AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D. C. 20523

BIBLIOGRAPHIC INPUT SHEET

FOR AID USE ONLY

1. SUBJECT CLASSIFICATION

A. PRIMARY: Agriculture — AF30-0180-0000

B. SECONDARY: Plant breeding--Cereals--Wheat

2. TITLE AND SUBTITLE

Results of the first International Winter Wheat Performance Nursery

3. AUTHOR(S)

Stroike,J.E.; Johnson,V.A.; Schmidt,J.W.; Mattern,P.J.

4. DOCUMENT DATE: 1971

5. NUMBER OF PAGES: 85p.

6. ARC NUMBER: ARC 633.11.S921c

7. REFERENCE ORGANIZATION NAME AND ADDRESS

Neb.

8. SUPPLEMENTARY NOTES *(Sponsoring Organization, Publishers, Availability)*

(In Research bul.245)

9. ABSTRACT

10. CONTROL NUMBER: PN-RAA- 261

11. PRICE OF DOCUMENT

12. DESCRIPTORS

Data
Environmental tests
Varieties
Wheat

13. PROJECT NUMBER

14. CONTRACT NUMBER: CSD-1208 Res.

15. TYPE OF DOCUMENT

AID 590-1 (4-74)

Research Bulletin

245

July 1971

Results of the First International Winter Wheat Performance Nursery

J. E. Stroike

V. A. Johnson

J. W. Schmidt

P. J. Mattern

Plant Science Research Division
Agricultural Research Service,
U.S. Department of Agriculture
Agency for International Development,
U.S. Department of State

University of Nebraska
College of Agriculture
The Agricultural Experiment Station
E. F. Frolik, Dean H. W. Ottoson, Director

CONTENTS

Acknowledgments 2
Summary 2
Procedures 4
Varieties 4
Nursery Sites 6
Nursery Management 7
Data Summarization and Statistical Treatment 7
Results and Discussion 8
Tables and Supplementary Information for Individual Nursery Sites 12
Summary Tables 56

Issued July 1971, 2,500

ACKNOWLEDGMENTS

The assistance of other organizations in the establishment of the International Winter Wheat Performance Nursery is acknowledged. The International Maize and Wheat Improvement Center, Mexico, D. F., gave invaluable assistance in establishing initial contacts with cooperating countries and providing guidance in details of nursery organization and procedures. Personnel of the Plant Production and Protection Division, Food and Agriculture Organization of the United Nations, assisted in nursery seed shipments to testing sites in many countries. Dr. Abdul Hafiz, FAO Near East Wheat and Barley Improvement Project, aided in nursery inspections at Near East sites.

SUMMARY

An International Winter Wheat Performance Nursery was organized by the Nebraska Agricultural Experiment Station and the Agricultural Research Service, U.S. Department of Agriculture under a contract with the Agency for International Development, U.S. Department of State. The first nursery was grown in 1969 at 23 sites in 16 countries and was comprised of 28 winter wheat varieties and 2 spring varieties. Data were reported from 21 sites.

Bezostaia with an average yield of 43 quintals per hectare was the most productive variety at 19 sites from which grain yields were reported. Blueboy, Sturdy, San Pastore and Timwin also were very productive. All of the most productive varieties possessed moderately short straw and were resistant to lodging.

There was excellent phenotypic expression of genetic differences in grain protein among varieties. Atlas 66, Purdue 4930A6-28-2-1 and NB67730, all known to possess genes for high protein from Frondoso, were the highest in average grain protein content. Lysine expressed as percent of protein was negatively correlated with protein content among the varieties tested.

Results of the First International Winter Wheat Performance Nursery

J. E. Stroike, V. A. Johnson, J. W. Schmidt and P. J. Mattern[1]

The International Winter Wheat Performance Nursery (IWWPN) was organized by the Nebraska Agricultural Experiment Station and the Agricultural Research Service, U.S. Department of Agriculture, under a contract with the Agency for International Development, U.S. Department of State. There has been informal cooperation with the Food and Agriculture Organization, United Nations, and the International Maize and Wheat Improvement Center (CIMMYT), Mexico, D. F.

Specific objectives of the nursery are to:

1. Test the adaptation of winter wheat varieties under a range of latitudes, daylengths, fertility conditions, water management and disease complexes.
2. Identify superior winter varieties 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.

Information on the adaptation and performance characteristics of winter wheat varieties is sparse. The International Spring Wheat Yield Nursery organized by CIMMYT has demonstrated that wide differences exist among spring wheats and that spring varieties of nearly universal adaptation as well as those with narrow geographic adaptation can be developed. It is not known whether universally adapted winter varieties exist or can be developed. Neither is it known which varieties among those now available are best adapted to the winter wheat production areas of the world.

High protein winter wheat experimental varieties have been developed in the United States. Research is in progress to identify varieties with genetic potential for high lysine. The full range of environments under which the high protein trait is expressed is not known nor is the impact of environment on lysine content of wheat

---

[1] Instructor, University of Nebraska; Research Agronomist, Agricultural Research Service, USDA; Professor and Associate Professor, University of Nebraska, Lincoln, Nebr., respectively; Cooperative investigations of the Nebraska Agricultural Experiment Station and the Agricultural Research Service, U.S. Department of Agriculture, Lincoln, Nebr., under a contract with the Agency for International Development, U.S. Department of State.

protein. Evaluation of such varieties in the IWWPN should provide useful information on breeding expectations for wheat varieties with improved nutritional value.

The IWWPN is designed to study the performance of winter wheat varieties and experimental lines from major winter wheat producing countries. Nursery sites were selected to sample the winter wheat production environments of the world. The nursery should aid in the early identification of superior winter wheat genotypes. It will serve as a vehicle for testing promising experimental lines on an international basis and it can be a continuing source of new genetic material for use by cooperators.

PROCEDURES

Varieties and experimental lines of winter wheat were nominated for nursery testing by cooperators. Seed in the amount of 1.5 kilograms of each variety was provided initially by cooperators and was increased under U.S. quarantine at Yuma, Ariz., before inclusion in the nursery.

Nursery size was restricted to 30 entries grown in 4 replications. Basic plot size was 6 rows each 2.5 meters long. Nursery seed was packaged and organized at the University of Nebraska for shipment to nursery sites. Note-recording books in duplicate were prepared and accompanied each nursery seed shipment. One completed notebook was returned from each test site to Lincoln, Nebr., following harvest.

Nursery cooperators were requested to provide performance information as follows:

Date of anthesis	Winter survival
Date ripe	Frost damage
Straw height	Disease notes
Lodging	Test weight
Shattering	Grain yield

Seed samples in the amount of 10 grams from each harvested nursery plot were returned to Lincoln, Nebr., for protein and lysine analyses.

VARIETIES

Varieties representative of important winter wheat production regions of the world were selected for the first IWWPN. In some cases these were old varieties rather than currently more popular ones. We believe that the performance of such varieties in the IWWPN will provide useful information initially. They will be

Name	C.I. or P.I. No.	Country of Origin	Pedigree
Felix	295992	Netherlands	
Heine VII	209794	W. Germany	
Odin	264272	Sweden	
San Pastore	213835	Italy	
Cappell Desprez	262223	France	Vilmorin 27/Hybride du Joncquois
Bezostaia	15158	USSR	Lutescens 17/Skorospelka 2
Bankuti 1201	232943	Hungary	
Fertodi 293	268072	Hungary	Kawvale/Bankuti
Yung Kwang		S. Korea	
Winalta	13670	Canada	Minter/Wichita
Blueboy	14031	No. Carolina, USA	Brevor/Norin 10//Anderson/Coker 55-9
Benhur	14054	Indiana, USA	Complex cross involving Knox 62, Hope, Hussar and Kenya Farmer
Riley 67	14110	Indiana, USA	Riley*5//Knox Type 7/Transfer/Purdue 501
Timwin	13787	Wisconsin, USA	Knox//Brevor/Norin, Sel. 10/(H483a-3-5)F_1
Stadler	13704	Missouri, USA	Thorne/Clarkan
Gaines	13448	Washington, USA	Norin 10/Brevor, Sel. 14//Brevor/Oro/Turkey/ Florence/Oro/Fortyfold/Federation
Yorkstar	14026	New York, USA	Genesee*3/3/Yorkwin/2/Norin 10/Brevor
Triumph 64	13679	Oklahoma, USA	Danne Bdl. Blackhull/3/Kanred/Blackhull/2/ Florence/4/Kanred/Blackhull/2/Triumph
Scout 66	13996	Nebraska, USA	Sel. from Nebred/2/Hope/Turkey/3/Cheyenne/Ponca
Parker	13285	Kansas, USA	Quivira/3/Kanred/Hard Federation/2/Prelude/ Kanred/4/Kawvale/Marquillo/2/Kawvale/Tenmarq
Gage	13532	Nebraska, USA	Ponca/3/Mediterranean/Hope/2/Pawnee
Sturdy	13684	Texas, USA	Sinvalocho/Wichita/2/Hope/Cheyenne/3/ 2*Wichita/4/Sen Seun
Shawnee	14157	Kansas, USA	Sel. from Mediterranean/Hope/2/Pawnee/3/ Oro/Illinois #1/2/Comanche
Lancer	13547	Nebraska, USA	Turkey/Cheyenne/2/Hope/2*Cheyenne
Atlas 66	12561	No. Carolina, USA	Frondoso/2/Redhart 3/Noll 28
High Protein Sel.	Purdue 4930A6-28-2-1	Indiana, USA	Complex cross involving Frondoso
High Protein Sel.	Nebr. 67730	Nebraska, USA	Atlas 66/Comanche
Arthur	14425	Indiana, USA	Purdue 5752-A1-1P-2
Lerma Rojo 64*	13929	Mexico	
INIA 66*	14195	Mexico	Lerma Rojo 64/Sonora 64

