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Results of the Thirteenth International Winter Wheat Performance Nursery Grown in 1981

S. L. Kuhr

C. J. Peterson

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by
S. L. Kuhr
C. J. Peterson
V. A. Johnson
P. J. Mattern
J. W. Schmidt

North Central Region
Agricultural Research Service
U.S. Department of Agriculture
The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Irvin T. Omtvedt, Director

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We would like to thank the nursery collaborators for the 1981 International Winter Wheat Performance Nursery. Their responsibilities for nursery management, data recording, harvesting, and return of data to Nebraska are gratefully acknowledged.

The cooperation of Stephen Johnson, Nebraska state entomologist, and the United States Animal and Plant Health Inspection Service (APHIS) for field and grain inspections before international shipments is acknowledged. We again thank the wheat personnel of CIMMYT for their continued assistance and cooperation.

The efforts of Joyce Kovar and the University of Nebraska Wheat Quality Laboratory staff are acknowledged. Appreciation also is expressed to Janet Whitehead for her help in preparing this report.

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DATA MANAGEMENT

Results presented in this report are based on data provided by cooperators throughout the world. We report the data as received and hope that we have kept transcription errors to a minimum. Where questions about data have arisen, cooperators were contacted for clarification. We hope that, by this procedure, we have detected questionable or incorrect data before publication.

SUMMARY

Replicated nurseries of the Thirteenth International Winter Wheat Performance Nursery (IWWPN) were sent to cooperators at 65 locations in 37 countries in July of 1980. In addition, unreplicated nurseries were provided to 39 agronomists in 21 countries for observation purposes. Replicated performance data were reported from 55 of the 65 nursery sites.

The nursery consisted of 30 wheat varieties. Thirteen winter wheats were included for a first year of testing in 1981. Seventeen wheats,

including four check varieties, were repeated from the 1980 nursery.

Data are reported on grain yield, test weight, 1000-kernel weight, grain protein and lysine content, plant height, lodging, winter survival, frost damage, maturity, shattering, plant diseases, and all other traits recorded by cooperators. Supplemental nursery management information is reported for each nursery site adjacent to the table of data from the site. Statistical analyses over locations and corresponding summary data are presented by trait for each cultivar tested in 1981. Two-year means and analyses for 17 cultivars tested in 1980 and 1981 also are reported.

The yield mean of all varieties averaged over 44 sites was 41.5 q/ha in 1981. This compares with 40.5 q/ha over 49 sites in 1980 and 39.0 q/ha over 49 sites in 1979. The relative performance of Bezostaya 1, the long-term check variety, was down significantly in the 1980 nursery. Sixteen cultivars had overall yield means greater than the yield mean of Bezostaya 1 in 1980. In 1981 only seven cultivars averaged higher grain yield than Bezostaya 1. Jugoslavija, the highest yielding cultivar, averaged 53.2 q/ha over 44 sites. This was 10.1% above the yield of Bezostaya 1. Jugoslavija ranked first in yield at 6 sites, and among the 10 highest yields at 34 sites. Seventeen cultivars did not rank first in yield at any of the 44 sites.

Individual nursery yield means ranged from only 1.2 q/ha at Jokioinen, Finland, to 77.4 q/ha at Billings, Montana, U.S.A. Eleven sites produced nursery yield means that were less than 20 q/ha. Eighteen sites had nursery means ranging from 20 to 40 q/ha while 17 sites had yields between 40 and 60 q/ha. Seven sites had nursery means in excess of 60 q/ha. Data from 9 of the 53 sites reporting yield were withheld from the statistical analyses over locations.

The two-year grand mean of 17 cultivars grown in 1980 and 1981 was 42.3 q/ha over 38 sites. TAM W-105 had the highest two-year mean of 50.6 q/ha while Irnerio was lowest with 30.4 q/ha. None of the test cultivars was statistically significantly higher yielding than Bezostaya 1 in the two-year period.

Bezostaya 1 had the highest average test weight value (79.9 kg/hl) in 1981, averaged over 17 sites. NE 79Y95097 had the lowest test weight value of 71.1 kg/hl while the overall mean of all entries was 75.4 kg/hl. The two-year average test weight values for TAM W-105 and Bezostaya 1 were 79.7 and 79.6 kg/hl, respectively, averaged over 11 sites. The 17 cultivars tested in 1980 and 1981 averaged 76.6 kg/hl in test weight, and ranged from 74.0 to 79.7 kg/hl.

Balkan had the highest 1000-kernel weight in the 13th IWWPN. Averaged over 23 sites, the mean value for this cultivar was 43.0 grams which was 20.4% greater than the nursery average of 35.7 grams and 56.4% greater than the mean for NE 79Y90576 (27.5 grams). Averaged over 16 sites, the highest two-year mean was 43.3 grams for MV-6.

The highest average grain protein content among the cultivars was 17.5% reported for Atlas 66, the long-term protein check. Its protein average in 1980 was similar, at 17.6%. Five other cultivars had protein contents significantly above the nursery average of 14.8% (averaged over 32 sites). These were Takahe, Kopara, Chokwang, WWP 4394, and Pai yu pao.

Averaged over 28 sites, Jugoslavija produced the highest amount of crude protein per hectare, this being 769.3 kg. All cultivars showed a positive highly significant relationship between grain yield and total protein production. Three cultivars exhibited a significant negative relationship between grain protein content and total protein production.

Averaging over two years, Atlas 66 had a mean protein content of 17.5%. The two-year protein means of Kopara, Huenufen, and WWP 4394 were above 15.0%, while 7 of the 17 cultivars averaged below 14.0%.

Adjusted lysine values ranged from 2.94% (Super X) to 3.20% (NE 79Y95097). The latter is the only cultivar statistically significantly higher than the nursery average of 3.06%. These differences, however, are very small and may not reflect real biological significance due to limitations in the laboratory equipment used in the determinations.

Irnerio was the shortest wheat in the 1981 nursery with a plant height of 66.4 cm averaged over 34 sites. Atlas 66, at 109.1 cm, was the tallest cultivar in the nursery. The average height of all varieties was 85.4 cm. Ten cultivars averaged less than 80 cm in height, while three exceeded 100 cm. Twenty-two sites recorded plant height data in both 1980 and 1981. Irnerio was about 23 cm shorter than the nursery average of 91.1 cm. Other than Atlas 66, Aura and Jana each averaged more than 100 cm in height.

Maris Mardler and Bounty, thick strawed short wheats from England, had the least amount of lodging as reported from 13 sites. The highest amount of lodging occurred in Atlas 66 and TX 71A562-6, each with 49.3% compared with the nursery mean of 18.8%. These two also had the highest incidence of lodging in the two-year analysis.

In 1980, Hachiman-komugi (from Japan) was the earliest flowering cultivar in the nursery; in 1981, Chokwang (from Korea) was the earliest. It was almost 9 days earlier than the nursery average of 169.3 days from January 1; Jana, the latest, flowered 9 days later than the nursery average.

In the two-year analysis, Irnerio flowered about 7 days earlier than the nursery average of 175 days (from January 1). Aura and Jana required about 182 days (from January 1) to reach the flowering stage. Date of ripening followed closely the sequence in the flowering data.

Winter hardiness, as measured by percent survival, was recorded

at 24 sites. Aura, MV-6, and Bezostaya 1 had the highest survival values whereas Bastion, Takahe, and Super X were most often harmed by winter conditions. Among the cultivars in the two-year analysis, Houser had the best survival record.

Cultivar differences in frost damage, shattering, disease response, and other traits are reported and discussed.

Results of the Thirteenth International Winter Wheat Performance Nursery Grown in 1981

S. L. Kuhr, C. J. Peterson, V. A. Johnson, P. J. Mattern, and J. W. Schmidt[1]

This is the thirteenth report of results from an International Winter Wheat Performance Nursery (IWWPN) organized in 1968 by the Nebraska Agricultural Experiment Station in cooperation with the Agricultural Research Service (ARS), U. S. Department of Agriculture, under contract number AID/ta-C-1093 with the U. S. International Development Corporation, Agency for International Development. The Nursery was designed to (1) test the adaptation and stability of winter wheat cultivars in a range of latitudes, daylengths, fertility conditions, water management regimes, and disease complexes; (2) identify superior winter cultivars to serve as recipient genotypes for high protein and high lysine genes; (3) test the degree of expression and stability of the high protein and high lysine traits in an array of environments; and (4) provide a vehicle for exchange of wheat germplasm and research cooperation throughout the major winter wheat producing areas of the world.

EXPERIMENTAL PROCEDURE

Wheat seed for nursery planting was provided to each cooperator in the approximate quantity requested. Seed for planting the nursery was shipped from Nebraska via air mail to all sites in early July. Each cooperator has been encouraged to adjust row length and spacing to achieve a seeding rate most compatible with local variety evaluation practices. Nursery size is restricted to 30 entries grown in four replications. However, cooperators are encouraged to add a limited number of local check varieties to the nursery to increase its utility at their locations.

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[1]Research Geneticist, Research Agronomist, and Leader Wheat Research, respectively, U.S. Department of Agriculture, Agricultural Research Service, Lincoln, Nebraska; and Professors, University of Nebraska–Lincoln, Lincoln, Nebraska.

Data field books in duplicate accompanied the seed shipment to each nursery site. Following harvest one completed book was returned to Lincoln, Nebraska, for data compilation and analysis. A 10-gram seed sample from each entry also was returned to Lincoln for protein analysis in the University of Nebraska Wheat Quality Laboratory.

CULTIVARS

Of the 30 cultivars grown in the 1981 IWWPN, 17 were repeated from the 1980 nursery. Cultivars are grown in the nursery for two successive years. Three check cultivars, Bezostaya 1 (U.S.S.R.), Blueboy (U.S.A.), and Atlas 66 (U.S.A.) have been in the nursery from its beginning. The CIMMYT spring wheat cultivar Super X served as an indicator of winter severity and provided comparative performance data on spring versus winter cultivars from plantings at locations with mild winters. Super X was killed by winter conditions at 10 sites, but performed at an above average yield level at 19 sites. Thirteen wheats were evaluated in their first year of testing in 1981. From 1969 to 1981, a total of 163 wheat varieties and one triticale originating from 29 countries have been tested in the IWWPN.

Names, pedigrees, and origins of cultivars in the nursery are given in Table 1.

Some cooperators included local winter cultivars in the IWWPN as additional entries at the end of the replications. The mean performance of these cultivars has been included herein from all sites reporting such data, but they were not included in any of the statistical analyses.

NURSERY SITES

Cooperators at the 65 sites to which seed of the Thirteenth IWWPN was dispatched are listed in Table 2. The nursery was grown at 55 sites in 30 countries. The location of each nursery site with respect to latitude, longitude, and elevation is given in Table 3. Figure 1 shows the distribution of nursery sites on a worldwide basis. The length of growing season for each location is depicted in Figure 2.

The seed shipment to Algiers, Algeria, was returned to Nebraska after a long period in the mail. Eskisehir, Turkey, received the seed at a date too late to plant. The seed shipment to Zagreb, Yugoslavia, also arrived late and was planted in the spring; consequently, only those varieties requiring little vernalization produced normal yields.

Thirty-two of the 55 sites growing the nursery returned 10-gram grain samples of harvested entries to Nebraska for protein analyses. Some sites could not send a sample of each cultivar because of winterkill, diseases, etc.

NURSERY MANAGEMENT

Details of nursery management of each IWWPN location are sum-

Table 1. Cultivars grown in the Thirteenth International Winter Wheat Performance Nursery, 1981.

Name	Origin	Pedigree
Jana	Poland	Halle 834348/Dankowska Biala
Trakia	Bulgaria	Bezostaya 1/Elia//Rousalka
Aura	Finland	Ertus/Vakka
Atlas 66	USA, NC	Frondoso/2/Redhart 3/Noll 28
Houser	USA, NY	Brevor/Norin 10//NY wheat-rye sel./3/Hope-Hussar (CI 11682)/ Yorkwin/4/Genesee//CI 12658/Alaskan/3/Avon
Huenufen	Chile	Noroeste 66/Heine 110
TX 71A562-6	USA, TX	Sturdy Sib/Triumph//Centurk
Blueboy	USA, NC	Norin 10/Brevor//Anderson/Coker 55-9
Kopara	New Zealand	Arawa/Gabo/2/Atson/Selkirk/3/Arawa/Selkirk/2/Aotea/Hilgendorf
Alcedo	East Germany	Poros/Rekord//Carsten VIII
TAM W-105	USA, TX	Short wheat/Scout
Irnerio	Italy	Produttore/Manitoba 2 pacifico
MV-6	Hungary	Bezostaya 1/Moisson
Bezostaya 1	USSR	Lutescens 17/Skorospelka 2
Bastion	Netherlands	H12//H35/Mara (H12 and H35 are unknown)
WWP 4394	Austria	Centurk/Kavkaz
WW 33G (Phoenix)	Australia	Penjamo 62/4* Gabo 56//Tezanos Pintos Precos/Nainari 60/4/2* (Lerma Rojo/Norin 10-Brevor/3/Yaktana 54/Norin 10-Brevor// 3* Andes)
Vega	Bulgaria	301/S13//Rannaya 12/3/NS 314
Loudogorka	Bulgaria	Bezostaya 1/Etoile de Choisy
Pai yu pao	China	Unavailable
Maris Mardler	England	Maris Huntsman/2/Maris Ranger/Durin
Chokwang	Korea	Jaekwang/Norin 72
Takahe	New Zealand	1066-1/Aotea *7/2/A-Federation/Aotea *7
Balkan	Yugoslavia	Backa/Bezostaya 1//Mironovskaya 808/3/NS 438/4/Skorospelka 35
Super X	Mexico	Penjamo 62 "S"-Gabo 55 II 8156
Jugoslavija	Yugoslavia	Bezostaya 1/NS 646//Aurora
Sadovo Super	Bulgaria	Moisson//Yubileina 3/Ppg 186
Bounty	England	Maris Ploughman/Durin
NE 79Y90576	USA, NE	Nap Hal/CR 8156/2/TX 62A4793-7/ NB 66403
NE 79Y95097	USA, NE	NB 68719//Nap Hal/CI 13449

Table 2. Nursery sites and cooperators for the Thirteenth International Winter Wheat Performance Nursery in 1981.

Country	Station	Cooperator(s)
Argentina	Balcarce	Ing. Agr. Ernesto F. Godoy and Ing. Roberto Bedogni
"	Bordenave	Ing. Agr. Ernesto F. Godoy, Ing. Santiago Garbini, and J. R. Lopez
"	Marcos Juarez	Ing. J. Nisi, R. Churin, M. Galich, J. Salines, and C. Bainotti
Austria	Vienna	Drs. R. Hron and H. Foessleitner
Bulgaria	Tolbukhin	Dr. I. Govedarov
Canada	Alberta, Lethbridge	Dr. J. Thomas
"	**Prince Edward Island	Dr. H. G. Nass
Chile	Chillan	Drs. Lilian E. Aguayo and I. Ramirez A.
"	**Temuco	Drs. Ignacio Ramirez A. and Juan Acevedo
Czechoslovakia	Male Ripnany	Ing. D. Michalik and V. Probsa
"	Sedlec	Ing. J. Schmidt, Ing. J. Maly, and Augustina Vernerova
East Germany	Böhnshausen	Dr. A. Meinel
England	**Cambridge	Dr. F. G. H. Lupton and Mr. R. H. Oliver
Finland	Jokioinen	Dr. Rolf Manner
France	Orgerus	Dr. J. P. Hardouin
Hungary	Martonvasar	Drs. L. Balla and S. Rajki
"	Szeged	Dr. I. Szaniel
Iran	**Hamaden	Dr. H. Kaveh and Mr. M. R. Eslampour
"	Karaj	Dr. H. Kaveh and N. Banisadr
Iraq	**Sulaimaniya	Dr. Y. Y. Klaimi and Mr. A. Alaka
Italy	Milano	Dr. Basilio Borghi
"	Rieti	Drs. G. Zitelli and E. Biancolatte
Japan	Morioka Iwate	Drs. T. Gotoh and Y. Taniguchi
Jordan	**Amman	Mr. Zulkifl Ghosheh
Korea	Suwon	Dr. Chang Hwan Cho and Mr. D. J. Maeng
Lebanon	Beirut	Dr. A. Alameddine, A. Chaaban, and M. Chehade
Mexico	Toluca	Bread Wheat Program - CIMMYT
Nepal	**Kathmandu	Dr. P. S. Rana, L. D. Pant, and K. M. S. Basnet
The Netherlands	Wageningen	Dr. A. C. Zeven
Norway	Vollebekk	Dr. Helge Skinnes
Pakistan	**Islamabad	Deputy Director of Research, A.R.C.
Peru	**Lima	Dr. Marino Romero
Poland	Przeclaw	Dr. E. Bilski
"	Warsaw	Dr. S. Starzycki
Romania	Fundulea	Drs. G. H. Ittu, N. N. Saulescu, and N. Ceapoiu
South Africa	*Bethlehem	Drs. R. Britz and K. W. Pakendorf
Spain	Alcala de Henares	Dr. J. Salazar and M. Brañas
"	Zaragoza	Ing. J. Comenge
Sweden	Svalof	Dr. Bo Kristiansson
Switzerland	Zurich	Dr. F. Weilenmann
Syria	Aleppo	ICARDA and CIMMYT Bread Wheat Staff
Turkey	Ankara	Dr. M. Kiziltan, K. Yakar, G. Mizrak, N. Zencirci, and I. Tutluer
"	Erzurum	Drs. C. Köycü and A. S. Kiral
"	Eskisehir	Dr. M. K. Haksel, B. Suzen, and T. Cetinel
USA	Davis, CA	Dr. C. O. Qualset, H. E. Vogt, P. K. Zwer, and L. C. Larson
"	Akron, CO	Drs. J. Quick, G. H. Ellis, and R. Normann
"	Fort Collins, CO	Drs. J. Quick, G. H. Ellis, and R. Normann
"	Brookston, IN	Dr. K. E. Miskin and J. E. Grogan
"	Hutchinson, KS	Drs. E. G. Heyne and G. Paulsen
"	Billings, MT	Mr. J. Lenneman and Mr. S. Scherer
"	Lincoln, NE	Drs. V. A. Johnson, S. L. Kuhr, and J. W. Schmidt
"	Ithaca, NY	Dr. M. E. Sorrells
"	Rowan Co., NC	Dr. C. F. Murphy
"	Stillwater, OK	Dr. E. L. Smith
"	Corvallis, OR	Drs. W. E. Kronstad, W. L. McCuistion, F. A. Cholick, and N. H. Scott
"	Lancaster Co., PA	Drs. M. L. Risius, H. G. Marshall, and J. A. Frank
"	Pullman, WA	Drs. C. J. Peterson, Jr. and R. E. Allan
USSR	Krasnodar	Dr. Y. M. Puchkov
"	Mironovski	Dr. V. N. Remeslo
"	Odessa	Dr. L. K. Sechnjak
West Germany	Monsheim	Dr. K. Brunckhorst and F. Bonne
"	Weihenstephan	Dr. G. Fischbeck
Yugoslavia	Novi Sad	Dr. S. Borojevic
"	Zagreb	Dr. J. Potocanac and R. Mlinar

* Two sets of seed were distributed for different planting dates.
** Data were not received from these sites.

Table 3. Latitude, longitude, and elevation of nursery sites where the Thirteenth International Winter Wheat Performance Nursery was grown in 1981.

Country	Station	Latitude	Longitude	Elevation (m)
Argentina	Balcarce	S37° 45'	W 58° 15'	130
"	Bordenave	S37° 51'	W 63° 01'	212
"	Marcos Juarez	S32° 42'	W 62° 01'	110
Austria	Vienna	N48° 12'	E 16° 45'	147
Bulgaria	Tolbukhin	N43° 40'	E 28° 10'	236
Canada	Alberta, Lethbridge	N49° 43'	W112° 48'	909
Chile	Chillan	S36° 31'	W 71° 55'	217
Czechoslovakia	Male Ripnany	N48° 29'	E 17° 59'	172
"	Sedlec	N50° 14'	E 14° 30'	300
East Germany	Böhnshausen	N51° 42'	E 11° 00'	202
Finland	Jokioinen	N60° 49'	E 23° 29'	92
France	Orgerus	N48° 50'	E 01° 43'	101
Hungary	Martonvasar	N47° 21'	E 18° 49'	150
"	Szeged	N46° 0'	E 20° 0'	80
Iran	Karaj	N50° 35'	E 58° 50'	1300
Italy	Milano	N45° 13'	E 09° 05'	70
"	Rieti	N42° 24'	E 12° 24'	402
Japan	Morioka Iwate	N39° 45'	E141° 08'	167
Korea	Suwon	N36° 19'	E126° 59'	37
Lebanon	Beirut	N33° 55'	E 35° 28'	950
Mexico	Toluca	N19° 16'	W 99° 51'	2640
The Netherlands	Wageningen	N51° 28'	E 05° 38'	7
Norway	Vollebekk	N60° 00'	E 11° 00'	90
Poland	Przeclaw	N50° 11'	E 21° 29'	185
"	Warsaw	N52° 12'	E 29° 39'	90
Romania	Fundulea	N44° 03'	E 24° 10'	66
South Africa	Bethlehem	S28° 10'	E 28° 18'	1631
Spain	Alcala de Henares	N40° 31'	W 03° 19'	673
"	Zaragoza	N41° 41'	W 02° 50'	208
Sweden	Svalof	N55° 35'	E 13° 06'	50
Switzerland	Zurich	N47° 29'	E 08° 32'	445
Syria	Aleppo	N36° 05'	E 36° 55'	283
Turkey	Ankara	N39° 40'	E 32° 40'	1050
Turkey	Erzurum	N39° 58'	E 41° 20'	1870
"	Eskisehir	N36° 45'	E 30° 55'	789
USA	Davis, CA	N38° 32'	W121° 46'	18
"	Akron, CO	N40° 10'	W103° 20'	1420
"	Fort Collins, CO	N40° 35'	W105° 10'	1475
"	Brookston, IN	N40° 25'	W 86° 56'	180
"	Hutchinson, KS	N38° 00'	W 98° 00'	468
"	Billings, MT	N46° 00'	W108° 00'	923
"	Lincoln, NE	N40° 50'	W 96° 40'	360
"	Ithaca, NY	N42° 30'	W 76° 30'	335
"	Rowan Co., NC	N35° 42'	W 80° 37'	251
USA	Stillwater, OK	N36° 07'	W 97° 04'	270
"	Corvallis, OR	N44° 30'	W123° 30'	68
"	Lancaster Co., PA	N40° 01'	W 76° 16'	--
"	Pullman, WA	N46° 42'	W117° 08'	760
USSR	Krasnodar	N45° 00'	E 38° 55'	37
"	Mironovski	N50° 15'	E 31° 10'	151
"	Odessa	N46° 00'	E 31° 00'	42
West Germany	Monsheim	N49° 35'	E 08° 20'	160
"	Weihenstephan	N48° 24'	E 11° 44'	467
Yugoslavia	Novi Sad	N45° 30'	E 19° 48'	84
"	Zagreb	N45° 49'	E 15° 59'	177

FIGURE 1

13th INTERNATIONAL WINTER WHEAT PERFORMANCE NURSERY

65 SITES : 37 COUNTRIES

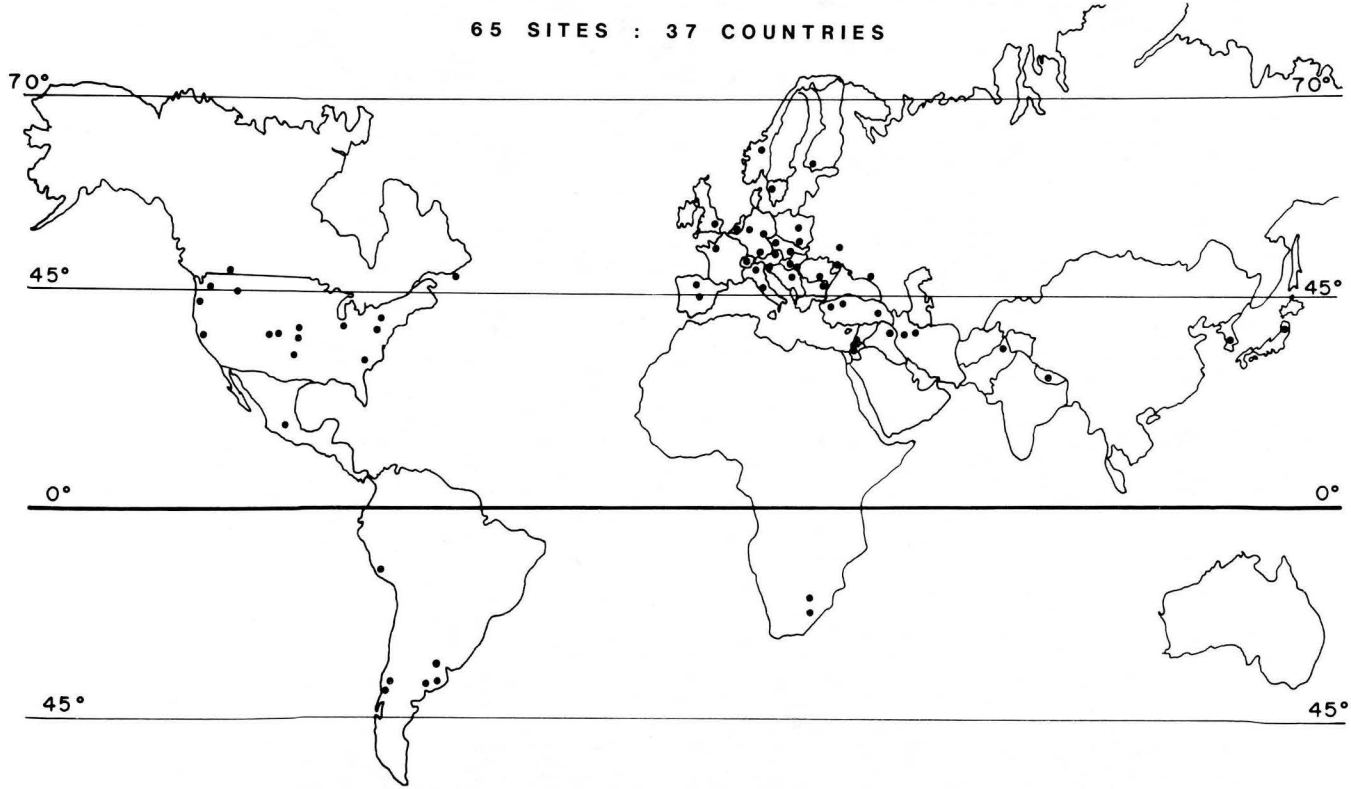
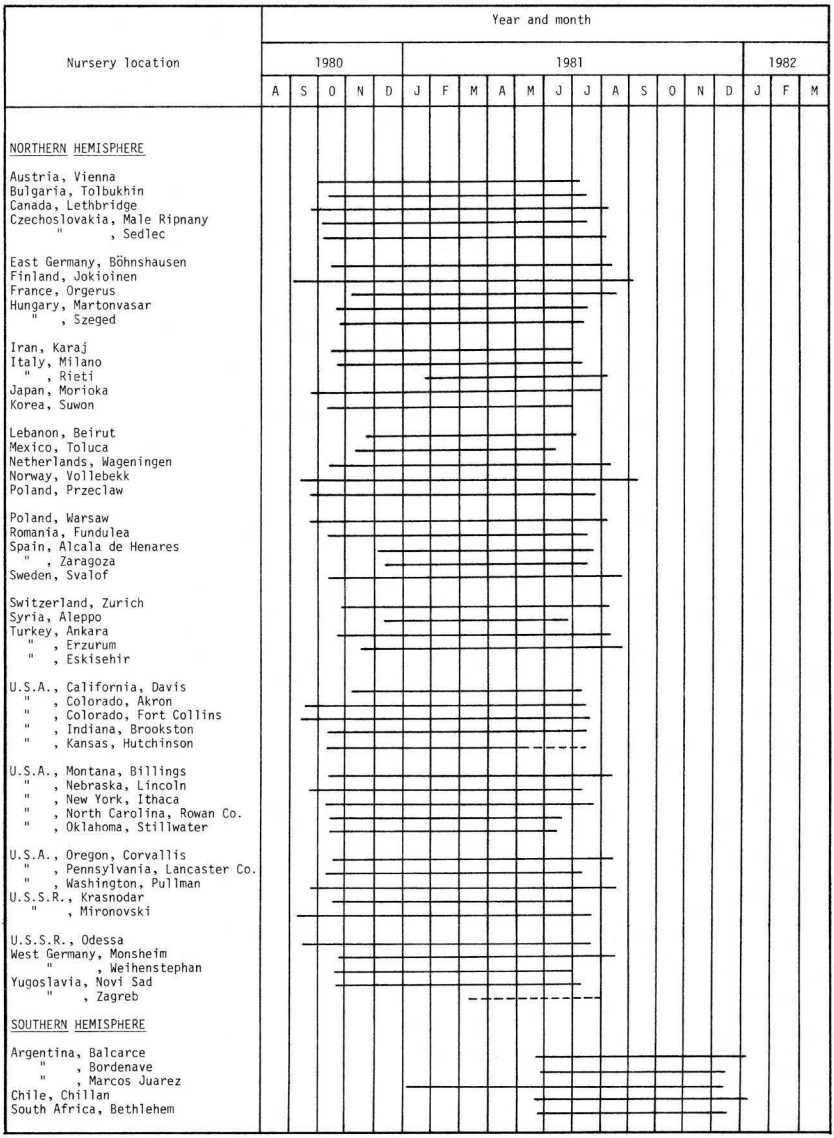


Figure 2. Length of growing season for nursery sites in the Thirteenth International Winter Wheat Performance Nursery in 1981.



marized and reported on the page preceding the table of nursery data. This information is general and includes dates of planting and harvest, precipitation, irrigation, fertilization, disease development, pest problems, plot size harvested for yield, and a general description of production conditions.

Precipitation data for the growing cycle were reported from 45 locations. Precipitation ranged from a low of 175 mm at Toluca, Mexico, to a high of 1804 mm at Morioka, Iwate, Japan. Twenty-four sites reported precipitation amounts between 0 and 500 mm; 20 sites between 501 and 1000 mm. Only Japan measured precipitation in excess of 1000 mm in 1981 compared with four sites in 1980. Irrigation water was applied at eight sites.

Yield performances for each variety were compared with reported location precipitation amounts. None of the correlation coefficients was statistically significant. Disease development, winter-killing, and other environmental factors affected yield values such that a direct relationship between yield and precipitation was not shown.

Fertilizer was applied to most of the nurseries. Nitrogen, phosphorus, and potassium rates are tabulated below.

Element	Number of sites	Amount used (kg/ha)		
		Range	Mean	S.D.
Nitrogen	50	9-224	94.6	48.1
Phosphorus	42	11-200	77.3	41.6
Potassium	30	6-220	90.9	54.2

Diseases reported included (stem rust) *Puccinia graminis tritici,* (leaf rust) *Puccinia recondita,* (yellow rust or stripe rust) *Puccinia striiformis,* (powdery mildew) *Erysiphe* sp., *Septoria* sp., *Helminthosporium* sp., Barley Yellow Dwarf Virus (B.Y.D.V.), and Soil Borne Mosaic Virus (S.B.M.V.). Other hazards or problems identified by cooperators included weeds, birds, and insects. Descriptions of these problems are reported with the individual nursery site information.

DATA SUMMARIZATION AND STATISTICAL TREATMENT

Data were reported by cooperators and the Nebraska Wheat Quality Laboratory as follows:

Grain yield: Weight of clean grain produced by the central harvested rows of each plot. Unit of measurement = grams, which were converted to quintals per hectare.

Test weight: Volume-weight of clean grain. Unit of measurement = kilograms per hectoliter.

1000-kernel weight: Weight of one-thousand kernels selected at random from clean grain. Unit of measurement = grams.

Grain protein: Seed samples received from cooperators were ana-

lyzed for protein by the Kjeldahl method. Unit of measurement = percent on a dry weight basis. The samples were composited by entry before analyses. Consequently, only one replication is reported for each site.

Maturity: Date of flowering = date of anther extrusion from 1/3 of the spikes in a plot. Date of ripening = date of physiological maturity. Unit of measurement = days from January 1.

Plant height: Average height of plants excluding awns. Unit of measurement = centimeters.

Lodging: Estimated portion of a plot with lodged or down straw at maturity. Unit of measurement = percent.

Shattering: Estimated portion of grain lost from spikes in the standing border rows of a plot two weeks after harvest of the yield rows. Unit of measurement = percent.

Winter survival: Estimated portion of live plants in each plot in the spring. Unit of measurement = percent.

Frost damage: Estimated amount of flower sterility in a plot resulting from spring frosts. Unit of measurement = (0-9) scale.

Diseases: Severity of the infection and response of cultivars according to the modified Cobb scale for stripe rust (*Puccinia striiformis,* West.), leaf rust (*Puccinia recondita,* Rob. ex. Desm.), and stem rust (*Puccinia graminis tritici,* Eriks. and Henn.). For most other diseases only severity of infection was reported.

Analyses of variance were completed on all traits for which data were reported from two or more replications at a nursery site. Means, coefficients of variation, and least significant differences (L.S.D.) for independent mean comparisons were reported for analyzable traits as a part of the individual nursery site data. For those locations reporting data for local cultivars not included in the IWWPN, mean values for each trait are reported. Correlation coefficients among traits at a site are reported on the nursery information sheets adjacent to the individual location data results.

A combined analysis for each trait over locations in the Thirteenth IWWPN having full complements of data was performed on yield, test weight, 1000-kernel weight, grain protein, days to flowering and ripening, plant height, lodging, shattering, winter survival, and frost damage. The number of locations included in each analysis varied depending on the trait involved, but ranged from a low of 5 locations for shattering to a high of 44 sites for yield. Correlation coefficients among all traits over 48 sites were computed and are reported.

Two-year means for each trait have been computed and ranked for each of 17 varieties at each of those locations reporting complete data in both years (1980 and 1981). Individual cultivar means also have been calculated by trait for each variety over all locations. Least significant differences (L.S.D.) and coefficients of variation are reported for the various traits analyzed.

RESULTS AND DISCUSSION

Yield and other agronomic, grain quality, and disease data are reported for individual Thirteenth International Winter Wheat Performance Nursery sites in Tables 4-64. Supplemental nursery management information is given on the page immediately preceding the table of data for each site.

Fifty-three nursery sites reported replicated yield data in 1981. In addition, yield data were received from observation nurseries at five sites. Yield data from nine sites were not utilized in the analyses over locations because of severe winterkilling, erratic growth, pest damage, etc.

Summary tabulations of average yields and yield rankings from all nursery sites are reported in Table 65. Summaries of other agronomic traits and grain quality measurements for each cultivar combined over nursery sites reporting at least three replications of data are presented in Table 67.

The highest average yield in 1981 was reported for Jugoslavija (NS 2699) with 53.2 q/ha over 44 sites. This yield was 10.1% higher than the yield of Bezostaya 1 which produced 48.3 q/ha of grain. The average yields reported for Bezostaya 1 in 1979 and 1980 were 42.4, and 39.2 q/ha, respectively. Twelve cultivars were significantly more productive than Bezostaya 1 in 1980, while only Jugoslavija was significantly higher yielding than Bezostaya 1 in 1981. The nursery mean over 44 sites was 41.5 q/ha in 1981 compared with 40.5 q/ha in 1980. The production figures may reflect improved climatic conditions among the sites or merely the omission of more sites from the overall analysis of variance.

It might be noted also that WWP 4394 did not perform as well in 1981 as in 1980. In 1980 this variety ranked highest in yield with an average value of 49.1 q/ha (25.3% above Bezostaya 1) whereas in 1981 it ranked 14th and averaged 44.2 q/ha (9.3% less than Bezostaya 1).

Germination of seeds used for planting the nurseries is tested before packaging for shipment, and poor germination was not apparent in WWP 4394 so it is uncertain why it performed differently in 1981 than in 1980. The same must be said for Bezostaya 1 in 1980.

Other varieties yielding more than Bezostaya 1 on the average in 1981 were Sadovo Super, Balkan (NS 2630-1), Martonvasari 6, TAM W-105, Loudogorka, and Phoenix (WW 33G). Phoenix is a photoperiod insensitive winter wheat derived largely from spring wheat parents (Table 1). It possesses a very low vernalization requirement, but in this nursery demonstrated good winter survival and productivity.

Nursery yield means were very low at Balcarce, Argentina (7.9 q/ha); Jokioinen, Finland (1.2 q/ha); and Madrid, Spain (4.8 q/ha). Extreme cold killed most of the wheat plants in the nursery in Finland, while drought conditions existed at the other two sites. Even though the total precipitation amounts at Balcarce appear to be adequate, the

distribution was such that most of the growing season was dry.

Average nursery yields in excess of 60 q/ha were reported for Warsaw, Poland; Fort Collins, Colorado, USA; Billings, Montana, USA; Odessa, USSR; Monsheim, West Germany; and Weihenstephan, West Germany.

The summary of yield rankings provides an indication of the range of adaptation for each cultivar. The number of times a cultivar ranked first in yield or was among the highest 10 entries is given below.

Cultivar	Number of sites		Cultivar	Number of sites	
	Ranked first	Ranked among highest ten		Ranked first	Ranked among highest ten
Jugoslavija	6	34	Vega	1	7
Sadovo Super	7	32	Jana	0	9
Balkan	6	30	Blueboy	0	9
Martonvasari 6	3	31	NE 79Y90576	0	7
TAM W-105	5	25	NE 79Y95097	0	8
Loudogorka	0	31	Aura	0	4
Phoenix	4	31	Chokwang	0	6
Bezostaya 1	0	20	Pai yu pao	0	5
Alcedo	2	21	Super X	1	10
TX 71A562-6	2	22	Atlas 66	0	1
Houser	2	18	Bastion	0	4
Trakia	0	16	Kopara	0	0
Maris Mardler	4	21	Huenufen	0	3
WWP 4394	1	15	Irnerio	0	8
Bounty	0	13	Takahe	0	0

Thirteen cultivars ranked first in yield at one or more nursery sites. The frequency of a cultivar rank among the highest 10 should reflect its adaptability and overall yield potential. In 1980 WWP 4394 ranked first in yield at 5 sites while being among the 10 best at 39 sites; yet in 1981 it ranked first at only 1 site and among the 10 best at only 15 sites. Conversely, in 1980 Bezostaya 1 was among the top 10 cultivars only 8 times, compared with 20 times in 1981. Jugoslavija and Balkan (both from Novi Sad, Yugoslavia) ranked first in yield at 6 sites each, and were among the 10 best at 34 and 30 of the 44 sites, respectively. Sadovo Super was the top yielding cultivar at seven sites. Only two of the entries never were among the top 10.

Performance of a given variety over environments was further analyzed by the linear regression of cultivar yield on location mean yield. In general, a regression coefficient greater than 1.00 indicates an improving yield performance as production conditions improve, but at a rate greater than the improvement in the nursery average. These data are shown on the next page.

Cultivars	Mean yield over 44 sites (q/ha)	Cultivater yield vs. location mean yield[a]			Regression coefficient[b] (by.x)
		Correlation coefficient (r)	Coefficient of determination (r^2)	Regression coefficient (by.x)	
Jugoslavija	53.2	.92	.85	1.12	1.08
Sadovo Super	51.8	.96	.92	1.19	1.14
Balkan	51.3	.89	.79	1.01	1.01
Martonvasari 6	50.3	.93	.87	1.05	1.08
TAM W-105	49.3	.89	.79	0.99	1.00
Loudogorka	49.1	.95	.91	1.03	0.99
Phoenix	49.0	.94	.88	1.23	1.10
Bezostaya 1	48.3	.95	.91	0.96	1.00
Alcedo	46.9	.89	.79	1.07	1.07
TX 71A562-6	46.9	.89	.78	1.02	1.01
Houser	46.5	.89	.79	1.02	1.02
Trakia	45.6	.92	.85	1.04	1.00
Maris Mardler	45.1	.89	.80	1.21	1.10
WWP 4394	44.2	.93	.86	0.96	0.91
Bounty	42.7	.92	.85	1.16	1.07
Vega	41.8	.92	.85	0.95	0.89
Jana	41.2	.91	.84	1.09	1.10
Blueboy	38.3	.87	.75	0.86	0.77
NE 79Y90576	38.0	.85	.73	0.97	0.92
NE 79Y95097	36.9	.86	.75	0.96	0.88
Aura	36.1	.88	.78	0.87	0.87
Chokwang	35.4	.83	.69	0.88	0.85
Pai yu pao	33.6	.85	.72	0.84	0.78
Atlas 66	33.6	.91	.82	0.87	0.82
Bastion	32.9	.85	.72	1.05	0.89
Kopara	32.7	.87	.75	0.92	0.76
Huenufen	31.6	.87	.76	1.00	0.85
Irnerio	27.8	.75	.56	0.87	0.68
Takahe	27.3	.81	.66	0.83	0.69

[a] Location men yields are exclusive of Super X.
[b] Location affect based upon performance of Bezostaya 1.

The two highest "b" values were computed for Phoenix and Maris Mardler, 1.23 and 1.21, respectively. Seven cultivars had "b" values of less than 0.90. Super X was not included in the nursery site means used in these comparisons because of the frequent winterkilling of this cultivar.

Along with the location mean comparisons, a comparison was made using Bezostaya 1 as an arbitrary indicator of a location's productive potential. At sites where Irnerio and/or other cultivars were winterkilled, certain more hardy types may have performed very well. Confusion may occur in a statistical comparison if zero yields are included in a location mean; they lower the yield mean even though production conditions were excellent.

The "b" values using the Bezostaya 1 production level are generally similar to those using the location mean; however, several cultivars showed a reduced "b" value in this analysis.

An attempt was made to further evaluate the nursery results on a regional basis. Table 66 contains yield data averaged over selected sites which may or may not accurately represent a given region. The regions shown are (a) Pacific Northwest, USA; (b) Great Plains, USA; (c) Central Plains, South America; (d) Central Europe; and (e) Eastern Europe. The six sites in the Central Europe analysis include: Sedlec, Czechoslovakia; Orgerus, France; Wageningen, The Netherlands; Zurich, Switzerland; Monsheim, West Germany; and Weihenstephan, West Germany. The six sites in the Eastern Europe analysis include: Martonvasar, Hungary; Warsaw, Poland; Fundulea, Romania; Krasnodar, USSR; Odessa, USSR; and Novi Sad, Yugoslavia. Sites in the other analyses may be determined from Table 65.

Jugoslavija was the most productive cultivar in all regions except the Great Plains of the USA. Yield values also were high for Sadovo Super, Balkan, and MV-6 in Central and Eastern Europe. The South America analysis indicated no statistically significant differences among the cultivars. In the Great Plains USA analysis, TAM W-105 and TX 71A562-6 were the two most productive cultivars, both averaging 14% more yield than Bezostaya 1. MV-6, Houser, and Sadovo Super also made good showings in that analysis.

Table 81 contains two-year means, rankings, and statistics for 17 cultivars grown in the 1980 and 1981 nurseries. The two-year nursery site means ranged from a high of 80.4 q/ha at Male Ripnany, Czechoslovakia, to a low of 13.8 q/ha at Madrid, Spain. Averaged over 38 sites, TAM W-105 had the best two-year mean yield of 50.6 q/ha. It was the only variety significantly higher in yield than the nursery mean of 42.3 q/ha; none were significantly more productive than Bezostaya 1. TAM W-105 ranked highest in yield at 9 of the 38 sites; WWP 4394 was not highest in yield at any of the sites but still averaged 49.8 q/ha. Trakia, averaging 49.2 q/ha over the two years was the most productive cultivar at six sites. There were no statistically significant differences among variety yield means at 15 of the 38 sites. The year x cultivar interactions were found to be statistically significant at all but one site.

Correlation coefficients for yield, grain protein, and other agronomic traits combined over 48 nursery sites are presented in Table 68. With the large number of paired comparisons, it will be noted that even relatively small "r" values are statistically significant. As in 1979 and 1980, grain yield was positively correlated with test weight, 1000-kernel weight, plant height, and winter survival.

Grain Protein

Grain samples for protein evaluations were received from 32 sites

in 1981. The results of these analyses are summarized in Table 65.

The high protein check variety, Atlas 66, had the highest mean protein content of 17.5%. This compares with 17.6% in 1980 and 17.1% in 1979. The next highest value was 16.4% for Takahe. Four other varieties had protein values which were statistically significantly above the overall mean of 14.8%.

In general, the inverse relationship between yield and grain protein content was demonstrated again in this nursery. In 1980 the overall "r" value between yield and protein was −.12; in 1981 it was −.49*. The correlation coefficients for all varieties were negative; 19 being statistically significant. Coefficient of determination (r^2) values for Bounty, Alcedo, Maris Mardler, NE 79Y95097, and Aura were .42, .40, .36, .34, and .29, respectively. R-square values for the two Texas wheats were about .05 each.

Table 69 lists some protein and yield comparisons analyzed over 28 sites. The relationship between total protein production and grain yield was very strong and didn't vary much among the varieties. The relationship between actual grain protein content and crude protein production was generally negative; Alcedo, Maris Mardler, and Bounty showed a statistically significant negative relationship. This occurred because of the strongly negative effect of yield level on protein content in these varieties as stated above (r^2 values).

Two-year protein means averaged over six sites are listed in Table 84 by location. Four cultivars averaged more than 15% protein, but Atlas 66 at 17.5% was the only cultivar with more than 15.6% protein. Location means varied from 12.7% at Przeclaw, Poland, to 15.0% at Billings, Montana.

Lysine analyses were performed on sets of grain samples from five sites. Expressed as percentages of total protein, and adjusted to a 13% protein level, the lysine values ranged from 2.94% (Super X) to 3.20% (NE 79Y95097). Other milling and/or quality measurements may be found in Tables 70-72.

Test Weight

Individual location test weight data as reported by cooperators appear in Tables 4-64. The highest average test weight value in 1981 was 79.7 kg/hl, made by Bezostaya1 (Table 67). Averaged over 17 sites, the mean of all cultivars was 75.4 kg/hl, down from 76.9 kg/hl in 1980. Six cultivars had average values equal to or higher than 79.0 kg/hl in 1980, but only Jugoslavija, Bezostaya 1, and WWP 4394 did so in 1981. Four cultivars averaged less than 73 kg/hl; these being the two English wheats and the two Nebraska wheats. Very late maturity more than likely contributed to the production of shriveled grain at certain sites for the English varieties. Test weight was positively correlated with grain yield and 1000-kernel weight. A negative correlation of −.20* existed with grain protein content.

Table 82 presents the two-year test weight means of 17 cultivars at each of 13 sites. The location means varied from 81.4 kg/hl at Szeged, Hungary, to 68.4 kg/hl at Przeclaw, Poland. TAM W-105 edged out Bezostaya 1 for the highest two-year average value; 79.7 kg/hl compared with 79.6 kg/hl, respectively. Huenufen had the lowest average value at 74.0 kg/hl. There were significant differences among the two-year test weight means at all but one of the sites.

1000-Kernel Weight

Twenty-three sites are included in the statistical analysis of 1000-kernel weight in Table 67. Mean values ranged from 43.0 grams (Balkan) to 27.5 grams (NE 79Y90576), and averaged 35.7 grams. This average is down from 38.5 grams in 1980. Seven cultivars had seed weight values statistically significantly higher than the overall nursery mean. The mean value for Balkan was 5% greater than that of Bezostaya 1 and 20% greater than the overall nursery mean.

The two-year means for the 17 cultivars tested in 1980 and 1981 are listed by location in Table 83. Location means ranged from a high of 44.3 grams at Monsheim, West Germany, to a low of 29.5 grams at Madrid, Spain (drought conditions). Averaged over 16 sites, MV-6 had the highest two-year seed weight value of 43.3 grams. This was about 14% above the overall nursery mean of 38.0 grams. There were no statistically significant differences among the cultivar means at four of the 16 sites.

Plant Height

Averaged over 34 sites the mean plant height of the 30 cultivars in the Thirteenth IWWPN was 85.4 cm. This is 8.5 cm shorter than the mean height over 31 sites in 1980. The shortest cultivar was Irnerio (66.4 cm) and the tallest cultivar as usual was Atlas 66 (109.1 cm). Along with Atlas 66, Aura and Jana both exceeded 100 cm in height. In 1980 only two cultivars were less than 80 cm tall; in 1981 there were nine. This appears to be due to environmental factors.

Two-year plant height means and analyses are presented in Table 85. Bethlehem, South Africa, was the site having the shortest plants, overall, averaging 71.7 cm (dryland). The irrigated nursery nearby averaged 75.1 cm. Corvallis, Oregon, USA, had the highest two-year average nursery mean of 134 cm. Seven sites showed average nursery plant heights in excess of 100 cm.

Averaged over 22 sites, the cultivar means ranged from 68.0 cm (Irnerio) to 112.3 cm (Atlas 66). The respective mean heights of Irnerio and Trakia were 34 and 22% less than the overall mean of 91.1 cm. There were statistically significant differences among the cultivar means at 21 of the 22 sites.

Lodging

The lodging values recorded for the entries in the Thirteenth

IWWPN were averaged over 13 sites and are shown in Table 67. Small amounts of lodging occurred in Maris Mardler, Bounty, Kopara, and Irnerio with average values of 1.4, 2.1, 3.8, and 4.2%, respectively. The cultivars lodging most often were TX 71A562-6 and Atlas 66, each with 49.3%. Eight cultivars showed statistically significantly less lodging than the nursery mean of 18.8%. Plant height and lodging were correlated at .19**; this over 28 locations.

Ten sites reported replicated lodging data in both 1980 and 1981 (Table 86). Averaged over six of those sites, Irnerio lodged least (0.9%) while TX 71A562-6 had the highest amount of lodging with 51.7% compared with the grand mean of 19.4%.

Warsaw, Poland, recorded the highest amount of lodging, the two-year site average being 50.6%. The lowest average was 9.7% for Szeged, Hungary. There were statistically significant differences among the two-year cultivar means at four of the six sites.

Winter Survival

Differential readings for winter survival were reported from 24 sites. The average survival of the 30 cultivars in the Thirteenth IWWPN at these sites was 71.9%. This is down from 82.1% over 19 sites in the Twelfth IWWPN. In 1980, seventeen varieties had survival values equal to or greater than 90%; in 1981 none did. Aura, Bezostaya 1, and MV-6 had the highest rates of survival at 87.4, 87.3, and 87.3%, respectively. Takahe and Super X had the least amount of survival at 42.0 and 41.2%, respectively. In the correlation analysis, winter survival was positively related to grain yield, but negatively related to date of flowering. This reflects the longer growing seasons at higher latitudes along with the reduced survivals from more severe winters.

Winter survival means of 17 cultivars analyzed over 15 sites for the two years 1980 and 1981 are listed in Table 87. Fundulea, Romania, had the highest nursery survival record for the two years, averaging 98.6%. The lowest survival readings were reported at Svalof, Sweden. The two-year mean at that site was 33.2%.

Averaged over the 15 sites, Houser scored the highest survival value of 91.7%. Irnerio and Super X survived the least, having average values of 43.4 and 31.5%, respectively. Ten of the 17 cultivars survived at least 80% but only Houser was over 90%. There were no statistically significant differences among the two-year cultivar means at six of the 15 sites.

Frost Damage

Seven sites reported frost damage to the cultivars in the Thirteenth IWWPN (Table 67). On the 0-9 scale, the average damage to Irnerio, Huenufen, and Super X was 3.9, 3.8, and 3.6, respectively. These were the only scores statistically significantly above the nursery mean of 2.5. Seven cultivars averaged at least a 3.0 rating, while none of the cultivars averaged readings of 1.0 or less.

Two-year means and analyses for frost damage from three sites are reported in Table 91. The damage score for Super X was 4.1 on the 0-9 scale. Irnerio, Bastion, Huenufen, and Kopara each averaged over 3.0. TAM W-105, Jana, and TX 71A562-6 had the least overall frost injury with scores of 0.8, 0.9, and 1.0, respectively.

Maturity

Flowering and ripening data summarized over 30 and 22 sites, respectively, are listed in Table 67. Chokwang was the earliest cultivar in the Thirteenth IWWPN. On the average, it required only 160.6 days from January 1 to reach the flowering stage. Phoenix and Pai yu pao also flowered early at 162.6 and 161.2 days from January 1, respectively. The average flowering date for Chokwang was almost 9 days earlier than the nursery mean of 169.3 days from January 1 and 18 days earlier than Jana, the latest cultivar.

Dates for reaching ripeness varied from 210.7 days from January 1 (Chokwang) to 225.1 days (Jana). The overall nursery mean of 217.9 days was almost 7 days later than the ripening date for Chokwang.

Among 18 sites reporting both flowering and ripening data, Bastion had the longest average grain filling time, i.e., the average number of days between flowering and ripening. In 1981 Bastion averaged 47.0 days compared with 46.9 days in 1980. These data are shown on the next page. Correlation coefficients are shown for grain yield vs. the grain filling period. In 1980 all varieties showed statistically significant positive correlation values; i.e., all varieties tended to yield more as the grain filling period was lengthened. In 1981 only 10 of the 30 cultivars showed a significant relationship. One of the largest "r" values in 1980 was computed for Alcedo at .76**; in 1981 the "r" value for Alcedo was only .17.

A correlation analysis also was performed on days to flowering vs. length of grain filling period. At some sites early flowering might be expected to increase the length of time a cultivar would have to form seed before hot dry conditions forced ripening. Bounty was the only cultivar with a statistically significant relationship (.32**). Thus, at sites where Bounty flowered late (high latitudes), it had a longer period for grain filling. In addition, correlations of date of flowering vs. grain yield were negative for all varieties and statistically significant for all varieties except Irnerio. This is probably linked to the low yields at South Africa and South America which on the Julian days scale have very late flowering and ripening dates.

Two-year flowering and ripening data for the 17 cultivars tested both in 1980 and 1981 are presented in Tables 88 and 89, respectively. In flowering, Irnerio was 6.7 days earlier than the nursery mean of 174.7 days from January 1. Aura had the latest overall flowering date of 182.5 days from January 1 over the 21 sites. Super X, the spring wheat check, averaged 171.4 days from January 1 for flowering.

Cultivar	Days from flowering to ripeness (Filling time)			Correlation of grain yield vs. filling time
	Mean	Range		
	N = 71	Shortest	Longest	
Bastion	47.0	30	67	.17
Phoenix	46.0	33	67	.26*
Trakia	45.9	34	63	.04
Blueboy	45.4	29	67	.28*
Irnerio	45.4	32	60	.13
Atlas 66	45.0	30	65	.25*
Martonvasari 6	45.0	30	64	.11
Bezostaya 1	44.9	31	64	.13
Loudogorka	44.8	32	59	.11
Kopara	44.7	30	65	.08
Pai yu pao	44.5	33	68	.30*
Sadovo Super	44.5	32	63	.23
Jugoslavija	44.4	32	61	.24*
Chokwang	44.3	34	68	.22
Maris Mardler	43.7	26	67	.21
Super X	43.6	26	61	.31*
Alcedo	43.5	25	67	.17
Takahe	43.5	28	63	.03
TAM W-105	43.0	32	59	.19
Houser	42.8	31	63	.11
Vega	42.5	32	63	.25*
WWP 4394	42.3	31	58	.08
NE 79Y95097	42.1	32	58	.17
Jana	42.0	29	61	.36**
NE 79Y90576	41.8	31	63	.22
Balkan	41.7	31	59	.12
Huenufen	41.2	29	62	.16
TX 71A562-6	41.1	30	56	.29*
Aura	41.0	26	64	.37**
Bounty	40.4	29	55	.21

* Significant at the .05 probability level.
** Significant at the .01 probability level.

Averaged over 14 sites Irnerio needed 228.1 days from January 1 to reach ripeness. This was about five days earlier than the nursery mean (233.1 days) and 10.7 days earlier than Jana (238.8 days).

Shattering

Five sites reported replicated shattering data in 1981. The average amount of shattering for the 30 cultivars in the Thirteenth IWWPN was 10.0%. The severity of shattering ranged from 5.2% in Houser to 28.0% in WWP 4394. Statistically, there were no significant differences among the variety means.

Table 90 lists the two-year cultivar means for 1980 and 1981 at

two sites. Averaged over the two sites, TX 71A562-6 had the least amount of shattering (0.3%) while WWP 4394 showed the most shattering (26.3%). There were no statistically significant differences among the cultivar means at either site.

Disease

Data are reported for yellow or stripe rust (*Puccinia striiformis*), leaf rust (*Puccinia recondita*), and stem rust (*Puccinia graminis tritici*) in Tables 73-75, respectively. Severity and response readings are listed for each cultivar on a location basis. Means and high scores for each cultivar averaged over locations also are reported.

Averaged over 18 sites, Jugoslavija had the lowest stripe rust severity mean of 1.4%. The two English wheats ranked second and third for least infection. Altogether, eight cultivars averaged less than 10% infection. In 1980 Irnerio had the most severe infection of stripe rust, averaging 57.4%; in 1981 it averaged 52.8%. The only variety with a more severe average infection was NE 79Y90576 at 58.2%. It averaged at or above 90% infection at 6 of the 18 sites. The disease readings at Szeged, Hungary; Ankara, Turkey; and Erzurum, Turkey, were less than 5%. Pullman, Washington, on the other hand, had the most uniformly severe infections, averaging 65.1%.

Leaf rust severity means ranged from 3.5% for Jugoslavija to 50.4% for Sadovo Super when averaged over 19 sites (Table 74). The overall mean was 22.3%. Five cultivars averaged less than 10% infection, while six cultivars were 100% infected at one or more sites. The site with the highest readings was Marcos Juarez, Argentina, where the average infection was 56.7%.

Table 75 contains stem rust data from eight sites. Averaged over seven of the eight sites, Jugoslavija had the lowest severity of stem rust infection at 0.7%. No infection was reported in Jugoslavija at six of the seven sites. Jugoslavija thus had the least reported infection percentages of all three rust diseases. Balkan and Super X each had average scores of 1.4% infection. Alcedo was most often infected with stem rust, averaging 51.4% over the seven sites; it also was most severely infected in 1980 (40.6% over 10 sites). Rieti, Italy, reported the highest severity of stem rust, with a location mean of 34.6%.

Data for powdery mildew (*Erysiphe graminis*), recorded on a 0-9 scale, are reported by location in Table 76. Averaged over 22 sites the grand mean was 3.9. Maris Mardler and Bounty had the two lowest average scores of 1.0 and 1.1, respectively. The two most severe mean values of 6.8 and 7.3 were reported for NE 79Y90576 and NE 79Y95097, respectively. Stations reporting average infection readings equal to or greater than 5.0 included Sedlec, Czechoslovakia; Martonvasar, Hungary; Szeged, Hungary; Zurich, Switzerland; Rowan County, North Carolina, USA; and Zagreb, Yugoslavia.

Severity means for *Septoria* sp. are reported in Table 77. Averaged

over eight sites, the grand mean was 4.0 based on the scale of 0-9. The lowest average infection of 2.3 was determined for Atlas 66. Four cultivars averaged less than 3.0; nine averaged from 3.0 to 3.9; twelve averaged 4.0 to 4.9; and five averaged at or above 5.0. Trakia and Super X had the highest average infection ratings of 5.6 and 6.4, respectively. Only two of the eight sites reported average infection readings of 5 or higher. Additional Septoria information is included in Table 78. These data were recorded at Septoria trials at Tel-Aviv University.

Reactions of the 30 cultivars in the Thirteenth IWWPN to dwarf bunt (*Tilletia controversa*) are listed in Table 79. The plants were artificially inoculated by Wade Dewey at Logan, Utah. Infection readings varied from 35% for Maris Mardler to 99% for Takahe and Alcedo. Fifteen cultivars scored at or above 90% infection. The overall average infection among the cultivars was 85.4% compared with 56% in 1980.

ARGENTINA

Balcarce

COOPERATOR: R. A. Bedogni

DATE OF PLANTING (EFFECTIVE GERMINATION): May 22, 1981.

PRECIPITATION DURING CYCLE OF TEST: 453 mm.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 18 kg/ha and P = 46 kg/ha. Diammonium Phosphate was used.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: The nursery was affected by the longest drought in the last 50 years. From June through October there was no rainfall.

DISEASE DEVELOPMENT: Infections of stripe rust, leaf rust, and Septoria were severe.

INSECT, WEED OR PEST PROBLEMS: There was some bird damage.

DATE OF HARVEST: January 5, 1982.

AREA HARVESTED FOR YIELD: 3.0 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Septoria - September 15, 1981.
Stripe rust - October 12, 1981.
Leaf rust - October 12, 1981.
Mildew - November 10, 1981.

Correlation Coefficients

N = Number of observations	Test weight	1000-kernel weight	Plant height	Flowering	Ripening	Shattering	Frost damage
Grain yield	.53**	.39**	.25**	.14	.19*	-.76**	-.67**
N	100	120	120	120	120	120	120
Test weight		.69**	-.28**	-.54**	-.53**	-.24*	-.28**
N		100	100	100	100	100	100
1000-kernel weight			-.23*	-.32**	-.29**	-.22*	-.16
N			120	120	120	120	120
Plant height				.72**	.75**	-.40**	-.42**
N				120	120	120	120
Flowering					.96**	-.40**	-.26**
N					120	120	120
Ripening						-.42**	-.27**
N						120	120
Shattering							.63**
N							120

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 4. Agronomic and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Balcarce, Argentina in 1981.

