25	4.2	1.11	3.38
Least significant difference, 5%			1305	2.9	2.9	6.2	2.56	8.6	2.28	6.92

TABLE 24. Correlations between the means of 8 variables and the regression of yield on the means of 7 variables for the "1st International Spring Wheat Yield Nursery" grown at Davis, California, U.S.A. 1964-65.

Correlations (r); d.f. = 23

	Yield	Test wt.	Days to flowering	Days to maturity	Stripe rust $\sqrt{X+1}$	Height	Lodging $\sqrt{\%+1}$
Test wt.	.45*						
Days to flowering	-.59**	-.49*					
Days to maturity	-.21	-.33	.81**				
Stripe rust $\sqrt{X+1}$	.20	.11	-.05	.12			
Height	-.61**	-.13	.49*	.27	.01		
Lodging $\sqrt{\%+1}$	-.15	.01	-.02	.05	.32	.08	
1000 grain wt.	.59**	.63**	-.54**	-.40*	.30	-.29	.21

Multiple regression
R^2 = .776
7 "independent" variables
constant term = 1077.814

Partial regression coef. (b)	"t" d.f. = n-k-1 = 17
-2.0377	-.028
-170.8835	-3.102**
161.5299	3.050**
21.1643	.394
-26.6538	-1.870
-303.4219	-2.230*
80.9504	2.259*

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

TABLE 25. Yield, agronomic and disease data of the 25 varieties in the "1st International Spring Wheat Yield Nursery" grown at St. Paul, Minnesota, U.S.A., 1965.

Variety or cross	Origin	Variety number	Yield kg/ha	Test wt. kg/hl	Days to flowering	Leaf rust	Stem rust	Height cms.	Lodging score (1 to 9)
Lerma Rojo 64A	Mexico	4	3662	73.1	52	T MR	0-10 MR	83	3.00
Nainari 60	Mexico	19	2924	70.3	58	30 MS-S	20 MS	93	2.25
Magnif 41	Argentina	1	2828	72.2	53	0	T MS	95	4.50
Penjamo 62	Mexico	6	2575	72.5	56	20 MR	0-10 S	82	1.75
Nariño 59	Colombia	11	2246	72.3	53	40 S	30 MS	95	4.75
Gaboto	Argentina	21	2221	73.9	60	0	5 MR	107	1.75
Justin	U.S.A.	15	2183	73.3	59	0 S	0	100	2.50
Pitic 62	Mexico	2	2166	63.5	59	20-40 S	TMS-30 MS	90	1.25
Triple Dirk	Australia	8	2146	69.7	55	60 S	T-5S	97	2.75
Crim	U.S.A.	22	2071	70.3	56	70 S	0	96	5.00
Carazinho	Brazil	12	2061	68.0	60	0	T MS	114	2.25
Sonora 64	Mexico	10	1983	62.4	51	DEAD	50 S	71	1.75
Pj sib x Gb (White grain)	Mexico	24	1963	66.3	57	20 S	0	76	2.00
Napo 63	Colombia	16	1866	68.8	50	DEAD	0	59	3.25
Giza 144	Egypt	9	1853	73.3	58	20MS-50S	0	91	2.50
CT-244	Canada	25	1701	68.4	56	70 S	30 S	88	3.75
Selkirk	Canada	7	1596	65.7	56	60 S	0	94	2.50
C-273	Pakistan	14	1540	73.1	53	20 S	50 S	94	2.25
Thatcher	U.S.A.	23	1413	68.9	57	70 S	10 S	93	2.75
Bonza 55	Colombia	18	1273	64.8	60	70 S	0	97	1.00
Giza 150	Egypt	5	1255	68.6	55	40 S	0	83	3.25
C-518	India	13	1136	71.1	58	5 S	40 S	88	1.25
Gabo	Australia	20	1125	54.7	56	70 S	50 S	86	1.75
C-271	Pakistan	3	963	62.7	56	60 S	50 S	87	2.50
Klein Rendidor	Argentina	17	(no data available)		—	—	—	—	—
Mean			1947	68.7	56	5.81 1/	3.14 1/	91	2.59
Statistical level of significance			0.5%	0.5%	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	0.5%	0.5%
Coefficient of variation			13.3%	2.1%				3.5%	44.8%
Standard error			259	1.4				3.2	1.16
Least significant difference, 5%			365	2.0				4.5	1.63

1/ Mean of data transformed $\sqrt{X+1}$

TABLE 26. Correlations between the means of 7 variables and the multiple regression of yield on the means of 6 variables for the "1st International Spring Wheat Yield Nursery" grown at St. Paul, Minnesota, U.S.A., 1965.

Correlations (r); d.f. = 23

	Yield	Test wt.	Days to flowering	Leaf rust $\sqrt{X+1}$	Stem rust $\sqrt{X+1}$	Height
Test wt.	.50*					
Days to flowering	-.21	-.02				
Leaf rust $\sqrt{X+1}$	-.50*	-.53**	-.27			
Stem rust $\sqrt{X+1}$	-.35	-.39	-.22	.21		
Height	.06	.34	.50*	-.32	-.32	
Lodging (1-9)	.26	.35	-.47*	.11	-.19	.13

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

Multiple regression
$R^2 = .491$
6 "independent" variables
constant term = 5924.704

Partial regression coef. (b)	"t" d.f. = n-k-1 = 18
17.7971	.531
-69.6296	-1.178
-108.2702	-2.205*
-73.8278	-1.405
-6.2145	-.375
49.1192	.342

TABLE 27. Yield, agronomic and disease data of the 25 varieties in the "1st International Spring Wheat Yield Nursery" grown at Stellenbosch, SOUTH AFRICA, 1965

Variety or cross	Origin	Variety number	Yield kg/ha	Test.wt. kg/hl	Days to flowering	Leaf rust $\sqrt{X+1}$	Stem rust $\sqrt{X+1}$	Height cms.	Lodging $\sqrt{X+1}$	Septoria tritici %	Septoria nodorum $\sqrt{\%+1}$	Seedling reaction to stem rust races 21	34	279	1000 grain weight gms.
Pj g"b x Gb (White grain)	Mexico	24	5183	74.7	121	4.38	3.19	107	7.35	20	1.39	S	S	MS	32.0
Penjamo 62	Mexico	6	4337	77.4	111	1.21	2.20	99	1.30	5	1.21	R	R	R	40.1
Nainari 60	Mexico	19	4167	75.4	115	2.58	5.22	114	6.75	10	1.29	S	S	MS	38.9
Gabo	Australia	20	3938	74.1	130	7.81	7.12	114	4.51	20	1.55	VS	S	S	35.2
Giza 150	Egypt	5	3846	79.6	113	2.38	4.86	130	2.22	30	2.01	VS	S	S	42.0
Pitic 62	Mexico	2	3595	73.7	119	2.01	3.89	107	1.58	5	1.47	R	R	R	36.1
Triple Dirk	Australia	8	3362	77.9	119	7.31	3.77	145	3.19	20	1.29	MR	S	MS	43.3
Nariño 59	Colombia	11	3250	75.1	108	2.77	4.24	107	4.05	10	2.40	MS	MR	MS	34.8
Lerma Rojo 64A	Mexico	4	3247	78.5	108	1.82	6.94	99	1.54	10	2.70	S	MS	MS	41.8
Bonza 55	Colombia	18	3159	74.3	119	3.47	2.69	122	8.92	20	1.73	MR	R	R	33.5
Sonora 64	Mexico	10	3130	75.5	100	4.96	1.65	91	1.00	40	1.57	R	R	MR	33.5
Magnif 41	Argentina	1	3044	78.7	112	1.49	2.30	122	1.00	10	1.65	MS	MS	R	41.5
Klein Rendidor	Argentina	17	3005	76.9	125	2.17	6.28	122	8.87	10	1.57	MS	S	S	35.4
Napo 63	Colombia	16	2980	73.1	104	6.77	1.65	107	5.43	20	2.09	MR	MS	MR	32.7
Carazinho	Brazil	12	2921	77.3	121	1.57	6.50	130	3.48	10	3.98	S	S	S	39.1
Giza 144	Egypt	9	2913	78.0	120	1.82	4.08	137	6.65	10	4.75	VS	VS	S	38.0
Gaboto	Argentina	21	2898	77.8	119	1.49	2.93	122	9.13	5	2.48	MS	MS	MS	29.7
Crim	U.S.A.	22	2688	75.1	132	7.14	1.41	122	9.26	30	1.41	MR	MR	R	31.2
CT-244	Canada	25	2123	73.7	154	2.42	2.22	107	4.69	5	1.00	S	MR	MR	28.4
C-271	Pakistan	3	1975	70.9	108	4.90	8.99	114	1.97	40	9.13	VS	VS	VS	32.0
C-273	Pakistan	14	1943	77.6	111	1.57	8.04	107	7.89	50	6.67	S	S	S	35.9
C-518	India	13	1554	75.5	119	4.32	6.61	114	6.13	50	8.99	VS	VS	VS	29.6
Thatcher	U.S.A.	23	1274	74.9	154	8.48	1.00	122	4.74	30	1.00	R	R	R	22.9
Selkirk	Canada	7	1081	71.7	149	2.80	2.03	145	1.72	5	1.00	MS	R	R	28.6
Justin	U.S.A.	15	804	72.0	149	2.42	3.08	130	6.30	30	1.00	R	R	R	23.9
Mean			2897	75.6	121	3.60	4.12	117	4.79	4.3 1/	2.61				34.4
Statistical level of significance			0.5%	0.5%	(only 1 rep.)	0.5%	0.5%	(only 1 rep.)	0.5%	(only 1 rep.)	0.5%				0.5%
Coefficient of variation			13.0%	1.7%		23.0%	21.2%		24.5%		20.17%				5.0%
Standard error			376	1.28		.83	.87		1.18		.53				1.7
Least significant difference, 5%			7.53	2.56		1.76	1.23		1.66		.75				2.4

1/ Mean of data transformed $\sqrt{\%+1}$

TABLE 28. Correlations between the means of 10 variables and the multiple regression of yield on the means of 9 variables for the "1st International Spring Wheat Yield Nursery" grown at Stellenbosch, SOUTH AFRICA, 1965.

Correlations (r); d.f. = 23

	Yield	Test wt.	Days to flowering	Septoria tritici $\sqrt{\%+1}$	Leaf rust $\sqrt{X+1}$	Stem rust $\sqrt{X+1}$	Height	Lodging $\sqrt{\%+1}$	Septoria nodorum $\sqrt{\%+}$
Test wt.	.39								
Days to flowering	-.53**	-.39							
Septoria tritici $\sqrt{\%+1}$	-.31	-.12	-.14						
Leaf rust $\sqrt{X+1}$	-.07	-.34	.18	.47*					
Stem rust $\sqrt{X+1}$	.02	.10	-.32	.26	-.19				
Height	-.33	.06	.44*	-.10	.06	-.07			
Lodging $\sqrt{\%+1}$	-.06	-.01	.20	.15	.08	.00	.15		
Septoria nodorum $\sqrt{\%+1}$	-.31	-.03	-.36	.52**	-.09	.68**	-.07	.05	
1000 grain wt.	.64**	.68**	-.65**	-.24	-.31	.32	.00	-.35	.00

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

Multiple regression
R^2 = .749
9 "independent" variables
constant term = 6416.656

Partial regression coef. (b)	"t" d.f. = n-k-1 = 15
-38.6548	-.400
-16.2210	-.844
-151.8191	-1.07[illegible]
103.2372	1.25[illegible]
27.0854	.253
-23.9296	-1.762
108.5254	1.843
-150.7768	-1.347
122.7932	1.765

TABLE 29. Yield, agronomic and disease data of the 25 varieties in the "1st International Spring Wheat Yield Nursery" grown at Debre Zeit, ETHIOPIA, 1964-65.

Variety or cross	Origin	Variety number	Yield kg/ha	Test wt. kg/hl	Days to: flowering	Days to: maturity	Leaf rust $\sqrt{X+1}$	Stem rust $\sqrt{X+1}$	Height cms.	Septoria $\sqrt{\%+1}$
Pj sib x Gb 55 (White grain)	Mexico	24	2995	77.3	47	102	2.20	2.64	73	5.98
Triple Dirk	Australia	8	2885	77.0	48	107	1.41	2.30	102	5.94
Nainari 60	Mexico	19	2868	74.0	58	114	1.62	1.41	93	5.20
Gabo	Australia	20	2790	74.8	57	112	1.62	3.56	93	6.35
Napo 63	Colombia	16	2626	73.2	39	100	1.21	1.21	95	4.29
Crim	U.S.A.	22	2478	76.9	59	114	1.21	1.00	108	4.99
Penjamo 62	Mexico	6	2414	75.7	47	102	1.00	1.00	70	4.20
Nariño 59	Colombia	11	2406	73.6	45	102	1.82	2.98	90	5.75
Carazinho	Brazil	12	2389	76.7	64	125	1.00	1.37	115	2.88
Sonora 64	Mexico	10	2325	71.1	39	102	1.00	1.00	70	7.78
CT-244	Canada	25	2227	74.0	65	120	1.00	1.57	97	4.54
Lerma Rojo 64 A	Mexico	4	2078	77.0	47	100	1.00	1.00	77	4.54
Gabot	Argentina	21	2048	76.5	66	123	1.21	1.00	112	2.44
Magnif 41	Argentina	1	2033	75.7	48	102	1.00	1.00	103	2.50
Giza 150	Egypt	5	1984	79.0	48	105	1.00	2.19	77	4.54
Bonza 55	Colombia	18	1928	73.6	62	114	1.00	1.21	97	3.95
Thatcher	U.S.A.	23	1908	72.9	68	120	1.41	1.21	100	3.51
Pitic 62	Mexico	2	1883	72.9	62	114	1.00	1.00	77	5.98
Justin	U.S.A.	15	1813	72.7	63	114	1.00	1.37	100	3.65
Giza 144	Egypt	9	1674	77.3	58	116	1.00	1.00	93	7.11
Selkirk	Canada	7	1591	71.7	63	111	1.21	1.82	95	3.65
C-273	Pakistan	14	1255	79.8	49	103	4.61	5.06	93	7.11
C-271	Pakistan	3	1198	69.2	50	111	4.07	4.28	95	7.42
C-518	India	13	882	74.8	58	107	4.28	4.86	82	6.69
Klein Rendidor	Argentina	17	(No data available)		—	—	—	—	—	—
Mean			2112	74.8	55	110	1.62	1.96	92	5.04
Statistical level of significance			0.5%	0.5%	0.5%	0.5%	NS	NS	0.5%	0.5%
Coefficient of variation			21.7%	2.0%	4.5%	3.5%	90.0%	90.9%	11.8%	22.1%
Standard error			457	1.5	2.45	3.86	1.46	1.78	10.9	1.12
Least significant difference, 5%			644	2.1	3.45	5.44	2.06	2.51	15.4	1.58

TABLE 30. Correlations between the means of 8 variables and the multiple regression of yield on the means of 7 variables for the "1st International Spring Wheat Yield Nursery" grown at Debre Zeit, ETHIOPIA, 1964-65.[1/]

Correlations (r); d.f. = 22

	Yield	Test wt.	Days to flowering	Days to maturity	Leaf rust $\sqrt{X+1}$	Stem rust $\sqrt{X+1}$	Height
Test wt.	.15						
Days to flowering	-.25	-.07					
Days to maturity	-.09	-.09	.90**				
Leaf rust $\sqrt{X+1}$	-.54**	.02	-.14	-.20			
Stem rust $\sqrt{X+1}$	-.41*	.08	-.17	-.24	.91**		
Height	.01	.04	.52**	.64**	-.08	-.11	
Septoria $\sqrt{\%+1}$	-.15	-.09	-.40*	-.32	.55**	.56**	-.48*

Multiple regression
R^2 = .498
7 "independent" variables
constant term = -774.608

Partial regression coef. (b)	"t" d.f. = n-k-1 = 1
27.7869	.700
-44.0466	-1.427
28.6576	.729
-474.8332	-2.130*
171.1788	.884
4.3484	.343
17.7440	.167

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

[1/] Data for Klein Rendidor were not available

TABLE 31. Yield, agronomic and disease data of the 25 varieties in the "1st International Spring Wheat Yield Nursery" grown at Ed-Damer, SUDAN, 1964-65.