* Spring wheat

replaced by newer important varieties as space in the nursery becomes available.

The 1st IWWPN grown in 1969–70 was comprised of 30 varieties, 2 of which were spring wheats. The latter, Lerma Rojo 64 and INIA 66, were included to provide comparative spring and winter wheat performance data from those sites at which mild winter temperatures permit the seeding of spring wheats in autumn. Varieties are identified in the listing on page 5. Pedigrees, where known, are indicated.

Cooperators were requested not to substitute other varieties for designated nursery entries. Where comparisons of nursery entries with local varieties were desired, the cooperator was asked to place them at the end of each replication and number such varieties independently of the nursery series.

NURSERY SITES

Seed for planting the 1st IWWPN was sent to cooperators at 23 sites in 16 countries. These are shown in the listing that follows:

Country	Station	Latitude	Longitude	Elev. (M)
Afghanistan	Kabul	34° 33′ N	69° 11′ E	1803
Algeria	El-Harrach	36° N	7° E	700
Argentina	Bordenave	37° 50′ 55″ S	63° 1′ 20″ W	212
Argentina	Pergamino	33° 52′ 58″ S	60° 35′ 15″ W	68
Chile	Temuco	38° 40′ S	72° 25′ W	332
France	Versailles	48° 53′ N	2° 40′ E	30
Iran	Karaj	35° 47′ N	50° 0′ E	1300
Iran	Kermanshah	34° 19′ N	47° 5′ E	1410
Iraq	Sulaimaniyka	36° 0′ N	46° 0′ E	700
Italy	Milano	45° 13′ N	9° 25′ E	73
Italy	Reiti	42° 24′ N	12° 52′ E	402
Japan	Sapporo	43° 3′ N	141° 20′ E	60
Netherlands	Wageningen	51° 58′ 2″ N	5° 38′ 30″ E	7
Romania	Fundulea	44° 30′ N	24° 10′ E	66
South Korea	Suwon	37° 16′ N	126° 59′ E	37
Sweden	Svalöf	55° 35′ N	13° 6′ E	50
Turkey	Ankara	39° 57′ N	32° 53′ E	850
Turkey	Eskischir	36° 45′ N	30° 95′ E	789
U.S.A.	Davis, Calif.	38° 32′ N	121° 45′ W	15
U.S.A.	Mead, Nebr.	41° 10′ N	96° 25′ W	360
U.S.A.	Raleigh, No. Car.	35° 42′ N	80° 37′ W	251
U.S.A.	Stillwater, Okla.	36° 6′ N	97° 4′ W	270
Yugoslavia	Novi Sad	45° 5′ N	19° 8′ E	84

Yield data were reported from all nursery sites except Versailles, France; El-Harrach, Algeria; and Mead, Nebr. At Versailles severe

early lodging of the nursery rendered it useless for yield purposes. Data were not reported from El-Harrach, Algeria. Loss of stands from temperatures and heavy ice cover during the winter resulted in abandonment of the nursery at Mead, Nebr. Seed samples from harvested plots for protein and lysine analyses at the University of Nebraska Wheat Quality Laboratory were received from all test sites except El-Harrach, Algeria, and Mead, Nebr.

NURSERY MANAGEMENT

The nurseries were planted at the normal time for seeding winter wheat at each test site. Seed was provided for 6-row plots in sufficient quantity to plant approximately 180 viable seeds per row or 80 kilos per hectare.

Cooperators were requested to apply good management practices, including the use of fertilizers and control of weeds. This would permit the most rapid progress in identification of varieties that respond well to fertilizers and good management.

Cooperators were urged to protect their nurseries against bird and animal pests since such damage would nullify the nursery's experimental value.

Detailed management data and other information pertinent to the nursery are presented for each site in connection with the agronomic and yield data.

DATA SUMMARIZATION AND STATISTICAL TREATMENT

Cooperators reported nursery data as follows:

Yield of grain:—determined from the 4 central rows of each 6-row plot. Grain weights were recorded for clean grain from each plot and are reported herein in quintals per hectare (1 quintal = 100 kilograms).

Test weight:—determined from clean grain in pounds per bushel or kilograms per hectoliter depending on weighing apparatus availability.

Maturity:—Two notes were reported. Date of flowering was based on date of anther extrusion from approximately ⅓ of the heads in a plot and reported as number of days from Jan. 1. Date ripe was based on date of physiological maturity and also reported as number of days from Jan. 1.

Plant height:—the average height of plants in a plot excluding awns and reported in centimeters.

Lodging:—the estimated percentage of a plot with lodged or down straw at the time of maturity.

Shattering:—the estimated percentage of grain lost from spikes in

the standing border rows of plots 2 weeks after harvest of the yield rows.

Winter survival:—the estimated percentage of plants in the center 4 rows of plots that were alive in the spring.

Frost damage:—the estimated percentage of flower sterility in plots resulting from late spring frosts.

Diseases:—severity in percent and response according to the modified Cobb scale were reported for stripe rust *(Puccinia striiformis)* West., leaf rust *(Puccinia recondita) Rob. ex Desm.*, stem rust *(Puccinia graminis tritici)*, Eriks. & Henn. and other diseases that were present in sufficient intensity to permit classification of variety reactions.

Cooperators were encouraged to report additional data for which notes were recorded.

An analysis of variance was computed for each trait for which data were reported from more than one replication at a nursery site. Coefficients of variation and least significant differences at the 5% level are reported for analyzable traits as a part of the individual test site data (Tables 1–22).

Data from all reporting sites are summarized individually for yield, test weight, protein, lysine and several agronomic traits in Tables 23–38.

RESULTS AND DISCUSSION

The most productive varieties averaged over 19 reporting nursery sites in 1969 were (Table 23):

	q/ha
Bezostaia	43.0
Blueboy	40.5
Sturdy	38.8
Timwin	38.2
San Pastore	37.2

All of the above varieties possess moderately short stiff straw (Table 33). At those nursery sites where they survived the winter, Lerma Rojo 64 and INIA 66 were considerably less productive than Bezostaia.

The superior yield of Bezostaia was associated with its highly consistent performance over environments. The yield rankings of varieties shown in Table 24 provide evidence. Bezostaia ranked no lower than seventh in yield at 14 sites and ranked first or second at seven sites. No other variety was so consistent.

Five American hard red winter wheat varieties and Bezostaia produced grain with highest test weight (Table 25). They are:

	kg/hl
Parker	82.2
Bezostaia	81.1
Triumph 64	80.9
Shawnee	80.8
Lancer	80.6
Scout 66	80.5

Grain protein content of varieties is summarized in Table 26. The three varieties possessing genes for high protein from Frondoso are Atlas 66, Purdue 4930A6-28-2-1 and NB67730. All produced more protein in their grain on the average than 27 other varieties in the 1st IWWPN. Cappell Desprez, Odin and Bankuti also produced grain with moderately high protein content. The American soft wheat varieties Gaines, Yorkstar and Stadler produced the lowest protein grain.