Cultivars	Yield q/ha	Test Weight kg/hl	1000-Kernel Weight g	Plant Height cm	Days to Flowering from Jan.1	Days to Ripening from Jan.1	Shattering %	Frost Damage 0-9	Stripe Rust Sev %	Stripe Rust Resp	Leaf Rust Sev %	Leaf Rust Resp	Mildew leaves 0-9	Septoria leaves 0-9
TX 71A562-6	23.6	77.5	36.5	68	297	347	20	5	33	MS-	8	MR-	3	6
TAM W-105	19.8	77.2	34.4	68	301	350	16	6	14	MS-	25	MS-S	4	5
Loudogorka	11.2	73.7	31.4	69	300	349	23	7	44	S-	38	MR-	0	7
Bezostaya 1	10.7	76.1	31.7	71	299	345	28	6	48	S-	25	MR-	0	6
Bounty	10.4	68.7	27.3	70	307	356	25	6	34	S-	15	MR-	0	5
Blueboy	10.2	72.8	32.8	70	302	351	25	6	45	S-	63	S-	0	5
Balkan	10.2	75.9	38.3	61	299	345	26	7	0	-	11	MR-	0	5
Kopara	10.0	74.0	34.2	84	306	354	25	7	13	MS-	75	S-	0	4
Martonvasari 6	10.0	73.4	37.1	69	303	353	25	7	30	S-	78	S-	0	6
Huenufen	9.7	71.6	26.2	76	315	361	23	7	6	MS-	30	MS-	0	6
Bastion	9.4	67.9	25.3	88	309	356	26	6	8	MR-	25	MS-	0	6
Houser	9.0	67.4	26.3	79	310	356	24	7	38	S-	100	S-	0	4
NE 79Y90576	8.2	73.6	25.3	71	299	349	26	7	48	S-	7	MR-	0	5
Atlas 66	7.9	73.2	25.6	88	304	352	29	6	7	MR-	85	S-	5	4
Jugoslavija	7.6	72.3	28.8	59	300	348	30	7	0	-	16	MR-	0	5
Phoenix (WW 33G)	7.2	76.9	36.5	63	290	342	28	6	0	-	75	S-	0	7
Jana	6.9	67.0	28.2	86	318	362	25	7	43	S-	83	S-	3	5
Sadovo Super	6.7	70.0	26.5	59	293	344	30	7	4	MR-MS	100	S-	0	6
Alcedo	6.6	68.5	22.9	90	315	362	30	7	63	S-	70	S-	1	5
Maris Mardler	6.4	70.0	31.0	60	310	357	30	7	15	MS-	10	MR-	0	5
NE 79Y95097	6.2	70.7	26.9	60	300	347	28	7	21	MS-	45	MS-S	4	5
Takahe	5.2	67.0	21.6	69	304	350	31	7	53	S-	85	S-	0	5
Aura	4.5	66.7	26.5	80	322	364	28	7	35	S-	75	S-	3	5
Super X	3.8	72.6	26.4	53	292	341	35	8	7	MS-	75	S-	0	7
Trakia	3.7	70.0	30.9	50	293	342	31	7	9	MR-	5	MS-	0	6
WWP 4394	3.4	72.0	27.1	71	300	347	35	6	6	MS-	1	MS-	0	5
Vega	2.8	70.3	22.6	53	293	344	39	8	14	MS-	65	S-	4	7
Pai yu pao	2.6	68.2	35.6	55	287	340	38	8	8	MS-	98	S-	4	8
Irnerio	2.5	.	26.2	59	290	339	38	8	25	MS-	34	S-	0	7
Chokwang	1.7	.	34.0	63	292	343	40	8	46	S-	88	S-	0	4
Mean	7.9	71.9	29.5	68.6	301.5	349.8	28.5	6.7	23.7		50.2		1.0	5.4
LSD of the cultivar means (.05)	2.6	-	0.7	4.9	2.8	1.0	4.9	0.7	-		-		-	-
Coefficient of variation (%)	23.5	1.4	1.7	5.0	0.7	0.2	12.3	7.5	-		-		-	-

ARGENTINA

Bordenave

COOPERATOR(S): S. Garbini and J. R. Lopez.

DATE OF PLANTING (EFFECTIVE GERMINATION): May 27, 1981.

PRECIPITATION DURING CYCLE OF TEST: 193.1 mm.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: None.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Conditions were good until mid-spring when a drought situation developed. The plants were stressed until the flowering stage. The weather improved after flowering to maturity.

DISEASE DEVELOPMENT: Mainly just leaf rust.

INSECT, WEED OR PEST PROBLEMS: None.

DATE OF HARVEST: December 1 to 30, 1981.

AREA HARVESTED FOR YIELD: 3.0 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Frost damage - September 18, 1981.
Leaf rust - November 27, 1981.
Plant height - December 1 to 30, 1981.
Shattering - December 1 to 30, 1981.

Correlation Coefficients

N = Number of observations	Test weight	1000-kernel weight	Protein	Plant height	Flowering	Ripening	Shattering	Frost damage
Grain yield	.65**	.57**	-.22	.14	-.34**	-.41**	-.12	-.04
N	120	120	30	120	120	120	120	119
Test weight		.80**	.04	-.25**	-.77**	-.76**	-.25**	-.13
N		120	30	120	120	120	120	119
1000-kernel weight			.00	-.35**	-.68**	-.61**	-.16	-.22
N			30	120	120	120	120	119
Protein				.08	-.05	-.01	-.23	.03
N				30	30	30	30	30
Plant height					.61**	.52**	.23*	-.05
N					120	120	120	119
Flowering						.87**	.38**	-.07
N						120	120	119
Ripening							.38**	.09
N							120	119
Shattering								-.14
N								119

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 5. Agronomic, grain quality, and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Bordenave, Argentina in 1981.

Cultivars	Yield q/ha	Test Weight kg/hl	1000-Kernel Weight g	Protein %	Plant Height cm	Days to Flowering from Jan.1	Days to Ripening from Jan.1	Shattering %	Frost Damage 0-9	Leaf Rust Sev %	Leaf Rust Resp
TX 71A562-6	39.0	81.7	34.8	15.0	65	296	341	0	0	2	R-
Irnerio	38.7	81.6	37.1	14.4	62	290	337	0	2	28	MS-
Blueboy	36.6	80.0	37.0	15.8	78	297	341	0	0	35	S-
TAM W-105	33.4	83.7	34.9	16.0	68	298	340	0	0	20	MS-S
Vega	33.1	81.0	42.2	17.1	59	292	335	0	0	73	S-
Loudogorka	30.5	80.8	39.4	17.1	68	297	342	0	0	33	MS-
WWP 4394	29.9	81.0	34.4	18.3	64	297	339	0	0	1	R-
Jugoslavija	29.8	79.6	38.8	16.5	65	299	346	23	0	4	R-
Phoenix (WW 33G)	29.6	84.6	35.5	15.9	58	288	336	0	2	50	S-
Martonvasari 6	28.0	79.8	38.1	16.1	77	299	349	24	0	45	S-
Kopara	26.5	75.6	35.2	18.2	75	302	350	0	2	35	S-
Bezostaya 1	26.2	80.7	37.9	16.1	63	298	342	0	0	14	MR-MS
Takahe	26.0	75.8	31.5	16.2	72	301	349	0	2	43	S-
Trakia	25.4	79.8	39.6	16.8	48	291	338	0	0	23	S-
Houser	25.3	73.9	28.8	14.0	85	306	349	28	0	30	MS-
Super X	25.0	82.4	36.0	15.6	57	290	338	0	2	38	S-
Sadovo Super	25.0	80.3	35.3	15.6	56	295	338	0	0	63	S-
Balkan	24.9	77.5	42.5	16.3	57	298	346	0	0	3	R-
Jana	24.1	70.5	27.3	14.0	97	312	354	0	0	15	MS-
Alcedo	23.3	75.3	29.8	17.1	87	309	350	0	0	48	S-
Pai yu pao	22.7	81.4	38.0	19.0	51	288	335	0	0	35	MS-S
Chokwang	22.6	79.9	36.3	17.0	60	289	336	0	0	40	S-
NE 79Y95097	22.0	77.6	30.5	16.0	61	295	340	0	2	26	MR-S
Huenufen	19.8	69.6	24.1	17.4	74	307	349	0	1	13	MR-
Bastion	18.6	68.6	23.0	17.3	85	306	352	0	1	23	MR-MS
Atlas 66	18.0	78.4	32.5	20.9	94	299	349	0	0	5	MR-
Bounty	17.7	69.2	25.8	15.7	64	307	351	24	1	33	MS-
NE 79Y90576	16.7	80.2	29.8	18.5	64	298	343	0	0	2	R-
Aura	15.2	70.2	27.3	17.1	89	314	353	23	0	45	S-
Maris Mardler	14.8	67.5	26.4	17.3	60	307	352	0	0	30	MR-MS
Mean	25.6	77.6	33.7	16.6	68.7	298.7	343.8	4.0	0.5	28.3	
LSD of the cultivar means (.05)	9.9	3.4	3.2	-	12.3	1.9	3.4	2.6	0.4	-	
Coefficient of variation (%)	27.4	3.1	6.8	-	12.8	0.5	0.7	46.1	63.2	-	

ARGENTINA

Marcos Juarez

COOPERATOR(S): J. Nisi, R. Churin, M. Galich, J. Salines, and C. Bainotti.

DATE OF PLANTING (EFFECTIVE GERMINATION): January 2, 1981.

PRECIPITATION DURING CYCLE OF TEST: 265.6 mm.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: None.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Conditions were generally favorable except that moisture was below normal at flowering time.

DISEASE DEVELOPMENT: Slight development of stripe rust was observed, but heavier amounts of leaf rust and stem rust were present.

INSECT, WEED OR PEST PROBLEMS: None.

DATE OF HARVEST: December 10, 1981.

AREA HARVESTED FOR YIELD: 5.0 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Diseases - November 10, 1981.

Correlation Coefficients

N = 30 observations	Flowering
Grain yield	-.67**

** Significant at the .01 probability level.

Table 6. Agronomic and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Marcos Juarez, Argentina in 1981.

Cultivars	Yield q/ha	Days to Flowering[a] from Jan.1	Leaf Rust[a] Sev %	Leaf Rust[a] Resp	Stem Rust[a] Sev %	Stem Rust[a] Resp
Phoenix (WW 33G)	30.6	271	80	S-	40	MS-
Jugoslavija	30.5	297	5	MR-	0	-
Super X	28.2	269	10	MS-	0	-
NE 79Y95097	27.3	286	10	MR-	80	S-
TAM W-105	27.2	286	80	S-	20	S-
Balkan	27.0	298	0	-	5	S-
NE 79Y90576	24.7	286	1	S-	40	S-
TX 71A562-6	24.6	287	10	MS-	60	S-
Irnerio	23.0	271	80	S-	40	S-
WWP 4394	22.8	287	60	MS-	0	-
Sadovo Super	22.6	286	80	S-	1	S-
Bezostaya 1	21.4	287	60	S-	20	S-
Vega	20.6	277	80	S-	40	MS-
Loudogorka	20.0	289	40	MS-	60	S-
Trakia	19.7	277	40	MS-	60	S-
Pai yu pao	17.8	280	80	S-	10	MS-
Bastion	17.3	298	60	S-	5	MS-
Kopara	16.8	296	60	S-	5	MS-
Huenufen	15.6	299	40	MS-	10	MS-
Atlas 66	14.9	287	100	S-	1	S-
Chokwang	13.7	286	80	S-	60	S-
Bounty	13.1	302	60	S-	10	S-
Maris Mardler	11.0	301	60	S-	30	S-
Martonvasari 6	10.9	300	80	S-	40	S-
Takahe	10.7	296	80	S-	20	S-
Houser	8.4	302	100	S-	10	MS-
Blueboy	8.0	287	80	S-	80	S-
Jana	4.2	301	5	MS-	0	-
Alcedo	1.7	304	80	S-	40	S-
Aura	1.0	314	100	S-	10	MS-
Mean	17.9	290.2	56.7		26.6	
LSD of the cultivar means (.05)	6.0	-	-		-	
Coefficient of variation (%)	23.8	-	-		-	

a/ One replication only.

AUSTRIA

Vienna

COOPERATOR(S): R. Hron and H. Foessleitner.

DATE OF PLANTING (EFFECTIVE GERMINATION): October 1, 1980.

PRECIPITATION DURING CYCLE OF TEST: 333 mm.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 96 kg/ha; P = 26 kg/ha; and K = 100 kg/ha. A compound fertilizer was applied preplant and in spring "nitro chalk" was applied as topdress.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Autumn was dry and cool. Some varieties showed moderate winter damage. Drought conditions in springtime allowed only medium kernel development and medium yields. The first replication was most affected by lack of moisture.

DISEASE DEVELOPMENT: There was a medium to strong incidence of mildew.

INSECT, WEED OR PEST PROBLEMS: None.

DATE OF HARVEST: July 7, 1981.

AREA HARVESTED FOR YIELD: 3.3 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Winter survival - March 26, 1981.
Powdery mildew - May 21, 1981.
Powdery mildew - June 3, 1981.
Shattering - July 22, 1981.

Correlation Coefficients

N = Number of observations	1000-kernel weight	Protein	Lysine/ protein	Plant height	Flowering	Ripening	Shattering	Winter survival
Grain yield	.48**	.04	-.22	.11	.22*	.33**	.01	-.20
N	90	30	30	90	90	90	90	90
1000-kernel weight		-.26	-.24	.25*	.63**	.72**	.19	.25*
N		30	30	90	90	90	90	90
Protein			-.39*	-.12	-.11	-.19	-.08	-.39*
N			30	30	30	30	30	30
Lysine/protein				-.23	-.41*	-.30	.04	.19
N				30	30	30	30	30
Plant height					.30**	.29**	.13	.10
N					90	90	90	90
Flowering						.85**	.12	.14
N						90	90	90
Ripening							.13	.29**
N							90	90
Shattering								-.01
N								90

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 7. Agronomic, grain quality, and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Vienna, Austria in 1981.

Cultivars	Yield q/ha	1000-Kernel Weight g	Protein %	Adjusted lysine/ Protein %	Days to Flowering from Jan.1	Days to Ripening from Jan.1	Plant Height cm	Shattering 1-9	Winter[a/] Survival 1-9	Mildew on leaves 0-9 May 21	Mildew on leaves 0-9 June 3
WWP 4394	52.3	36.6	14.7	2.91	145	187	92	1	3	4	5
Houser	51.5	40.9	16.3	2.97	148	189	87	4	1	4	5
Maris Mardler	51.0	42.1	16.4	2.79	150	193	68	2	1	1	1
Alcedo	49.4	39.3	14.6	2.68	150	189	92	2	1	4	5
Trakia	49.1	33.8	15.7	3.04	141	182	75	2	1	4	5
Vega	44.8	31.5	17.4	2.95	141	181	75	2	2	5	7
Sadovo Super	44.0	32.0	16.4	2.88	143	182	78	2	1	4	7
Loudogorka	43.5	33.3	16.7	2.78	144	187	93	2	1	5	5
Martonvasari 6	43.3	36.9	15.3	2.94	145	183	92	2	1	4	5
Jugoslavija	43.3	36.1	15.0	2.90	144	185	85	2	1	2	3
Bounty	43.2	36.7	15.8	2.81	152	189	68	1	1	2	3
Bastion	43.1	42.2	14.0	3.07	148	190	90	2	4	1	2
Jana	41.7	43.3	15.5	2.81	153	192	90	3	3	4	5
Kopara	40.9	35.7	16.0	2.98	146	188	88	1	3	4	5
Bezostaya 1	40.8	35.7	15.5	2.73	145	183	88	1	1	3	5
TX 71A562-6	40.7	27.9	14.3	3.08	143	179	83	1	1	4	5
Balkan	40.1	37.2	14.2	2.82	143	180	78	2	1	3	4
Chokwang	39.9	36.7	15.2	3.19	136	181	73	2	1	7	7
Phoenix (WW 33G)	38.6	23.8	14.8	3.03	139	181	77	1	1	5	7
Blueboy	38.2	35.9	14.7	2.95	146	189	87	2	4	5	7
Huenufen	37.5	36.7	13.8	3.08	150	190	75	2	2	5	6
Aura	37.4	40.1	17.0	2.77	154	190	88	2	1	4	4
TAM W-105	37.0	29.4	18.3	2.73	141	180	80	2	1	4	7
Super X	36.5	30.4	15.5	2.87	143	184	80	3	3	3	5
Irnerio	35.7	34.6	14.9	3.02	140	180	67	2	4	5	7
Takahe	33.5	38.1	14.3	2.93	148	191	82	1	4	2	3
Atlas 66	33.4	38.9	15.2	2.94	147	188	105	3	3	4	4
Pai yu pao	32.7	30.7	16.4	2.92	137	177	73	1	3	7	8
NE 79Y90576	32.6	22.5	15.7	3.09	140	177	87	1	1	6	8
NE 79Y95097	27.5	23.6	15.5	3.06	142	181	73	3	1	7	8
Mean	40.8	34.7	15.5	2.92	144.7	185.0	82.3	1.9	1.8	4.1	-
LSD of the cultivar means (.05)	5.9	3.6	-	-	1.4	1.9	5.7	1.3	0.7	-	-
Coefficient of variation (%)	8.5	6.0	-	-	0.6	0.6	4.0	40.1	21.3	-	-
Local cultivar: Probstdorfer Extrem	46.0	33.8	-	-	147.0	188.0	102.0	1	1	3	4

a/ 1 = least damage; 9 = most damage.

BRAZIL

Passo Fundo - Rio Grande Do Sul

COOPERATOR: Leo de J. A. Del Duca

DATE OF INITIAL VERNALIZATION: May 4, 1981

DATE OF TRANSPLANTING: June 10, 1981 (limed soil)
June 10, 1981 (acid soil)

PRECIPITATION DURING CYCLE OF TEST: 592,3 mm (June 10 - November 30)

AMOUNT OF IRRIGATION APPLIED: None

FERTILIZER USED: N = 49 kg/ha; P = 19 kg/ha; K = 22 kg/ha (limed soil)
N = 52 kg/ha; P = 26 kg/ha; K = 30 kg/ha (acid soil)

pH OF LIMED SOIL: 5,1 with 0,75 m.e. Al/100 g of soil

pH OF ACID SOIL: 4,3 with 3,70 m.e. Al/100 g of soil

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Precipitation, temperatures and air humidity were lower than the normal values recorded for the period from 1950 to 1979, and were favorable to the wheat crop in 1981.

DISEASE DEVELOPMENT: Infection of leaf blotch (Septoria tritici), leaf spot (Helminthosporium sativum), scab (Gibberella zeae), glume blotch (Septoria nodorum) and leaf rust (Puccinia recondita) was slight to moderate, however, a heavy infection of stem rust (Puccinia graminis tritici) and powdery mildew (Erysiphe graminis) occurred.

INSECT, WEED OR PEST PROBLEMS: None

DATE OF HARVEST: From November 15 to November 30, 1981

AREA HARVESTED: 0,4 m^2 (2 m x 0,2 m)

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Heading	- August 28 to November 13, 1981
Erysiphe graminis	- September 17, 1981
Puccinia recondita	- October 17, 1981 and November 4, 1981
Puccinia graminis tritici	- November 4, 1981
Leaf spot disease complex	- October 17, 1981
Disease complex on spike	- November 4, 1981
Reaction to soil acidity	- October 16, 1981 and November 21, 1981

Table 8. Agronomic and disease data and reaction to soil acidity for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Passo Fundo, Brazil, in 1981.[1/]

Cultivars	Seed grade[2/]	Plant height	Days to flowering (from Jan. 1)		Mildew[3/]	Leaf rust		Stem rust		Disease complex[4/] on		Reaction to soil acidity[5/]
			vernalized	not vernalized		sev.	resp.	sev.	resp.	leaf	spike	
	1-9	cm			sev. 0-5	%		%		0-9	0-9	1-5
Jana	-	--	---	---	5	15	MR	80	S	5	-	5
Trakia	6	60	247	286	5	10	MR	70	S	7	7	5
Aura	7	--	---	---	4	40	S	60	S	5	-	5
Atlas 66	9	95	278	295	3	80	S	30	S	5	5	1
Houser	9	65	300	---	3	60	MS	90	S	7	4	5
Huenufen	9	60	300	308	4	15	MR	t	S	9	7	5
TX 71A562-6	7	70	278	308	4	5	R	80	S	2	7	5
Blueboy	6	75	265	286	5	60	S	90	S	7	7	4
Kopara	8	70	300	308	3	40	MS	40	S	5	5	3
Alcedo	9	65	317	---	4	5	MR	90	S	3	4	5
TAM W-105	7	70	286	308	5	10	MR	50	S	5	7	5
Irnerio	5	55	245	253	3	70	S	40	S	9	5	4
Martonvasari 6	4	75	247	308	4	40	S	70	S	7	5	4
Bezostaya 1	3	75	247	286	5	10	MR	80	S	7	7	4
Bastion	9	85	300	308	0	5	R	50	S	4	7	4
WWP 4394	1	70	253	295	0	t	R	5	MR	7	5	5
Phoenix (WW33G)	4	65	247	278	5	60	S	40	S	8	9	5
Vega	5	60	247	278	5	t	R	80	S	9	8	5
Loudogorka	5	80	255	295	4	t	R	70	S	7	5	5
Pai yu pao	5	65	240	295	5	5	R	80	S	5	1	5
Maris Mardler	7	60	300	308	0	30	S	60	S	4	7	5
Chokwang	6	75	245	308	5	70	S	30	S	7	3	4
Takahe	9	70	298	298	2	80	S	15	MS	5	5	3
Balkan	1	70	247	300	0	0		0		4	1	4
Super X	5	70	245	247	5	40	S	0		6	5	5
Jugoslavija	3	70	247	306	3	0		0		6	3	5
Sadovo Super	5	60	247	298	5	70	S	30	S	7	3	5
Bounty	9	50	295	317	1	30	S	80	S	5	4	5
NE 79Y90576	7	70	278	300	4	t	MR	90	S	7	7	5
NE 79Y95097	7	60	278	286	5	t	R	70	S	9	9	5

1/ The cultivars were tested in a limed soil with a pH = 5,1 and 0,75 m.e. Al/100 g of soil and only to aluminum in an acid soil with a pH = 4,3 and 3,7 m.e. Al/100 g of soil.
2/ 1 = very good; 9 = very poor.
3/ 0 = immunity; 5 = highly susceptible.
4/ Septoria tritici, Septoria nodorum and/or Helminthosporium sativum. 0 = immunity; 9 = highly susceptible.
5/ 1 = resistant; 5 = highly susceptible.

BULGARIA

Tolbuhin

COOPERATOR: Ivan Govedarov.

DATE OF PLANTING (EFFECTIVE GERMINATION): October 11, 1980.

PRECIPITATION DURING CYCLE OF TEST: 359.3 mm.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 70 kg/ha and P = 130 kg/ha.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: All conditions were favorable.

DISEASE DEVELOPMENT: Leaf rust made a strong showing.

INSECT, WEED OR PEST PROBLEMS: None.

DATE OF HARVEST: July 15, 1981.

AREA HARVESTED FOR YIELD: 5.0 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN: Not reported.

Correlation Coefficients

N = 30 observations	Test weight	1000-kernel weight	Plant height	Flowering	Ripening	Frost damage
Grain yield	.03	.70**	-.12	-.02	.17	.28
Test weight		.07	.19	-.18	-.21	-.16
1000-kernel weight			-.28	-.01	-.05	.28
Plant height				.55**	.42*	.25
Flowering					.80**	.33
Ripening						.10

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 9. Agronomic and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Tolbukhin, Bulgaria in 1981.

Cultivars	Yield q/ha	Test [a] Weight kg/hl	1000-[a] Kernel Weight g	Plant[a] Height cm	Days to [a] Flowering from Jan.1	Days to[a] Ripening from Jan.1	Frost [a] Damage 0-9	Leaf Rust[a] Sev %	Resp	Mildew[a] leaves 0-9
Sadovo Super	97.0	75.1	39.0	89	136	185	7	100	-	1
Balkan	96.0	79.4	44.8	87	142	184	6	5	-	1
Jugoslavija	96.0	81.2	45.5	96	142	185	6	0	-	1
Maris Mardler	95.5	74.3	46.6	70	146	188	7	100	-	0
Phoenix (WW 33G)	92.0	78.7	39.1	75	136	184	4	40	-	2
Trakia	91.5	80.0	46.8	70	139	185	6	5	-	1
Loudogorka	89.0	79.3	41.7	97	144	185	7	10	-	1
Martonvasari 6	85.5	76.1	44.4	99	145	187	8	40	-	1
WWP 4394	85.0	79.2	38.1	87	142	185	8	5	-	2
Super X	84.0	79.8	41.9	76	136	185	0	5	-	0
Bounty	84.0	73.3	43.0	66	148	187	7	50	-	0
TX 71A562-6	82.5	77.2	40.4	80	142	186	8	5	-	2
Bezostaya 1	82.5	81.5	43.7	95	145	185	8	10	-	2
Houser	82.0	75.2	41.0	93	145	187	8	50	-	0
Vega	81.0	77.1	44.8	66	138	182	5	40	-	1
Jana	79.5	76.3	39.0	105	151	187	8	0	-	1
Alcedo	75.0	80.7	40.2	96	146	187	8	0	-	0
TAM W-105	70.5	76.5	41.1	80	139	182	9	20	-	2
Bastion	70.0	77.5	36.8	90	145	187	2	50	-	1
Huenufen	69.0	73.9	36.2	85	145	188	4	20	-	1
Chokwang	69.0	77.2	45.9	76	134	176	6	100	-	5
Aura	65.0	77.2	37.8	115	153	188	8	40	-	1
Atlas 66	64.0	79.8	35.4	129	144	186	4	5	-	0
NE 79Y95097	63.5	74.0	36.6	72	137	182	5	10	-	5
Irnerio	63.0	80.4	37.1	61	137	182	1	5	-	1
NE 79Y90576	58.5	77.1	33.4	90	136	182	6	10	-	5
Pai yu pao	55.5	79.7	35.6	77	135	179	6	10	-	2
Takahe	52.5	76.8	36.8	91	146	187	2	50	-	1
Kopara	47.0	78.6	35.7	86	145	186	6	5	-	1
Blueboy	44.0	77.0	38.9	92	145	187	6	50	-	4
Mean	75.7	77.7	40.2	86.4	142.1	184.9	5.9	28.0		1.5
LSD of the cultivar means (.05)	5.4	-	-	-	-	-	-	-		-
Coefficient of variation (%)	5.1	-	-	-	-	-	-	-		-

[a] One replication only.

CANADA

Alberta

Lethbridge

COOPERATOR(S): J. Thomas and M. N. Grant

DATE OF PLANTING (EFFECTIVE GERMINATION): September 25, 1980.

PRECIPITATION DURING CYCLE OF TEST: 414 mm.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 9.4kg/ha and P = 41 kg/ha.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Most everything was normal. The high yields were obtained primarily because of the excellent distribution of rainfall.

DISEASE DEVELOPMENT: There was some powdery mildew present.

INSECT, WEED OR PEST PROBLEMS: None.

DATE OF HARVEST: August 5, 1981.

AREA HARVESTED FOR YIELD: 2.28 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Winter survival - April 29, 1981.
Plant height - July 12, 1981.
Lodging - July 12, 1981.

Correlation Coefficients

N = Number of observations	Test weight	1000-kernel weight	Plant height	Lodging	Flowering	Ripening	Shattering	Winter survival
Grain yield	.11	.24	.17	.24*	-.13	-.17	-.24	.81**
N	29	29	116	117	109	111	29	120
Test weight		.29	-.23	.19	-.47*	-.47*	-.45*	.08
N		29	29	29	28	28	29	29
1000-kernel weight			-.07	-.12	.22	.15	-.07	.10
N			29	29	28	28	29	29
Plant height				.28**	.56**	.43**	.52**	.02
N				116	109	111	29	116
Lodging					-.19	-.22*	.08	.27**
N					109	111	29	117
Flowering						.85**	.38*	-.36**
N						109	28	109
Ripening							.41*	-.53**
N							28	111
Shattering								-.21
N								29

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 10. Agronomic data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Lethbridge, Alberta, Canada in 1981.

Cultivars	Yield q/ha	Test Weight kg/hl	1000-Kernel Weight g	Plant Height cm	Lodging %	Days to Flowering from Jan.1	Days to Ripening from Jan.1	Shattering %	Winter Survival %	Winter Survival % (Winnipeg)	Winter Survival % (Edmonton)
Sadovo Super	80.1	79.2	42.4	85	5	155	202	0	94	0	45
Bounty	79.9	75.5	43.2	84	0	165	205	0	93	0	60
Loudogorka	79.7	81.2	41.8	100	5	158	205	0	78	10	40
TX 71A562-6	79.3	79.0	33.6	94	10	153	200	0	90	70	25
Martonvasari 6	78.6	81.1	44.0	108	10	158	202	0	95	40	30
Trakia	78.6	81.5	46.8	81	10	152	202	0	84	5	10
Phoenix (WW 33G)	75.7	82.2	36.8	75	0	151	203	0	80	0	30
Balkan	74.3	80.1	49.6	89	3	155	201	0	86	60	70
TAM W-105	74.3	81.7	37.0	86	13	150	201	0	80	70	60
Maris Mardler	74.2	73.9	43.8	78	0	163	209	0	65	0	5
Houser	73.9	76.6	43.0	105	10	159	204	20	84	60	40
Jugoslavija	73.6	81.6	47.2	91	3	157	202	0	91	0	50
Bezostaya 1	72.7	82.3	42.8	99	13	157	202	0	93	60	30
Alcedo	66.6	81.2	41.8	105	3	164	209	0	65	50	25
NE 79Y95097	64.2	74.0	31.6	80	5	153	199	0	93	0	40
Jana	63.9	76.7	39.0	123	5	166	210	20	50	0	5
NE 79Y90576	62.8	79.0	29.0	93	8	148	198	0	78	50	45
Pai yu pao	59.6	79.1	34.6	81	5	148	200	0	54	5	25
Aura	58.9	67.0	35.2	115	10	168	209	20	74	80	45
Blueboy	58.7	76.0	37.6	108	10	162	209	10	24	10	20
WWP 4394	56.8	81.7	36.8	89	10	156	202	10	53	20	30
Vega	56.5	80.5	43.4	75	8	153	202	0	58	30	35
Takahe	50.8	78.8	39.6	98	0	163	208	0	20	5	0
Chokwang	50.5	77.8	40.6	76	10	147	198	10	85	20	55
Huenufen	37.2	79.2	43.6	85	0	162	208	20	9	0	25
Kopara	36.1	76.6	39.2	84	3	162	209	0	8	0	0
Atlas 66	33.7	78.4	36.4	110	10	161	205	10	11	0	5
Irnerio	21.8	79.0	41.2	66	0	154	203	0	6	0	0
Bastion	19.2	77.9	38.8	91	3	168	210	0	9	0	0
Super X	0.0	.	.	.	0	.	.	.	0	0	0
Mean	59.7	78.6	40.0	91.4	5.7	157.0	203.7	4.1	60.2	21.5	28.3
LSD of the cultivar means (.05)	13.1	-	-	6.6	5.7	-	-	-	14.6	-	-
Coefficient of variation (%)	15.5	-	-	5.1	71.0	0.8	0.7	-	17.3	-	-

Table 11. Agronomic data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown in unreplicated plots at Woodslee, Ontario, Canada, in 1981.[a/]

Cultivars	Grain yield q/ha	Test weight kg/hl	Plant height cm	Winter survival %
Pai yu pao	65.4	70	98	99
Alcedo	63.9	73	110	100
NE 79Y90576	59.1	70	102	98
Jana	58.7	70	117	98
Martonvasari 6	58.5	74	110	98
TAM W-105	58.0	72	95	97
TX 71A562-6	57.2	70	98	99
Balkan	54.9	69	83	88
Chokwang	54.8	72	82	95
Bezostaya 1	53.8	76	102	97
Houser	53.4	66	108	99
Blueboy	49.0	74	108	13
Aura	48.7	70	122	100
Vega	43.1	65	83	48
Trakia	42.2	77	83	99
Loudogorka	36.5	70	98	50
WWP 4394	35.3	71	95	17
Sadovo Super	35.0	70	84	48
Jugoslavija	32.5	75	80	12
NE 79Y95097	17.5	67	80	4
Maris Mardler	14.1	64	67	5
Bounty	13.0	61	65	9
Atlas 66	9.1	72	--	1
Phoenix (WW33G)	8.2	--	67	2
Kopara	7.7	--	--	1
Bastion	6.6	--	--	1
Takahe	2.2	--	--	1
Irnerio	1.3	--	--	1
Super X	1.2	--	--	1
Huenufen	0.8	--	--	1
Means	34.7	70.3	92.9	49.4

a/ Data provided by Dr. A. H. Teich.

CHILE

Chillan

COOPERATOR(S): L. E. Aguayo and I. Ramirez.

DATE OF PLANTING (EFFECTIVE GERMINATION): May 20, 1981.

PRECIPITATION DURING CYCLE OF TEST: 508.7 mm.

AMOUNT OF IRRIGATION APPLIED: Three applications (amounts not reported).

FERTILIZER USED: N = 140 kg/ha; P = 65.5 kg/ha; and K = 116 kg/ha. Potassium nitrate and triple-phosphate were used.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Rainfall was heavy in May at planting time. Temperatures in June reached a low of -8.0°C and averaged 8.3°C.

DISEASE DEVELOPMENT: Heavy infections of stripe rust and leaf rust were observed.

INSECT, WEED OR PEST PROBLEMS: A slight aphid infestation was present.

DATE OF HARVEST: January 6, 1982.

AREA HARVESTED FOR YIELD: 3.0 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Rusts - November 5 and
December 29, 1981.

Correlation Coefficients

N = 120 observations	Test weight	Plant height	Flowering
Grain yield	.71**	.37**	.33**
Test weight		.55**	.19*
Plant height			.54**

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 12. Agronomic and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Chillan, Chile in 1981.

Cultivars	Yield q/ha	Test Weight kg/hl	Plant Height cm	Days to Flowering from Jan.1	Stripe Rust[a/] Sev %	Stripe Rust[a/] Resp	Leaf Rust[a/] Sev %	Leaf Rust[a/] Resp
Jugoslavija	76.0	85.1	120	302	10	R-	0	-
Alcedo	69.9	83.6	133	319	0	-	60	S-
Trakia	64.4	83.8	94	294	40	MR-	0	-
Balkan	61.5	83.4	115	305	70	M-M	0	-
Blueboy	60.4	78.2	121	304	40	MR-	0	-
Loudogorka	59.3	84.1	119	304	60	M-M	5	S-
Huenufen	58.9	79.1	101	312	20	S-	60	S-
NE 79Y95097	57.7	77.4	98	303	10	M-M	5	M-M
Bastion	56.8	79.5	130	315	50	MS-	30	S-
Bezostaya 1	56.2	85.1	126	303	50	M-M	10	S-
WWP 4394	56.1	84.5	125	298	80	S-	0	-
Martonvasari 6	55.9	84.2	130	308	40	M-M	20	S-
Phoenix (WW 33G)	54.2	83.2	93	291	60	M-M	30	S-
Kopara	54.1	81.8	130	310	60	S-	70	S-
Maris Mardler	53.7	73.9	86	314	0	-	80	S-
TAM W-105	53.5	82.7	109	303	80	S-	0	-
Sadovo Super	51.0	79.8	116	298	20	S-	60	S
Jana	49.1	77.1	129	320	60	MS-	60	S-
Bounty	48.5	75.2	93	317	10	R-	80	S-
Vega	46.0	81.8	90	294	70	S-	0	-
Houser	43.7	74.6	111	315	60	MS-	0	-
Aura	37.5	80.9	151	321	0	-	60	S-
Super X	34.8	75.2	101	282	90	S-	0	-
TX 71A562-6	34.7	77.5	100	304	90	S-	0	-
Takahe	33.2	81.2	101	310	90	S-	0	-
Atlas 66	29.8	84.2	146	308	80	S-	0	-
Pai yu pao	17.0	64.5	86	291	100	S-	0	-
NE 79Y90576	16.3	66.0	101	302	100	S-	0	-
Chokwang	10.8	74.1	90	292	100	S-	0	-
Irnerio	7.2	69.9	78	289	100	S-	0	-
Mean	46.9	79.1	110.8	304.1	54.7		21.0	
LSD of the cultivar means (.05)	5.3	1.5	4.6	1.1	-		-	
Coefficient of variation (%)	8.0	1.4	2.9	0.3	-		-	

a/ One replication only.

CZECHOSLOVAKIA

Male Ripnany

COOPERATOR(S): D. Michalik and V. Probsa

DATE OF PLANTING (EFFECTIVE GERMINATION): October 3, 1980.

PRECIPITATION DURING CYCLE OF TEST: 386 mm.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 80 kg/ha; P = 54 kg/ha; and K = 75 kg/ha.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: The weather was extremely volatile with dramatic temperature changes.

DISEASE DEVELOPMENT: There wasn't much disease development.

INSECT, WEED OR PEST PROBLEMS: None.

DATE OF HARVEST: July 17, 1981.

AREA HARVESTED FOR YIELD: 7.5 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN: Not reported.

Correlation Coefficients

N = Number of observations	Test weight	1000-kernel weight	Protein	Plant height	Lodging	Flowering	Ripening	Winter survival
Grain yield	.30**	.51**	-.11	.59**	.19*	.27**	.44**	.58**
N	120	120	30	120	120	120	120	120
Test weight		-.08	-.30	.18	.29**	-.40**	-.31**	.25**
N		120	30	120	120	120	120	120
1000-kernel weight			.33	.41**	-.31**	.47**	.53**	.06
N			30	120	120	120	120	120
Protein				.53**	.17	.47**	.43*	-.43*
N				30	30	30	30	30
Plant height					.35**	.44**	.66**	.21*
N					120	120	120	120
Lodging						-.04	.03	.06
N						120	120	120
Flowering							.68**	-.04
N							120	120
Ripening								.02
N								120

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 13. Agronomic, grain quality, and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Male Ripnany, Czechoslovakia in 1981.

Cultivars	Yield q/ha	Test Weight kg/hl	1000-Kernel Weight g	Protein %	Plant Height cm	Lodging %	Days to Flowering from Jan.1	Days to Ripening from Jan.1	Winter Survival %	Leaf Rust Sev %	Leaf Rust Resp	Mildew leaves 0-9
Alcedo	74.0	77.6	44.7	15.1	100	0	154	196	100	20	VR-	3
Martonvasari 6	73.4	79.1	47.4	15.4	111	0	153	197	100	15	VR-	3
Maris Mardler	73.2	71.4	46.5	12.4	64	0	153	197	100	0	-	1
Jana	70.3	76.5	46.6	14.7	105	0	157	198	100	0	-	2
TAM W-105	69.4	82.8	36.7	13.5	85	28	146	194	100	0	-	5
Bezostaya 1	67.8	81.5	44.9	14.7	103	0	150	196	100	0	-	3
TX 71A562-6	65.0	78.8	31.0	13.2	92	32	150	193	100	0	-	3
Houser	64.7	76.4	45.7	13.9	90	0	153	196	100	0	-	3
Trakia	64.2	79.5	42.0	13.3	80	0	145	192	75	0	-	3
Loudogorka	62.9	79.2	44.0	14.3	78	0	146	192	100	0	-	2
Aura	62.2	73.0	42.2	15.9	102	0	158	197	100	10	VR-	2
Bastion	61.8	75.4	51.8	15.6	92	0	161	197	85	15	VR-	3
Super X	60.6	81.0	39.6	13.4	76	0	145	191	100	0	-	1
Bounty	60.6	74.2	40.8	12.7	66	0	154	193	100	0	-	1
Jugoslavija	59.2	80.2	44.7	12.7	80	0	145	191	100	0	-	1
Sadovo Super	59.0	78.2	43.2	12.3	76	0	146	190	100	0	-	3
Atlas 66	54.5	78.0	41.9	18.3	115	30	151	195	76	0	-	2
Balkan	53.7	77.4	44.6	13.8	66	0	146	193	100	0	-	1
Kopara	53.7	73.3	42.5	15.9	82	0	160	195	70	0	-	5
Phoenix (WW 33G)	51.7	79.5	34.7	12.9	63	0	144	191	100	0	-	1
Blueboy	51.6	71.7	44.3	14.8	91	0	154	198	72	0	-	4
Chokwang	51.3	78.7	39.1	14.7	68	0	143	189	100	0	-	2
Vega	45.3	76.9	39.5	13.5	65	0	145	191	100	0	-	2
WWP 4394	42.8	80.9	42.8	14.8	67	0	149	192	65	0	-	1
Huenufen	42.5	76.7	38.8	15.2	81	0	153	196	81	0	-	7
NE 79Y95097	37.8	73.2	33.0	13.1	67	0	145	192	100	0	-	5
NE 79Y90576	36.8	74.4	29.6	13.0	68	0	145	192	100	0	-	3
Takahe	33.0	68.5	43.6	17.4	65	0	154	193	46	15	VR-	1
Irnerio	30.7	77.0	37.6	14.0	65	0	146	194	31	0	-	4
Pai yu pao	29.5	76.6	33.3	13.9	65	0	143	190	50	0	-	3
Mean	55.4	76.9	41.2	14.3	80.9	3.0	149.8	193.7	88.4	2.5		2.7
LSD of the cultivar means (.05)	4.2	1.2	1.5	-	0.3	0.1	5.2	0.2	12.9	-		-
Coefficient of variation (%)	5.4	1.2	2.6	-	0.3	3.0	2.5	0.1	10.3	-		-

CZECHOSLOVAKIA

Sedlec

COOPERATOR(S): J. Schmidt, J. Maly, and A.Vernerova.

DATE OF PLANTING (EFFECTIVE GERMINATION): October 6, 1980.

PRECIPITATION DURING CYCLE OF TEST: 260 mm.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 63 kg/ha. Nitrogen was applied as Ammonium sulfate (preplant)in September; Ammonium nitrate (topdress) in March; and as a 10% water spray of Urea in April. Phosphorus and Potassium levels were satisfactory from previous fertilizations.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Winter was average. From mid-March to mid-July, conditions were on the dry side. After mid-July, rainy weather persisted.

DISEASE DEVELOPMENT: Mildew was the only significant disease.

INSECT, WEED OR PEST PROBLEMS: None. The nursery was sprayed with herbicide in mid-April.

DATE OF HARVEST: July 24 to August 5, 1981.

AREA HARVESTED FOR YIELD: 7.7 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Pre-winter evaluation	- November 24, 1980.
Winter survival	- March 27, 1981.
Plant height	- June 22, 1981.
Lodging	- July 8 and 31, 1981.
Mildew	- July 8, 1981.
Ears per square meter	- July 10, 1981.

Correlation Coefficients

N = Number of observations	Test weight	1000-kernel weight	Protein	Plant height	Lodging	Flowering	Ripening	Shattering	Winter survival	Plants/m^2	Ears/m^2
Grain yield	.76**	.53**	-.44*	.16	.18*	-.06	-.27**	.00	.74**	.66**	.45**
N	120	120	30	120	120	120	120	120	120	120	120
Test weight		.55**	-.03	.00	.19*	-.41**	-.47**	.13	.64**	.46**	.29**
N		120	30	120	120	120	120	120	120	120	120
1000-kernel weight			-.15	.24**	-.13	-.07	.12	-.05	.51**	.22*	.16
N			30	120	120	120	120	120	120	120	120
Protein			-.02	.08	-.25	.06	.35	-.19	-.19	-.13
N			30	30	30	30	30	30	30	30
Plant height				.47**	.52**	.51**	.44**	.26**	.27**	.13
N				120	120	120	120	120	120	120
Lodging					.09	-.18	.66**	.38**	.45**	.16
N					120	120	120	120	120	120
Flowering						.68**	.19*	-.06	-.02	.10
N						120	120	120	120	120
Ripening							.13	-.32**	-.27**	.04
N							120	120	120	120
Shattering								.22*	.25**	.07
N								120	120	120
Winter survival									.59**	.37**
N									120	120
Plants/m^2										.37**
N										120

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 14. Agronomic, grain quality, and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Sedlec, Czechoslovakia in 1981.

Cultivars	Yield q/ha	Test Weight kg/hl	1000-Kernel Weight g	Protein %	Plant Height cm	Lodging % (July 31)	Lodging % (July 8)	Days to Flowering from Jan.1	Days to Ripening from Jan.1	Winter Survival %	Mildew Leaves 0-9
TAM W-105	72.3	80.9	36.9	16.1	83	25	8	154	206	82	5
Sadovo Super	70.7	78.3	43.2	12.4	85	7	0	153	207	84	6
Houser	70.2	77.1	43.8	11.4	97	23	5	157	213	83	4
Alcedo	69.6	76.2	44.9	12.2	106	44	9	159	214	95	4
Martonvasari 6	68.9	78.1	48.4	13.3	103	43	6	156	214	97	4
TX 71A562-6	68.6	78.8	34.9	11.7	84	61	16	155	205	89	6
Jugoslavija	68.6	77.8	49.9	12.4	86	5	0	154	212	74	5
Maris Mardler	68.5	77.8	46.7	12.5	87	9	0	156	213	86	2
Loudogorka	67.1	77.6	45.9	13.4	97	8	0	155	211	91	5
Phoenix (WW 33G)	67.1	79.0	34.2	12.1	75	6	0	153	207	73	5
Bezostaya 1	66.0	78.9	48.9	13.0	96	34	1	153	211	96	4
Trakia	65.8	79.9	45.2	12.0	76	1	0	153	208	67	6
NE 79Y90576	63.7	76.7	29.3	11.6	91	65	0	153	196	81	9
Super X	62.1	78.4	38.1	11.8	85	29	0	156	208	40	4
Balkan	59.4	77.8	48.0	12.6	82	3	0	153	203	92	4
Jana	58.3	72.4	40.3	11.9	114	26	4	160	218	91	6
Bounty	55.6	68.7	35.0	12.2	76	0	0	162	215	67	3
NE 79Y95097	55.3	73.4	33.0	12.5	85	55	0	153	202	71	8
Chokwang	53.6	78.7	43.0	15.0	74	33	0	148	195	91	4
Atlas 66	50.3	77.0	39.2	15.8	109	75	49	155	213	74	4
Vega	49.8	76.9	42.0	13.3	70	1	0	154	203	72	5
WWP 4394	46.9	77.8	41.4	13.9	89	5	0	155	210	69	5
Aura	46.4	75.8	37.7	13.3	106	75	25	161	212	96	4
Pai yu pao	42.4	74.7	32.9	12.8	71	5	0	153	204	50	6
Blueboy	39.8	70.2	37.9	11.7	97	8	0	158	216	36	7
Huenufen	34.7	69.5	30.5	13.4	79	5	0	157	211	33	7
Irnerio	33.7	73.1	36.1	13.1	64	1	0	151	208	57	6
Kopara	28.9	71.3	37.8	14.5	87	5	0	157	217	29	5
Bastion	27.6	71.2	37.5	13.0	93	6	0	156	218	12	2
Takahe	14.0	66.9	28.5	15.6	87	6	0	154	217	11	5
Mean	54.9	75.7	39.7	13.0	87.6	22.2	4.1	155.1	209.5	69.4	5.0
LSD of the cultivar means (.05)	7.4	1.4	2.3	-	4.0	20.7	8.1	0.4	0.8	11.3	-
Coefficient of variation (%)	9.6	1.4	4.1	-	3.3	66.3	140.9	0.2	0.3	11.5	-

Table 14. Agronomic, grain quality, and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Sedlec, Czechoslovakia in 1981.

Cultivars	Plants/m^2 in Autumn	Ears/m^2	Autumn Stand Rating 1-9	Spring Stand Rating 1-9	Promptness of Spring Growth 1-9	Kernel Sprouting at Maturity %
TAM W-105	338	476.5	2	3	3.75	2
Sadovo Super	401	503.0	2	2	2.00	4
Houser	314	448.0	1	3	3.50	30
Alcedo	365	553.5	2	3	4.25	6
Martonvasari 6	330	425.5	1	2	2.75	5
TX 71A562-6	297	501.0	2	3	4.00	16
Jugoslavija	327	355.0	1	3	2.25	3
Maris Mardler	327	504.5	1	3	2.00	6
Loudogorka	296	454.0	2	3	2.50	3
Phoenix (WW 33G)	367	555.5	2	4	2.50	22
Bezostaya 1	338	491.5	1	2	2.50	1
Trakia	268	372.0	4	4	3.25	0
NE 79Y90576	386	328.0	2	3	1.75	5
Super X	372	434.5	1	5	3.25	1
Balkan	332	446.5	1	2	1.50	7
Jana	349	513.0	1	2	5.00	6
Bounty	336	476.0	2	5	4.25	2
NE 79Y95097	400	458.5	1	3	2.75	9
Chokwang	346	349.5	1	2	2.00	2
Atlas 66	369	412.0	1	3	2.25	0
Vega	177	353.5	4	6	2.25	10
WWP 4394	116	414.5	5	6	2.75	11
Aura	355	407.0	1	3	3.50	2
Pai yu pao	171	450.5	4	7	3.00	36
Blueboy	97	377.5	5	8	2.75	2
Huenufen	156	285.3	4	7	4.50	2
Irnerio	158	397.5	3	6	3.00	16
Kopara	177	332.5	3	8	3.50	0
Bastion	148	301.0	4	8	4.00	2
Takahe	186	379.0	4	9	5.25	1
Mean	286.3	425.2	2.2	4.0	3.08	7.1
LSD of the cultivar means (.05)	50.2	112.2	0.8	1.0	0.82	-
Coefficient of variation (%)	12.5	18.7	25.5	17.2	18.94	-

EAST GERMANY

Bohnshausen

COOPERATOR: A. Meinel.

DATE OF PLANTING (EFFECTIVE GERMINATION): October 15, 1980.

PRECIPITATION DURING CYCLE OF TEST: 559.7 mm.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 40 kg/ha; P = 57 kg/ha; and K = 100 kg/ha.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: In general, the winter was mild. The first frost occurred in the first decade of November. Temperatures reached as low as -13°C near the soil surface in late February. Warm weather in spring hastened plant development.

DISEASE DEVELOPMENT: Warm wet weather in late May resulted in a heavy mildew infection. Septoria, Fusarium and several rust diseases also developed.

INSECT, WEED OR PEST PROBLEMS: None.

DATE OF HARVEST: August 8, 1981.

AREA HARVESTED FOR YIELD: 7.95 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Frost damage	March 25, 1981.
Mildew	June 11, 1981.
Stripe rust	July 16, 1981.
Leaf rust	July 21, 1981.
Cercosporella	July 31, 1981.
Septoria	August 3, 1981.
Fusarium	August 3, 1981.

Correlation Coefficients

N = Number of observations	1000-kernel weight	Protein	Plant height	Lodging	Flowering	Ripening	Winter survival	Frost damage
Grain yield	.56**	-.28	.33**	-.13	.37**	.43**	-.07	-.36**
N	120	30	120	120	120	120	120	120
1000-kernel weight		.28	.22*	-.32**	.14	.42**	-.05	-.06
N		30	120	120	120	120	120	120
Protein			-.14	-.31	-.07	.09	-.03	.23
N			30	30	30	30	30	30
Plant height				.18	.54**	.62**	-.10	-.08
N				120	120	120	120	120
Lodging					-.20*	-.38**	-.23*	-.29**
N					120	120	120	120
Flowering						.69**	-.06	.15
N						120	120	120
Ripening							.04	.19*
N							120	120
Winter survival								.00
N								120

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 15. Agronomic, grain quality, and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Bohnshausen, East Germany in 1981.

Cultivars	Yield q/ha	1000-Kernel Weight g	Protein %	Plant Height cm	Lodging %	Days to Flowering from Jan.1	Days to Ripening from Jan.1	Winter Survival %	Frost Damage 0-9	Stripe Rust Sev %	Stripe Rust Resp	Leaf Rust Sev %	Leaf Rust Resp	Mildew leaves 0-9	Septoria Ears %	Fusarium 0-9	Cercosporella Herpotricoides
Alcedo	61.4	47.3	15.3	96	11	161	215	114	2	0	-	34	MS-S	5	1	1	1
Sadovo Super	53.0	41.5	14.4	76	11	159	209	97	2	9	MR-MS	43	S-VS	7	1	3	0
Balkan	51.9	49.4	15.0	68	0	158	206	77	2	1	MR-	1	MS-	1	2	4	0
Bounty	50.3	43.6	14.5	73	0	161	213	90	2	0	-	9	MS-	2	2	5	0
Martonvasari 6	50.2	48.8	14.6	88	31	160	212	86	2	8	R-M	9	M-MS	4	2	3	2
Jana	48.6	39.0	13.0	104	15	163	215	99	1	8	MR-	11	M-MS	5	3	3	0
Jugoslavija	48.5	47.9	14.6	72	1	158	210	96	2	0	-	0	-	4	1	3	2
Loudogorka	48.1	46.9	15.9	79	5	159	213	98	3	11	MR-M	13	MS-	5	3	4	1
Maris Mardler	44.0	40.0	13.8	70	0	161	213	106	2	0	-	8	MS-	2	3	5	0
Houser	44.0	47.3	12.4	87	58	160	209	83	3	15	MR-S	11	MS-	4	2	3	0
Bezostaya 1	42.2	47.3	15.0	78	16	160	209	85	3	5	R-M	8	M-MS	6	2	3	1
Phoenix (WW 33G)	41.8	35.3	13.7	65	39	158	208	91	3	6	MR-M	33	MS-VS	7	0	5	0
TAM W-105	41.8	38.8	14.0	78	70	151	204	90	2	15	MR-M	5	M-MS	7	1	1	2
Bastion	41.3	40.9	13.8	86	0	160	214	102	3	6	MR-M	5	M-MS	1	2	2	0
TX 71A562-6	38.6	34.5	13.0	75	73	158	205	86	2	6	R-M	1	MS-	7	1	6	2
Aura	38.5	40.8	14.2	103	53	163	214	96	2	0	-	30	MS-S	6	4	3	1
Trakia	36.6	40.5	13.9	65	0	152	207	96	3	0	-	3	MS-	4	1	5	0
WWP 4394	36.3	42.0	15.4	77	1	160	212	103	3	1	M-M	4	MS-	4	2	1	0
Blueboy	36.3	41.8	12.7	92	5	161	214	97	3	11	MR-M	5	MS-	7	3	4	0
Atlas 66	33.0	45.3	17.7	98	35	160	215	93	4	13	MR-S	6	MS-	3	2	2	0
Vega	32.5	40.9	16.1	62	15	159	205	117	3	5	MR-M	0	-	4	2	6	1
Irnerio	32.2	40.0	14.3	61	0	152	204	119	3	18	M-M	15	MS-S	5	1	4	0
Super X	31.3	28.8	13.3	70	58	158	202	90	3	3	MR-M	1	MS-	3	3	3	0
Takahe	28.2	38.6	16.0	82	1	162	216	75	4	43	M-M	3	MS-	1	3	2	0
Huenufen	27.1	28.8	14.8	74	0	162	208	104	3	11	MR-M	0	-	7	2	4	0
Kopara	25.8	35.5	14.3	78	2	159	212	103	3	6	R-MS	8	MS-	4	3	4	0
NE 79Y90576	25.6	30.3	13.2	80	78	151	201	90	2	4	MR-M	1	MR-	8	1	6	3
NE 79Y95097	24.9	26.4	14.8	73	44	159	202	96	2	3	R-M	3	M-MS	9	1	7	2
Pai yu pao	19.5	33.9	15.1	65	6	154	205	98	4	3	MR-	1	MS-	5	1	4	1
Chokwang	13.4	44.4	17.1	62	15	150	202	99	2	3	MR-M	6	M-MS	8	2	1	1
Mean	38.2	40.2	14.5	77.8	21.4	158.1	209.0	95.7	2.5	7.0		9.1		4.7	1.9	3.6	0.6
LSD of the cultivar means (.05)	6.6	2.6	-	4.1	14.4	1.6	2.4	18.9	0.6	-		-		-	-	-	0.7
Coefficient of variation (%)	12.3	4.5	-	3.7	47.8	0.7	0.8	14.0	16.5	-		-		-	-	-	87.0

FINLAND

Jokioinen

COOPERATOR: Rolf Manner.

DATE OF PLANTING (EFFECTIVE GERMINATION): September 2, 1980.

PRECIPITATION DURING CYCLE OF TEST: 772.6 mm.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 130 kg/ha; P = 44 kg/ha; and K = 62 kg/ha.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Very few of the plots survived the winter weather.

DISEASE DEVELOPMENT: Only a moderate amount of Septoria was noted.

INSECT, WEED OR PEST PROBLEMS: None.

DATE OF HARVEST: September 7, 1981.

AREA HARVESTED FOR YIELD: 2.0 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Winter survival - May 12, 1981.
Plant height - July 24, 1981.
Septoria - September 4, 1981.

Correlation Coefficients

N = Number of observations	1000-kernel weight	Plant height	Flowering	Ripening	Winter survival
Grain yield	.79*	.75**	.07	-.56	.98**
N	8	12	12	12	30
1000-kernel weight		.51	-.36	-.53	.74*
N		8	8	8	8
Plant height			.09	-.52	.81**
N			12	12	12
Flowering				.58*	.01
N				12	12
Ripening					-.63*
N					12

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 16. Agronomic and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Jokioinen, Finland in 1981.

Cultivars	Yield[a] q/ha	1000-Kernel Weight[a] g	Plant Height[a] cm	Days to Flowering[a] from Jan.1	Days to Ripening[a] from Jan.1	Winter Survival[a] %	Septoria Leaves[a] 0-9
Alcedo	12.1	30.4	61	184	234	21	5
Martonvasari 6	10.2	38.2	61	184	237	19	9
Bezostaya 1	8.3	38.0	53	182	234	31	3
TAM W-105	5.3	35.2	54	170	232	12	9
Aura	0.4	17.9	56	183	235	41	7
Jana	0.4	19.8	45	183	243	7	9
WWP 4394	0.3	27.0	43	184	245	1	5
Trakia	0.2	21.8	30	185	244	11	9
Pai yu pao	0.1	.	35	178	237	3	3
Loudogorka	0.1	.	42	184	246	2	9
Houser	0.0	.	.	.	.	22	.
Balkan	0.0	.	.	.	.	12	.
NE 79Y90576	0.0	.	30	174	234	2	5
TX 71A562-6	0.0	.	21	182	244	1	7
Atlas 66	0.0	.	.	.	.	0	.
Huenufen	0.0	.	.	.	.	0	.
Blueboy	0.0	.	.	.	.	0	.
Kopara	0.0	.	.	.	.	0	.
Irnerio	0.0	.	.	.	.	0	.
Bastion	0.0	.	.	.	.	0	.
Phoenix (WW 33G)	0.0	.	.	.	.	0	.
Vega	0.0	.	.	.	.	0	.
Maris Mardler	0.0	.	.	.	.	0	.
Chokwang	0.0	.	.	.	.	0	.
Takahe	0.0	.	.	.	.	0	.
Super X	0.0	.	.	.	.	0	.
Jugoslavija	0.0	.	.	.	.	0	.
Sadovo Super	0.0	.	.	.	.	0	.
Bounty	0.0	.	.	.	.	0	.
NE 79Y95097	0.0	.	.	.	.	0	.
Mean	1.2	28.5	44.3	181.1	238.8	6.1	6.7
LSD of the cultivar means (.05)	-	-	-	-	-	20.6	-
Coefficient of variation (%)	-	-	-	-	-	241.1	-

a/ One replication only.

FRANCE

Orgerus

COOPERATOR: J. P. Hardouin.

DATE OF PLANTING (EFFECTIVE GERMINATION): November 8, 1980.

PRECIPITATION DURING CYCLE OF TEST: 588.6 mm.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 175 kg/ha; P = 120 kg/ha; and K = 120 kg/ha.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Not reported.

DISEASE DEVELOPMENT: Mildew, Septoria, stripe rust and Ophiobolus graminis were observed. Replications 1 and 3 were sprayed with a fungicide in April and again in June.

INSECT, WEED OR PEST PROBLEMS: None.

DATE OF HARVEST: August 18, 1981.

AREA HARVESTED FOR YIELD: 13.5 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN: Not reported.

Correlation Coefficients

N = 30 observations	Protein	Lodging	Flowering
Grain yield	-.53**	-.05	.41*
Protein		--	--
Lodging			.53**

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 17. Agronomic, grain quality, and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Orgerus, France in 1981.

Cultivars	Yield q/ha	Protein %	Lodging[a] %	Days to Flowering from Jan.1	Stripe Rust[a] Sev %	Resp	Mildew[a] Leaves 0-9	Septoria[a] Leaves 0-9
Balkan	62.7	14.0	0	142	20	-	0	6
Jugoslavija	62.5	13.4	20	143	0	-	3	6
Martonvasari 6	56.2	13.2	0	145	70	-	4	5
Loudogorka	55.8	13.5	0	147	70	-	3	6
WWP 4394	54.1	14.4	0	143	60	-	3	6
Sadovo Super	51.8	12.7	0	143	80	-	3	7
Bastion	51.6	13.0	0	147	0	-	5	4
Alcedo	50.8	13.2	60	150	0	-	4	4
Phoenix (WW 33G)	50.4	12.5	0	140	70	-	8	7
Bezostaya 1	49.2	13.6	20	145	60	-	4	6
Vega	48.7	13.4	0	139	40	-	6	7
Bounty	48.3	12.9	0	149	0	-	2	4
Jana	46.6	13.9	70	151	70	-	6	5
Trakia	46.6	12.9	0	143	70	-	6	5
Maris Mardler	44.6	13.5	0	150	0	-	2	4
Atlas 66	44.2	15.6	70	148	30	-	3	3
Kopara	43.4	14.9	0	143	70	-	5	6
Aura	42.5	13.7	80	154	0	-	4	4
TAM W-105	36.4	13.3	60	145	100	-	.	.
Blueboy	36.2	12.7	30	148	40	-	9	4
Huenufen	34.9	14.2	0	147	20	-	9	4
Houser	32.7	13.0	70	149	100	-	.	.
Irnerio	32.7	12.2	0	139	100	-	.	.
Takahe	30.2	16.0	0	143	100	-	.	.
NE 79Y95097	30.2	13.2	0	142	80	-	9	7
Pai yu pao	26.8	14.6	0	135	100	-	.	.
Super X	26.5	12.6	30	141	100	-	.	.
TX 71A562-6	26.2	12.7	70	143	80	-	9	7
NE 79Y90576	24.5	12.2	20	142	100	-	.	.
Chokwang	13.7	19.4	0	132	100	-	.	.
Mean	42.0	13.7	20.0	144.3	57.7		4.9	5.3
LSD of the cultivar means (.05)	11.2	-	-	-	-		-	-
Coefficient of variation (%)	18.9	-	-	-	-		-	-

a/ One replication only.

Table 18. Agronomic and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Thessaloniki, Greece, in 1981.a/

Cultivars	Grain yield	Plant height	Days to		Leaf rust		Stem rust		Powdery mildew
			heading	maturity	sev.	resp.	sev.	resp.	
	g	cm	from Jan. 1		%		%		0-9
Super X	430	95	165	203	0		10	MS	0
Balkan	405	93	162	203	0		0		0
Jugoslavija	371	100	161	204	0		0		0
Sadovo Super	302	100	162	204	20	MR	70	MS	0
Atlas 66	260	115	162	204	0		30	MS	0
Chokwang	243	90	156	201	10	MR	70	MS	4
Bezostaya 1	175	100	163	204	5	MR	70	MS	0
WWP 4394	166	86	165	205	0		0		0
Pai yu pao	151	80	158	201	15	MR	40	MS	3
TAM W-105	148	95	165	204	5	MR	70	MS	3
NE 79Y90576	135	95	162	201	5	MR	70	MS	6
Trakia	124	75	161	201	10	MR	60	MS	4
Kopara	116	105	167	202	0		60	MS	0
Martonvasari 6	116	105	163	203	15	MR	70	MS	0
Loudogorka	114	86	163	201	10	MR	30	MS	0
Phoenix (WW33G)	106	76	160	201	0		0		0
Vega	104	74	161	201	0		30	MS	0
TX 71A562-6	103	82	163	201	10	MR	40	MS	0
Irnerio	97	76	161	201	5	MR	80	MS	4
Huenufen	82	75	174	206	0		0		0
Takahe	71	96	168	204	15	MR	70	MS	0
Aura	48	98	180	205	15	MR	60	MS	0
Maris Mardler	47	80	176	---	10	MR	70	MS	0
Houser	46	96	173	206	20	MR	70	MS	0
Jana	35	95	178	205	10	MR	70	MS	2
Blueboy	33	85	167	201	0		60	MS	0
Bounty	26	80	176	205	20	MR	70	MS	0
Bastion	25	100	174	205	5	MR	70	MS	0
NE 79Y95097	24	75	166	201	10	MR	70	MS	5
Alcedo	23	110	177	206	20	MR	70	MS	0
Means	137.5	90.6	166.3	203.1	7.8		49.3		1.0

a/ Data provided by Dr. Elnis A. Skorda.