Variety or cross	Origin	Variety number	Yield kg/ha	Days to: flowering	Days to: maturity	Height cms.	1000 grain weight gms.
Klein Rendidor	Argentina	17	2772	61	96	93	37.5
C-271	Pakistan	3	2689	56	85	82	43.4
Nainari 60	Mexico	19	2614	65	98	94	38.6
Pitic 62	Mexico	2	2598	68	100	86	34.8
C-518	India	13	2576	62	93	83	38.3
Giza 150	Egypt	5	2307	57	91	86	35.8
CT-244	Canada	25	2291	69	103	92	27.3
Gabo	Australia	20	2254	62	98	95	36.4
Lerma Rojo 64 A	Mexico	4	2211	52	84	88	34.9
Giza 144	Egypt	9	2171	64	101	88	36.7
C-273	Pakistan	14	2129	59	85	87	37.1
Bonza 55	Colombia	18	1971	60	88	104	32.5
Triple Dirk	Australia	8	1862	58	90	78	40.9
Crim	U.S.A.	22	1735	60	92	110	29.7
Magnif 41	Argentina	1	1678	56	87	69	39.9
Pj sib x Gb 55 (White grain)	Mexico	24	1629	57	88	93	31.7
Penjamo 62	Mexico	6	1595	59	89	80	35.3
Gaboto	Argentina	21	1551	66	100	92	28.5
Selkirk	Canada	7	1383	66	100	82	28.3
Carazinho	Brazil	12	1342	65	96	100	36.9
Sonora 64	Mexico	10	1338	54	85	69	32.4
Thatcher	U.S.A.	23	1239	69	106	95	19.0
Napo 63	Colombia	16	1005	62	98	91	32.0
Justin	U.S.A.	15	946	62	99	98	18.4
Nariño 59	Colombia	11	697	52	82	69	31.5
Mean			1867	61	93	88	33.5
Statistical level of significance			0.5%	0.5%	0.5%	2½%	0.5%
Coefficient of variation			18.3%	8.9%	7.5%	17.3%	4.5%
Standard error			341	5.4	7.0	15.3	1.5
Least significant difference 5%			480	7.6	9.9	21.6	2.1

TABLE 32. Correlations between the means of 5 variables and the multiple regression of yield on the means of 4 variables for the "1st International Spring Wheat Yield Nursery" grown at Ed-Damer, SUDAN, 1964-65.

Correlations (r): d.f. = 23

	Yield	Days to flowering	Days to maturity	Height
Days to flowering	.10			
Days to maturity	.02	.93**		
Height	.12	.46*	.44*	
1000 grain wt.	.59**	-.39	-.48*	-.34

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

Multiple regression
$R^2 = .533$
4 "independent" variables
constant term = -4439.156

Partial regression coef. (b)	"t" d.f. = n-k-1 = 20
25.8316	.491
8.6621	.219
14.2194	1.435
79.8715	4.473**

TABLE 33.. Yield, disease data and correlations of the 25 varieties in the "1st International Spring Wheat Yield Nursery" grown at Sidi Mesri, Tripoli, LIBYA, 1964-65.

Variety or cross	Origin	Variety number	Yield kg/ha	Leaf rust $\sqrt{X+1}$
Pitic 62	Mexico	2	6511	1.00
Nainari 60	Mexico	19	6045	1.00
Pj sib x Gb 55 (White grain)	Mexico	24	5788	1.55
Lerma Rojo 64 A	Mexico	4	5763	1.00
Giza 144	Egypt	9	5466	1.00
Gabo	Australia	20	5449	1.00
C-271	Pakistan	3	5328	1.78
Giza 150	Egypt	5	5327	1.50
Penjamo 62	Mexico	6	5097	1.00
Triple Dirk	Australia	8	4738	1.18
Napo 63	Colombia	16	4655	2.28
Bonza 55	Colombia	18	4502	1.00
C-518	India	13	4478	1.37
Carazinho	Brazil	12	4462	1.00
Gaboto	Argentina	21	4417	1.00
Klein Rendidor	Argentina	17	4203	1.00
Nariño 59	Colombia	11	4199	1.00
C-273	Pakistan	14	3878	1.31
Crim	U.S.A.	22	3808	1.00
Magnif 41	Argentina	1	3664	1.00
Sonora 64	Mexico	10	3570	1.00
Selkirk	Canada	7	3569	1.00
CT-244	Canada	25	2555	1.00
Justin	U.S.A.	15	2279	1.18
Thatcher	U.S.A.	23	2166	4.05
Mean			4477	1.29
Statistical level of significance			0.5%	0.5%
Coefficient of variation			15.9%	44.1%
Standard error			710	.57
Least significant difference, 5%			1000	.80

$r = -.31$ (NS)
$(r^2 = .096)$

$\hat{y} = 5171.134 - 540.0106\ (X)$

TABLE 34. Yield and agronomic data for the 25 varieties in the "1st International Spring Wheat Yield Nursery" grown at Prastio, CYPRUS, 1964-65.

Variety or cross	Origin	Variety number	Yield kg/ha	Test weight kg/hl	1000 grain weight gms.
Pitic 62	Mexico	2	4583	74.8	37.5
Pj sib x Gb 55 (White grain)	Mexico	24	4522	79.8	37.2
Nainari 60	Mexico	19	4330	74.8	41.0
Sonora 64	Mexico	10	4266	78.6	39.7
Lerma Rojo 64 A	Mexico	4	4173	77.3	40.2
Penjamo 62	Mexico	6	4116	78.6	42.2
Gabo	Australia	20	4030	76.1	40.5
Giza 150	Egypt	5	3838	79.8	39.3
C-518	India	13	3576	82.3	39.7
Triple Dirk	Australia	8	3491	78.6	41.7
CT-244	Canada	25	3405	77.3	37.5
Giza 144	Egypt	9	3405	79.8	41.0
Napo 63	Colombia	16	3298	76.1	37.0
Carazinho	Brazil	12	3277	77.3	43.5
Bonza 55	Colombia	18	3191	74.8	38.4
Gaboto	Argentina	21	3014	78.6	33.2
Justin	U.S.A.	15	2929	77.3	37.0
C-273	Pakistan	14	2901	79.8	43.9
C-271	Pakistan	3	2871	77.3	45.0
Magnif 41	Argentina	1	2829	77.3	40.7
Crim	U.S.A.	22	2814	76.1	35.7
Nariño 59	Colombia	11	2538	77.3	37.2
Selkirk	Canada	7	2517	74.8	37.2
Thatcher	U.S.A.	23	2388	77.3	31.2
Kyperounda[1/]	Cyprus	17	1983	78.6	38.0
Mean			3371	77.6	39.0
Statistical level of significance			0.5%	(only 1 rep.)	(only 1 rep.)
Coefficient of variation			17.7%		
Standard error			598		
Least significant difference, 5%			843		

1/ Substituted for Klein Rendidor

TABLE 35. Correlations between the means of 3 variables and the multiple regression of yield on 2 variables for the "1st International Spring Wheat Yield Nursery" grown at Prastio, CYPRUS, 1964-65.

	Correlations (r); d.f. = 23		Multiple regression R^2 = .067 2 "independent" variables constant term = 1448.891	
	Yield	Test wt.	Partial regression coef. (b)	"t" d.f. = n-k-1 = 22
Test wt.	.03		-4.7298	-.060
1000 grain wt.	.26	.18	58.6749	1.250

TABLE 36. Yield, agronomic and disease data of the 25 varieties in the "1st International Spring Wheat Yield Nursery" grown at Kharj, SAUDI ARABIA, 1964-65.

Variety or cross	Origin	Variety number	Yield kg/ha	Test wt. kg/hl	Days to: flowering	Days to: maturity	Height cms.	1000 grain weight gms.
C-518	India	13	5116	81.9	74	117	75	36.7
C-271	Pakistan	3	4266	78.8	69	108	67	41.2
CT-244	Canada	25	3982	70.2	96	133	90	23.2
Penjamo 62	Mexico	6	3866	76.8	72	113	59	31.1
Carazinho	Brazil	12	3766	78.3	79	119	81	39.1
Nainari 60	Mexico	19	3570	75.1	77	115	65	40.4
Triple Dirk	Australia	8	3566	77.9	77	108	85	42.1
Samma[1]	Saudi Arabia	17	3491	73.1	81	116	86	31.5
Pitic 62	Mexico	2	3391	71.9	75	116	61	29.3
C-273	Pakistan	14	3358	79.7	74	106	86	36.0
Pj sib x Gb 55 (White grain)	Mexico	24	3195	76.3	73	112	63	29.5
Giza 150	Egypt	5	3116	78.4	74	116	64	38.6
Giza 144	Egypt	9	2724	78.7	75	112	66	37.2
Lerma Rojo 64A	Mexico	4	2866	78.3	72	112	60	34.8
Crim	U.S.A.	22	2583	77.1	84	123	93	31.3
Gabo	Australia	20	2366	71.7	74	111	75	36.3
Thatcher	U.S.A.	23	2349	65.5	108	140	78	17.4
Justin	U.S.A.	15	2233	72.4	104	133	80	20.8
Gaboto	Argentina	21	2124	79.7	78	115	69	28.0
Magnif 41	Argentina	1	2091	79.0	71	116	69	38.3
Napo 63	Colombia	16	2049	76.6	68	110	66	33.3
Selkirk	Canada	7	1916	73.9	101	135	89	27.3
Nariño 59	Colombia	11	1358	78.5	69	117	63	32.2
Sonora 64	Mexico	10	1258	76.5	71	110	44	28.2
Bonza 55	Colombia	18	(No data available)		—	—	—	—
Mean			2942	76.1	79	117	72	32.4
Statistical level of significance			0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
Coefficient of variation			33.6%	3.8%	3.0%	6.2%	9.6%	5.8%
Standard error			971	2.9	2.3	7.3	6.9	1.9
Least significant difference, 5%			1368	4.1	3.2	10.3	9.7	2.7

1/ Substituted for Klein Rendidor

TABLE 37.- Correlations between the means of 6 variables and the multiple regression of yield on the means of 5 variables for the "1st International Spring Wheat Yield Nursery" grown at Kharj, SAUDI ARABIA, 1964-65[1/]

Correlations (r); d.f. = 22

	Yield	Test wt.	Days to flowering	Days to maturity	Height
Test wt.	.17				
Days to flowering	-.11	-.70**			
Days to maturity	.15	-.66**	.93**		
Height	.24	-.23	.58**	.46*	
1000 grain wt.	.36	.68**	-.72**	-.75**	-.10

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

1/ Data were not used from Bonza 55

Multiple regression
R^2 = .210
5 "independent" variables
constant term = 280.054

Partial regression coef. (b)	"t" d.f. = n-k-1
-15.2486	-.190
-.2419	-.004
2.0546	.033
20.0928	.824
66.2685	1.154

TABLE 38. Yield, agronomic and disease data of the 25 varieties in the "1st International Spring Wheat Yield Nursery" grown at Deir Alla, JORDAN, 1964-65.