Grain yield and grain protein content frequently are negatively correlated. Therefore, protein comparisons, to be most valid, should be made among varieties of comparable yield. The protein content of several such varieties is compared in the tabulation that follows:

Variety	Grain yield (q/ha)	Protein content (%)
Atlas 66	33.4	17.5
Cappell Desprez	32.0	16.0
Odin	26.7	15.4
Felix	29.6	14.9
Winalta	32.2	13.8
Gaines	30.7	13.0
NB67730	34.8	16.4
Bankuti 1201	35.6	15.1
Triumph 64	35.6	14.7
Riley 67	36.3	14.1
Yorkstar	35.8	12.4

Atlas 66 showed a substantial protein advantage over five other varieties that yielded comparably. Similarly NB67730 produced grain with higher protein content than four other equally productive varieties.

The amino acid lysine is in shortest supply among the essential amino acids in wheat protein. The nutritional value of wheat protein, therefore, hinges upon the amount and availability of lysine in the protein. Protein quantity and lysine content of the protein tend to be inversely related in wheat. High protein wheats can be expected to have less lysine than lower protein varieties. This is evident from the lysine summary in Table 27 and in the tabulation that follows:

Variety	Protein content (%)	Lysine content (% of protein)	Lysine content (% of dry grain wt.)
Yorkstar	12.4	3.14	0.39
Gaines	13.0	3.08	0.40
Bezostaia	13.4	2.90	0.39
Fertodi 293	14.9	2.84	0.42
NB67730	16.4	2.75	0.45
Atlas 66	17.5	2.69	0.47

As protein content of varieties increases, the lysine content of the protein decreases. However, the high protein varieties produce more lysine per unit weight of dry grain than do lower protein varieties.

For breeding purposes it is important that lysine differences due to variation in quantity of protein be eliminated from lysine comparisons. We have utilized the regression of lysine on protein to adjust lysine values to a common protein level (13.5%) The adjusted lysine values for varieties in the 1st IWWPN are summarized in Table 28. The range of lysine variation following adjustment is only .24% (3.09–2.85), suggesting that here is little genetic difference for lysine among varieties in the nursery.

Differential winter survival was reported for nursery entries from nine test sites. The survival data are summarized in Table 29. Frost damage occurred at five sites (Table 30). The most severe differential killing occurred at Sapporo, Japan, where stand survivals among winter varieties ranged from only 1% for Atlas 66 and Cappell Desprez to 96% for Stadler. There was no survival for Lerma Rojo 64 or INIA 66 at Sapporo. The average survival of Atlas 66 at nine sites was 71% and for Lerma Rojo 64 46% indicating the relatively mild winter conditions at most of the sites.

San Pastore, Benhur, Triumph 64, Sturdy and Arthur in that order were the earliest to flower among the winter wheats (Table 31). The northern European varieties Odin, Felix, Cappell Desprez and Heine VII were latest flowering. Date of ripening was closely associated with date of flowering, with the earliest flowering varieties ripening first and the latest flowering varieties the last to ripen (Table 32).

Varieties with the shortest plant height on the average were as follows:

	Ht. (cm)		Ht. (cm)
Gaines	76	San Pastore	95
Sturdy	84	Blueboy	97
Timwin	89	Heine VII	98
Cappell Desprez	93	Bezostaia	99
Felix	93		

These compare with 125 and 120 cm. for Bankuti 1201 and NB67730, respectively, the tallest varieties in the nursery.

Lodging was recorded at 14 sites and was closely related to plant height (Table 34). Sturdy and Felix lodged the least on the average with the tall varieties NB67730, Scout 66 and Bankuti 1201 lodging the most severely.

Shattering was reported from five sites with the most severe at Wageningen (Table 35). Winalta and Sturdy were the most resistant to shattering on the average whereas Purdue 4930A6-28-2-1 and San Pastore were the most susceptible.

Varietal reactions to stripe rust, leaf rust and stem rust are summarized in Tables 36 to 38. The most resistant varieties to each rust appear in the listing that follows:

Stripe rust ($\bar{x}$ of 10 sites)		Leaf rust ($\bar{x}$ of 11 sites)		Stem rust ($\bar{x}$ of 9 sites)	
Variety	% Infection	Variety	% Infection	Variety	% Infection
Cappell Desprez	3.2	NB67730	7.3	Timwin	3.2
Odin	5.0	Sturdy	7.8	Arthur	3.8
Bezostaia	5.9	Benhur	8.2	Purdue 28-2-1	5.2
Fertodi 293	5.9	Bezostaia	12.5	Yung Kwang	6.8
Felix	7.1	Parker	12.5	Shawnee	7.4
Sturdy	7.3	Atlas 66	12.5	Atlas 66	9.7
Lancer	7.8	Purdue 28-2-1	12.5	Bezostaia	9.7
NB67730	8.2	Timwin	16.5	NB67730	11.0

The lowest average severities of infection to all three rusts was exhibited by Bezostaia and NB67730.

TABLES AND SUPPLEMENTAL INFORMATION FOR INDIVIDUAL NURSERY SITES

ARGENTINA

Bordenave

Cooperators: Santiago Garbini; Ernesto Florencio Godoy.

Date of planting: July 16, 1968

Precipitation during cycle of test: 397 mm.

Amount of irrigation applied: None

Fertilizer used: None

General description of climatic conditions during test: Heavy frost in September. High temperature at end of November and early in December.

Disease development: *P. striiformis*—moderate intensity; *P. recondita*—moderate to low intensity; *P. graminis tritici*—low intensity.

Insect, weed or pest problems: None

Date of harvest: Dec. 11, 1968 to Jan. 8, 1969

Area harvested for yield: 3 square meters

Dates when different notes were taken: Height—Nov. 1–20, 1968; Lodging—Dec. 8, 1968 to Jan. 3, 1969; Shattering—Dec. 23, 1968 to Jan. 18, 1969; Stem Rust—Dec. 9, 1968; Stripe Rust—Nov. 4, 1968; Leaf Rust—Nov. 4, 1968; Frost Damage—Sept. 15, 1968.

Data in Table 1.

Table 1. Agronomic, grain quality and disease data for the 30 cultivars in the "1st International Winter Wheat Performance Nursery" grown at Bordenave, Argentina, 1969.

Cultivar	Yield	Test weight	Protein	Lysine	Date of Flowering	Date of Ripening	Plant height	Shattering	Rust: Stripe sev.	Rust: Stripe resp.	Rust: Leaf sev.	Rust: Leaf resp.	Rust: Stem sev.	Rust: Stem resp.	Frost damage
	q/ha	kg/hl	%	% of Protein	Days from Jan 1		cm	%	sev.	resp.	sev.	resp.	sev.	resp.	0-9
Blueboy	28.4	73.4	12.4	2.96	317	358	94	0	15	S	11	S	25	S	1.3
Parker	26.7	81.1	12.2	3.07	315	357	103	0	4	R	0	O	15	S	0.0
Triumph 64	25.2	80.6	13.3	3.04	315	352	113	0	10	MS	16	MS	6	S	0.0
Scout 66	25.1	80.3	13.3	2.98	316	355	120	0	4	R	16	S	5	MS-S	0.0
Sturdy	24.5	79.1	13.8	2.93	313	354	93	0	5	R	1	R	8	S	0.0
San Pastore	24.4	73.0	13.1	2.95	304	345	93	10	0	O	25	S	10	S	1.5
Bezostaia	24.2	80.4	13.7	2.91	318	358	94	0	2	R-MR	3	R-MR	22	S	0.0
Gage	23.2	78.8	11.8	3.16	315	355	113	0	40	S	1	R-MR	7	MS-S	0.0
NB 67730	21.6	79.4	16.1	2.81	315	354	124	0	18	MS	4	R	4	MS-S	0.0
Benhur	20.9	73.9	15.0	2.83	322	360	101	0	21	MS	2	R	4	MS	0.0
Fertodi 293	20.8	71.9	14.6	2.89	319	358	116	0	2	R	21	MS	5	MS-S	0.8
Atlas 66	20.4	75.4	17.4	2.73	316	354	123	0	16	MS	5	MR-MS	7	S	2.3
Bankuti 1201	20.1	81.1	13.7	2.98	323	360	123	0	10	MS	13	MS	10	S	0.5
Shawnee	19.4	80.1	12.6	3.07	315	352	115	0	52	S	11	MS-S	6	MS-S	0.3
Winalta	18.5	79.4	12.8	2.95	323	360	113	0	1	R	18	S	7	S	0.0
Timwin	18.4	68.8	15.7	2.91	325	361	86	0	7	MS	11	MR-MS	0	O	0.0
Gaines	15.6	65.3	13.1	3.09	323	362	84	0	6	R-MR	0	R	42	S	0.0
Arthur	15.4	77.8	14.3	2.94	318	357	90	10	72	S	0	O	11	S	0.0
Lancer	15.4	75.0	13.6	2.98	324	363	113	0	2	R	21	MS	11	S	0.0
Lerma Rojo 64	15.0	75.2	14.9	2.78	294	345	83	0	7	MS	8	S	0	O	5.3
Yung Kwang	13.4	71.3	13.8	2.83	322	359	99	0	72	S	16	S	15	S	0.0
Cappell Desprez	13.3	62.0	16.2	2.79	327	363	88	0	1	R	17	MR	8	S	1.8
Yorkstar	12.8	68.4	13.0	3.15	324	363	95	0	77	S	7	MS-S	22	S	0.0
Purdue 4930A6-28-2-1	12.7	77.4	16.0	2.90	322	356	113	20	50	S	1	MR	7	S	0.0
Stadler	12.4	69.6	14.3	2.98	325	365	109	0	5	MS	5	MR	25	S	0.0
Riley 67	12.3	71.8	14.6	2.89	325	362	96	0	60	S	0	O	15	S	0.0
INIA 66	12.1	76.0	15.2	2.78	300	344	69	0	0	O	10	S	0	O	6.8
Heine VII	5.0	.. ..	16.3	2.73	321	369	78	0	0	O	37	S	25	S	1.0
Felix	1.8	.....	18.1	2.86	310	372	68	0	0	O	37	S	47	S	1.8
Odin	.....	... .	.. ..	. ..	.	. ..	70	0	6	MS-S	53	S	25	S	1.0
Mean	17.9	75.0	14.3	2.93	318	358	99	1.3	19		12		13		0.8
Coefficient of Variation	11.6	1.2	5.8	2.13	2.1	0.7	5.0	0.03	....		....		....		....
Least Significant Difference, 5%	2.9	1.3	1.2	0.09	9.2	3.4	7.0	0.00	....		....		....		....