HUNGARY

Martonvasar

COOPERATOR: L. Balla

DATE OF PLANTING (EFFECTIVE GERMINATION): October 20, 1980.

PRECIPITATION DURING CYCLE OF TEST: 509 mm.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N, P, and K each at 144 kg/ha.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Temperatures were normal during winter, but it was a long winter. Conditions turned very dry in spring, and summer came early.

DISEASE DEVELOPMENT: Diseases consisted mainly of stem rust and mildew.

INSECT, WEED OR PEST PROBLEMS: None.

DATE OF HARVEST: July 14, 1981.

AREA HARVESTED FOR YIELD: 8.0 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Winter survival - March 16, 1981.
Powdery mildew - June 10, 1981.
Lodging - July 2, 1981.
Stem rust - July 3, 1981.

Correlation Coefficients

N = 120 observations	Plant height	Lodging	Flowering	Ripening	Winter survival
Grain yield	.28**	.14	-.22*	.07	.59**
Plant height		.42**	.34**	.50**	.21*
Lodging			.02	-.05	.33**
Flowering				.53**	-.29**
Ripening					-.09

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 19. Agronomic and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Martonvasar, Hungary in 1981.

Cultivars	Yield q/ha	Plant Height cm	Lodging %	Days to Flowering from Jan.1	Days to Ripening from Jan.1	Winter Survival %	Stem Rust Sev %	Stem Rust Resp	Mildew leaves 0-9
Sadovo Super	71.3	81	4	145	189	80	53	M-S	7
Balkan	67.7	82	6	144	182	83	0	VR-	4
Martonvasari 6	66.4	105	51	145	192	94	36	MR-S	5
TAM W-105	66.2	81	93	143	184	88	2	VR-R	8
Jugoslavija	63.7	87	13	146	190	93	0	VR-	3
Alcedo	58.4	103	61	149	192	87	100	VS-	6
Bezostaya 1	57.7	95	88	145	191	90	44	R-S	6
Phoenix (WW 33G)	56.4	72	13	143	184	84	9	R-MR	8
Loudogorka	55.8	93	1	146	191	84	55	M-VS	5
WWP 4394	54.5	88	8	146	184	87	1	VR-	7
Houser	54.3	92	80	149	188	82	48	M-VS	5
Maris Mardler	53.4	77	9	151	187	75	34	MR-S	1
Jana	53.2	111	75	151	192	94	65	MR-VS	6
Bounty	50.7	75	4	152	188	55	45	R-S	1
TX 71A562-6	50.0	76	100	146	184	90	0	VR-	9
Trakia	48.9	73	10	144	190	92	6	R-	6
Chokwang	48.1	70	40	140	182	89	2	VR-R	9
Atlas 66	44.1	119	89	148	186	63	15	R-M	4
Vega	41.4	71	39	144	183	66	4	VR-R	8
Super X	36.5	76	19	146	185	45	0	VR-	6
Aura	34.8	102	100	152	187	92	59	M-VS	5
NE 79Y90576	29.7	84	69	144	182	71	2	VR-R	9
Blueboy	29.5	95	51	149	190	92	90	S-VS	8
Bastion	28.2	98	0	148	192	46	94	S-VS	1
NE 79Y95097	27.4	77	29	145	182	66	3	VR-R	9
Pai yu pao	22.7	69	26	143	182	85	1	VR-	9
Kopara	21.0	86	4	147	189	34	26	R-S	6
Irnerio	20.2	61	0	145	184	68	100	VS-	7
Huenufen	19.2	79	4	151	187	44	1	VR-	6
Takahe	5.3	73	0	151	193	6	80	S-VS	3
Mean	44.6	84.9	36.1	146.5	187.1	74.0	32.4		5.9
LSD of the cultivar means (.05)	11.1	6.5	27.7	1.2	-	21.7	-		-
Coefficient of variation (%)	17.7	5.4	54.6	0.6	-	20.9	-		-

HUNGARY

Szeged

COOPERATOR: I. Szaniel.

DATE OF PLANTING (EFFECTIVE GERMINATION): October 25, 1980.

PRECIPITATION DURING CYCLE OF TEST: 298.2 mm.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N, P, and K each at 100 kg/ha.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Autumn was dry. Winter was average in both temperature and moisture levels. It became dry again in springtime.

DISEASE DEVELOPMENT: There was a very heavy mildew infection.

INSECT, WEED OR PEST PROBLEMS: Not reported.

DATE OF HARVEST: July 10, 1981.

AREA HARVESTED FOR YIELD: 2.0 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Winter survival - March 13, 1981.
Plant height - June 20, 1981.
Diseases - June 26, 1981.
Lodging - June 29, 1981.

Correlation Coefficients

N = 120 observations	Test weight	1000-kernel weight	Plant height	Lodging	Flowering	Winter survival
Grain yield	.27**	.26**	.05	.15	-.12	.55**
Test weight		.55**	.22*	.18	-.26**	.00
1000-kernel weight			.19*	.05	.26**	-.06
Plant height				.28**	.40**	-.08
Lodging					-.07	.26**
Flowering						-.25**

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 20. Agronomic and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Szeged, Hungary in 1981.

Cultivars	Yield q/ha	Test Weight kg/hl	1000-Kernel Weight g	Plant Height cm	Lodging %	Days to Flowering from Jan.1	Winter Survival %	Stripe Rust Sev %	Stripe Rust Resp	Leaf Rust Sev %	Leaf Rust Resp	Mildew leaves 0-9
Maris Mardler	62.5	77.0	38.5	75	0	147	83	0	-	1	R-	0
Sadovo Super	60.9	82.5	38.3	88	5	140	73	8	-	33	MR-S	8
Martonvasari 6	60.3	84.1	44.2	100	33	142	73	10	-	30	MR-S	7
TAM W-105	58.9	84.2	36.1	85	23	138	65	0	-	0	MR-	8
Jugoslavija	56.1	85.1	44.7	86	3	141	70	0	-	3	R-	4
Phoenix (WW 33G)	54.0	84.3	32.1	75	10	135	83	0	-	5	MS-	7
Super X	53.0	82.7	33.2	85	5	138	70	0	-	0	-	7
Loudogorka	51.5	85.1	43.4	93	3	141	73	5	-	20	MR-MS	7
WWP 4394	51.1	85.1	39.8	90	5	139	50	0	-	3	MR-	8
TX 71A562-6	50.4	81.4	33.3	89	68	140	65	0	-	0	-	7
Bezostaya 1	50.2	85.1	42.7	100	30	141	83	0	-	11	MR-MS	7
Balkan	49.4	84.1	45.8	85	0	141	75	0	-	0	MR-	5
Houser	47.7	81.8	39.6	91	23	145	58	23	-	4	MR-	6
Alcedo	46.1	83.9	41.1	93	0	147	40	10	-	30	MS-S	6
Bounty	45.4	79.0	34.5	73	0	147	73	0	-	5	R-MS	0
Jana	44.4	81.3	38.4	103	5	148	40	0	-	0	-	7
Chokwang	43.9	82.5	37.4	78	33	131	80	0	-	0	-	9
Blueboy	43.4	80.3	36.5	96	3	145	33	0	-	1	MR-	9
Kopara	41.6	82.3	35.3	91	0	142	35	3	-	10	R-MS	7
Vega	40.9	82.3	39.9	74	5	138	53	0	-	0	-	9
Trakia	39.9	84.5	43.5	73	3	138	30	0	-	0	-	7
Aura	39.4	82.2	36.9	100	33	148	68	8	-	25	MR-S	7
Pai yu pao	38.7	83.7	31.6	80	0	132	35	0	-	0	-	9
Atlas 66	36.4	84.8	36.5	111	30	145	40	3	-	1	MR-	6
NE 79Y90576	36.1	77.6	24.1	91	3	136	73	0	-	0	-	9
NE 79Y95097	34.5	77.4	25.5	80	3	140	78	0	-	1	MR-	9
Irnerio	34.0	83.1	36.6	73	0	138	30	35	-	3	MR-	8
Huenufen	29.2	79.6	33.4	81	0	146	43	0	-	6	MR-	8
Takahe	28.2	80.0	41.1	90	0	147	8	40	-	21	MS-S	7
Bastion	24.1	82.3	39.4	95	3	145	10	5	-	13	MR-MS	2
Mean	45.1	82.3	37.5	87.4	10.8	141.2	56.1	4.9		7.5		6.5
LSD of the cultivar means (.05)	10.4	1.6	3.2	6.7	16.4	1.1	14.9	-		-		-
Coefficient of variation (%)	16.4	1.4	6.1	5.5	108.7	0.6	18.8	-		-		-

IRAN

Karaj

COOPERATOR: N. Banisadr.

DATE OF PLANTING (EFFECTIVE GERMINATION): October 14, 1980.

PRECIPITATION DURING CYCLE OF TEST: 250 mm.

AMOUNT OF IRRIGATION APPLIED: 500 mm.

FERTILIZER USED: N = 120 kg/ha; and P = 60 kg/ha. Fertilizer types were Urea and Diammonium phosphate.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Rainfall was generally above average. A late snowfall occurred in early April. Temperatures fell below freezing at that time.

DISEASE DEVELOPMENT: The rusts and mildew were developing well.

INSECT, WEED OR PEST PROBLEMS: None.

DATE OF HARVEST: June 30, 1981.

AREA HARVESTED FOR YIELD: 3.0 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Heading - As indicated.
Ripening - As indicated.

Correlation Coefficients

N = Number of observations	Plant height	Flowering	Ripening
Grain yield	-.16	-.29**	-.27**
N	90	120	120
Plant height		.40**	.39**
N		90	90
Flowering			.90**
N			120

**, Significant at the .01 probability level.

Table 21. Agronomic data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Karaj, Iran in 1981.

Cultivars	Yield q/ha	Plant Height cm	Days to Flowering from Jan.1	Days to Ripening from Jan.1
Phoenix (WW 33G)	86.3	92	120	171
Sadovo Super	69.8	92	124	173
Super X	68.0	100	121	172
Bounty	67.6	85	137	177
Houser	67.2	113	134	176
Irnerio	67.1	83	118	172
Loudogorka	66.5	108	125	174
Pai yu pao	65.4	93	118	172
Maris Mardler	65.1	87	142	181
Chokwang	62.1	93	118	170
Bezostaya 1	61.5	108	124	172
NE 79Y90576	60.8	107	124	171
NE 79Y95097	60.8	95	125	171
Vega	60.2	87	121	170
Balkan	59.6	97	125	171
Bastion	59.0	115	134	179
WWP 4394	57.4	107	128	173
TX 71A562-6	56.2	95	129	175
Trakia	56.1	90	121	171
Jugoslavija	56.1	102	127	174
Martonvasari 6	55.4	113	129	175
Kopara	55.0	112	129	177
Blueboy	54.4	110	129	175
Alcedo	54.0	105	137	177
Huenufen	52.4	97	136	181
Aura	52.2	123	139	182
Takahe	50.8	108	129	177
TAM W-105	50.0	100	129	176
Jana	47.5	122	142	180
Atlas 66	47.5	113	129	173
Mean	59.7	101.7	128.1	174.6
LSD of the cultivar means (.05)	14.1	10.1	-	-
Coefficient of variation (%)	16.8	5.8	-	-
Local cultivars:				
Omid	64.8	125	136	178
Azadi	59.4	103	122	176

ITALY

Milano

COOPERATOR: B. Borghi.

DATE OF PLANTING (EFFECTIVE GERMINATION): October 23, 1980.

PRECIPITATION DURING CYCLE OF TEST: Not reported.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 120 kg/ha; P = 75 kg/ha; and K = 75 kg/ha. Fertilizers were applied as: (8-24-24) at 39 kg/ha; Calcium nitrate at 29 kg/ha; and Ammonium nitrate at 19 kg/ha.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Temperatures were generally very cold during winter. Precipitation was below average in springtime.

DISEASE DEVELOPMENT: Mildew and Septoria were notable but not severe.

INSECT, WEED OR PEST PROBLEMS: Not reported.

DATE OF HARVEST: July 11, 1981.

AREA HARVESTED FOR YIELD: 10 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN: Not reported.

Correlation Coefficients

N = Number of observations	Test weight	1000-kernel weight	Protein	Plant height	Lodging	Flowering	Ripening
Grain yield	.55**	.55**	-.51**	-.14	-.27*	-.46**	-.32**
N	120	120	30	120	60	120	120
Test weight		.68**	-.24	.14	-.07	-.40**	-.25**
N		120	30	120	60	120	120
1000-kernel weight			-.02	-.01	-.08	-.32**	-.25**
N			30	120	60	120	120
Protein				.26	.30	.35	.16
N				30	30	30	30
Plant height					.51**	.45**	.48**
N					60	120	120
Lodging						.23	.19
N						60	60
Flowering							.75**
N							120

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 22. Agronomic, grain quality, and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Milano, Italy in 1981.

Cultivars	Yield q/ha	Test Weight kg/hl	1000-Kernel Weight g	Protein %	Plant Height cm	Lodging %	Days to Flowering from Jan.1	Days to Ripening from Jan.1	Stem Rust Sev %	Stem Rust Resp	Mildew leaves 0-9	Septoria leaves 0-9
Sadovo Super	78.3	71.8	33.3	13.6	93	0	134	175	40	-	15	25
Phoenix (WW 33G)	76.1	75.4	34.3	14.8	80	0	130	174	10	-	15	15
Jugoslavija	74.5	76.0	38.1	14.7	101	10	138	175	0	-	0	30
Balkan	71.3	74.0	42.2	15.1	89	0	134	171	0	-	0	35
Loudogorka	68.1	73.7	36.8	15.7	105	0	137	176	0	-	5	40
Martonvasari 6	67.9	75.4	37.1	15.1	115	5	138	176	0	-	15	20
Chokwang	66.6	74.8	39.5	15.6	83	0	128	170	10	-	15	3
NE 79Y90576	65.7	69.8	27.8	13.8	106	20	132	171	0	-	25	20
Irnerio	64.5	72.3	35.6	14.2	74	0	131	174	15	-	15	30
Alcedo	63.2	75.1	32.9	13.3	120	5	143	183	0	-	0	8
Trakia	61.6	73.9	35.0	15.1	79	0	134	175	0	-	0	35
TAM W-105	60.7	75.6	32.1	15.1	95	75	137	174	0	-	5	35
Bastion	60.3	71.9	30.6	14.9	111	0	142	183	5	-	0	15
Blueboy	59.0	69.5	31.5	12.3	108	0	139	183	0	-	35	25
Houser	58.6	68.0	32.7	16.3	109	65	140	180	0	-	0	30
TX 71A562-6	56.4	67.6	25.7	14.4	93	25	137	174	0	-	10	35
Super X	54.9	68.7	26.7	14.2	91	60	132	171	0	-	0	40
Bezostaya 1	54.8	76.9	39.8	16.0	104	15	136	175	0	-	15	25
WWP 4394	54.8	72.2	29.7	16.9	105	3	137	175	0	-	0	25
NE 79Y95097	54.6	65.8	26.9	15.1	91	0	138	173	0	-	55	18
Jana	53.7	69.1	29.0	16.9	128	70	146	184	0	-	30	15
Vega	53.7	70.3	32.9	15.2	80	0	132	172	0	-	0	25
Pai yu pao	52.3	70.2	30.0	16.2	81	0	128	170	0	-	0	0
Takahe	52.2	70.9	31.0	16.2	108	0	142	181	5	-	0	25
Maris Mardler	52.0	67.0	32.4	14.4	76	0	145	180	0	-	0	35
Atlas 66	49.4	73.1	33.3	17.6	134	90	138	178	0	-	10	35
Bounty	48.2	61.4	25.2	17.7	80	0	146	180	0	-	0	20
Kopara	47.3	70.1	28.9	15.7	103	0	145	177	0	-	0	60
Aura	44.7	67.4	29.3	17.1	125	70	146	182	10	-	10	20
Huenufen	41.8	63.2	24.2	15.9	89	0	144	180	0	-	35	15
Mean	58.9	71.0	32.2	15.3	98.4	17.1	137.4	176.3	3.2		10.3	25.3
LSD of the cultivar means (.05)	7.3	2.9	3.5	-	5.0	32.8	2.9	2.4	-		-	-
Coefficient of variation (%)	8.8	2.9	7.7	-	3.6	87.3	1.5	1.0	-		-	-

ITALY

Rieti

COOPERATOR(S): G. Zitelli and E. Biancolatte.

DATE OF PLANTING (EFFECTIVE GERMINATION): January 28, 1981.

PRECIPITATION DURING CYCLE OF TEST: Not reported.

AMOUNT OF IRRIGATION APPLIED: Not reported.

FERTILIZER USED: N = 106 kg/ha and P = 92 kg/ha. Fertilizers included Diammonium phosphate and Ammonium nitrate.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Not reported.

DISEASE DEVELOPMENT: There was a moderately heavy attack of the rust diseases.

INSECT, WEED OR PEST PROBLEMS: Not reported.

DATE OF HARVEST: August 4, 1981.

AREA HARVESTED FOR YIELD: 10.2 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN: Not reported.

Correlation Coefficients

N = Number of observations	Test weight	1000-kernel weight	Protein	Plant height	Percent moisture
Grain yield	.50**	.69**	-.07	-.02	-.44**
N	109	115	28	115	115
Test weight		.70**	.28	.39**	-.16
N		109	27	109	109
1000-kernel weight			.15	.09	-.28**
N			28	115	115
Protein				.17	.23
N				28	28
Plant height					.19*
N					115

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 23. Agronomic, grain quality, and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Rieti, Italy in 1981.

Cultivars	Yield q/ha	Test Weight kg/hl	1000-Kernel Weight g	Protein %	Plant Height cm	Stripe Rust Sev %	Stripe Rust Resp	Leaf Rust Sev %	Leaf Rust Resp	Stem Rust Sev %	Stem Rust Resp	Moisture %
Jugoslavija	83.9	79.3	48.6	13.3	90	0	-	0	-	0	-	11.1
Bezostaya 1	70.9	80.1	45.8	14.4	101	45	-	38	-	35	-	10.5
WWP 4394	70.0	77.9	42.4	13.3	95	0	-	4	-	0	-	10.3
TAM W-105	68.7	78.1	37.2	13.4	89	0	-	30	-	35	-	9.9
Sadovo Super	68.6	72.3	38.6	11.0	89	0	-	75	-	35	-	10.9
Bastion	68.3	76.4	38.2	12.3	98	63	-	53	-	43	-	10.8
Balkan	67.0	80.6	49.8	14.6	88	0	-	4	-	0	-	10.8
Loudogorka	62.8	77.4	43.4	14.2	90	0	-	40	-	40	-	10.4
Super X	62.8	74.6	37.9	12.6	86	0	-	37	-	27	-	11.0
Phoenix (WW 33G)	59.6	77.8	36.4	11.9	70	37	-	50	-	0	-	10.8
Huenufen	57.3	73.6	34.0	14.1	77	0	-	1	-	0	-	10.7
Kopara	56.9	73.8	37.1	15.1	92	0	-	43	-	55	-	11.1
Bounty	56.2	72.0	37.1	13.5	68	0	-	40	-	53	-	11.6
NE 79Y95097	55.8	69.7	33.9	13.1	78	0	-	14	-	23	-	11.1
Martonvasari 6	54.3	79.4	44.2	13.4	107	65	-	43	-	45	-	10.5
Vega	54.0	72.3	41.1	14.1	68	0	-	0	-	43	-	11.2
Jana	52.2	75.2	36.1	11.2	102	0	-	4	-	10	-	13.2
Blueboy	52.0	71.5	37.9	11.9	97	0	-	0	-	75	-	10.7
TX 71A562-6	51.7	74.2	34.2	13.2	87	0	-	30	-	77	-	10.7
Maris Mardler	51.4	71.6	40.7	13.8	64	0	-	0	-	80	-	11.6
Irnerio	50.5	72.6	33.9	13.0	68	80	-	33	-	40	-	10.4
Trakia	48.8	77.0	40.1	14.2	70	0	-	1	-	20	-	12.8
Chokwang	48.5	74.9	39.5	13.4	77	53	-	6	-	45	-	10.5
Houser	47.9	67.8	32.1	12.8	87	57	-	1	-	1	-	11.1
Takahe	46.5	74.4	37.4	14.0	95	55	-	0	-	55	-	10.9
Pai yu pao	46.1	73.0	36.7	13.7	75	0	-	0	-	55	-	11.4
Atlas 66	43.6	77.1	37.6	15.1	123	0	-	25	-	0	-	12.9
NE 79Y90576	43.1	75.9	33.5	11.2	85	0	-	5	-	10	-	11.8
Alcedo	27.3	69.9	28.7	12.7	88	0	-	33	-	57	-	10.8
Aura	18.0	66.0	28.2	14.6	100	0	-	0	-	33	-	13.4
Mean	55.2	74.8	38.1	13.3	87.2	16.0		21.0		34.6		11.1
LSD of the cultivar means (.05)	12.6	-	3.1	-	6.1	-		-		-		0.7
Coefficient of variation (%)	16.2	2.1	5.8	-	4.9	-		-		-		4.3

JAPAN

Morioka, Iwate

COOPERATOR(S): T. Gotoh and Y. Taniguchi.

DATE OF PLANTING (EFFECTIVE GERMINATION): September 25, 1980.

PRECIPITATION DURING CYCLE OF TEST: 1804 mm.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 105 kg/ha; P = 126 kg/ha; and K = 112 kg/ha. In autumn, a compound fertilizer (12:18:16) was applied. In spring, a topdress of Ammonium sulfate was applied.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: A long period of snow cover (100 days) severely damaged many cultivars. The number of ears per plant were few. Cool temperatures after heading slowed down the ripening process.

DISEASE DEVELOPMENT: Infections of leaf rust and head scab were about average.

INSECT, WEED OR PEST PROBLEMS: No problems.

DATE OF HARVEST: July 29 and August 3, 1981.

AREA HARVESTED FOR YIELD: 4.125 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Winter survival - April 16, 1981.
Leaf rust - July 3, 1981.
Head scab - July 13, 1981.

Correlation Coefficients

N = Number of observations	1000-kernel weight	Plant height	Flowering	Ripening	Winter survival
Grain yield	.81**	.64**	-.61**	-.35**	.95**
N	101	101	98	96	60
1000-kernel weight		.40**	-.69**	-.38**	.73**
N		101	98	95	50
Plant height			-.20*	-.04	.68**
N			98	95	50
Flowering				.75**	-.63**
N				92	49
Ripening					-.37**
N					49

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 24. Agronomic and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Morioka Iwate, Japan in 1981.

Cultivars	Yield q/ha	1000-Kernel Weight g	Plant Height cm	Days to Flowering from Jan.1	Days to Ripening from Jan.1	Winter Survival %	Leaf Rust Sev %	Leaf Rust Resp	Fusarium (Scab) 0-9
Balkan	40.9	44.7	100	165	200	100	1	VR-	5
TX 71A562-6	36.4	34.7	99	165	202	99	1	VR-R	3
Martonvasari 6	36.3	36.0	120	167	205	100	34	MR-MS	3
Bezostaya 1	35.0	38.3	115	165	204	100	19	R-S	3
Houser	34.5	32.5	121	167	206	100	53	MS-S	3
Trakia	30.5	32.8	87	165	206	97	19	VR-MS	4
Alcedo	29.2	26.1	119	171	206	100	34	M-MS	3
Loudogorka	28.6	35.3	108	167	206	96	13	R-MR	5
Jana	27.8	29.5	121	174	208	98	23	VR-S	2
WWP 4394	27.4	29.6	106	166	203	81	17	VR-S	3
TAM W-105	26.8	33.1	94	164	205	99	3	R-S	3
Vega	26.8	35.9	85	164	199	96	16	VR-MS	4
Aura	25.0	24.9	128	171	206	100	59	MS-VS	3
Blueboy	20.3	28.2	114	169	211	83	61	MS-VS	2
Pai yu pao	19.9	30.5	95	163	197	95	66	S-VS	8
Chokwang	16.4	31.0	92	162	197	34	100	MS-VS	6
NE 79Y90576	15.7	24.6	96	164	198	21	1	R-	7
Jugoslavija	14.3	36.8	89	169	210	20	1	VR-	3
Sadovo Super	10.7	21.9	90	168	202	33	65	MS-S	4
Bounty	1.5	21.3	78	182	214	9	16	MR-M	2
NE 79Y95097	1.0	20.2	81	171	206	5	15	R-MS	3
Atlas 66	0.4	21.6	107	177	214	2	17	VR-S	2
Takahe	0.2	14.8	80	183	213	2	8	R-MS	1
Phoenix (WW 33G)	0.1	16.6	65	170	207	0	53	MS-S	4
Huenufen	0.0	12.6	74	184	212	2	5	R-M	1
Kopara	0.0	13.8	83	175	205	2	14	MS-	3
Irnerio	0.0	.	.	.	.	0	.	-	.
Bastion	0.0	.	.	.	.	0	.	-	.
Maris Mardler	0.0	.	.	.	.	0	.	-	.
Super X	0.0	.	.	.	.	0	.	-	.
Mean	16.9	28.4	98.7	168.9	204.8	52.4	26.9		3.2
LSD of the cultivar means (.05)	5.8	2.3	4.7	1.5	1.8	13.8	-		1.0
Coefficient of variation (%)	24.3	5.8	3.4	0.6	0.6	12.0	-		20.3

KOREA

Suwon

COOPERATOR(S): C. H. Cho and D. J. Maeng.

DATE OF PLANTING (EFFECTIVE GERMINATION): October 9, 1980.

PRECIPITATION DURING CYCLE OF TEST: 392.2 mm.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 120 kg/ha as $(NH_4)_2 CO_2$; P = 90 kg/ha as Ca $(H_2PO_4)_2$; and K = 70 kg/ha as KCl.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: The winter months were very cold, but a snow cover prevented too much winter injury to the plants.

DISEASE DEVELOPMENT: Powdery mildew was prevalent, but very little rust development was noted.

INSECT, WEED OR PEST PROBLEMS: None.

DATE OF HARVEST: June 30, 1981.

AREA HARVESTED FOR YIELD: 4.8 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN: Not reported.

Correlation Coefficients

N = Number of observations	Test weight	1000-kernel weight	Plant height	Flowering	Ripening	Winter survival	Spikes/m^2
Grain yield	.60**	.58**	.27**	-.63**	-.66**	.80**	.47**
N	100	116	116	116	116	120	112
Test weight		.50**	.13	-.73**	-.76**	.35**	.07
N		100	100	100	100	100	99
1000-kernel weight			.03	-.43**	-.46**	.35**	.23*
N			116	116	116	116	112
Plant height				.06	-.18	.41**	.20*
N				116	116	116	112
Flowering					.85**	-.41**	-.23*
N					116	116	112
Ripening						-.53**	-.18
N						116	112
Winter survival							.51**
N							112

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 25. Agronomic and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Suwon, Korea in 1981.

Cultivars	Yield q/ha	Test Weight kg/hl	1000-Kernel Weight g	Plant Height cm	Days to Flowering from Jan.1	Days to Ripening from Jan.1	Winter Survival %	Mildew leaves 0-9	Ears/m^2
Balkan	51.9	74.5	45.3	102	139	176	84	0	748
Sadovo Super	50.2	72.0	39.9	103	137	177	78	1	692
Vega	49.4	75.3	40.8	91	136	171	89	0	563
Martonvasari 6	48.8	73.1	40.9	117	143	178	81	0	615
Bezostaya 1	47.5	75.3	40.7	113	142	178	85	0	615
NE 79Y90576	47.3	73.8	28.2	111	134	171	89	8	585
Loudogorka	46.9	72.9	36.5	108	141	181	83	0	589
Pai yu pao	46.3	76.9	36.4	97	134	168	93	1	595
Chokwang	46.1	78.6	44.0	98	132	168	83	5	487
WWP 4394	45.7	76.1	38.2	117	140	174	90	0	582
Trakia	45.1	73.7	40.1	87	137	176	90	0	593
Jugoslavija	43.3	74.0	40.1	101	141	181	73	0	532
TAM W-105	42.6	77.0	34.8	108	136	174	93	0	783
TX 71A562-6	42.0	73.5	32.2	102	140	177	88	0	672
Phoenix (WW 33G)	41.8	76.2	33.1	89	135	176	71	1	680
Blueboy	39.9	69.6	35.0	120	142	182	88	3	668
Houser	36.6	67.1	37.2	107	145	181	79	0	592
Alcedo	33.9	70.2	32.1	104	147	186	85	1	617
NE 79Y95097	33.6	68.4	27.9	94	138	177	65	8	510
Atlas 66	31.7	73.6	34.1	134	142	176	55	0	517
Jana	28.7	65.1	28.1	118	150	186	90	0	613
Aura	27.7	69.0	32.9	121	149	184	91	0	607
Maris Mardler	23.6	66.5	34.8	76	146	190	40	0	582
Bounty	21.9	62.5	30.2	76	149	189	69	0	548
Takahe	13.4	74.4	33.9	106	147	187	40	0	537
Bastion	12.4	64.7	30.6	98	150	191	30	0	333
Irnerio	10.2	71.1	35.3	71	141	184	15	0	347
Kopara	9.6	.	30.8	104	145	183	28	0	417
Huenufen	8.7	64.0	26.0	89	149	190	25	0	358
Super X	0.0	.	.	.	.	.	0	.	.
Mean	34.2	72.1	35.2	102.0	141.4	179.6	68.8	1.0	579.8
LSD of the cultivar means (.05)	9.7	3.0	3.1	6.4	1.4	4.0	12.1	-	139.0
Coefficient of variation (%)	20.1	2.8	6.0	4.4	0.7	1.6	12.5	-	17.0

LEBANON

Tel Amara

COOPERATOR(S): A. Alameddine, A. Chaabane, and M. Chehade.

DATE OF PLANTING (EFFECTIVE GERMINATION): November 24, 1980.

PRECIPITATION DURING CYCLE OF TEST: 810 mm.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 100 kg/ha and P = 80 kg/ha. Ammonium nitrate and superphosphate were used.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Not reported.

DISEASE DEVELOPMENT: Negligible.

INSECT, WEED OR PEST PROBLEMS: Not reported.

DATE OF HARVEST: July 2, 1981.

AREA HARVESTED FOR YIELD: 3.0 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN: Not reported.

Correlation Coefficients

N = 30 observations	1000-kernel weight	Protein	Plant height	Flowering	Ripening
Grain yield	.35	-.37*	.42*	-.64**	-.61**
1000-kernel weight		.05	.16	-.16	-.23
Protein			-.42*	.52**	.41*
Plant height				-.60**	-.59**
Flowering					.91**

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 26. Agronomic and grain quality data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Beirut, Lebanon in 1981.

Cultivars	Yield q/ha	1000-Kernel[a/] Weight g	Protein[a/] %	Plant Height[a/] cm	Days to Flowering[a/] from Jan.1	Days to Ripening[a/] from Jan.1
WWP 4394	25.5	30.0	14.7	80	198	225
Super X	25.0	30.0	13.7	80	194	225
Chokwang	18.8	28.0	17.7	75	190	220
NE 79Y90576	18.5	30.0	14.1	95	192	224
Phoenix (WW 33G)	17.8	28.0	13.6	70	192	225
Sadovo Super	17.5	29.0	13.6	80	195	225
Balkan	17.3	32.0	13.5	75	196	225
Irnerio	16.8	26.0	13.5	70	193	225
Vega	16.8	27.0	17.1	70	195	225
NE 79Y95097	16.3	29.0	17.3	70	198	226
Trakia	15.0	29.0	16.0	65	194	225
Takahe	14.7	29.0	19.1	75	205	233
Kopara	14.3	28.0	15.9	70	205	232
TAM W-105	14.3	22.0	15.0	75	198	226
Pai yu pao	14.3	29.0	18.3	70	190	223
Jugoslavija	14.2	26.0	15.5	80	199	226
TX 71A562-6	14.0	27.0	13.4	70	198	222
Loudogorka	13.0	21.0	14.4	75	199	228
Bezostaya 1	12.7	24.0	14.9	75	200	228
Atlas 66	10.8	25.0	18.6	85	204	227
Martonvasari 6	10.0	31.0	17.6	70	201	228
Bastion	9.2	27.0	14.0	70	205	236
Blueboy	8.5	27.0	14.8	80	200	230
Houser	8.3	24.0	15.4	70	206	233
Aura	7.7	28.0	21.8	60	218	236
Huenufen	7.7	22.0	16.7	60	206	234
Bounty	6.5	30.0	18.7	50	215	235
Maris Mardler	5.7	24.0	16.4	50	210	235
Alcedo	2.5	30.0	16.9	65	220	236
Jana	2.2	24.0	17.7	60	218	236
Mean	13.2	27.2	16.0	71.3	201.1	228.5
LSD of the cultivar means (.05)	10.1	-	-	-	-	-
Coefficient of variation (%)	34.9	-	-	-	-	-

a/ One replication only.

MEXICO

Toluca

COOPERATOR(S): CIMMYT Bread Wheat Staff.

DATE OF PLANTING (EFFECTIVE GERMINATION): November 10, 1981.

PRECIPITATION DURING CYCLE OF TEST: 175 mm.

AMOUNT OF IRRIGATION APPLIED: Twelve times, amounts not reported.

FERTILIZER USED: N = 180 kg/ha and P = 100 kg/ha.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: January was the coldest period, with a monthly average temperature of 7.7°C. Temperatures ranged from -11°C to 30°C during the test cycle.

DISEASE DEVELOPMENT: Only stripe rust was notable.

INSECT, WEED OR PEST PROBLEMS: None.

DATE OF HARVEST: June 10, 1981.

AREA HARVESTED FOR YIELD: 3.6 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN: Not reported.

Correlation Coefficients

N = Number of observations	Protein	Plant height	Flowering	Ripening	Frost damage	B.Y.D.V.
Grain yield	-.11	.03	-.03	-.31*	-.09	-.13
N	26	52	52	52	52	52
Protein		-.52**	-.64**	-.55**	.19	.41*
N		30	.30	29	30	30
Plant height			.59**	.48**	-.23	-.38**
N			60	58	60	60
Flowering				.82**	-.32*	-.53**
N				58	60	60
Ripening					-.14	-.42**
N					58	58
Frost damage						.31*
N						60

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 27. Agronomic, grain quality, and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Toluca, Mexico in 1981.

Cultivars	Yield q/ha	Protein %	Plant[a] Height cm	Days to[a] Flowering from Jan.1	Days to[a] Ripening from Jan.1	Frost[a] Damage 0-9	Stripe Rust Sev %	Stripe Rust Resp	BYDV 0-9
WWP 4394	40.0	15.4	90	176	235	1	0	-	4
NE 79Y90576	36.2	14.6	95	164	227	1	73	S-	4
TAM W-105	30.4	14.3	88	169	230	1	73	S-	3
Trakia	28.1	14.3	70	164	231	1	0	S-	4
Huenufen	27.5	14.6	78	197	240	2	5	S-	4
Vega	27.1	14.8	73	165	230	1	0	-	5
Maris Mardler	25.0	14.6	78	175	246	1	0	-	4
Kopara	24.9	15.3	93	174	235	1	16	MS-S	4
Bounty	23.4	13.1	85	180	242	1	0	-	3
NE 79Y95097	23.3	16.6	75	161	230	2	15	MS-S	5
Phoenix (WW 33G)	22.7	14.3	85	152	228	3	15	S-	5
Blueboy	22.6	14.2	95	170	237	1	4	MS-S	5
Jugoslavija	21.5	15.6	88	178	240	1	0	-	4
TX 71A562-6	21.0	13.7	88	174	230	1	80	S-	5
Loudogorka	21.0	14.2	80	175	238	1	0	-	4
Sadovo Super	20.7	14.5	85	170	235	1	3	S-	4
Bezostaya 1	20.6	15.6	85	171	237	1	3	S-	4
Balkan	20.4	16.0	93	178	235	1	0	-	4
Bastion	18.6	14.0	100	172	238	1	0	-	4
Chokwang	17.1	17.2	75	161	225	2	88	S-	4
Takahe	16.5	17.1	88	178	242	1	55	S-	4
Martonvasari 6	16.1	14.6	95	176	238	1	31	S-	4
Houser	15.2	11.9	103	193	242	1	80	S-	4
Atlas 66	15.1	17.1	98	169	242	3	5	MS-S	5
Super X	14.2	13.9	78	161	238	3	20	S-	5
Pai yu pao	11.3	18.1	80	161	225	1	40	S-	5
Jana	.	12.2	103	198	255	1	0	-	3
Aura	.	12.6	105	210	255	1	3	S-	3
Alcedo	.	10.6	108	203	255	1	0	-	3
Irnerio	.	16.9	65	152	.	2	33	S-	5
Mean	22.3	14.7	87.2	174.0	237.1	1.3	21.3		4.0
LSD of the cultivar means (.05)	7.9	-	10.9	6.4	5.2	0.8	-		1.1
Coefficient of variation (%)	25.0	-	5.7	1.7	1.0	27.0	-		12.9

a/ Two replications.

THE NETHERLANDS

Wageningen

COOPERATOR: A. C. Zeven.

DATE OF PLANTING (EFFECTIVE GERMINATION): October 14, 1980.

PRECIPITATION DURING CYCLE OF TEST: 510 mm.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 46 kg/ha. (50% NO_3 and 50% NH_4).

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Winter conditions were mild, but cool wet weather predominated in spring right into summer.

DISEASE DEVELOPMENT: None.

INSECT, WEED OR PEST PROBLEMS: None.

DATE OF HARVEST: First two weeks of August, 1981.

AREA HARVESTED FOR YIELD: 4.5 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Winter survival - March 25, 1981.
Plant height - July 29, 1981.

Correlation Coefficients

N = 120 observations	Test weight	1000-kernel weight	Plant height	Flowering	Ripening	Shattering	Winter survival
Grain yield	.35**	.60**	.54**	.22*	.35**	-.26**	-.02
Test weight		.49**	.34**	-.10	.28**	-.18*	-.22*
1000-kernel weight			.54**	.25**	.61**	-.20*	.16
Plant height				.42**	.63**	-.09	-.06
Flowering					.59**	-.10	.28**
Ripening						-.19*	.23*
Shattering							-.37**

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 28. Agronomic data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Wageningen, The Netherlands in 1981.

Cultivars	Yield q/ha	Test Weight kg/hl	1000-Kernel Weight g	Plant Height cm	Days to Flowering from Jan.1	Days to Ripening from Jan.1	Shattering %	Winter Survival %
Maris Mardler	47.6	75.8	37.4	70	155	200	5	95
Jana	41.7	78.2	42.6	101	159	220	5	95
Bastion	41.3	77.6	41.0	88	157	223	5	91
Bounty	41.0	75.2	38.8	74	151	198	5	95
Houser	38.2	75.1	40.5	86	157	220	5	95
Alcedo	38.2	80.7	45.8	89	158	220	5	95
Aura	36.2	77.0	35.6	99	159	222	9	95
TX 71A562-6	35.9	78.7	34.0	68	154	208	5	91
Martonvasari 6	35.4	79.4	43.9	85	159	222	5	95
Blueboy	35.1	76.6	38.9	84	153	220	5	95
Huenufen	35.0	78.0	41.7	78	155	217	5	95
Phoenix (WW 33G)	34.5	79.6	30.5	64	148	204	5	95
Takahe	33.6	78.2	38.1	87	150	199	5	95
Trakia	33.0	79.9	43.8	55	150	210	5	95
WWP 4394	32.4	78.9	31.4	73	151	209	5	95
TAM W-105	32.0	79.9	33.3	72	154	211	5	95
Sadovo Super	32.0	74.7	29.6	66	158	208	5	95
Jugoslavija	31.8	77.1	34.5	70	151	199	10	90
Atlas 66	31.7	81.0	38.7	105	151	216	5	90
Loudogorka	31.6	79.0	37.8	79	156	201	5	95
Bezostaya 1	29.7	80.3	44.8	81	154	218	5	95
Balkan	29.5	77.5	36.5	63	151	198	5	95
Kopara	29.1	76.4	37.3	80	155	220	10	95
Super X	29.0	79.5	27.5	68	149	190	10	85
NE 79Y90576	24.8	75.6	22.7	71	153	201	5	95
NE 79Y95097	21.5	72.5	21.0	61	152	199	5	94
Vega	20.3	74 7	33.5	57	150	198	9	95
Irnerio	18.4	76.7	32.5	59	150	208	5	95
Pai yu pao	17.8	75.5	25.2	58	159	204	5	95
Chokwang	13.0	71.8	27.4	59	155	200	9	95
Mean	31.7	77.4	35.6	74.9	153.8	208.8	5.9	94.0
LSD of the cultivar means (.05)	4.5	1.9	0.4	5.3	0.7	2.7	1.1	1.1
Coefficient of variation (%)	10.0	1.8	0.9	5.1	0.3	0.9	13.0	0.8

NORWAY

Vollebekk

COOPERATOR: Helge Skinnes.

DATE OF PLANTING (EFFECTIVE GERMINATION): September 10, 1980.

PRECIPITATION DURING CYCLE OF TEST: 719 mm.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 120 kg/ha; P = 15 kg/ha; and K = 40 kg/ha. The nitrogen was applied in a split application. Thirty-five kg/ha was applied in autumn and 85 kg/ha was applied in spring.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Autumn and spring were generally warm and dry. Summer was wet and cold, however. The nursery (especially reps 1 and 2) was harmed by an ice covering during the winter. Many plots were killed because of the ice.

DISEASE DEVELOPMENT: There was a medium attack of mildew, and a strong attack of Septoria nodorum.

INSECT, WEED OR PEST PROBLEMS: None.

DATE OF HARVEST: September 7, 1981.

AREA HARVESTED FOR YIELD: 2.63 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Percent emergence	- October 7, 1980.
Winter survival	- May 13, 1981.
Frost damage	- May 13, 1981.
Plant height	- July 22, 1981.
Diseases	- August 3 and 20, 1981.

Correlation Coefficients

N = Number of observations	Test weight	1000-kernel weight	Plant height	Flowering	Ripening	Percent emergence	Winter survival	Frost damage	Falling number	Zeleny value	Neotec protein
Grain yield	.41	.57**	.68**	.55**	.22	.05	.78**	-.45**	-.32	-.36	-.73**
N	23	23	47	47	42	60	60	45	23	23	23
Test weight		.58**	.37	.03	.10	.04	.34	-.60**	-.29	.16	-.30
N		23	23	23	21	23	23	22	23	23	23
1000-kernel weight			.41	.25	.07	.09	.34	-.57**	-.48*	-.28	-.33
N			23	23	21	23	23	22	23	23	23
Plant height				.63**	.26	-.22	.14	-.31*	-.15	-.27	-.42*
N				47	42	47	47	45	23	23	23
Flowering					.57**	-.23	-.14	.02	-.10	-.51*	-.68**
N					42	47	47	45	23	23	23
Ripening						-.22	-.24	.32*	.05	-.15	-.38
N						42	42	42	21	21	21
Percent emergence							.39**	.17	.08	.49*	.05
N							60	45	23	23	23
Winter survival								-.43**	-.41*	.24	-.25
N								45	23	23	23
Frost damage									.49*	.25	.16
N									22	22	22
Falling number										.14	.11
N										23	23
Zeleny value											.39
N											23

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 29. Agronomic and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Vollebekk, Norway in 1981.

Cultivars	Yield q/ha	Test Weight kg/hl	1000-Kernel Weight g	Plant Height cm	Days to Flowering from Jan.1	Days to Ripening from Jan.1	Stand Establishment %	Winter Survival %	Frost Damage 0-9	Mildew leaves 0-9	Septoria leaves 0-9	Septoria ears %	Falling Number	Zeleny Value	Neotec Protein %
Aura	72.3	82.3	41.1	106	180	237	100	88	4	1	2	3	377	36	14.1
Houser	69.9	81.8	51.3	81	174	230	100	90	4	2	6	3	274	25	13.1
Martonvasari 6	62.5	84.0	45.4	89	175	231	100	100	4	1	5	6	267	50	14.1
Bezostaya 1	57.0	84.7	46.6	85	174	236	100	95	4	1	7	6	342	63	15.0
Jana	54.7	81.5	44.2	91	181	.	68	50	3	1	0	3	301	24	13.1
Blueboy	49.3	81.0	41.8	86	176	240	50	45	4	5	0	4	241	23	13.5
Alcedo	46.9	83.4	37.8	84	177	234	100	90	4	1	8	5	283	57	13.6
Sadovo Super	46.9	80.3	36.4	74	173	237	100	83	4	3	5	6	294	40	15.3
Loudogorka	45.5	81.4	39.1	81	174	238	100	90	4	1	5	6	246	58	15.0
Balkan	44.8	82.0	43.3	69	172	227	100	93	4	0	8	6	242	57	15.0
Jugoslavija	41.1	82.1	42.0	71	176	236	100	80	4	0	4	6	249	44	15.4
Trakia	28.3	82.6	43.0	59	172	233	93	50	4	2	5	7	415	37	14.0
Vega	27.3	81.2	43.6	65	168	229	93	50	4	0	5	7	256	36	16.9
WWP 4394	26.1	80.2	32.6	80	172	232	78	33	4	0	7	6	422	42	16.4
NE 79T90576	26.0	82.8	38.4	74	160	227	100	85	4	8	.	6	367	70	17.4
Bounty	25.7	72.6	32.0	68	180	238	100	53	7	1	5	7	369	42	14.6
TX 71A562-6	23.1	82.0	34.2	67	167	227	100	85	4	5	6	6	273	62	14.6
TAM W-105	18.6	82.3	45.8	62	163	237	98	83	4	4	5	6	238	60	17.7
Chokwang	17.6	75.0	34.5	56	163	220	100	88	4	8	7	8	338	47	19.9
Phoenix (WW 33G)	17.1	83.2	35.7	55	168	238	100	58	6	4	2	4	389	59	15.9
NE 79T95097	14.2	77.5	33.4	60	169	235	100	48	7	7	3	6	440	65	16.1
Atlas 66	12.5	81.9	43.1	94	176	.	90	18	6	2	0	4	281	49	18.6
Pai yu pao	10.3	80.0	31.7	58	166	232	83	35	5	1	7	6	322	46	17.5
Huenufen	0.0	.	.	64	176	.	90	2	.	4	7	7	.	.	.
Kopara	0.0	.	.	.	.	.	85	0	.	.	.	.	.	.	.
Irnerio	0.0	.	.	.	.	.	85	0	.	.	.	.	.	.	.
Bastion	0.0	.	.	.	.	.	90	0	.	.	.	.	.	.	.
Maris Mardler	0.0	.	.	.	.	.	100	0	.	.	.	.	.	.	.
Takahe	0.0	.	.	.	.	.	85	0	.	.	.	.	.	.	.
Super X	0.0	.	.	.	.	.	100	0	.	.	.	.	.	.	.
Mean	27.9	81.1	39.9	74.1	171.8	232.9	92.8	52.9	4.4	2.3	4.5	5.6	314.2	47.5	15.5
LSD of the cultivar means (.05)	10.7	-	-	8.3	2.6	5.9	12.4	18.1	1.2	-	-	-	-	-	-
Coefficient of variation (%)	17.4	-	-	5.1	0.7	1.1	6.1	15.6	12.1	-	-	-	-	-	-

POLAND

Przeclaw

COOPERATOR: E. Bilski.

DATE OF PLANTING (EFFECTIVE GERMINATION): September 23, 1980.

PRECIPITATION DURING CYCLE OF TEST: 595.1 mm.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 40 kg/ha; P = 80 kg/ha; and K = 100 kg/ha.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Autumn, especially October, was very wet. An adequate snow cover was present most of the time in winter. Spring temperatures were below average, but the days were sunny. July started out as very dry, but ended up too wet.

DISEASE DEVELOPMENT: There were moderate amounts of many diseases.

INSECT, WEED OR PEST PROBLEMS: None.

DATE OF HARVEST: July 25, 1981.

AREA HARVESTED FOR YIELD: 7.2 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Winter survival	- April 6, 1981.
Mildew	- June 17, 1981.
Septoria (leaves)	- June 23, 1981.
Leaf rust	- June 29, 1981.
Plant height	- July 1, 1981.
Septoria (ears)	- July 15, 1981.

Correlation Coefficients

N = Number of observations	Test weight	1000-kernel weight	Protein	Lysine/ protein	Plant height	Flowering	Ripening	Winter survival
Grain yield	.20*	.52**	-.49**	-.16	.25**	.55**	.53**	.29**
N	120	120	30	30	120	120	120	120
Test weight		.25**	.17	-.25	-.05	-.38**	-.35**	.09
N		120	30	30	120	120	120	120
1000-kernel weight			.00	-.10	.35**	.26**	.57**	-.06
N			30	30	120	120	120	120
Protein				-.04	-.09	-.45*	-.39*	-.35
N				30	30	30	30	30
Lysine/protein					.15	-.09	-.04	.17
N					30	30	30	30
Plant height						.25**	.59**	-.10
N						120	120	120
Flowering							.67**	.18
N							120	120
Ripening								-.09
N								120

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 30. Agronomic, grain quality, and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Przeclaw, Poland in 1981.

Cultivars	Yield q/ha	Test Weight kg/hl	1000-Kernel Weight g	Protein %	Adjusted lysine/ Protein %	Plant Height cm	Days to Flowering from Jan.1	Days to Ripening from Jan.1	Winter Survival %	Stripe Rust Sev %	Stripe Rust Resp	Leaf Rust Sev %	Leaf Rust Resp	Mildew leaves 0-9	Septoria leaves 0-9	Septoria ears %
Maris Mardler	51.3	62.9	44.3	11.0	3.00	68	165	202	90	0	-	1	R-	1	2	3
Alcedo	50.5	70.5	47.5	10.4	3.05	93	156	200	98	0	-	11	MR-	2	2	3
Jugoslavija	45.7	72.0	47.4	11.9	2.83	83	154	197	97	0	-	1	R-	3	4	3
WWP 4394	44.5	72.2	40.0	11.7	2.95	84	155	197	65	0	-	2	R-	4	3	3
Phoenix (WW 33G)	43.0	72.2	38.5	11.2	2.95	73	152	197	98	4	R-	6	R-	4	3	2
Balkan	41.0	72.0	50.0	12.4	2.91	78	154	197	97	0	-	1	R-	3	2	3
Jana	40.5	64.7	43.2	10.0	3.23	105	161	202	97	3	R-	18	MR-	3	2	3
Bounty	39.6	65.5	42.2	11.3	2.93	69	163	198	97	0	-	1	R-	2	2	3
Loudogorka	39.1	69.4	43.0	11.3	2.96	88	154	197	98	3	R-	6	R-MR	4	3	3
TAM W-105	38.5	72.3	40.2	12.1	3.20	78	152	195	97	2	R-	6	R-	7	2	3
Martonvasari 6	37.9	71.1	47.8	12.1	3.00	92	156	199	95	3	R-	8	R-	2	3	3
Sadovo Super	36.8	67.3	39.0	9.9	2.87	76	153	196	90	9	MR-	15	MR-	5	3	3
Houser	36.5	66.1	42.4	10.7	2.91	89	156	199	98	19	MR-	16	MR-	4	3	3
Blueboy	36.2	65.5	46.7	11.2	3.01	95	156	203	53	1	R-	5	R-	6	2	2
Bezostaya 1	35.8	70.5	46.4	12.9	3.11	89	153	197	97	1	R-	5	R-	4	3	3
Huenufen	34.9	67.9	39.9	12.1	2.91	82	156	197	68	0	-	10	MR-	5	3	3
Kopara	34.8	68.1	39.9	13.5	2.86	86	154	198	78	3	R-	5	R-	5	4	4
Bastion	33.7	64.5	44.5	11.1	3.00	89	156	200	50	2	R-	2	R-	3	3	3
Aura	33.4	66.6	41.3	11.0	2.91	100	162	202	98	0	-	13	MR-	3	3	2
Trakia	31.6	70.5	47.3	12.5	2.97	65	153	197	88	0	-	10	MR-	4	3	2
TX 71A562-6	31.3	69.8	31.1	11.0	2.88	79	154	196	98	5	R-	6	R-MR	5	3	3
Vega	28.9	68.7	40.5	13.0	2.88	66	153	196	90	10	MR-	5	R-	5	3	3
Atlas 66	28.2	68.5	43.1	15.0	2.95	106	155	197	49	0	-	11	MR-	4	1	3
Super X	26.0	72.9	39.7	11.8	2.84	74	156	196	58	0	-	2	R-	4	3	3
Pai yu pao	24.8	67.4	33.3	13.1	2.93	66	151	194	73	5	R-	2	R-	7	2	3
Takahe	24.2	67.3	44.6	13.1	3.02	89	148	199	53	21	MR-	2	R-	4	2	2
NE 79Y90576	23.9	67.3	29.9	11.0	3.11	81	151	195	97	18	MR-	8	R-	7	1	2
NE 79Y95097	21.8	63.7	23.7	12.4	3.10	70	153	195	95	11	MR-	3	R-	7	1	2
Irnerio	21.7	68.2	36.9	11.9	3.08	62	152	194	53	16	MR-	9	R-	4	4	4
Chokwang	12.6	66.5	39.9	13.8	3.14	70	150	194	97	25	MR-	0	-	5	3	2
Mean	34.3	68.4	41.2	11.9	2.98	81.4	154.7	197.4	83.5	5.3		6.3		4.0	2.5	2.8
LSD of the cultivar means (.05)	1.5	0.2	0.6	-	-	5.2	0.5	0.5	3.9	-		-		-	-	-
Coefficient of variation (%)	3.2	0.2	1.1	-	-	4.6	0.2	0.2	3.3	-		-		-	-	-

POLAND

Warsaw

COOPERATOR: Stanislaw Starzycki.

DATE OF PLANTING (EFFECTIVE GERMINATION): September 24, 1980.

PRECIPITATION DURING CYCLE OF TEST: 564.5 mm.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 120 kg/ha; P = 120 kg/ha; and K = 80 kg/ha.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Climatic conditions were very good throughout the test cycle.

DISEASE DEVELOPMENT: There was a very heavy epidemic of stripe rust and Septoria.

INSECT, WEED OR PEST PROBLEMS: None.

DATE OF HARVEST: August 4, 1981.

AREA HARVESTED FOR YIELD: 6.0 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Winter survival	- March 26, 1981.
Mildew	- June 26, 1981.
Stripe rust	- July 6, 1981.
Leaf rust	- July 11, 1981.
Stem rust	- July 11, 1981.
Plant height	- July 20, 1981.
Septoria	- July 24, 1981.
Lodging	- July 31, 1981.

Correlation Coefficients

N = Number of observations	Test weight	1000-kernel weight	Protein	Plant height	Lodging	Flowering	Ripening	Winter survival
Grain yield	.56**	.67**	-.32	.29**	-.14	.25**	.43**	.54**
N	120	120	30	120	120	120	120	120
Test weight		.70**	.17	.31**	-.18*	.26**	.47**	.16
N		120	30	120	120	120	120	120
1000-kernel weight			.05	.09	-.44**	.25**	.52**	.26**
N			30	120	120	120	120	120
Protein				-.10	.13	-.16	-.07	-.38*
N				30	30	30	30	30
Plant height					.32**	.48**	.50**	.11
N					120	120	120	120
Lodging						-.06	-.18*	.16
N						120	120	120
Flowering							.62**	.03
N							120	120
Ripening								.20*
N								120

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 31. Agronomic, grain quality, and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Warsaw, Poland in 1981.

Cultivars	Yield q/ha	Test Weight kg/hl	1000-Kernel Weight g	Protein %	Plant Height cm	Lodging %	Days to Flowering from Jan.1	Days to Ripening from Jan.1	Winter Survival %	Stripe Rust Sev %	Stripe Rust Resp	Leaf Rust Sev %	Leaf Rust Resp	Mildew leaves 0-9	Septoria leaves 0-9
Balkan	87.8	76.5	49.4	15.5	81	38	156	204	81	0	-	0	-	2	5
Jugoslavija	87.4	76.0	43.6	14.3	86	13	156	215	84	0	-	0	-	1	4
Alcedo	83.4	76.7	36.9	14.0	103	78	157	214	99	0	-	20	MR-	4	4
Sadovo Super	82.8	73.6	37.9	13.7	85	15	155	214	78	70	MS-	75	S-	4	5
Jana	80.6	74.2	35.5	13.6	112	80	161	215	99	78	S-	80	S-	3	5
Maris Mardler	80.4	73.8	40.8	14.0	75	0	161	215	83	0	-	0	-	0	5
Phoenix (WW 33G)	79.6	73.1	35.0	14.3	78	43	154	214	75	78	MS-	45	MS-	2	6
Martonvasari 6	79.0	75.5	38.0	14.7	102	43	157	214	89	88	S-	0	-	3	6
Bounty	76.9	71.0	35.7	14.3	80	13	159	211	84	0	-	0	-	1	4
Blueboy	76.5	73.6	36.0	13.6	111	45	159	215	39	0	-	0	-	8	2
WWP 4394	72.0	75.3	35.9	17.1	88	65	156	203	50	0	-	0	-	2	6
TAM W-105	69.2	75.3	30.6	14.0	79	100	155	201	83	73	MS-S	0	-	4	8
Bezostaya 1	68.6	76.1	37.3	16.4	94	80	157	215	75	68	MS-	0	-	7	6
Loudogorka	67.8	76.0	37.5	15.0	97	25	157	212	71	80	S-	0	-	4	5
Vega	66.3	71.7	36.5	15.0	77	28	153	201	60	85	S-	13	MR-	5	9
Huenufen	65.0	71.8	31.4	14.3	85	60	157	203	58	0	-	50	MR-MS	4	6
Aura	61.5	72.8	30.9	15.1	110	100	161	215	80	0	-	90	S-	4	5
NE 79Y95097	60.2	67.0	27.5	14.0	77	40	155	201	79	0	-	0	-	8	7
NE 79Y90576	60.1	69.4	23.5	13.0	91	95	152	200	86	80	S-	0	-	4	9
Atlas 66	60.0	77.2	34.7	17.4	103	100	156	214	55	45	MR-MS	60	MS-	2	3
Pai yu pao	59.1	70.8	30.3	14.3	76	53	151	200	63	80	S-	0	-	5	8
TX 71A562-6	57.0	66.4	21.9	14.4	88	98	155	202	84	80	S-	0	-	8	9
Bastion	56.0	72.9	29.9	14.6	93	60	156	212	35	0	-	0	-	2	6
Houser	53.7	64.8	26.0	12.7	90	80	158	204	74	90	S-	15	MR-	2	8
Kopara	52.7	73.9	33.4	15.9	93	25	155	202	43	53	MR-MS	0	-	2	6
Trakia	48.8	73.6	41.7	15.7	74	3	155	215	70	0	-	35	MR-	6	7
Chokwang	41.6	69.1	28.2	15.9	76	100	148	199	93	90	S-	0	-	5	8
Super X	26.7	73.5	27.2	16.0	76	38	156	201	26	20	MR-	0	-	3	6
Irnerio	23.5	62.1	22.8	15.8	72	48	151	200	35	90	S-	50	MS-	4	9
Takahe	20.2	68.6	25.7	15.7	83	40	160	209	38	90	S-	15	MR-	3	8
Mean	63.5	72.4	33.4	14.8	87.6	53.3	155.8	207.9	68.8	44.5		18.3		3.6	6.0
LSD of the cultivar means (.05)	11.6	3.2	2.9	-	8.4	35.2	0.9	1.3	11.5	-		-		-	-
Coefficient of variation (%)	13.0	3.1	6.1	-	6.8	46.9	0.4	0.4	11.9	-		-		-	-

ROMANIA

Fundulea

COOPERATOR(S): G. Ittu and N. Saulescu.

DATE OF PLANTING (EFFECTIVE GERMINATION): October 10, 1980.

PRECIPITATION DURING CYCLE OF TEST: 665.7 mm.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 130 kg/ha and P = 80 kg/ha.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Autumn conditions were ideal for emergence and growth. Mild weather persisted throughout winter and spring. Rainfall was adequate until flowering time, after which hot, dry weather began. The drought conditions may have reduced the yields somewhat.

DISEASE DEVELOPMENT: Conditions were right for Septoria development. Leaf rust and stripe rust also were noted.

INSECT, WEED OR PEST PROBLEMS: Weeds were controlled with ICEDIN (2, 4-D + Dicamba).

DATE OF HARVEST: July 15, 1981.

AREA HARVESTED FOR YIELD: 5.0 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Density of plants/m^2	-	October 25, 1980.
Frost damage	-	March 15, 1981.
Winter survival	-	March 20, 1981.
No. of spikes/m^2	-	June 15, 1981.
Septoria	-	June 15, 1981.
Stripe rust	-	June 15, 1981.
Plant height	-	June 18, 1981.
Leaf rust	-	June 25, 1981.

Correlation Coefficients

N = Number of observations	Test weight	1000-kernel weight	Protein	Plant height	Flowering	Ripening	Winter survival	Frost damage	Plants/m^2	Spikes/m^2
Grain yield	.51**	.52**	-.17	.13	-.24**	-.23*	.58**	-.51**	.48**	.71**
N	120	120	30	120	120	120	120	120	120	120
Test weight		.59**	-.05	.17	-.55**	-.51**	.14	-.24**	.01	.33**
N		120	30	120	120	120	120	120	120	120
1000-kernel weight			.18	.02	-.24**	-.20*	.24**	-.17	-.03	.09
N			30	120	120	120	120	120	120	120
Protein				.27	.22	.25	.02	.27	-.36	-.28
N				30	30	30	30	30	30	30
Plant height					.36**	.38**	.21*	-.26**	.15	.19*
N					120	120	120	120	120	120
Flowering						.98**	.02	.01	.12	-.18
N						120	120	120	120	120
Ripening							-.03	.09	.11	-.19*
N							120	120	120	120
Winter survival								-.80**	.36**	.48**
N								120	120	120
Frost damage									-.35**	-.51**
N									120	120
Plants/m^2										.58**
N										120

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 32. Agronomic, grain quality, and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Fundulea, Romania in 1981.