Variety or cross	Origin	Variety number	Yield kg/ha	Test weight kg/hl	Days to: flowering	Days to: maturity	Stripe rust $\sqrt{X+1}$	Height cms.	Lodging $\sqrt{\%+1}$	Shattering $\sqrt{\%+1}$	1000 grain weight gms.
Pitic 62	Mexico	2	4383	79.9	88	140	1.31	93	3.60	1.00	40.0
Triple Dirk	Australia	8	3907	79.5	91	146	1.21	119	6.14	1.00	47.7
Nainari 60	Mexico	19	3841	80.4	90	145	5.30	108	3.25	1.00	45.8
Deir Alla 1 1/	Jordan	23	3832	80.2	92	147	2.23	111	1.00	1.00	44.5
Lerma Rojo 64 A	Mexico	4	3812	86.4	81	135	3.25	95	8.00	1.00	46.7
Penjamo 62	Mexico	6	3803	82.0	85	139	1.41	89	3.25	1.58	46.4
Gb x PC 250 27-378-34-1 1/	Jordan	7	3583	83.5	94	147	2.56	103	1,90	1.00	43.3
C-271	Pakistan	3	3533	82.6	84	143	3.15	101	6.74	1.00	50.5
Pj sib x Gb 55 (White grain)	Mexico	24	3508	83.5	86	140	1.41	91	2.35	2.79	38.7
Klein Rendidor	Argentina	17	3470	83.4	97	145	1.10	99	3.69	1.00	40.0
C-518	India	13	3424	85.3	89	143	1.10	105	6.59	1.00	42.6
Carazinho	Brazil	12	3212	81.4	93	144	4.01	116	6.14	1.58	44.5
Giza 150	Egypt	5	3099	83.2	88	149	9.06	106	5.84	1.00	34.0
Gaboto	Argentina	21	3008	82.5	92	144	1.10	109	7.20	1.00	32.7
Gabo	Australia	20	2999	74.7	88	140	9.06	110	1.90	1.00	34.8
CT-244	Canada	25	2979	77.3	112	169	1.41	116	1.00	1.00	29.3
C-273	Pakistan	14	2950	84.7	89	142	1.21	110	3.60	1.00	44.7
Giza 144	Egypt	9	2891	79.6	93	145	7.87	105	3.25	1.00	38.4
Bonza 55	Colombia	18	2741	80.7	86	139	1.21	115	7.40	1.00	38.0
Magnif 41	Argentina	1	2704	81.6	87	138	1.10	116	6.14	1.00	46.1
Sonora 64	Mexico	10	2445	83.0	73	134	2.45	75	1.90	2.47	41.6
Justin	U.S.A.	15	2437	76.8	112	160	1.00	119	1.00	1.00	28.0
Crim	U.S.A.	22	2249	77.5	101	150	7.26	123	2.35	1.00	27.5
Nariño 59	Colombia	11	2008	83.5	84	138	2.23	108	8.30	4.60	40.3
Napo 63	Colombia	16	1949	81.6	80	134	1.31	103	6.39	4.40	39.4
Mean			3151	81.4	90	144	2.97	106	4.35	1.46	40.2
Statistical level of significance			0.5%	(only 1 rep.)	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	(only 1 rep.)
Coefficient of variation			10.6%		3.7%	2.3%	49.0%	4.9%	42.0%	59.9%	
Standard error			333		3.4	3.3	1.45	5.2	1.83	.87	
Least significant difference, 5%			469		4.8	4.6	2.04	7.3	2.58	1.23	

1/ Deir Alla 1 and Gb x PC250 27-378-34-1 were substituted for Thatcher and Selkirk, respectively.

TABLE 39. Correlations between the means of 9 variables and the multiple regression of yield on the means of 8 variables for the "1st International Spring Wheat Yield Nursery" grown at Deir Alla, JORDAN, 1964-1965.

Correlations (r); d.f. = 23

	Yield	Test wt.	Days to flowering	Days to maturity	Stripe rust $\sqrt{X+1}$	Height	Lodging $\sqrt{\%+1}$	Shattering $\sqrt{\%+1}$
Test wt.	.17							
Days to flowering	-.04	-.55**						
Days to maturity	-.01	-.50*	.93**					
Stripe rust $\sqrt{X+1}$	-.10	-.34	.00	.07				
Height	-.25	-.49*	.63**	.53**	.14			
Lodging $\sqrt{\%+1}$	-.09	.52**	-.46*	-.42*	-.14	.07		
Shattering $\sqrt{\%+1}$	-.52**	.21	-.43*	-.40*	-.19	-.29	.24	
1000 grain wt.	.50**	.54**	-.60**	-.57**	-.26	-.33	.35	

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

Multiple regression
$R^2 = .671$
8 "independent" variables
constant term = 4015.723

Partial regression coef. (b)	"t" d.f. = n-k-1 = 16
-39.8493	-.747
30.7838	.823
5.1285	.158
2.8254	.065
-33.3388	-2.164*
41.9425	.662
-307.4269	-3.760*
65.8673	2.953**

TABLE 40. Yield, agronomic and disease data for the 25 varieties in the "1st International Spring Wheat Yield Nursery" grown at Kjarabo, SYRIA, 1964-65.

Variety or cross	Origin	Variety number	Yield kg/ha	Test wt. kg/hl	Days to: flowering	Days to: maturity	Stripe rust[1/]	Leaf rust[1/]	Stem rust[1/]	Height cms.	Lodging $\sqrt{\%+1}$	Shattering $\sqrt{\%+1}$	1000 grain weight gms.	Frost (scale)
Pitic 62	Mexico	2	4938	78.2	144	188	5.0	3.0	5.5	109	1.00	4.17	39.5	0.25
Penjamo 62	Mexico	6	4644	82.6	141	188	7.0	2.5	2.5	104	1.00	6.35	41.0	0.00
Nainari 60	Mexico	19	4582	80.5	139	186	10.0	3.0	3.5	116	1.00	3.58	45.4	0.25
Napo 63	Colombia	16	4455	82.4	137	183	3.0	10.0	9.0	120	1.00	5.84	42.0	0.00
Pj sib x Gb 55 (White grain)	Mexico	24	4455	81.9	148	193	2.0	3.0	4.0	113	1.00	7.77	37.0	0.00
Triple Dirk	Australia	8	4430	81.4	145	192	9.0	3.5	4.0	134	1.58	4.29	47.0	0.00
Giza 144	Egypt	9	4283	83.4	146	194	10.0	2.5	2.0	131	2.47	1.73	43.6	0.75
Giza 150	Egypt	5	4244	82.8	142	189	10.0	2.0	5.0	120	4.07	1.00	40.6	0.75
C-271	Pakistan	3	4221	82.3	137	188	4.5	9.0	10.0	109	1.00	7.85	46.9	0.75
Lerma Rojo 64 A	Mexico	4	4216	82.9	141	186	7.5	2.5	2.0	116	1.00	2.95	42.4	0.25
C-518	India	13	4102	85.2	140	194	2.5	7.0	9.5	114	1.90	1.00	43.0	0.75
C-273	Pakistan	14	3933	83.9	140	189	3.0	6.5	9.5	126	2.14	2.30	43.8	0.25
Bonza 55	Colombia	18	3855	80.1	142	186	2.0	2.0	3.5	119	1.00	3.41	38.0	0.25
Klein Rendidor	Argentina	17	3755	81.7	145	188	2.0	7.0	6.5	128	2.54	5.35	48.5	0.25
Crim	U.S.A.	22	3641	81.1	144	187	10.0	3.0	3.5	126	3.25	3.31	38.4	0.00
Gabo	Australia	20	3636	79.2	139	189	10.0	3.5	4.0	111	1.00	3.31	39.3	0.00
Sonora 64	Mexico	10	3585	81.7	138	187	9.0	4.0	2.0	84	1.00	6.59	38.5	1.00
CT-244	Canada	25	3552	81.9	149	195	10.0	4.0	2.0	148	6.03	2.30	36.6	0.00
Nariño 59	Colombia	11	3458	83.2	143	190	2.0	3.5	3.5	129	1.00	8.80	38.6	0.00
Magnif 41	Argentina	1	3185	82.1	139	184	3.0	2.0	3.5	138	5.49	1.94	43.1	0.00
Gaboto	Argentina	21	3163	82.7	147	191	2.5	2.0	2.0	134	3.00	5.20	32.4	0.00
Carazinho	Brazil	12	3155	81.8	146	188	8.5	2.5	3.5	136	1.00	7.33	41.5	0.00
Thatcher	U.S.A.	23	2913	80.7	153	195	8.5	5.5	7.5	150	5.03	2.66	29.3	0.25
Justin	U.S.A.	15	2588	79.8	153	198	3.0	4.0	2.0	139	1.36	6.23	33.3	0.00
Selkirk	Canada	7	2472	79.5	152	189	3.0	2.0	4.0	135	1.00	2.88	36.3	0.00
Mean			3818	81.7	143	189	5.9	4.0	4.6	123	2.07	4.36	40.2	0.23
Statistical level of significance			0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
Coefficient of variation			10.4%	0.8%	1.1%	1.3%	21.9%	55.4%	53.7%	3.9%	89.2%	19.9%	4.1%	111.2%
Standard error			396	.6	1.6	2.5	1.29	2.20	2.45	4.9	1.85	0.87	1.63	0.37
Least significant difference, 5%			558	.9	2.2	3.5	1.81	3.11	3.45	6.8	2.61	1.23	2.3	0.52

1/ Data transformed to scale of 1 to 10

TABLE 41. Correlations between the means of 12 variables and the multiple regression of yield on the means of 11 variables for the "1st International Spring Wheat Yield Nursery" grown at Kjarabo, SYRIA, 1964-65.

Correlations (r); d.f. = 23

	Yield	Test wt.	Days to flowering	Days to maturity	Stripe rust	Leaf rust	Stem rust	Height	Lodging $\sqrt{\%+1}$	Shattering $\sqrt{\%+1}$	1000 grain wt.
Test wt.	.19										
Days to flowering	-.56**	-.35									
Days to maturity	-.27	.10	.68**								
Stripe rust	.17	-.14	-.03	.06							
Leaf rust	.17	.28	-.30	-.05	-.28						
Stem rust	.22	.26	.31	.09	.34	.82**					
Height	-.56**	-.03	.65**	.42*	-.03	-.10	-.07				
Lodging $\sqrt{\%+1}$	-.30	.16	.25	.28	.22	-.08	-.04	.60**			
Shattering $\sqrt{\%+1}$	.01	-.06	-.02	-.12	-.29	.17	-.09	-.28	-.55**		
1000 grain wt.	.57**	.32	-.63**	-.41*	.05	.31	.31	-.30	-.24	-.02	
Frost	.27	.34	-.36	.06	.20	.23	.26	-.49*	-.04	-.20	.27

Multiple regression
$R^2 = .604$
11 "independent" variables
constant term = -7364.0838

Partial regression coef. (b)	"t" d.f. = n-k-1 = 13
48.9505	.461
8.8812	.136
38.5844	.663
43.5352	1.002
-47.3204	-.446
80.8553	.869
-35.4556	-1.944
40.9930	.335
-22.8523	-.297
68.3937	1.905
-817.9402	-1.418

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

TABLE 42. Yield and agronomic data of the 25 varieties in the "1st International Spring Wheat Yield Nursery" grown at the AUB farm, Beirut, LEBANON, 1964-65.

Variety or cross	Origin	Variety number	Yield kg/ha	Days to: flowering	Days to: maturity	Winter injury $\sqrt{\%+1}$
Napo 63	Colombia	16	2358	155	208	1.36
Nainari 60	Mexico	19	2305	156	208	2.90
Triple Dirk	Australia	8	2204	163	210	1.00
Gabo	Australia	20	2194	155	208	1.58
Pitic 62	Mexico	2	2179	163	209	1.00
Pj sib x Gb 55 (White grain)	Mexico	24	2170	163	209	1.00
Crim	U.S.A.	22	2029	159	209	1.00
Sonora 64	Mexico	10	2010	155	209	6.03
Narino 59	Colombia	11	1989	163	210	1.00
Penjamo 62	Mexico	6	1965	158	208	1.00
Lerma Rojo 64A	Mexico	4	1926	163	209	1.00
Magnif 41	Argentina	1	1805	160	209	1.00
C-271	Pakistan	3	1699	157	209	1.58
Thatcher	U.S.A.	23	1682	169	211	1.00
Justin	U.S.A.	15	1670	169	211	1.00
CT-244	Canada	25	1624	163	210	1.00
AUB-1 (local check)[1/]	Lebanon	17	1582	154	209	2.73
Gaboto	Argentina	21	1574	163	208	1.00
Giza 150	Egypt	5	1566	163	209	1.00
Bonza 55	Colombia	18	1512	163	209	1.58
Carazinho	Brazil	12	1460	165	208	1.00
C-273	Pakistan	14	1441	159	210	3.54
Selkirk	Canada	7	1321	169	211	1.00
Giza 144	Egypt	9	1270	163	212	1.58
C-518	India	13	1048	165	209	3.82
Mean			1783	161	209	1.67
Statistical level of significance			0.5%	(only 1 rep.)	10.0%	0.5%
Coefficient of variation			18.1%		0.8%	43.9%
Standard error			322		1.6	.73
Least significant difference, 5%			454		2.3	1.03

1/ Substituted for Klein Rendidor

TABLE 43. Correlations between the means of 4 variables and the multiple regression of yield on the means of 3 variables for the "1st International Spring Wheat Yield Nursery" grown at the AUB farm, Beirut, LEBANON, 1964-65

Correlations (r); d.f. = 23

	Yield	Days to flowering	Days to maturity
Days to flowering	-.47*		
Days to maturity	-.35	.54**	
Winter injury $\sqrt{\% + 1}$	-.12	-.44*	-.17

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

Multiple regression
$R^2 = .360$
3 "independent" variables
constant term = 16610.000

Partial regression coef. (b)	"t" d.f. = n-k-1 = 21
-46.9633	-2.601*
-33.7534	-.446
-112.0620	-2.019

TABLE 44. Yield, agronomic and disease data of the 25 varieties in the "1st International Spring Wheat Yield Nursery" grown at Eskisehir, TURKEY, 1964-65.