ARGENTINA

Pergamino

Cooperators: José Rath; Ernesto Florencio Godoy

Date of planting: July 8, 1968

Precipitation during cycle of test: June to December, 1968 = 584 mm. (1968 total = 911.2 mm.).

Amount of irrigation applied: None

Fertilizer used: None

General description of climatic conditions during test: Dry fall (April and May); mild winter (June, July and August); early spring (September and October) normal but November hot and dry.

Disease development: severe attack of leaf rust.

Insect, weed or pest problems: some greenbug damage.

Date of harvest: Dec. 21, 1968

Area harvested for yield: 3 square meters

Dates when different notes were taken: Leaf rust—Oct. 24, 1968.

Data in Table 2.

Table 2. Grain quality and disease data for the 30 cultivars in the "1st International Winter Wheat Performance Nursery" grown in Pergamino, Argentina, 1969.

Cultivar	Protein	Lysine	Leaf rust[a]	
	%	% of Protein	sev.	resp.
Felix	.....	.....	5	S
Heine VII	.....	.....	0	O
Odin	.....	.....	10	S
San Pastore	19.3	2.89	5	S
Cappell Desprez	.....	.....	0	O
Bezostaia	18.3	2.80	0	O
Bankuti 1201	.....	.....	50	S
Fertodi 293	.....	.....	0	O
Yung Kwang	.....	.....	80	S
Winalta	.....	.....	80	S
Blueboy	17.5	2.72	25	S
Benhur	18.7	2.76	10	S
Riley 67	.....	.....	80	S
Timwin	.....	.....	80	S
Stadler	.....	.....	60	S
Gaines	19.4	2.87	80	S
Yorkstar	18.2	2.94	30	S
Triumph 64	14.4	2.80	80	S
Scout 66	15.8	2.87	80	S
Parker	18.1	2.84	20	S
Gage	17.9	2.86	0	O
Sturdy	16.8	2.85	10	S
Shawnee	17.3	2.89	10	S
Lancer	15.3	3.04	60	S
Atlas 66	22.5	2.68	80	S
Purdue 4930A6-28-2-1	21.4	2.87	60	MR
NB 67730	19.3	2.77	20	S
Arthur	17.3	2.91	80	S
Lerma Rojo 64	19.4	2.83	1	S
INIA 66	17.6	2.76	5	S
Mean	18.1	2.84	37	

[a] One rep only.

CHILE

Temuco

Cooperators: Rodolfo Gonzalez B.; Juan Acevedo A.

Date of planting: Aug. 22, 1968

Precipitation during cycle of test: not reported

Amount of irrigation applied: None

Fertilizer used: P_2O_5 = 200 kg./ha.; N = 96 kg./ha.

General description of climatic conditions during test: Growing season more warm and moist than normal with drought during filling.

Disease development in general: Good development of stripe rust. Due to late planting date no records on leaf rust were obtained. No stem rust occurs at this location.

Insect, weed or pest problems: none mentioned

Date of harvest: March 27, 1969

Area harvested for yield: 3 square meters

Dates when different notes were taken: Stripe Rust—Dec. 22, 1968; height and lodging—March 15, 1969.

Data in Table 3.

Table 3. Agronomic, grain quality and disease data for the 30 cultivars in the "1st International Winter Wheat Performance Nursery" grown at Temuco, Chile, 1969.

Cultivar	Yield	Test weight[a]	Protein	Lysine	Plant height[a]	Lodging[a]	Stripe rust[a]	
	q/ha	kg/hl	%	% of Protein	cm.	%	sev.	resp.
Sturdy	35.1	75.0	12 3	3.12	90	10	10	MS
Fertodi 293	31.7	73.2	11.5	3.13	115	40	10	MS
Scout 66	28.3	75.5	12.3	3.08	125	40	10	S
Blueboy	27.8	69.2	12.4	3.09	95	10	20	MS
Winalta	25.7	77.9	11.6	3.03	110	60	1	MS
Atlas 66	23.3	73.7	14.2	3.09	115	90	40	S
Lancer	23.1	77.3	12.1	3.21	110	20	10	MS
Benhur	22.5	77.5	12.9	3.02	105	10	30	S
Bezostaia	22.1	72.5	13.0	2.87	75	20	0	O
San Pastore	20.6	67.3	14.2	2.93	85	10	70	S
Parker	19.3	75.7	13.5	3.04	115	30	1	MS
Gage	18.8	73.7	12.4	3.17	115	40	40	MS
NB 67730	17.4	76.3	14.4	3.08	115	40	10	MS
INIA 66	17.3	71.2	13.6	2.92	80	20	70	S
Timwin	17.1	75.9	13.5	3.02	80	10	30	S
Arthur	16.4	76.8	13.0	3.18	90	20	20	MS
Gaines	15.5	63.0	11.6	3.22	80	10	10	MS
Shawnee	15.1	75.7	11.4	3.23	110	30	50	S
Bankuti 1201	13.5	74.1	13.2	2.93	110	40	5	MS
Cappell Desprez	12.8	65.0	13.9	2.84	80	10	10	MS
Purdue 4930A6-28-2-1	12.3	78.6	16.0	2.95	90	10	70	S
Lerma Rojo 64	12.3	69.6	15.2	2.91	80	20	70	S
Yorkstar	11.9	65.0	11.5	3.36	95	20	50	S
Riley 67	10.3	75.0	13.2	3.07	95	10	60	S
Triumph 64	8.4	72.3	12.3	3.15	105	40	30	S
Yung Kwang	4.2	.....	11.2	3.34	80	20	60	S
Stadler	2.8	.....	12.5	3.20	100	10	20	S
Felix	.....	.....	.....	.....	.....	....	10	MS
Heine VII	.....	.....	.....	.....	.....	....	0	O
Odin	.....	.....	.....	.....	.....	....	0	O
Mean	18.0	73.1	12.9	3.08	100	25.6	27	
Coefficient of Variation	18.8	.....	7.1	3.20	.....	....	....	.....
Least Significant Difference, 5%	4.8	.....	1.3	0.10	.....	....	....	.....

[a] One rep only.

UNITED STATES

North Carolina

Cooperator: C. F. Murphy

Date of planting: Oct. 23, 1968

Precipitation during cycle of test: not reported

Amount of irrigation applied: None

Fertilizer used: N = 90 kg./ha.; P = 90 kg./ha.; K = 90 kg./ha.

General description of climatic conditions during test: Very dry at planting time; good winter conditions; quite dry during early spring.