Cultivars	Yield q/ha	Test Weight kg/hl	1000-Kernel Weight g	Protein %	Plant Height cm	Days to Flowering from Jan.1	Days to Ripening from Jan.1	Winter Survival %	Frost Damage 0-9	Stripe Rust Sev %	Stripe Rust Resp	Leaf Rust Sev %	Leaf Rust Resp	Septoria leaves 0-9	Plants/m^2	Ears/m^2
Jugoslavija	69.8	80.8	43.1	13.9	101	148	180	100	4	0	VR-	9	R-	4	283	485.0
Balkan	65.9	79.6	44.2	15.5	97	148	180	100	3	5	R-	9	R-	4	334	584.5
Sadovo Super	65.9	74.3	34.5	13.2	104	147	179	100	2	0	VR-	83	S-	5	308	580.0
Trakia	63.1	79.2	43.1	13.2	81	146	180	100	2	5	R-	28	MS-	6	266	484.0
Phoenix (WW 33G)	61.9	79.8	32.7	12.5	82	145	178	100	4	0	VR-	90	S-	3	350	573.5
Bezostaya 1	61.7	81.8	41.4	13.7	108	149	180	100	0	5	R-	53	MS-	5	301	560.5
TX 71A562-6	61.3	75.3	32.7	10.7	91	150	180	100	0	9	MS-	10	R-	4	305	600.0
Alcedo	61.0	79.5	34.0	11.8	109	152	183	100	1	0	VR-	70	VS-	3	426	600.5
Martonvasari 6	60.9	79.9	39.5	12.9	117	150	181	100	1	10	R-	50	S-	5	418	530.5
Loudogorka	59.2	77.5	38.6	14.3	105	149	181	100	2	6	R-	40	MS-	4	290	467.5
TAM W-105	59.0	80.6	35.2	13.0	94	147	179	100	0	20	MR-MS	10	R-	6	358	616.0
Houser	54.5	73.4	32.9	11.9	100	151	182	100	0	75	S-	55	S-	0	358	602.0
WWP 4394	53.1	80.4	35.4	14.2	105	149	181	100	1	0	VR-	0	VR-	3	209	520.5
Vega	51.9	77.0	40.2	14.5	80	145	177	100	3	6	R-	13	R-	5	202	377.0
Jana	49.9	74.9	35.4	13.7	115	156	185	100	0	0	VR-	8	R-	4	404	471.0
NE 79Y90576	48.3	75.0	29.0	12.5	101	144	177	100	0	88	S-	0	-	0	406	518.0
NE 79Y95097	46.9	72.8	30.9	12.5	86	147	179	100	3	13	R-MR	9	R-	5	378	533.0
Pai yu pao	45.2	80.0	31.1	12.4	84	143	176	100	1	33	S-	0	-	8	172	504.5
Chokwang	44.9	80.5	37.1	12.5	83	140	174	100	1	10	MR-	73	VS-	3	340	544.0
Atlas 66	43.7	77.4	30.9	16.8	138	150	182	100	4	23	S-	10	R-	2	280	543.5
Maris Mardler	42.6	69.5	32.4	13.8	77	154	184	100	5	0	VR-	83	S-	5	392	478.0
Super X	41.4	78.3	35.2	12.9	89	146	179	90	7	5	R-	10	R-	7	342	525.5
Bounty	40.5	70.6	30.9	14.1	80	156	185	100	2	0	VR-	68	S-	3	376	483.0
Takahe	39.1	74.0	33.2	15.3	102	153	182	100	1	20	MR-	50	MR-	4	152	431.0
Aura	35.5	73.0	28.7	13.5	116	157	186	100	2	0	VR-	55	S-	3	416	455.5
Huenufen	33.2	73.7	31.5	13.0	83	152	183	94	6	0	VR-	65	S-	4	203	299.5
Kopara	29.9	73.5	31.8	14.3	97	150	182	95	6	0	VR-	45	MS-	5	142	339.0
Irnerio	19.8	74.6	30.9	13.4	73	146	178	91	6	90	VS-	68	S-	0	138	293.0
Bastion	19.8	75.5	32.3	13.6	105	152	183	90	7	0	VR-	43	MS-	3	124	291.0
Blueboy	19.6	75.0	37.4	13.4	104	151	182	100	2	9	R-	10	R-	4	95	304.5
Mean	48.3	76.6	34.9	13.4	96.7	149.1	180.6	98.7	2.5	14.3		37.0		3.9	292.3	486.5
LSD of the cultivar means (.05)	3.7	1.0	1.3	-	6.3	-	0.1	0.9	0.3	-		-		-	86.4	85.3
Coefficient of variation (%)	5.4	0.9	2.6	-	4.6	0.0	0.1	0.7	9.9	-		-		-	21.0	12.5

REPUBLIC OF SOUTH AFRICA

Bethlehem

(dryland)

COOPERATOR(S): R. Britz and K. W. Packendorf.

DATE OF PLANTING (EFFECTIVE GERMINATION): May 26, 1981.

PRECIPITATION DURING CYCLE OF TEST: 177.4 mm.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 18 kg/ha; P = 12 kg/ha; and K = 6 kg/ha. A compound fertilizer (3:2:1) was used.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Not reported.

DISEASE DEVELOPMENT: Only a mild infection of leaf rust and stem rust was noted.

INSECT, WEED OR PEST PROBLEMS: The nursery was sprayed with a pre-emergence herbicide. Aphids were controlled with metasystox and Folidol.

DATE OF HARVEST: December 15 and 28, 1981.

AREA HARVESTED FOR YIELD: 10.8 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Rusts - December 2 and 7, 1981.
Plant height - December 7, 1981.

Correlation Coefficients

N = Number of observations	Test weight	1000-kernel weight	Protein	Plant height	Flowering	Ripening
Grain yield	.38**	.37**	-.50**	-.10	-.31*	-.23*
N	120	120	30	90	60	90
Test weight		.43**	-.35	.33**	-.01	-.01
N		120	30	90	60	90
1000-kernel weight			.03	-.01	.15	.14
N			30	90	60	90
Protein				.13	.10	-.11
N				30	30	30
Plant height					.20	-.03
N					60	90
Flowering						.77**
N						60

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 33. Agronomic, grain quality, and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Bethlehem, South Africa in 1981 (dryland).

Cultivars	Yield q/ha	Test Weight kg/hl	1000-Kernel Weight g	Protein %	Plant Height cm	Days to Flowering from Jan.1	Days to Ripening from Jan.1	Leaf Rust Sev %	Leaf Rust Resp	Stem Rust Sev %	Stem Rust Resp
Sadovo Super	18.6	73.6	32.9	14.4	62	294	331	10	S-	0	-
Balkan	18.5	78.1	37.9	16.2	68	303	326	0	-	0	-
Jugoslavija	18.5	79.2	36.9	15.9	62	304	332	0	-	0	-
Loudogorka	17.0	79.1	38.8	15.6	75	303	334	30	S-	0	-
Martonvasari 6	16.8	77.8	37.7	16.6	75	306	335	0	-	0	-
Trakia	16.6	76.4	36.1	15.0	65	294	327	0	-	10	S-
Irnerio	16.5	76.0	33.4	14.6	55	289	331	0	-	0	-
Bounty	16.3	72.3	31.5	16.0	50	309	343	0	-	0	-
Blueboy	16.2	75.3	33.8	13.5	78	303	333	10	S-	2	S-
Bezostaya 1	16.2	80.2	36.6	17.0	75	302	334	0	-	0	-
WWP 4394	16.0	78.6	31.7	16.3	70	302	332	0	-	0	-
TX 71A562-6	15.7	77.9	29.6	13.8	75	303	332	0	-	0	-
Chokwang	15.6	74.9	34.8	18.7	65	291	322	0	-	0	-
Maris Mardler	14.9	73.0	36.1	16.5	55	306	342	30	S-	0	-
Vega	14.5	72.4	32.1	16.2	65	296	327	0	-	0	-
Super X	14.3	77.9	35.2	16.3	65	292	330	0	-	0	-
Phoenix (WW 33G)	14.1	77.5	35.6	15.9	60	286	327	10	S-	0	-
TAM W-105	13.6	80.3	28.8	14.1	70	303	334	30	S-	0	-
NE 79Y90576	12.8	74.0	25.8	17.4	75	296	326	0	-	0	-
Houser	12.6	75.2	31.4	14.3	65	310	344	30	S-	2	S-
Bastion	12.4	75.3	33.3	16.7	70	306	346	20	S-	20	S-
Jana	12.2	73.4	32.6	17.0	70	312	345	20	S-	10	S-
NE 79Y95097	12.2	70.7	27.6	16.2	60	294	330	50	S-	20	S-
Kopara	12.1	72.7	32.0	17.6	75	305	335	30	S-	0	-
Atlas 66	11.5	75.4	30.5	20.2	80	305	336	10	S-	5	S-
Takahe	11.4	71.8	32.3	19.0	65	303	324	50	S-	20	S-
Pai yu pao	11.3	74.2	31.0	17.3	65	289	314	0	-	0	-
Alcedo	10.3	75.7	33.3	17.5	60	315	344	20	S-	40	S-
Huenufen	10.0	74.5	32.8	16.0	65	308	344	40	S-	5	S-
Aura	9.6	76.2	37.6	16.9	70	315	346	5	S-	5	S-
Mean	14.3	75.7	33.3	16.3	67.0	301.5	333.5	13.2		4.6	
LSD of the cultivar means (.05)	2.2	0.9	1.3	-	1.7	0.3	3.8	-		-	
Coefficient of variation (%)	11.0	0.8	2.7	-	1.6	0.0	0.7	-		-	

REPUBLIC OF SOUTH AFRICA

Bethlehem

(irrigated)

COOPERATOR(S): R. Britz and K. W. Packendorf.

DATE OF PLANTING (EFFECTIVE GERMINATION): June 3, 1981.

PRECIPITATION DURING CYCLE OF TEST: 235.8 mm.

AMOUNT OF IRRIGATION APPLIED: 200 mm.

FERTILIZER USED: N = 18 kg/ha; P = 12 kg/ha; and K = 6 kg/ha.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Climatic conditions were not reported, but it was noted that the ideal plant population per plot was not achieved because of planter problems.

DISEASE DEVELOPMENT: There were moderate amounts of leaf rust and stem rust, but they developed late and did not harm the overall yields.

INSECT, WEED OR PEST PROBLEMS: The plots were heavily infested with aphids, which were sprayed with Metasystox and Folidol.

DATE OF HARVEST: December 29, 1981.

AREA HARVESTED FOR YIELD: 7.0 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Rusts - December 7, 1981.
Plant height - December 10, 1981.
Shattering - December 28, 1981.

Correlation Coefficients

N = Number of observations	Test weight	1000-kernel weight	Protein	Plant height	Flowering	Ripening	Shattering
Grain yield	.62**	.49**	-.39*	.09	-.33**	-.24**	.36
N	120	120	30	120	120	120	30
Test weight		.63**	-.12	.33**	-.39**	-.36**	.36
N		120	30	120	120	120	30
1000-kernel weight			-.12	.08	-.10	-.04	.10
N			30	120	120	120	30
Protein				.27	.00	.12	-.16
N				30	30	30	30
Plant height					-.08	-.07	.37*
N					120	120	30
Flowering						.72**	-.28
N						120	30
Ripening							-.43*
N							30

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 34. Agronomic, grain quality, and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Bethlehem, South Africa in 1981 (irrigated).

Cultivars	Yield q/ha	Test Weight kg/hl	1000-Kernel Weight g	Protein %	Plant Height cm	Days to Flowering from Jan.1	Days to Ripening from Jan.1	Shattering %	Leaf Rust Sev %	Leaf Rust Resp	Stem Rust Sev %	Stem Rust Resp
Jugoslavija	34.7	76.0	39.6	20.5	80	305	346	5	0	-	0	-
Phoenix (WW 33G)	30.8	74.5	32.5	19.9	70	293	339	0	60	S-	50	S-
Maris Mardler	29.0	67.4	34.1	20.3	60	314	366	0	50	S-	30	S-
TAM W-105	28.7	76.7	30.2	18.4	76	307	344	0	10	S-	20	S-
Sadovo Super	28.0	71.0	34.6	20.9	73	301	346	10	90	S-	10	S-
NE 79Y95097	27.6	67.0	25.3	20.9	75	300	336	5	30	S-	20	S-
Balkan	26.5	74.2	40.9	22.0	80	306	340	5	0	-	0	-
Bounty	25.8	69.2	32.7	19.2	65	314	364	0	20	S-	10	S-
Martonvasari 6	25.3	74.6	34.9	21.6	80	308	354	0	30	S-	30	S-
Irnerio	25.1	70.9	33.4	17.8	60	300	341	0	60	S-	30	S-
NE 79Y90576	24.8	68.7	26.1	21.0	83	302	338	5	5	S-	5	S-
Bezostaya 1	24.4	75.5	36.8	22.6	77	307	349	0	20	S-	20	S-
Super X	23.4	72.3	30.0	18.2	77	293	337	15	0	-	0	S-
Houser	23.2	70.7	30.6	18.2	80	314	354	5	50	S-	30	S-
Loudogorka	22.8	72.3	36.3	22.9	80	307	357	0	0	-	30	S-
Chokwang	22.7	70.2	30.2	22.1	75	293	334	5	30	S-	0	-
Trakia	20.2	69.2	32.8	22.1	65	299	339	0	30	S-	30	S-
WWP 4394	20.2	74.9	32.1	22.8	87	302	340	10	0	-	5	S-
Vega	19.5	67.8	29.0	22.5	63	302	342	0	30	S-	20	S-
Kopara	19.3	66.7	28.3	22.8	80	307	354	0	30	S-	5	S-
Bastion	18.9	67.5	30.4	20.1	75	314	369	0	10	S-	50	S-
Pai yu pao	18.8	71.2	31.5	20.8	75	293	337	0	30	S-	10	S-
Takahe	18.0	68.2	28.9	24.3	80	312	349	0	60	S-	40	S-
Huenufen	17.9	69.0	31.7	20.7	65	314	349	0	30	S-	20	S-
Atlas 66	15.9	71.6	28.5	25.5	80	314	359	0	50	S-	20	S-
Blueboy	14.1	67.4	29.8	18.4	80	307	346	0	50	S-	20	S-
TX 71A562-6	12.9	66.0	27.2	19.9	60	309	339	0	5	S-	5	S-
Aura	12.6	66.0	29.7	21.1	73	324	362	0	40	S-	40	S-
Jana	11.0	58.0	26.5	21.2	70	322	364	0	30	S-	30	S-
Alcedo	5.7	57.6	26.0	22.5	70	312	360	0	90	S-	30	S-
Mean	21.6	69.8	31.4	21.0	73.8	306.5	348.4	2.2	31.3		20.3	
LSD of the cultivar means (.05)	6.6	3.3	2.7	-	2.3	6.4	4.0	-	-		-	
Coefficient of variation (%)	21.8	3.4	6.0	-	2.2	1.5	0.8	-	-		-	

SPAIN

Alcala de Henares

COOPERATOR(S): J. Salazar and M. Branas.

DATE OF PLANTING (EFFECTIVE GERMINATION): December 2, 1980.

PRECIPITATION DURING CYCLE OF TEST: 195.8 mm.

AMOUNT OF IRRIGATION APPLIED: 10 mm.

FERTILIZER USED: N = 110 kg/ha; P = 120 kg/ha; and K = 40 kg/ha. A compound fertilizer (8-24-8) was used along with Calcium nitrate.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Temperatures became very hot and detrimental to plant development during the month of June.

DISEASE DEVELOPMENT: There was only a modest occurrence of mildew in the nursery.

INSECT, WEED OR PEST PROBLEMS: None.

DATE OF HARVEST: July 20, 1981.

AREA HARVESTED FOR YIELD: 7.5 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Mildew - May 22, 1981.

Correlation Coefficients

N = Number of observations	1000-kernel weight	Protein	Plant height	Flowering	Ripening	Frost damage
Grain yield	.42**	-.59**	.55**	-.70**	-.17	-.14
N	119	30	120	120	120	120
1000-kernel weight		-.48**	.28**	-.11	.17	-.09
N		30	119	119	119	119
Protein			.15	.32	.21	.14
N			30	30	30	30
Plant height				-.33**	.08	-.07
N				120	120	120
Flowering					.54**	.10
N					120	120
Ripening						.02
N						1120

** Significant at the .01 probability level.

Table 35. Agronomic, grain quality, and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Madrid, Spain in 1981.

Cultivars	Yield q/ha	1000-Kernel Weight g	Protein %	Plant Height cm	Days to Flowering from Jan.1	Days to Ripening from Jan.1	Frost Damage 0-9	Mildew leaves 0-9
Chokwang	12.9	26.0	15.7	78	134	168	1	6
Jugoslavija	9.1	27.3	18.7	78	141	165	1	2
TAM W-105	7.6	21.5	19.1	70	142	165	0	5
Phoenix (WW 33G)	7.0	20.3	19.0	68	135	164	1	6
Irnerio	6.8	24.3	18.8	67	138	164	3	5
Super X	6.6	21.8	18.0	65	140	163	0	6
TX 71A562-6	6.1	19.5	22.2	75	142	169	0	5
Vega	6.1	19.5	19.8	68	140	167	1	5
Pai yu pao	6.1	21.5	21.8	72	136	167	0	6
Martonvasari 6	5.8	29.0	20.7	79	146	170	0	3
WWP 4394	5.5	22.3	21.2	73	147	170	1	1
Loudogorka	5.4	27.3	19.0	81	144	170	1	5
Sadovo Super	5.4	23.3	21.5	69	143	166	0	5
Bezostaya 1	4.8	26.0	21.4	68	147	168	1	4
Balkan	4.7	27.3	18.4	68	142	166	1	0
NE 79Y95097	4.6	19.5	22.0	69	141	164	1	7
Blueboy	4.5	22.3	21.3	72	146	168	0	5
NE 79Y90576	4.5	18.5	20.0	78	141	166	3	7
Trakia	4.3	20.3	20.1	66	140	168	0	4
Takahe	3.8	22.5	20.5	76	150	169	3	0
Houser	3.1	23.5	17.3	61	151	170	1	4
Kopara	3.1	19.3	22.1	63	148	170	1	5
Bastion	3.0	20.8	22.7	73	150	170	1	0
Maris Mardler	3.0	23.0	16.6	48	152	170	0	0
Atlas 66	2.9	19.3	22.8	87	150	168	1	5
Huenufen	2.8	19.3	22.1	60	151	170	4	4
Bounty	1.3	19.3	22.5	53	152	168	1	0
Alcedo	1.1	24.5	20.3	64	152	170	1	2
Aura	0.9	23.5	20.3	69	152	169	1	2
Jana	0.7	20.0	23.1	63	152	170	0	2
Mean	4.8	22.4	20.3	69.3	144.8	167.6	0.9	3.6
LSD of the cultivar means (.05)	3.0	3.5	-	11.7	2.3	2.7	1.3	-
Coefficient of variation (%)	45.0	11.0	-	12.0	1.1	1.1	103.3	-

SPAIN

Zaragoza

COOPERATOR: J. Comenge.

DATE OF PLANTING (EFFECTIVE GERMINATION): December 10, 1980.

PRECIPITATION DURING CYCLE OF TEST: 250 mm.

AMOUNT OF IRRIGATION APPLIED: 240 mm.

FERTILIZER USED: N = 110 kg/ha; P = 144 kg/ha; and K = 48 kg/ha. A granular compound (12-24-8) was used along with Calcium ammonium nitrate.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Winter was mild, dry, and windy. There were occasional spring frosts but no spring rains.

DISEASE DEVELOPMENT: There was an abundance of Oidium, especially at the end of the growing season. Very little rust was observed.

INSECT, WEED OR PEST PROBLEMS: A mild attack by birds is common each year.

DATE OF HARVEST: July 15, 1981.

AREA HARVESTED FOR YIELD: 8.25 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Oidium - May, 1981.
Plant height - July, 1981.

Correlation Coefficients

N = 30 observations	Test weight	Protein	Lysine/protein	Plant height	Flowering
Grain yield	.39*	-.57**	-.11	.05	-.40*
Test weight		-.23	-.21	-.34	-.52**
Protein			-.33	.22	.11
Lysine/protein				.01	.33
Plant height					.38*

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 36. Agronomic, grain quality, and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Zaragoza, Spain in 1981.

Cultivars	Yield q/ha	Test Weight kg/hl	Protein %	Adjusted Lysine/Protein %	Plant Height cm	Days to Flowering from Jan.1	Mildew leaves 0-9
Super X	34.5	78.7	12.8	2.91	80	131	4
TAM W-105	33.3	79.5	11.5	3.21	65	140	4
Phoenix (WW 33G)	33.0	80.0	12.9	3.09	75	130	5
Houser	28.4	73.1	12.7	3.25	85	146	1
TX 71A562-6	27.2	80.0	11.9	3.16	70	143	5
Jugoslavija	26.0	76.4	15.0	3.20	85	137	3
NE 79Y95097	26.0	70.5	13.2	3.31	70	137	7
Sadovo Super	24.8	74.1	14.0	3.20	75	135	6
Bezostaya 1	24.5	80.0	15.0	3.04	75	136	4
Chokwang	24.2	75.5	13.3	3.24	70	134	6
Maris Mardler	23.6	67.9	13.9	3.17	60	154	1
Martonvasari 6	21.8	78.5	15.0	3.06	80	140	5
NE 79Y90576	21.5	71.9	13.0	3.21	75	139	8
Balkan	20.3	73.8	14.5	3.19	70	136	1
Loudogorka	19.4	76.0	16.4	3.08	80	141	3
Kopara	18.5	71.0	15.2	3.14	75	146	6
Bounty	18.1	78.5	14.8	3.17	65	138	2
Trakia	17.5	75.3	15.2	3.13	65	134	3
Atlas 66	17.5	68.9	18.3	2.99	105	145	3
WWP 4394	16.0	78.3	17.9	3.06	70	140	1
Blueboy	14.8	72.3	13.8	3.19	80	142	5
Bastion	14.5	70.0	15.6	3.27	90	146	3
Takahe	14.5	71.8	16.7	3.18	75	142	1
Irnerio	13.9	83.1	15.5	3.14	55	131	4
Pai yu pao	13.6	74.9	15.5	3.16	60	130	7
Huenufen	12.7	73.9	15.0	3.17	70	153	5
Vega	12.7	70.8	15.4	2.91	50	132	5
Alcedo	11.5	77.4	14.2	3.24	65	153	5
Jana	10.3	70.0	15.1	3.11	95	156	1
Aura	7.3	68.9	15.1	3.28	85	157	4
Mean	20.1	74.7	14.6	3.15	74.0	140.8	3.9
LSD of the cultivar means (.05)	4.2	-	-	-	-	-	-
Coefficient of variation (%)	14.9	-	-	-	-	-	-

SWEDEN

Svalof

COOPERATOR: Bo Kristiansson.

DATE OF PLANTING (EFFECTIVE GERMINATION): October 11, 1980.

PRECIPITATION DURING CYCLE OF TEST: 794 mm.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 120 kg/ha; P = 28 kg/ha; and K = 52 kg/ha. Fertilizers used were (15-0-0) at 800 kg/ha and (0-7-13) at 400 kg/ha.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Many plots were killed due to wet and cold conditions during autumn and winter.

DISEASE DEVELOPMENT: Diseases were not a problem; incidences of outbreak were below normal.

INSECT, WEED OR PEST PROBLEMS: None.

DATE OF HARVEST: August 25, 1981.

AREA HARVESTED FOR YIELD: Plots were not harvested.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Mildew - June 25, 1981.
Plant height - July 10, 1981.

Correlation Coefficients

N = Number of observations	Plant height	Flowering	Winter survival
1000-kernel weight	.54**	.26	.29*
N	54	51	54
Plant height		.54**	.35**
N		65	75
Flowering			.04
N			65

*, ** Significant at the .05 and .01 probability levels, respectively

Table 37. Agronomic data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Svalof, Sweden in 1981.

Cultivars	1000-Kernel Weight g	Plant Height cm	Days to Flowering from Jan.1	Winter Survival %
Alcedo	42.4	90	168	24
Chokwang	37.5	57	149	21
Sadovo Super	36.3	67	156	20
Aura	38.7	88	174	18
Martonvasari 6	49.3	73	168	15
NE 79Y90576	35.1	73	152	15
Jana	42.0	95	172	12
TAM W-105	39.1	65	151	10
Bezostaya 1	47.5	78	167	10
Loudogorka	40.8	77	160	9
Jugoslavija	38.4	68	159	9
Houser	45.8	84	160	6
Bounty	34.5	72	174	5
NE 79Y95097	31.3	68	156	5
Trakia	36.5	68	161	3
WWP 4394	35.5	78	160	3
Vega	34.0	58	158	3
TX 71A562-6	37.0	68	158	2
Blueboy	38.5	80	160	2
Pai yu pao	28.0	60	163	2
Maris Mardler	33.5	65	161	2
Balkan	20.5	57	157	2
Phoenix (WW 33G)	.	57	157	1
Atlas 66	.	.	.	0
Huenufen	.	.	.	0
Kopara	.	.	.	0
Irnerio	.	50	170	0
Bastion	.	.	.	0
Takahe	.	.	.	0
Super X	.	45	156	0
Mean	38.8	71.4	161.0	6.6
LSD of the cultivar means (.05)	-	-	-	14.3
Coefficient of variation (%)	8.0	13.6	2.2	154.2

SWITZERLAND

Zurich

COOPERATOR: F. Weilenmann.

DATE OF PLANTING (EFFECTIVE GERMINATION): October 29, 1980.

PRECIPITATION DURING CYCLE OF TEST: 586 mm. There were 133 days with measurable precipitation.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 120 kg/ha; P = 90 kg/ha; and K = 180 kg/ha.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Winter weather was relatively harsh, but there was an adequate snow cover most of the time. Spring and early summer were warm with good growing conditions. The crop matured earlier than normal.

DISEASE DEVELOPMENT: Mildew was very severe. A lesser attack of Septoria nodorum also was present.

INSECT, WEED OR PEST PROBLEMS: None.

DATE OF HARVEST: August 7, 1981.

AREA HARVESTED FOR YIELD: 4.3 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN: Not reported.

Correlation Coefficients

N = Number of observations	1000-kernel weight	Protein (Kjeldahl)	Plant height	Flowering	Winter survival	Grain note	Zeleny value	Neotec protein	Grain hardness
Grain yield	.66**	-.11	.30**	.24**	.54**	-.62**	.07	.19*	-.46**
N	120	30	120	120	120	120	120	120	120
1000-kernel weight		.32	.30**	.24**	.29**	-.68**	.08	.45**	-.34**
N		30	120	120	120	120	120	120	120
Protein (Kjeldahl)			-.30	-.31	-.21	.07	.23	.55**	.09
N			30	30	30	30	30	30	30
Plant height				.72**	.01	-.45**	-.39**	-.04	-.08
N				120	120	120	120	120	120
Flowering					-.04	-.13	-.27**	-.01	-.12
N					120	120	120	120	120
Winter survival						-.36**	.28**	-.04	-.41**
N						120	120	120	120
Grain note							-.08	-.26**	.33**
N							120	120	120
Zeleny value								.42**	-.32**
N								120	120
Neotec protein									-.42**
N									120

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 38. Agronomic, grain quality, and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Zurich, Switzerland in 1981.

Cultivars	Yield q/ha	1000-Kernel Weight g	Protein %	Plant Height cm	Days to Flowering from Jan.1	Winter Survival %	Mildew Leaves 0-9	Grain Rating 1-9	Zeleny Value	Neotec Protein %	Grain Hardness a/
Maris Mardler	42.9	43.1	12.2	70	160	90	2	7	50	13.9	24.2
Alcedo	41.8	42.0	12.2	101	159	85	5	3	48	12.6	25.7
Martonvasari 6	41.1	47.4	13.7	93	152	88	6	3	61	14.5	26.1
Jugoslavija	41.1	47.3	14.1	75	149	83	1	3	50	15.2	24.8
Balkan	39.8	46.2	13.6	69	148	88	2	5	62	13.7	27.8
Bezostaya 1	39.7	45.3	14.4	86	150	88	5	3	70	15.5	24.7
Bounty	37.0	37.4	13.6	73	161	75	2	7	54	13.2	26.3
Aura	35.2	39.4	12.6	113	161	85	4	4	47	13.8	22.6
Jana	34.9	39.7	11.0	106	160	83	6	4	19	9.7	30.0
Phoenix (WW 33G)	34.7	31.9	12.7	63	142	88	7	6	69	12.8	25.5
TAM W-105	34.1	33.7	12.2	74	148	85	8	4	64	12.1	25.1
Loudogorka	34.0	42.8	14.3	83	151	58	5	4	67	15.9	27.1
Sadovo Super	32.6	34.9	12.4	70	149	78	8	4	43	11.5	32.0
WWP 4394	31.5	34.7	13.9	78	152	40	3	5	40	14.1	29.4
Super X	28.8	30.5	12.2	69	149	83	3	7	56	13.1	23.1
Houser	28.3	35.8	11.5	91	156	83	6	6	34	10.6	29.6
Bastion	27.3	36.2	12.7	98	157	43	3	6	41	12.6	32.2
Atlas 66	27.1	38.1	14.0	110	158	48	4	4	37	13.6	32.1
TX 71A562-6	26.4	32.8	12.5	79	153	53	7	7	58	11.7	29.4
Vega	26.0	38.0	14.2	60	144	33	4	7	37	12.4	29.8
Kopara	22.8	36.3	14.5	86	155	33	6	6	54	15.0	28.2
NE 79Y95097	21.0	30.4	13.1	73	152	80	8	8	65	12.3	30.1
Trakia	20.2	38.6	13.6	64	145	43	8	7	52	14.4	28.0
Blueboy	19.1	35.8	11.9	91	156	25	8	6	24	10.3	31.6
NE 79Y90576	18.5	27.8	11.5	80	144	73	9	7	47	10.7	29.9
Takahe	18.2	34.2	13.8	91	160	38	3	7	38	15.0	23.6
Chokwang	17.6	35.5	15.9	58	141	80	9	7	45	13.6	32.6
Huenufen	14.3	33.5	13.3	78	160	40	8	8	60	13.0	33.9
Irnerio	13.5	29.6	12.9	56	145	58	8	7	59	11.9	31.9
Pai yu pao	13.5	30.3	13.6	65	142	33	9	8	44	12.7	28.6
Mean	28.8	37.0	13.1	80.0	151.9	65.0	5.5	5.5	49.7	13.1	28.2
LSD of the cultivar means (.05)	5.8	1.8	-	4.8	2.0	14.8	-	1.0	7.3	1.4	0.9
Coefficient of variation (%)	14.3	3.5	-	4.3	0.9	16.2	-	13.2	10.4	7.7	2.4
Local cultivars:											
Probus	29.7	41.9	-	123	161	85	7	4	66	15.8	20.2
Zenith	40.1	35.2	-	102	160	80	4	5	57	14.1	25.1

a/ Grain hardness represents the percentage of flour particles which passed through two sieves (750 µm and 300 µm) after 7 minutes of shaking.

SYRIA

Aleppo

COOPERATOR(S): ICARDA/CIMMYT Bread Wheat Staff.

DATE OF PLANTING (EFFECTIVE GERMINATION): December 11, 1980.

PRECIPITATION DURING CYCLE OF TEST: 371 mm.

AMOUNT OF IRRIGATION APPLIED: Two applications totalling 100 mm.

FERTILIZER USED: N = 120 kg/ha and P = 60 kg/ha. Application was made as Ammonium nitrate and Triple-superphosphate.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Conditions were generally good. Distribution of rainfall was good. The winter temperatures were too mild for adequate vernalization of some varieties, however.

DISEASE DEVELOPMENT: Stripe rust developed early and did reduce yields of susceptible varieties. Leaf rust came on late and did not appreciably lower yields.

INSECT, WEED OR PEST PROBLEMS: None.

DATE OF HARVEST: June 28, 1981.

AREA HARVESTED FOR YIELD: 3.0 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Stripe rust - May 14, 1981.
Leaf rust - May 25, 1981.
Plant height- Late May, 1981.

Correlation Coefficients

N = Number of observations	Plant height	Flowering
Grain yield	-.45**	-.64**
N	90	30
Plant height		.24
N		30

** Significant at the .01 probability level.

Table 39. Agronomic and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Aleppo, Syria in 1981.

Cultivars	Yield q/ha	Plant Height cm	Days to Flowering[a] from Jan.1	Stripe Rust[a] Sev %	Stripe Rust[a] Resp	Leaf Rust[a] Sev %	Leaf Rust[a] Resp
Vega	63.8	85	134	10	MS-	5	R-
Trakia	60.2	77	137	10	S-	0	-
Pai yu pao	58.7	88	130	20	S-	0	-
Phoenix (WW 33G)	57.2	80	132	30	S-	0	-
Sadovo Super	55.9	97	137	0	S-	40	S-
Jugoslavija	55.5	83	139	0	-	0	-
Bezostaya 1	51.8	95	139	5	R-	1	R-
Loudogorka	50.9	97	139	10	R-	10	S-
Blueboy	50.3	113	139	0	-	10	S-
TAM W-105	49.1	100	139	20	MS-	0	-
Super X	47.1	92	130	30	S-	20	S-
NE 79Y95097	47.1	92	131	20	MS-	1	MR-
Bounty	45.8	82	148	0	-	10	R-
TX 71A562-6	44.7	90	139	5	MS-	0	-
Irnerio	42.8	87	141	80	S-	0	-
Maris Mardler	42.5	77	148	0	-	0	-
Balkan	42.5	83	140	1	R-	0	-
Kopara	40.5	108	143	20	MS-	5	MR-
WWP 4394	40.2	102	139	0	-	0	-
Chokwang	37.3	95	133	60	S-	0	-
Martonvasari 6	36.6	107	140	10	R-	0	-
Alcedo	35.9	108	148	0	-	20	S-
Takahe	35.5	108	140	0	-	30	S-
Huenufen	32.3	88	148	0	-	0	-
Houser	30.6	98	148	10	MR-	0	-
Jana	29.9	120	148	0	-	0	-
Bastion	28.0	110	148	0	-	0	-
NE 79Y90576	22.9	98	140	100	S-	0	-
Atlas 66	20.8	120	144	60	S-	0	-
Aura	20.3	105	148	0	-	20	S-
Mean	42.6	96.2	140.3	16.7		5.7	
LSD of the cultivar means (.05)	8.4	13.2	-	-		-	
Coefficient of variation (%)	11.5	8.0	-	-		-	

a/ One replication only.

TURKEY

Ankara

COOPERATOR(S): K. Yakar, M. Kiziltan, G. Mizrak, N. Zencirci, and I. Tutluer.

DATE OF PLANTING (EFFECTIVE GERMINATION): October 25, 1980.

PRECIPITATION DURING CYCLE OF TEST: 350.8 mm.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 60 kg/ha and P = 60 kg/ha. Fertilizers used were Diammonium phosphate and Ammonium nitrate.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Autumn rains came later than usual.

DISEASE DEVELOPMENT: There wasn't much disease development in the nursery.

INSECT, WEED OR PEST PROBLEMS: Weeds were a difficult problem.

DATE OF HARVEST: August 8, 1981.

AREA HARVESTED FOR YIELD: 6.0 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN: Not reported.

Correlation Coefficients

N = 120 observations	1000-kernel weight	Plant height	Flowering	Winter survival	Frost damage
Grain yield	.66**	.42**	-.34**	.45**	-.42**
1000-kernel weight		.22*	-.44**	.25**	-.24**
Plant height			-.03	.19*	-.29**
Flowering				-.29**	.36**
Winter survival					-.58**

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 40. Agronomic and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Ankara, Turkey in 1981.

Cultivars	Yield q/ha	1000-Kernel Weight g	Plant Height cm	Days to Flowering from Jan.1	Winter Survival %	Frost Damage 0-9	Stripe Rust Sev %	Stripe Rust Resp
Martonvasari 6	24.6	33.0	71	170	100	3	20	MS-S
Bezostaya 1	23.7	35.5	81	170	100	3	0	-
Alcedo	23.0	31.8	76	167	100	3	0	-
Balkan	21.4	34.3	66	170	100	3	0	-
Jugoslavija	20.9	33.3	69	170	100	3	0	-
TX 71A562-6	20.2	29.5	64	169	100	3	0	-
Sadovo Super	18.8	27.3	69	171	100	3	10	S-
Maris Mardler	17.8	30.3	55	174	100	3	0	-
Chokwang	17.7	34.3	56	167	100	3	0	-
TAM W-105	16.0	29.3	55	167	100	2	0	-
Trakia	15.7	33.5	56	171	100	4	0	-
Houser	15.2	30.3	68	172	80	3	25	MS-S
Phoenix (WW 33G)	14.9	30.3	59	166	100	4	0	-
Aura	14.7	25.3	75	172	100	2	0	-
Loudogorka	14.0	31.8	65	170	100	3	0	-
Super X	12.9	27.8	60	170	100	3	0	-
NE 79Y90576	12.9	27.8	61	167	100	3	0	-
NE 79Y95097	11.9	27.5	61	170	100	3	0	-
Vega	11.8	30.8	59	172	100	3	0	-
WWP 4394	10.2	29.8	67	167	100	3	0	-
Jana	10.1	25.8	71	177	100	3	0	-
Bounty	9.9	24.5	56	175	96	4	0	-
Irnerio	9.1	28.8	53	172	98	4	5	S-
Blueboy	8.4	29.5	73	170	100	3	0	-
Pai yu pao	5.6	29.3	50	167	78	3	0	-
Kopara	5.2	25.5	60	174	88	4	0	-
Atlas 66	4.8	25.5	69	173	99	4	15	MS-S
Bastion	4.3	26.0	65	171	70	5	0	-
Huenufen	2.8	26.5	57	174	73	5	0	-
Takahe	2.1	25.5	55	176	23	6	0	-
Mean	13.4	29.3	63.4	170.7	93.4	3.3	2.5	
LSD of the cultivar means (.05)	6.8	3.0	9.6	0.3	20.3	0.8	-	
Coefficient of variation (%)	36.1	7.2	10.7	0.1	15.5	17.1	-	

TURKEY

Erzurum

COOPERATOR(S): C. Köycü and A. S. Kiral.

DATE OF PLANTING (EFFECTIVE GERMINATION): November 18, 1980.

PRECIPITATION DURING CYCLE OF TEST: Not reported.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 60 kg/ha and P = 60 kg/ha. Ammonium sulphate and triple superphosphate were applied at planting time. Ammonium nitrate was applied in springtime.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Early spring was cooler and wetter than normal. The seed for planting was received late. The plants did not get established prior to winter. Yield levels were not up to standard because of winter injury.

DISEASE DEVELOPMENT: Nothing of significance developed.

INSECT, WEED OR PEST PROBLEMS: None.

DATE OF HARVEST: August 24-28, 1981.

AREA HARVESTED FOR YIELD: 3.2 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Winter survival - June 30, 1981.
Plant height - August 10, 1981.

Correlation Coefficients

N = Number of observation	Test weight	1000-kernel weight	Protein	Plant height	Flowering	Ripening	Shattering	Winter survival
Grain yield	.33**	.07	-.57**	.35**	-.23*	-.26**	.06	.81**
N	120	120	30	120	120	120	120	120
Test weight		.27**	-.49**	-.04	-.61**	-.63**	.10	.33**
N		120	30	120	120	120	120	120
1000-kernel weight			-.17	-.16	-.11	.07	.11	.04
N			30	120	120	120	120	120
Protein				-.12	.20	.20	-.02	-.47**
N				30	30	30	30	30
Plant height					.09	.06	-.06	.38**
N					120	120	120	120
Flowering						.81**	-.01	-.18
N						120	120	120
Ripening							-.09	-.25**
N							120	120
Shattering								.07
N								120

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 41. Agronomic, grain quality, and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Erzurum, Turkey in 1981.

Cultivars	Yield q/ha	Test Weight kg/hl	1000-Kernel Weight g	Protein %	Plant Height cm	Days to Flowering from Jan.1	Days to Ripening from Jan.1	Shattering %	Winter Survival %	Stripe Rust Sev %	Stripe Rust Resp
TAM W-105	40.2	81.3	35.4	10.2	68	189	229	20	63	0	-
Houser	37.7	77.9	35.8	10.0	75	191	233	0	45	20	S-
NE 79Y90576	37.6	77.8	31.1	12.4	70	189	231	0	50	30	S-
Alcedo	36.4	79.4	37.8	10.3	71	193	234	0	50	0	-
Bezostaya 1	34.6	81.6	39.4	10.1	74	189	232	0	53	0	-
NE 79Y95097	33.0	75.5	32.4	14.7	63	190	231	20	40	0	-
Maris Mardler	32.7	76.3	38.4	11.9	56	198	239	0	43	0	-
Sadovo Super	32.4	77.0	35.0	12.0	58	190	234	0	48	0	-
Martonvasari 6	31.4	79.6	39.6	10.0	70	189	234	0	48	10	MS-
Phoenix (WW 33G)	30.6	81.8	36.9	11.8	58	191	230	0	40	0	-
TX 71A562-6	29.1	80.1	35.6	9.8	62	190	231	0	40	0	-
Loudogorka	28.0	78.3	42.6	14.5	69	191	236	0	38	0	-
Aura	24.1	75.4	34.1	13.7	75	203	236	0	48	0	-
Jana	23.9	74.8	37.0	11.5	66	201	239	5	30	0	-
Balkan	23.5	77.8	39.9	13.2	59	191	233	20	40	0	-
Chokwang	22.8	80.2	37.6	10.8	60	189	230	0	40	0	-
Jugoslavija	22.1	78.5	40.7	14.7	61	190	232	0	38	0	-
Bounty	21.5	74.2	36.6	14.9	52	200	237	0	38	0	-
WWP 4394	20.3	79.8	35.7	11.2	65	191	231	20	30	0	-
Super X	20.1	80.8	35.6	13.9	61	191	231	0	30	0	-
Trakia	18.8	79.3	43.8	11.8	54	191	234	15	30	0	-
Blueboy	16.1	75.6	37.9	12.5	69	193	236	0	25	0	-
Pai yu pao	15.5	78.8	33.5	16.8	57	188	230	0	21	0	-
Vega	15.3	78.0	38 5	14.8	53	189	229	0	25	0	-
Kopara	12.3	74.1	36.0	14.7	61	195	238	0	23	0	-
Bastion	12.1	75.4	36.4	12.3	67	195	236	0	15	0	-
Atlas 66	11.8	74.5	31.3	15.8	76	196	237	0	28	6	S-
Huenufen	11.2	77.6	38.6	15.2	62	201	239	20	20	0	-
Irnerio	7.7	78.7	36.3	13.8	51	189	233	0	23	8	S-
Takahe	4.6	72.6	31.5	12.6	61	202	239	0	11	0	-
Mean	23.6	77.8	36.7	12.7	63.4	192.7	233.8	4.0	35.6	2.5	
LSD of the cultivar means (.05)	8.2	1.7	2.3	-	6.7	2.4	2.2	3.7	11.1	-	
Coefficient of variation (%)	24.7	1.6	4.5	-	7.5	0.9	0.7	65.7	22.2	-	

UNITED STATES

California

Davis

COOPERATOR(S): C. O. Qualset, H. E. Vogt, P. K. Zwer, and L. C. Larson.

DATE OF PLANTING (EFFECTIVE GERMINATION): November 4, 1980.

PRECIPITATION DURING CYCLE OF TEST: 283 mm.

AMOUNT OF IRRIGATION APPLIED: 330 mm.

FERTILIZER USED: N = 148 kg/ha applied as aqua ammonia and granular ammonium nitrate.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Conditions were moderately dry, with warm drying winds toward the end of the growing season.

DISEASE DEVELOPMENT: Stripe rust development was heavy, but other diseases were minimal.

INSECT, WEED OR PEST PROBLEMS: None.

DATE OF HARVEST: July 7, 1981.

AREA HARVESTED FOR YIELD: 3.0 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Diseases - May 14, 1981.
Plant height - July 6, 1981.
Lodging - July 6, 1981
Shattering - July 6, 1981.

Correlation Coefficients

N = Number of observations	Test weight	1000-kernel weight	Protein	Lysine/ protein	Plant height	Lodging	Flowering	Ripening	Shattering
Grain yield	.59**	.12	-.69**	-.11	-.19*	-.04	-.50**	-.46**	-.33**
N	30	30	30	30	120	120	30	30	120
Test weight		.62**	-.42*	-.53**	.16	.26	-.79**	-.78**	.32
N		30	30	30	30	30	30	30	30
1000-kernel weight			.08	-.38*	.15	.29	-.46*	-.45*	.28
N			30	30	30	30	30	30	30
Protein				-.03	.37*	.21	.44*	.32	.09
N				30	30	30	30	30	30
Lysine/protein					-.24	-.14	.60**	.51**	-.53**
N					30	30	30	30	30
Plant height						.38**	.05	-.10	.20*
N						120	30	30	120
Lodging							-.09	-.16	.05
N							30	30	120
Flowering								.93**	-.38*
N								30	30
Ripening									-.34
N									30

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 42. Agronomic, grain quality, and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Davis, California USA in 1981.

Cultivars	Yield q/ha	Test[a] Weight kg/hl	1000-Kernel Weight g	Protein %	Adjusted lysine/ Protein %	Plant Height cm	Lodging %	Days to[a] Flowering from Jan.1	Days to[a] Ripening from Jan.1	Shat-tering %	Stripe Rust[a] Sev %	Resp	Septoria[a] leaves 0-9
Phoenix (WW 33G)	71.6	75.8	32.4	12.6	3.05	95	33	109	150	0	0	-	6
TX 71A562-6	63.4	74.1	30.6	11.8	3.18	109	19	116	150	1	20	-	0
TAM W-105	62.3	74.3	30.0	12.3	3.22	112	4	117	150	0	60	-	0
NE 79Y95097	60.0	68.9	21.7	13.6	3.26	104	0	119	150	0	50	-	0
Trakia	52.4	72.2	33.0	13.3	3.12	92	1	110	147	1	0	-	5
Super X	50.8	76.4	31.7	12.3	2.99	111	18	103	147	29	10	-	6
Jugoslavija	50.3	75.7	40.0	13.2	3.10	107	18	115	150	2	0	-	2
Blueboy	50.2	68.5	29.2	13.1	3.29	107	0	114	151	3	10	-	0
Pai yu pao	49.2	71.8	32.2	14.3	3.14	94	0	102	139	2	5	-	0
Irnerio	48.8	70.3	26.3	12.8	2.98	90	0	106	149	4	100	-	3
Vega	48.0	74.3	39.8	13.9	3.08	93	5	110	145	2	5	-	0
NE 79Y90576	45.7	70.5	19.5	11.5	3.20	117	4	115	148	3	100	-	1
Balkan	44.6	73.5	45.3	13.6	3.32	101	0	118	151	5	0	-	1
Bezostaya 1	42.7	72.5	40.3	14.6	3.15	118	68	114	153	2	5	-	0
Kopara	42.1	65.0	24.0	15.6	3.16	110	0	124	155	0	0	-	1
Martonvasari 6	41.6	73.7	45.0	15.0	3.09	116	21	116	151	11	20	-	3
Sadovo Super	41.1	70.1	32.5	13.4	3.15	115	10	113	150	15	5	-	2
Alcedo	40.1	69.9	25.7	14.7	3.32	112	0	131	165	2	0	-	0
Houser	39.5	65.5	25.5	12.4	3.27	96	5	128	165	16	70	-	2
Chokwang	39.1	75.4	36.2	13.7	3.15	107	6	104	141	26	90	-	4
Loudogorka	37.4	68.6	39.3	14.4	3.32	110	30	116	150	3	1	-	2
Maris Mardler	34.1	62.3	23.8	13.5	3.33	74	0	131	165	0	0	-	0
Huenufen	33.2	63.8	23.3	15.3	3.35	90	0	130	165	0	0	-	2
Takahe	33.0	61.6	25.4	14.8	3.28	109	4	123	156	1	30	-	5
Bounty	32.4	59.2	22.0	14.0	3.33	87	3	131	165	1	0	-	0
Jana	28.5	63.4	27.1	15.4	3.26	108	1	135	165	5	0	-	0
Bastion	27.2	62.9	32.2	16.9	3.02	116	1	131	165	3	0	-	1
Aura	22.2	65.0	26.9	15.4	3.26	115	5	136	165	8	0	-	3
Atlas 66	22.0	70.3	26.6	16.4	3.17	132	50	121	148	4	10	-	0
WWP 4394	21.8	73.1	38.4	15.8	2.87	118	18	110	146	80	0	-	0
Mean	42.5	69.6	30.9	14.0	3.18	105.4	10.7	118.3	153.2	7.5	19.7		1.6
LSD of the cultivar means (.05)	6.8	-	-	-	-	6.9	14.4	-	-	9.9	-		-
Coefficient of variation (%)	11.4	-	-	-	-	4.6	95.7	-	-	93.7	-		-

a/ One replication only.

UNITED STATES

Colorado

Akron

COOPERATOR(S): J. Quick, G. Ellis, and R. Normann.

DATE OF PLANTING (EFFECTIVE GERMINATION): September 18, 1980.

PRECIPITATION DURING CYCLE OF TEST: 220 mm.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: None.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: All conditions were normal. Rains were adequate and timely.

DISEASE DEVELOPMENT: None.

INSECT, WEED OR PEST PROBLEMS: None.

DATE OF HARVEST: July 14, 1981.

AREA HARVESTED FOR YIELD: 3.9 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Winter survival - April 1, 1981.

Correlation Coefficients

N = Number of observations	Test weight	Plant height	Flowering	Winter survival
Grain yield	.02	.30**	.08	.59**
N	29	116	116	120
Test weight		-.06	-.63**	.16
N		29	29	29
Plant height			.36**	.11
N			116	116
Flowering				-.24*
N				116

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 43. Agronomic data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Akron, Colorado USA in 1981.

Cultivars	Yield q/ha	Test Weight[a] kg/hl	Plant Height cm	Days to Flowering from Jan.1	Winter Survival %
Sadovo Super	41.0	70.8	80	151	96
TX 71A562-6	39.0	72.8	90	151	90
Martonvasari 6	37.5	74.1	104	154	96
Bezostaya 1	36.5	77.0	102	152	95
Phoenix (WW 33G)	32.4	77.5	80	148	91
Aura	31.7	70.4	113	159	96
Jugoslavija	31.5	74.1	84	153	95
Maris Mardler	31.0	63.6	72	157	94
Loudogorka	31.0	72.8	93	153	91
NE 79Y95097	30.1	69.5	75	150	93
TAM W-105	30.0	77.0	82	147	96
Jana	29.6	66.7	107	159	74
Alcedo	29.4	71.0	99	158	84
Takahe	29.4	68.2	96	155	76
Blueboy	28.4	66.4	101	155	78
Houser	28.0	69.5	88	154	98
Bounty	27.7	66.7	73	159	91
WWP 4394	26.8	75.0	88	152	63
Balkan	26.1	74.4	83	152	94
Trakia	25.0	73.9	75	152	44
Vega	23.9	72.3	73	151	84
Kopara	23.0	68.2	94	154	76
Atlas 66	22.3	74.1	114	154	89
Pai yu pao	20.9	74.6	77	148	76
Bastion	19.2	64.6	98	158	41
Huenufen	19.1	69.8	81	159	59
NE 79Y90576	18.0	73.9	91	146	95
Irnerio	15.7	73.1	64	150	59
Chokwang	10.2	71.6	78	148	93
Super X	0.0	.	.	.	1
Mean	26.5	71.5	88.0	153.0	80.2
LSD of the cultivar means (.05)	7.5	-	7.1	1.6	9.2
Coefficient of variation (%)	20.2	-	5.7	0.7	8.1

a/ One replication only.

UNITED STATES

Colorado

Fort Collins

COOPERATOR(S): J. Quick, G. Ellis, and R. Normann.

DATE OF PLANTING (EFFECTIVE GERMINATION): September 13, 1980.

PRECIPITATION DURING CYCLE OF TEST: 300 mm.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: None was needed.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Growing conditions were excellent.

DISEASE DEVELOPMENT: There was some stem rust due to artificial inoculation.

INSECT, WEED OR PEST PROBLEMS: None.

DATE OF HARVEST: July 22, 1981.

AREA HARVESTED FOR YIELD: 3.345 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Stem rust - July 10, 1981.
Lodging - July 22, 1981.

Correlation Coefficients

N = Number of observations	Test weight	Protein	Plant height	Lodging	Flowering
Grain yield	.54**	-.37*	.07	.20	-.04
N	30	30	120	30	120
Test weight		.13	-.11	.08	-.56**
N		30	30	30	30
Protein			-.05	-.03	-.21
N			30	30	30
Plant height				.46*	.58**
N				30	120
Lodging					.02
N					30

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 44. Agronomic, grain quality, and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Fort Collins, Colorado USA in 1981.

Cultivars	Yield q/ha	Test [a] Weight kg/hl	Protein %	Plant Height cm	Lodging[a] 0-9	Days to Flowering from Jan.1	Stem Rust[a] Sev %	Resp
Houser	89.3	69.2	12.7	97	1	156	40	S-
TAM W-105	88.9	77.7	13.8	88	0	146	60	S-
Jugoslavija	86.7	76.2	14.8	88	0	151	0	-
Sadovo Super	85.9	72.8	13.5	81	0	148	30	S-
Martonvasari 6	84.3	74.1	14.4	99	0	151	40	S-
TX 71A562-6	80.1	76.6	13.7	93	3	150	0	-
NE 79Y90576	79.8	73.9	14.4	87	1	146	0	-
WWP 4394	79.5	76.2	16.8	90	0	149	30	S-
Maris Mardler	79.5	61.5	14.7	78	0	156	50	S-
Loudogorka	78.0	74.4	15.4	92	0	151	60	S-
Bounty	74.0	65.1	13.1	80	0	158	60	S-
Phoenix (WW 33G)	73.2	76.2	15.5	76	0	144	0	-
Chokwang	72.3	72.3	16.8	79	1	143	0	-
NE 79Y95097	71.2	69.5	13.8	77	0	143	0	-
Bezostaya 1	71.0	77.5	14.6	91	0	150	80	S-
Balkan	70.4	75.4	14.9	79	0	148	0	-
Super X	69.4	75.9	13.8	78	0	148	0	-
Jana	68.2	66.4	15.4	106	0	159	90	S-
Kopara	68.1	66.2	16.7	87	0	151	0	-
Blueboy	67.6	60.2	13.4	98	1	152	80	S-
Alcedo	67.6	60.2	13.4	101	0	158	90	S-
Atlas 66	67.0	71.9	18.1	117	2	151	20	S-
Takahe	66.4	66.7	16.6	95	0	155	5	S-
Bastion	66.2	69.5	15.0	102	0	153	90	S-
Vega	66.2	73.9	15.9	75	0	149	0	-
Trakia	65.9	70.8	15.1	78	0	150	50	S-
Huenufen	63.7	64.9	16.2	88	0	157	0	-
Pai yu pao	57.6	74.6	17.7	77	0	142	0	-
Aura	53.5	66.7	14.7	116	1	160	70	S-
Irnerio	52.0	65.1	15.6	59	0	144	80	S-
Mean	72.1	70.7	15.0	88.2	0.3	150.5	34.2	
LSD of the cultivar means (.05)	14.1	-	-	4.1	-	1.1	-	
Coefficient of variation (%)	13.9	-	-	3.3	-	0.5	-	

[a] One replication only.

UNITED STATES

Indiana

Brookston

COOPERATOR(S): K. E. Miskin and J. E. Grogan.

DATE OF PLANTING (EFFECTIVE GERMINATION): October 8, 1980.

PRECIPITATION DURING CYCLE OF TEST: 791 mm.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 135 kg/ha; P = 95 kg/ha; and K = 95 kg/ha.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Dry conditions in autumn ended as winter began. In January a week with 15-16°C temperatures was followed by a sudden temperature drop to -21°C. The very wet winter lead into a cooler than normal spring.

DISEASE DEVELOPMENT: Leaf rust and mildew were abundant. A uniform infection of Rhizoctonia solani was observed across the nursery. Some varieties may have been more susceptible to this disease and have suffered greater winter injury because of it.

INSECT, WEED OR PEST PROBLEMS: None.

DATE OF HARVEST: July 14, 1981.

AREA HARVESTED FOR YIELD: 6.72 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Winter survival - March 10, 1981.

Correlation Coefficients

N = Number of observations	Test weight	1000-kernel weight	Plant height	Lodging	Flowering	Winter survival
Grain yield	.65**	.51**	.24*	.18	-.02	.69**
N	92	96	96	100	78	120
Test weight		.73**	.33**	.12	-.18	.24*
N		92	92	92	78	92
1000-kernel weight			.12	.08	-.25*	.25*
N			96	96	78	96
Plant height				.22*	.47**	.34**
N				96	78	96
Lodging					-.32**	.42**
N					78	100
Flowering						-.22
N						78

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 45. Agronomic and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Brookston, Indiana USA in 1981.

Cultivars	Yield q/ha	Test Weight kg/hl	1000-Kernel Weight g	Plant Height cm	Lodging %	Days to Flowering from Jan.1	Winter Survival %	Leaf Rust Sev %	Leaf Rust Resp	Mildew leaves 0-9
Jugoslavija	43.9	72.0	33.0	93	10	150	65	0	-	1
Balkan	42.6	72.3	38.0	91	10	149	83	5	VR-	1
WWP 4394	39.5	74.2	26.8	109	20	151	45	5	VR-	1
Atlas 66	34.2	74.9	31.8	127	15	154	45	8	VR-VS	6
Chokwang	34.1	71.3	39.7	89	50	143	90	40	S-	9
Loudogorka	34.1	73.0	33.9	100	15	151	78	25	R-	6
TAM W-105	33.5	68.1	23.4	104	28	150	90	40	MS-	8
Vega	33.3	67.7	30.7	86	30	148	63	18	MR-	4
Trakia	32.2	63.5	25.6	87	10	149	83	3	VR-	8
Phoenix (WW 33G)	32.2	69.0	24.0	84	5	148	55	40	MS-S	7
Houser	32.1	61.8	24.0	104	18	156	93	53	MS-	7
Martonvasari 6	32.0	68.5	28.0	118	25	151	90	65	S-VS	7
Bezostaya 1	30.9	73.1	30.5	104	25	150	93	8	VR-R	8
Sadovo Super	30.2	64.6	25.8	105	23	149	83	100	S-VS	8
Pai yu pao	27.8	61.0	23.1	89	23	145	48	5	VR-	7
TX 71A562-6	27.4	62.6	22.0	109	55	151	88	8	R-	8
Blueboy	27.4	63.9	27.3	110	5	154	25	25	MS-	8
Jana	25.3	67.6	28.0	114	5	.	95	5	VR-	8
NE 79Y90576	23.7	63.7	21.9	110	68	147	95	10	VS-	9
Alcedo	23.4	65.0	22.9	106	3	.	93	59	MS-VS	8
NE 79Y95097	19.1	51.5	17.4	87	0	154	30	15	R-	9
Aura	14.7	66.8	31.1	115	13	.	95	33	MS-S	7
Bounty	13.1	55.7	24.5	80	0	.	48	5	VR-	3
Maris Mardler	5.6	.	21.6	67	3	146	33	23	R-S	2
Kopara	1.1	.	.	.	0	.	3	.	-	.
Huenufen	0.3	.	.	.	0	.	1	.	-	.
Bastion	0.0	.	.	.	0	.	4	.	-	.
Irnerio	0.0	.	.	.	.	.	0	.	-	.
Takahe	0.0	.	.	.	.	.	0	.	-	.
Super X	0.0	.	.	.	.	.	0	.	-	.
Mean	23.1	66.6	27.3	99.4	18.2	149.7	56.9	24.7		6.1
LSD of the cultivar means (.05)	4.3	-	-	7.6	15.1	1.2	12.3	-		-
Coefficient of variation (%)	13.1	-	-	5.2	55.8	0.5	15.3	-		-

Table 46. Agronomic data for the cultivars in the Thirteenth International Winter Wheat Performance Nursery grown in unreplicated plots at Colwich, Kansas, USA, in 1981.[a/]

Cultivars	Grain yield (grams)	Days to heading (from Jan. 1)
NE 79Y90576	1510	112
Jugoslavija	1375	115
TAM W-105	1370	115
WWP 4394	1330	112
Balkan	1330	112
TX 71A562-6	1295	116
Bezostaya 1	1250	115
Sadovo Super	1240	113
Houser	1230	123
Martonvasari 6	1225	116
Loudogorka	1210	115
Phoenix (WW33G)	1185	110
Bounty	1160	130
Alcedo	1060	125
Pai yu pao	1055	110
Chokwang	1050	110
Takahe	980	123
NE 79Y95097	970	113
Blueboy	960	115
Jana	945	125
Maris Mardler	845	123
Trakia	810	112
Vega	780	112
Kopara	770	121
Atlas 66	760	117
Aura	750	125
Bastion	680	127
Huenufen	635	121
Irnerio	605	113
Super X	0	---
Mean	1012.2	117.1

a/ Data provided by Dr. K. D. Wilhelmi and Mr. Dennis Delaney, Rohm & Haas, Inc.

UNITED STATES

Kansas

Hutchinson

COOPERATOR(S): E. G. Heyne and G. M. Paulsen.

DATE OF PLANTING (EFFECTIVE GERMINATION): October 8, 1980.

PRECIPITATION DURING CYCLE OF TEST: Not reported.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: Not reported.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: The seedbed was dry at planting time, and the seedlings emerged unevenly. Winter was dry and mild. Drought conditions remained throughout spring. Many plots had late uneven maturity.

DISEASE DEVELOPMENT: None.

INSECT, WEED OR PEST PROBLEMS: A heavy infestation of greenbug lasted from March into April. The nursery was sprayed with insecticide but many plots were severely damaged.

DATE OF HARVEST: Because of drought and insect damage, the plots were abandoned.

AREA HARVESTED FOR YIELD: --------

DATES WHEN DIFFERENT NOTES WERE TAKEN: Not reported.

Correlation Coefficients

N = Number of observations	Flowering	Winter survival
Plant height	.33**	.18
N	115	57
Flowering		-.14
N		56

** Significant at the .01 probability level.

Table 47. Agronomic and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Hutchinson, Kansas USA in 1981.

Cultivars	Plant Height cm	Days to Flowering from Jan.1	Winter Survival %	Soil-borne Mosaic Virus Resp
Jana	80	138	100	S-
Aura	82	132	100	MS-
Houser	79	126	100	R-
TX 71A562-6	68	119	100	R-
Blueboy	67	120	100	R-
Alcedo	72	135	100	R-S
TAM W-105	63	118	100	R-
Martonvasari 6	68	119	100	R-S
Bezostaya 1	65	117	100	R-
WWP 4394	64	117	100	R-
Vega	49	116	100	S-
Pai yu pao	61	110	100	R-S
Chokwang	64	113	100	R-S
Takahe	62	122	100	R-S
Balkan	57	116	100	R-S
Jugoslavija	57	119	100	MS-
Sadovo Super	56	115	100	MS-
Bounty	55	138	100	R-S
NE 79Y95097	59	117	95	S-
Loudogorka	60	118	90	R-S
Phoenix (WW 33G)	61	113	80	R-S
Atlas 66	74	122	70	R-
Maris Mardler	55	132	70	R-S
NE 79Y90576	66	118	70	R-
Trakia	59	114	60	R-S
Kopara	61	130	53	R-
Irnerio	42	114	53	R-
Bastion	64	139	50	-
Huenufen	65	136	30	R-
Super X	51	117	0	-
Mean	63.0	121.7	84.0	-
LSD of the cultivar means (.05)	7.0	5.6	NS	-
Coefficient of variation (%)	7.9	3.2	33.2	-

Table 48. Agronomic and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown in unreplicated plots at two sites in Maryland, USA, in 1981.[a/]

Cultivars	Grain yield (kg/ha)			Plant height	Lodging	Heading date	Winter survival	Mildew	Septoria
	Queenstown	Clarksville	Average	cm	%		%	0-9	0-9
TAM W-105	2143	2588	2366	97	15	May 17	100	5.5	5.0
Balkan	3080	1564	2322	84	45	16	98	0.0	6.5
Jugoslavija	2878	1011	1945	91	25	15	98	0.0	5.0
Phoenix (WW33G)	1725	1934	1830	86	50	10	92	5.5	5.0
Sadovo Super	1766	1725	1746	94	20	14	98	5.0	5.0
Atlas 66	2190	1260	1725	117	25	18	95	0.5	3.5
WWP 4394	1995	1368	1682	99	10	14	82	1.0	6.0
Vega	2325	782	1554	81	40	12	88	3.0	6.5
Pai yu pao	1725	1173	1449	81	20	5	100	5.5	5.5
TX 71A562-6	930	1921	1426	91	50	18	98	6.0	5.0
Loudogorka	2089	721	1405	97	8	18	92	2.0	4.5
Martonvasari 6	2217	559	1388	99	15	19	72	2.5	3.5
Bezostaya 1	1442	1186	1314	91	20	16	95	4.5	5.0
Chokwang	1375	1240	1302	84	10	6	95	6.5	7.5
NE 79Y90576	1173	1065	1119	102	40	14	100	9.0	5.5
Alcedo	1038	1004	1021	107	10	28	100	2.0	3.5
Blueboy	1355	600	978	107	30	19	72	7.0	4.5
Houser	330	1570	950	107	40	24	98	3.0	3.5
Super X	1415	431	923	86	30	14	75	0.5	6.0
Jana	1139	499	819	94	15	28	98	3.0	2.5
Takahe	1213	0	607	91	5	28	52	0.0	3.5
Trakia	721	418	570	76	10	15	90	7.0	7.0
NE 79Y95097	445	452	449	76	30	19	100	8.5	5.5
Aura	553	236	395	97	10	30	82	1.0	3.5
Irnerio	674	67	371	71	10	14	62	5.5	6.5
Bastion	654	27	341	97	2	June 1	60	0.5	3.0
Kopara	559	27	293	99	32	May 26	70	2.5	6.0
Maris Mardler	485	88	287	76	18	26	100	1.0	4.0
Bounty	270	195	233	76	50	28	98	0.0	4.0
Huenufen	67	94	81	84	50	28	82	5.5	5.5
Means	1332.4	860.2	1096.4	91.3	24.5		88.1	3.5	4.9

[a/] Data provided by Dr. D. J. Sammons, University of Maryland.