Variety or cross	Origin	Variety number	Yield kg/ha	Test wt. kg/hl	Days to: flowering	Days to: maturity	Stripe rust $\sqrt{\%+1}$	Leaf rust $\sqrt{\%+1}$	Stem rust $\sqrt{\%+1}$	Height cms.	Lodging $\sqrt{\%+1}$	Shattering $\sqrt{\%+1}$	1000 grain wt. gms.	Frost (scale)	Sawfly $\sqrt{\%+1}$
Pitic 62	Mexico	2	3633	77.0	189	257	7.48	2.10	3.24	90	4.78	1.00	37.8	1.50	2.48
Nainari 60	Mexico	19	3383	79.8	181	253	8.42	1.41	1.41	101	1.00	1.00	41.4	1.25	3.46
Lerma Rojo 64A	Mexico	4	3299	82.3	182	253	7.81	1.41	1.41	93	5.57	1.00	42.8	1.25	2.78
Bonza 55	Colombia	18	3079	78.6	186	255	3.95	1.58	1.58	107	3.24	1.00	36.5	2.00	3.14
Penjamo 62	Mexico	6	2995	79.6	185	254	8.65	1.41	1.41	89	3.24	1.40	42.6	2.00	2.38
Pj sib x Gb 55 (White grain)	Mexico	24	2941	80.5	190	257	7.64	2.20	1.31	81	1.00	1.00	35.7	2.25	1.90
Gaboto	Argentina	21	2816	80.9	188	257	6.09	1.68	4.49	110	6.35	1.00	32.8	1.00	3.09
Napo 63	Colombia	16	2816	79.5	185	253	7.12	3.38	1.10	103	1.00	3.37	36.8	2.50	3.22
Carazinho	Brazil	12	2608	79.7	188	259	7.96	1.41	1.41	109	3.99	1.15	40.5	2,00	3.30
Justin	U.S.A.	15	2549	81.1	191	262	8.42	1.41	1.41	110	3.24	1.00	35.4	2.00	2.81
Nariño 59	Colombia	11	2462	80.3	188	257	6.96	1.58	1.00	114	2.50	3.17	39.6	2.50	3.24
Triple Dirk	Australia	8	2374	80.6	188	260	9.13	1.41	1.41	106	3.99	1.00	42.5	2.25	2.09
Sonora 64	Mexico	10	2291	81.5	182	253	9.26	1.41	1.41	79	1.00	1.00	36.1	3.00	2.10
Klein Rendidor	Argentina	17	2241	81.4	185	258	8.85	1.41	1.41	106	3.99	1.27	36.0	1.00	2.80
C-518	India	13	2225	84.2	187	258	3.95	4.72	3.37	90	4.78	1.00	41.0	3.50	3.38
C-271	Pakistan	3	2183	82.3	183	256	3.95	5.07	4.96	85	3.24	1.00	47.2	3.50	3.01
CT-244	Canada	25	2124	80.5	189	258	8.99	1.41	1.41	102	4.78	1.00	36.0	3.00	2.93
Magnif 41	Argentina	1	2041	80.2	187	254	8.99	1.41	1.41	106	6.35	2.38	42.2	1.25	3.24
Selkirk	Canada	7	2024	80.2	192	256	8.42	1.41	1.41	97	2.50	1.00	33.7	1.00	3.09
C-273	Pakistan	14	1916	82.4	186	258	6.44	3.91	3.00	96	6.35	1.00	39.4	4.00	3.77
Giza 150	Egypt	5	1891	81.1	184	257	8.99	1.41	1.41	97	3.99	1.00	34.0	3.75	2.63
Crim	U.S.A.	22	1870	80.4	187	256	9.13	1.41	1.41	103	5.57	1.00	33.3	2.25	3.09
Gabo	Australia	20	1787	77.6	182	253	9.40	1.41	1.41	91	1.75	1.00	36.2	2.75	2.65
Thatcher	U.S.A.	23	1656	80.4	190	258	9.40	1.41	1.41	106	3.99	1.00	31.8	1.50	3.06
Giza 144	Egypt	9	1574	80.8	189	259	8.71	1.41	1.41	102	4.78	1.00	36.0	4.00	2.71
Mean			2431	80.5	187	256	7.77	1.95	1.86	99	3.72	1.27	38.0	2.28	2.93
Statistical level of significance			0.5%	0.5%	(only 1 rep.)	(only 1 rep.)	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
Coefficient of variation			8.4%	1.5%			7.1%	52.2%	46.8%	5.3%	34.9%	58.9%	4.5%	23.8%	12.3%
Standard error			205	1.2			.55	1.02	0.87	5.2	1.30	.75	1.71	.52	.36
Least significant difference, 5%			289	1.7			.77	1.44	1.23	7.3	1.83	1.06	2.41	.73	.51

TABLE 45. Correlations between the means of 13 variables and the multiple regression of yield on 12 variables for the "1st International Spring Wheat Yield Nursery" grown at Eskisehir, TURKEY, 1964-65.

Correlations (r); d.f. = 23

	Yield	Test wt.	Days to flowering	Days to maturity	Stripe rust $\sqrt{\% + 1}$	Leaf rust $\sqrt{\% + 1}$	Stem rust $\sqrt{\% + 1}$	Height	Lodging $\sqrt{\% + 1}$	Shattering $\sqrt{\% + 1}$	1000 grain wt.	Sawfly $\sqrt{\% + 1}$
Test wt.	-.31											
Days to flowering	-.17	-.07										
Days to maturity	-.28	.25	.70**									
Stripe rust $\sqrt{\% + 1}$	-.16	-.24	-.14	.00								
Leaf rust $\sqrt{\% + 1}$	-.05	.48*	-.14	.02	-.60**							
Stem rust $\sqrt{\% + 1}$	.08	.30	-.06	.12	-.55**	.67**						
Height	-.10	-.15	.37	.40*	.10	-.37	-.24					
Lodging $\sqrt{\% + 1}$	-.21	.29	.23	.34	-.01	.04	.37	.31				
Shattering $\sqrt{\% + 1}$	.07	-.15	-.02	-.27	.02	.08	-.28	.34	-.20			
1000 grain wt.	.32	.20	-.43	-.20	-.22	.42*	.25	-.21	.03	.14		
Sawfly $\sqrt{\% + 1}$	-.16	.21	.03	.13	-.35	.31	.19	.58**	.36	.23	.22	
Frost damage	-.48*	.35	-.15	.18	-.05	.49*	.16	-.31	-.01	-.06	.11	

Multiple regression

$R^2 = .555$

12 "independent" variables

constant term = 8027.402

Partial regression coef. (b)	"t" d.f. = n-k-1 = 12
-124.6816	-1.170
-77.1573	-.780
78.3473	.492
-95.3670	-.865
87.1578	.250
-34.2338	-.155
-1.4603	-.032
7.9586	.075
84.1925	.216
40.7295	.974
-466.5507	-.719
-355.8453	-2.032

* = Significant at the 5% level

** = Significant at the 1% level

TABLE 46. Yield, agronomic and disease data for the 25 varieties in the "1st International Spring Wheat Yield Nursery" grown at the Brasov Agricultural Experimental Station, RUMANIA, 1965.

Variety or cross	Origin	Variety number	Yield kg/ha	Test wt. kg/hl	Days to: flowering	Days to: maturity	Stripe rust (coef.)	Leaf rust (coef.)	Stem rust (coef.)	Height cms.	Lodging %	Shattering %	1000 grain wt. gms.	Erisiphe graminis (coef.)
Pitic 62	Mexico	2	3427	74.6	61	108	0	1	2	83	3	0	36.3	8
Magnif 41	Argentina	1	2899	79.6	55	104	0	1	1	108	18	1.20	43.5	20
Selkirk	Canada	7	2677	78.8	62	107	35	1	1	100	13	5.30	39.4	40
Nainari 60	Mexico	19	2633	77.8	54	105	5	1	1	85	5	.01	40.8	30
Penjamo 62	Mexico	6	2557	79.3	55	104	0	2	1	79	3	1.80	38.5	40
Crim	U.S.A.	22	2414	79.4	56	104	9	1	1	98	35	.40	39.7	10
Bonza 55	Colombia	18	2359	76.0	58	106	0	1	1	97	20	.80	34.9	20
CT-244	Canada	25	2335	79.7	57	111	2	1	2	94	25	0	38.9	50
Carazinho	Brazil	12	2233	79.9	60	111	0	2	1	97	23	1.50	39.2	85
Gaboto	Argentina	21	2223	79.0	61	112	0	1	0	92	3	.70	35.5	80
Klein Rendidor	Argentina	17	2217	77.1	65	116	0	1	2	91	3	.20	37.0	23
Pj sib x Gb 55 (white grain)	Mexico	24	2214	77.2	57	104	1	38	2	70	3	.01	32.0	8
Triple Dirk	Australia	8	2184	79.6	59	106	10	40	6	101	8	.10	40.5	80
Lerma Rojo 64A	Mexico	4	2065	79.3	55	105	15	27	2	78	3	.04	38.9	85
Giza 144	Egypt	9	2054	79.6	57	105	1	1	5	94	3	.02	38.2	15
Napo 63	Colombia	16	2049	77.7	51	103	1	80	1	93	3	.03	34.2	73
Nariño 59	Colombia	11	1988	78.9	57	106	0	1	5	83	10	4.90	36.6	50
Justin	U.S.A.	15	1913	77.9	63	108	0	1	1	94	5	3.00	37.3	45
Gabo	Australia	20	1838	74.1	54	103	65	1	1	77	3	.50	35.6	70
Giza 150	Egypt	5	1757	81.1	54	104	75	38	6	80	3	0	38.5	38
Sonora 64	Mexico	10	1683	76.3	51	102	3	65	2	72	3	.20	31.4	28
Thatcher	U.S.A.	23	1611	78.1	60	104	0	90	38	98	5	.20	28.0	75
C-273	Pakistan	14	1369	81.0	54	105	1	45	25	88	3	.03	38.6	30
C-271	Pakistan	3	1177	75.6	51	102	0	75	10	78	3	.40	35.5	78
C-518	India	13	816	75.1	56	104	0	38	6	76	3	0	29.8	95
Mean			2108	78.1	57	106	2.28 1/	3.77 1/	2.12 1/	88	2.87 1/	1.29	36.8	6.59
Statistical level of significance			0.5%	(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.)	(only 1 rep.)	(only 1 rep.)
Coefficient of variation			4.2%											
Standard error			88											
Least significant difference, 5%			123											

1/ Mean of data transformed $\sqrt{X+1}$

TABLE 47. Correlations between the means of 12 variables and the multiple regression of yield on 11 variables for the "1st International Spring Wheat Yield Nursery" grown at the Brasov Agricultural Experimental Station, RUMANIA, 1965.

Correlations (r); d.f. = 23

	Yield	Test wt.	Days to flowering	Days to maturity	Stripe rust $\sqrt{X+1}$	Leaf rust $\sqrt{X+1}$	Stem rust $\sqrt{X+1}$	Height	Lodging $\sqrt{\%+1}$	Shattering $\sqrt{\%+1}$	1000 grain wt.	Multiple regression $R^2 = 0.667$ 11 "independent" variables constant term = 1978.874 Partial regression coef. (b)	"t" d.f. = n-k-1 = 13
Test wt.	.10											-16.2123	-.238
Days to flowering	.35	.04										41.4196	.720
Days to maturity	.31	.16	.78**									-24.8011	-.426
Stripe rust $\sqrt{X+1}$	-.03	.08	-.17	-.24								-15.4873	-.333
Leaf rust $\sqrt{X+1}$	-.63**	-.07	-.49*	-.53**	-.01							-2.5428	-.043
Stem rust $\sqrt{X+1}$	-.54**	.15	-.09	-.26	-.11	.61**						-190.5072	-1.718
Height	.38	.44*	.50*	.38	-.14	-.38	.03					14.2449	.812
Lodging $\sqrt{\%+1}$	.33	.29	.24	.22	-.08	-.47*	-.27	.66**				-68.9396	-.617
Shattering $\sqrt{\%+1}$	.20	.14	.34	.13	.02	-.43*	-.22	.27	.36			-40.0981	-.143
1000 grain wt.	.53**	.56**	.05	.22	.21	-.56**	-.38	.47*	.41*	.22		46.0482	.955
Erisiphe graminis $\sqrt{\%+1}$	-.52**	.00	-.10	.01	.10	.35	.19	-.07	-.15	.06	-.20	-86.0913	-1.727

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

TABLE 48. Yield, agronomic and disease data of the 25 varieties in the "1st International Spring Wheat Yield Nursery" grown at Abu-Ghraib, Baghdad, IRAQ, 1964-65.

Variety or cross	Origin	Variety number	Yield kg/ha	Test wt. kg/hl	Days to: flowering	Days to: maturity	Height cms.	1000 grain weight gms.
Giza 150	Egypt	5	2362	76.1	119	171	102	37
C-271	Pakistan	3	2116	76.1	112	169	95	36
Nainari 60	Mexico	19	2016	73.6	119	165	92	39
Lerma Rojo 64A	Mexico	4	2012	74.8	119	166	100	36
Pitic 62	Mexico	2	2004	71.1	121	169	90	28
Sonora 64	Mexico	10	1958	73.6	105	163	72	32
Triple Dirk	Australia	8	1941	72.3	122	169	117	37
Bonza 55	Colombia	18	1908	72.3	117	169	92	31
Giza 144	Egypt	9	1887	74.8	121	169	105	35
C-518	India	13	1854	77.3	118	171	97	20
Penjamo 62	Mexico	6	1845	76.1	120	165	90	35
Gabo	Australia	20	1754	72.3	118	166	88	25
Ajeba 1/	Iraq	17	1750	78.6	124	169	98	31
C-273	Pakistan	14	1695	78.6	117	171	108	34
Pj sib x Gb 55 (White grain)	Mexico	24	1569	74.0	125	165	72	28
Magnif 41	Argentina	1	1566	74.8	119	163	115	35
Carazinho	Brazil	12	1554	74.8	125	167	110	35
Crim	U.S.A.	22	1549	72.3	125	169	102	26
Selkirk	Canada	7	1399	71.1	144	176	102	25
Napo 63	Colombia	16	1283	73.6	115	163	95	28
Nariño 59	Colombia	11	1166	74.8	119	163	100	30
Gaboto	Argentina	21	1099	73.6	126	167	100	24
CT-244	Canada	25	1016	73.6	138	179	93	26
Thatcher	U.S.A.	23	604	69.8	146	179	97	23
Justin	U.S.A.	15	487	67.3	147	176	87	23
Mean			1616	73.9	123	168	96	30
Statistical level of significance			0.5%	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)
Coefficient of variation			25.3%					
Standard error			408					
Least significant diference, 5%			575					

1/ Substituted for Klein Rendidor

TABLE 49.- Correlations between the means of 6 variables and the multiple regression of yield on the means of 5 variables for the "1st Internationl Spring Wheat Yield Nursery" grown at Abu-Ghraib, Bagdad, IRAQ, 1964-65.

Correlations (r); d.f. = 23

	Yield	Test wt.	Days to flowering	Days to maturity	Height
Test wt.	.54**				
Days to flowering	-.75**	-.58**			
Days to maturity	-.45*	-.36	.79**		
Height	.05	.22	.09	.10	
1000 grain wt.	.74**	.57**	-.61**	-.45*	.33

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

Multiple regression
$R^2 = .740$
5 "Independent" variables
constant term = -796.402

Partial regression coef. (b)	"t" d.f. = n-k-1 = 19
-4.8458	-.171
-33.0015	-2.937**
34.1292	1.777
-3.9066	-.663
47.2969	2.956**

TABLE 50. Yield, agronomic and disease data of the 25 varieties in the "1st International Spring Wheat Yield Nursery" grown at Ahwaz, IRAN, 1964-65.