Disease development: None

Insect, weed or pest problems: None

Date of harvest: June 16, 1969

Area harvested for yield: 1.5 square meters

Dates when different notes were taken: Winter survival—April 5, 1969; plant height—May 28, 1969; lodging—May 28, 1969.

Data in Table 4.

Table 4. Agronomic and grain quality data for the 30 cultivars in the "1st International Winter Wheat Performance Nursery" grown at Rowan Co., North Carolina, 1969.

Cultivar	Yield	Test weight[a]	Protein[a]	Lysine[a]	Plant height[a]	Lodging
	q/ha	kg/hl	%	% of Protein	cm.	%
Blueboy	46.9	74.2	15.0	2.75	102	0.0
Yorkstar	44.2	73.7	14.5	2.87	107	0.0
Arthur	42.8	79.7	15.7	2.88	112	2.5
Stadler	42.1	80.0	14.6	2.68	122	3.8
San Pastore	41.6	75.5	14.8	2.88	108	0.0
Shawnee	39.7	80.1	14.9	2.82	122	0.0
Bezostaia	39.4	79.7	14.8	2.84	109	0.0
Gaines	38.9	76.9	13.8	2.85	78	0.0
Heine VII	38.0	75.6	17.2	2.73	99	0.0
Riley 67	37.3	77.4	15.5	2.79	121	2.5
Gage	36.3	79.1	15.8	2.79	113	1.3
Benhur	34.8	78.0	14.8	2.79	116	0.0
Purdue 4930A6-28-2-1	34.6	78.2	18.1	2.78	128	5.0
Scout 66	34.1	79.9	15.1	2.74	121	25.0
Lancer	34.0	79.3	15.4	2.84	116	20.0
Parker	34.0	81.0	16.2	2.75	117	3.8
Yung Kwang	33.5	76.0	17.6	2.62	116	1.3
Triumph 64	33.3	80.6	14.3	2.69	119	40.0
Fertodi 293	32.9	78.2	15.9	2.77	117	0.0
Atlas 66	32.7	76.1	18.9	2.68	117	26.3
NB 67730	32.4	78.7	17.0	2.71	121	53.8
Sturdy	31.5	78.7	16.0	2.70	93	0.0
Bankuti 1201	31.3	80.0	16.5	2.87	131	17.5
Timwin	30.7	75.7	15.4	2.88	95	0.0
Winalta	30.2	79.7	14.7	2.84	112	1.3
Lerma Rojo 64	28.1	78.7	16.2	2.73	97	0.0
Odin	26.8	72.2	17.6	2.84	111	0.0
Cappell Desprez	25.1	71.0	18.1	2.72	98	0.0
Felix	24.7	72.1	18.5	2.83	90	0.0
INIA 66	.....	.....	17.0	2.73	.....	.....
Mean	34.9	77.5	16.0	2.78	111	7.0
Coefficient of Variation	12.2	.....	.....	.....	.....	.....
Least Significant Difference, 5%	6.0	.....	.....	.....	.....	.....

[a] One rep only.

UNITED STATES

Oklahoma

Cooperators: E. L. Smith; L. H. Edwards

Date of planting: Oct. 7, 1968

Precipitation during cycle of test: July 1, 1968 through June 30, 1969 = 738.1 mm.

Amount of irrigation applied: None

Fertilizer used: NH_4NO_3 = 44.8 kg./ha.

General description of climatic conditions during test: Good moisture throughout growing season.

Disease development: Powdery mildew developed in early spring followed by moderate leaf rust infection.

Insect, weed or pest problems: none of consequence

Date of harvest: June 10, 1969 (June 18, 1969 for later cultivars)

Area harvested for yield: 1.5 square meters

Dates when different notes were taken: Leaf rust—May 21, 1969; stem rust—June 5, 1969; powdery mildew—April 24, 1969; plant height—June 9, 1969; lodging—June 10, 1969 and June 18, 1969 for later cultivars.

Data in Table 5.

Table 5. Agronomic, grain quality and disease data for the 30 cultivars in the "1st International Winter Wheat Performance Nursery" grown at Stillwater, Okla., 1969.

Cultivar	Yield	Test weight[a]	Protein[a]	Lysine[a]	Date of Flowering	Date of Ripening	Plant height[b]	Lodging[b]	Rust[b] Leaf sev.	Rust[b] Leaf resp.	Rust[b] Stem sev.	Rust[b] Stem resp.	Mildew[b] sev.
	q/ha	kg/hl	%	% of Protein	Days from Jan. 1		cm.	%					
Arthur	44.9	80.1	15.6	2.84	117	151	97	10	5	MR	0	O	1
Bezostaia	41.5	80.8	14.4	2.79	120	153	99	20	1	MR	20	S	20
Parker	38.4	82.0	16.2	2.76	120	151	104	20	20	MS	1	S	10
Triumph 64	38.3	81.7	15.9	2.81	117	145	104	70	50	S	1	S	20
Scout 66	38.3	79.7	15.4	2.88	121	152	109	60	50	S	0	O	1
Benhur	37.7	79.3	16.3	2.71	113	146	109	30	10	MS	1	S	1
Gage	35.6	79.2	16.3	2.83	122	154	107	30	10	MS	1	MS	10
San Pastore	34.4	75.7	15.4	2.79	112	152	94	20	30	S	1	S	20
Riley 67	33.1	78.8	16.5	2.82	119	148	109	60	0	O	5	S	1
Fertodi 293	33.0	77.7	16 6	2.86	123	156	112	5	40	S	1	S	10
Blueboy	32.8	69.1	15.3	2.81	122	156	97	5	50	S	1	S	10
Shawnee	31.9	80.6	15.3	2.76	123	154	114	5	50	S	1	MS	20
Purdue 4930A6-28-2-1	31.8	80.0	19.4	2.72	122	155	114	20	20	MS	1	MS	10
NB 67730	31.7	78.3	19.0	2.65	122	154	114	50	1	R	0	O	20
Stadler	31.4	80.9	16.0	2.78	120	151	114	20	5	MS	10	S	20
Yung Kwang	31.3	72.5	16.8	2.66	122	155	109	60	80	S	20	S	20
Sturdy	31.2	77.4	15.7	2.74	118	151	94	10	1	MR	20	S	30
Timwin	30.3	72.1	17.5	2.81	121	154	84	30	30	S	0	O	1
Bankuti 1201	28.9	80.6	17.4	2.86	124	158	119	10	40	S	1	S	20
Winalta	28.5	79.6	15.2	2.81	129	159	112	10	60	S	1	S	30
Lancer	27.5	79.7	15.3	2.90	124	157	107	5	50	S	1	S	1
Yorkstar	26.6	70.3	15.1	2.93	125	161	112	10	60	S	1	S	1
Heine VII	25.6	72.5	16.6	2.63	129	162	97	5	20	S	20	S	10
Gaines	24.9	65.9	15.4	2.97	129	166	84	60	20	S	5	S	30
Cappell Desprez	20.8	66.6	18.4	2.74	131	165	94	5	1	R	1	S	1
Atlas 66	20.8	76.1	19.5	2.66	123	160	107	40	1	S	1	S	10
Felix	14.3	67.5	18.4	2.82	136	169	86	10	30	S	5	S	20
Odin	10.8	65.8	19.4	2.78	138	169	91	30	15	S	10	S	1
Lerma Rojo 64	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
INIA 66	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mean	30.6	76.1	16.6	2.79	123	156	103	25.4	27	.....	5	.....	12
Coefficient of Variation	14.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Least Significant Difference, 5%	6.1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

[a] One rep only.
[b] Two reps only.

UNITED STATES

California

Cooperators: J. A. Rupert; C. O. Qualset

Date of planting: Dec. 15, 1968

Precipitation (or irrigation) during cycle of test: One irrigation during flowering.

Amount of irrigation applied: not reported

Fertilizer used: None (previous crop was beans)

General description of climatic conditions during test: Excessive winter rains in seedling stage. Hot, dry winds during and after flowering damaged late varieties.

Disease development: Heavy infection of stripe rust.

Insect, weed or pest problems: None

Date of harvest: July 10, 1969

Area harvested for yield: 3 square meters

Dates when different notes were taken: Stripe rust—May 26, 1969.

Data in Table 6.

Table 6. Agronomic, grain quality and disease data for the 30 cultivars in the "1st International Winter Wheat Performance Nursery" grown at Davis, Calif., 1969.