UNITED STATES

Montana

Billings

COOPERATOR(S): J. Lennenman and S. Scherer.

DATE OF PLANTING (EFFECTIVE GERMINATION): October 14, 1980.

PRECIPITATION DURING CYCLE OF TEST: Not reported.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 50 kg/ha.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Autumn was cool and wet. A very wet snowfall (30 cm) occurred the day after planting. Most of the winter was mild and drier. In May, 203 mm of rainfall was received. Otherwise the remainder of summer was very dry.

DISEASE DEVELOPMENT: Disease build-up was moderate.

INSECT, WEED OR PEST PROBLEMS: None.

DATE OF HARVEST: August 12, 1981.

AREA HARVESTED FOR YIELD: 2.79 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Percent stand - April , 1981.
Plant height - August 10, 1981.
Lodging - August 10, 1981.
Diseases - July 22, 1981.

Correlation Coefficients

N = Number of observations	Test weight	Protein	Plant height	Lodging	Flowering	Percent stand
Grain yield	.36*	-.43*	-.11	.31	-.32	.42**
N	30	30	30	30	30	120
Test weight		.11	.12	.22	-.40*	.06
N		30	30	30	30	30
Protein			.37*	-.05	.26	-.12
N			30	30	30	30
Plant height				-.07	.56**	.01
N				30	30	30
Lodging					-.42*	.03
N					30	30
Flowering						-.01
N						30

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 49. Agronomic, grain quality, and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Billings, Montana USA in 1981.

Cultivars	Yield q/ha	Test[a] Weight kg/hl	Protein %	Plant[a] Height cm	Lodging[a] %	Days to[a] Flowering from Jan.1	Stripe Rust[a] Sev %	Resp	Leaf Rust[a] Sev %	Resp	Mildew[a] leaves 0-9	% of Normal Stand	Tan Spot 0-9
TX 71A562-6	104.5	79.6	13.2	87	25	155	15	-	15	-	3	100	4
TAM W-105	98.1	80.6	14.4	90	10	147	15	-	20	-	2	100	4
Phoenix (WW 33G)	94.8	80.0	12.5	80	0	146	10	-	20	-	1	100	2
NE 79Y90576	94.3	78.1	11.1	97	15	146	10	-	20	-	3	100	2
Jana	92.3	75.6	14.6	122	0	166	10	-	15	-	1	100	1
Super X	91.6	81.5	11.6	95	0	155	10	-	15	-	1	100	1
Houser	88.5	73.6	12.2	100	0	158	20	-	20	-	1	100	2
Bezostaya 1	87.8	81.9	14.4	100	0	157	10	-	15	-	2	100	3
Martonvasari 6	87.4	78.6	13.3	107	0	158	10	-	30	-	2	100	2
NE 79Y95097	84.9	74.5	10.5	87	0	153	15	-	40	-	4	100	3
Jugoslavija	82.7	80.6	12.9	92	0	158	10	-	10	-	1	100	1
Alcedo	82.3	79.0	14.9	110	0	163	15	-	20	-	1	100	3
Sadovo Super	81.6	74.5	11.9	90	0	155	10	-	35	-	1	100	4
Maris Mardler	81.2	65.9	12.7	85	0	163	10	-	30	-	1	100	2
Bounty	79.4	71.7	12.1	77	0	164	10	-	15	-	1	100	2
Loudogorka	74.4	78.8	14.3	95	0	158	10	-	10	-	1	94	1
WWP 4394	70.6	79.3	15.5	95	0	158	10	-	10	-	1	75	2
Trakia	70.1	78.6	13.9	75	0	155	10	-	15	-	1	88	3
Pai yu pao	69.9	78.8	13.9	80	10	146	15	-	15	-	2	81	4
Balkan	69.7	77.0	13.7	82	0	154	10	-	10	-	1	100	1
Bastion	69.1	74.9	13.9	105	0	159	10	-	15	-	1	63	2
Vega	68.6	77.4	13.2	77	0	153	10	-	20	-	1	88	3
Huenufen	68.3	71.9	15.0	92	0	162	10	-	20	-	3	100	3
Atlas 66	67.9	79.6	17.8	122	5	158	15	-	20	-	1	100	1
Blueboy	65.1	70.9	14.0	100	5	158	20	-	30	-	1	56	1
Kopara	64.8	73.1	15.7	95	0	160	10	-	25	-	1	88	3
Chokwang	63.9	75.6	13.7	72	10	144	10	-	50	-	1	100	1
Aura	62.0	74.0	14.2	117	5	168	10	-	20	-	1	94	5
Irnerio	59.0	72.1	14.4	67	0	153	20	-	30	-	1	81	4
Takahe	46.3	74.4	13.3	100	0	166	15	-	35	-	1	75	2
Mean	77.4	76.4	13.6	93.1	2.8	156.5	12.2		21.5		1.4	92.7	2.4
LSD of the cultivar means (.05)	13.4	-	-	-	-	-	-		-		-	12.7	-
Coefficient of variation (%)	12.3	-	-	-	-	-	-		-		-	9.7	-

a/ One replication only.

UNITED STATES

Nebraska

Lincoln

COOPERATOR(S): V. A. Johnson, S. L. Kuhr, J. W. Schmidt, and C. J. Peterson.

DATE OF PLANTING (EFFECTIVE GERMINATION): September 25, 1980.

PRECIPITATION DURING CYCLE OF TEST: 369 mm.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 12 kg/ha and P = 11 kg/ha.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: The winter was very mild. An early warm spring hastened plant growth and by late April the crop was 3 weeks ahead of normal development. A very severe frost in early May was responsible for yield reductions across a wide area.

DISEASE DEVELOPMENT: The rusts were fairly severe.

INSECT, WEED OR PEST PROBLEMS: Chinch bugs continued to be a problem. The nursery was sprayed four times with Sevin.

DATE OF HARVEST: July 6, 1981.

AREA HARVESTED FOR YIELD: 1.486 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Winter survival - March 13, 1981.

Correlation Coefficients

N = 104 observations	Plant height	Flowering	Winter survival
Grain yield	.36**	-.24*	.71**
Plant height		.45**	.15
Flowering			-.49**

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 50. Agronomic and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Lincoln, Nebraska USA in 1981.

Cultivars	Yield q/ha	Plant Height cm	Days to Flowering from Jan.1	Winter Survival %	Leaf Rust Sev %	Leaf Rust Resp	S.B.M.V. Sev %	S.B.M.V. Resp
TAM W-105	45.6	80	127	100	80	MS-	5	MS-
TX 71A562-6	41.3	81	131	100	1	R-	5	MS-
Martonvasari 6	37.6	91	132	100	90	S-	15	MR-
Houser	33.9	91	139	100	40	S-	0	-
Loudogorka	33.7	82	130	95	20	R-	5	MS-
Bezostaya 1	32.9	81	130	100	1	R-	20	MS-
Sadovo Super	32.2	73	125	100	90	S-	90	S-
NE 79Y90576	30.5	77	125	100	20	R-	20	MR-
Balkan	25.1	69	126	100	1	R-	50	MS-
Trakia	25.0	66	125	93	1	R-	20	S-
Alcedo	24.0	91	145	90	80	S-	100	MS-
Blueboy	24.0	89	131	68	25	R-	0	-
Jugoslavija	23.4	65	130	100	1	R-	90	S-
WWP 4394	22.0	74	129	86	1	R-	1	R-
Aura	18.7	99	146	100	20	MS-	75	MS-
Bounty	16.6	72	145	99	50	MR-	80	MS-
Jana	15.4	99	146	91	40	MR-	50	MS-
Atlas 66	13.4	84	140	60	20	R-	100	VS-
NE 79Y95097	13.3	66	130	95	90	S-	100	S-
Chokwang	12.4	72	120	100	90	S-	75	S-
Maris Mardler	11.0	66	146	23	80	S-	90	S-
Vega	10.9	62	125	94	50	S-	100	VS-
Phoenix (WW 33G)	9.6	58	125	73	80	S-	90	MS-
Pai yu pao	8.8	66	120	88	90	S-	75	MS-
Takahe	6.4	72	145	16	90	S-	100	MS-
Kopara	6.3	76	146	3	20	R-	0	S-
Huenufen	1.2	.	.	0	.	-	.	-
Irnerio	0.0	.	.	0	.	-	.	-
Bastion	0.0	.	.	0	.	-	.	-
Super X	0.0	.	.	0	.	-	.	-
Mean	19.2	76.9	132.9	72.4	45.0		52.2	
LSD of the cultivar means (.05)	6.3	5.5	2.0	9.9	-		-	
Coefficient of variation (%)	23.3	5.1	1.1	9.7	-		-	
Local cultivar: Bennett	41.4	88	130	100	-		-	

UNITED STATES

New York

Ithaca

COOPERATOR: Mark E. Sorrells.

DATE OF PLANTING (EFFECTIVE GERMINATION): October 8, 1980.

PRECIPITATION DURING CYCLE OF TEST: 775 mm.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 77 kg/ha; P = 68 kg/ha; and K = 68 kg/ha. Fertilizer was applied as preplant broadcast with additional nitrogen as topdress.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Autumn and winter were near normal. Conditions in springtime became very warm and dry. Summer rains caused pre-harvest sprouting which greatly reduced the test weights of early maturing lines.

DISEASE DEVELOPMENT: Powdery mildew infection was extensive. Otherwise, there were no other significant disease problems.

INSECT, WEED OR PEST PROBLEMS: None.

DATE OF HARVEST: July 23, 1981.

AREA HARVESTED FOR YIELD: 2.0 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Winter survival - April 8, 1981.
Powdery mildew - June 10, 1981.

Correlation Coefficients

N = Number of observations	Test weight	Protein	Plant height	Flowering	Ripening	Winter survival
Grain yield	.74**	-.75**	.57**	-.21	-.15	.86**
N	22	30	83	83	83	90
Test weight		-	.51*	-.08	-.06	.49*
N		0	22	22	22	22
Protein			-.44*	.43*	.31	-.74**
N			26	26	26	30
Plant height				.28*	.27*	.53**
N				83	83	83
Flowering					.70**	-.20
N					83	83
Ripening						-.29**
N						83

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 51. Agronomic, grain quality, and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Ithaca, New York USA in 1981.

Cultivars	Yield q/ha	Test[a/] Weight kg/hl	Protein %	Plant Height cm	Days to Flowering from Jan.1	Days to Ripening from Jan.1	Winter Survival %	Mildew leaves 0-9
Balkan	60.5	72.8	14.1	73	152	190	83	0
Alcedo	58.9	76.9	13.4	102	159	195	95	3
Martonvasari 6	56.2	74.8	14.5	98	154	192	93	3
TAM W-105	55.4	75.0	12.9	85	151	191	89	5
Houser	55.1	68.1	13.0	93	157	194	88	3
Bezostaya 1	53.2	74.8	15.3	93	154	192	88	3
Jana	51.7	71.7	14.1	105	163	198	93	3
Jugoslavija	49.7	72.2	15.9	82	154	193	53	0
Aura	46.0	68.4	14.7	107	165	199	93	3
Sadovo Super	46.0	69.1	15.8	77	153	193	63	5
Loudogorka	42.8	71.5	15.9	85	154	194	53	2
TX 71A562-6	42.0	69.7	13.4	78	153	189	87	5
WWP 4394	40.9	75.3	16.2	77	153	193	30	1
Vega	31.3	65.5	16.2	63	151	191	30	4
NE 79Y90576	31.0	63.3	13.2	88	150	187	93	7
Trakia	29.6	60.6	15.7	67	153	191	63	4
Chokwang	28.6	69.1	15.2	72	147	186	80	5
Blueboy	23.5	60.9	13.4	88	156	194	12	6
Bounty	20.6	49.3	19.4	73	164	199	50	2
Atlas 66	19.4	.	17.8	98	161	197	6	4
Pai yu pao	18.6	58.5	14.7	65	148	187	30	6
Phoenix (WW 33G)	17.1	64.7	15.9	63	152	194	25	5
NE 79Y95097	15.1	57.0	19.0	70	165	191	40	7
Maris Mardler	8.0	.	19.4	63	164	199	8	0
Huenufen	4.6	.	16.9	70	160	196	5	5
Super X	2.6	.	21.9	75	152	192	2	4
Takahe	2.5	.	17.4	73	164	199	2	1
Irnerio	2.0	.	17.5	58	152	194	3	5
Kopara	2.0	.	18.5	80	158	195	2	6
Bastion	1.6	.	16.6	80	159	194	1	3
Mean	30.6	67.7	15.9	80.5	155.7	193.1	48.8	3.7
LSD of the cultivar means (.05)	13.7	-	-	-	-	-	24.7	-
Coefficient of variation (%)	26.2	-	-	5.9	2.6	0.7	29.6	-

a/ One replication only.

UNITED STATES

North Carolina

Rowan County

COOPERATOR: C. F. Murphy.

DATE OF PLANTING (EFFECTIVE GERMINATION): October 14, 1980.

PRECIPITATION DURING CYCLE OF TEST: 641.9 mm.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 100 kg/ha; P = 200 kg/ha; and K = 200 kg/ha. Fertilizer was applied as a (10-20-20) granular compound.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Early conditions were on the dry side, but in spring adequate precipitation was received.

DISEASE DEVELOPMENT: Moderate amounts of mildew were present, otherwise nothing.

INSECT, WEED OR PEST PROBLEMS: A heavy infestation of Aphids occurred in April.

DATE OF HARVEST: June 17, 1981.

AREA HARVESTED FOR YIELD: 1.484 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Winter survival - March 18, 1981.
Plant height - June 10, 1981.

Correlation Coefficients

N = Number of observations	Test weight	1000-kernel weight	Protein	Plant height	Lodging	Flowering	Winter survival
Grain yield	.58**	.39*	-.56**	.32**	.27**	-.51**	.39**
N	30	30	30	120	120	120	120
Test weight		.60**	-.21	.25	.21	-.70**	-.05
N		30	30	30	30	30	30
1000-kernel weight			-.11	.14	.07	-.35	-.03
N			30	30	30	30	30
Protein				.03	.03	.18	-.07
N				30	30	30	30
Plant height					.29**	.08	.38**
N					120	120	120
Lodging						-.39**	.14
N						120	120
Flowering							-.01
N							120

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 52. Agronomic, grain quality, and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Rowan County, North Carolina in 1981.

Cultivars	Yield q/ha	Test[a] Weight kg/hl	1000-[a] Kernel Weight g	Protein %	Plant Height cm	Lodging %	Days to Flowering from Jan.1	Winter Survival %	Mildew leaves 0-9
TAM W-105	52.7	79.8	35.9	14.5	83	15	117	100	8
TX 71A562-6	49.1	77.8	37.2	13.6	85	33	119	100	8
Vega	45.7	75.8	40.4	15.7	81	28	116	100	4
Houser	44.7	73.7	37.5	13.9	89	10	123	100	4
Blueboy	44.5	76.6	41.0	14.2	91	4	117	100	9
Jugoslavija	41.8	80.4	46.6	15.3	83	11	121	100	1
Sadovo Super	41.1	75.6	42.8	14.8	85	6	116	100	8
Balkan	39.5	79.0	51.8	16.3	86	9	118	100	0
Phoenix (WW 33G)	38.8	78.4	33.2	14.1	73	20	113	100	6
Pai yu pao	38.3	77.3	36.2	16.1	80	28	110	100	9
Trakia	36.7	76.1	37.9	15.4	75	4	116	100	3
WWP 4394	36.6	76.5	38.6	18.4	91	8	118	100	0
Loudogorka	36.0	77.6	42.8	16.0	89	5	117	100	6
Martonvasari 6	35.2	78.2	44.0	15.9	95	14	120	100	9
Bezostaya 1	35.0	79.6	42.1	15.9	93	18	118	100	9
NE 79Y90576	34.5	76.9	32.2	14.7	91	30	116	100	9
Chokwang	31.5	76.0	39.5	16.9	80	84	112	100	9
Aura	30.4	74.0	35.7	15.3	105	33	128	100	4
Atlas 66	30.0	78.4	36.7	19.0	104	28	120	100	7
Irnerio	29.6	77.6	38.7	15.1	64	0	114	100	6
Kopara	29.2	76.2	36.3	17.1	78	0	124	100	7
NE 79Y95097	27.3	71.6	31.6	15.4	69	5	119	100	9
Maris Mardler	26.2	69.9	39.6	14.9	61	0	126	100	3
Alcedo	25.4	74.3	36.5	16.7	86	0	131	100	4
Bastion	21.2	72.9	34.3	16.3	86	1	128	100	1
Bounty	19.4	63.1	31.9	15.7	65	0	129	100	2
Huenufen	18.8	68.2	33.1	18.2	74	0	128	100	4
Jana	14.4	66.7	32.2	16.5	95	0	131	93	6
Takahe	14.3	67.8	30.5	18.1	74	0	124	100	1
Super X	11.9	79.6	40.9	16.2	56	0	120	30	2
Mean	32.7	75.2	37.9	15.9	82.2	13.0	120.1	97.4	5.1
LSD of the cultivar means (.05)	7.7	-	-	-	6.4	11.7	2.2	5.3	-
Coefficient of variation (%)	16.7	-	-	-	5.5	64.0	1.3	3.8	-

a/ One replication only.

UNITED STATES

Oklahoma

Stillwater

COOPERATOR: E. L. Smith.

DATE OF PLANTING (EFFECTIVE GERMINATION): October 14, 1980.

PRECIPITATION DURING CYCLE OF TEST: 485.9 mm.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 39 kg/ha applied as Ammonium nitrate top dress.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: A very hard rainstorm occurred after planting. This caused some emergence problems. Otherwise, conditions were about normal.

DISEASE DEVELOPMENT: There was good development of Powdery mildew, but little else.

INSECT, WEED OR PEST PROBLEMS: Birds caused some damage to the nursery.

DATE OF HARVEST: June 9-16, 1981.

AREA HARVESTED FOR YIELD: 1.486 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN: Not reported.

Correlation Coefficients

N = Number of observations	Test weight	Protein	Plant height	Flowering	Ripening	Winter survival
Grain yield	.60**	-.53**	.33**	-.27**	-.30**	.40**
N	30	30	120	120	120	120
Test weight		-.26	.21	-.57**	-.47**	-.04
N		30	30	30	30	30
Protein			.22	.27	.42*	-.09
N			30	30	30	30
Plant height				.25**	.26**	.27**
N				120	120	120
Flowering					.91**	.14
N					120	120
Ripening						-.03
N						120

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 53. Agronomic, grain quality, and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Stillwater, Oklahoma USA in 1981.

Cultivars	Yield q/ha	Test[a] Weight kg/hl	Protein %	Plant Height cm	Days to Flowering from Jan.1	Days to Ripening from Jan.1	Winter Survival %	Mildew Resp
TAM W-105	30.5	81.5	15.0	71	113	157	100	MS-S
Houser	30.4	74.9	14.8	73	119	160	100	R-
Martonvasari 6	28.7	79.6	16.7	80	108	148	100	S-
Bezostaya 1	28.5	80.9	16.1	75	107	147	100	MS-S
Phoenix (WW 33G)	27.7	76.2	14.7	64	101	143	100	S-
TX 71A562-6	27.6	78.9	14.9	70	114	153	100	S-
Loudogorka	26.7	77.6	16.0	77	107	148	100	MS-S
Sadovo Super	24.6	73.6	15.5	65	104	145	100	MS-VS
Balkan	24.4	76.9	16.6	62	105	142	100	-
Jugoslavija	24.1	79.6	15.5	67	107	146	100	-
Bounty	21.5	69.6	16.7	56	124	160	100	-
Maris Mardler	21.4	67.6	16.5	57	118	159	100	-
NE 79Y90576	20.8	71.6	13.9	71	110	146	100	S-VS
Chokwang	20.1	75.6	16.2	67	101	139	100	S-
Blueboy	19.9	74.3	18.5	75	110	157	100	S-
WWP 4394	19.9	77.6	19.0	66	108	147	100	-
Atlas 66	19.3	75.6	20.0	87	112	158	100	R-
Vega	17.8	69.0	16.9	64	105	141	100	MS-S
Pai yu pao	16.3	74.3	15.7	60	101	137	100	S-
NE 79Y95097	15.3	67.0	15.9	63	110	151	99	S-VS
Bastion	15.1	71.6	18.2	72	118	160	98	-
Trakia	14.9	77.6	16.4	57	108	149	100	MS-S
Takahe	14.2	67.6	18.5	71	117	160	99	-
Alcedo	13.5	69.0	18.7	74	126	163	100	R-
Kopara	13.5	72.9	19.0	63	118	159	99	-
Aura	9.3	66.3	18.4	78	127	164	100	R-
Jana	8.9	64.3	18.7	79	127	164	100	MS-S
Huenufen	8.5	62.3	14.9	62	125	163	94	S-
Super X	5.8	76.9	17.0	58	106	152	45	S-
Irnerio	4.3	68.3	18.4	49	102	147	91	S-
Mean	19.1	73.3	16.8	67.5	111.8	151.9	97.5	-
LSD of the cultivar means (.05)	4.8	-	-	4.9	0.8	2.0	2.2	-
Coefficient of variation (%)	17.9	-	-	5.2	0.5	0.9	1.6	-

a/ One replication only.

UNITED STATES

Oregon

Corvallis

COOPERATOR(S): W. E. Kronstad, W. L. McCuistion, F. A. Cholick, and N. H. Scott.

DATE OF PLANTING (EFFECTIVE GERMINATION): October 18, 1980.

PRECIPITATION DURING CYCLE OF TEST: 970 mm.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 224 kg/ha. A granular combination of Ammonium sulfate and Urea was applied in autumn and spring.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Precipitation was below normal, but wet spring conditions fostered disease development.

DISEASE DEVELOPMENT: Although the nursery was inoculated with stripe rust, the disease never developed strongly. There was, however, a severe epidemic of Septoria tritici.

INSECT, WEED OR PEST PROBLEMS: None.

DATE OF HARVEST: August 13, 1981.

AREA HARVESTED FOR YIELD: 6.5 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Diseases - June 15 and July 15, 1981.
Lodging - August 5, 1981.
Plant height - August 5, 1981.

Correlation Coefficients

N = Number of observations	Test weight	Protein	Plant height	Lodging	Flowering
Grain yield	.57**	-.47**	.18	-.29	.49**
N	28	30	30	30	30
Test weight		.05	.28	.28	.31
N		28	28	28	28
Protein			-.43*	-.08	-.35
N			30	30	30
Plant height				.49**	.61**
N				30	30
Lodging					.12
N					30

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 54. Agronomic, grain quality, and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Corvallis, Oregon USA in 1981.

Cultivars	Yield q/ha	Test Weight[a] kg/hl	Protein %	Plant Height[a] cm	Lodging[a] %	Days to Flowering[a] from Jan.1	Stripe Rust[a] Sev %	Stripe Rust[a] Resp	Septoria[a] leaves 0-9
Alcedo	63.0	82.8	10.9	146	10	144	0	-	2
Loudogorka	61.7	79.2	14.0	117	5	136	30	S-	5
Sadovo Super	56.3	79.6	11.9	132	30	128	15	MS-	5
Balkan	50.3	79.5	14.1	115	5	132	0	-	4
Jugoslavija	47.2	80.1	13.4	120	40	133	0	-	8
Maris Mardler	46.7	72.9	15.5	100	0	143	0	-	3
Martonvasari 6	44.8	80.6	13.7	144	30	136	50	S-	2
Huenufen	43.8	75.9	12.8	115	5	143	15	MS-	3
Bounty	43.4	74.9	12.6	114	30	144	1	R-	3
Phoenix (WW 33G)	43.0	76.8	13.8	107	20	126	0	-	8
Kopara	40.8	75.3	12.5	148	40	139	40	S-	4
Vega	40.7	74.9	15.6	98	10	122	30	S-	9
WWP 4394	40.4	78.8	15.0	123	20	131	10	MR-	7
Trakia	39.0	75.4	15.1	100	30	128	0	-	9
Jana	34.8	77.2	11.4	152	50	145	15	MS-	3
Aura	33.9	78.4	13.1	155	80	146	5	MS-	2
Bezostaya 1	33.9	80.5	14.5	126	50	134	30	S-	5
NE 79Y95097	31.7	69.8	12.6	121	5	133	0	-	8
TAM W-105	30.1	79.0	13.6	130	30	136	70	S-	4
Blueboy	29.6	73.2	10.1	140	60	136	70	S-	2
Bastion	29.6	75.1	12.5	143	30	140	15	MR-	3
Houser	29.4	65.3	11.7	140	10	140	99	S-	2
TX 71A562-6	27.4	78.2	10.4	125	50	136	50	S-	4
Super X	25.1	.	13.9	115	70	125	0	-	9
NE 79Y90576	24.7	68.6	10.7	145	10	131	99	S-	0
Atlas 66	23.7	79.1	14.2	161	90	136	50	S-	2
Irnerio	22.7	66.3	14.3	98	20	120	99	S-	9
Pai yu pao	21.1	67.5	14.1	101	30	120	0	-	9
Takahe	21.1	75.4	20.8	131	40	138	30	S-	3
Chokwang	6.5	.	20.7	105	20	122	99	S-	0
Mean	36.2	75.7	13.7	125.6	30.7	134.1	30.7		4.6
LSD of the cultivar means (.05)	12.3	-	-	-	-	-	-		-
Coefficient of variation (%)	24.1	-	-	-	-	-	-		-

a/ One replication only.

UNITED STATES

Pennsylvania

Lancaster County

COOPERATOR(S): M. L. Risius, H. G. Marshall, and J. A. Frank.

DATE OF PLANTING (EFFECTIVE GERMINATION): October 9, 1980.

PRECIPITATION DURING CYCLE OF TEST: Not reported.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 67 kg/ha; P = 20 kg/ha; and K = 37 kg/ha. The nitrogen was applied as 22 kg/ha in autumn (preplant) and 45 kg/ha in spring.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Winter was dry and colder than normal. From April to harvest, 383.5 mm of rainfall were measured.

DISEASE DEVELOPMENT: Not reported.

INSECT, WEED OR PEST PROBLEMS: Not reported.

DATE OF HARVEST: July 10, 1981.

AREA HARVESTED FOR YIELD: 2.43 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Winter survival - March 24, 1981.
Lodging - July 10, 1981.

Correlation Coefficients

N = Number of observations	Test weight	Plant height	Lodging	Winter survival
Grain yield	.83**	.51**	-.06	.85**
N	76	79	79	90
Test weight		.55**	-.08	.35**
N		76	76	76
Plant height			-.05	.12
N			79	79
Lodging				-.17
N				79

** Significant at the .01 probability level.

Table 55. Agronomic data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Lancaster County, Pennsylvania USA in 1981.

Cultivars	Yield q/ha	Test Weight kg/hl	Plant Height cm	Lodging %	Winter Survival %
Martonvasari 6	50.6	73.8	111	2	100
Balkan	49.8	71.9	90	15	100
Houser	48.7	65.5	94	5	100
Jugoslavija	48.5	72.9	96	0	100
TAM W-105	48.0	72.6	88	0	100
Sadovo Super	47.6	68.7	88	5	100
Loudogorka	45.3	71.6	100	0	98
Bezostaya 1	44.8	75.0	105	8	100
Jana	43.8	66.0	110	2	100
Alcedo	43.0	69.4	104	0	100
Aura	41.7	68.6	111	5	100
Trakia	41.7	67.6	79	0	98
NE 79Y90576	41.3	65.5	95	7	100
WWP 4394	39.7	72.5	93	0	85
Atlas 66	39.3	74.2	114	2	97
Chokwang	39.0	71.8	85	10	100
Pai yu pao	38.1	64.9	76	2	100
TX 71A562-6	37.4	66.5	92	57	73
Phoenix (WW 33G)	33.1	68.8	77	18	95
Blueboy	30.9	61.8	97	2	60
Vega	30.7	66.9	74	0	85
NE 79Y95097	25.5	56.9	84	10	95
Bounty	22.4	50.7	74	5	97
Maris Mardler	19.0	51.9	70	0	95
Huenufen	14.1	52.8	81	17	68
Kopara	11.9	54.1	86	0	25
Takahe	3.8	.	94	0	5
Irnerio	0.0	.	.	.	0
Bastion	0.0	.	.	.	0
Super X	0.0	.	.	.	0
Mean	32.7	66.6	91.2	6.5	79.2
LSD of the cultivar means (.05)	5.6	2.3	4.1	19.8	15.5
Coefficient of variation (%)	10.6	2.0	2.6	178.7	12.0

Table 56. Agronomic and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown in unreplicated plots at Overton, Texas, USA, in 1981.a/

Cultivars	Grain yield	Plant height	Lodging	Heading date	Leaf rust sev.	Powdery mildew	Septoria
	q/ha	cm	%	April	%	%	0-9
TX 71A562-6	40.4	97	5	11	2	5	4
Phoenix (WW33G)	39.9	84	0	1	20	5	4
Bezostaya 1	36.8	104	10	10	5	15	3
TAM W-105	35.7	94	0	11	3	10	5
Blueboy	35.4	107	5	8	20	10	2
Loudogorka	34.7	107	5	9	3	3	4
Takahe	31.0	99	0	14	50	0	3
WWP 4394	30.3	107	0	8	10	0	3
Pai yu pao	30.3	91	5	2	20	20	9
Martonvasari 6	28.8	112	5	11	50	5	3
Alcedo	27.7	109	0	19	60	5	1
Jana	26.9	109	0	22	5	0	0
Atlas 66	26.9	122	10	11	15	0	2
Bastion	25.3	114	0	11	10	0	3
Jugoslavija	24.2	89	10	8	0	0	5
Balkan	22.9	91	0	9	0	0	4
Kopara	22.1	102	5	14	20	10	6
Chokwang	20.4	84	5	1	50	20	7
Sadovo Super	18.7	86	5	7	70	5	5
Vega	18.6	81	0	4	20	2	5
Trakia	18.2	79	5	4	10	0	3
NE 79Y90576	16.0	97	0	9	10	30	7
Aura	15.0	112	5	23	25	0	2
Houser	14.7	104	10	16	30	0	1
Maris Mardler	14.7	74	0	14	10	0	1
Super X	12.5	71	0	1	10	0	6
Bounty	12.1	76	5	19	10	0	2
NE 79Y95097	10.1	81	5	7	30	50	7
Huenufen	9.3	81	40	17	50	2	2
Irnerio	8.2	61	5	1	10	10	8
Means	23.6	94.2	4.8	10	20.9	6.9	3.9

a/ Data provided by Dr. L. R. Nelson.

UNITED STATES

Washington

Pullman

COOPERATOR(S): C. J. Peterson Jr. and R. E. Allan.

DATE OF PLANTING (EFFECTIVE GERMINATION): September 25, 1980.

PRECIPITATION DURING CYCLE OF TEST: Not reported.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 90 kg/ha.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Winter was relatively mild with very little snow cover.

DISEASE DEVELOPMENT: Stripe rust and leaf rust were prevalent in the nursery.

INSECT, WEED OR PEST PROBLEMS: Weeds were somewhat of a problem.

DATE OF HARVEST: Mid-August, 1981.

AREA HARVESTED FOR YIELD: 2.973 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN: Not reported.

Correlation Coefficients

N = Number of observations	Test weight	Protein	Plant height	Flowering
Grain yield	.69**	-.31	-.04	.26**
N	120	30	120	120
Test weight		-.39*	.26**	.42**
N		30	120	120
Protein			-.22	-.59**
N			30	30
Plant height				.70**
N				120

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 57. Agronomic, grain quality, and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Pullman, Washington USA in 1981.

Cultivars	Yield q/ha	Test Weight kg/hl	Protein %	Plant Height cm	Days to Flowering from Jan.1	Stripe Rust Sev %	Stripe Rust Resp
Jugoslavija	71.8	81.8	15.0	97	152	5	VR-
Bounty	69.6	75.5	13.6	98	164	5	VR-
Maris Mardler	69.4	71.5	13.8	92	161	5	VR-
Balkan	61.1	80.9	15.5	96	152	5	VR-
Huenufen	58.7	76.5	13.8	103	159	5	VR-
Loudogorka	54.3	80.3	14.6	107	153	70	MS-S
Alcedo	50.9	83.2	13.3	120	168	50	MR-S
WWP 4394	49.5	82.5	15.5	105	154	35	R-MS
Trakia	48.9	79.2	14.3	88	153	55	MS-S
Phoenix (WW 33G)	40.7	71.1	14.6	94	149	78	MS-S
Bezostaya 1	39.9	78.8	14.8	102	154	86	MS-S
Sadovo Super	39.6	77.7	13.2	102	152	80	S-
Martonvasari 6	36.1	76.8	14.0	114	158	81	MS-S
Aura	35.6	80.9	14.1	132	168	33	MS-
Vega	35.6	77.1	15.4	86	149	68	S-
Bastion	31.8	74.4	14.2	114	159	65	MS-
Jana	30.8	77.1	12.7	121	171	58	MS-S
NE 79Y95097	28.2	61.4	15.3	95	151	89	MS-S
Blueboy	25.8	67.3	13.0	119	162	78	MS-S
TAM W-105	24.8	67.9	14.4	103	151	95	S-
Kopara	23.6	73.6	15.5	107	157	85	MS-S
Takahe	20.0	69.6	16.0	102	161	90	MS-S
TX 71A562-6	19.6	63.1	13.6	103	155	90	MS-S
Houser	18.9	59.7	13.1	108	162	93	S-
Atlas 66	15.6	75.4	15.5	124	159	88	S-
Irnerio	14.1	65.2	13.6	75	146	95	MS-S
Chokwang	11.7	60.2	17.4	96	144	90	S-
Pai yu pao	10.9	53.3	17.4	96	144	93	MS-S
Super X	10.6	64.2	13.8	87	152	90	MS-S
NE 79Y90576	4.9	50.6	17.6	103	150	96	S-
Mean	35.1	71.9	14.6	102.8	155.5	65.1	
LSD of the cultivar means (.05)	9.5	2.0	-	5.2	1.2	-	
Coefficient of variation (%)	19.1	1.9	-	3.6	0.5	-	

U.S.S.R.

Krasnodar

COOPERATOR: Y. M. Puchkov.

DATE OF PLANTING (EFFECTIVE GERMINATION): October 17, 1980.

PRECIPITATION DURING CYCLE OF TEST: 658 mm.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 150 kg/ha; P = 90 kg/ha; and K = 45 kg/ha.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Winter was relatively warm. Spring remained warm and many rainy days were recorded. Hot and dry conditions became prevalent as summer arrived.

DISEASE DEVELOPMENT: Conditions were generally not favorable for much disease development.

INSECT, WEED OR PEST PROBLEMS: Not reported.

DATE OF HARVEST: June 30, 1981.

AREA HARVESTED FOR YIELD: 6.6 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Frost damage - March 9, 1981.
Mildew - May 12, 1981.
Septoria - June 2, 1981.
Stripe rust - June 5, 1981.
Leaf rust - June 16, 1981.
Lodging - June 18, 1981.

Correlation Coefficients

N = Number of observations	Test weight	1000-kernel weight	Protein	Plant height	Lodging	Flowering	Ripening	Frost damage
Grain yield	.29**	.33**	-.30	-.41**	-.20*	-.28**	-.12	-.08
N	120	120	30	120	120	120	120	120
Test weight		.61**	.12	.09	.09	-.46**	-.46**	-.25**
N		120	30	120	120	120	120	120
1000-kernel weight			.10	-.15	-.02	-.33**	-.23*	-.30**
N			30	120	120	120	120	120
Protein				.47**	.38*	.42*	.44*	-.09
N				30	30	30	30	30
Plant height					.35**	.47**	.08	-.40**
N					120	120	120	120
Lodging						-.06	-.17	.01
N						120	120	120
Flowering							.58**	-.10
N							120	120
Ripening								.22*
N								120

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 58. Agronomic, grain quality, and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Krasnodar, USSR in 1981.

Cultivars	Yield q/ha	Test Weight kg/hl	1000-Kernel Weight g	Protein %	Plant Height cm	Lodging %	Days to Flowering from Jan.1	Days to Ripening from Jan.1	Frost Damage 0-9	Stripe Rust Sev %	Stripe Rust Resp	Leaf Rust Sev %	Leaf Rust Resp	Mildew leaves 0-9	Septoria leaves 0-9
Phoenix (WW 33G)	70.5	78.6	33.3	12.9	91	20	138	175	2	0	-	15	MR-	7	4
TX 71A562-6	65.9	77.0	34.6	11.6	101	34	139	176	0	2	-	1	R-	6	4
Trakia	65.5	78.8	40.4	13.4	89	0	138	176	0	0	-	0	VR-	5	7
Irnerio	65.0	80.4	37.4	12.7	83	0	136	173	2	1	-	2	MR-M	5	4
Sadovo Super	64.0	76.1	33.0	13.9	106	24	138	174	1	1	-	15	M-MS	7	5
Loudogorka	60.0	79.9	40.4	15.4	110	19	139	177	1	0	-	3	R-MR	5	4
Houser	59.4	72.7	37.8	13.9	113	38	144	179	0	3	-	4	MR-	4	3
Bastion	59.2	75.7	33.3	13.4	114	4	144	194	1	0	-	0	R-	5	4
Balkan	57.4	80.0	41.6	15.5	100	20	139	175	0	0	-	1	R-M	0	4
WWP 4394	56.3	81.0	36.6	14.8	110	8	139	176	0	0	-	1	R-MS	4	4
Vega	56.0	76.1	42.3	13.1	82	0	135	174	1	0	-	1	R-M	0	3
Huenufen	55.7	74.5	31.1	13.4	98	8	144	176	1	0	-	3	MR-	8	3
Jugoslavija	55.4	79.5	40.5	15.5	104	36	139	177	1	0	-	0	VR-R	6	5
Bounty	55.4	69.9	33.4	14.3	89	0	147	180	0	0	-	0	R-	0	3
Chokwang	54.4	80.3	43.0	13.6	93	24	130	169	1	3	-	100	MS-	6	5
Maris Mardler	54.1	67.8	33.2	14.1	82	0	146	205	3	0	-	1	R-MR	1	4
Alcedo	53.9	77.5	36.7	13.4	114	0	149	183	1	0	-	3	R-M	6	2
Takahe	53.9	77.7	34.4	14.5	111	19	143	177	1	0	-	3	M-MS	0	3
Super X	53.7	75.0	32.3	13.1	99	33	139	176	3	3	-	1	MR-	4	7
TAM W-105	53.6	80.4	37.0	13.3	103	19	138	174	0	6	-	1	VR-R	6	4
Bezostaya 1	52.9	80 5	41.6	14.6	112	23	140	177	0	0	-	3	M-MS	8	5
Martonvasari 6	51.0	79.7	39.5	15.8	121	24	142	177	0	1	-	2	M-M	6	4
Blueboy	50.8	74.1	36.9	13.1	116	15	144	177	0	0	-	4	M-M	6	4
Kopara	50.8	76.9	32.2	14.9	111	0	142	178	1	0	-	1	R-	5	4
NE 79Y90576	49.3	72.6	28.3	11.7	106	24	133	170	0	73	-	0	-	7	5
NE 79Y95097	47.9	70.5	31.6	11.7	92	13	138	176	3	1	-	1	R-MR	8	5
Jana	43.5	71.3	31.2	15.4	116	24	150	185	0	0	-	0	VR-R	5	2
Pai yu pao	43.5	77.5	34.5	12.6	92	0	132	174	2	65	-	0	-	5	6
Atlas 66	35.5	76.5	32.5	18.4	116	80	142	178	2	2	-	0	-	5	4
Aura	31.9	73.7	29.9	15.3	124	5	149	184	1	0	-	8	M-MS	4	3
Mean	54.2	76.4	35.7	14.0	103.1	17.0	140.4	178.0	0.9	5.3		5.7		4.8	4.1
LSD of the cultivar means (.05)	5.4	0.8	2.0	-	2.3	9.1	0.9	6.2	0.3	-		-		-	-
Coefficient of variation (%)	7.0	0.7	3.9	-	1.6	38.1	0.4	2.5	19.9	-		-		-	-

U.S.S.R.

Mironovski

COOPERATOR(S): V. N. Remeslo and A. F. Mel'nikov.

DATE OF PLANTING (EFFECTIVE GERMINATION): September 9, 1980.

PRECIPITATION DURING CYCLE OF TEST: 615.5 mm.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 60 kg/ha; P = 90 kg/ha; and K = 90 kg/ha.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: The autumn of 1980 was moderately warm with adequate precipitation. Similar conditions were prevalent during winter. The soil did not freeze as deeply as usual because of the warmer winter weather. In summer, temperatures remained high but precipitation declined.

DISEASE DEVELOPMENT: No diseases developed.

INSECT, WEED OR PEST PROBLEMS: None.

DATE OF HARVEST: July 20-25, 1981.

AREA HARVESTED FOR YIELD: 2.0 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Winter survival - April 20, 1981.
Lodging - July 13, 1981.

Correlation Coefficients

N = Number of observations	Plant height	Lodging	Flowering	Ripening	Winter survival
Grain yield	.07	-.16	.11	.23*	.78**
N	107	107	107	107	120
Plant height		.38**	.46**	.31**	.08
N		107	107	107	107
Lodging			-.03	-.18	-.06
N			107	107	107
Flowering				.90**	-.07
N				107	107
Ripening					-.12
N					107

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 59. Agronomic data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Mironovski, USSR in 1981.

Cultivars	Yield q/ha	Plant Height cm	Lodging %	Days to Flowering from Jan.1	Days to Ripening from Jan.1	Winter Survival %
Houser	69.8	95	29	151	186	94
Jugoslavija	66.8	92	4	148	184	92
Balkan	66.6	85	3	148	183	96
Sadovo Super	59.7	88	3	148	184	80
Vega	58.1	76	6	145	182	94
Bounty	57.2	69	0	154	188	92
Alcedo	56.1	104	20	155	189	73
Maris Mardler	53.3	66	0	152	189	51
TX 71A562-6	51.9	83	41	149	183	84
Loudogorka	50.7	101	14	151	186	73
Bezostaya 1	48.9	90	6	150	184	84
Martonvasari 6	46.6	94	13	152	186	80
Trakia	46.1	67	0	148	184	86
Aura	45.1	103	15	157	189	82
WWP 4394	41.6	92	8	150	184	75
Jana	41.5	109	25	156	189	60
Kopara	39.2	92	16	148	184	57
Bastion	39.0	93	6	149	186	62
Chokwang	36.8	76	20	144	181	74
Takahe	33.2	102	7	153	187	60
NE 79Y90576	32.8	87	32	145	180	69
Atlas 66	32.4	107	40	150	184	50
Blueboy	32.1	90	14	151	184	78
Phoenix (WW 33G)	32.0	66	14	148	184	38
TAM W-105	30.1	77	11	148	182	48
Pai yu pao	22.8	76	19	145	180	65
Huenufen	15.9	73	0	152	186	16
Irnerio	0.0	.	.	.	.	0
Super X	0.0	.	.	.	.	0
NE 79Y95097	0.0	.	.	.	.	0
Mean	40.2	87.1	13.6	149.9	184.6	63.7
LSD of the cultivar means (.05)	9.2	3.2	7.3	1.1	1.2	23.0
Coefficient of variation (%)	16.3	2.6	37.9	0.5	0.5	25.6

U.S.S.R.

Odessa

COOPERATOR: L. K. Sechnjak

DATE OF PLANTING (EFFECTIVE GERMINATION): September 14, 1980.

PRECIPITATION DURING CYCLE OF TEST: 395.3 mm.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 60 kg/ha.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Winter was relatively mild. Temperatures at the tillering node level did not drop below -5.0°C. A severe drought developed from mid-May through June.

DISEASE DEVELOPMENT: There was a moderate build-up of leaf rust and mildew.

INSECT, WEED OR PEST PROBLEMS: None.

DATE OF HARVEST: July 21, 1981.

AREA HARVESTED FOR YIELD: 3.0 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Winter survival - April 20, 1981.
Mildew - May 15 and 28, 1981.
Leaf rust - June 15, 1981.

Correlation Coefficients

N = Number of observations	Test weight	1000-kernel weight	Protein	Plant height	Lodging	Flowering	Ripening	Winter survival
Grain yield	.51**	.61**	-.24	-.09	-.31**	-.16	-.01	.32**
N	120	120	30	120	120	120	120	120
Test weight		.54**	.05	.27**	.01	-.24**	-.17	.07
N		120	30	120	120	120	120	120
1000-kernel weight			.18	.02	-.15	.04	.24**	.11
N			30	120	120	120	120	120
Protein				.40*	.45*	.19	.14	-.11
N				30	30	30	30	30
Plant height					.41**	.25**	.11	.06
N					120	120	120	120
Lodging						.02	-.04	.07
N						120	120	120
Flowering							.47**	.01
N							120	120
Ripening								-.11
N								120

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 60. Agronomic, grain quality, and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Odessa, USSR in 1981.

Cultivars	Yield q/ha	Test Weight kg/hl	1000-Kernel Weight g	Protein %	Plant Height cm	Lodging %	Days to Flowering from Jan.1	Days to Ripening from Jan.1	Winter Survival %	Leaf Rust Sev %	Leaf Rust Resp	Mildew leaves 0-9
Jugoslavija	91.7	79.7	45.8	14.4	106	0	154	190	100	0	-	0
Sadovo Super	85.2	75.8	38.3	13.8	103	0	151	186	100	17	R-S	1
Balkan	82.7	79.0	45.5	15.1	95	0	154	187	100	1	R-	0
Phoenix (WW 33G)	79.5	78.4	33.0	13.8	82	0	150	185	100	30	S-	1
Trakia	78.2	76.7	43.6	13.6	77	0	151	187	100	0	R-	1
TAM W-105	77.2	79.2	36.3	13.5	94	0	150	186	100	17	R-S	4
Loudogorka	76.7	77.7	41.4	14.8	105	0	154	189	100	2	R-S	2
Martonvasari 6	73.7	78.9	41.3	15.5	112	0	155	187	100	26	S-	2
Houser	73.5	73.8	36.5	12.6	99	0	157	189	100	19	S-	0
WWP 4394	73.2	78.1	39.4	15.3	110	0	153	186	100	1	R-	2
Bezostaya 1	72.5	79.6	41.5	15.3	110	0	154	187	100	8	R-S	6
Vega	71.5	75.4	39.3	15.6	83	0	150	185	100	1	R-	0
Super X	69.2	78.4	37.5	13.7	94	0	153	189	95	1	R-	0
TX 71A562-6	68.0	75.6	34.1	13.0	91	0	154	187	100	7	R-S	3
Chokwang	66.0	77.9	41.8	16.2	88	0	145	185	100	100	S-	7
Alcedo	65.6	78.2	38.4	13.3	107	0	166	188	100	11	R-S	0
Bounty	65.5	71.9	34.6	14.8	76	0	159	190	100	2	R-S	0
Maris Mardler	64.5	71.5	40.0	14.7	72	0	160	190	100	5	R-S	0
NE 79Y90576	64.2	75.3	28.8	12.3	100	0	147	178	100	1	R-	6
Bastion	61.2	76.2	37.3	14.4	108	0	156	189	86	2	R-S	0
NE 79Y95097	60.7	72.4	31.0	13.6	83	0	150	186	100	7	R-S	7
Huenufen	58.0	72.0	31.6	14.3	86	0	156	187	100	8	R-S	2
Irnerio	58.0	76.2	34.3	14.0	77	0	148	185	85	35	S-	1
Pai yu pao	57.5	77.7	34.3	14.5	85	0	146	186	100	4	R-S	6
Blueboy	56.2	75.5	37.0	13.4	108	5	155	188	100	1	R-	5
Aura	56.0	75.0	32.8	14.8	117	0	159	189	100	23	R-S	3
Jana	55.5	73.1	35.0	15.0	113	0	166	190	100	0	-	1
Kopara	50.7	73.8	31.4	15.3	98	0	155	186	100	1	R-	1
Atlas 66	47.0	76.3	32.9	17.8	130	16	154	186	100	0	-	1
Takahe	43.5	74.1	34.5	16.4	99	0	157	189	85	17	R-S	0
Mean	66.8	76.1	37.0	14.5	96.9	0.7	153.9	187.0	98.4	11.3		2.0
LSD of the cultivar means (.05)	5.5	0.7	1.7	-	7.2	2.6	5.5	2.7	3.8	-		-
Coefficient of variation (%)	5.9	0.7	3.3	-	5.3	262.8	2.5	1.0	2.8	-		-

WEST GERMANY

Monsheim

COOPERATOR(S): K. Brunckhorst and F. Bonne.

DATE OF PLANTING (EFFECTIVE GERMINATION): October 27, 1980.

PRECIPITATION DURING CYCLE OF TEST: Not reported.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 113 kg/ha; P = 65 kg/ha; and K = 200 kg/ha. Nitrophos and Komkali were used.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Not reported.

DISEASE DEVELOPMENT: Mildew was the only significant disease problem.

INSECT, WEED OR PEST PROBLEMS: Not reported.

DATE OF HARVEST: August 14, 1981.

AREA HARVESTED FOR YIELD: 4.375 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Winter survival - March 27, 1981.
Mildew - May 19, 1981.
Lodging - July 24, 1981.

Correlation Coefficients

N = Number of observations	1000-kernel weight	Protein	Plant height	Lodging	Flowering	Winter survival
Grain yield	-.08	-.79**	-.27**	.11	-.11	.36**
N	120	30	120	120	120	120
1000-kernel weight		.17	.07	-.39**	.39**	-.14
N		30	120	120	120	120
Protein			.32	-.10	.05	-.49**
N			30	30	30	30
Plant height				.08	.59**	-.17
N				120	120	120
Lodging					-.34**	.38**
N					120	120
Flowering						-.18*
N						120

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 61. Agronomic, grain quality, and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Monsheim, West Germany in 1981.

Cultivars	Yield q/ha	1000-Kernel Weight g	Protein %	Plant Height cm	Lodging %	Days to Flowering from Jan.1	Winter Survival %	Mildew leaves 0-9
Sadovo Super	76.2	44.4	11.3	89	31	146	100	7
TAM W-105	76.0	40.1	12.1	93	35	146	100	6
Phoenix (WW 33G)	75.1	37.5	11.6	82	40	141	100	5
Trakia	74.9	47.9	11.6	85	53	145	98	5
Jugoslavija	72.3	47.4	12.7	91	40	146	100	2
Blueboy	71.4	44.6	12.4	107	8	154	75	7
Loudogorka	70.5	47.0	13.0	94	40	152	99	5
Super X	70.4	38.0	12.6	93	61	145	100	3
TX 71A562-6	70.0	37.0	11.7	91	73	150	99	7
Balkan	69.4	51.4	12.8	86	31	145	100	1
Martonvasari 6	68.5	48.1	13.2	102	45	153	100	5
Bezostaya 1	67.3	46.1	13.1	100	44	147	100	5
NE 79Y95097	64.7	37.2	12.6	91	36	149	100	8
WWP 4394	64.3	41.0	13.1	98	28	147	85	4
Bounty	63.9	46.3	12.7	84	9	158	100	2
Maris Mardler	63.8	52.3	13.4	81	1	158	100	2
Alcedo	63.2	46.2	13.4	106	21	157	100	5
NE 79Y90576	61.5	33.2	12.5	97	64	145	100	8
Irnerio	61.5	43.0	12.5	69	6	145	93	6
Houser	59.8	49.3	12.4	103	58	153	100	4
Kopara	59.3	43.7	14.6	101	4	153	81	6
Vega	59.2	45.4	13.0	80	58	141	86	4
Bastion	59.0	49.9	14.4	103	5	154	79	2
Jana	57.2	49.0	13.1	115	8	157	100	6
Huenufen	54.8	49.5	13.6	91	3	154	84	6
Aura	52.1	43.1	13.2	117	48	157	100	5
Pai yu pao	50.0	38.3	14.3	79	31	134	89	7
Takahe	49.8	49.0	15.9	101	5	157	70	1
Chokwang	48.3	46.7	17.1	83	39	134	100	7
Atlas 66	44.4	41.8	16.9	122	66	154	87	3
Mean	63.3	44.5	13.2	94.3	32.9	149.2	94.1	4.7
LSD of the cultivar means (.05)	3.5	2.4	-	4.0	17.5	1.3	5.4	-
Coefficient of variation (%)	3.9	3.9	-	3.0	37.9	0.6	4.1	-

WEST GERMANY

Weihenstephan

COOPERATOR: G. Fischbeck.

DATE OF PLANTING (EFFECTIVE GERMINATION): October 22, 1980.

PRECIPITATION DURING CYCLE OF TEST: 562 mm.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 65 kg/ha; P = 128 kg/ha; and K = 220 kg/ha. Fertilizers used included Kalkammonsaltpeter, and Rhekaphos.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Temperatures were generally below average during winter, but above average in the spring. Rainfall had a favorable distribution throughout the season.

DISEASE DEVELOPMENT: There were not many diseases present. Mildew was most predominant.

INSECT, WEED OR PEST PROBLEMS: None.

DATE OF HARVEST: June 25 - July 3, 1981.

AREA HARVESTED FOR YIELD: 3.25 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Mildew - June 5, 1981.
Plant height - July 22, 1981.
Lodging - July 23, 1981.

Correlation Coefficients

N = Number of observations	Test weight	1000-kernel weight	Protein	Plant height	Lodging	Flowering	Ripening
Grain yield	.57**	.46**	-.54**	.18	-.21*	.32**	.22*
N	120	120	30	120	120	120	120
Test weight		.57**	-.09	.37**	-.35**	.17	.20*
N		120	30	120	120	120	120
1000-kernel weight			.07	.26**	-.43**	.36**	.38**
N			30	120	120	120	120
Protein				.04	.03	-.36	-.07
N				30	30	30	30
Plant height					.20*	.53**	.69**
N					120	120	120
Lodging						-.18*	.05
N						120	120
Flowering							.75**
N							120

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 62. Agronomic, grain quality, and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Weihenstephan, West Germany in 1981.

Cultivars	Yield q/ha	Test Weight kg/hl	1000-Kernel Weight g	Protein %	Plant Height cm	Lodging %	Days to Flowering from Jan.1	Days to Ripening from Jan.1	Mildew leaves 0-9
Martonvasari 6	88.0	80.2	51.7	11.8	94	10	150	209	3
Sadovo Super	87.8	77.1	44.9	10.8	72	5	147	207	4
Maris Mardler	87.1	74.0	47.0	11.1	72	0	159	213	1
Super X	86.0	79.5	39.7	11.0	74	35	148	209	3
Alcedo	85.2	80.8	46.4	11.3	89	10	154	214	3
Balkan	84.5	77.0	49.9	12.0	69	8	147	206	2
Phoenix (WW 33G)	84.4	78.2	36.3	11.7	67	10	140	206	3
TX 71A562-6	83.6	75.2	39.3	10.7	75	43	150	206	3
Bounty	83.4	75.2	44.8	11.3	75	0	160	213	1
Jugoslavija	83.3	80.1	49.2	11.6	83	3	148	209	2
TAM W-105	81.9	80.9	40.8	11.4	78	28	147	206	3
Houser	81.4	75.2	48.9	10.8	90	45	155	212	2
Bezostaya 1	81.4	82.2	48.8	11.9	86	13	149	209	4
Aura	80.9	78.8	45.5	12.0	106	38	158	215	2
Jana	79.5	75.2	46.7	11.4	99	20	161	215	3
WWP 4394	77.5	78.6	43.0	12.8	82	5	150	206	3
Bastion	77.3	78.9	43.0	11.8	87	5	148	208	2
Loudogorka	75.4	79.3	51.4	13.2	84	8	150	209	3
Takahe	74.2	78.1	46.6	12.8	88	10	156	215	2
NE 79Y90576	72.4	74.8	31.2	10.7	80	45	143	206	7
Kopara	71.9	78.5	42.9	12.7	87	8	151	209	3
Vega	71.1	74.5	45.0	13.0	63	3	144	206	2
Atlas 66	70.5	80.6	44.5	14.0	115	33	151	215	2
Trakia	69.0	79.3	49.9	12.2	67	0	144	206	2
Blueboy	68.1	76.1	43.4	10.6	91	25	154	215	5
Irnerio	63.2	76.0	40.8	11.8	59	0	146	206	4
Huenufen	62.4	75.6	40.7	11.7	78	3	156	206	3
Chokwang	61.5	75.7	44.6	14.5	67	38	138	206	6
NE 79Y95097	56.8	69.5	29.1	11.7	74	30	148	206	6
Pai yu pao	54.7	64.4	32.9	13.0	66	48	138	206	6
Mean	76.1	77.0	43.6	11.9	80.4	17.4	149.6	209.1	3.1
LSD of the cultivar means (.05)	6.0	1.5	2.0	-	5.9	9.9	1.7	1.1	-
Coefficient of variation (%)	5.6	1.4	3.2	-	5.3	40.5	0.8	0.4	-

YUGOSLAVIA

Novi Sad

COOPERATOR: Slavko Borojevic.

DATE OF PLANTING (EFFECTIVE GERMINATION): October 23, 1980.

PRECIPITATION DURING CYCLE OF TEST: Not reported.

AMOUNT OF IRRIGATION APPLIED: Not reported.

FERTILIZER USED: N = 56 kg/ha; P = 56 kg/ha; and K = 56 kg/ha. The fertilizer was a (14-14-14) compound.

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Temperature and precipitation were near normal throughout the growing season.

DISEASE DEVELOPMENT: Leaf rust and mildew were fairly severe; other diseases were not a problem.

INSECT, WEED OR PEST PROBLEMS: None.

DATE OF HARVEST: July 8, 1981.

AREA HARVESTED FOR YIELD: 5.0 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN: Not reported.

Correlation Coefficients

N = 30 observations	Test weight	1000-kernel weight	Protein	Lysine/ protein	Flowering
Grain yield	.37*	.58**	-.22	-.23	-.01
Test weight		.56**	.14	-.40*	-.45*
1000-kernel weight			.24	-.35	-.22
Protein				-.25	.19
Lysine/protein					.12

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 63. Agronomic, grain quality, and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Novi Sad, Yugoslavia in 1981.

Cultivars	Yield q/ha	Test[a] Weight kg/hl	1000-[a] Kernel Weight g	Protein %	Adjusted lysine/ Protein %	Days to[a] Flowering from Jan.1	Stripe Rust Sev %	Stripe Rust Resp	Leaf Rust Sev %	Leaf Rust Resp	Mildew leaves 0-9
Balkan	73.3	80.1	47.7	14.4	2.93	139	0	-	27	VR-VS	4
Jugoslavija	67.8	81.7	43.9	14.6	2.94	140	0	-	8	VR-S	4
Martonvasari 6	67.3	81.3	41.5	14.5	3.05	142	8	MR-MS	65	VS-	4
Sadovo Super	66.2	79.5	36.0	13.9	3.18	150	4	MS-VS	78	VS-	6
Bezostaya 1	64.6	82.9	45.6	14.6	3.04	140	1	VR-MR	45	S-VS	5
Loudogorka	60.8	79.5	43.0	14.9	3.06	142	18	MS-VS	55	VS-	4
Maris Mardler	60.7	69.8	41.9	14.9	3.12	147	0	-	25	MS-S	0
Phoenix (WW 33G)	59.9	79.3	33.7	13.2	3.10	138	1	VR-MS	50	S-VS	7
Super X	58.6	78.7	33.8	13.0	3.07	142	4	MR-MS	41	MS-VS	5
TAM W-105	57.4	73.6	36.1	13.0	3.08	144	4	VR-VS	25	MS-S	9
Trakia	56.9	79.3	40.1	14.3	2.83	139	0	VR-	41	VS-	5
Bounty	55.4	69.4	32.5	14.7	3.18	150	0	-	60	VS-	1
Houser	54.6	73.8	32.6	13.5	3.10	147	29	VS-	60	S-VS	4
Jana	54.3	73.6	38.8	14.5	3.14	150	10	MR-MS	3	MS-S	6
Alcedo	53.8	78.7	35.4	13.8	3.22	147	0	MR-	90	VS-	4
Bastion	52.3	74.0	37.0	14.2	3.17	147	9	MR-MS	68	S-VS	0
TX 71A562-6	51.1	76.0	32.2	13.2	3.15	141	14	VR-MS	35	MR-VS	8
WWP 4394	49.3	81.3	38.6	15.4	3.05	142	0	-	40	VR-MR	6
NE 79Y95097	47.2	71.4	27.5	13.9	3.28	141	5	VR-MR	50	MR-S	9
Atlas 66	47.0	80.1	37.9	17.9	3.02	145	11	MS-S	18	S-	3
NE 79Y90576	44.3	73.0	27.1	12.2	3.15	140	29	MS-	25	R-	9
Vega	43.3	73.0	36.4	15.1	3.17	139	8	MS-VS	55	MR-VS	6
Blueboy	42.4	72.8	36.7	12.9	3.15	145	1	VR-	45	S-VS	7
Chokwang	42.0	78.5	39.4	16.0	3.18	135	33	VS-	25	VR-	6
Aura	41.7	72.2	29.3	16.3	2.86	150	1	MS-	65	VS-	5
Kopara	41.2	79.9	35.1	15.5	3.02	145	3	VR-MR	73	VS-	5
Pai yu pao	39.3	78.2	31.2	13.7	3.10	138	15	MS-VS	23	VR-S	8
Huenufen	39.0	73.6	31.8	15.5	2.92	148	0	-	65	VS-	5
Irnerio	34.4	74.8	33.9	13.5	3.06	139	36	MS-VS	70	VS-	5
Takahe	32.3	71.6	31.6	15.4	3.34	147	28	MS-VS	53	VS-	2
Mean	52.0	76.4	36.3	14.4	3.09	143.3	9.0		47.4		4.9
LSD of the cultivar means (.05)	7.7	-	-	-	-	-	-		-		-
Coefficient of variation (%)	10.6	-	-	-	-	-	-		-		-

a/ One replication only.