Variety or cross	Origin	Variety number	Yield kg/ha	Days to: flowering	Days to: maturity	Stripe rust $\sqrt{X+1}$	Leaf rust $\sqrt{X+1}$	Height cms.	Lodging %	Shattering $\sqrt{\%+1}$	1000 grain weight gms.
Khalij[1]	Iran	8	2933	90	147	8.99	5.56	95	30	1.00	53.5
Pj sib x Gb 55 (White grain)	Mexico	24	2908	81	107	1.00	1.00	84	0	1.00	43.3
Gabo	Australia	20	2816	80	130	4.99	1.00	80	0	1.00	45.8
C-518	India	13	2633	81	137	1.00	1.31	85	0	1.00	46.5
Pitic 62	Mexico	2	2483	80	134	1.00	1.00	85	0	1.00	39.3
Sholeh[2]	Iran	3	2441	82	139	1.00	1.00	90	20	1.00	43.5
Lerma Rojo 64 A	Mexico	4	2341	80	130	1.00	1.00	89	0	1.00	41.5
Nainari 60	Mexico	19	2300	81	130	1.00	1.00	81	0	1.00	44.8
Nariño 59	Colombia	11	2299	79	130	1.00	1.00	100	10	5.56	40.8
Bonza 55	Colombia	18	2199	81	130	1.00	1.00	95	0	4.58	39.3
Giza 150	Egypt	5	2099	81	135	1.00	1.00	84	0	4.53	41.0
Giza 144	Egypt	9	2083	83	139	1.31	1.00	93	0	1.00	43.8
Crim	U.S.A.	22	2058	83	142	1.00	1.00	100	0	1.00	39.3
Klein Rendidor	Argentina	17	2024	82	130	1.00	1.00	89	0	1.00	41.0
CT-244	Canada	25	1975	108	147	1.00	1.00	90	0	1.00	35.0
Napo 63	Colombia	16	1924	79	125	1.00	1.00	90	0	1.00	39.5
Carazinho	Brazil	12	1883	83	138	1.00	1.00	100	0	1.00	44.3
Penjamo 62	Mexico	6	1766	80	129	1.00	1.00	80	0	1.00	43.5
Magnif 41	Argentina	1	1658	79	130	1.00	1.00	98	0	2.16	44.3
Thatcher	U.S.A.	23	1583	101	147	1.00	1.00	90	0	1.00	25.0
Gabóto	Argentina	21	1574	83	138	1.00	1.00	90	0	4.58	35.5
Selkirk	Canada	7	1499	108	147	1.00	1.00	95	0	1.00	35.8
Justin	U.S.A.	15	1291	108	147	1.00	1.00	90	0	1.00	28.3
Sonora 64	Mexico	10	1250	81	118	1.00	1.00	75	0	4.58	37.5
C-273	Pakistan	14	1250	80	136	1.00	1.00	84	0	1.00	41.8
Mean			2051	85	134	1.49	1.19	89	1.42[3]	1.80	40.5
Statistical level of significance			0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	(only 1 rep.)	0.5%	0.5%
Coefficient of variation			26.8%	4.3%	0.3%	8.2%	10.3%	1.5%		14.8%	11.6%
Standard error			550	3.7	.3	.12	.12	1.4		.27	4.7
Least significant difference, 5%			775	5.2	.4	.17	.17	2.0		.38	6.6

[1] Substituted for Triple Dirk
[2] Substituted for C-271
[3] Mean of data transformed $\sqrt{X+1}$

TABLE 51. Correlations between the means of 9 variables and the multiple regression of yield on the means of 8 variables in the "1st International Wheat Yield Nursery" grown at Ahwaz, IRAN, 1964-65.

Correlations (r); d.f. = 23

	Yield	Days to flowering	Days to maturity	Stripe rust $\sqrt{X+1}$	Leaf rust $\sqrt{X+1}$	Height	Lodging $\sqrt{\%+1}$	Shattering $\sqrt{\%+1}$
Days to flowering	-.34							
Days to maturity	-.22	.66**						
Stripe rust $\sqrt{X+1}$	.48*	.03	.21					
Leaf rust $\sqrt{X+1}$	.39	.09	.28	.89**				
Height	-.01	.20	.45*	.04	.17			
Lodging $\sqrt{\%+1}$	.42*	-.02	.23	.62**	.71**	.28		
Shattering $\sqrt{\%+1}$	-.17	-.26	-.24	-.15	-.12	.05	.05	
1000 grain wt.	.64**	-.61**	-.28	.52**	.48*	-.03	.42*	-.12

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

Multiple regression
R^2 = .528
8 "independent" variables
constant term = 1919.241

Partial regression coef. (b)	"t" d.f. = n-k-1 = 16
1.848	.110
-15.124	-1.097
141.340	1.257
-218.112	-.921
7.767	.511
118.248	1.093
-57.177	-.871
32.080	1.114

TABLE 52. Yield, agronomic and disease data of the 25 varieties in the "1st International Spring Wheat Yield Nursery" grown at Tandojam, PAKISTAN, 1964-65.

Variety or cross	Origin	Variety number	Yield kg/ha	Test weight kg/hl	Days to: flowering	Days to: maturity	Stem rust	Height cms.	Lodging %	Shattering %	1000 grain weight gms.
Pj sib x Gb 55 (White grain)	Mexico	24	4918	78.0	72	144	30 MR	99	0	0	40
Pitic 62	Mexico	2	4516	73.8	77	144	0	107	0	0	50
Penjamo 62	Mexico	6	3950	77.3	70	144	0	102	0	10	60
Gabo	Australia	20	3784	75.2	72	144	50 MR	112	0	0	50
Lerma Rojo 64 A	Mexico	4	3783	78.6	71	144	0	104	50	0	40
Nainari 60	Mexico	19	3499	76.2	76	144	25 MR	122	0	0	60
Giza 150	Egypt	5	3476	78.7	73	144	15 MR	117	75	0	60
Magnif 41	Argentina	1	3263	78.6	72	144	T R	130	0	0	50
Giza 144	Egypt	9	3121	77.0	76	144	30 MR	119	25	0	40
Triple Dirk	Australia	8	2955	74.8	75	144	30 MR	130	50	0	50
Carazinho	Brazil	12	2484	72.6	80	144	40 MR	124	100	0	40
Nariño 59	Colombia	11	2459	74.8	68	144	5 R	127	100	10	50
Gaboto	Argentina	21	2412	75.5	83	144	20 MR	124	50	0	40
Bonza 55	Colombia	18	2318	73.6	75	144	0	127	10	0	60
Napo 63	Colombia	16	2317	77.3	65	144	10 R	104	0	5	50
C-271	Pakistan	3	2269	71.2	71	144	70 S	119	50	0	50
CT-244	Canada	25	2246	70.0	100	160	20 R	130	0	0	40
Sonora 64	Mexico	10	2176	78.0	63	144	0	76	0	40	40
C-518	India	13	1938	68.0	76	144	80 S	117	75	0	30
C-273	Pakistan	14	1892	76.1	75	144	50 S	130	75	0	50
Crim	U.S.A.	22	1891	71.1	92	144	0	137	25	0	40
Selkirk	Canada	7	899	59.9	109	160	10 R	132	0	10	20
Klein Rendidor	Argentina	17	875	58.0	96	144	100 S	132	50	0	40
Justin	U.S.A.	15	709	61.1	112	160	5 R	135	0	10	30
Thatcher	U.S.A.	23	591	57.6	114	160	30 R	130	50	0	30
Mean			2589	72.4	81	147	3.26 1/	119	4.54 1/	1.64 1/	44
Statistical level of significance			0.5%	(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			23.4%								
Standard error			606								
Least significant difference, 5%			854								

1/ Mean of the rust coefficient or percentage transformed to $\sqrt{X+1}$.

TABLE 53. Correlations between the means of 9 variables and the multiple regression of yield on the means of 8 variables for the "1st International Spring Wheat Yield Nursery" grown at Tandojam, PAKISTAN, 1964-65.

Correlations (r); d.f. = 23

	Yield	Test wt.	Days to flowerin	Days to maturit	Stem rust $\sqrt{X+1}$	Height	Lodging $\sqrt{\%+1}$	Shattering $\sqrt{\%+}$
Test Wt.	.79**							
Days to flowering	-.68**	-.88**						
Days to maturity	-.57**	-.70**	.86**					
Stem rust $\sqrt{X+1}$	-.24	-.29	-.01	-.31				
Height	-.53**	-.53**	.62**	.38	.18			
Lodging $\sqrt{\%+1}$	-.24	-.09	-.06	-.26	.46*	-.32		
Shattering $\sqrt{\%+1}$	-.22	-.01	-.07	.17	-.37	-.47	-.33	
1000 grain wt.	.57**	.65**	-.66**	-.61**	-.11	-.18	-.04	-.17

Multiple regression

$R^2 = .820$

8 "independent" variables

constant term = 5440.650

	Partial regression coef. (b)	"t" d.f. = n-k-1 = 1
Test Wt.	60.7380	1.035
Days to flowering	-3.4962	-.094
Days to maturity	-12.9782	-.266
Stem rust $\sqrt{X+1}$	-76.0860	-1.004
Height	-35.1686	-2.311*
Lodging $\sqrt{\%+1}$	-58.5927	-1.279
Shattering $\sqrt{\%+1}$	-454.9375	-3.268**
1000 grain wt.	8.8941	.472

* = Significant at the 5% level

** = Significant at the 1% level

TABLE 54. Yield, agronomic and disease data of the 25 varieties in the "1st International Spring Wheat Yield Nursery" grown at Lyallpur, PAKISTAN, 1964-65.

Variety or cross	Origin	Variety number	Yield kg/ha	Days to: flowering	Days to: maturity	Stripe rust $\sqrt{X+1}$	Leaf rust $\sqrt{X+1}$	Stem rust $\sqrt{X+1}$	Height cms.	Lodging (scale)	Shattering $\sqrt{\%+1}$
Pj sib x Gb 55 (White grain)	Mexico	24	4339	111	152	1.31	4.58	1.41	118	0	1.01
Lerma Rojo 64 A	Mexico	4	4149	100	149	1.00	1.21	1.00	122	.50	1.05
Sonora 64	Mexico	10	3957	83	139	5.49	1.18	1.00	99	0	1.08
Penjamo 62	Mexico	6	3863	103	146	1.57	1.00	1.00	120	0	1.03
Napo 63	Colombia	16	3546	92	144	3.28	6.40	1.00	1361	2.50	1.00
Pitic 62	Mexico	2	3483	108	152	1.86	1.00	1.00	103	0	1.03
C-566 1/	Pakistan	17	3419	107	151	3.28	7.26	5.04	119	0	1.00
C-271	Pakistan	3	3324	105	146	1.00	9.52	7.26	128	0	1.25
C-518	India	13	3201	106	148	6.40	5.44	6.40	141	.75	1.00
Triple Dirk	Australia	8	3135	104	150	5.04	1.10	1.00	150	.25	1.29
Nainari 60	Mexico	19	3039	107	149	1.98	1.10	1.00	146	1.75	1.02
C-273	Pakistan	14	2850	105	149	4.58	5.95	5.95	157	1.00	1.00
Magnif 41	Argentina	1	2723	103	147	1.00	1.00	1.00	158	2.00	1.27
Carazinho	Brazil	12	2723	114	147	1.00	1.00	1.78	157	2.75	1.04
Crim	U.S.A.	21	2628	112	148	1.00	1.00	1.00	157	2.50	1.00
Nariño 59	Colombia	11	2533	98	145	2.11	3.41	1.00	146	2.00	1.05
Giza 144	Egypt	9	2470	104	150	9.52	1.10	1.00	148	0	1.00
Crim	U.S.A.	22	2470	109	155	5.49	1.00	1.00	138	2.50	1.01
Gabo	Australia	20	2469	103	148	9.99	1.98	1.00	142	0	1.07
Bonza 55	Colombia	18	2153	110	146	1.86	4.58	1.00	149	2.00	1.00
Giza 150	Egypt	5	2153	104	149	9.99	1.10	1.37	146	.25	1.00
CT-244	Canada	25	1822	127	161	5.04	1.00	1.00	149	.75	1.73
Selkirk	Canada	7	1646	121	158	8.12	5.04	1.10	154	0	1.15
Thatcher	U.S.A.	23	1075	127	163	4.58	9.52	1.00	151	1.75	1.65
Justin	U.S.A.	15	854	123	160	1.73	1.86	1.00	155	1.00	1.18
Mean			2801	107	150	3.93	3.17	1.89	139	.87	1.12
Statistical level of significance			0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
Coefficient of variation			17.3%	1.0%	1.0%	16.1%	17.3%	19.5%	1.2%	42.8%	8.2%
Standard error			484	1.1	1.5	.63	.55	.37	1.7	.42	.09
Least significant difference, 5%			682	1.5	2.1	.89	.77	.52	2.3	.58	.13

1/ Substituted for Klein Rendidor

TABLE 55. Correlations between the means of 9 variables and the multiple regression of yield on the means of 8 variables for the "1st International Spring Wheat Yield Nursery" grown at Lyallpur, PAKISTAN, 1964-65.

Correlations (r); d.f. = 23

	Yield	Days to flowering	Days to maturity	Stripe rust $\sqrt{X+1}$	Leaf rust $\sqrt{X+1}$	Stem rust $\sqrt{X+1}$	Height	Lodging
Days to flowering	-.69**							
Days to maturity	-.65**	.89*						
Stripe rust $\sqrt{X+1}$	-.31	-.02	.16					
Leaf rust $\sqrt{X+1}$	-.07	.14	.15	-.06				
Stem rust $\sqrt{X+1}$	.20	-.07	-.14	-.04	.62**			
Height	-.71**	.48*	.32	.16	-.02	-.07		
Lodging	-.28	.11	-.05	-.38	-.04	-.22	.51**	
Shattering $\sqrt{X+1}$	-.48*	.57**	.61**	.02	.18	-.11	.25	-.00

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

Multiple regression
R^2 = .776
8 "independent" variables
constant term = 115[illegible],000

Partial regression coef. (b)	"t" d.f. = n-k-1 = 16
-3[illegible].0155	-1.079
-11.3956	-.215
-89.9145	-1.806
-39.7847	-.750
78.5342	.972
-19.1143	-1.819
-118.0217	-.716
-378.8809	-.536

TABLE 56. Yield, agronomic and disease data of the 25 varieties in the "1st International Spring Wheat Yield Nursery" grown at Tarnab, PAKISTAN, 1964-65.