Cultivar	Yield	Protein[a]	Lysine[a]	Date of Flowering[a]	Date of Ripening[a]	Plant height[a]	Stripe rust[a]	
	q/ha	%	% of Protein	Days from Jan. 1		cm.	sev.	resp.
Lerma Rojo 64	56.7	13.7	2.87	115	140	105	5	R
Triumph 64	49.9	13.7	2.96	125	146	115	50	MS
INIA 66	49.7	16.2	2.76	113	135	80	10	R
Sturdy	46.8	14.5	2.90	128	152	80	5	R
San Pastore	46.2	14.3	2.86	121	142	95	5	R
Bezostaia	45.2	14.7	2.81	128	154	105	10	R
Scout 66	43.0	13.2	2.91	129	154	120	20	MR
Benhur	41.7	15.2	2.84	128	152	105	60	MS
Yung Kwang	40.9	15.4	2.78	131	157	110	90	S
Timwin	40.4	14.5	2.90	130	156	90	50	S
Parker	38.5	15.4	2.86	126	152	105	20	MR
Gaines	37.4	14.4	2.96	137	165	85	30	MR
Heine VII	37.3	15.8	2.78	141	166	110	20	MR
Arthur	36.6	13.9	2.90	128	154	105	90	S
Lancer	36.3	14.6	2.82	155	160	130	10	R
Stadler	35.6	14.4	3.05	128	154	125	70	S
Fertodi 293	34.6	15.9	2.78	133	161	120	0	O
Riley 67	33.5	15.4	2.85	128	152	110	40	MS
Shawnee	31.0	14.8	2.88	133	156	120	80	S
Blueboy	30.4	16.4	2.83	133	153	95	80	S
NB 67730	29.5	18.2	2.80	128	152	125	5	R
Gage	29.1	17.1	2.76	133	153	120	10	R
Atlas 66	29.1	18.8	2.71	123	156	125	5	R
Winalta	28.7	15.5	2.81	140	154	125	5	R
Yorkstar	27.4	15.5	2.89	135	161	115	80	S
Felix	27.0	18.3	2.89	142	174	105	0	O
Bankuti 1201	26.4	15.1	2.68	137	156	135	0	O
Purdue 4930A6-28-2-1	25.2	17.0	2.92	131	157	125	60	S
Cappell Desprez	21.0	17.8	2.69	140	164	95	0	O
Odin	10.1	17.9	2.97	147	176	95	0	O
Mean	35.5	15.6	2.85	131	155	109	30	.....
Coefficient of Variation	12.5	.....	.....	.....	.....	.....	....	.....
Least Significant Difference, 5%	6.3	.....	.....	.....	.....	.....	....	.....

[a] One rep only.

SWEDEN

Svalöf

Cooperator: Gösta Olsson

Date of planting: Oct. 5, 1968

Precipitation during cycle of test: March 1 to July 31, 1968 = 252 mm.; Aug. 1 to Aug. 31, 1968 = 67 mm.

Amount of irrigation applied: None

Fertilizer used: N = 90 kg./ha.; P = 72 kg./ha.; K = 72 kg./ha.

General description of climatic conditions during test: More sun, higher temperature and less precipitation than normal.

Disease development: Relatively weak attack of mildew. Leaf rust very late. No stem rust or no stripe rust.

Insect, weed or pest problems: None

Date of harvest: Aug. 3–20, 1968. Dried on the field before threshing.

Area harvested for yield: 5 square meters

Dates when different notes were taken: Winter survival—April 17, 1969; mildew—July 9, 1969; plant height—July 20, 1969; lodging—July 20, 1969.

Data in Table 7.

Table 7. Agronomic, grain quality and disease data for the 30 cultivars in the "1st International Winter Wheat Performance Nursery" grown at Svalöf, Sweden, 1969.

Cultivar	Yield	Test weight	Protein	Lysine	Date of Flowering	Date of Ripening	Plant height	Lodging	Shattering	Winter survival	Mildew
	q/ha	kg/hl	%	% of Protein	Days from Jan. 1		cm.	%	%	%	sev.
Odin	73.4	82.6	14.8	2.83	174	230	109	12.5	0.9	98.0	5
Heine VII	70.1	78.9	14.2	2.67	170	223	89	37.5	0.0	99.8	43
Bezostaia	69.1	83.0	14.1	2.81	168	222	79	10.0	0.0	92.0	40
Stadler	67.9	84.2	15.0	2.86	167	219	95	40.0	0.7	90.0	43
Felix	66.7	79.9	13.9	2.95	173	226	85	0.0	0.0	94.5	40
Cappell Desprez	65.2	79.2	14.3	2.85	170	222	80	10.0	0.0	84.8	25
Blueboy	59.9	80.8	17.3	2.78	168	228	89	10.0	1.6	82.5	1
Yorkstar	59.1	79.8	15.1	2.84	169	219	89	50.0	1.9	93.5	30
Sturdy	58.9	80.9	15.3	2.68	165	215	69	0.0	0.0	89.8	65
Fertodi 293	58.8	80.7	17.0	2.79	166	215	91	37.5	0.0	99.0	20
Riley 67	58.7	81.7	16.8	2.80	163	219	85	42.5	0.0	87.5	15
San Pastore	57.6	81.3	13.6	2.98	165	213	75	5.0	4.1	72.5	73
Yung Kwang	57.4	79.9	17.8	2.75	163	212	81	45.0	0.0	89.8	70
Parker	56.6	83.1	16.9	2.70	165	219	79	5.0	0.0	87.3	80
Timwin	56.1	81.1	15.7	2.87	168	219	76	50.0	0.0	94.3	11
Benhur	54.0	81.7	17.5	2.63	164	217	86	7.5	0.0	96.8	9
Lancer	53.3	82.4	16.2	2.75	167	216	85	60.0	0.0	94.3	10
Gaines	53.1	78.7	13.9	2.92	168	223	69	7.5	0.0	89.8	63
Gage	51.2	79.9	17.5	2.66	165	217	81	15.0	0.0	92.3	19
Shawnee	49.4	82.3	16.6	2.69	166	220	91	15.0	0.0	94.3	53
Winalta	48.8	80.9	16.4	2.80	168	218	88	25.0	0.0	96.8	40
NB 67730	48.4	78.6	20.5	2.51	164	213	96	50.0	0.0	96.8	20
Triumph 64	47.2	80.5	16.7	2.68	164	213	84	42.5	0.0	94.5	75
Atlas 66	46.3	80.6	18.8	2.60	167	226	90	30.0	2.0	72.5	13
Scout 66	45.7	80.3	18.3	2.66	165	213	84	55.0	0.0	96.8	10
Purdue 4930A6-28-2-1	45.2	80.6	19.5	2.61	166	216	90	45.5	4.1	92.3	10
Arthur	44.4	80.3	17.4	2.77	166	218	81	27.5	2.9	91.0	0
Bankuti 1201	44.1	79.1	17.9	2.72	166	215	93	57.5	0.0	99.0	23
Lerma Rojo 64	40.6	79.7	16.5	2.71	162	212	70	47.5	0.0	57.5	83
INIA 66	11.8	70.6	15.8	2.73	160	213	60	2.5	0.0	15.0	83
Mean	54.0	80.7	16.4	2.75	167	218	83.9	28.0	0.6	87.5	36
Coefficient of Variation	11.5	0.8	2.3	2.85	0.3	0.2	3.5	37.0	182	7.6	...
Least Significant Difference, 5%	8.8	0.9	0.6	0.11	0.7	0.6	4.1	14.6	1.6	8.4	....

NETHERLANDS

Wageningen

Cooperators: Ir. A. C. Zeven; J. Sneep

Date of planting: Oct. 22, 1968

Precipitation during cycle of test: 449.1 mm.

Amount of irrigation applied: None

Fertilizer used: $K_2O = 40$ kg./ha.; $P_2O_5 = 40$ kg./ha.; $N = 23$ kg./ha.

General description of climatic conditions during test: Winter severe, spring cold and wet, summer hot and dry.

Disease development: Some cultivars were attacked by stripe rust and/or mildew; other diseases were not observed.

Insect, weed or pest problems: None

Date of harvest: According to date of ripeness.

Area harvested for yield: 3.75 square meters

Dates when different notes were taken: Winter survival and frost damage—Febr. 25, 1969; stripe rust and mildew—July 15, 1969; height —June 13, 1969.

Data in Table 8.

Table 8. Agronomic, grain quality and disease data for the 30 cu[illegible] in the "1st International Winter Wheat Performanc[illegible] Nursery" grown at Wageningen, Netherlands, 1969.