YUGOSLAVIA

Zagreb

COOPERATOR(S): J. Potocanac and R. Mlinar.

DATE OF PLANTING (EFFECTIVE GERMINATION): March 10, 1981.

PRECIPITATION DURING CYCLE OF TEST: Not reported.

AMOUNT OF IRRIGATION APPLIED: None.

FERTILIZER USED: N = 176 kg/ha; P = 90 kg/ha; and K = 90 kg/ha. Fertilizers used were a granular compound (9-18-18) and 27% KAN (NH_4NO_3).

GENERAL DESCRIPTION OF CLIMATIC CONDITIONS DURING TEST: Temperatures and rainfall were below average during the spring months, especially March and April.

DISEASE DEVELOPMENT: There was a particularly heavy attack of mildew and Septoria sp.

INSECT, WEED OR PEST PROBLEMS: None.

DATE OF HARVEST: July 29, 1981.

AREA HARVESTED FOR YIELD: 4.0 square meters.

DATES WHEN DIFFERENT NOTES WERE TAKEN:

Mildew - June 1, 1981.
Septoria - June 17, 1981.
Rusts - July 13, 1981.
Lodging - July 25, 1981.

Correlation Coefficients

N = Number of observations	Test weight	1000-kernel weight	Plant height	Lodging	Flowering	Ripening	Percent emergence
Grain yield	-.05	.55**	.08	.19	-.74**	-.69**	.04
N	21	21	83	21	21	21	83
Test weight		.06	.35	-.12	-.08	.12	-.27
N		21	21	21	21	21	21
1000-kernel weight			-.15	-.08	-.64**	-.31	-.53*
N			21	21	21	21	21
Plant height				-.11	.42	.33	-.29**
N				21	21	21	86
Lodging					-.37	-.66**	.22
N					21	21	21
Flowering						.79**	.12
N						21	21
Ripening							-.10
N							21

*, ** Significant at the .05 and .01 probability levels, respectively.

Table 64. Agronomic and disease data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Zagreb, Yugoslavia in 1981.

Cultivars	Yield q/ha	Test[a] Weight kg/hl	1000-[a] Kernel Weight g	Plant Height cm	Lodging[a] %	Days to[a] Flowering from Jan.1	Days to[a] Ripening from Jan.1	Percent Emergence	Leaf Rust[a] Sev %	Leaf Rust[a] Resp	Stem Rust[a] Sev %	Stem Rust[a] Resp	Mildew[a] leaves 0-9	Septoria[a] leaves 0-9
Bastion	34.4	66.8	40.6	83	0	160	200	92	40	MS-	10	MR-	4	2
Phoenix (WW 33G)	31.2	62.3	28.0	68	0	161	201	98	30	MR-	2	R-	6	3
Takahe	30.1	60.7	35.3	84	0	163	201	94	70	MS-	40	MR-	5	4
Atlas 66	29.2	71.9	36.3	97	5	165	203	93	15	MR-	5	MS-	2	2
Maris Mardler	22.7	55.8	33.3	63	0	169	200	98	40	R-	5	R-	2	3
Super X	22.2	61.0	28.7	66	30	154	178	98	0	-	10	R-	8	6
Huenufen	20.7	66.0	35.0	70	0	165	202	92	40	S-	30	MS-	7	4
Irnerio	20.4	69.7	37.7	61	0	155	196	96	15	MS-	5	R-	7	3
Vega	20.0	69.4	36.4	65	0	164	209	94	35	MR-	10	MS-	6	4
Kopara	17.7	56.8	32.1	74	0	162	202	93	20	MR-	5	R-	8	5
Blueboy	15.9	59.8	35.8	86	0	166	207	81	35	M-M	80	S-	8	3
NE 79Y95097	15.4	65.4	30.3	68	5	157	199	98	30	R-	25	MR-	8	6
NE 79Y90576	13.6	72.0	26.1	82	0	166	201	97	5	MR-	20	MS-	8	5
Trakia	11.3	64.6	36.2	65	0	167	219	94	10	MR-	55	MS-	5	2
TAM W-105	9.2	70.8	24.8	74	0	177	209	92	25	MS-	25	MR-	6	4
Sadovo Super	9.1	64.8	25.2	77	0	178	217	99	20	R-	45	S-	3	2
TX 71A562-6	8.9	60.7	31.1	75	3	176	210	95	20	MR-	40	S-	7	3
WWP 4394	7.4	67.3	29.0	81	0	179	220	84	10	R-	5	MS-	4	3
Loudogorka	6.4	61.9	23.2	79	0	185	218	98	40	R-	35	MS-	6	2
Jugoslavija	6.1	59.5	23.9	74	0	191	215	98	10	R-	5	R-	3	3
Bezostaya 1	6.0	69.0	27.4	83	0	178	220	98	15	R-	15	MS-	5	4
Jana	.	.	.	.	.	.	.	99	5	MR-	75	S-	5	3
Aura	.	.	.	.	.	.	.	98	35	MS-	20	MS-	6	4
Houser	.	.	.	.	.	.	.	98	30	VR-	20	S-	6	4
Alcedo	.	.	.	.	.	.	.	99	10	MR-	60	MS-	5	4
Martonvasari 6	.	.	.	.	.	.	.	99	10	MR-	30	MS-	6	3
Pai yu pao	.	.	.	.	.	.	.	93	15	R-	40	S-	8	4
Chokwang	.	.	.	.	.	.	.	98	45	MR-	60	MR-	8	5
Balkan	.	.	.	69	.	.	.	99	20	R-	5	R-	3	3
Bounty	.	.	.	58	.	.	.	97	10	MR-	15	MS-	1	3
Mean	17.2	64.6	31.3	74.5	2.0	168.5	206.0	95.2	23.5		26.6		5.5	3.5
LSD of the cultivar means (.05)	6.0	-	-	7.1	-	-	-	6.0	-		-		-	-
Coefficient of variation (%)	23.6	-	-	6.5	-	-	-	4.5	-		-		-	-

a/ One replication only.

Table 65. Summary of average yield in quintals per hectare and rankings for the 30 cultivars grown in the Thirteenth International Winter Wheat Performance Nursery in 1981.

Cultivars	Balcarce,[a] Argentina		Bordenave, Argentina		Marcos Juarez, Argentina		Vienna, Austria		Tolbukhin, Bulgaria		Lethbridge, Alberta, Canada		Chillan, Chile	
	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank
Jugoslavija	7.6	15	29.8	8	30.5	2	43.3	9	96.0	2	73.6	12	76.0	1
Sadovo Super	6.7	18	25.0	16	22.6	11	44.0	7	97.0	1	80.1	1	51.0	17
Balkan	10.2	6	24.9	18	27.0	6	40.1	17	96.0	2	74.3	8	61.5	4
Martonvasari 6	10.0	8	28.0	10	10.9	24	43.3	9	85.5	8	78.6	5	55.9	12
TAM W-105	19.8	2	33.4	4	27.2	5	37.0	23	70.5	18	74.3	8	53.5	16
Loudogorka	11.2	3	30.5	6	20.0	14	43.5	8	89.0	7	79.7	3	59.3	6
Phoenix (WW 33G)	7.2	16	29.6	9	30.6	1	38.6	19	92.0	5	75.7	7	54.2	13
Bezostaya 1	10.7	4	26.2	12	21.4	12	40.8	15	82.5	12	72.7	13	56.2	10
Alcedo	6.6	19	23.3	20	1.7	29	49.4	4	75.0	17	66.6	14	69.9	2
TX 71A562-6	23.6	1	39.0	1	24.6	8	40.7	16	82.5	12	79.3	4	34.7	24
Houser	9.0	12	25.3	15	8.4	26	51.5	2	82.0	14	73.9	11	43.7	21
Trakia	3.7	25	25.4	14	19.7	15	49.1	5	91.5	6	78.6	5	64.4	3
Maris Mardler	6.4	20	14.8	30	11.0	23	51.0	3	95.5	4	74.2	10	53.7	15
WWP 4394	3.4	26	29.9	7	22.8	10	52.3	1	85.0	9	56.8	21	56.1	11
Bounty	10.4	5	17.7	27	13.1	22	43.2	11	84.0	10	79.9	2	48.5	19
Vega	2.8	27	33.1	5	20.6	13	44.8	6	81.0	15	56.5	22	46.0	20
Jana	6.9	17	24.1	19	4.2	28	41.7	13	79.5	16	63.9	16	49.1	18
Blueboy	10.2	6	36.6	3	8.0	27	38.2	20	44.0	30	58.7	20	60.4	5
NE 79Y90576	8.2	13	16.7	28	24.7	7	32.6	29	58.5	26	62.8	17	16.3	28
NE 79Y95097	6.2	21	22.0	23	27.3	4	27.5	30	63.5	24	64.2	15	57.7	8
Aura	4.5	23	15.2	29	1.0	30	37.4	22	65.0	22	58.9	19	37.5	22
Chokwang	1.7	30	22.6	22	13.7	21	39.9	18	69.0	20	50.5	24	10.8	29
Pai yu pao	2.6	28	22.7	21	17.8	16	32.7	28	55.5	27	59.6	18	17.0	27
Super X	3.8	24	25.0	16	28.2	3	36.5	24	84.0	10	0.0	30	34.8	23
Atlas 66	7.9	14	18.0	26	14.9	20	33.4	27	64.0	23	33.7	27	29.8	26
Bastion	9.4	11	18.6	25	17.3	17	43.1	12	70.0	19	19.2	29	56.8	9
Kopara	10.0	8	26.5	11	16.8	18	40.9	14	47.0	29	36.1	26	54.1	14
Huenufen	9.7	10	19.8	24	15.6	19	37.5	21	69.0	20	37.2	25	58.9	7
Irnerio	2.5	29	38.7	2	23.0	9	35.7	25	63.0	25	21.8	28	7.2	30
Takahe	5.2	22	26.0	13	10.7	25	33.5	26	52.5	28	50.8	23	33.2	25
Means	7.9		25.6		17.9		40.8		75.7		59.7		46.9	
LSD of the cultivar means (.05)	2.6		9.9		6.0		5.9		5.4		13.1		5.3	
Coefficient of variation (%)	23.5		27.4		23.8		8.5		5.1		15.5		8.0	

a/ This site not included in the overall means.

Table 65. Summary of average yield in quintals per hectare and rankings for the 30 cultivars grown in the Thirteenth International Winter Wheat Performance Nursery in 1981.

Cultivars	Male Ripnany, Czechoslovakia		Sedlec, Czechoslovakia		Bohnshausen,[a] East Germany		Jokioinen,[a] Finland		Orgerus, France		Martonvasar, Hungary		Szeged, Hungary	
	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank
Jugoslavija	59.2	15	68.6	6	48.5	7	0.0	11	62.5	2	63.7	5	56.1	5
Sadovo Super	59.0	16	70.7	2	53.0	2	0.0	11	51.8	6	71.3	1	60.9	2
Balkan	53.7	18	59.4	15	51.9	3	0.0	11	62.7	1	67.7	2	49.4	12
Martonvasari 6	73.4	2	68.9	5	50.2	5	10.2	2	56.2	3	66.4	3	60.3	3
TAM W-105	69.4	5	72.3	1	41.8	12	5.3	4	36.4	19	66.2	4	58.9	4
Loudogorka	62.9	10	67.1	9	48.1	8	0.1	9	55.8	4	55.8	9	51.5	8
Phoenix (WW 33G)	51.7	20	67.1	9	41.8	12	0.0	11	50.4	9	56.4	8	54.0	6
Bezostaya 1	67.8	6	66.0	11	42.2	11	8.3	3	49.2	10	57.7	7	50.2	11
Alcedo	74.0	1	69.6	4	61.4	1	12.1	1	50.8	8	58.4	6	46.1	14
TX 71A562-6	65.0	7	68.6	6	38.6	15	0.0	11	26.2	28	50.0	15	50.4	10
Houser	64.7	8	70.2	3	44.0	9	0.0	11	32.7	22	54.3	11	47.7	13
Trakia	64.2	9	65.8	12	36.6	17	0.2	8	46.6	13	48.9	16	39.9	21
Maris Mardler	73.2	3	68.5	8	44.0	9	0.0	11	44.6	15	53.4	12	62.5	1
WWP 4394	42.8	24	46.9	22	36.3	18	0.3	7	54.1	5	54.5	10	51.1	9
Bounty	60.6	13	55.6	17	50.3	4	0.0	11	48.3	12	50.7	14	45.4	15
Vega	45.3	23	49.8	21	32.5	21	0.0	11	48.7	11	41.4	19	40.9	20
Jana	70.3	4	58.3	16	48.6	6	0.4	5	46.6	13	53.2	13	44.4	16
Blueboy	51.6	21	39.8	25	36.3	18	0.0	11	36.2	20	29.5	23	43.4	18
NE 79Y90576	36.8	27	63.7	13	25.6	27	0.0	11	24.5	29	29.7	22	36.1	25
NE 79Y95097	37.8	26	55.3	18	24.9	28	0.0	11	30.2	24	27.4	25	34.5	26
Aura	62.2	11	46.4	23	38.5	16	0.4	5	42.5	18	34.8	21	39.4	22
Chokwang	51.3	22	53.6	19	13.4	30	0.0	11	13.7	30	48.1	17	43.9	17
Pai yu pao	29.5	30	42.4	24	19.5	29	0.1	9	26.8	26	22.7	26	38.7	23
Super X	60.6	13	62.1	14	31.3	23	0.0	11	26.5	27	36.5	20	53.0	7
Atlas 66	54.5	17	50.3	20	33.0	20	0.0	11	44.2	16	44.1	18	36.4	24
Bastion	61.8	12	27.6	29	41.3	14	0.0	11	51.6	7	28.2	24	24.1	30
Kopara	53.7	18	28.9	28	25.8	26	0.0	11	43.4	17	21.0	27	41.6	19
Huenufen	42.5	25	34.7	26	27.1	25	0.0	11	34.9	21	19.2	29	29.2	28
Irnerio	30.7	29	33.7	27	32.2	22	0.0	11	32.7	22	20.2	28	34.0	27
Takahe	33.0	28	14.0	30	28.2	24	0.0	11	30.2	24	5.3	30	28.2	29
Means	55.4		54.9		38.2		1.2		42.0		44.6		45.1	
LSD of the cultivar means (.05)	4.2		7.4		6.6		-		11.2		11.1		10.4	
Coefficient of variation (%)	5.4		9.6		12.3		-		18.9		17.7		16.4	

[a] These sites were not included in the overall means.

Table 65. Summary of average yield in quintals per hectare and rankings for the 30 cultivars grown in the Thirteenth International Winter Wheat Performance Nursery in 1981.

Cultivars	Karaj, Iran		Milano, Italy		Rieti,[a/] Italy		Morioka, Iwate, Japan		Suwon, Korea		Beirut,[a/] Lebanon		Toluca,[a/] Mexico	
	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank
Jugoslavija	56.1	19	74.5	3	83.9	1	14.3	18	43.3	12	14.2	16	21.5	13
Sadovo Super	69.8	2	78.3	1	68.6	5	10.7	19	50.2	2	17.5	6	20.7	16
Balkan	59.6	15	71.3	4	67.0	7	40.9	1	51.9	1	17.3	7	20.4	18
Martonvasari 6	55.4	21	67.9	6	54.3	15	36.3	3	48.8	4	10.0	21	16.1	22
TAM W-105	50.0	28	60.7	12	68.7	4	26.8	11	42.6	13	14.3	13	30.4	3
Loudogorka	66.5	7	68.1	5	62.8	8	28.6	8	46.9	7	13.0	18	21.0	14
Phoenix (WW 33G)	86.3	1	76.1	2	59.6	10	0.1	24	41.8	15	17.8	5	22.7	11
Bezostaya 1	61.5	11	54.8	18	70.9	2	35.0	4	47.5	5	12.7	19	20.6	17
Alcedo	54.0	24	63.2	10	27.3	29	29.2	7	33.9	18	2.5	29	.	.
TX 71A562-6	56.2	18	56.4	16	51.7	19	36.4	2	42.0	14	14.0	17	21.0	14
Houser	67.2	5	58.6	15	47.9	24	34.5	5	36.6	17	8.3	24	15.2	23
Trakia	56.1	19	61.6	11	48.8	22	30.5	6	45.1	11	15.0	11	28.1	4
Maris Mardler	65.1	9	52.0	25	51.4	20	0.0	25	23.6	23	5.7	28	25.0	7
WWP 4394	57.4	17	54.8	18	70.0	3	27.4	10	45.7	10	25.5	1	40.0	1
Bounty	67.6	4	48.2	27	56.2	13	1.5	20	21.9	24	6.5	27	23.4	9
Vega	60.2	14	53.7	21	54.0	16	26.8	11	49.4	3	16.8	8	27.1	6
Jana	47.5	29	53.7	21	52.2	17	27.8	9	28.7	21	2.2	30	.	.
Blueboy	54.4	23	59.0	14	52.0	18	20.3	14	39.9	16	8.5	23	22.6	12
NE 79Y90576	60.8	12	65.7	8	43.1	28	15.7	17	47.3	6	18.5	4	36.2	2
NE 79Y95097	60.8	12	54.6	20	55.8	14	1.0	21	33.6	19	16.3	10	23.3	10
Aura	52.2	26	44.7	29	18.0	30	25.0	13	27.7	22	7.7	25	.	.
Chokwang	62.1	10	66.6	7	48.5	23	16.4	16	46.1	9	18.8	3	17.1	20
Pai yu pao	65.4	8	52.3	23	46.1	26	19.9	15	46.3	8	14.3	13	11.3	26
Super X	68.0	3	54.9	17	62.8	8	0.0	25	0.0	30	25.0	2	14.2	25
Atlas 66	47.5	29	49.4	26	43.6	27	0.4	22	31.7	20	10.8	20	15.1	24
Bastion	59.0	16	60.3	13	68.3	6	0.0	25	12.4	26	9.2	22	18.6	19
Kopara	55.0	22	47.3	28	56.9	12	0.0	25	9.6	28	14.3	13	24.9	8
Huenufen	52.4	25	41.8	30	57.3	11	0.0	25	8.7	29	7.7	25	27.5	5
Irnerio	67.1	6	64.5	9	50.5	21	0.0	25	10.2	27	16.8	8	.	.
Takahe	50.8	27	52.2	24	46.5	25	0.2	23	13.4	25	14.7	12	16.5	21
Means	59.7		58.9		55.2		16.9		34.2		13.2		22.3	
LSD of the cultivar means (.05)	14.1		7.3		12.6		5.8		9.7		10.1		7.9	
Coefficient of variation (%)	16.8		8.8		16.2		24.3		20.1		34.9		25.0	

a/ These sites were not included in the overall means.

Table 65. Summary of average yield in quintals per hectare and rankings for the 30 cultivars grown in the Thirteenth International Winter Wheat Performance Nursery in 1981.

Cultivars	Wageningen, The Netherlands		Vollebekk,[a/] Norway		Przeclaw, Poland		Warsaw, Poland		Fundulea, Romania		Bethlehem, South Africa (dryland)		Bethlehem, South Africa (irrigated)	
	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank
Jugoslavija	31.8	18	41.1	11	45.7	3	87.4	2	69.8	1	18.5	2	34.7	1
Sadovo Super	32.0	16	46.9	7	36.8	12	82.8	4	65.9	2	18.6	1	28.0	5
Balkan	29.5	22	44.8	10	41.0	6	87.8	1	65.9	2	18.5	2	26.5	7
Martonvasari 6	35.4	9	62.5	3	37.9	11	79.0	8	60.9	9	16.8	5	25.3	9
TAM W-105	32.0	16	18.6	18	38.5	10	69.2	12	59.0	11	13.6	18	28.7	4
Loudogorka	31.6	20	45.5	9	39.1	9	67.8	14	59.2	10	17.0	4	22.8	15
Phoenix (WW 33G)	34.5	12	17.1	20	43.0	5	79.6	7	61.9	5	14.1	17	30.8	2
Bezostaya 1	29.7	21	57.0	4	35.8	15	68.6	13	61.7	6	16.2	9	24.4	12
Alcedo	38.2	5	46.9	7	50.5	2	83.4	3	61.0	8	10.3	28	5.7	30
TX 71A562-6	35.9	8	23.1	17	31.3	21	57.0	22	61.3	7	15.7	12	12.9	27
Houser	38.2	5	69.9	2	36.5	13	53.7	24	54.5	12	12.6	20	23.2	14
Trakia	33.0	14	28.3	12	31.6	20	48.8	26	63.1	4	16.6	6	20.2	17
Maris Mardler	47.6	1	0.0	24	51.3	1	80.4	6	42.6	21	14.9	14	29.0	3
WWP 4394	32.4	15	26.1	14	44.5	4	72.0	11	53.1	13	16.0	11	20.2	17
Bounty	41.0	4	25.7	16	39.6	8	76.9	9	40.5	23	16.3	8	25.8	8
Vega	20.3	27	27.3	13	28.9	22	66.3	15	51.9	14	14.5	15	19.5	19
Jana	41.7	2	54.7	5	40.5	7	80.6	5	49.9	15	12.2	22	11.0	29
Blueboy	35.1	10	49.3	6	36.2	14	76.5	10	19.6	30	16.2	9	14.1	26
NE 79Y90576	24.8	25	26.0	15	23.9	27	60.1	19	48.3	16	12.8	19	24.8	11
NE 79Y95097	21.5	26	14.2	21	21.8	28	60.2	18	46.9	17	12.2	22	27.6	6
Aura	36.2	7	72.3	1	33.4	19	61.5	17	35.5	25	9.6	30	12.6	28
Chokwang	13.0	30	17.6	19	12.6	30	41.6	27	44.9	19	15.6	13	22.7	16
Pai yu pao	17.8	29	10.3	23	24.8	25	59.1	21	45.2	18	11.3	27	18.8	22
Super X	29.0	24	0.0	24	26.0	24	26.7	28	41.4	22	14.3	16	23.4	13
Atlas 66	31.7	19	12.5	22	28.2	23	60.0	20	43.7	20	11.5	25	15.9	25
Bastion	41.3	3	0.0	24	33.7	18	56.0	23	19.8	28	12.4	21	18.9	21
Kopara	29.1	23	0.0	24	34.8	17	52.7	25	29.9	27	12.1	24	19.3	20
Huenufen	35.0	11	0.0	24	34.9	16	65.0	16	33.2	26	10.0	29	17.9	24
Irnerio	18.4	28	0.0	24	21.7	29	23.5	29	19.8	28	16.5	7	25.1	10
Takahe	33.6	13	0.0	24	24.2	26	20.2	30	39.1	24	11.4	26	18.0	23
Means	31.7		27.9		34.3		63.5		48.3		14.3		21.6	
LSD of the cultivar means (.05)	4.5		10.7		1.5		11.6		3.7		2.2		6.6	
Coefficient of variation (%)	10.0		17.4		3.2		13.0		5.4		11.0		21.8	

a/ This site not included in the overall means.

Table 65. Summary of average yield in quintals per hectare and rankings for the 30 cultivars grown in the Thirteenth International Winter Wheat Performance Nursery in 1981.

Cultivars	Madrid,[a] Spain		Zaragoza, Spain		Zurich, Switzerland		Aleppo, Syria		Ankara, Turkey		Erzurum, Turkey		Davis, California, USA	
	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank
Jugoslavija	9.1	2	26.0	6	41.1	3	55.5	6	20.9	5	22.1	17	50.3	7
Sadovo Super	5.4	12	24.8	8	32.6	13	55.9	5	18.8	7	32.4	8	41.1	17
Balkan	4.7	15	20.3	14	39.8	5	42.5	16	21.4	4	23.5	15	44.6	13
Martonvasari 6	5.8	10	21.8	12	41.1	3	36.6	21	24.6	1	31.4	9	41.6	16
TAM W-105	7.6	3	33.3	2	34.1	11	49.1	10	16.0	10	40.2	1	62.3	3
Loudogorka	5.4	12	19.4	15	34.0	12	50.9	8	14.0	15	28.0	12	37.4	21
Phoenix (WW 33G)	7.0	4	33.0	3	34.7	10	57.2	4	14.9	13	30.6	10	71.6	1
Bezostaya 1	4.8	14	24.5	9	39.7	6	51.8	7	23.7	2	34.6	5	42.7	14
Alcedo	1.1	28	11.5	28	41.8	2	35.9	22	23.0	3	36.4	4	40.1	18
TX 71A562-6	6.1	7	27.2	5	26.4	19	44.7	14	20.2	6	29.1	11	63.4	2
Houser	3.1	21	28.4	4	28.3	16	30.6	25	15.2	12	37.7	2	39.5	19
Trakia	4.3	19	17.5	18	20.2	23	60.2	2	15.7	11	18.8	21	52.4	5
Maris Mardler	3.0	23	23.6	11	42.9	1	42.5	16	17.8	8	32.7	7	34.1	22
WWP 4394	5.5	11	16.0	20	31.5	14	40.2	19	10.2	20	20.3	19	21.8	30
Bounty	1.3	27	18.1	17	37.0	7	45.8	13	9.9	22	21.5	18	32.4	25
Vega	6.1	7	12.7	26	26.0	20	63.8	1	11.8	19	15.3	24	48.0	11
Jana	0.7	30	10.3	29	34.9	9	29.9	26	10.1	21	23.9	14	28.5	26
Blueboy	4.5	17	14.8	21	19.1	24	50.3	9	8.4	24	16.1	22	50.2	8
NE 79Y90576	4.5	17	21.5	13	18.5	25	22.9	28	12.9	16	37.6	3	45.7	12
NE 79Y95097	4.6	16	26.0	6	21.0	22	47.1	11	11.9	18	33.0	6	60.0	4
Aura	0.9	29	7.3	30	35.2	8	20.3	30	14.7	14	24.1	13	22.2	28
Chokwang	12.9	1	24.2	10	17.6	27	37.3	20	17.7	9	22.8	16	39.1	20
Pai yu pao	6.1	7	13.6	25	13.5	29	58.7	3	5.6	25	15.5	23	49.2	9
Super X	6.6	6	34.5	1	28.8	15	47.1	11	12.9	16	20.1	20	50.8	6
Atlas 66	2.9	25	17.5	18	27.1	18	20.8	29	4.8	27	11.8	27	22.0	29
Bastion	3.0	23	14.5	22	27.3	17	28.0	27	4.3	28	12.1	26	27.2	27
Kopara	3.1	21	18.5	16	22.8	21	40.5	18	5.2	26	12.3	25	42.1	15
Huenufen	2.8	26	12.7	26	14.3	28	32.3	24	2.8	29	11.2	28	33.2	23
Irnerio	6.8	5	13.9	24	13.5	29	42.8	15	9.1	23	7.7	29	48.8	10
Takahe	3.8	20	14.5	22	18.2	26	35.5	23	2.1	30	4.6	30	33.0	24
Means	4.8		20.1		28.8		42.6		13.4		23.6		42.5	
LSD of the cultivar means (.05)	3.0		4.2		5.8		8.4		6.8		8.2		6.8	
Coefficient of variation (%)	45.0		14.9		14.3		11.5		36.1		24.7		11.4	

[a] This site not included in the overall means.

Table 65. Summary of average yield in quintals per hectare and rankings for the 30 cultivars grown in the Thirteenth International Winter Wheat Performance Nursery in 1981.

Cultivars	Akron, Colorado, USA		Fort Collins, Colorado, USA		Brookston, Indiana, USA		Billings, Montana, USA		Lincoln, Nebraska, USA		Ithaca, New York, USA		Rowan County, North Carolina USA	
	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank
Jugoslavija	31.5	7	86.7	3	43.9	1	82.7	11	23.4	13	49.7	8	41.8	6
Sadovo Super	41.0	1	85.9	4	30.2	14	81.6	13	32.2	7	46.0	9	41.1	7
Balkan	26.1	19	70.4	16	42.6	2	69.7	20	25.1	9	60.5	1	39.5	8
Martonvasari 6	37.5	3	84.3	5	32.0	12	87.4	9	37.6	3	56.2	3	35.2	14
TAM W-105	30.0	11	88.9	2	33.5	7	98.1	2	45.6	1	55.4	4	52.7	1
Loudogorka	31.0	8	78.0	10	34.1	5	74.4	16	33.7	5	42.8	11	36.0	13
Phoenix (WW 33G)	32.4	5	73.2	12	32.2	9	94.8	3	9.6	23	17.1	22	38.8	9
Bezostaya 1	36.5	4	71.0	15	30.9	13	87.8	8	32.9	6	53.2	6	35.0	15
Alcedo	29.4	13	67.6	20	23.4	20	82.3	12	24.0	11	58.9	2	25.4	24
TX 71A562-6	39.0	2	80.1	6	27.4	16	104.5	1	41.3	2	42.0	12	49.1	2
Houser	28.0	16	89.3	1	32.1	11	88.5	7	33.9	4	55.1	5	44.7	4
Trakia	25.0	20	65.9	26	32.2	9	70.1	18	25.0	10	29.6	16	36.7	11
Maris Mardler	31.0	8	79.5	8	5.6	24	81.2	14	11.0	21	8.0	24	26.2	23
WWP 4394	26.8	18	79.5	8	39.5	3	70.6	17	22.0	14	40.9	13	36.6	12
Bounty	27.7	17	74.0	11	13.1	23	79.4	15	16.6	16	20.6	19	19.4	26
Vega	23.9	21	66.2	24	33.3	8	68.6	22	10.9	22	31.3	14	45.7	3
Jana	29.6	12	68.2	18	25.3	18	92.3	5	15.4	17	51.7	7	14.4	28
Blueboy	28.4	15	67.6	20	27.4	16	65.1	25	24.0	11	23.5	18	44.5	5
NE 79Y90576	18.0	27	79.8	7	23.7	19	94.3	4	30.5	8	31.0	15	34.5	16
NE 79Y95097	30.1	10	71.2	14	19.1	21	84.9	10	13.3	19	15.1	23	27.3	22
Aura	31.7	6	53.5	29	14.7	22	62.0	28	18.7	15	46.0	9	30.4	18
Chokwang	10.2	29	72.3	13	34.1	5	63.9	27	12.4	20	28.6	17	31.5	17
Pai yu pao	20.9	24	57.6	28	27.8	15	69.9	19	8.8	24	18.6	21	38.3	10
Super X	0.0	30	69.4	17	0.0	27	91.6	6	0.0	28	2.6	26	11.9	30
Atlas 66	22.3	23	67.0	22	34.2	4	67.9	24	13.4	18	19.4	20	30.0	19
Bastion	19.2	25	66.2	24	0.0	27	69.1	21	0.0	28	1.6	30	21.2	25
Kopara	23.0	22	68.1	19	1.1	25	64.8	26	6.3	26	2.0	28	29.2	21
Huenufen	19.1	26	63.7	27	0.3	26	68.3	23	1.2	27	4.6	25	18.8	27
Irnerio	15.7	28	52.0	30	0.0	27	59.0	29	0.0	28	2.0	28	29.6	20
Takahe	29.4	13	66.4	23	0.0	27	46.3	30	6.4	25	2.5	27	14.3	29
Means	26.5		72.1		23.1		77.4		19.2		30.6		32.7	
LSD of the cultivar means (.05)	7.5		14.1		4.3		13.4		6.3		13.7		7.7	
Coefficient of variation (%)	20.2		13.9		13.1		12.3		23.3		26.2		16.7	

Table 65. Summary of average yield in quintals per hectare and rankings for the 30 cultivars grown in the Thirteenth International Winter Wheat Performance Nursery in 1981.

Cultivars	Stillwater, Oklahoma, USA		Corvallis, Oregon, USA		Lancaster Co. Pennsylvania, USA		Pullman, Washington, USA		Krasnodar, USSR		Mironovski, USSR		Odessa, USSR	
	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank
Jugoslavija	24.1	10	47.2	5	48.5	4	71.8	1	55.4	13	66.8	2	91.7	1
Sadovo Super	24.6	8	56.3	3	47.6	6	39.6	12	64.0	5	59.7	4	85.2	2
Balkan	24.4	9	50.3	4	49.8	2	61.1	4	57.4	9	66.6	3	82.7	3
Martonvasari 6	28.7	3	44.8	7	50.6	1	36.1	13	51.0	22	46.6	12	73.7	8
TAM W-105	30.5	1	30.1	19	48.0	5	24.8	20	53.6	20	30.1	25	77.2	6
Loudogorka	26.7	7	61.7	2	45.3	7	54.3	6	60.0	6	50.7	10	76.7	7
Phoenix (WW 33G)	27.7	5	43.0	10	33.1	19	40.7	10	70.5	1	32.0	24	79.5	4
Bezostaya 1	28.5	4	33.9	16	44.8	8	39.9	11	52.9	21	48.9	11	72.5	11
Alcedo	13.5	24	63.0	1	43.0	10	50.9	7	53.9	17	56.1	7	65.6	16
TX 71A562-6	27.6	6	27.4	23	37.4	18	19.6	23	65.9	2	51.9	9	68.0	14
Houser	30.4	2	29.4	22	48.7	3	18.9	24	59.4	7	69.8	1	73.5	9
Trakia	14.9	22	39.0	14	41.7	11	48.9	9	65.5	3	46.1	13	78.2	5
Maris Mardler	21.4	12	46.7	6	19.0	24	69.4	3	54.1	16	53.3	8	64.5	18
WWP 4394	19.9	15	40.4	13	39.7	14	49.5	8	56.3	10	41.6	15	73.2	10
Bounty	21.5	11	43.4	9	22.4	23	69.6	2	55.4	13	57.2	6	65.5	17
Vega	17.8	18	40.7	12	30.7	21	35.6	14	56.0	11	58.1	5	71.5	12
Jana	8.9	27	34.8	15	43.8	9	30.8	17	43.5	27	41.5	16	55.5	27
Blueboy	19.9	15	29.6	20	30.9	20	25.8	19	50.8	23	32.1	23	56.2	25
NE 79Y90576	20.8	13	24.7	25	41.3	13	4.9	30	49.3	25	32.8	21	64.2	19
NE 79Y95097	15.3	20	31.7	18	25.5	22	28.2	18	47.9	26	0.0	28	60.7	21
Aura	9.3	26	33.9	16	41.7	11	35.6	14	31.9	30	45.1	14	56.0	26
Chokwang	20.1	14	6.5	30	39.0	16	11.7	27	54.4	15	36.8	19	66.0	15
Pai yu pao	16.3	19	21.1	28	38.1	17	10.9	28	43.5	27	22.8	26	57.5	24
Super X	5.8	29	25.1	24	0.0	28	10.6	29	53.7	19	0.0	28	69.2	13
Atlas 66	19.3	17	23.7	26	39.3	15	15.6	25	35.5	29	32.4	22	47.0	29
Bastion	15.1	21	29.6	20	0.0	28	31.8	16	59.2	8	39.0	18	61.2	20
Kopara	13.5	24	40.8	11	11.9	26	23.6	21	50.8	23	39.2	17	50.7	28
Huenufen	8.5	28	43.8	8	14.1	25	58.7	5	55.7	12	15.9	27	58.0	22
Irnerio	4.3	30	22.7	27	0.0	28	14.1	26	65.0	4	0.0	28	58.0	22
Takahe	14.2	23	21.1	28	3.8	27	20.0	22	53.9	17	33.2	20	43.5	30
Means	19.1		36.2		32.7		35.1		54.2		40.2		66.8	
LSD of the cultivar means (.05)	4.8		12.3		5.6		9.5		5.4		9.2		5.5	
Coefficient of variation (%)	17.9		24.1		10.6		19.1		7.0		16.3		5.9	

Table 65. Summary of average yield in quintals per hectare and rankings for the 30 cultivars grown in the Thirteenth International Winter Wheat Performance Nursery in 1981.

Cultivars	Monsheim, West Germany		Weihenstephan, West Germany		Novi Sad, Yugoslavia		Zagreb,[a] Yugoslavia		Cultivar means over 44 sites
	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha
Jugoslavija	72.3	5	83.3	10	67.8	2	6.1	20	53.2
Sadovo Super	76.2	1	87.8	2	66.2	4	9.1	16	51.8
Balkan	69.4	10	84.5	6	73.3	1	.	.	51.3
Martonvasari 6	68.5	11	88.0	1	67.3	3	.	.	50.3
TAM W-105	76.0	2	81.9	11	57.4	10	9.2	15	49.3
Loudogorka	70.5	7	75.4	18	60.8	6	6.4	19	49.1
Phoenix (WW 33G)	75.1	3	84.4	7	59.9	8	31.2	2	49.0
Bezostaya 1	67.3	12	81.4	12	64.6	5	6.0	21	48.3
Alcedo	63.2	17	85.2	5	53.8	15	.	.	46.9
TX 71A562-6	70.0	9	83.6	8	51.1	17	8.9	17	46.9
Houser	59.8	20	81.4	12	54.6	13	.	.	46.5
Trakia	74.9	4	69.0	24	56.9	11	11.3	14	45.6
Maris Mardler	63.8	16	87.1	3	60.7	7	22.7	5	45.1
WWP 4394	64.3	14	77.5	16	49.3	18	7.4	18	44.2
Bounty	63.9	15	83.4	9	55.4	12	.	.	42.7
Vega	59.2	22	71.1	22	43.3	22	20.0	9	41.8
Jana	57.2	24	79.5	15	54.3	14	.	.	41.2
Blueboy	71.4	6	68.1	25	42.4	23	15.9	11	38.3
NE 79Y90576	61.5	18	72.4	20	44.3	21	13.6	13	38.0
NE 79Y95097	64.7	13	56.8	29	47.2	19	15.4	12	36.9
Aura	52.1	26	80.9	14	41.7	25	.	.	36.1
Chokwang	48.3	29	61.5	28	42.0	24	.	.	35.4
Pai yu pao	50.0	27	54.7	30	39.3	27	.	.	33.6
Super X	70.4	8	86.0	4	58.6	9	22.2	6	33.6
Atlas 66	44.4	30	70.5	23	47.0	20	29.2	4	33.5
Bastion	59.0	23	77.3	17	52.3	16	34.4	1	32.9
Kopara	59.3	21	71.9	21	41.2	26	17.7	10	32.7
Huenufen	54.8	25	62.4	27	39.0	28	20.7	7	31.6
Irnerio	61.5	18	63.2	26	34.4	29	20.4	8	27.8
Takahe	49.8	28	74.2	19	32.3	30	30.1	3	27.3
Means	63.3		76.1		52.0		17.2		41.5
LSD of the cultivar means (.05)	3.5		6.0		7.7		6.0		4.2
Coefficient of variation (%)	3.9		5.6		10.6		23.6		13.9

[a] This site not included in the overall means.

Table 66. Means yields and rankings for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery averaged over selected sites as representing five major winter wheat producing regions of the world.

Cultivars	Pacific Northwest USA		Great Plains USA		Central Plains South America		Central Europe		Eastern Europe		Cultivar means over 44 sites
	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha
Number of sites	2		5		3		6		6		
Jugoslavija	59.5	1	49.7	7	45.4	1	60.0	1	72.7	1	53.2
Sadovo Super	48.0	8	53.0	5	32.9	12	58.5	4	72.6	2	51.8
Balkan	55.7	6	43.1	15	37.8	4	57.6	7	72.5	3	51.3
Martonvasari 6	40.5	12	55.1	3	31.6	15	59.7	2	66.4	5	50.3
TAM W-105	27.5	21	58.6	1	38.0	3	55.5	9	63.8	6	49.3
Loudogorka	58.0	3	48.7	8	36.6	5	55.7	8	63.4	7	49.1
Phoenix (WW33G)	41.9	11	47.5	10	38.1	2	57.7	6	68.0	4	49.0
Bezostaya 1	36.9	14	51.3	6	34.6	10	55.5	9	63.0	8	48.3
Alcedo	56.9	4	43.3	14	31.6	15	58.1	5	62.7	9	46.9
TX 71A562-6	23.5	23	58.5	2	32.8	13	51.8	13	58.9	13	46.9
Houser	24.2	22	54.0	4	25.8	22	51.7	14	58.3	14	46.5
Trakia	43.9	10	40.2	19	36.5	6	51.6	15	60.3	10	45.6
Maris Mardler	58.1	2	44.8	11	26.5	20	59.1	3	59.3	12	45.1
WWP 4394	44.9	9	43.8	13	36.3	7	51.1	16	59.7	11	44.2
Bounty	56.5	5	43.9	12	26.5	20	54.9	11	57.4	15	42.7
Vega	38.2	13	37.5	21	33.2	11	45.8	20	55.1	17	41.8
Jana	32.8	16	42.9	17	25.8	22	53.1	12	56.2	16	41.2
Blueboy	27.7	20	41.0	18	35.0	9	44.9	21	45.8	24	38.3
NE 79Y90576	14.8	29	48.7	8	19.3	27	44.2	23	49.3	19	38.0
NE 79Y95097	30.0	19	43.0	16	35.7	8	41.6	25	48.4	20	36.9
Aura	34.7	15	35.1	23	17.9	29	48.9	18	43.6	27	36.1
Chokwang	9.1	30	35.8	22	15.7	30	34.6	29	49.5	18	35.4
Pai yu pao	16.0	28	34.7	25	19.2	28	34.2	30	44.6	26	33.6
Super X	17.9	27	33.4	27	29.3	19	50.5	17	47.7	21	33.6
Atlas 66	19.7	25	38.0	20	20.9	26	44.7	22	46.2	22	33.5
Bastion	30.7	18	33.9	26	30.9	18	47.4	19	46.1	23	32.9
Kopara	32.2	17	35.1	23	32.5	14	42.6	24	41.1	28	32.7
Huenufen	51.2	7	32.2	29	31.4	17	39.4	26	45.0	25	31.6
Irnerio	18.4	26	26.2	30	23.0	25	37.2	27	36.8	29	27.8
Takahe	20.5	24	32.6	28	23.3	24	36.6	28	32.4	30	27.3
Means	35.7		42.9		30.1		49.5		54.9		41.5
L.S.D. of the cultivar means (.05)	17.3		9.0		N.S.		9.1		10.6		4.2
Coefficient of variation (%)	21.8		16.5		17.3		9.9		10.4		13.9

Table 67. Summary of agronomic, quality, and yield data for cultivars grown in the Thirteenth International Winter Wheat Performance Nursery in 1981.

Cultivars	Grain yield		Test weight		1000-kernel weight		Grain protein		Adjusted lysine/protein		Plant height	
	q/ha	% of Bezostaya 1	kg/hl	rank	g	rank	%	rank	%	rank	cm	rank
Number of sites	44		17		23		32		5		34	
Jugoslavija	53.2	110.1	79.1	2	41.2	3	14.6	16	2.99	28	85.1	16
Sadovo Super	51.8	107.2	75.8	13	35.8	13	13.8	26	3.06	15	82.6	13
Balkan	51.3	106.2	78.1	8	43.0	1	14.8	12	3.03	20	80.5	12
Martonvasari 6	50.3	104.1	78.5	5	41.4	2	14.8	12	3.03	20	98.1	27
TAM W-105	49.3	102.1	79.1	2	34.2	20	14.0	24	3.09	10	84.2	15
Loudogorka	49.1	101.7	78.2	7	39.8	5	15.1	9	3.04	18	90.6	21
Phoenix (WW33G)	49.0	101.4	78.3	6	33.3	24	13.9	25	3.04	18	74.4	7
Bezostaya 1	48.3	100.0	79.7	1	40.8	4	15.1	9	3.01	25	92.9	23
Alcedo	46.9	97.1	77.2	10	37.5	8	14.2	22	3.10	8	96.7	26
TX 71A562-6	46.9	97.1	74.8	16	31.8	28	13.3	29	3.09	10	83.8	14
Houser	46.5	96.3	72.7	26	36.7	10	13.2	30	3.10	8	91.5	22
Trakia	45.6	94.4	77.9	9	39.8	5	14.6	16	3.02	23	72.5	4
Maris Mardler	45.1	93.4	71.7	28	37.8	7	14.5	19	3.08	13	71.0	2
WWP 4394	44.2	91.5	79.0	4	35.7	15	15.7	5	2.97	29	88.9	20
Bounty	42.7	88.4	71.7	28	34.2	20	14.8	12	3.08	13	73.5	5
Vega	41.8	86.5	75.5	14	36.7	10	15.3	7	3.00	27	72.2	3
Jana	41.2	85.3	73.1	24	35.8	13	14.5	19	3.11	6	102.5	28
Blueboy	38.3	79.3	73.7	21	36.6	12	13.7	27	3.12	5	95.7	25
NE 79Y90576	38.0	78.7	72.1	27	27.5	30	13.6	28	3.15	3	87.7	18
NE 79Y95097	36.9	76.4	71.1	30	28.2	29	14.6	16	3.20	1	77.7	9
Aura	36.1	74.7	74.4	17	34.3	18	15.3	7	3.02	23	104.0	29
Chokwang	35.4	73.3	75.1	15	37.5	8	15.9	3	3.18	2	76.3	8
Pai yu pao	33.6	69.6	73.1	24	32.2	27	15.5	6	3.05	17	74.1	6
Super X	33.6	69.6	76.5	12	32.6	25	14.1	23	2.94	30	77.8	10
Atlas 66	33.5	69.4	77.1	11	34.7	17	17.5	1	3.01	25	109.1	30
Bastion	32.9	68.1	74.3	18	35.4	16	14.8	12	3.11	6	94.1	24
Kopara	32.7	67.7	74.3	18	34.2	20	15.9	3	3.03	20	88.8	19
Huenufen	31.6	65.4	73.5	22	32.5	26	15.1	9	3.09	10	80.3	11
Irnerio	27.8	57.6	74.2	20	34.1	23	14.4	21	3.06	15	66.4	1
Takahe	27.3	56.5	73.2	23	34.3	18	16.4	2	3.15	3	87.6	17
Means	41.5	85.6	75.4		35.7		14.8		3.06		85.4	
L.S.D. of the cultivar means (.05)	4.2		2.2		2.0		0.6		0.13		2.9	
Coefficient of variation (%)	13.9		1.8		4.7		8.1		3.5		5.3	

Table 67. Continued.

Cultivars	Lodging		Days to flowering		Days to ripening		Shattering		Winter survival		Frost damage	
	%	rank	from Jan. 1	rank	from Jan. 1	rank	%	rank	%	rank	0-9	rank
Number of sites	13		30		22		5		24		7	
Jugoslavija	11.1	11	167.8	13	217.2	15	12.9	25	82.1	11	2.5	18
Sadovo Super	9.5	10	166.3	8	215.8	12	10.0	19	82.9	10	2.2	11
Balkan	8.9	9	167.1	12	213.8	6	11.2	23	85.3	4	2.3	14
Martonvasari 6	24.9	22	170.1	18	219.9	18	12.8	24	87.3	2	1.8	4
TAM W-105	34.7	26	166.6	9	215.5	11	8.3	14	83.6	8	1.4	1
Loudogorka	11.3	12	168.5	16	218.4	17	6.0	2	80.4	14	2.3	14
Phoenix (WW33G)	17.9	18	162.6	3	214.1	7	6.5	3	76.3	16	2.9	21
Bezostaya 1	32.6	24	168.2	15	217.8	16	6.9	7	87.3	2	1.8	4
Alcedo	17.5	17	175.5	27	223.3	26	7.3	10	84.2	6	2.0	8
TX 71A562-6	49.3	29	168.6	17	215.2	9	5.2	1	82.1	11	1.4	1
Houser	32.9	25	173.2	23	220.9	23	14.5	27	83.7	7	1.9	6
Trakia	6.4	6	165.1	7	215.9	13	10.4	20	75.3	17	2.2	11
Maris Mardler	1.4	1	175.3	26	223.8	27	7.0	8	71.7	20	3.0	24
WWP 4394	12.2	13	167.8	13	215.9	13	28.0	30	68.4	21	1.9	6
Bounty	2.1	2	176.1	28	221.6	25	10.8	22	78.6	15	2.3	14
Vega	14.4	15	164.7	5	212.6	4	9.9	18	73.3	19	2.6	20
Jana	19.9	19	178.5	30	225.1	30	7.9	13	81.5	13	1.5	3
Blueboy	13.7	14	170.7	19	220.8	22	6.5	3	61.0	24	2.1	10
NE 79Y90576	37.1	27	164.7	5	212.1	3	6.8	5	83.5	9	2.0	8
NE 79Y95097	19.9	19	166.7	10	213.6	5	10.5	21	74.1	18	2.9	21
Aura	38.3	28	178.2	29	224.1	28	13.3	26	87.4	1	2.2	11
Chokwang	32.3	23	160.6	1	210.7	1	15.0	29	85.3	4	2.3	14
Pai yu pao	15.5	16	161.2	2	211.5	2	8.9	15	66.9	22	2.5	18
Super X	24.0	21	166.7	10	215.4	10	14.8	28	41.2	30	3.6	28
Atlas 66	49.3	29	170.9	20	220.4	20	7.5	12	62.4	23	2.9	21
Bastion	6.7	8	173.4	24	224.6	29	6.8	5	44.3	28	3.4	26
Kopara	3.8	3	171.6	21	220.5	21	7.0	8	49.9	25	3.4	26
Huenufen	6.3	5	174.8	25	221.1	24	9.5	17	49.8	26	3.8	29
Irnerio	4.2	4	163.6	4	214.3	8	9.2	16	45.3	27	3.9	30
Takahe	6.5	7	173.0	22	220.3	19	7.4	11	42.0	29	3.3	25
Means	18.8		169.3		217.9		10.0		71.9		2.5	
L.S.D. of the cultivar means (.05)	12.1		1.5		2.3		N.S.		9.4		1.0	
Coefficient of variation (%)	64.5		1.0		0.8		38.3		13.1		20.6	

Table 68. Correlation coefficients for yield, protein, and other agronomic traits combined over 48 nursery sites of the Thirteenth International Winter Wheat Performance Nursery in 1981.

Trait	Test weight	1000-kernel weight	Protein	Adjusted lysine	Plant height	Lodging	Flowering	Ripening	Shattering	Winter survival	Frost damage
Grain yield	.33**	.58**	-.49**	-.19*	.37**	.03	-.22**	-.29**	-.14**	.39**	.10*
N	2697	2991	870	150	4475	1903	4308	2865	809	2910	679
Test weight		.48**	-.20**	-.12	.03	-.08**	.05*	.00	.17**	-.02	-.05
N		2164	658	120	2619	1245	2526	1911	592	1511	412
1000-kernel weight			-.45**	-.42**	.14**	-.15**	-.13**	-.04*	.10**	.18**	.11**
N			630	120	2931	1312	2909	2316	682	1981	650
Protein				-.09	-.24**	.04	.37**	.33**	-.07	-.20**	-.10
N				150	806	390	836	566	180	390	120
Adjusted lysine					.16	-.14	-.34**	-.55**	-.07	.27*	--
N					120	30	150	90	60	60	0
Plant height						.19**	-.06**	-.31**	.00	.12**	-.11**
N						1868	4303	2834	796	2861	679
Lodging							.03	.13**	.28**	.08**	.01
N							1704	1148	269	1363	120
Flowering								.98**	-.09*	-.28**	-.26**
N								2829	705	2755	679
Ripening									-.03	-.29**	-.20**
N									700	1798	551
Shattering										.05	.87**
N										539	164
Winter survival											-.44**
N											290

*,** Significant at the .05 and .01 probability levels, respectively.
N = Number of paired comparisons.

Table 69. Summary of relative protein production per hectare for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery in 1981.a/

Cultivars	Grain yield		Grain protein		Relative protein production	Correlation coefficients Protein production vs.	
	q/ha	rank	%	rank	kg/ha	Grain yield	Protein content
Jugoslavija	54.4	1	14.5	16	769.3	.97**	-.23
Balkan	51.4	3	14.7	12	744.2	.97**	-.06
Loudogorka	49.4	7	15.0	9	727.9	.97**	-.20
Martonvasari 6	50.9	6	14.7	14	727.8	.97**	-.20
Bezostaya 1	48.3	9	14.8	11	703.7	.96**	-.10
TAM W-105	51.0	5	13.8	23	697.2	.96**	.05
Sadovo Super	52.3	2	13.6	25	693.6	.96**	-.12
Phoenix (WW33G)	51.3	4	13.7	24	688.2	.97**	-.17
WWP 4394	45.0	14	15.6	5	688.2	.96**	-.04
Maris Mardler	47.3	10	14.5	16	654.7	.97**	-.41*
Alcedo	48.5	8	14.2	21	646.7	.97**	-.47*
Trakia	45.2	13	14.5	16	634.2	.97**	-.29
Vega	42.2	16	15.2	6	624.8	.97**	-.26
Bounty	44.3	15	14.6	15	615.8	.96**	-.46*
Houser	46.8	12	13.2	28	606.4	.96**	-.03
Atlas 66	35.2	26	17.5	1	603.3	.98**	-.08
TX 71A562-6	47.3	10	13.0	29	601.7	.97**	-.07
Jana	42.1	17	14.5	16	587.4	.97**	-.22
Chokwang	36.2	24	15.9	3	560.0	.98**	-.17
Kopara	36.3	23	15.8	4	558.5	.98**	-.25
NE 79Y95097	39.4	19	14.3	20	537.2	.96**	-.37
Aura	36.8	22	15.2	6	536.6	.97**	-.37
Bastion	37.1	21	14.7	12	527.7	.98**	-.20
NE 79Y90576	40.5	18	13.5	26	520.8	.96**	-.24
Blueboy	39.2	20	13.5	26	517.7	.97**	-.09
Huenufen	35.3	25	14.9	10	509.4	.98**	-.28
Pai yu pao	33.9	27	15.2	6	502.4	.97**	-.20
Takahe	29.5	29	16.3	2	464.4	.97**	-.16
Irnerio	32.5	28	14.2	21	448.6	.98**	-.29

a/ Data are from 28 sites and exclude Super X.

Table 70. Grain quality data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Vienna, Austria, in 1981.[a/]

Cultivars	Wet gluten %	Swelling[b/] number Q_0/Q_{30}	Test weight kg/hl	Zeleny value
Jana	42.1	2/1	77.50	31
Trakia	40.0	4/1	75.75	44
Aura	48.9	4/0	78.00	69
Atlas 66	54.4	1/0	78.60	51
Houser	33.9	2/0	76.35	22
Huenufen	39.8	16/9	75.45	46
TX 71A562-6	39.5	20/14	72.15	73
Blueboy	32.4	2/1	74.15	38
Kopara	39.9	2/1	74.65	62
Alcedo	34.8	24/20	79.00	69
TAM W-105	35.3	22/18	75.85	73
Irnerio	33.3	26/22	74.15	59
Martonvasari 6	39.4	14/9	78.30	64
Bezostaya 1	36.4	24/20	78.80	68
Bastion	39.2	12/5	78.00	43
WWP 4394	43.5	6/2	78.90	55
Phoenix (WW33G)	37.7	16/10	72.15	54
Vega	43.0	4/1	74.65	36
Loudogorka	38.6	22/18	78.90	70
Pai yu pao	36.5	19/14	76.75	70
Maris Mardler	38.7	2/1	76.55	39
Chokwang	54.7	4/1	77.60	41
Takahe	47.1	7/3	76.75	67
Balkan	37.6	26/21	76.95	68
Super X	36.3	14/10	76.45	51
Jugoslavija	36.0	20/14	78.70	51
Sadovo Super	38.0	11/7	77.05	57
Bounty	39.6	11/7	74.95	62
NE 79Y90576	29.7	28/21	72.85	56
NE 79Y95097	34.4	26/22	71.15	73
Probstdorfer Extrem[c/]	43.6	16/10	79.10	68

a/ Data provided by Dr. R. Hron.
b/ According to Berliner.
c/ Local standard.

Table 71. Grain quality data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Bethlehem, South Africa (dryland) in 1981.

Cultivars	Pearling index	Flour extraction %	Flour protein %	Mixograph peak	
				time	height
Jana	52.1	38.4	15.0	1.8	64.0
Trakia	51.1	37.2	13.1	1.7	88.0
Aura	56.2	42.8	14.9	2.4	69.0
Atlas 66	56.7	45.3	13.7	4.1	71.0
Houser	52.2	41.7	15.0	2.6	60.0
Huenufen	57.1	47.7	13.8	3.1	63.0
TX 71A562-6	58.1	42.9	11.4	3.1	60.0
Blueboy	53.6	49.6	14.6	3.2	76.0
Kopara	53.7	46.4	14.0	5.3	72.0
Alcedo	67.3	42.8	14.7	3.0	76.0
TAM W-105	67.6	45.6	14.0	3.9	72.0
Irnerio	46.7	45.7	12.2	3.5	76.0
Martonvasari 6	46.6	31.3	14.2	3.8	64.0
Bezostaya 1	57.7	32.9	13.3	2.8	55.0
Bastion	57.9	31.7	12.8	1.3	65.0
WWP 4394	63.9	37.5	14.3	1.5	62.0
Phoenix (WW 33G)	58.1	40.7	13.0	2.4	73.0
Vega	58.2	42.7	12.9	2.4	63.0
Loudogorka	61.1	37.7	12.9	3.3	65.0
Pai yu pao	61.8	38.3	13.8	2.7	70.0
Maris Mardler	41.0	41.5	12.4	1.8	66.0
Chokwang	46.7	27.5	14.0	1.0	62.0
Takahe	47.3	37.7	15.7	2.0	85.0
Balkan	52.5	40.7	13.9	3.3	59.0
Super X	53.9	38.7	12.5	1.9	87.0
Jugoslavija	51.7	41.3	13.6	2.8	64.0
Sadovo Super	56.1	37.1	11.3	2.1	56.0
Bounty	61.7	43.3	12.5	2.7	60.0
NE 79Y90576	62.5	34.9	12.9	4.1	56.0
NE 79Y95097	62.5	38.3	12.3	2.9	64.0

Table 72. Grain quality data for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery grown at Bethlehem, South Africa (irrigated) in 1981.

Cultivars	Pearling index	Flour extraction %	Flour protein %	Mixograph peak	
				time	height
Jana	56.3	34.4	15.4	1.4	83.0
Trakia	57.9	42.1	16.8	1.9	96.0
Aura	62.8	40.3	17.2	1.4	103.0
Atlas 66	50.9	26.5	15.9	1.2	104.0
Houser	60.0	29.3	12.5	1.4	70.0
Huenufen	45.0	31.4	15.1	1.5	92.0
TX 71A562-6	56.1	38.0	14.8	2.3	76.0
Blueboy	60.0	31.2	13.4	1.7	81.0
Kopara	61.7	43.7	17.7	1.7	102.0
Alcedo	52.1	37.3	17.3	2.3	82.0
TAM W-105	51.2	43.5	14.1	2.4	82.0
Irnerio	40.6	30.9	12.9	4.1	59.0
Martonvasari 6	41.2	41.0	17.4	2.0	77.0
Bezostaya 1	53.8	60.7	18.7	2.2	94.0
Bastion	53.3	43.8	14.9	1.2	97.0
WWP 4394	53.1	60.4	18.8	1.4	96.0
Phoenix (WW 33G)	55.0	60.0	16.4	2.0	97.0
Vega	56.1	50.8	16.8	1.2	100.0
Loudogorka	63.1	54.5	17.7	2.0	96.0
Pai yu pao	61.1	58.4	16.5	2.5	92.0
Maris Mardler	56.6	55.7	15.8	1.3	92.0
Chokwang	53.6	39.7	15.7	1.4	94.0
Takahe	51.8	52.9	19.7	1.3	107.0
Balkan	63.3	61.8	18.7	2.5	85.0
Super X	45.9	58.5	14.7	2.4	92.0
Jugoslavija	45.0	64.6	17.7	2.0	80.0
Sadovo Super	51.4	43.9	15.9	2.0	87.0
Bounty	53.7	58.1	15.3	1.9	92.0
NE 79Y90576	61.9	50.8	15.3	4.1	80.0
NE 79Y95097	59.5	54.1	15.4	3.4	70.0

Table 73. Reaction of International Winter Wheat Performance Nursery cultivars to yellow rust (Puccinia striiformis) in 1981.

Cultivars	Balcarce, Argentina		Chillan, Chile		Bohnshausen, East Germany		Orgerus, France		Szeged, Hungary		Rieti,[a] Italy		Toluca, Mexico	
	Sev	Resp	Sev	Resp	Sev	Resp	Sev	Resp	Sev	Resp	Sev	Resp	Sev	Resp
Number of replications	4		1		4		1		4		4		4	
Jugoslavija	0	-	10	R-	0	-	0	-	0	-	0	-	0	-
Maris Mardler	15	MS-	0	-	0	-	0	-	0	-	0	-	0	-
Bounty	34	S-	10	R-	0	-	0	-	0	-	0	-	0	-
Huenufen	6	MS-	20	S-	11	MR-M	20	-	0	-	0	-	5	S-
Aura	35	S-	0	-	0	-	0	-	8	-	0	-	3	S-
Balkan	0	-	70	M-M	1	MR-	20	-	0	-	0	-	0	-
Alcedo	63	S-	0	-	0	-	0	-	10	-	0	-	0	-
Bastion	8	MR-	50	MS-	6	MR-M	0	-	5	-	63	-	0	-
Trakia	9	MR-	40	MR-	0	-	70	-	0	-	0	-	0	S-
WWP 4394	6	MS-	80	S-	1	M-M	60	-	0	-	0	-	0	-
Sadovo Super	4	MR-MS	20	S-	9	MR-MS	80	-	8	-	0	-	3	S-
Blueboy	45	S-	40	MR-	11	MR-M	40	-	0	-	0	-	4	MS-S
NE 79Y95097	21	MS-	10	M-M	3	R-M	80	-	0	-	0	-	15	MS-S
Phoenix (WW 33G)	0	-	60	M-M	6	MR-M	70	-	0	-	37	-	15	S-
Jana	43	S-	60	MS-	8	MR-	70	-	0	-	0	-	0	-
Vega	14	MS-	70	S-	5	MR-M	40	-	0	-	0	-	0	-
Bezostaya 1	48	S-	50	M-M	5	R-M	60	-	0	-	45	-	3	S-
Kopara	13	MS-	60	S-	6	R-MS	70	-	3	-	0	-	16	MS-S
Super X	7	MS-	90	S-	3	MR-M	100	-	0	-	0	-	20	S-
Loudogorka	44	S-	60	M-M	11	MR-M	70	-	5	-	0	-	0	-
Atlas 66	7	MR-	80	S-	13	MR-S	30	-	3	-	0	-	5	MS-S
Martonvasari 6	30	S-	40	M-M	8	R-M	70	-	10	-	65	-	31	S-
TX 71A562-6	33	MS-	90	S-	6	R-M	80	-	0	-	0	-	80	S-
Pai yu pao	8	MS-	100	S-	3	MR-	100	-	0	-	0	-	40	S-
TAM W-105	14	MS-	80	S-	15	MR-M	100	-	0	-	0	-	73	S-
Takahe	53	S-	90	S-	43	M-M	100	-	40	-	55	-	55	S-
Chokwang	46	S-	100	S-	3	MR-M	100	-	0	-	53	-	88	S-
Houser	38	S-	60	MS-	15	MR-S	100	-	23	-	57	-	80	S-
Irnerio	25	MS-	100	S-	18	M-M	100	-	35	-	80	-	33	S-
NE 79Y90576	48	S-	100	S-	4	MR-M	100	-	0	-	0	-	73	S-
Means	23.7		54.7		7.0		57.7		4.9		16.0		21.3	

[a] This site was not included in the overall means.