Variety or cross	Origin	Variety number	Yield kg/ha	Days to flowering	Stripe rust $\sqrt{X+1}$	Leaf rust $\sqrt{X+1}$	Height cms.	Lodging $\sqrt{\%+1}$
Penajmo 62	Mexico	8	4634	114	1.00	1.00	122	7.36
Sonora 64	Mexico	10	4020	107	1.58	1.00	99	1.00
Lerma Rojo 64A	Mexico	4	4019	114	1.00	1.00	114	1.90
Pitic 62	Mexico	2	3782	116	1.00	1.00	117	7.03
Dirk[1]	Australia	17	3618	116	3.05	2.16	140	7.04
Pj sib x Gb 55 (White grain)	Mexico	24	3571	121	1.36	1.00	99	1.00
Triple Dirk	Australia	8	3287	116	3.31	1.58	163	9.74
Nainari 60	Mexico	19	3215	115	3.35	1.00	122	6.39
Carazinho	Brazil	12	3121	117	3.13	1.00	159	9.16
Nariño 59	Colombia	11	2979	114	1.36	1.00	147	9.74
Napo 63	Colombia	16	2979	108	2.47	1.94	130	4.67
C-273	Pakistan	14	2861	114	1.58	1.00	137	9.16
C-518	India	13	2695	114	2.16	1.58	124	9.63
C-271	Pakistan	3	2624	109	1.36	3.95	137	9.76
Bonza 55	Colombia	18	2624	115	1.00	1.00	140	9.99
Gaboto	Argentina	21	2364	118	1.00	1.00	139	8.21
Magnif 41	Argentina	1	2245	115	1.00	1.00	145	9.45
CT-244	Canada	25	2080	132	6.00	1.00	152	7.61
Giza 144	Egypt	9	1963	119	7.97	1.00	150	9.88
Justin	U.S.A.	15	1891	136	1.36	1.00	162	6.89
Giza 150	Egypt	5	1654	115	9.16	1.00	145	9.99
Gabo	Australia	20	1609	115	9.99	1.00	130	2.90
Crim	U.S.A.	22	1608	121	5.54	1.00	159	9.99
Thatcher	U.S.A.	23	1277	137	4.11	3.69	152	9.88
Selkirk	Canada	7	1135	133	7.80	1.00	160	7.31
Mean			2714	118	3.30	1.36	138	7.43
Statistical level of significance			0.5%	0.5%	0.5%	0.5%	(only 1 rep.)	0.5%
Coefficient of variation			25.0%	1.1%	45.1%	53.6%		28.9%
Standard error			678	1.3	1.49	.73		2.14
Least significant difference, 5%			955	1.8	2.10	1.03		3.02

[1] Substituted for Klein Rendidor

TABLE 57. Correlations between the means of 6 variables and the multiple regression of yield on the means of 5 variables for the "1st International Spring Wheat Yield Nursery" grown at Tarnab, PAKISTAN, 1964-65.

Correlations (r); d.f. = 23

	Yield	Days to flowering	Stripe rust $\sqrt{X+1}$	Leaf rust $\sqrt{X+1}$	Height
Days to flowering	-.59**				
Stripe rust $\sqrt{X+1}$	-.65**	.28			
Leaf rust $\sqrt{X+1}$	-.14	.07	-.10		
Height	-.65**	.53**	.37	.11	
Lodging $\sqrt{\%+1}$	-.42*	.17	.09	.23	.72

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

Multiple regression
$R^2 = .710$
5 "independent" variables
constant term=9434.951

Partial regression coef.(b)	"t" d.f. = n-k-1 = 19
-38.5658	-2.142*
-164.1525	-3.560**
-124.7356	-.839
-7.4239	-.613
-59.2504	-.918

TABLE 58. Yield, agronomic and disease data of the 25 varieties in the "1st International Spring Wheat Yield Nursery" grown at Pusa (Bihar), INDIA, 1964-65.

Variety or cross	Origin	Variety number	Yield kg/ha	Days to: flowering	Days to: maturity	Leaf rust (1 to 10) 1/	Stem rust (1 to 10) 1/	Height cms.	1000 grain weight gms.
Triple Dirk	Australia	8	3041	73	125	1.0	2.0	131	50.8
Gabo	Australia	20	2958	74	127	2.0	10.0	111	44.0
Giza 144	Egypt	9	2833	82	128	2.0	1.3	120	39.6
NP 884 2/	India	17	2833	74	120	1.0	3.3	114	42.0
Bonza 55	Colombia	18	2833	75	125	6.0	1.5	124	37.0
Carazinho	Brazil	12	2750	80	135	2.0	1.0	142	37.8
C-273	Pakistan	14	2583	75	126	10.0	10.0	127	42.4
Pj sib x Gb 55 (White grain)	Mexico	24	2499	66	120	10.0	2.0	83	38.3
Giza 150	Egypt	5	2458	75	125	1.8	1.0	115	41.6
Pitic 62	Mexico	2	2416	83	136	2.0	1.8	95	31.3
CT-244	Canada	25	2333	103	155	2.0	10.0	116	30.8
Crim	U.S.A.	22	2250	91	139	2.0	2.0	119	33.9
Penjamo 62	Mexico	6	2249	68	120	6.0	1.0	88	41.4
Lerma Rojo 64 A	Mexico	4	2166	67	117	2.0	2.0	91	38.4
Sonora 64	Mexico	10	2166	52	111	10.0	1.0	86	38.4
Gaboto	Argentina	21	2166	84	135	2.0	2.0	121	30.8
C-518	India	13	2083	81	135	10.0	9.5	123	42.3
C-271	Pakistan	3	2000	77	129	10.0	9.5	120	40.3
Nainari 60	Mexico	19	2000	81	131	1.0	1.0	114	45.0
Napo 63	Colombia	16	1916	54	111	10.0	2.0	104	37.9
Magnif 41	Argentina	1	1833	68	126	1.3	2.0	128	44.5
Selkirk	Canada	7	1416	107	158	1.0	1.5	117	27.5
Nariño 59	Colombia	11	1333	53	112	5.5	2.0	102	43.4
Justin	U.S.A.	15	1249	116	165	3.3	10.0	117	22.0
Thatcher	U.S.A.	23	458	119	170	10.0	10.0	112	18.3
Mean			2193	79	131	4.6	4.0	113	37.6
Statistical level of significance			0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
Coefficient of variation			18.9%	2.4%	1.8%	30.7%	24.2%	5.5%	2.6%
Standard error			414	1.9	2.4	1.4	1.0	6.2	.96
Least significant difference, 5%			583	2.7	3.4	2.0	1.4	8.7	1.35

1/ Converted from reaction type, e.g. R, HS etc.
2/ Substituted for Klein Rendidor

TABLE 59. Correlations between the means of 7 variables and the multiple regression of yield on the means of 6 variables for the "1st. International Spring Wheat Yield Nursery" grown at Pusa (Bihar), INDIA, 1964-65.

Correlations (r); d.f. = 23

	Days to flowering	Days to maturity	Leaf rust	Stem rust	Height
Days to flowering	-.43*				
Days to maturity	-.51**	.98**			
Leaf rust	-.27	-.23	-.16		
Stem rust	-.25	-.47*	.51**	.35	
Height	.15	.35	.34	-.30	.22
1000 grain wt.	.62**	-.76**	-.79	-.08	-.29	.07

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

Multiple regression
R^2 = .578
6 "independent" variables
constant term = 7437.797

Partial regression coef.(b)	"t" d.f. = n-k-1 = 18
61.9858	1.936
-87.7329	-2.382*
-36.8030	-1.029
28.3142	.765
7.8305	.930
14.9631	.535

TABLE 60. Yield, agronomic data and correlations of the 25 varieties in the "1st International Spring Wheat Yield Nursery" grown at New Pusa (Delhi), INDIA, 1964-65.

Variety or cross	Origin	Variety number	Yield kg/ha	1000 grain weight gms.	
Sonora 64	Mexico	10	4821	39.2	
Pj sib x Gb 55 (White grain)	Mexico	24	4522	41.6	
Pitic 62	Mexico	2	4510	27.4	
Lerma Rojo 64A	Mexico	4	4366	38.6	
Penjamo 62	Mexico	6	4342	38.4	
Napo 63	Colombia	16	4247	39.8	
Nainari 60	Mexico	19	3936	36.4	
Gabo	Australia	20	3505	33.4	$r = .68$**
Triple Dirk	Australia	8	3337	44.4	($r^2 = .462$)
C-271	Pakistan	3	3207	41.6	$\hat{y} = -143.912 + 96.1543\ (X)$
Magnif 41	Argentina	1	3193	34.8	
Carazinho	Brazil	12	3158	36.6	
Crim	U.S.A.	22	3123	33.8	** = Significant at the 1% level
C-518	India	13	3110	39.4	
C-273	Pakistan	14	3098	42.4	
Nariño 59	Colombia	11	2931	37.2	
Giza 150	Egypt	5	2679	35.4	
Gaboto	Argentina	21	2609	25.0	
Giza 144	Egypt	9	2511	39.6	
Klein Rendidor	Argentina	17	2476	29.6	
Bonza 55	Colombia	18	2464	30.4	
Selkirk	Canada	7	2344	25.8	
CT-244	Canada	25	2177	23.4	
Justin	U.S.A.	15	944	21.4	
Thatcher	U.S.A.	23	730	16.6	
Mean			3133	34.1	
Statistical level of significance			0.5%	(only 1 rep.)	
Coefficient of variation			22.4%		
Standard error			703		
Least significant difference, 5%			891		

TABLE 61. Yield, agronomic and disease data of the 25 varieties in the "1st International Spring Wheat Yield Nursery" grown at Ludhiana, Punjab, INDIA, 1964-65.[1]

Variety or cross	Origin	Variety number	Yield[1] kg/ha	Days to flowering	Stripe rust	Leaf rust	Stem rust	Height cms.	Lodging %
Penjamo 62	Mexico	6	5232	97	F	M	T	103	10
Lerma Rojo 64A	Mexico	4	4955	1[illegible]	F	F	T	103	10
Pitic 62	Mexico	2	4877	108	F	T	T	112	10
Triple Dirk	Australia	8	4721	104	M	T	M	138	20
Magnif 41	Argentina	1	4521	94	F	M	T	132	10
Napo 63	Colombia	16	4455	95	T	VHS	T	112	25
Pj sib x Gb 55 (White grain)	Mexico	24	4399	105	T	VHS	T	94	10
Nariño 59	Colombia	11	4233	98	F	VHS	T	127	20
Nainari 60	Mexico	19	4222	105	M	T	T	119	10
Sonora 64	Mexico	10	4044	81	T	T	F	91	10
Klein Rendidor	Argentina	17	3694	115	F	T	M	120	70
C-273	Pakistan	14	3610	100	L	HS	HS	135	30
Gaboto	Argentina	21	3499	113	F	T	T	125	50
Carazinho	Brazil	12	3438	112	F	T	M	144	90
Bonza 55	Colombia	18	3305	104	L	M	T	139	30
Crim	U.S.A.	22	3299	114	L	T	F	127	50
C-518	India	13	3266	104	HS	VHS	VHS	119	50
C-271	Pakistan	3	3144	98	F	VHS	M	111	20
Giza 144	Egypt	9	2866	107	HS	L	L	140	10
Gabo	Australia	20	2166	102	VHS	M	T	120	25
Giza 150	Egypt	5	2027	106	HS	M	T	134	10
Justin	U.S.A.	15	1644	128	L	M	M	121	90
Selkirk	Canada	7	1500	128	L	T	T	130	40
CT-244	Canada	25	1444	129	HS	F	L	125	80
Thatcher	U.S.A.	23	722	127	M	VHS	VHS	122	15
Mean			3411	107	-			122	5.32[2]
Statistical level of significance			0.5%	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)	(only 1 rep.)
Coefficient of variation			13.5%						
Standard error			460						
Least significant difference, 5%			648						

[1] The yield of the local C 306 was 5199 kg/ha

[2] Mean of data transformed to $\sqrt{\% + 1}$

TABLE 62. Correlations between the means of 4 variables and the multiple regression of yield on the means of 3 variables for the "1st International Spring Wheat Yield Nursery" grown at Ludhiana, Punjab, INDIA, 1964-65.

	Correlations (r); d.f. = 23			Multiple regression
	Yield	Days to flowering	Height	R^2 = .516
				3 "independent" variables
				constant term = 12234.000
				Partial regression coef. (b) / "t" d.f. = n-k-1 = 21
Days to flowering	-.71**			-72.4813 / -3.579**
Height	-.34	.35		-9.7363 / -.670
Lodging $\sqrt{\%+1}$	-.42*	.61**	.35	21.3901 / .191

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

TABLE 63. Yield and agronomic data of the 25 varieties in the "1st International Spring Wheat Yield Nursery" grown at Wagga Wagga, N.S.W., AUSTRALIA, 1965.

Variety or cross	Origin	Variety number	Yield kg/ha	Test wt. kg/hl	Days to flowering	Height cms.	Lodging $\sqrt{\%+1}$
Pj sib x Gb 55 (White grain)	Mexico	24	2609	81.7	145	81	1.00
Pitic 62	Mexico	2	2463	76.4	146	91	3.95
Sonora 64	Mexico	10	2247	77.0	139	68	1.00
Triple Dirk	Australia	8	2222	78.9	148	110	3.80
Gabo	Australia	20	2214	76.7	140	97	4.19
Nainari 60	Mexico	19	2161	77.6	141	95	4.26
Penjamo 62	Mexico	6	2143	78.6	142	85	1.58
Carazinho	Brazil	12	2107	77.3	144	112	3.48
Lerma Rojo 64A	Mexico	4	2092	80.1	142	95	4.97
Napo 63	Colombia	16	2078	73.9	139	103	5.49
C-271	Pakistan	3	2063	79.5	140	91	4.68
Giza 150	Egypt	5	2043	83.3	144	90	3.31
Bonza 55	Colombia	18	1974	75.5	141	110	5.08
Crim	U.S.A.	22	1886	77.6	147	113	3.05
Klein Rendidor	Argentina	17	1879	77.0	141	104	4.64
CT-244	Canada	25	1875	76.7	149	105	2.16
C-273	Pakistan	14	1817	82.3	141	100	2.73
Gaboto	Argentina	21	1801	79.2	147	111	4.12
Giza 144	Egypt	9	1790	79.8	147	105	2.73
C-518	India	13	1770	82.6	142	89	3.31
Justin	U.S.A.	15	1735	77.0	152	103	2.73
Nariño 59	Colombia	11	1659	77.6	142	104	4.39
Thatcher	U.S.A.	23	1434	74.2	154	101	1.00
Magnif 41	Argentina	1	1325	77.0	146	114	4.38
Selkirk	Canada	7	1286	71.7	153	100	1.58
Mean			1947	78.0	144	99	3.34
Statistical level of significance			0.5%	(only 1 rep.)	(only 1 rep.)	0.5%	0.5%
Coefficient of variation			10.9%			4.3%	26.7%
Standard error			212			4.3	.89
Least significant difference, 5%			299			6.1	1.25

TABLE 64. Correlations between the means of 5 variables and the multiple regression of yield on the means of 4 variables for the "1st International Spring Wheat Yield Nursery" grown at Wagga Wagga, N.S.W., AUSTRALIA, 1965.