Cultivar	Yield	Test weight	Protein	Lysine	Date of Flowering	Date of Ripening	Plant height	Lodging	Shattering	Winter survival	Stripe rust	Mildew	Frost damage
	q/ha	kg/hl	%	% of Protein	Days from Jan 1		cm.	%	%	%	resp.	resp.	0–9
Yorkstar	51.3	76.8	11.5	3.39	164	212	106	0 0	18.8	91.3	S	S	3.5
San Pastore	50.3	80 0	13.2	3.11	159	206	108	0.0	28.8	91.3	S	R-S	3.5
Heine VII	49.2	78.9	13.3	3.10	167	217	119	0.0	7.5	95.8	R-S	S	2.0
Blueboy	48.4	76.4	11.7	3.30	164	212	104	0.0	10.0	88 8	S-VS	S	4.5
Bezostaia	48.1	82.7	12.6	3.16	162	212	103	0.0	7.5	90 0	R-S	S	4.0
Sturdy	46.8	83.3	12.9	3.10	159	206	100	0.0	5.0	92.5	R	VS	3.0
Lerma Rojo 64	46.7	84.0	12.9	3.09	159	204	114	0.0	20.0	63.8	S	S-VS	6.5
Cappell Desprez	46.2	76.2	14 6	2.96	167	217	112	0.0	18.8	88.8	R	R-S	4.5
Gaines	45.8	76.2	11.8	3.29	165	212	80	0.0	20.0	90.0	S	S-VS	4.0
Benhur	45.0	82.0	12.8	3 09	156	203	115	0 0	16.3	92.5	S-VS	S	2.5
Riley 67	45.0	82.5	13.4	3.08	163	185	124	12.5	20.0	87.5	[illegible]	S-VS	5.0
Yung Kwang	44.3	80.0	12.1	3.15	158	203	126	12.5	17.5	88.8	S-VS	R-S	4.5
Felix	43.5	78.9	12.7	3.22	168	217	113	0 0	10.0	93.3	R	S	3.0
Fertodi 293	43.3	80.8	14.1	3 06	162	208	133	17.5	18.8	90.0	R	R-S	4.0
Stadler	43.3	83.7	12.2	3.28	163	185	126	0.0	20.0	86.3	S-VS	S-VS	4.5
Atlas 66	42.7	83.0	14.6	2.97	163	207	136	52.5	18.8	91.3	S	S	3.5
Timwin	42.0	77.2	13.0	3.20	163	181	102	0.0	15.0	85.0	S-VS	S	5.5
Arthur	41.6	81.5	13.1	3.16	161	206	119	0.0	26.3	88.8	S-VS	R-S	4.5
Gage	40.8	82.6	13.2	3.07	163	207	125	27.5	21 3	88.8	S	S	4.5
Bankuti 1201	40.8	82.6	13.8	3.03	162	208	145	77.5	23.8	91.3	S	S	5.5
Parker	37.6	83.6	13.8	3.06	161	206	111	0.0	17.5	88.8	S-VS	S-VS	4.5
Purdue 4930A6-28-2-1	37.1	83.1	14.7	3.01	160	204	132	0.0	23.8	88.8	R-S	S	4.0
Scout 66	37.1	82.3	14.4	2.97	160	205	128	61.3	26.3	92.5	S	R-S	2.5
Odin	37.0	76.7	13.6	3.13	169	217	146	0.0	17.5	92.5	R	R	3.0
Shawnee	34.8	81.9	12.0	3.15	163	207	127	0.0	18.8	78.8	VS	S	6.5
NB 67730	34.7	82.6	14.5	3.04	159	204	139	55.0	13.8	90.0	S	S	4.0
Lancer	34.2	82.8	14.1	3.05	164	206	130	97.5	21.3	87.5	R-VS	R-S	5.0
Triumph 64	33.7	81.9	15.2	3.00	158	203	127	85.0	17.5	95.0	S	S-VS	2.0
Winalta	33.3	82.3	13.7	3.02	164	209	132	92.5	5.0	88.8	S	S	4.5
INIA 66	21.8	78.8	14.5	2.95	152	204	90	0.0	21.3	50.0	S	S-VS	8.0
Mean	41.5	80.8	13.3	3.11	162	206	119	19.7	17.5	87.6	...	...	4.2
Coefficient of Variation	6.7	1.6	3.4	2.06	0.8	6.5	2.8	47.7	12.9	4.6	.....	.....	28.9
Least Significant Difference, 5%	3.9	1.9	0.6	0.09	1.7	19.1	4.8	13.3	3.2	5.7	.....	.....	1.7

FRANCE

Versailles

Cooperator: C. Goujan

Date of planting: Nov. 9, 1968

Precipitation during cycle of test: 502 mm.

Amount of irrigation applied: None

Fertilizer used: 100 P; 100 K; 90 N

General description of climatic conditions during test: Normal climate for Versailles.

Disease development: not reported

Insect, weed or pest problems: none mentioned

Date of harvest: July 20, 1969

Area harvested for yield: Nursery was harvested for seed only because of severe early lodging.

Dates when different notes were taken: Lodging—June 3, 1969; stripe rust—June 19, 1969; stem rust—July 8, 1969; mildew—June 19, 1969.

Data in Table 9.

Table 9. Agronomic and disease data for the 30 cultivars in the "1st International Winter Wheat Performance Nursery" grown in Versailles, France, 1969.

Cultivar	Date of flowering[a]	Lodging[a]	Rust[a]	
			Stripe	Stem
	Days from Jan. 1	%	resp.	resp.
Felix	149	85.0	O	S
Heine VII	148	85.0	O	S
Odin	150	85.0	O	S
San Pastore	133	25.0	MR	S
Cappell Desprez	145	75.0	R	S
Bezostaia	142	95.0	MS	MS
Bankuti 1201	143	85.0	MS	MR
Fertodi 293	145	95.0	O	MR
Yung Kwang	142	95.0	S	S
Winalta	149	85.0	MS	MS
Blueboy	146	75.0	O	MR
Benhur	134	95.0	MS	S
Riley 67	143	95.0	MS	MS
Timwin	143	95.0	S	MS
Stadler	141	95.0	S	S
Gaines	149	95.0	S	S
Yorkstar	150	95.0	S	S
Triumph 64	134	95.0	S	S
Scout 66	140	35.0	O	S
Parker	140	95.0	S	S
Gage	145	85.0	S	S
Sturdy	134	25.0	O	S
Shawnee	143	95.0	S	S
Lancer	146	25.0	O	S
Atlas 66	144	25.0	O	S
Purdue 4930A6-28-2-1	141	95.0	S	S
NB 67730	140	25.0	S	S
Arthur	140	95.0	S	S
Lerma Rojo 64	129	25.0	O	S
INIA 66	125	25.0	O	S
Mean	142	73.3	.....	.....

[a] One rep only.

ITALY

Milano

Cooperator: Bruno Rusmini

Date of planting: Nov. 1–4, 1968

Precipitation during cycle of test: 452 mm.

Amount of irrigation applied: None

Fertilizer used: N = 96 kg./ha.; P_2O = 106 kg./ha.; K_2O = 106 kg./ha.

General description of climatic conditions during test: not reported

Disease development: not reported

Insect, weed or pest problems: none mentioned

Date of harvest: 2–3 days after ripening

Area harvested for yield: 3 square meters

Dates when different notes were taken: none reported

Data in Table 10.

Table 10. Agronomic, grain quality and disease data for the 30 cultivars in the "1st International Winter Wheat Performance Nursery" grown in Milano, Italy, 1969.