Table 73. Reaction of International Winter Wheat Performance Nursery cultivars to yellow rust (Puccinia striiformis) in 1981.

Cultivars	Przeclaw, Poland		Warsaw, Poland		Fundulea, Romania		Aleppo, Syria		Ankara, Turkey		Erzurum, Turkey		Davis, California, USA	
	Sev	Resp	Sev	Resp	Sev	Resp	Sev	Resp	Sev	Resp	Sev	Resp	Sev	Resp
Number of replications	4		4		4		1		4		4		1	
Jugoslavija	0	-	0	-	0	VR-	0	-	0	-	0	-	0	-
Maris Mardler	0	-	0	-	0	VR-	0	-	0	-	0	-	0	-
Bounty	0	-	0	-	0	VR-	0	-	0	-	0	-	0	-
Huenufen	0	-	0	-	0	VR-	0	-	0	-	0	-	0	-
Aura	0	-	0	-	0	VR-	0	-	0	-	0	-	0	-
Balkan	0	-	0	-	5	R-	1	R-	0	-	0	-	0	-
Alcedo	0	-	0	-	0	VR-	0	-	0	-	0	-	0	-
Bastion	2	R-	0	-	0	VR-	0	-	0	-	0	-	0	-
Trakia	0	-	0	-	5	R-	10	S-	0	-	0	-	0	-
WWP 4394	0	-	0	-	0	VR-	0	-	0	-	0	-	0	-
Sadovo Super	9	MR-	70	MS-	0	VR-	0	S-	10	S-	0	-	5	-
Blueboy	1	R-	0	-	9	R-	0	-	0	-	0	-	10	-
NE 79Y95097	11	MR-	0	-	13	R-MR	20	MS-	0	-	0	-	50	-
Phoenix (WW 33G)	4	R-	78	MS-	0	VR-	30	S-	0	-	0	-	0	-
Jana	3	R-	78	S-	0	VR-	0	-	0	-	0	-	0	-
Vega	10	MR-	85	S-	6	R-	10	MS-	0	-	0	-	5	-
Bezostaya 1	1	R-	68	MS-	5	R-	5	R-	0	-	0	-	5	-
Kopara	3	R-	53	MR-MS	0	VR-	20	MS-	0	-	0	-	0	-
Super X	0	-	20	MR-	5	R-	30	S-	0	-	0	-	10	-
Loudogorka	3	R-	80	S-	6	R-	10	R-	0	-	0	-	1	-
Atlas 66	0	-	45	MR-MS	23	S-	60	S-	15	MS-S	6	S-	10	-
Martonvasari 6	3	R-	88	S-	10	R-	10	R-	20	MS-S	10	MS-	20	-
TX 71A562-6	5	R-	80	S-	9	MS-	5	MS-	0	-	0	-	20	-
Pai yu pao	5	R-	80	S-	33	S-	20	S-	0	-	0	-	5	-
TAM W-105	2	R-	73	MS-S	20	MR-MS	20	MS-	0	-	0	-	60	-
Takahe	21	MR-	90	S-	20	MR-	0	-	0	-	0	-	30	-
Chokwang	25	MR-	90	S-	10	MR-	60	S-	0	-	0	-	90	-
Houser	19	MR-	90	S-	75	S-	10	MR-	25	MS-S	20	S-	70	-
Irnerio	16	MR-	90	S-	90	VS-	80	S-	5	S-	8	S-	100	-
NE 79Y90576	18	MR-	80	S-	88	S-	100	S-	0	-	30	S-	100	-
Means	5.3		44.5		14.3		16.7		2.5		2.5		19.7	

Table 73. Reaction of International Winter Wheat Performance Nursery cultivars to yellow rust (Puccinia striiformis) in 1981.

Cultivars	Billings, Montana, USA		Corvallis, Oregon, USA		Pullman, Washington, USA		Krasnodar, USSR		Novi Sad, Yugoslavia		Severity means over 18 sites	
	Sev	Resp	Sev	Resp	Sev	Resp	Sev	Resp	Sev	Resp	%	High score
Number of replications	1		1		4		4		4			
Jugoslavija	10	-	0	-	5	VR-	0	-	0	-	1.4	10
Maris Mardler	10	-	0	-	5	VR-	0	-	0	-	1.7	15
Bounty	10	-	1	R-	5	VR-	0	-	0	-	3.3	34
Huenufen	10	-	15	MS-	5	VR-	0	-	0	-	5.1	20
Aura	10	-	5	MS-	33	MS-	0	-	1	MS-	5.3	35
Balkan	10	-	0	-	5	VR-	0	-	0	-	6.2	70
Alcedo	15	-	0	-	50	MR-S	0	-	0	MR-	7.7	63
Bastion	10	-	15	MR-	65	MS-	0	-	9	MR-MS	9.4	65
Trakia	10	-	0	-	55	MS-S	0	-	0	VR-	11.1	70
WWP 4394	10	-	10	MR-	35	R-MS	0	-	0	-	11.2	80
Sadovo Super	10	-	15	MS-	80	S-	1	-	4	MS-VS	18.2	80
Blueboy	20	-	70	S-	78	MS-S	0	-	1	VR-	18.3	78
NE 79Y95097	15	-	0	-	89	MS-S	1	-	5	VR-MR	18.5	89
Phoenix (WW 33G)	10	-	0	-	78	MS-S	0	-	1	VR-MS	19.6	78
Jana	10	-	15	MS-	58	MS-S	0	-	10	MR-MS	19.7	78
Vega	10	-	30	S-	68	S-	0	-	8	MS-VS	20.1	85
Bezostaya 1	10	-	30	S-	86	MS-S	0	-	1	VR-MR	20.9	86
Kopara	10	-	40	S-	85	MS-S	0	-	3	VR-MR	21.2	85
Super X	10	-	0	-	90	MS-S	3	-	4	MR-MS	21.8	100
Loudogorka	10	-	30	S-	70	MS-S	0	-	18	MS-VS	23.2	80
Atlas 66	15	-	50	S-	88	S-	2	-	11	MS-S	25.7	88
Martonvasari 6	10	-	50	S-	81	MS-S	1	-	8	MR-MS	27.8	88
TX 71A562-6	15	-	50	S-	90	MS-S	2	-	14	VR-MS	32.2	90
Pai yu pao	15	-	0	-	93	MS-S	65	-	15	MS-VS	32.3	100
TAM W-105	15	-	70	S-	95	S-	6	-	4	VR-VS	35.9	100
Takahe	15	-	30	S-	90	MS-S	0	-	28	MS-VS	39.2	100
Chokwang	10	-	99	S-	90	S-	3	-	33	VS-	47.1	100
Houser	20	-	99	S-	93	S-	3	-	29	VS-	48.3	100
Irnerio	20	-	99	S-	95	MS-S	1	-	36	MS-VS	52.8	100
NE 79Y90576	10	-	99	S-	96	S-	73	-	29	MS-	58.2	100
Means	12.2		30.7		65.1		5.3		9.0		22.1	

Table 74. Reaction of International Winter Wheat Performance Nursery cultivars to leaf rust (Puccinia recondita) in 1981.

Cultivars	Balcarce, Argentina		Bordenave, Argentina		Marcos Juarez, Argentina		Tolbukhin, Bulgaria		Chillan, Chile		Male Ripnany, Czechoslovakia	
	Sev	Resp	Sev	Resp	Sev	Resp	Sev	Resp	Sev	Resp	Sev	Resp
Number of replications	4		4		1		1		1		4	
Jugoslavija	16	MR-	4	R-	5	MR-	0	-	0	-	0	-
NE 79Y90576	7	MR-	2	R-	1	S-	10	-	0	-	0	-
Balkan	11	MR-	3	R-	0	-	5	-	0	-	0	-
TX 71A562-6	8	MR-	2	R-	10	MS-	5	-	0	-	0	-
WWP 4394	1	MS-	1	R-	60	MS-	5	-	0	-	0	-
Super X	75	S-	38	S-	10	MS-	5	-	0	-	0	-
Trakia	5	MS-	23	S-	40	MS-	5	-	0	-	0	-
TAM W-105	25	MS-S	20	MS-S	80	S-	20	-	0	-	0	-
Bezostaya 1	25	MR-	14	MR-MS	60	S-	10	-	10	S-	0	-
Pai yu pao	98	S-	35	MS-S	80	S-	10	-	0	-	0	-
NE 79Y95097	45	MS-S	26	MR-S	10	MR-	10	-	5	M-M	0	-
Jana	83	S-	15	MS-	5	MS-	0	-	60	S-	0	-
Loudogorka	38	MR-	33	MS-	40	MS-	10	-	5	S-	0	-
Atlas 66	85	S-	5	MR-	100	S-	5	-	0	-	0	-
Bastion	25	MS-	23	MR-MS	60	S-	50	-	30	S-	15	VR-
Blueboy	63	S-	35	S-	80	S-	50	-	0	-	0	-
Vega	65	S-	73	S-	80	S-	40	-	0	-	0	-
Bounty	15	MR-	33	MS-	60	S-	50	-	80	S-	0	-
Kopara	75	S-	35	S-	60	S-	5	-	70	S-	0	-
Huenufen	30	MS-	13	MR-	40	MS-	20	-	60	S-	0	-
Irnerio	34	S-	28	MS-	80	S-	5	-	0	-	0	-
Martonvasari 6	78	S-	45	S-	80	S-	40	-	20	S-	15	VR-
Maris Mardler	10	MR-	30	MR-MS	60	S-	100	-	80	S-	0	-
Houser	100	S-	30	MS-	100	S-	50	-	0	-	0	-
Phoenix (WW 33G)	75	S-	50	S-	80	S-	40	-	30	S-	0	-
Takahe	85	S-	43	S-	80	S-	50	-	0	-	15	VR-
Alcedo	70	S-	48	S-	80	S-	0	-	60	S-	20	VR-
Chokwang	88	S-	40	S-	80	S-	100	-	0	-	0	-
Aura	75	S-	45	S-	100	S-	40	-	60	S-	10	VR-
Sadovo Super	100	S-	63	S-	80	S-	100	-	60	S-	0	-
Means	50.2		28.3		56.7		28.0		21.0		2.5	

Table 74. Reaction of International Winter Wheat Performance Nursery cultivars to leaf rust (Puccinia recondita) in 1981.

Cultivars	Bohnshausen, East Germany		Szeged, Hungary		Rieti,[a] Italy		Morioka, Iwate,[a] Japan		Przeclaw, Poland		Warsaw, Poland	
	Sev	Resp	Sev	Resp	Sev	Resp	Sev	Resp	Sev	Resp	Sev	Resp
Number of replications	4		4		4		4		4		4	
Jugoslavija	0	-	3	R-	0	-	1	VR-	1	R-	0	-
NE 79Y90576	1	MR-	0	-	5	-	1	R-	8	R-	0	-
Balkan	1	MS-	0	MR-	4	-	1	VR-	1	R-	0	-
TX 71A562-6	1	MS-	0	-	30	-	1	VR-R	6	R-MR	0	-
WWP 4394	4	MS-	3	MR-	4	-	17	VR-S	2	R-	0	-
Super X	1	MS-	0	-	37	-	.	-	2	R-	0	-
Trakia	3	MS-	0	-	1	-	19	VR-MS	10	MR-	35	MR-
TAM W-105	5	M-MS	0	MR-	30	-	3	R-S	6	R-	0	-
Bezostaya 1	8	M-MS	11	MR-MS	38	-	19	R-S	5	R-	0	-
Pai yu pao	1	MS-	0	-	0	-	66	S-VS	2	R-	0	-
NE 79Y95097	3	M-MS	1	MR-	14	-	15	R-MS	3	R-	0	-
Jana	11	M-MS	0	-	4	-	23	VR-S	18	MR-	80	S-
Loudogorka	13	MS-	20	MR-MS	40	-	13	R-MR	6	R-MR	0	-
Atlas 66	6	MS-	1	MR-	25	-	17	VR-S	11	MR-	60	MS-
Bastion	5	M-MS	13	MR-MS	53	-	.	-	2	R-	0	-
Blueboy	5	MS-	1	MR-	0	-	61	MS-VS	5	R-	0	-
Vega	0	-	0	-	0	-	16	VR-MS	5	R-	13	MR-
Bounty	9	MS-	5	R-MS	40	-	16	MR-M	1	R-	0	-
Kopara	8	MS-	10	R-MS	43	-	14	MS-	5	R-	0	-
Huenufen	0	-	6	MR-	1	-	5	R-M	10	MR-	50	MR-MS
Irnerio	15	MS-S	3	MR-	33	-	.	-	9	R-	50	MS-
Martonvasari 6	9	M-MS	30	MR-S	43	-	34	MR-MS	8	R-	0	-
Maris Mardler	8	MS-	1	R-	0	-	.	-	1	R-	0	-
Houser	11	MS-	4	MR-	1	-	53	MS-S	16	MR-	15	MR-
Phoenix (WW 33G)	33	MS-VS	5	MS-	50	-	53	MS-S	6	R-	45	MS-
Takahe	3	MS-	21	MS-S	0	-	8	R-MS	2	R-	15	MR-
Alcedo	34	MS-S	30	MS-S	33	-	34	M-MS	11	MR-	20	MR-
Chokwang	6	M-MS	0	-	6	-	100	MS-VS	0	-	0	-
Aura	30	MS-S	25	MR-S	0	-	59	MS-VS	13	MR-	90	S-
Sadovo Super	43	S-VS	33	MR-S	75	-	65	MS-S	15	MR-	75	S-
Means	9.1		7.5		21.0		26.9		6.3		18.3	

a/ These sites not included in the overall means.

Table 74. Reaction of International Winter Wheat Performance Nursery cultivars to leaf rust (Puccinia recondita) in 1981.

Cultivars	Fundulea, Romania		Bethlehem, South Africa (dryland)		Bethlehem, South Africa (irrigated)		Aleppo, Syria		Brookston, Indiana, a/ USA		Billings, Montana, USA	
	Sev	Resp	Sev	Resp	Sev	Resp	Sev	Resp	Sev	Resp	Sev	Resp
Number of replications	4		1		1		1		4		1	
Jugoslavija	9	R-	0	-	0	-	0	-	0	-	10	-
NE 79Y90576	0	-	0	-	5	S-	0	-	10	VS-	20	-
Balkan	9	R-	0	-	0	-	0	-	5	VR-	10	-
TX 71A562-6	10	R-	0	-	5	S-	0	-	8	R-	15	-
WWP 4394	0	VR-	0	-	0	-	0	-	5	VR-	10	-
Super X	10	R-	0	-	0	-	20	S-	.	-	15	-
Trakia	28	MS-	0	-	30	S-	0	-	3	VR-	15	-
TAM W-105	10	R-	30	S-	10	S-	0	-	40	MS-	20	-
Bezostaya 1	53	MS-	0	-	20	S-	1	R-	8	VR-R	15	-
Pai yu pao	0	-	0	-	30	S-	0	-	5	VR-	15	-
NE 79Y95097	9	R-	50	S-	30	S-	1	MR-	15	R-	40	-
Jana	8	R-	20	S-	30	S-	0	-	5	VR-	15	-
Loudogorka	40	MS-	30	S-	0	-	10	S-	25	R-	10	-
Atlas 66	10	R-	10	S-	50	S-	0	-	8	VR-VS	20	-
Bastion	43	MS-	20	S-	10	S-	0	-	.	-	15	-
Blueboy	10	R-	10	S-	50	S-	10	S-	25	MS-	30	-
Vega	13	R-	0	-	30	S-	5	R-	18	MR-	20	-
Bounty	68	S-	0	-	20	S-	10	R-	5	VR-	15	-
Kopara	45	MS-	30	S-	30	S-	5	MR-	.	-	25	-
Huenufen	65	S-	40	S-	30	S-	0	-	.	-	20	-
Irnerio	68	S-	0	-	60	S-	0	-	.	-	30	-
Martonvasari 6	50	S-	0	-	30	S-	0	-	65	S-VS	30	-
Maris Mardler	83	S-	30	S-	50	S-	0	-	23	R-S	30	-
Houser	55	S-	30	S-	50	S-	0	-	53	MS-	20	-
Phoenix (WW 33G)	90	S-	10	S-	60	S-	0	-	40	MS-S	20	-
Takahe	50	MR-	50	S-	60	S-	30	S-	.	-	35	-
Alcedo	70	VS-	20	S-	90	S-	20	S-	59	MS-VS	20	-
Chokwang	73	VS-	0	-	30	S-	0	-	40	S-	50	-
Aura	55	S-	5	S-	40	S-	20	S-	33	MS-S	20	-
Sadovo Super	83	S-	10	S-	90	S-	40	S-	100	S-VS	35	-
Means	37.0		13.2		31.3		5.7		24.7		21.5	

a/ This site not included in the overall means.

Table 74. Reaction of International Winter Wheat Performance Nursery cultivars to leaf rust (Puccinia recondita) in 1981.

Cultivars	Lincoln, Nebraska,a/ USA		Krasnodar, USSR		Odessa, USSR		Novi Sad, Yugoslavia		Zagreb, Yugoslavia		Severity means over 19 sites	
	Sev	Resp	Sev	Resp	Sev	Resp	Sev	Resp	Sev	Resp	%	High score
Number of replications	1		4		4		4		1			
Jugoslavija	1	R-	0	VR-R	0	-	8	VR-S	10	R-	3.5	16
NE 79Y90576	20	R-	0	-	1	R-	25	R-	5	MR-	4.5	25
Balkan	1	R-	1	R-M	1	R-	27	VR-VS	20	R-	4.7	27
TX 71A562-6	1	R-	1	R-	7	R-S	35	MR-VS	20	MR-	6.6	35
WWP 4394	1	R-	1	R-MS	1	R-	40	VR-MR	10	R-	7.3	60
Super X	.	-	1	MR-	1	R-	41	MS-VS	0	-	11.5	75
Trakia	1	R-	0	VR-	0	R-	41	VS-	10	MR-	12.9	41
TAM W-105	80	MS-	1	VR-R	17	R-S	25	MS-S	25	MS-	15.5	80
Bezostaya 1	1	R-	3	M-MS	8	R-S	45	S-VS	15	R-	15.9	60
Pai yu pao	90	S-	0	-	4	R-S	23	VR-S	15	R-	16.5	98
NE 79Y95097	90	S-	1	R-MR	7	R-S	50	MR-S	30	R-	16.9	50
Jana	40	MR-	0	VR-R	0	-	3	MS-S	5	MR-	18.6	83
Loudogorka	20	R-	3	R-MR	2	R-S	55	VS-	40	R-	18.7	55
Atlas 66	20	R-	0	-	0	-	18	S-	15	MR-	20.8	100
Bastion	.	-	0	R-	2	R-S	68	S-VS	40	MS-	22.2	68
Blueboy	25	R-	4	M-M	1	R-	45	S-VS	35	M-M	22.8	80
Vega	50	S-	1	R-M	1	R-	55	MR-VS	35	MR-	22.9	80
Bounty	50	MR-	0	R-	2	R-S	60	VS-	10	MR-	23.1	80
Kopara	20	R-	1	R-	1	R-	73	VS-	20	MR-	26.2	75
Huenufen	.	-	3	MR-	8	R-S	65	VS-	40	S-	26.3	65
Irnerio	.	-	2	MR-M	35	S-	70	VS-	15	MS-	26.5	80
Martonvasari 6	90	S-	2	M-M	26	S-	65	VS-	10	MR-	28.3	80
Maris Mardler	80	S-	1	R-MR	5	R-S	25	MS-S	40	R-	29.2	100
Houser	40	S-	4	MR-	19	S-	60	S-VS	30	VR-	31.3	100
Phoenix (WW 33G)	80	S-	15	MR-	30	S-	50	S-VS	30	MR-	35.2	90
Takahe	90	S-	3	M-MS	17	R-S	53	VS-	70	MS-	35.9	85
Alcedo	80	S-	3	R-M	11	R-S	90	VS-	10	MR-	37.2	90
Chokwang	90	S-	100	MS-	100	S-	25	VR-	45	MR-	38.8	100
Aura	20	MS-	8	M-MS	23	R-S	65	VS-	35	MS-	39.9	100
Sadovo Super	90	S-	15	M-MS	17	R-S	78	VS-	20	R-	50.4	100
Means	45.0		5.7		11.3		47.4		23.5		22.3	

a/ This site not included in overall means.

Table 75. Reaction of International Winter Wheat Performance Nursery cultivars to stem rust (Puccinia graminis tritici) in 1981.

Cultivars	Marcos Juarez, Argentina		Martonvasar, Hungary		Milano, Italy		Rieti,[a/] Italy		Bethlehem, South Africa (dryland)	
	Sev	Resp	Sev	Resp	Sev	Resp	Sev	Resp	Sev	Resp
Number of replications	1		4		2		4		1	
Jugoslavija	0	-	0	VR-	0	-	0	-	0	-
Balkan	5	S-	0	VR-	0	-	0	-	0	-
Super X	0	-	0	VR-	0	-	27	-	0	-
Kopara	5	MS-	26	R-S	0	-	55	-	0	-
WWP 4394	0	-	1	VR-	0	-	0	-	0	-
Pai yu pao	10	MS-	1	VR-	0	-	55	-	0	-
Atlas 66	1	S-	15	R-M	0	-	0	-	5	S-
Huenufen	10	MS-	1	VR-	0	-	0	-	5	S-
NE 79Y90576	40	S-	2	VR-R	0	-	10	-	0	-
Vega	40	MS-	4	VR-R	0	-	43	-	0	-
TX 71A562-6	60	S-	0	VR-	0	-	77	-	0	-
Phoenix (WW 33G)	40	MS-	9	R-MR	10	-	0	-	0	-
TAM W-105	20	S-	2	VR-R	0	-	35	-	0	-
Chokwang	60	S-	2	VR-R	10	-	45	-	0	-
Bounty	10	S-	45	R-S	0	-	53	-	0	-
NE 79Y95097	80	S-	3	VR-R	0	-	23	-	20	S-
Maris Mardler	30	S-	34	MR-S	0	-	80	-	0	-
Houser	10	MS-	48	M-VS	0	-	1	-	2	S-
Martonvasari 6	40	S-	36	MR-S	0	-	45	-	0	-
Bezostaya 1	20	S-	44	R-S	0	-	35	-	0	-
Sadovo Super	1	S-	53	M-S	40	-	35	-	0	-
Takahe	20	S-	80	S-VS	5	-	55	-	20	S-
Trakia	60	S-	6	R-	0	-	20	-	10	S-
Aura	10	MS-	59	M-VS	10	-	33	-	5	S-
Loudogorka	60	S-	55	M-VS	0	-	40	-	0	-
Irnerio	40	S-	100	VS-	15	-	40	-	0	-
Jana	0	-	65	MR-VS	0	-	10	-	10	S-
Bastion	5	MS-	94	S-VS	5	-	43	-	20	S-
Blueboy	80	S-	90	S-VS	0	-	75	-	2	S-
Alcedo	40	S-	100	VS-	0	-	57	-	40	S-
Means	26.6		32.4		3.2		34.6		4.6	

a/ This site not included in the overall means.

Table 75. Reaction of International Winter Wheat Performance Nursery cultivars to stem rust (Puccinia graminis tritici) in 1981.

Cultivars	Bethlehem, South Africa (irrigated)		Fort Collins, Colorado, USA		Zagreb, Yugoslavia		Severity means over 7 sites	
	Sev	Resp	Sev	Resp	Sev	Resp	%	High score
Number of replications	1		1		1			
Jugoslavija	0	-	0	-	5	R-	0.7	5
Balkan	0	-	0	-	5	R-	1.4	5
Super X	0	S-	0	-	10	R-	1.4	10
Kopara	5	S-	0	-	5	R-	5.9	26
WWP 4394	5	S-	30	S-	5	MS-	5.9	30
Pai yu pao	10	S-	0	-	40	S-	8.7	40
Atlas 66	20	S-	20	S-	5	MS-	9.4	20
Huenufen	20	S-	0	-	30	MS-	9.4	30
NE 79Y90576	5	S-	0	-	20	MS-	9.6	40
Vega	20	S-	0	-	10	MS-	10.6	40
TX 71A562-6	5	S-	0	-	40	S-	15.0	60
Phoenix (WW 33G)	50	S-	0	-	2	R-	15.9	50
TAM W-105	20	S-	60	S-	25	MR-	18.1	60
Chokwang	0	-	0	-	60	MR-	18.9	60
Bounty	10	S-	60	S-	15	MS-	20.0	60
NE 79Y95097	20	S-	0	-	25	MR-	21.1	80
Maris Mardler	30	S-	50	S-	5	R-	21.3	50
Houser	30	S-	40	S-	20	S-	21.4	48
Martonvasari 6	30	S-	40	S-	30	MS-	25.1	40
Bezostaya 1	20	S-	80	S-	15	MS-	25.6	80
Sadovo Super	10	S-	30	S-	45	S-	25.6	53
Takahe	40	S-	5	S-	40	MR-	30.0	80
Trakia	30	S-	50	S-	55	MS-	30.1	60
Aura	40	S-	70	S-	20	MS-	30.6	70
Loudogorka	30	S-	60	S-	35	MS-	34.3	60
Irnerio	30	S-	80	S-	5	R-	38.6	100
Jana	30	S-	90	S-	75	S-	38.6	90
Bastion	50	S-	90	S-	10	MR-	39.1	94
Blueboy	20	S-	80	S-	80	S-	50.3	90
Alcedo	30	S-	90	S-	60	MS-	51.4	100
Means	20.3		34.2		26.6		21.1	

Table 76. Reaction (0-9) of International Winter Wheat Performance Nursery cultivars to powdery mildew (Erysiphe graminis) in 1981.

Cultivars	Balcarce, Argentina	Vienna, Austria	Tolbukhin, Bulgaria	Male Ripnany, Czechoslovakia	Sedlec, Czechoslovakia	Bohnshausen, East Germany	Orgerus,[a] France
Number of replications	4	3	1	4	4	4	1
Maris Mardler	0	1	0	1	2	2	2
Bounty	0	2	0	1	3	2	2
Balkan	0	3	1	1	4	1	0
Bastion	0	1	1	3	2	1	5
Takahe	0	2	1	1	5	1	.
Jugoslavija	0	2	1	1	5	4	3
WWP 4394	0	4	2	1	5	4	3
Houser	0	4	0	3	4	4	.
Atlas 66	5	4	0	2	4	3	3
Super X	0	3	0	1	4	3	.
Alcedo	1	4	0	3	4	5	4
Aura	3	4	1	2	4	6	4
Jana	3	4	1	2	6	5	6
Loudogorka	0	5	1	2	5	5	3
Martonvasari 6	0	4	1	3	4	4	4
Trakia	0	4	1	3	6	4	6
Vega	4	5	1	2	5	4	6
Kopara	0	4	1	5	5	4	5
Irnerio	0	5	1	4	6	5	.
Phoenix (WW 33G)	0	5	2	1	5	7	8
Bezostaya 1	0	3	2	3	4	6	4
Sadovo Super	0	4	1	3	6	7	3
Huenufen	0	5	1	7	7	7	9
TAM W-105	4	4	2	5	5	7	.
TX 71A562-6	3	4	2	3	6	7	9
Blueboy	0	5	4	4	7	7	9
Chokwang	0	7	5	2	4	8	.
Pai yu pao	4	7	2	3	6	5	.
NE 79Y90576	0	6	5	3	9	8	.
NE 79Y95097	4	7	5	5	8	9	9
Means	1.0	4.1	1.5	2.7	5.0	4.7	4.9

[a] This site was not included in the overall means.

Table 76. Reaction (0-9) of International Winter Wheat Performance Nursery cultivars to powdery mildew (Erysiphe graminis) in 1981.

Cultivars	Martonvasar, Hungary	Szeged, Hungary	Milano,[a] Italy	Suwon, Korea	Vollebekk,[a] Norway	Przeclaw, Poland	Warsaw, Poland
Number of replications	4	4	2	4	2	4	4
Maris Mardler	1	0	0	0	.	1	0
Bounty	1	0	0	0	1	2	1
Balkan	4	5	0	0	0	3	2
Bastion	1	2	0	0	.	3	2
Takahe	3	7	0	0	.	4	3
Jugoslavija	3	4	0	0	0	3	1
WWP 4394	7	8	0	0	0	4	2
Houser	5	6	0	0	2	4	2
Atlas 66	4	6	10	0	2	4	2
Super X	6	7	0	.	.	4	3
Alcedo	6	6	0	1	1	2	4
Aura	5	7	10	0	1	3	4
Jana	6	7	30	0	1	3	3
Loudogorka	5	7	5	0	1	4	4
Martonvasari 6	5	7	15	0	1	2	3
Trakia	6	7	0	0	2	4	6
Vega	8	9	0	0	0	5	5
Kopara	6	7	0	0	.	5	2
Irnerio	7	8	15	0	.	4	4
Phoenix (WW 33G)	8	7	15	1	4	4	2
Bezostaya 1	6	7	15	0	1	4	7
Sadovo Super	7	8	15	1	3	5	4
Huenufen	6	8	35	0	4	5	4
TAM W-105	8	8	5	0	4	7	4
TX 71A562-6	9	7	10	0	5	5	8
Blueboy	8	9	35	3	5	6	8
Chokwang	9	9	15	5	8	5	5
Pai yu pao	9	9	0	1	1	7	5
NE 79Y90576	9	9	25	8	8	7	4
NE 79Y95097	9	9	55	8	7	7	8
Means	5.9	6.5	10.3	1.0	2.3	4.0	3.6

[a] These sites were not included in the overall means.

Table 76. Reaction (0-9) of International Winter Wheat Performance Nursery cultivars to powdery mildew (Erysiphe graminis) in 1981.

Cultivars	Madrid, Spain	Zaragoza, Spain	Zurich, Switzerland	Brookston, Indiana, a/ USA	Billings, Montana, USA	Ithaca, New York, a/ USA	Rowan County, North Carolina USA
Number of replications	4	4	4	4	1	3	4
Maris Mardler	0	1	2	2	1	0	3
Bounty	0	2	2	3	1	2	2
Balkan	0	1	2	1	1	0	0
Bastion	0	3	3	.	1	3	1
Takahe	0	1	3	.	1	1	1
Jugoslavija	2	3	1	1	1	0	1
WWP 4394	1	1	3	1	1	1	0
Houser	4	1	6	7	1	3	4
Atlas 66	5	3	4	6	1	4	7
Super X	6	4	3	.	1	4	2
Alcedo	2	5	5	8	1	3	4
Aura	2	4	4	7	1	3	4
Jana	2	1	6	8	1	3	6
Loudogorka	5	3	5	6	1	2	6
Martonvasari 6	3	5	6	7	2	3	9
Trakia	4	3	8	8	1	4	3
Vega	5	5	4	4	1	4	4
Kopara	5	6	6	.	1	6	7
Irnerio	5	4	8	.	1	5	6
Phoenix (WW 33G)	6	5	7	7	1	5	6
Bezostaya 1	4	4	5	8	2	3	9
Sadovo Super	5	6	8	8	1	5	8
Huenufen	4	5	8	.	3	5	4
TAM W-105	5	4	8	8	2	5	8
TX 71A562-6	5	5	7	8	3	5	8
Blueboy	5	5	8	8	1	6	9
Chokwang	6	6	9	9	1	5	9
Pai yu pao	6	7	9	7	2	6	9
NE 79Y90576	7	8	9	9	3	7	9
NE 79Y95097	7	7	8	9	4	7	9
Means	3.6	3.9	5.5	6.1	1.4	3.7	5.1

a/ These sites were not included in the overall means.

Table 76. Reaction (0-9) of International Winter Wheat Performance Nursery cultivars to powdery mildew (Erysiphe graminis) in 1981.

Cultivars	Krasnodar, USSR	Odessa, USSR	Monsheim, West Germany	Weihenstephan, West Germany	Novi Sad, Yugoslavia	Zagreb, Yugoslavia	Severity means over 22 sites (0-9)	High score
Number of replications	4	4	4	4	4	1		
Maris Mardler	1	0	2	1	0	2	1.0	3
Bounty	0	0	2	1	1	1	1.1	3
Balkan	0	0	1	2	4	3	1.7	5
Bastion	5	0	2	2	0	4	1.7	5
Takahe	0	0	1	2	2	5	2.0	7
Jugoslavija	6	0	2	2	4	3	2.2	6
WWP 4394	4	2	4	3	6	4	3.0	8
Houser	4	0	4	2	4	6	3.1	6
Atlas 66	5	1	3	2	3	2	3.2	7
Super X	4	0	3	3	5	8	3.3	8
Alcedo	6	0	5	3	4	5	3.5	6
Aura	4	3	5	2	5	6	3.6	7
Jana	5	1	6	3	6	5	3.7	7
Loudogorka	5	2	5	3	4	6	3.8	7
Martonvasari 6	6	2	5	3	4	6	3.8	9
Trakia	5	1	5	2	5	5	3.8	8
Vega	0	0	4	2	6	6	3.9	9
Kopara	5	1	6	3	5	8	4.2	8
Irnerio	5	1	6	4	5	7	4.4	8
Phoenix (WW 33G)	7	1	5	3	7	6	4.4	8
Bezostaya 1	8	6	5	4	5	5	4.5	9
Sadovo Super	7	1	7	4	6	3	4.6	8
Huenufen	8	2	6	3	5	7	4.8	8
TAM W-105	6	4	6	3	9	6	5.2	9
TX 71A562-6	6	3	7	3	8	7	5.3	9
Blueboy	6	5	7	5	7	8	5.8	9
Chokwang	6	7	7	6	6	8	5.9	9
Pai yu pao	5	6	7	6	8	8	6.0	9
NE 79Y90576	7	6	8	7	9	8	6.8	9
NE 79Y95097	8	7	8	6	9	8	7.3	9
Means	4.8	2.0	4.7	3.1	4.9	5.5	3.9	

Table 77. Reaction (0-9) of International Winter Wheat Performance Nursery cultivars to Septoria (Septoria tritici, Septoria nodorum) in 1981.

Cultivars	Balcarce, Argentina	Jokioinen,[a/] Finland	Orgerus,[a/] France	Milano,[a/] Italy	Vollebekk,[a/] Norway	Przeclaw, Poland	Warsaw, Poland
Number of replications	4	1	1	2	2	4	4
Atlas 66	4	.	3	35	0	1	3
Alcedo	5	5	4	8	8	2	4
Blueboy	5	.	4	25	0	2	2
Bounty	5	.	4	20	5	2	4
Jana	5	9	5	15	0	2	5
Houser	4	.	.	30	6	3	8
NE 79Y90576	5	5	.	20	.	1	9
Maris Mardler	5	.	4	35	.	2	5
Aura	5	7	4	20	2	3	5
Balkan	5	.	6	35	8	2	5
Bastion	6	.	4	15	.	3	6
Huenufen	6	.	4	15	7	3	6
WWP 4394	5	5	6	25	7	3	6
Chokwang	4	.	.	3	7	3	8
Loudogorka	7	9	6	40	5	3	5
Martonvasari 6	6	9	5	20	5	3	6
Kopara	4	.	6	60	.	4	6
Sadovo Super	6	.	7	25	5	3	5
TAM W-105	5	9	.	35	5	2	8
TX 71A562-6	6	7	7	35	6	3	9
Bezostaya 1	6	3	6	25	7	3	6
Takahe	5	.	.	25	.	2	8
Jugoslavija	5	.	6	30	4	4	4
NE 79Y95097	5	.	7	18	3	1	7
Irnerio	7	.	.	30	.	4	9
Phoenix (WW 33G)	7	.	7	15	2	3	6
Vega	7	.	7	25	5	3	9
Pai yu pao	8	3	.	0	7	2	8
Trakia	6	9	5	35	5	3	7
Super X	7	.	.	40	.	3	6
Means	5.4	6.7	5.3	25.3	4.5	2.5	6.0

a/ These sites were not included in the overall means.

Table 77. Reaction (0-9) of International Winter Wheat Performance Nursery cultivars to Septoria (Septoria tritici, Septoria nodorum) in 1981.

Cultivars	Fundulea, Romania	Davis, California, USA	Corvallis, Oregon, USA	Krasnodar, USSR	Zagreb, Yugoslavia	Severity means over 8 sites (0-9)	High score
Number of replications	4	1	1	4	1		
Atlas 66	2	0	2	4	2	2.3	4
Alcedo	3	0	2	2	4	2.8	5
Blueboy	4	0	2	4	3	2.8	5
Bounty	3	0	3	3	3	2.9	5
Jana	4	0	3	2	3	3.0	5
Houser	0	2	2	3	4	3.3	8
NE 79Y90576	0	1	0	5	5	3.3	9
Maris Mardler	5	0	3	4	3	3.4	5
Aura	3	3	2	3	4	3.5	5
Balkan	4	1	4	4	3	3.5	5
Bastion	3	1	3	4	2	3.5	6
Huenufen	4	2	3	3	4	3.9	6
WWP 4394	3	0	7	4	3	3.9	7
Chokwang	3	4	0	5	5	4.0	8
Loudogorka	4	2	5	4	2	4.0	7
Martonvasari 6	5	3	2	4	3	4.0	6
Kopara	5	1	4	4	5	4.1	6
Sadovo Super	5	2	5	5	2	4.1	6
TAM W-105	6	0	4	4	4	4.1	8
TX 71A562-6	4	0	4	4	3	4.1	9
Bezostaya 1	5	0	5	5	4	4.3	6
Takahe	4	5	3	3	4	4.3	8
Jugoslavija	4	2	8	5	3	4.4	8
NE 79Y95097	5	0	8	5	6	4.6	8
Irnerio	0	3	9	4	3	4.9	9
Phoenix (WW 33G)	3	6	8	4	3	5.0	8
Vega	5	0	9	3	4	5.0	9
Pai yu pao	8	0	9	6	4	5.6	9
Trakia	6	5	9	7	2	5.6	9
Super X	7	6	9	7	6	6.4	9
Means	3.9	1.6	4.6	4.1	3.5	4.0	

Table 78. Reaction of the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery to Septoria tritici at the Bet-Dagan, Experiment Station, Israel, in 1981.[a/]

Cultivars	Days to heading[b/]	Plant height (cm)	Percent coverage		SPC x 10[e/]
			Upper leaves[c/]	Fd[/]	
Jana	133	125	1.50	0	1.60
Trakia	103	80	57.50	50	7.50
Aura	108	110	20.00	10	7.27
Atlas 66	123	125	20.00	10	8.80
Houser	127	100	35.00	30	8.00
Huenufen	133	85	20.00	10	8.23
TX 71A562-6	122	110	22.50	20	8.18
Blueboy	106	122	25.00	20	8.19
Kopara	132	110	25.00	10	8.64
Alcedo	134	125	22.50	10	8.40
TAM W-105	123	110	55.00	50	8.18
Irnerio	98	80	65.00	60	8.75
Martonvasari 6	100	110	45.00	40	8.64
Bezostaya 1	96	105	47.50	40	9.05
Bastion	134	120	2.50	0	4.17
WWP 4394	96	100	40.00	30	8.00
Phoenix (WW33G)	94	85	55.00	50	8.82
Vega	94	85	75.00	70	8.82
Loudogorka	100	100	77.50	70	8.50
Pai yu pao	88	85	87.50	80	7.65
H.895 (susceptible check)	96	85	65.00	60	8.82
Maris Mardler	133	75	20.00	10	8.67
Chokwang	88	75	80.00	80	8.00
Takahe	133	105	11.25	5	9.05
Balkan	91	85	57.50	50	9.41
Super X	93	86	45.00	30	8.72
Jugoslavija	100	95	52.50	40	8.95
Sadovo Super	104	110	65.00	60	8.64
Bounty	97	85	15.00	10	8.82
NE 79Y90576	117	120	32.50	30	7.50
Cee'on (check)	96	85	62.50	60	8.82
NE 79Y95097	133	75	20.00	10	8.67
Lakhish (check)	99	100	62.50	60	8.69

a/ Data were provided by Dr. Zahir Eyal.
b/ Days to heading from seedling transplanting on December 25, 1980, following 8 weeks of vernalization at 4°C.
c/ Mean pycnidia coverage on 4 uppermost leaves.
d/ Mean pycnidia coverage on flag leaf.
e/ SPC = (disease height/plant height) x 10.

Table 79. Dwarf bunt (Tilletia controversa) reactions for the 30 cultivars in the Thirteenth International Winter Wheat Performance Nursery at Logan, Utah, USA.[a/]

Cultivars	Percent infection[b/]
Jana	85
Trakia	80
Aura	80
Atlas 66	75
Houser	80
Huenufen	85
TX 71A562-6	98
Blueboy	45
Kopara	90
Alcedo	99
TAM W-105	97
Irnerio	85
Martonvasari 6	95
Bezostaya 1	92
Bastion	95
WWP 4394	97
Phoenix (WW33G)	90
Vega	90
Loudogorka	85
Pai yu pao	87
Maris Mardler	35
Chokwang	98
Takahe	99
Balkan	87
Super X	70
Jugoslavija	75
Sadovo Super	97
Bounty	92
NE 79Y90576	95
NE 79Y95097	85
Mean	85.4

a/ Data were provided by Dr. Wade B. Dewey.
b/ Plants were artificially inoculated.

Table 80. Summary of two-year means, rankings, and statistics for 17 cultivars grown in the International Winter Wheat Performance Nursery, 1980 and 1981.

Cultivars	Grain yield		Test weight		1000-kernel weight		Grain protein		Plant height		Lodging	
	q/ha	% of Bezostaya 1	kg/hl	rank	g	rank	%	rank	cm	rank	%	rank
Number of sites	38		11		16		6		22		6	
TAM W-105	50.6	111.0	79.7	1	35.9	13	13.5	13	86.7	6	31.9	13
WWP 4394	49.8	109.2	79.0	3	37.4	9	15.1	3	91.1	8	5.4	5
Trakia	49.2	107.9	77.7	6	42.2	3	13.8	10	74.7	2	5.4	5
Martonvasari 6	48.5	106.4	78.4	5	43.3	1	14.1	7	98.0	14	20.6	10
TX 71A562-6	48.4	106.1	76.0	9	33.5	17	13.1	16	85.2	5	51.7	17
Houser	48.0	105.3	74.3	16	39.9	5	13.2	14	93.5	9	32.5	14
Alcedo	47.7	104.6	78.6	4	40.5	4	13.7	11	95.3	12	14.2	9
Bezostaya 1	45.6	100.0	79.6	2	42.7	2	14.5	6	93.7	10	22.1	11
Blweboy	44.8	98.2	74.6	14	38.1	7	12.7	17	97.7	13	13.9	8
Jana	43.5	95.4	74.7	13	38.6	6	14.1	7	101.9	15	13.8	7
Bastion	37.6	82.5	75.7	10	38.0	8	14.1	7	94.4	11	3.8	2
Aura	35.6	78.1	75.1	12	36.1	12	14.9	5	103.2	16	33.6	15
Atlas 66	35.3	77.4	77.5	7	36.8	11	17.5	1	112.3	17	41.8	16
Kopara	35.2	77.2	74.6	14	35.7	14	15.5	2	90.5	7	5.3	4
Huenufen	34.3	75.2	74.0	17	34.5	16	15.1	3	80.9	3	5.2	3
Super X	33.8	74.1	77.0	8	35.1	15	13.2	14	81.8	4	28.3	12
Irnerio	30.4	66.7	75.4	11	37.0	10	13.7	11	68.0	1	0.9	1
Means	a/ 42.3	b/ 42.8	a/ 76.6	b/ 76.6	a/ 38.0	b/ 38.1	a/ 14.2	b/ 14.3	a/ 91.1	b/ 91.7	a/ 19.4	b/ 18.9
L.S.D. of the cultivar means (.05)	7.7	7.7	1.6	1.6	2.0	1.9	0.4	0.4	3.8	3.4	14.0	14.7
Coefficient of variation (%)	13.0	12.9	1.6	1.6	4.5	4.5	6.4	6.4	4.8	4.8	48.4	50.4
F test:												
Cultivars	6.9**	6.8**	12.2**	12.7**	18.0**	18.7**	79.1**	78.1**	65.7**	86.2**	43.0**	40.5**
Year x cultivar	7.2**	7.3**	1.8*	2.1*	1.8*	1.9*	0.2	0.3	2.1*	1.4	0.7	0.8
Location x cultivar	2.2**	1.9**	1.9**	2.2**	1.7**	1.8**	--	--	2.2**	1.9**	0.6	0.6

a/ Analyses including Super X. b/ Analyses excluding Super X.
*,** Significant at the .05 and .01 probability levels, respectively.

Table 80. Continued.

Cultivars	Days to flowering		Days to ripening		Shattering		Winter survival		Frost damage	
	from Jan. 1	rank	from Jan. 1	rank	%	rank	%	rank	0-9	rank
Number of sites	21		14		2		15		3	
TAM W-105	170.3	3	228.6	2	5.8	9	89.8	2	0.8	1
WWP 4394	171.7	5	229.7	5	26.3	17	80.9	10	1.6	10
Trakia	169.0	2	229.2	4	7.1	12	85.9	9	1.5	9
Martonvasari 6	174.2	9	233.7	9	6.4	10	89.1	3	1.3	6
TX 71A562-6	172.4	6	228.9	3	0.3	1	88.9	4	1.0	3
Houser	177.0	13	235.0	13	10.4	16	91.7	1	1.1	4
Alcedo	179.4	15	236.8	14	5.4	7	87.6	6	1.1	4
Bezostaya 1	172.5	7	231.6	7	3.3	5	87.2	7	1.3	6
Blueboy	174.0	8	233.5	8	1.7	2	79.5	11	1.7	11
Jana	181.9	16	238.8	17	2.7	4	86.7	8	0.9	2
Bastion	176.9	12	237.2	15	5.1	6	48.7	15	3.5	14
Aura	182.5	17	238.3	16	2.0	3	88.6	5	1.3	6
Atlas 66	174.7	10	234.2	10	6.9	11	63.2	12	2.5	12
Kopara	175.1	11	234.5	11	5.6	8	53.4	14	3.9	16
Huenufen	178.3	14	234.5	11	7.5	13	54.9	13	3.6	15
Super X	171.4	4	230.5	6	10.1	15	35.1	17	4.1	17
Irnerio	168.0	1	228.1	1	9.6	14	43.4	16	3.3	13
Means	a 174.7	b 174.9	a 233.1	b 233.3	a 6.8	b 6.6	a 73.8	b 76.2	a 2.0	b 1.9
L.S.D. of the cultivar means (.05)	2.1	1.7	2.5	2.3	N.S.	N.S.	17.1	15.9	1.8	1.7
Coefficient of variation (%)	0.9	0.9	1.0	1.0	76.7	69.2	10.2	9.9	19.4	20.2
F test: Cultivars	30.3**	50.4**	14.8**	18.0**	0.6	0.7	10.4**	9.5**	3.4**	3.3**
Year x cultivar	4.7**	2.1**	1.2	1.5	1.7	1.8	3.6**	3.3**	1.0	1.0
Location x cultivar	9.9**	4.8**	3.5**	3.8**	1.2	1.1	2.4**	2.3**	8.4**	7.1**

a/ Analyses including Super X. b/ Analyses excluding Super X.
*,** Significant at the .01 probability level.

Table 81. Two-year means and rankings of grain yield (q/ha) for 17 cultivars grown in the International Winter Wheat Performance Nursery, 1980 and 1981.

Cultivars	Bordenave, Argentina[a]		Vienna, Austria		Tolbukhin, Bulgaria		Lethbridge, Alberta, Canada[a]		Chillan, Chile		Male Ripnany, Czechoslovakia		Sedlec, Czechoslovakia	
	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank
TAM W-105	29.9	3	59.6	9	73.5	7	52.0	8	48.6	8	92.2	3	75.9	3
WWP4394	27.5	5	61.8	7	86.9	2	46.5	11	51.3	4	78.2	9	63.5	9
Trakia	25.7	7	63.5	4	88.9	1	58.1	4	56.6	1	86.9	6	71.3	6
Martonvasari 6	26.3	6	56.6	11	75.3	5	59.7	3	47.0	10	94.2	2	70.1	7
TX 71A562-6	33.3	2	66.3	2	71.2	9	61.1	1	35.5	13	86.8	7	74.9	4
Houser	23.2	10	63.4	5	77.5	3	61.0	2	36.7	12	83.9	8	81.0	1
Alcedo	21.3	12	66.5	1	71.5	8	56.9	5	52.8	3	95.5	1	76.0	2
Bezostaya 1	24.1	8	49.9	15	75.6	4	56.8	6	50.0	5	72.1	14	59.5	11
Blueboy	28.5	4	60.0	8	58.3	12	50.0	10	53.1	2	73.2	12	62.9	10
Jana	19.7	14	62.3	6	74.0	6	54.9	7	42.8	11	89.2	4	71.8	5
Bastion	19.4	15	66.1	3	69.3	10	9.6	16	48.8	7	88.2	5	56.5	13
Aura	14.1	17	53.7	14	52.6	17	51.4	9	35.3	14	72.1	14	59.3	12
Atlas 66	16.1	16	39.9	17	62.7	11	16.9	14	29.6	16	63.9	16	53.7	16
Kopara	22.6	11	55.3	13	53.9	15	18.0	13	48.1	9	76.9	11	46.9	17
Huenufen	20.5	13	55.5	12	58.2	13	18.6	12	49.2	6	72.6	13	55.0	14
Super X	23.5	9	58.7	10	53.0	16	0.0	17	33.0	15	77.3	10	67.0	8
Irnerio	33.6	1	49.8	16	56.9	14	10.9	15	15.2	17	63.3	17	54.1	15
Mean	24.1		58.2		68.2		40.1		43.1		80.4		64.7	
LSD of the cultivar means (.05)	7.0		NS		NS		17.6		16.0		NS		NS	
Coefficient of variation (%)	25.0		7.3		3.8		19.7		12.5		2.9		8.7	
F tests:														
Cultivars	5.4**		2.2		1.4		13.9**		4.0**		1.6		1.1	
Year x Cultivar	1.2		9.1**		111.0**		4.4**		7.9**		95.4**		21.5**	

a/ These sites were not included in the overall means and analyses.
** Significant at the .01 probability level.

Table 81. Two-year means and rankings of grain yield (q/ha) for 17 cultivars grown in the International Winter Wheat Performance Nursery, 1980 and 1981.

Cultivars	Bohnshausen, East Germany[a/]		Orgerus France		Martonvasar, Hungary		Szeged, Hungary		Milano, Italy		Morioka, Iwate, Japan		Suwon, Korea	
	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank
TAM W-105	53.0	4	33.9	14	67.1	1	59.7	1	62.0	2	38.7	7	45.1	1
WWP4394	50.5	8	53.8	3	63.2	2	56.8	2	57.6	5	42.6	4	44.5	2
Trakia	49.2	9	53.2	4	58.2	7	48.7	7	55.0	7	47.4	2	41.1	6
Martonvasari 6	53.0	4	52.3	5	63.2	2	55.5	4	56.0	6	45.0	3	43.1	3
TX 71A562-6	50.9	7	30.5	15	60.9	6	49.4	6	52.7	8	48.9	1	43.0	4
Houser	53.8	3	30.2	16	63.2	2	49.9	5	62.5	1	40.5	5	36.8	8
Alcedo	62.6	1	55.7	2	63.1	5	47.9	9	47.8	12	35.8	10	29.8	9
Bezostaya 1	47.1	11	46.4	8	56.0	9	47.6	10	50.9	9	39.1	6	42.5	5
Blueboy	48.8	10	46.3	9	45.3	12	48.6	8	58.6	4	37.9	9	40.9	7
Jana	56.8	2	48.5	6	56.7	8	44.2	11	46.7	14	38.1	8	26.0	12
Bastion	51.7	6	56.8	1	51.7	10	40.4	13	47.6	13	20.6	14	11.0	14
Aura	44.2	13	47.4	7	42.4	13	37.9	16	33.8	17	33.5	11	27.3	11
Atlas 66	41.1	14	40.1	12	41.7	14	38.7	15	49.0	11	24.5	12	27.6	10
Kopara	39.6	16	45.6	10	40.4	15	41.7	12	44.5	15	19.9	15	10.9	15
Huenufen	39.2	17	43.8	11	35.0	17	29.9	17	42.9	16	20.7	13	10.8	16
Super X	39.8	15	27.8	17	47.0	11	55.9	3	50.5	10	0.1	17	1.8	17
Irnerio	45.2	12	34.9	13	35.7	16	39.9	14	59.8	3	15.0	16	11.9	13
Mean	48.6		43.9		52.4		46.6		51.7		32.3		29.1	
LSD of the cultivar means (.05)	11.7		13.2		NS		14.7		NS		20.0		8.2	
Coefficient of variation (%)	9.4		17.5		14.4		16.2		10.8		15.1		22.8	
F tests: Cultivars	2.8*		4.6**		1.9		2.6*		1.8		4.0**		28.6**	
Year x Cultivar	5.9**		2.6**		8.5**		3.4**		8.4**		14.9**		1.4	

a/ This site was not included in the overall means and analyses.
*,** Significant at the .05 and .01 probability levels, respectively.

Nursery, 1980 and 1981.

Cultivars	Beirut,[a] Lebanon		Wageningen, The Netherlands		Przeclaw, Poland		Warsaw, Poland		Fundulea, Romania		Bethlehem, South Africa (dryland)		Bethlehem, South Africa (irrigated)	
	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank
TAM W-105	23.6	8	41.3	11	46.5	7	58.1	5	56.5	3	21.5	5	34.5	1
WWP4394	27.4	2	46.2	6	51.6	4	68.6	2	53.5	4	20.7	7	24.2	7
Trakia	24.3	6	46.4	5	40.7	10	45.1	12	58.4	2	23.0	2	23.2	10
Martonvasari 6	22.5	11	45.6	7	47.8	6	65.3	3	49.1	8	20.0	8	26.5	4
TX 71A562-6	24.4	5	41.0	12	46.1	8	48.0	11	62.3	1	22.4	3	27.2	3
Houser	20.4	12	44.9	8	51.8	3	51.6	10	52.3	6	19.7	10	29.7	2
Alcedo	17.0	16	48.7	2	54.4	1	64.9	4	52.8	5	17.0	11	17.3	16
Bezostaya 1	23.1	9	40.2	13	40.2	11	56.1	6	50.5	7	22.0	4	25.0	6
Blueboy	29.2	1	44.7	9	50.3	5	54.2	8	36.9	13	25.2	1	23.6	9
Jana	19.1	14	47.1	4	52.7	2	69.7	1	46.7	9	21.1	6	20.4	13
Bastion	26.9	3	49.3	1	35.6	12	29.1	15	35.2	14	16.3	13	26.5	4
Aura	15.1	17	41.4	10	43.0	9	54.3	7	30.6	17	16.1	14	17.3	16
Atlas 66	18.4	15	35.4	16	34.0	15	52.5	9	40.4	11	13.5	17	17.4	15
Kopara	19.3	13	39.7	15	34.4	14	34.1	14	33.7	15	16.0	15	18.3	14
Huenufen	22.7	10	47.5	3	35.5	13	36.2	13	39.1	12	15.4	16	21.2	12
Super X	25.8	4	40.0	14	26.7	16	13.3	16	46.0	10	17.0	11	21.4	11
Irnerio	24.3	6	33.5	17	24.2	17	12.9	17	31.8	16	20.0	8	23.9	8
Mean	22.6		43.1		42.1		47.9		45.6		19.2		23.4	
LSD of the cultivar means (.05)	NS		NS		15.5		23.5		NS		6.3		NS	
Coefficient of variation (%)	18.6		9.4		3.5		20.1		6.3		15.4		18.2	
F tests: Cultivars	1.0		1.8		3.2*		5.0**		1.4		2.3*		1.0	
Year x Cultivar	5.0**		5.5**		96.7**		5.3**		71.1**		4.0**		9.7**	

a/ This site was not included in the overall means and analyses.
*,** Significant at the .05 and .01 probability levels, respectively.

Table 81. Two-year means and rankings of grain yield (q/ha) for 17 cultivars grown in the International Winter Wheat Performance Nursery, 1980 and 1981.

Cultivars	Madrid,[a] Spain		Zaragoza, Spain		Zurich, Switzerland		Aleppo, Syria		Erzurum, Turkey		Davis, California, USA		Akron, Colorado, USA	
	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank
TAM W-105	15.7	5	41.7	2	32.7	9	53.9	3	29.9	2	67.8	1	25.9	6
WWP4394	15.2	8	31.6	6	42.1	2	51.8	6	18.6	9	36.5	15	26.0	5
Trakia	15.4	7	30.2	7	28.7	12	67.1	1	19.2	7	55.8	6	25.4	8
Martonvasari 6	14.0	10	27.7	10	37.9	3	42.2	14	22.6	6	46.5	10	29.4	3
TX 71A562-6	16.3	3	39.3	4	24.1	14	50.1	8	23.3	5	67.1	2	32.4	1
Houser	16.2	4	40.7	3	17.7	17	43.4	11	31.1	1	57.6	5	25.5	7
Alcedo	10.9	14	15.6	15	42.8	1	44.6	9	25.5	3	48.1	8	24.2	9
Bezostaya	13.6	11	28.9	8	35.3	4	53.4	4	25.4	4	46.5	10	29.7	2
Blueboy	16.5	2	33.0	5	33.5	8	55.6	2	19.2	7	60.2	3	26.4	4
Jana	12.6	13	14.4	16	35.1	6	40.5	15	18.4	10	42.0	13	23.1	10
Bastion	17.0	1	28.1	9	35.3	4	42.7	13	10.7	15	40.7	14	9.6	16
Aura	6.9	17	9.5	17	35.0	7	28.5	16	16.5	11	27.6	16	22.5	11
Atlas 66	10.4	16	24.0	14	31.9	10	26.9	17	10.1	16	27.1	17	19.2	13
Kopara	10.6	15	26.8	12	28.6	13	43.6	10	10.1	16	46.8	9	19.7	12
Huenufen	12.7	12	24.7	13	22.5	15	42.9	12	11.0	14	42.5	12	17.1	14
Super X	15.6	6	42.0	1	31.2	11	52.3	5	15.9	12	60.1	4	0.0	17
Irnerio	14.9	9	27.1	11	19.4	16	51.1	7	12.3	13	48.8	7	16.6	15
Mean	13.8		28.6		31.4		46.5		18.8		48.3		21.9	
LSD of the cultivar means (.05)	NS		13.8		NS		8.6		NS		14.5		10.1	
Coefficient of variation (%)	28.6		12.1		11.1		10.2		25.5		13.1		17.6	
F tests:														
Cultivars	1.6		4.2**		1.3		10.0**		2.1		6.2**		5.6**	
Year x Cultivar	2.4**		14.3**		26.4**		2.9**		7.4**		4.7**		6.1**	

[a] This site was not included in the overall means and analyses.
** Significant at the .01 probability level.

Table 81. Two-year means and rankings of grain yield (q/ha) for 17 cultivars grown in the International Winter Wheat Performance Nursery, 1980 and 1981.

Cultivars	Fort Collins, Colorado, USA		Brookston, Indiana, USA		Billings, Montana, USA		Lincoln, Nebraska, USA		Ithaca, New York, USA		Rowan County, North Carolina, USA		Stillwater, Oklahoma, USA	
	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank
TAM W-105	70.9	3	46.2	1	78.3	2	46.6	1	48.1	5	38.5	1	37.1	1
WWP4394	67.7	4	45.5	2	68.4	4	35.3	7	47.4	6	31.5	5	28.8	5
Trakia	57.5	12	39.2	6	53.9	10	33.8	8	37.7	9	30.9	6	24.9	8
Martonvasari 6	67.3	5	36.7	9	56.2	7	40.4	4	52.0	1	28.3	7	28.5	6
TX 71A562-6	73.9	2	39.8	5	88.5	1	44.7	2	37.7	9	36.1	3	33.3	2
Houser	76.8	1	41.5	4	66.7	5	41.2	3	49.2	3	36.2	2	25.7	7
Alcedo	61.6	7	37.4	7	50.7	12	27.8	9	51.5	2	20.7	14	21.2	11
Bezostaya 1	58.8	10	36.5	10	54.9	9	35.9	6	48.6	4	27.3	8	32.4	3
Blueboy	65.7	6	42.8	3	42.4	15	38.0	5	33.1	11	35.8	4	29.9	4
Jana	60.3	9	35.8	11	55.6	8	21.3	11	44.3	7	15.4	17	18.2	12
Bastion	58.5	11	14.6	15	45.1	14	3.4	15	20.0	13	22.8	12	21.4	10
Aura	44.6	17	24.3	12	35.7	16	20.4	12	43.5	8	21.3	13	9.1	15
Atlas 66	54.1	14	36.8	8	56.5	6	23.1	10	30.7	12	23.7	10	22.3	9
Kopara	55.5	13	16.6	14	47.9	13	15.3	13	14.5	14	23.3	11	17.6	13
Huenufen	53.8	15	19.0	13	51.8	11	5.2	14	5.5	15	16.9	15	9.4	14
Super X	61.3	8	0.0	17	73.6	3	0.0	16	1.3	16	16.1	16	2.9	17
Irnerio	47.2	16	5.1	16	35.4	17	0.0	16	1.0	17	25.9	9	6.2	16
Mean	60.9		30.4		56.6		25.4		33.3		26.5		21.9	
LSD of the cultivar means (.05)	12.6		15.6		25.8		13.0		21.1		14.5		12.7	
Coefficient of variation (%)	14.7		14.7		14.8		19.0		17.3		17.5		16.3	
F tests:														
Cultivars	4.4**		7.6**		2.9*		13.6**		4.9**		2.4*		5.4**	
Year x Cultivar	1.8*		10.9**		8.5**		6.4**		12.0**		8.7**		11.3**	

*,** Significant at the .05 and .01 probability levels, respectively.

Table 81. Two-year means and rankings of grain yield (q/ha) for 17 cultivars grown in the International Winter Wheat Performance Nursery, 1980 and 1981.

Cultivars	Corvallis, Oregon, USA		Pullman, Washington, USA		Krasnodar, USSR		Mironovski, USSR		Odessa, USSR	
	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank	q/ha	rank
TAM W-105	33.5	10	34.3	9	45.7	6	26.1	12	47.8	2
WWP4394	41.1	6	49.4	3	51.9	3	37.0	8	47.4	3
Trakia	52.2	2	55.4	2	54.9	1	41.4	3	50.3	1
Martonvasari 6	42.8	4	37.7	7	41.1	7	41.2	4	44.8	4
TX 71A562-6	22.5	13	32.7	10	51.2	4	38.1	6	40.1	7
Houser	21.7	14	25.8	12	52.7	2	60.1	1	42.4	6
Alcedo	64.9	1	57.1	1	37.8	9	50.6	2	38.0	8
Bezostaya 1	36.1	7	40.0	4	47.2	5	35.3	10	44.3	5
Blueboy	34.7	9	36.8	8	39.8	8	36.7	9	33.2	11
Jana	35.0	8	40.0	4	28.3	14	39.1	5	37.9	9
Bastion	33.5	10	15.9	14	29.6	13	19.5	14	32.4	12
Aura	23.1	12	37.9	6	22.1	17	37.4	7	31.0	13
Atlas 66	20.1	16	18.6	13	34.2	10	26.5	11	30.8	15
Kopara	42.8	4	11.8	15	30.8	12	19.6	13	28.9	17
Huenufen	46.2	3	29.3	11	27.8	15	8.0	15	30.9	14
Super X	17.3	17	5.3	17	26.9	16	0.0	16	34.7	10
Irnerio	21.6	15	7.1	16	32.5	11	0.0	16	29.0	16
Mean	34.7		31.5		38.5		30.4		37.9	
LSD of the cultivar means (.05)	17.2		NS		NS		19.8		13.8	
Coefficient of variation (%)	24.7		22.2		7.9		18.7		8.8	
F tests:										
Cultivars	5.1**		2.0		1.2		6.4**		2.4*	
Year x Cultivar	3.6**		19.8**		78.8**		10.8**		15.2**	

*,** Significant at the .05 and .01 probability levels, respectively.