Correlations (r); d.f. = 23

	Yield	Test wt.	Days to flowering	Height
Test wt.	.33			
Days to flowering	-.49*	-.31		
Height	-.51**	-.28	.36	
Lodging $\sqrt{\%+1}$	.06	-.01	-.48*	.44*

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

Multiple regression
R^2 = .392
4 "independent" variables
constant term = 3927.854

Partial regression coef. (b)	"t" d.f. = n-k-1 = 20
15.9823	.737
-13.8212	-.643
-13.8735	-1.715
43.1978	.618

TABLE 65: Yield, agronomic and disease data of 25 varieties in the "1st International Spring Wheat Yield Nursery" grown at Waite Institute, AUSTRALIA, 1966.

Variety or cross	Origin	Variety number	Yield kg/ha	Test wt. kg/hl	Days to: flowering	Days to: maturity	Height cms.	Shattering $\sqrt{\%+1}$	1000 grain weight gms.
Pitic 62	Mexico	2	1378	75.2	71	110	57	1.00	30.9
Triple Dirk	Australia	8	1358	77.2	68	112	69	1.00	37.5
Napo 63	Colombia	16	1241	75.1	67	110	59	1.00	30.5
Sonora 64	Mexico	10	1141	75.5	67	110	44	1.36	30.5
C-273	Pakistan	14	1103	79.8	68	111	63	1.00	34.8
Pj sib x Gb 55 (White grain)	Mexico	24	1075	77.3	70	110	59	1.00	32.3
Penjamo 62	Mexico	6	1059	75.8	68	110	51	1.18	34.2
Gabo	Australia	20	1001	75.8	68	110	54	1.00	33.8
Nainari 60	Mexico	19	985	74.9	71	111	52	1.00	34.5
Giza 150	Egypt	5	902	77.8	68	112	48	1.00	32.0
Giza 144	Egypt	9	889	77.0	71	113	58	1.00	35.0
C-518	India	13	888	79.7	68	113	54	1.00	34.6
Crim	U.S.A.	22	823	77.3	76	113	59	1.00	29.1
Nariño 59	Colombia	11	791	75.6	68	111	59	1.00	33.5
CT-244	Canada	25	791	75.8	77	114	52	1.00	30.0
Bonza 55	Colombia	18	769	74.5	72	114	60	1.00	29.0
Lerma Rojo 64 A	Mexico	4	763	75.8	69	110	61	1.00	38.5
Magnif 41	Argentina	1	755	75.5	67	110	72	1.00	34.6
C-271	Pakistan	3	687	77.3	67	110	54	2.26	36.3
Gaboto	Argentina	21	677	75.9	76	116	59	1.00	29.3
Carazinho	Brazil	12	624	74.1	76	114	65	1.00	31.1
Selkirk	Canada	7	541	75.8	82	114	55	1.75	29.0
Thatcher	U.S.A.	23	539	72.3	85	119	54	1.75	24.7
Justin	U.S.A.	15	486	75.7	85	119	58	2.35	27.7
Klein Rendidor	Argentina	17	466	75.3	80	117	53	1.00	33.7
Mean			869	76.1	72	112	57	1.18	32.3
Statistical level of significance			0.5%	0.5%	0.5%	0.5%	0.5%	NS	0.5%
Coefficient of variation			17.2%	2.0%	1.2%	1.4%	11.0%	64.8%	6.8%
Standard error			150	1.5	.8	1.6	6.3	.77	2.2
Least significant difference, 5%			211	2.1	1.1	2.3	8.9	1.08	3.1

TABLE 66. Correlations between the means of 7 variables and the multiple regression of yield on the means of 6 variables for the "1st International Spring Wheat Yield Nursery" grown at the Waite Institute, AUSTRALIA, 1966.

Correlations (r); d.f. = 23

	Yield	Test weight	Days to flowering	Days to maturity	Height	Shattering $\sqrt{\%+1}$
Test wt.	.30					
Days to flowering	-.69**	-.45*				
Days to maturity	-.69**	-.34	.91**			
Height	.05	.04	-.11	-.05		
Shattering $\sqrt{\%+1}$	-.45*	-.15	.46*	.37	-.24	
1000 grain wt.	.34	.49*	-.70**	-.61**	.25	-.31

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

Multiple regression
$R^2 = .570$
6 "independent" variables
constant term=6224.491

Partial regression coef. (b)	"t" d.f. = n-k-1 = 18
15.6570	.529
-16.7606	-.825
-39.6068	-1.084
.1850	.027
-127.0456	-1.089
-23.0340	-1.251

TABLE 67. Overall means of yield, agronomic and disease data of the 25 varieties in the "1st International Spring Wheat Yield Nursery", 1964-65. The number of locations from which data was available differed between variables.

Variety or cross	Origin	Variety number	Yield kg/ha	Test wt. kg/hl	1000 grain weight gms.	Days to: flowering	Days to: maturity	Height cms.	Shattering $\sqrt{\%+1}$	Lodging $\sqrt{\%+1}$	Stripe rust Leaf $\sqrt{\%+1}$	Stripe rust Head $\sqrt{\%+1}$	Leaf rust $\sqrt{X+1}$	Stem rust $\sqrt{X+1}$	Septoria $\sqrt{\%+1}$	Frost (scale)
Pitic 62	Mexico	2	3526	72.7	33.0	97	147	94	1.32	3.33	3.63	5.72	3.31	2.27	4.94	1.58
Nainari 60	Mexico	19	3422	74.9	40.3	94	144	102	1.26	2.88	4.43	6.22	1.67	3.01	4.68	1.16
Penjamo 62	Mexico	6	3417	76.9	38.8	90	140	89	2.10	2.20	3.24	5.84	1.64	2.02	3.74	1.00
Pj sib x Gb 55 (White grain)	Mexico	24	3321	75.6	32.8	94	143	85	1.85	1.69	4.28	8.05	3.35	2.26	5.65	1.41
Lerma Rojo 64 A	Mexico	4	3253	76.9	37.2	89	134	93	1.44	3.02	3.76	7.29	3.27	1.79	4.47	1.16
Napo 63	Colombia	16	3221	76.1	36.1	84	138	101	2.34	2.50	1.80	1.00	5.64	1.38	4.48	1.16
Bonza 55 2/	Colombia	18	2821	74.3	34.8	96	146	114	1.67	5.42	1.67	1.53	3.35	1.64	3.65	1.75
Triple Dirk	Australia	8	2812	75.7	39.7	94	146	115	1.40	3.52	7.80	9.88	2.86	2.35	5.03	1.75
Nariño 59	Colombia	11	2800	77.0	36.9	89	140	105	3.62	4.90	1.68	1.20	2.77	2.33	4.12	1.50
C-271	Pakistan	3	2719	75.4	39.0	89	142	99	1.85	4.33	1.55	3.48	5.59	7.16	6.13	2.75
Sonora 64	Mexico	10	2718	75.2	32.9	83	136	77	2.69	1.30	5.49	9.99	2.75	2.16	6.25	1.66
Gabo	Australia	20	2661	72.1	34.7	92	143	98	1.25	2.44	8.70	8.62	2.24	3.50	5.17	1.58
Klein Rendidor 1/	Argentina	17	2624	76.2	35.7	106	151	106	1.52	5.29	3.51	3.79	3.08	4.60	3.94	.62
C-273	Pakistan	14	2624	80.1	39.3	91	143	109	1.13	4.90	1.66	2.33	3.53	6.04	5.85	2.41
Magnif 41	Argentina	1	2623	77.1	39.8	90	140	113	1.42	4.28	2.96	8.21	1.15	1.24	4.06	1.08
Giza 150	Egypt	5	2622	77.7	36.5	92	143	102	1.35	4.00	6.68	9.06	3.54	2.37	4.89	2.16
Gaboto	Argentina	21	2613	77.0	29.8	100	148	114	1.80	6.08	2.48	5.87	1.19	2.55	3.15	1.00
Carazinho	Brazil	12	2613	76.0	36.6	100	150	117	1.76	6.15	4.33	5.92	1.77	3.88	3.16	1.66
Giza 144	Egypt	9	2595	77.2	36.4	96	147	111	1.11	4.34	5.38	8.44	3.19	1.73	4.99	2.58
C-518	India	13	2543	78.2	34.8	93	145	100	1.00	4.72	1.75	1.92	3.79	6.10	6.46	2.41
Crim	U.S.A.	22	2460	75.7	32.1	98	147	115	1.25	5.39	4.78	9.30	1.98	1.16	4.62	1.75
CT-244	Canada	25	2439	75.5	31.0	107	155	110	1.20	4.15	3.47	4.97	1.57	1.76	4.46	1.66
Selkirk	Canada	7	1995	73.6	31.4	108	152	115	1.65	2.87	2.70	2.01	3.02	1.54	3.88	1.66
Justin	U.S.A.	15	1966	74.6	28.0	110	155	114	2.00	3.42	1.73	1.85	2.58	1.79	4.17	2.00
Thatcher	U.S.A.	23	1641	72.7	24.6	111	156	114	1.31	4.20	3.36	4.57	6.16	2.62	4.12	1.91
Mean			2722	75.8	34.9	96	145	105	1.65	3.88	3.71	5.48	3.00	2.75	4.65	1.67
Number of locations			34	19	23	31	21	30	10	19	18	2	17	16	3	3

1/ Data from Klein Rendidor were only available from 30 locations
2/ Data from Bonza 55 were only available from 33 locations

TABLE 68. Correlations between the means of 14 variables averaged over all locations where both variables were measured for the "1st International Spring Wheat Yield Nursery", 1964-65.[1/]

Correlations (r); d.f. = 23

	Yield	Test wt.	1000 grain wt.	Days to flowering	Days to maturity	Height	Shattering $\sqrt{\%+1}$	Lodging $\sqrt{\%+1}$	Stripe rust, leaf $\sqrt{X+1}$	Stripe rust, head $\sqrt{\%+1}$	Leaf rust $\sqrt{X+1}$	Stem rust $\sqrt{X+1}$	Septoria $\sqrt{\%+1}$
Test wt.	.03												
1000 grain wt.	.56**	.52**											
Days to flowering	-.63**	-.40*	-.67**										
Days to maturity	-.55**	-.42*	-.64**	.98**									
Height	-.56**	-.01	-.15	.58**	.63**								
Shattering $\sqrt{\%+1}$	.04	.00	.04	-.29	-.37	-.19							
Lodging $\sqrt{\%+1}$	-.32	.18	-.08	.34	.29	.72**	-.11						
Stripe rust, leaf $\sqrt{X+1}$	-.22	-.59**	-.05	-.12	-.05	-.19	-.21	-.33					
Stripe rust, head $\sqrt{\%+1}$	-.67**	-.91**	-.60**	-.14	-.02	-.34	-.28	-.39	.84**				
Leaf rust $\sqrt{X+1}$	-.19	-.14	-.22	-.12	-.06	-.13	-.13	-.31	-.36	-.46*			
Stem rust $\sqrt{X+1}$	-.25	.11	.13	-.05	.18	-.11	-.35	.05	-.27	-.36	.40*		
Septoria $\sqrt{\%+1}$	-.01	-.13	-.10	.40*	.43*	-.47*	2/	.15	-.23	2/	.24	.33	
Frost	-.63**	.06	-.41*	-.20	.11	.10	-.42*	.22	-.37	2/	.21	.24	2/

* = Significant at the 5% level
** = Significant at the 1% level
1/ Data were not included from Marcos Juarez, Argentina
2/ Not measured at the same locations

TABLE 69. Predicted yield (kg/ha) and the number of "independent" variables involved in the multiple regression of these estimates for the 25 varieties in the "1st International Spring Wheat Yield Nursery" grown at 34 locations, 1964-65.

Variety or cross	Variety No.	ARGENTINA Castelar	ARGENTINA Marcos Juarez	ARGENTINA Pergamino	ARGENTINA Paraná	CHILE Santiago	ECUADOR Quito	COLOMBIA Tibaitatá	GUATEMALA Quezaltenango	MEXICO CIAB early	MEXICO CIAB late	MEXICO Chapingo	U. S. A. Davis, Calif.	U. S. A. St. Paul, Minn.	SOUTH AFRICA Stellenbosch	ETHIOPIA Debre Zeit	SUDAN Ed-Damer	LIBYA Tripoli	CYPRUS Prastio
Magnif 41	1	3231	3035	4290	2616	6780	1863	1469	1399	3986	3605	3087	2952	2936	3311	2317	1927	4631	3471
Pitic 62	2	3345	2744	4410	2178	4671	3835	2324	1056	2985	3932	2907	4684	1580	3401	1933	2173	4631	3295
C-271	3	3104	2075	3705	1927	4711	2097	2597	996	4255	5008	2399	4966	1351	1745	1471	2362	4210	3724
Lerma Rojo 64A	4	3283	2523	4149	2119	6921	606	4111	2060	2928	3869	4087	5138	2958	4022	2257	1669	4631	3442
Giza 150	5	3795	2680	3987	2345	4706	777	912	1158	2934	4085	1848	4332	2196	3033	2626	1911	4367	3377
Penjamo 62	6	399[illegible]	3034	4547	2585	6427	1292	3810	2078	3071	4378	3500	5709	2388	3955	2246	1810	4631	3553
Selkirk	7	2652	2666	2850	1738	5626	3794	2219	975	3187	3361	2348	2547	1813	1280	1858	1534	4631	3278
Triple Dirk	8	3263	2886	3877	2742	4809	-87	235	596	3290	3068	1662	4676	1878	3631	2575	2201	4534	3524
Giza 144	9	3479	2703	3246	2345	5701	522	1463	1115	3775	3570	2122	3410	2041	2749	2381	2264	4631	3477
Sonora 64	10	3697	3183	4949	2135	5460	197	321	1026	3594	5361	2376	6039	1518	3272	2534	1262	4631	3407
Nariño 59	11	3111	3061	3902	2354	7227	3020	1894	2745	5068	4357	3264	3499	2101	3448	2353	1106	4631	3266
Carazinho	12	3092	2812	3214	1947	5496	1253	1354	568	3378	2826	2299	4020	2144	2767	2444	2435	4631	3636
C-518	13	3259	2490	3659	2007	5209	1806	1645	1032	4974	4878	1312	4000	1933	1326	1092	2195	4437	3389
C-273	14	3246	2614	3220	2432	4939	2693	3133	1435	4464	4754	2786	4441	2039	2616	1440	2010	4459	3647
Justin	15	2872	2227	2973	1837	5032	2403	958	178	3208	3030	2221	3318	1949	1063	2020	889	4534	3254
Napo 63	16	3150	2758	3872	2222	6281	5699	3929	2983	5172	5070	2994	4414	2121	3682	2531	1842	3945	3260
Klein Rendidor	17	3305	2080	3128	1915	6340	1331	632	1/	2413	2496	1/	3439	1/	3464	1/	2284	4631	3307
Bonza 55	18	2956	2559	3718	1967	7146	3813	2481	686	4267	4083	2718	3987	1364	3254	2037	1945	4631	3348
Nainari 60	19	3488	3271	4011	2612	6528	1448	2989	1159	3134	3858	2943	3915	1791	4127	1978	2511	4631	3501
Gabo	20	3058	2637	4649	2377	4903	417	1040	705	3190	3827	1564	4564	1114	3596	2390	2256	4631	3465
Gaboto	21	3106	2610	3310	2197	5909	2111	1106	229	4217	2538	2283	3617	2250	2687	2098	1714	4631	3025
Crim	22	3096	2801	3581	2398	5280	470	-234	582	3819	3758	3297	3035	1939	3001	2186	1846	4631	3184
Thatcher	23	2166	1879	2450	1480	4328	553	530	221	2954	2485	1225	2718	1581	1332	1704	1127	2984	2914
Pj sib x Gb55(white g.)	24	3480	2670	4370	2175	5132	725	2179	877	3366	3857	3303	5030	2191	3366	2050	1682	4340	3254
CT-244	25	3271	2943	3104	1976	5830	1447	1967	664	3622	3366	2356	2595	1558	2289	2158	1727	4631	3284
Number of "independent" variables used		7	9	7	10	6	10	10	11	5	6	8	7	6	9	7	4	1	2

1/ No data available

TABLE 69. (continued)

Variety or cross	Variety No.	SAUDI ARABIA Kharj	JORDAN Deir Alla	SYRIA Kjarabo	LEBANON Beirut	TURKEY Eskisehir	RUMANIA Brasov	IRAQ Baghdad	IRAN Ahwaz	PAKISTAN Tando-jam	PAKISTAN Lyallpur	PAKISTAN Tarnab	INDIA Pusa (Bihar)	INDIA New Pusa (Delhi)	INDIA Lud-hiana	AUSTRALIA Wagga Wagga	AUSTRALIA Waite	Mean (34 locations)
Magnif 41	1	3217	3273	3565	1938	2581	2878	1683	2194	3346	2748	3075	2274	3202	4207	1744	1025	2936.94
Pitic 62	2	2573	3658	4094	1789	3181	2682	1606	1945	3877	3798	3397	1818	2490	3387	2042	1017	2924.65
C-271	3	3364	3975	4311	1998	2856	1447	2238	2471	2394	3646	2921	2261	3856	4149	2203	840	2871.56
Lerma Rojo 64A	4	2810	3702	4025	1789	2891	1870	1891	2105	3846	3754	3801	2538	3567	4055	2139	890	3130.76
Giza 150	5	2811	2827	4035	1780	1873	1853	2095	1773	3228	2416	1703	2640	3260	3318	2160	1023	2643.06
Penjamo 62	6	2565	3825	4578	2066	2893	2234	1810	2116	3328	3742	3418	2269	3548	4272	2110	987	3198.71
Selkirk	7	2935	3532	3209	1448	2555	2568	898	1765	461	1591	1272	1576	2337	1829	1636	643	2319.76
Triple Dirk	8	3795	3525	4291	1755	2496	2197	1888	2970	2578	2640	2425	2722	4125	3451	1788	869	2731.62
Giza 144	9	3087	3323	3741	1640	1661	2524	1861	2119	3127	2415	1735	2724	3663	3187	1833	843	2661.09
Sonora 64	10	2071	3209	4174	1610	2243	1760	2177	1848	2726	4505	4151	1825	3625	5549	2334	1054	2935.97
Nariño 59	11	2696	1980	3404	1763	2420	1861	1505	2180	1657	3053	3041	2177	3433	3993	1949	1006	2897.79
Carazinho	12	3536	3207	3594	1737	2561	2097	1641	2166	2343	2461	2571	2196	3375	2919	1770	763	2625.09
C-518	13	3190	3367	4423	1396	2073	1382	1764	2067	1939	2937	2989	2080	3644	3691	2190	962	2668.74
C-273	14	3382	3215	4193	1676	1656	1653	1984	1984	2296	2758	3115	2494	3933	3791	2022	1044	2869.82
Justin	15	2410	2854	2818	1456	2349	2464	847	1485	531	2052	2222	1487	1914	1983	1743	364	2147.21
Napo 63	16	2861	2019	3836	2149	2493	1786	1568	2126	3526	3176	3373	2126	3683	4368	1996	1100	3179.74
Klein Rendidor	17	3203	3605	4039	2018	2842	2584	1582	2093	839	3511	2756	3019	2702	2911	1970	537	2699.20
Bonza 55	18	1/	2818	3410	1725	2909	2448	1867	1878	3122	2562	3080	2435	2779	3463	1886	903	2855.91
Nainari 60	19	3337	3609	4293	1930	2788	2432	2036	2154	3412	2828	3043	2534	3356	3537	2085	898	3004.91
Gabo	20	3308	2879	4326	2126	2535	1870	1463	2739	3525	2471	2109	2585	3067	3782	2057	1019	2713.06
Gaboto	21	2515	2832	3004	1814	2496	2201	1133	1603	2761	2491	3078	2189	2260	2980	1800	753	2539.65
Crim	22	3270	2329	3858	1977	1927	2583	1327	1946	2277	2443	1962	2273	3106	2888	1707	890	2512.74
Thatcher	23	2254	3352	2799	1448	2029	1096	865	1367	1085	1113	1305	921	1452	1927	1627	459	1756.76
PjLibxGb55(white)	24	2540	2796	4083	1797	2625	2172	1394	2473	4144	3364	3636	1897	3856	3780	2149	1045	2876.56
CT-244	25	2805	3050	3353	1755	1846	2045	1268	1702	2367	1542	1677	1759	2106	1860	1730	796	2366.15
Number of "independent" variables used		5	8	11	3	12	11	5	8	8	8	5	6	1	3	4	6	

1/ No data available.

TABLE 70. The differences (kg/ha) between observed and calculated yields (observed-calculated) for the 25 varieties in the "1st International Spring Wheat Yield Nursery" 1964-65.

Variety or cross	Variety No.	Castelar	Marcos Juarez	Pergamino	Paraná	Santiago	ECUADOR Quito	COLOMBIA Tibaitatá	GUATEMALA Quezaltenango	MEXICO CIAB	MEXICO CIAB	MEXICO Chapingo	U.S.A. Davis, Calif.	U.S.A. St. Paul, Minn.	SOUTH AFRICA Stellenbosch	ETHIOPIA Debre zeit	SUDAN Ed-Damer	LIBYA Tripoli	CYPRUS Prastio
Magnif 41	1	-273	-186	-1041	-75	-940	-480	-440	-157	-479	803	-76	339	-108	-267	-284	-249	-967	-642
Pitic 62	2	971	339	831	422	308	-45	-587	158	2406	366	-246	690	586	194	-51	425	1880	1288
C-271	3	-322	241	-531	-119	-799	354	-532	226	52	633	-691	42	-388	231	-272	326	1118	-853
Lerma Rojo 64A	4	-259	-199	-716	39	957	-24	100	214	-704	-178	-45	-331	704	-775	-179	542	1132	731
Giza 150	5	-479	3	-372	104	326	-302	-142	-313	506	22	11	42	-942	813	-643	496	961	461
Penjamo 62	6	-42	308	-232	-352	-99	-1	[illegible]	-149	411	338	138	231	186	382	168	-215	465	563
Selkirk	7	-286	-559	-318	-98	-448	-1686	-6[illegible]	-95	-854	-162	71	-648	-217	-199	-268	-151	-1062	-761
Triple Dirk	8	-81	-36	105	-18	-260	283	-73	42	-1132	-144	-71	-93	258	-269	310	-338	204	-33
Giza 144	9	145	-3	203	-96	744	1	-339	-328	-34	479	-282	-394	-188	164	-707	-93	834	-73
Sonora 64	10	-648	-350	300	15	-628	-75	-80	-276	-1012	-820	-18	18	465	-142	-209	76	-1061	859
Nariño 59	11	446	71	56	-46	-612	796	-212	-10	506	-608	582	-233	145	-198	53	-409	-432	-728
Carazinho	12	149	246	521	211	587	-840	58	-143	-1029	131	-265	262	-83	154	-54	-1094	-170	-359
C-518	13	-284	-458	-1018	-191	6	-275	116	-440	-309	-29	-139	-943	-797	228	-209	380	42	187
C-273	14	53	-282	-4	-66	498	-1211	-217	117	394	-430	-290	-875	-500	-673	-185	120	-591	-747
Justin	15	-389	-36	-598	-113	213	1700	-171	96	-452	-456	204	890	233	-259	-208	57	-2255	-325
Napo 63	16	358	166	910	-73	605	438	353	109	-108	279	2	-157	-255	-702	95	-837	710	38
Klein Rendidor	17	19	-39	546	-57	-86	-377	-3	1/	61	-180	1/	18	1/	-459	1/	488	-428	-1324
Bonza 55	18	27	-151	123	-201	-477	39	-28	51	982	208	27	-4	-92	-94	-109	26	-129	-157
Nainari 60	19	245	-155	605	387	896	758	806	552	965	224	659	400	1133	41	890	102	1414	829
Gabo	20	133	87	-416	-28	-595	-77	426	4	-574	-45	-38	-6	10	342	401	-2	818	565
Gaboto	21	251	440	356	261	-351	726	797	315	-168	836	-3	-526	-29	211	-50	-163	-215	-11
Crim	22	20	398	-123	-257	248	-389	467	256	-70	-917	-406	1180	132	-313	292	-111	-824	-369
Thatcher	23	-167	-213	-108	-30	-221	375	11	-118	54	-386	641	-469	-168	-58	204	111	-818	-526
Pj sib x Gb55(white g.)	24	211	313	587	41	51	-165	529	138	34	251	177	319	-228	1816	945	-53	1449	1267
CT-244	25	203	57	354	340	77	473	-368	-248	244	-217	-33	246	143	-166	69	565	-2076	121
Number of "independent" variables used		7	9	7	10	6	10	10	11	5	6	8	7	6	9	7	4	1	2

1/ No data available

TABLE 70. (continued)

Variety or cross	Variety No.	SAUDI ARABIA Kharj	JORDAN Deir Alla	SYRIA Kjarabo	LEBANON Beirut	TURKEY Eskisehir	RUMANIA Brasov	IRAQ Baghdad	IRAN Ahwaz	PAKISTAN Tandojam	PAKISTAN Lyallpur	PAKISTAN Tarnab	INDIA Pusa (Bihar)	INDIA New Pusa (Delhi)	INDIA Ludhiana	AUSTRALIA Wagga Wagga	AUSTRALIA Waite	Mean (34 locations)
Magnif 41	1	-1126	-569	-380	-133	-540	20	-117	-537	-84	-26	-830	-441	-9	314	-419	-269	-313.76
Pitic 62	2	817	723	843	391	452	744	397	538	839	-315	385	598	2019	1489	421	361	601.09
C-271	3	902	-443	-90	-299	-674	-270	-122	-30	-125	-322	-297	-262	-649	-1005	-140	-154	-152.18
Lerma Rojo 64 A	4	56	109	191	137	408	195	121	236	-63	395	218	-372	799	900	-47	-127	122.50
Giza 150	5	305	272	209	-215	18	-96	266	327	248	-263	-49	-182	-580	-1291	-117	-121	-21.15
Penjamo 62	6	1301	-21	65	-101	102	323	35	-350	622	121	1216	-20	793	960	33	72	218.71
Selkirk	7	-1079	51	-738	-127	-531	109	502	-265	438	55	-137	-160	8	-329	-350	-102	-325.09
Triple Dirk	8	-229	382	139	449	-122	-13	53	-37	377	495	861	319	-788	1270	434	488	80.50
Giza 144	9	-363	-432	542	-370	-87	-471	26	-37	-6	54	228	109	-1152	-321	-42	46	-65.97
Sonora 64	10	-814	-764	-589	400	48	-77	-219	-599	-550	-548	-131	341	1196	-1505	-87	86	-217.59
Nariño 59	11	-1339	28	53	226	42	126	-339	119	802	-520	-62	-844	-502	239	-290	-215	-97.32
Carazinho	12	230	5	-440	-277	47	136	-88	-283	141	261	550	554	-217	519	337	-139	-11.82
C-518	13	1926	57	-321	-347	151	-566	90	566	-1	263	-294	3	-534	-425	-420	-74	-136.44
C-273	14	-25	-266	-260	-235	260	-294	-289	-735	-404	92	-255	89	-835	-181	-205	58	-246.00
Justin	15	-178	-417	-229	214	200	-551	-360	-194	177	-1199	-331	-238	-969	-339	-8	122	-181.44
Napo 63	16	-812	-70	619	208	323	263	-285	-201	-1210	370	-394	-210	564	87	82	141	41.41
Klein Rendidor	17	287	-136	-285	-436	-601	-367	168	-68	36	-92	862	-187	-226	782	-92	-71	-74.90
Bonza 55	18	1/	-77	445	-213	170	-89	41	321	-805	-409	-455	398	-315	-158	88	-134	-34.88
Nainari 60	19	233	232	290	375	595	201	-20	146	87	211	172	-535	580	685	76	87	416.65
Gabo	20	-942	120	-691	68	-748	-33	290	77	258	-2	-500	373	437	-1616	156	-18	-51.94
Gaboto	21	-390	176	159	-240	321	21	-34	-28	-349	137	-713	-23	349	519	1	-76	73.74
Crim	22	-688	-80	-217	52	-57	-169	222	112	-386	27	-355	-23	17	411	179	-68	-53.21
Thatcher	23	95	480	115	234	-37	515	-262	215	-494	-38	-28	-463	-723	-1206	193	80	-104.26
Pj sib x Gb55(white g.)	24	655	711	372	373	316	42	175	434	773	975	-65	602	667	619	460	30	444.94
CT-244	25	1177	-72	199	-131	278	290	-252	273	-121	279	403	574	71	-416	145	-5	72.82
Number of "independent" variables used		5	8	11	3	12	11	5	8	8	8	5	6	1	3	4	6	

1/ No data available