Table 81. Two-year means and rankings of grain yield (q/ha) for 17 cultivars grown in the International Winter Wheat Performance Nursery, 1980 and 1981.

Cultivars	Monsheim, West Germany		Weihenstephan, West Germany		Novi Sad, Yugoslavia		Cultivar means over 38 sites
	q/ha	rank	q/ha	rank	q/ha	rank	
TAM W-105	75.5	4	69.0	11	58.4	2	50.6
WWP4394	76.4	3	75.3	6	57.0	4	49.8
Trakia	79.9	1	66.5	13	58.2	3	49.2
Martonvasari 6	72.3	6	77.9	3	58.8	1	48.5
TX 71A562-6	73.6	5	73.7	7	49.1	11	48.4
Houser	66.4	12	76.9	4	52.1	8	48.0
Alcedo	71.2	8	78.4	1	49.8	10	47.7
Bezostaya 1	67.1	10	70.8	10	55.8	5	45.6
Blueboy	76.6	2	66.2	14	44.9	14	44.8
Jana	64.1	15	75.7	5	51.2	9	43.5
Bastion	66.7	11	73.0	8	55.8	5	37.6
Aura	58.4	16	72.4	9	35.9	17	35.6
Atlas 66	52.4	17	60.8	17	46.2	13	35.3
Kopara	68.3	9	66.8	12	40.5	16	35.2
Huenufen	64.6	14	60.9	16	40.6	15	34.3
Super X	71.3	7	78.0	2	54.1	7	33.8
Irnerio	64.8	13	65.2	15	48.1	12	30.4
Mean	68.8		71.0		50.4		42.3
LSD of the cultivar means (.05)	10.5		NS		NS		7.7
Coefficient of variation (%)	8.8		5.6		11.1		13.0
F tests:							
Cultivars	4.0**		2.0		1.5		6.9**
Year x Cultivar	2.7**		8.5**		8.1**		7.2**

** Significant at the .01 probability level.

Table 82. Two-year means and rankings of test weight (kg/hl) for 17 cultivars grown in the International Winter Wheat Performance Nursery, 1980 and 1981.

Cultivars	Chillan, Chile		Male Ripnany, Czechoslovakia		Sedlec, Czechoslovakia		Szeged, Hungary		Milano, Italy		Wageningen, The Netherlands		Przeclaw, Poland	
	kg/hl	rank	kg/hl	rank	kg/hl	rank	kg/hl	rank	kg/hl	rank	kg/hl	rank	kg/hl	rank
TAM W-105	82.3	6	82.0	1	81.8	1	83.4	4	77.1	1	79.6	7	72.6	1
Bezostaya 1	83.9	1	80.3	3	79.8	5	84.2	1	75.4	2	80.6	3	70.5	5
WWP4394	82.7	4	80.8	2	80.4	2	83.8	2	74.5	4	79.6	7	70.9	4
Alcedo	82.4	5	79.5	5	79.3	7	83.1	5	74.8	3	80.7	2	71.7	2
Martonvasari 6	83.0	2	78.9	7	79.6	6	83.0	6	73.3	6	80.3	4	71.2	3
Trakia	81.8	7	79.3	6	80.0	4	82.7	7	72.5	8	80.0	6	68.6	8
Atlas 66	83.0	2	78.7	8	78.6	9	83.6	3	73.8	5	81.3	1	69.1	7
Super X	77.9	13	79.7	4	80.1	3	81.0	11	68.5	13	80.1	5	66.7	11
TX 71A562-6	76.9	15	77.3	11	79.1	8	79.9	14	68.4	14	77.5	15	70.5	5
Bastion	79.3	10	77.5	10	76.5	12	82.0	8	70.2	9	79.5	9	63.9	17
Irnerio	74.2	16	78.3	9	76.0	13	81.0	11	72.7	7	77.3	16	66.7	11
Aura	79.9	9	74.6	16	76.9	10	80.6	13	68.2	15	77.8	13	66.3	15
Jana	77.3	14	77.0	12	74.8	14	81.1	9	69.6	12	77.9	12	65.9	16
Blueboy	78.1	12	73.5	17	74.4	16	79.0	15	69.7	10	77.8	13	66.5	13
Kopara	80.6	8	75.8	15	74.8	14	81.1	9	66.2	16	78.3	10	67.1	10
Houser	72.3	17	76.0	14	76.8	11	78.8	16	69.7	10	75.9	17	67.5	9
Huenufen	78.8	11	76.6	13	73.8	17	76.3	17	63.7	17	78.0	11	66.4	14
Mean	79.7		78.0		77.8		81.4		71.1		79.0		68.4	
LSD of the cultivar means (.05)	4.9		3.8		4.8		2.4		4.7		2.3		NS	
Coefficient of variation (%)	1.3		0.7		1.3		1.3		3.5		2.0		0.7	
F tests: Cultivars	4.1**		3.1*		2.4*		6.8**		5.2**		3.7**		1.9	
Year x Cultivar	19.0**		41.7**		18.8**		4.4**		3.1**		1.9*		108.8**	

*,** Significant at the .05 and .01 probability levels, respectively.

Table 82. Two-year means and rankings of test weight (kg/hl) for 17 cultivars grown in the International Winter Wheat Performance Nursery, 1980 and 1981.

Cultivars	Fundulea, Romania		Bethlehem, South Africa (dryland)		Erzurum, Turkey		Fort Collins,[a/] Colorado, USA		Odessa,[a/] USSR		Weihenstephan, West Germany		Cultivar means over 11 sites
	kg/hl	rank	kg/hl	rank	kg/hl	rank	kg/hl	rank	kg/hl	rank	kg/hl	rank	
TAM W-105	80.3	2	78.6	2	80.5	1	77.1	1	76.9	4	79.1	7	79.7
Bezostaya 1	80.9	1	78.9	1	80.2	2	76.6	2	78.5	1	81.0	1	79.6
WWP4394	79.8	4	77.5	3	78.8	5	76.3	3	75.5	6	79.3	5	79.0
Alcedo	80.0	3	74.9	9	77.8	6	67.3	14	73.5	9	80.1	2	78.6
Martonvasari 6	79.2	5	76.6	4	77.6	8	74.3	6	77.5	3	80.0	3	78.4
Trakia	78.9	6	74.6	10	77.8	6	72.6	7	75.3	8	78.1	9	77.7
Atlas 66	78.1	8	74.1	15	72.7	17	71.6	8	75.5	6	79.3	5	77.5
Super X	78.3	7	75.9	5	79.1	3	76.0	5	78.4	2	79.5	4	77.0
TX 71A562-6	76.3	11	75.7	6	78.9	4	76.2	4	72.1	11	76.0	12	76.0
Bastion	77.4	9	74.6	10	74.0	13	70.7	9	72.5	10	78.1	9	75.7
Irnerio	74.5	15	75.2	8	77.4	9	69.6	10	76.2	5	75.6	14	75.4
Aura	73.5	17	75.7	6	73.0	16	67.2	15	69.0	15	78.9	8	75.1
Jana	75.7	12	73.6	16	73.3	15	66.8	16	70.7	13	75.7	13	74.7
Blueboy	76.6	10	74.4	13	74.9	12	65.6	17	71.1	12	75.5	15	74.6
Kopara	74.7	13	71.4	17	73.4	14	68.6	12	70.3	14	77.8	11	74.6
Houser	74.5	15	74.5	12	76.7	10	69.5	11	68.3	16	74.7	17	74.3
Huenufen	74.7	13	74.3	14	75.8	11	68.2	13	67.6	17	75.4	16	74.0
Mean	77.3		75.3		76.6		71.4		73.2		77.9		76.6
LSD of the cultivar means (.05)	2.5		1.9		1.4		6.9		3.7		2.2		1.6
Coefficient of variation (%)	0.8		0.9		1.6		4.6		0.9		1.2		1.6
F tests:													
Cultivars	8.3**		8.5**		32.1**		3.0*		7.5**		7.5**		12.2**
Year x Cultivar	14.9**		7.3**		1.2		-		28.8**		4.7**		1.8**

a/ These sites were not included in the overall means and analyses.
*,** Significant at the .05 and .01 probability levels, respectively.

Table 83. Two-year means and rankings of 1000-kernel weight (grams) for 17 cultivars grown in the International Winter Wheat Performance Nursery, 1980 and 1981.

Cultivars	Bordenave, Argentina		Vienna, Austria		Tolbukhin,[a/] Bulgaria		Male Ripnany, Czechoslovakia		Sedlec, Czechoslovakia		Bohnshausen, East Germany		Szeged, Hungary	
	g	rank	g	rank	g	rank	g	rank	g	rank	g	rank	g	rank
Martonvasari 6	38.6	2	46.5	3	43.9	3	48.5	2	50.1	1	44.9	1	46.0	1
Bezostaya 1	38.5	3	44.5	7	44.6	2	46.2	4	48.6	2	44.7	2	44.9	3
Trakia	39.3	1	45.4	6	46.4	1	46.4	3	45.5	4	39.9	6	45.5	2
Alcedo	31.9	13	46.1	4	36.7	13	45.9	5	46.6	3	44.3	3	41.4	5
Houser	32.3	12	47.0	2	38.6	8	45.1	7	44.9	5	41.7	4	41.5	4
Jana	30.1	14	45.5	5	37.9	10	45.6	6	43.9	6	37.0	10	41.2	6
Blueboy	37.2	4	40.7	14	38.9	7	41.5	11	40.7	11	39.1	7	36.5	13
Bastion	28.0	15	48.0	1	35.4	15	49.1	1	41.4	9	36.9	11	41.2	6
WWP4394	34.5	8	42.6	8	39.5	6	43.4	8	41.7	8	38.9	8	41.2	6
Irnerio	36.7	5	41.7	13	36.9	12	41.3	13	40.4	12	37.7	9	38.3	10
Atlas 66	33.1	11	42.2	9	37.3	11	42.2	10	41.8	7	41.2	5	37.4	11
Aura	28.0	15	42.2	9	32.3	17	41.3	13	41.0	10	36.9	11	36.8	12
TAM W-105	34.4	9	38.8	16	39.9	5	39.2	16	38.4	14	36.1	13	38.8	9
Kopara	34.0	10	42.0	11	35.6	14	42.8	9	38.8	13	34.9	14	36.1	14
Super X	35.6	6	40.4	15	40.3	4	41.5	11	37.2	15	28.2	17	34.8	15
Huenufen	27.9	17	42.0	11	32.5	16	40.1	15	33.6	17	29.4	16	32.8	17
TX 71A562-6	34.8	7	35.0	17	38.3	9	39.1	17	33.8	16	31.6	15	34.6	16
Mean	33.8		43.0		38.5		43.5		41.7		37.9		39.4	
LSD of the cultivar means (.05)	5.3		NS		5.7		NS		5.0		4.7		2.9	
Coefficient of variation (%)	6.6		4.8		7.0		2.3		3.9		4.9		6.4	
F tests:														
Cultivars	4.4**		2.0		4.0**		1.4		7.6**		9.9**		16.7**	
Year x Cultivar	5.1**		8.9**		-		53.8**		8.5**		5.6**		1.2	

[a/] This site was not included in the overall means and analyses.
** Significant at the .01 probability level

Table 83. Two-year means and rankings of 1000-kernel weight (grams) for 17 cultivars grown in the International Winter Wheat Performance Nursery, 1980 and 1981.

Cultivars	Milano, Italy		Suwon, Korea[a/]		Wageningen, The Netherlands		Przeclaw, Poland		Fundulea, Romania		Bethlehem, South Africa (dryland)		Madrid, Spain	
	g	rank	g	rank	g	rank	g	rank	g	rank	g	rank	g	rank
Martonvasari 6	40.8	2	38 2	1	43.8	4	46.5	1	38.3	3	39.9	1	34.2	1
Bezostaya 1	42.3	1	37.5	2	43.9	3	45.3	3	39.8	2	39.6	2	32.4	3
Trakia	36.1	5	37.3	3	44.4	2	45.9	2	42.6	1	37.1	4	31.8	5
Alcedo	35.4	6	29.9	12	44.5	1	44.5	4	35.8	9	35.0	8	32.1	4
Houser	36.2	4	35.2	5	41.1	6	43.1	6	37.5	5	33.5	13	32.9	2
Jana	31.4	12	25.9	14	42.9	5	39.3	9	36.8	6	34.1	11	31.1	6
Blueboy	34.7	8	34.0	6	38.8	9	43.8	5	38.2	4	34.8	9	28.4	12
Bastion	32.8	10	25.6	15	39.3	8	38.8	11	34.0	11	35.7	5	28.4	12
WWP4394	32.4	11	35.4	4	34.9	17	38.5	12	35.9	8	33.8	12	28.9	11
Irnerio	36.4	3	31.8	9	37.3	10	39.1	10	31.8	15	34.4	10	30.6	7
Atlas 66	35.1	7	31.1	11	36.8	11	41.2	7	32.5	12	32.5	15	25.1	17
Aura	30.6	13	31.7	10	36.3	12	36.2	14	28.8	17	39.0	3	29.8	8
TAM W-105	33 8	9	33.7	7	35.8	13	39.8	8	36.0	7	30.6	17	29.5	9
Kopara	29.5	14	27.6	13	35.0	16	37.8	13	31.7	16	32.7	14	28.1	14
Super X	28.9	15	22.0	17	35.4	15	34.7	16	35.6	10	35.1	7	29.1	10
Huenufen	25.9	17	24.2	16	39.7	7	36.2	14	32.5	12	35.6	6	26.8	16
TX 71A562-6	27.0	16	32.4	8	35.6	14	33.7	17	32.4	14	32.0	16	27.3	15
Mean	33.5		31.8		39.2		40.3		35.3		35.0		29.8	
LSD of the cultivar means (.05)	2.7		2.7		NS		7.1		4.2		2.4		4.7	
Coefficient of variation (%)	6.5		6.8		0.9		1.0		2.4		3.1		8.3	
F tests:														
Cultivars	23.4**		24.8**		1.8		2.8*		6.1**		10.8**		2.4*	
Year x Cultivar	1.4		1.4		515.5**		301.2**		22.2**		4.4**		3.1**	

a/ This site was not included in the overall means and analyses.
*,** Significant at the .05 and .01 probability levels, respectively.

Table 83. Two-year means and rankings of 1000-kernel weight (grams) for 17 cultivars grown in the International Winter Wheat Performance Nursery, 1980 and 1981.

Cultivars	Zurich, Switzerland		Erzurum, Turkey		Rowan County, North Carolina USA[a]		Odessa,[a] USSR		Monsheim, West Germany		Weihenstephan, West Germany		Cultivar means over 16 sites
	g	rank	g	rank	g	rank	g	rank	g	rank	g	rank	
Martonvasari 6	43.9	1	35.1	3	40.0	1	39.0	3	48.5	2	48.3	1	43.3
Bezostaya 1	43.1	2	35.7	2	38.7	2	43.4	1	46.8	4	46.4	3	42.7
Trakia	41.2	3	38.7	1	35.8	6	43.0	2	49.3	1	46.1	4	42.2
Alcedo	40.8	4	34.4	4	35.4	7	32.3	15	45.4	7	44.3	5	40.5
Houser	34.7	11	32.9	6	36.9	4	34.5	11	47.4	3	47.1	2	39.9
Jana	37.4	5	32.8	8	31.6	17	37.1	6	45.2	9	43.5	6	38.6
Blueboy	37.2	7	33.0	5	37.4	3	35.8	8	44.3	10	41.8	8	38.1
Bastion	36.5	9	32.1	11	33.4	16	34.8	10	46.6	5	39.7	12	38.0
WWP4394	36.3	10	31.4	15	35.4	7	38.9	4	43.3	11	41.0	9	37.4
Irnerio	30.4	17	32.0	12	34.0	12	34.3	12	45.6	6	39.2	14	37.0
Atlas 66	37.3	6	28.1	17	33.5	14	34.3	12	43.1	12	39.8	10	36.8
Aura	37.2	7	30.1	16	34.8	9	29.3	17	41.0	14	42.2	7	36.1
TAM W-105	33.1	14	31.6	13	33.5	14	36.1	7	40.8	15	38.3	16	35.9
Kopara	34.7	11	32.5	10	34.5	11	34.9	9	42.4	13	39.4	13	35.7
Super X	32.5	15	32.9	6	36.8	5	38.4	5	40.2	16	39.8	10	35.1
Huenufen	34.0	13	32.7	9	33.7	13	29.4	16	45.4	7	38.6	15	34.5
TX 71A562-6	32.2	16	31.5	14	34.7	10	33.3	14	37.8	17	38.2	17	33.5
Mean	36.6		32.8		35.3		35.8		44.3		42.0		38.0
LSD of the cultivar means (.05)	5.1		2.4		NS		7.3		NS		3.4		2.0
Coefficient of variation (%)	3.5		4.8		6.0		3.4		5.0		3.3		4.5
F tests: Cultivars	5.2**		8.4**		2.0		2.6*		2.2		8.6**		18.0**
Year x Cultivar	14.5**		2.1*		-		31.4**		7.4**		5.6**		1.8*

[a] These sites were not included in the overall means and analyses.
*,** Significant at the .05 and .01 probability levels, respectively.

Table 84. Two-year means and rankings of grain protein content (%) for 17 cultivars grown in the International Winter Wheat Performance Nursery, 1980 and 1981.

Cultivars	Milano, Italy		Przeclaw, Poland		Billings, Montana, USA		Rowan County, North Carolina, USA		Monsheim, West Germany		Novi Sad, Yugoslavia		Cultivar means over 6 sites
	%	rank	%	rank	%	rank	%	rank	%	rank	%	rank	
Atlas 66	16.8	1	15.8	1	18.6	1	18.8	1	16.9	1	17.8	1	17.5
Kopara	15.4	2	14.3	2	16.5	3	16.0	2	15.1	2	15.4	4	15.5
WWP4394	15.0	5	12.8	8	16.3	4	15.9	3	14.7	3	16.0	3	15.1
Huenufen	15.1	3	13.1	4	17.8	2	15.8	4	13.8	7	15.1	5	15.1
Aura	15.1	3	12.4	11	15.4	5	15.6	5	14.1	5	16.6	2	14.9
Bezostaya 1	14.8	6	13.6	3	14.8	9	14.9	9	13.9	6	15.0	6	14.5
Martonvasari 6	14.4	9	12.7	9	14.1	12	15.0	8	13.8	7	14.8	7	14.1
Bastion	13.9	12	12.4	11	15.0	7	14.8	10	14.2	4	14.3	10	14.1
Jana	14.4	9	11.3	16	15.3	6	15.6	5	13.5	11	14.5	9	14.1
Trakia	14.6	7	13.1	4	13.7	14	14.4	11	12.3	17	14.6	8	13.8
Irnerio	14.0	11	13.1	4	14.7	10	13.6	13	13.3	12	13.6	15	13.7
Alcedo	12.6	16	11.4	14	15.0	7	15.5	7	13.8	7	14.1	12	13.7
TAM W-105	13.7	13	12.9	7	13.8	13	13.3	14	13.6	10	13.8	13	13.5
Super X	12.9	15	12.6	10	13.4	16	13.9	12	12.9	13	13.2	16	13.2
Houser	14.6	7	11.2	17	12.7	17	13.3	14	12.9	13	14.2	11	13.2
TX 71A562-6	13.6	14	11.5	13	14.2	11	12.4	17	12.9	13	13.7	14	13.1
Blueboy	11.7	17	11.4	14	13.5	15	13.3	14	12.9	13	13.0	17	12.7
Mean	14.3		12.7		15.0		14.8		13.8		14.7		14.2
LSD of the cultivar means (.05)	1.9		1.0		2.4		2.2		1.4		0.9		0.4
Coefficient of variation (%)	6.2		3.8		7.7		7.0		4.9		2.9		6.4
F tests: Cultivars	3.5**		12.3**		3.8**		4.3**		5.1**		17.2**		79.1**
Year x Cultivar	-		-		-		-		-		-		-

** Significant at the .01 probability level.

Table 85. Two-year means and rankings of plant height (cm) for 17 cultivars grown in the International Winter Wheat Performance Nursery, 1980 and 1981.

Cultivars	Bordenave, Argentina		Vienna, Austria		Tolbukhin,[a] Bulgaria		Chillan, Chile		Male Ripnany, Czechoslovakia		Bohnshausen, East Germany		Martonvasar, Hungary	
	cm	rank	cm	rank	cm	rank	cm	rank	cm	rank	cm	rank	cm	rank
Irnerio	66	2	73	1	63	1	77	1	66	1	66	1	69	1
Trakia	58	1	80	2	73	3	90	2	83	3	73	2	77	2
Huenufen	70	4	82	3	83	4	95	3	87	5	83	4	83	3
Super X	67	3	91	5	69	2	96	4	84	4	81	3	86	5
TX 71A562-6	72	5	92	6	83	4	97	5	87	5	83	4	85	4
TAM W-105	72	5	89	4	84	6	104	6	92	8	85	6	86	5
Kopara	77	9	96	8	88	7	122	14	90	7	86	8	92	7
WWP4394	76	7	98	10	97	11	117	9	80	2	87	9	92	7
Houser	81	11	96	8	97	11	106	7	95	9	97	12	95	9
Bezostaya 1	76	7	95	7	93	9	120	10	100	12	85	6	97	10
Bastion	85	15	101	14	91	8	120	10	96	10	90	10	99	11
Alcedo	80	10	100	12	99	13	121	13	103	13	99	13	103	13
Blueboy	81	11	99	11	96	10	111	8	99	11	102	14	99	11
Martonvasari 6	81	11	100	12	102	14	120	10	108	16	95	11	103	13
Jana	87	16	104	16	105	15	123	15	107	15	109	17	110	16
Aura	83	14	103	15	115	17	138	16	105	14	105	16	103	13
Atlas 66	96	17	111	17	113	16	141	17	126	17	102	14	114	17
Mean	76.8		94.6		91.0		111.6		94.3		89.8		93.6	
LSD of the cultivar means (.05)	NS		6.8		17.0		10.0		14.6		7.9		11.7	
Coefficient of variation (%)	9.6		3.4		8.8		4.8		0.4		3.2		4.6	
F tests:														
Cultivars	1.7		15.3**		6.4**		25.8**		7.8**		19.7**		9.0**	
Year x Cultivar	7.1**		4.0**		-		3.1**		1425.7**		6.5**		6.7**	

[a] This site was not included in the overall means and analyses.
** Significant at the .01 probability level.

Table 85. Two-year means and rankings of plant height (cm) for 17 cultivars grown in the International Winter Wheat Performance Nursery, 1980 and 1981.

Cultivars	Szeged, Hungary		Milano, Italy		Rieti,[a/] Italy		Suwon, Korea		Wageningen, The Netherlands		Przeclaw, Poland		Fundulea, Romania	
	cm	rank	cm	rank	cm	rank	cm	rank	cm	rank	cm	rank	cm	rank
Irnerio	79	1	72	1	72	1	62	2	68	1	61	1	81	1
Trakia	80	2	74	2	74	2	80	3	74	2	67	2	86	2
Huenufen	89	3	89	3	79	3	82	4	88	5	79	5	95	3
Super X	94	4	89	3	87	5	58	1	85	4	73	3	98	4
TX 71A562-6	96	6	91	6	86	4	93	7	84	3	80	6	99	5
TAM W-105	94	4	90	5	92	6	98	8	89	7	76	4	102	6
Kopara	100	7	100	9	99	10	92	6	93	8	82	7	105	7
WWP4394	102	8	98	8	98	9	106	12	88	5	83	8	109	8
Houser	102	8	107	12	99	10	99	9	100	14	89	10	109	8
Bezostaya 1	103	10	97	7	100	12	105	11	95	9	89	10	111	10
Bastion	103	10	107	12	95	8	91	5	95	9	87	9	113	11
Alcedo	103	10	113	14	92	6	99	9	98	11	89	10	117	13
Blueboy	108	13	104	10	103	13	109	15	98	11	96	14	116	12
Martonvasari 6	109	14	106	11	108	14	106	12	99	13	89	10	120	15
Jana	111	15	123	16	111	15	106	12	111	15	97	15	120	15
Aura	114	16	119	15	113	16	112	16	111	15	100	16	117	13
Atlas 66	121	17	124	17	124	17	119	17	120	17	101	17	131	17
Mean	100.4		100.2		96.4		96.5		93.8		84.5		107.6	
LSD of the cultivar means (.05)	7.7		8.3		14.3		-		9.9		7.5		13.5	
Coefficient of variation (%)	4.7		5.6		2.8		5.2		4.8		3.7		4.2	
F tests:														
Cultivars	18.9**		30.5**		8.1**		-		15.6**		20.7**		8.3**	
Year x Cultivar	2.5**		1.9*		24.2**		0.0		4.3**		5.1**		7.8**	

a/ This site was not included in the overall means and analyses.
*,** Significant at the .05 and .01 probability levels, respectively.

Table 85. Two-year means and rankings of plant height (cm) for 17 cultivars grown in the International Winter Wheat Performance Nursery, 1980 and 1981.

Cultivars	Bethlehem, South Africa (dryland)		Bethlehem, South Africa (irrigated)		Madrid, Spain		Zurich, Switzerland		Erzurum, Turkey		Davis, California, USA		Fort Collins,[a] Colorado, USA	
	cm	rank	cm	rank	cm	rank	cm	rank	cm	rank	cm	rank	cm	rank
Irnerio	60	1	61	1	72	3	68	1	52	1	86	1	61	1
Trakia	65	4	66	2	71	1	73	2	57	2	90	2	75	2
Huenufen	63	2	67	3	73	4	87	5	57	2	92	3	83	4
Super X	73	8	78	10	71	1	83	3	58	5	108	6	79	3
TX 71A562-6	73	8	69	4	82	10	87	5	60	6	107	5	89	8
TAM W-105	71	6	78	10	79	6	86	4	62	8	111	7	85	6
Kopara	73	8	78	10	79	6	97	9	57	2	116	12	84	5
WWP4394	75	12	84	16	80	9	93	7	64	9	111	7	88	7
Houser	67	5	78	10	78	5	104	12	72	16	105	4	95	10
Bezostaya 1	76	14	76	7	82	10	95	8	68	13	114	9	89	8
Bastion	71	6	76	7	85	14	102	10	66	12	118	13	97	13
Alcedo	63	2	72	5	79	6	106	14	64	9	115	11	96	11
Blueboy	78	16	80	15	85	14	105	13	68	13	114	9	98	14
Martonvasari 6	74	11	77	9	88	16	103	11	68	13	118	13	96	11
Jana	75	12	75	6	84	13	113	15	61	7	119	16	103	15
Aura	77	15	79	14	83	12	120	16	65	11	118	13	108	16
Atlas 66	84	17	84	16	105	17	123	17	74	17	144	17	118	17
Mean	71.7		75.1		80.9		96.6		62.9		110.8		90.8	
LSD of the cultivar means (.05)	7.7		9.8		14.9		9.7		9.4		17.0		-	
Coefficient of variation (%)	4.1		5.7		8.2		3.8		4.5		4.8		3.6	
F tests:														
Cultivars	5.2**		3.7**		2.6*		22.1**		3.7**		5.6**		-	
Year x Cultivar	6.1**		4.7**		4.5**		6.1**		9.9**		8.9**		-	

[a] This site was not included in the overall means and analyses.
*,** Significant at the .05 and .01 probability levels, respectively.

Table 85. Two-year means and rankings of plant height (cm) for 17 cultivars grown in the International Winter Wheat Performance Nursery, 1980 and 1981.

Cultivars	Rowan County, North Carolina, USA		Stillwater, Oklahoma, USA		Corvallis, Oregon, USA[a/]		Odessa, USSR[a/]		Monsheim, West Germany		Weihenstephan, West Germany		Cultivar means over 22 sites
	cm	rank	cm	rank	cm	rank	cm	rank	cm	rank	cm	rank	
Irnerio	68	1	53	1	97	1	77	1	71	1	66	1	68.0
Trakia	77	4	68	3	105	2	84	3	81	2	75	2	74.7
Huenufen	75	3	74	4	115	3	83	2	87	3	83	3	80.9
Super X	68	1	58	2	118	4	93	4	91	6	86	5	81.8
TX 71A562-6	86	7	83	6	125	5	97	5	87	3	84	4	85.2
TAM W-105	88	8	83	6	133	8	100	7	89	5	87	6	86.7
Kopara	84	6	79	5	144	11	98	6	99	9	95	11	90.5
WWP4394	92	11	83	6	127	6	113	12	96	7	91	8	91.1
Houser	88	8	88	10	135	9	108	9	98	8	100	12	93.5
Bezostaya 1	92	11	87	9	128	7	111	10	103	12	94	9	93.7
Bastion	90	10	89	11	144	11	104	8	100	10	90	7	94.4
Alcedo	82	5	91	12	148	14	112	11	103	12	94	9	95.3
Blueboy	98	15	91	12	140	10	117	13	104	14	102	14	97.7
Martonvasari	96	14	93	14	147	13	117	13	102	11	100	12	98.0
Jana	92	11	96	16	151	15	119	15	113	15	106	15	101.9
Aura	98	15	93	14	160	16	120	16	114	16	112	16	103.2
Atlas 66	110	17	99	17	163	17	128	17	119	17	120	17	112.3
Mean	87.2		83.5		134.0		105.8		97.4		93.1		91.1
LSD of the cultivar means (.05)	13.9		-		8.3		8.3		6.4		6.7		3.8
Coefficient of variation (%)	5.1		4.2		2.9		5.0		3.1		3.8		4.8
F tests:													
Cultivars	5.7**		-		44.1**		23.9**		32.6**		35.0**		65.7**
Year x Cultivar	8.7**		0.0		-		2.2*		4.1**		3.2**		2.1*

a/ These sites were not included in the overall means and analyses.
*,** Significant at the .05 and .01 probability levels, respectively.

Table 86. Two-year means and rankings of lodging (%) for 17 cultivars grown in the International Winter Wheat Performance Nursery, 1980 and 1981.

Cultivars	Male Ripnany, Czechoslovakia		Sedlec, Czechoslovakia		Bohnshausen, East Germany		Orgerus, a/ France		Szeged, Hungary		Warsaw, a/ Poland	
	%	rank	%	rank	%	rank	%	rank	%	rank	%	rank
Irnerio	0	1	0	1	1	2	0	1	0	1	38	5
Bastion	0	1	3	4	2	4	10	5	2	5	40	8
Huenufen	8	6	3	4	3	5	0	1	0	1	30	3
Kopara	5	5	3	4	3	5	13	8	1	3	14	2
WWP4394	0	1	2	3	1	2	10	5	5	8	39	7
Trakia	0	1	0	1	0	1	0	1	1	3	8	1
Jana	13	7	13	9	13	9	35	13	4	7	56	11
Blueboy	15	9	4	7	8	8	15	9	5	8	47	9
Alcedo	13	7	22	14	6	7	30	10	2	5	49	10
Martonvasari 6	15	9	21	13	19	11	0	1	18	13	34	4
Bezostaya 1	23	12	17	12	13	9	10	5	18	13	72	15
Super X	30	14	15	11	34	12	30	10	6	10	38	5
TAM W-105	44	16	13	9	40	16	33	12	12	11	61	12
Houser	29	13	12	8	35	14	35	13	15	12	70	14
Aura	15	9	38	15	35	14	40	15	20	15	86	16
Atlas 66	40	15	40	16	34	12	60	17	20	15	66	13
TX 71A562-6	56	17	44	17	51	17	55	16	38	17	93	17
Mean	17.9		14.7		17.5		22.1		9.7		50.6	
LSD of the cultivar means (.05)	29.5		NS		33.0		NS		NS		NS	
Coefficient of variation (%)	5.5		85.8		47.3		109.9		95.5		55.7	
F tests: Cultivars	2.9*		1.6		2.4*		1.3		1.5		2.4	
Year x Cultivar	801.1**		6.5**		14.2**		-		6.8**		2.3**	

a/ These sites were not included in the overall means and analyses.
*,** Significant at the .05 and .01 probability levels, respectively.

Table 86. Two-year means and rankings of lodging (%) for 17 cultivars grown in the International Winter Wheat Performance Nursery, 1980 and 1981.

Cultivars	Corvallis, a/ Oregon, USA		Odessa, a/ USSR		Monsheim, West Germany		Weihenstephan, West Germany		Cultivar means over 6 sites
	%	rank	%	rank	%	rank	%	rank	
Irnerio	10	4	0	1	5	1	0	1	0.9
Bastion	15	5	0	1	13	2	3	4	3.8
Huenufen	3	1	0	1	17	3	1	3	5.2
Kopara	20	9	0	1	17	3	4	5	5.3
WWP4394	30	12	2	11	19	5	5	6	5.4
Trakia	15	5	0	1	30	6	0	1	5.4
Jana	25	10	7	12	30	6	11	9	13.8
Blueboy	38	15	53	17	34	8	18	11	13.9
Alcedo	5	2	0	1	37	9	5	6	14.2
Martonvasari 6	15	5	0	1	44	10	8	8	20.6
Bezostaya 1	30	12	0	1	48	11	15	10	22.1
Super X	35	14	1	10	66	15	19	12	28.3
TAM W-105	15	5	0	1	59	12	24	13	31.9
Houser	5	2	48	15	65	14	40	16	32.5
Aura	85	17	41	14	59	12	35	14	33.6
Atlas 66	60	16	37	13	71	16	46	17	41.8
TX 71A562-6	25	10	50	16	84	17	36	15	51.7
Mean	25.3		14.9		41.0		15.8		19.4
LSD of the cultivar means (.05)	36.2		NS		36.1		18.2		14.0
Coefficient of variation (%)	67.5		66.3		29.7		52.3		48.4
F tests:									
Cultivars	3.0*		1.1		3.7**		6.3**		43.0**
Year x Cultivar	-		32.0**		7.8**		4.3**		0.7

a/ These sites were not included in the overall means and analyses.
*,** Significant at the .05 and .01 probability levels, respectively.

Table 87. Two-year means and rankings of winter survival (%) for 17 cultivars grown in the International Winter Wheat Performance Nursery, 1980 and 1981.

Cultivars	Lethbridge, Alberta, Canada		Male Ripnany, Czechoslovakia		Bohnshausen,[a] East Germany		Morioka,[a] Iwate, Japan		Suwon, Korea		Wageningen, The Netherlands		Vollebekk,[a] Norway	
	%	rank	%	rank	%	rank	%	rank	%	rank	%	rank	%	rank
Houser	87.5	6	100.0	1	88.4	14	100.0	1	89.4	10	93.1	3	91.7	1
TAM W-105	90.0	5	100.0	1	92.5	11	96.3	9	96.3	1	91.9	7	84.2	4
Martonvasari 6	96.3	1	100.0	1	86.6	17	100.0	1	90.6	9	91.9	7	84.2	4
TX 71A562-6	95.0	3	100.0	1	91.1	12	99.5	6	93.8	5	86.9	15	89.2	2
Aura	83.8	7	100.0	1	94.5	9	100.0	1	85.6	11	90.6	10	88.3	3
Alcedo	74.4	8	96.5	8	105.1	1	99.8	4	92.5	7	93.8	1	75.0	7
Bezostaya 1	95.6	2	100.0	1	86.8	16	99.8	4	92.5	7	91.3	9	79.2	6
Jana	59.4	10	100.0	1	98.6	3	99.0	7	95.0	2	90.0	12	57.5	11
Trakia	91.3	4	87.5	12	96.8	7	98.5	8	95.0	2	93.8	1	69.2	8
WWP4394	72.5	9	82.5	16	97.6	6	90.3	11	95.0	2	92.5	6	64.2	10
Blueboy	55.6	11	86.1	14	93.1	10	91.5	10	93.8	5	93.1	3	65.8	9
Atlas 66	6.5	12	88.0	11	89.6	13	50.3	13	62.5	12	86.3	16	6.2	12
Huenufen	4.6	13	90.5	10	98.5	5	50.8	12	56.3	13	93.1	3	0.5	13
Kopara	4.0	15	85.0	15	98.6	3	46.5	14	32.5	14	90.6	10	0.0	14
Bastion	4.5	14	92.5	9	95.0	8	44.3	16	25.0	15	90.0	12	0.0	14
Irnerio	3.0	16	65.5	17	101.6	2	46.0	15	18.8	16	90.0	12	0.0	14
Super X	0.0	17	87.0	13	87.5	15	0.0	17	7.5	17	62.5	17	0.0	14
Mean	54.3		91.8		94.2		77.2		71.9		89.5		50.3	
LSD of the cultivar means (.05)	28.9		NS		NS		NS		23.0		NS		23.8	
Coefficient of variation (%)	14.0		9.3		10.4		4.4		9.8		3.5		15.2	
F tests:														
Cultivars	17.4**		0.8		0.9		2.1		16.8**		2.2		17.7**	
Year x Cultivar	12.8**		12.8**		2.6**		156.2**		9.5**		20.0**		8.6**	

[a] These sites were not included in the overall means and analyses.
** Significant at the .01 probability level.

Table 87. Two-year means and rankings of winter survival (%) for 17 cultivars grown in the International Winter Wheat Performance Nursery, 1980 and 1981.

Cultivars	Przeclaw, Poland		Warsaw, Poland		Fundulea, Romania		Svalof, Sweden		Zurich, Switzerland		Erzurum, a/ Turkey		Lincoln, Nebraska, USA	
	%	rank	%	rank	%	rank	%	rank	%	rank	%	rank	%	rank
Houser	98.1	3	75.6	5	100.0	1	51.1	1	91.3	1	52.5	5	100.0	1
TAM W-105	98.3	2	77.5	3	100.0	1	47.8	4	83.8	2	56.9	3	100.0	1
Martonvasari 6	95.5	7	77.5	3	100.0	1	39.4	10	75.0	4	46.9	8	94.1	6
TX 71A562-6	98.4	1	73.8	6	100.0	1	48.0	3	65.0	10	50.0	7	95.8	4
Aura	97.9	6	72.5	7	100.0	1	46.0	6	75.0	4	59.4	1	99.4	3
Alcedo	98.0	4	81.9	2	100.0	1	42.1	8	71.3	7	55.0	4	91.3	9
Bezostaya 1	93.6	8	68.8	8	100.0	1	39.0	11	68.8	8	58.1	2	93.1	7
Jana	98.0	4	85.0	1	100.0	1	49.1	2	72.5	6	38.8	14	91.6	8
Trakia	92.1	9	66.3	9	100.0	1	43.1	7	60.0	11	41.3	12	94.8	5
WWP4394	80.9	10	56.9	10	100.0	1	40.0	9	56.3	12	41.9	10	91.0	10
Blueboy	76.0	11	54.4	11	100.0	1	47.6	5	55.0	13	50.6	6	82.9	11
Atlas 66	46.9	15	36.9	12	100.0	1	11.4	15	51.3	14	42.5	9	79.5	12
Huenufen	73.1	12	29.8	13	96.9	14	17.5	12	51.3	14	39.4	13	41.3	13
Kopara	65.0	13	23.3	14	97.5	13	14.1	14	47.5	16	30.6	16	34.8	14
Bastion	42.5	16	17.8	15	95.0	16	6.3	16	47.5	16	26.9	17	7.5	15
Irnerio	50.0	14	17.6	16	95.6	15	16.1	13	68.8	8	41.9	10	1.1	16
Super X	40.6	17	13.1	17	90.6	17	5.4	17	78.8	3	38.1	15	0.0	17
Mean	79.1		54.6		98.6		33.2		65.8		45.3		70.5	
LSD of the cultivar means (.05)	27.8		31.9		5.1		NS		NS		NS		39.8	
Coefficient of variation (%)	4.0		13.0		0.7		32.4		18.1		27.8		9.1	
F tests:														
Cultivars	5.7**		5.8**		2.5*		1.4		0.9		1.6		7.9**	
Year x cultivar	68.4**		17.9**		42.5**		13.7**		10.2**		2.8**		33.9**	

a/ This site was not included in the overall means and analyses.
*,** Significant at the .05 and .01 probability levels, respectively.

Table 87. Two-year means and rankings of winter survival (%) for 17 cultivars grown in the International Winter Wheat Performance Nursery, 1980 and 1981.

Cultivars	Ithaca, New York, USA		Rowan County, North Carolina USA		Stillwater, Oklahoma, USA		Mironovski, USSR		Odessa, USSR		Cultivar means over 15 sites
	%	rank	%	rank	%	rank	%	rank	%	rank	
Houser	94.2	6	98.1	10	100.0	1	97.1	1	100.0	1	91.7
TAM W-105	94.7	5	98.8	7	100.0	1	69.6	11	100.0	1	89.8
Martonvasari 6	96.7	1	95.0	14	100.0	1	87.1	2	100.0	1	89.1
TX 71A562-6	93.3	8	99.4	2	100.0	1	85.4	4	100.0	1	88.9
Aura	96.3	4	99.4	2	100.0	1	84.8	5	100.0	1	88.6
Alcedo	96.7	1	98.8	7	100.0	1	80.0	8	98.8	11	87.6
Bezostaya 1	94.2	6	93.8	15	100.0	1	78.9	9	100.0	1	87.2
Jana	96.7	1	89.4	16	100.0	1	77.0	10	100.0	1	86.7
Trakia	80.0	9	99.4	2	100.0	1	84.1	6	100.0	1	85.9
WWP4394	65.0	10	96.3	12	100.0	1	81.0	7	100.0	1	80.9
Blueboy	55.8	11	100.0	1	100.0	1	85.6	3	100.0	1	79.5
Atlas 66	38.7	12	99.4	2	97.5	12	50.3	12	86.3	12	63.2
Huenufen	5.0	15	98.1	10	92.5	15	8.1	15	53.4	14	54.9
Kopara	14.5	14	99.4	2	96.3	13	28.6	14	59.0	13	53.4
Bastion	18.7	13	98.8	7	95.6	14	31.1	13	49.9	15	48.7
Irnerio	1.5	16	96.3	12	73.1	16	0.0	16	42.5	17	43.4
Super X	0.8	17	55.6	17	23.4	17	0.0	16	47.8	16	35.1
Mean	61.3		95.0		92.8		61.0		84.6		73.8
LSD of the cultivar means (.05)	35.7		NS		19.5		40.2		NS		17.1
Coefficient of variation (%)	9.3		6.3		2.9		23.6		4.7		10.2
F tests: Cultivars	8.1**		2.3		8.6**		6.1**		1.4		10.4**
Year x Cultivar	34.9**		10.8**		46.4**		7.0**		203.2**		3.6**

** Significant at the .01 probability level.

Table 88. Two-year means and rankings of date of flowering (days from Jan. 1) for 17 cultivars grown in the International Winter Wheat Performance Nursery, 1980 and 1981.

Cultivars	Bordenave, Argentina		Vienna, Austria		Tolbukhin,[a/] Bulgaria		Chillan, Chile		Male Ripnany, Czechoslovakia		Sedlec, Czechoslovakia		Bohnshausen, East Germany	
	date	rank	date	rank	date	rank	date	rank	date	rank	date	rank	date	rank
Irnerio	292	2	147	1	138	1	289	2	151	2	160	1	157	1
Trakia	292	2	148	3	141	2	293	3	152	3	161	2	158	2
TAM W-105	299	7	147	1	141	2	302	5	150	1	161	2	158	2
Super X	291	1	149	4	143	4	284	1	153	4	163	8	162	5
WWP4394	297	4	151	6	143	4	299	4	155	5	162	5	163	9
TX 71A562-6	299	7	149	4	143	4	304	8	155	5	162	5	162	5
Bezostaya 1	298	5	151	6	148	11	303	6	156	7	161	2	162	5
Blueboy	298	5	153	10	147	9	303	6	159	13	165	13	163	9
Martonvasari 6	300	9	152	9	146	8	308	10	157	8	163	8	163	9
Atlas 66	301	10	153	10	144	7	307	9	157	8	162	5	162	5
Kopara	304	11	151	6	147	9	309	11	160	14	164	11	161	4
Bastion	308	12	153	10	148	11	314	13	162	15	163	8	163	9
Houser	308	12	154	14	148	11	314	13	158	11	165	13	164	13
Huenufen	311	14	153	10	148	11	313	12	157	8	164	11	164	13
Alcedo	314	15	155	15	149	15	318	15	158	11	165	13	164	13
Jana	316	16	159	16	154	16	320	16	162	15	170	16	167	16
Aura	320	17	159	16	154	16	321	17	162	15	170	16	167	16
Mean	302.8		152.1		145.6		305.8		156.5		163.4		162.3	
LSD of the cultivar means (.05)	4.7		2.2		5.0		2.8		5.5		3.3		3.8	
Coefficient of variation (%)	0.6		0.5		1.6		0.2		2.2		0.3		0.7	
F tests:														
Cultivars	30.2**		19.7**		6.7**		130.1**		4.1**		6.8**		4.6**	
Year x Cultivar	5.4**		9.3**		-		11.9**		2.3**		36.1**		9.7**	

a/ This site was not included in the overall means and analyses.
** Significant at the .01 probability level.

Table 88. Two-year means and rankings of date of flowering (days from Jan. 1) for 17 cultivars grown in the International Winter Wheat Performance Nursery, 1980 and 1981.

Cultivars	Orgerus,[a] France		Martonvasar, Hungary		Szeged, Hungary		Suwon, Korea		Beirut,[a] Lebanon		Wageningen, The Netherlands		Przeclaw, Poland	
	date	rank	date	rank	date	rank	date	rank	date	rank	date	rank	date	rank
Irnerio	138	1	148	2	143	1	145	5	162	1	151	1	160	2
Trakia	144	3	149	3	144	3	143	2	163	2	152	2	160	2
TAM W-105	146	6	147	1	143	1	142	1	168	5	155	6	159	1
Super X	142	2	149	3	144	3	151	12	163	2	152	2	162	8
WWP4394	145	4	150	5	145	5	144	3	165	4	152	2	161	5
TX 71A562-6	145	4	150	5	145	5	144	3	168	5	156	9	161	5
Bezostaya 1	147	8	150	5	147	7	145	5	168	5	155	6	160	2
Blueboy	148	9	153	11	149	10	145	5	169	8	155	6	162	8
Martonvasari 6	150	12	152	8	148	8	146	8	172	9	160	16	162	8
Atlas 66	149	11	152	8	150	11	147	9	172	9	154	5	163	12
Kopara	146	6	152	8	148	8	150	11	175	12	156	9	161	5
Bastion	148	9	153	11	150	11	153	14	175	12	158	12	162	8
Houser	151	14	153	11	150	11	147	9	173	11	158	12	163	12
Huenufen	150	12	154	14	151	14	154	15	176	14	157	11	163	12
Alcedo	153	15	156	15	153	15	152	13	183	16	159	14	163	12
Jana	155	16	156	15	155	16	154	15	183	16	160	16	167	16
Aura	157	17	157	17	155	16	154	15	182	15	159	14	168	17
Mean	147.6		151.8		148.1		147.9		171.4		155.7		162.2	
LSD of the cultivar means (.05)	4.4		3.0		2.2		2.8		6.6		2.1		1.4	
Coefficient of variation (%)	1.4		0.4		0.6		1.1		1.8		0.1		0.2	
F tests:														
Cultivars	10.3**		8.2**		28.4**		19.9**		9.8**		17.3**		26.3**	
Year x Cultivar	-		19.7**		6.3**		3.0**		-		550.5**		14.1**	

[a] These sites were not included in the overall means and analyses.
** Significant at the .01 probability level.

Table 88. Two-year means and rankings of date of flowering (days from Jan. 1) for 17 cultivars grown in the International Winter Wheat Performance Nursery, 1980 and 1981.

Cultivars	Fundulea, Romania		Bethlehem, a/ South Africa (dryland)		Bethlehem, South Africa (irrigated)		Madrid, Spain		Zurich, Switzerland		Erzurum, Turkey		Fort Collins, Colorado, USA	
	date	rank	date	rank	date	rank	date	rank	date	rank	date	rank	date	rank
Irnerio	147	1	286	2	294	2	133	1	150	1	181	1	151	1
Trakia	147	1	288	3	294	2	135	2	151	2	182	4	155	3
TAM W-105	147	1	293	5	302	6	138	4	153	3	181	1	152	2
Super X	147	1	285	1	289	1	137	3	153	3	183	8	155	3
WWP4394	150	5	293	5	298	4	141	7	155	5	182	4	155	3
TX 71A562-6	151	6	294	7	302	6	138	4	157	7	181	1	155	3
Bezostaya 1	151	6	294	7	302	6	141	7	155	5	182	4	157	7
Blueboy	152	10	292	4	300	5	140	6	159	9	184	10	158	9
Martonvasari 6	151	6	296	9	304	10	142	9	158	8	182	4	158	9
Atlas 66	152	10	296	9	306	11	144	11	161	13	187	13	158	9
Kopara	151	6	297	11	303	9	142	9	159	9	185	11	157	7
Bastion	153	13	299	12	309	12	145	12	159	9	187	13	159	12
Houser	152	10	304	14	310	13	146	13	160	12	183	8	161	13
Huenufen	153	13	303	13	312	14	147	14	163	14	191	15	162	14
Alcedo	154	15	310	17	313	15	148	15	163	14	186	12	163	15
Jana	157	16	309	15	317	16	149	16	165	16	192	16	164	16
Aura	157	16	309	15	319	17	151	17	165	16	193	17	165	17
Mean	151.1		296.9		304.3		142.0		157.9		184.7		157.9	
LSD of the cultivar means (.05)	1.8		-		6.4		4.1		3.3		2.8		2.2	
Coefficient of variation (%)	0.1		0.7		1.5		1.0		0.7		0.7		0.7	
F tests:														
Cultivars	28.4**		-		14.8**		13.2**		17.7**		18.1**		30.1**	
Year x Cultivar	376.0**		-		1.8*		7.1**		7.1**		4.3**		3.9**	

a/ This site was not included in the overall means and analyses.
*,** Significant at the .05 and .01 probability levels, respectively.

Table 88. Two-year means and rankings of date of flowering (days from Jan. 1) for 17 cultivars grown in the International Winter Wheat Performance Nursery, 1980 and 1981.

Cultivars	Billings,[a/] Montana, USA		Rowan County, North Carolina USA		Stillwater, Oklahoma, USA		Odessa,[a/] USSR		Monsheim, West Germany		Weihenstephan, West Germany		Cultivar means over 21 sites
	date	rank	date	rank	date	rank	date	rank	date	rank	date	rank	
Irnerio	158	2	116	1	113	2	148	1	146	1	152	1	168.0
Trakia	159	3	118	2	116	3	153	5	146	1	153	2	169.0
TAM W-105	153	1	120	4	119	8	152	2	148	3	153	2	170.3
Super X	164	11	119	3	106	1	155	7	148	3	155	4	171.4
WWP4394	161	5	120	4	116	3	154	6	150	5	156	6	171.7
TX 71A562-6	159	3	121	7	121	10	155	7	150	5	156	6	172.4
Bezostaya 1	161	5	121	7	117	5	152	2	152	7	157	9	172.5
Blueboy	162	7	120	4	118	6	157	9	156	13	159	12	174.0
Martonvasari 6	162	7	122	9	118	6	157	9	155	10	157	9	174.2
Atlas 66	163	10	122	9	120	9	152	2	156	13	156	6	174.7
Kopara	165	12	126	11	125	11	157	9	154	8	157	9	175.1
Bastion	165	12	128	13	126	12	158	12	155	10	155	4	176.9
Houser	162	7	127	12	126	12	158	12	154	8	160	14	177.0
Huenufen	167	14	129	14	133	16	159	14	155	10	159	12	178.3
Alcedo	168	15	133	16	132	14	165	16	158	15	160	14	179.4
Jana	170	16	133	16	132	14	165	16	159	16	165	17	181.9
Aura	172	17	132	15	134	17	162	15	159	16	164	16	182.5
Mean	162.9		123.8		122.4		156.6		153.0		157.1		174.7
LSD of the cultivar means (.05)	3.7		3.7		-		4.8		2.9		4.1		2.1
Coefficient of variation (%)	1.1		0.9		0.6		3.4		0.7		0.7		0.9
F tests: Cultivars	14.7**		19.3**		-		7.0**		20.7**		6.8**		30.3**
Year x Cultivar	-		8.7**		0.0		0.7		6.9**		12.6**		4.7**

a/ These sites were not included in the overall means and analyses.
** Significant at the .01 probability level

Table 89. Two-year means and rankings of date of ripening (days from Jan. 1) for 17 cultivars grown in the International Winter Wheat Performance Nursery, 1980 and 1981.

Cultivars	Bordenave, Argentina		Vienna, Austria		Tolbukhin,[a] Bulgaria		Male Ripnany, Czechoslovakia		Sedlec, Czechoslovakia		Bohnshausen, East Germany		Suwon, Korea	
	date	rank	date	rank	date	rank	date	rank	date	rank	date	rank	date	rank
Irnerio	338	1	194	2	187	1	202	1	213	2	210	1	182	10
TAM W-105	341	5	194	2	187	1	203	3	213	2	210	1	175	2
TX 71A562-6	343	7	193	1	189	5	203	3	211	1	212	4	176	3
Trakia	339	2	198	4	188	3	203	3	216	4	214	6	176	3
WWP4394	340	4	198	4	188	3	204	6	217	6	215	7	174	1
Super X	339	2	198	4	190	7	202	1	218	7	210	1	182	10
Bezostaya 1	342	6	199	7	190	7	205	7	219	8	215	7	178	6
Blueboy	343	7	201	11	191	12	207	12	222	11	219	14	180	8
Martonvasari 6	349	10	199	7	191	12	207	12	220	9	217	11	178	6
Atlas 66	346	9	201	11	189	5	212	17	222	11	218	12	177	5
Huenufen	352	13	199	7	190	7	205	7	216	4	213	5	188	16
Kopara	350	11	201	11	190	7	205	7	222	11	216	10	184	12
Houser	351	12	200	10	190	7	206	10	220	9	215	7	180	8
Alcedo	353	15	201	11	191	12	206	10	222	11	219	14	187	14
Bastion	352	13	202	15	191	12	207	12	225	16	218	12	189	17
Aura	355	16	202	15	192	17	207	12	222	11	220	16	186	13
Jana	355	16	203	17	191	12	208	16	225	16	220	16	187	14
Mean	346.3		198.9		189.4		205.2		218.9		215.3		181.0	
LSD of the cultivar means (.05)	3.7		4.9		2.6		NS		5.5		3.7		4.3	
Coefficient of variation (%)	0.7		0.5		0.7		2.5		0.8		0.5		1.6	
F tests: Cultivars	24.9**		3.0*		2.6*		1.7		5.2**		7.9**		12.0**	
Year x Cultivar	2.4**		19.3**		-		1.2		10.0**		8.9**		2.1*	

a/ This site was not included in the overall means and analyses.
*,** Significant at the .05 and .01 probability levels, respectively.

Table 89. Two-year means and rankings of date of ripening (days from Jan. 1) for 17 cultivars grown in the International Winter Wheat Performance Nursery, 1980 and 1981.

Cultivars	Beirut, Lebanon[a]		Wageningen, The Netherlands		Przeclaw, Poland		Fundulea, Romania		Bethlehem, South Africa (dryland)		Bethlehem, South Africa (irrigated)		Madrid, Spain	
	date	rank	date	rank	date	rank	date	rank	date	rank	date	rank	date	rank
Irnerio	197	2	210	2	205	1	181	1	328	3	338	4	163	1
TAM W-105	200	6	212	6	206	3	182	2	330	7	342	7	165	3
TX 71A562-6	198	3	210	2	205	1	185	5	329	4	339	5	167	4
Trakia	198	3	211	5	207	5	184	4	325	2	333	2	168	6
WWP4394	199	5	210	2	207	5	185	5	329	4	337	3	167	4
Super X	194	1	204	1	206	3	183	3	324	1	331	1	163	1
Bezostaya 1	201	7	219	8	207	5	185	5	329	4	342	7	168	6
Blueboy	202	8	221	11	211	17	187	10	330	7	340	6	168	6
Martonvasari 6	202	8	224	16	208	11	186	8	331	9	348	9	170	10
Atlas 66	202	8	217	7	207	5	187	10	332	10	350	12	168	6
Huenufen	206	13	219	8	207	5	187	10	342	12	348	9	172	14
Kopara	204	11	222	12	207	5	186	8	334	11	349	11	170	10
Houser	205	12	222	12	208	11	188	13	342	12	350	12	171	12
Alcedo	207	14	220	10	208	11	189	15	344	15	356	14	172	14
Bastion	207	14	224	16	208	11	188	13	342	12	358	15	172	14
Aura	209	16	223	15	210	15	191	17	346	16	360	16	171	12
Jana	209	16	222	12	210	15	190	16	346	16	360	16	173	17
Mean	202.1		216.8		207.4		185.9		334.3		345.9		168.6	
LSD of the cultivar means (.05)	5.0		9.5		2.7		2.2		4.7		8.2		4.4	
Coefficient of variation (%)	1.2		0.8		0.2		0.0		0.6		1.1		0.9	
F tests: Cultivars	7.3**		3.7**		3.4**		12.3**		20.5**		11.2**		4.4**	
Year x Cultivar	-		26.8**		47.1**		597.0**		5.5**		4.0**		7.8**	

a/ This site was not included in the overall means and analyses.
** Significant at the .01 probability level.

Table 89. Two-year means and rankings of date of ripening (days from Jan. 1) for 17 cultivars grown in the International Winter Wheat Performance Nursery, 1980 and 1981.

Cultivars	Erzurum, Turkey		Davis,[a] California, USA		Odessa,[a] USSR		Weihenstephan, West Germany		Cultivar means over 14 sites
	date	rank	date	rank	date	rank	date	rank	
Irnerio	224	5	146	3	185	1	217	1	228.1
TAM W-105	221	1	151	9	186	2	217	1	228.6
TX 71A562-6	222	2	148	6	189	3	219	3	228.9
Trakia	224	5	145	1	193	10	219	3	229.2
WWP4394	223	3	145	1	192	6	219	3	229.7
Super X	224	5	146	3	189	3	221	8	230.5
Bezostaya 1	223	3	149	8	192	6	221	8	231.6
Blueboy	226	10	148	6	194	12	224	14	233.5
Martonvasari 6	224	5	154	10	190	5	221	8	233.7
Atlas 66	226	10	147	5	194	12	224	14	234.2
Huenufen	228	15	163	15	195	14	219	3	234.5
Kopara	227	14	155	11	193	10	221	8	234.5
Houser	225	9	164	16	195	14	222	12	235.0
Alcedo	226	10	161	13	192	6	223	13	236.8
Bastion	226	10	160	12	196	16	220	7	237.2
Aura	228	15	162	14	196	16	224	14	238.3
Jana	230	17	165	17	192	6	224	14	238.8
Mean	225.0		153.2		192.1		220.6		233.1
LSD of the ultivar means (.05)	3.4		5.9		NS		NS		2.5
Coefficient of variation (%)	0.5		1.8		2.3		0.3		1.0
F tests:									
Cultivars	4.1**		14.3**		1.8		1.8		14.8**
Year x Cultivar	7.6**		-		2.1*		74.5**		1.2

a/ These sites were not included in the overall means and analyses.
*,** Significant at the .05 and .01 probability levels, respectively.

Table 90. Two-year means and rankings of shattering (%) for 17 cultivars grown in the International Winter Wheat Performance Nursery, 1980 and 1981.

Cultivars	Erzurum, Turkey		Davis, California, USA		Cultivar means over 2 sites
	%	rank	%	rank	
TX 71A562-6	0	1	1	4	0.3
Blueboy	2	3	2	9	1.7
Aura	0	1	4	12	2.0
Jana	3	5	2	9	2.7
Bezostaya 1	6	7	1	4	3.3
Bastion	9	9	1	4	5.1
Alcedo	10	10	1	4	5.4
Kopara	11	11	0	1	5.6
TAM W-105	11	11	0	1	5.8
Martonvasari 6	8	8	5	13	6.4
Atlas 66	2	3	12	15	6.9
Trakia	14	15	1	4	7.1
Huenufen	15	16	0	1	7.5
Irnerio	18	17	2	9	9.6
Super X	3	5	17	16	10.1
Houser	13	14	8	14	10.4
WWP4394	12	13	41	17	26.3
Mean	7.9		5.7		6.8
LSD of the cultivar means (.05)	NS		NS		NS
Coefficient of variation (%)	57.5		102.1		76.7
F tests:					
Cultivars	0.6		1.0		0.6
Year x Cultivar	20.8**		23.4**		1.7

** Significant at the .01 probability level.

Table 91. Two-year means and rankings of frost damage (0-9) for 17 cultivars grown in the International Winter Wheat Performance Nursery, 1980 and 1981.

Cultivars	Bordenave, Argentina		Tolbukhin,[a] Bulgaria		Bohnshausen, East Germany		Fundulea, Romania		Cultivar means over 3 sites
	0-9	rank	0-9	rank	0-9	rank	0-9	rank	
TAM W-105	0	1	9	13	2	1	1	1	0.8
Jana	0	1	9	13	2	1	1	1	0.9
TX 71A562-6	0	1	9	13	2	1	1	1	1.0
Houser	0	1	8	9	3	6	1	1	1.1
Alcedo	0	1	9	13	2	1	1	1	1.1
Martonvasari 6	0	1	8	9	2	1	2	7	1.3
Bezostaya 1	0	1	8	9	3	6	1	1	1.3
Aura	0	1	8	9	3	6	2	7	1.3
Trakia	0	1	6	7	3	6	2	7	1.5
WWP4394	0	1	9	13	3	6	2	7	1.6
Blueboy	0	1	6	7	3	6	2	7	1.7
Atlas 66	0	1	5	5	4	14	4	12	2.5
Irnerio	1	13	1	1	3	6	6	13	3.3
Bastion	1	13	2	3	4	14	6	13	3.5
Huenufen	2	15	3	4	3	6	6	13	3.6
Kopara	3	17	5	5	4	14	6	13	3.9
Super X	2	15	1	1	4	14	7	17	4.1
Mean	0.5		6.0		2.9		2.7		2.0
LSD of the cultivar means (.05)	1.0		1.7		0.9		1.5		1.8
Coefficient variation (%)	90.3		13.2		17.1		8.1		19.4
F tests:									
Cultivars	6.1**		26.6**		3.6**		23.9**		3.4**
Year x Cultivar	5.3**		-		3.1**		38.8**		1.0

[a] This site was not included in the overall means and analyses.
** Significant at the .01 probability level.