Cultivar	Yield	Test weight	Protein	Lysine	Date of Flowering	Date of Ripening	Plant height	Lodging	Winter survival	Rust Leaf sev.	Rust Leaf resp.	Rust Stem sev.	Rust Stem resp.	Frost damage
	q/ha	kg/hl	%	% of Protein	Days from Jan. 1		cm	%	%	sev.	resp.	sev.	resp.	0–9
Blueboy	61.2	75.7	10.0	3.28	140	188	92	0.0	96.5	8	MR	58	S	5.5
Timwin	54.5	79.2	11.2	3.20	140	188	85	2.5	96.5	14	R-MR	0	O	4.5
Yorkstar	50.6	72.6	9.4	3.37	141	191	101	1.3	95.3	53	MS-S	97	MS-S	5.5
Heine VII	49.1	73.7	10.1	3.14	146	191	97	0.0	93.3	58	MR-MS	80	MS-S	5.0
Arthur	48.3	79.9	11.6	3.10	137	183	101	30.0	92.8	11	MR	8	MR	6.0
Yung Kwang	48.3	79.0	12.0	2.95	137	188	104	15.0	95.5	23	MR	0	O	4.5
San Pastore	48.0	77.4	10.5	3.25	134	178	95	0.0	92.8	73	MS-S	58	S	4.5
Stadler	47.8	80.1	10.2	3.22	139	185	117	18.8	95 8	18	MR	88	MS	4.0
Parker	46.6	83.1	11.6	3.05	137	185	99	2.5	97.5	10	MR	20	MR	4.5
Sturdy	46.6	80.4	12.9	2.84	136	183	74	0.0	94.0	10	MR	10	MR	4.0
Fertodi 293	46.3	80.6	11.9	2.97	140	185	122	27.5	95.5	7	MR	16	R-MR	7.0
Bezostaia	45.2	81.6	11.8	2.84	137	188	94	0 0	92.0	3	MR	10	R	6.0
Benhur	44.4	80.3	12.6	2.90	135	181	104	1.3	94.8	15	MR	46	MS	4.0
Gaines	44.0	72.5	9.4	3.36	142	186	74	0.0	97.3	14	R-MR	99	MS	2.0
Lerma Rojo 64	43.9	79.8	12.8	2.89	133	178	87	5.0	89.3	28	MR-MS	4	R	4.5
Gage	43.1	80.2	12.2	2.92	140	185	115	53.8	96.5	25	MR	19	MR	4.0
Shawnee	42.6	81.0	11.8	2.98	141	189	116	43.8	90.0	3	R-MR	0	O	4.5
Atlas 66	42.6	78.4	14.7	2.74	140	189	129	75.0	94.3	9	R-MR	9	R	4.5
Triumph 64	41.5	79.8	13.2	3.87	135	178	113	75 0	97.0	6	MR	3	R	4.0
Bankuti 1201	39.2	81.5	13.0	2.82	141	189	134	75.0	96.0	8	MR	44	MR	4.0
Felix	39.1	71.4	10.1	3.09	147	191	92	0.0	97.5	63	MS-S	92	MS-S	4.0
Cappell Desprez	38.8	73.7	12.5	2.85	147	190	94	0.0	97.3	2	R-MR	85	S	4.5
Scout 66	38.7	79.3	12.1	2.98	139	184	118	75.0	95.8	13	MR	13	R	4.5
Riley 67	38.6	77.8	10.6	3.24	138	181	107	27.5	96.0	75	MS	91	MS	6.0
Purdue 4930A6-28-2-1	38.5	81.8	14.3	2.86	138	184	122	27.5	93.3	15	MR	9	R	4.0
Winalta	37.0	81.6	11.3	3.04	143	186	121	72.5	95.8	29	MR	13	MR	4.0
Odin	35.7	73.3	10.5	3.23	151	194	120	0.0	94.8	8	MR	90	S	4.0
Lancer	34.9	78.9	12.5	2.97	142	189	118	75.0	96.5	15	MR	20	MR	4.0
NB 67730	33.3	81.1	13.6	2.85	138	184	123	65.0	95.3	15	MR-MS	15	R-MR	3.5
INIA 66	30.5	77.5	14.8	2.74	131	177	73	12.5	89.8	11	MR	0	O	8.0
Mean	43.3	78.4	11.8	3.02	139	186	105	26.0	89.8	21		36		4.6
Coefficient of Variation	8.6	1.2	3.7	2.88	0.3	0.1	4.6	65.7	2.8	.		...		15.0
Least Significant Difference, 5%	5.3	1.3	0.6	0.12	0.5	0.2	6.8	24.2	2.8	....		....		1.0

ITALY

Reiti

Cooperators: C. Zitelli; Udo de Cillis

Date of planting: Dec. 23–26, 1968

Precipitation during cycle of test: 690 mm.

Amount of irrigation applied: None

Fertilizer used: 10-30-0 = 400 kg./ha.; 10-10-10 = 100 kg./ha.; NH_4NO_3 = 150 kg./ha.

General description of climatic conditions during test: not reported

Disease development in general: not reported

Insect, weed or pest problems: none mentioned

Date of harvest: July 10–19, 1969

Area harvested for yield: 3 square meters

Dates when different notes were taken: none reported

Data in Tables 11 and 12.

Table 11. Agronomic, grain quality and disease data for the 30 cultivars in the "1st International Winter Wheat Performance Nursery" grown at Reiti, Italy, 1969.

Cultivar	Yield	Test weight	Protein	Lysine	Date of Flowering	Date of Ripening	Plant height	Lodging	Winter survival	Rust Stripe		Rust Leaf		Rust Stem	
	q/ha	kg/hl	%	% of Protein	Days from Jan. 1		cm.	%	%	sev.	resp.	sev.	resp.	sev.	resp.
Blueboy	68.5	77.3	11.8	2.96	146	199	107	0 0	96.0	0	O	30	MR	99	S
Bezostaia	60.8	83.9	12.8	2.76	143	191	108	0.0	96.5	0	O	0	O	10	MS
Timwin	60.8	81.6	12.3	2.94	143	191	95	0 0	82 0	60	MS	23	MR	8	MR
Lerma Rojo 64	58.2	81.8	13.1	2.80	135	182	92	0.0	94.8	0	O	30	MR	0	O
Benhur	55.9	82.6	13.5	2.72	139	189	115	0.0	87.5	0	O	0	O	90	S
Fertodi 293	55.2	81.4	13.7	2.74	148	193	136	25.0	95.5	0	O	30	MS	80	MS
Scout 66	55.0	82.7	13.5	2.85	143	189	128	50.5	94.0	0	O	30	MR	99	MS
Shawnee	54.7	83.3	12 8	2.76	148	188	134	0 0	89.3	80	MS	30	MR	30	MR
Gage	54.1	82.9	13.3	2.89	147	192	127	0.0	94.8	0	O	80	MS	99	MS
Yung Kwang	53.9	78.9	12.3	2.82	143	191	115	0.0	92.8	0	O	80	MS	0	O
Atlas 66	52 6	82.3	16.1	2.61	148	197	135	0 0	90.8	30	MS	0	O	40	MS
Arthur	52.4	82.3	12.9	2.79	142	191	113	0 0	90.8	80	S	60	MS	0	O
Parker	52.3	84.6	12.5	2.96	143	191	117	0.0	89.0	0	O	30	MR	99	S
INIA 66	51.9	80.6	12.8	2 73	132	181	86	0 0	87.3	0	O	0	O	0	O
San Pastore	51.3	78.9	10.7	3.05	136	181	102	0.0	92.3	0	O	90	S	99	MS
Sturdy	50.3	81.3	13.7	2.89	139	188	81	0.0	92.0	0	O	0	O	80	MS
Triumph 64	50.1	82.1	14.3	2.78	136	188	121	12.5	89.5	30	MS	60	MS	80	MR
Purdue 4930A6-28-2-1	48.6	82.4	15.5	2.76	143	189	139	0.0	90.3	60	MS	0	O	0	O
Winalta	48.3	83.0	12.4	2.80	150	192	137	31.3	97.5	0	O	99	S	80	MS
NB 67730	47.8	83.0	15.2	2.71	143	191	137	31.3	93.3	0	O	0	O	70	MS
Bankuti 1201	47.6	81.9	14.3	2.66	148	193	145	43.8	95.5	0	O	10	MS	99	MS
Lancer	47.5	82.8	13.2	2.81	148	192	133	25.0	92.5	0	O	0	O	30	MS
Riley 67	42.5	77.6	10.8	3.13	143	188	126	0 0	97.8	0	O	10	MR-MS	99	S
Stadler	40.9	75.3	10.1	3.31	142	188	128	0.0	83.0	80	MS	30	MS	99	VS
Heine VII	39.7	72.9	11.7	2.99	153	199	112	0 0	95.3	0	O	90	S	99	S
Cappell Desprez	39.1	69.5	13.1	2.72	156	199	107	0.0	99.9	0	O	99	S	99	S
Yorkstar	38.0	67.6	9.3	3.30	150	188	119	0 0	93.3	0	O	99	S	99	MS-VS
Gaines	34.9	65.0	10.5	3.29	150	188	87	0.0	93.0	0	O	60	MS	99	VS
Felix	24.1	65.4	12.5	2.99	164	197	103	0 0	99.9	0	O	99	S	99	S
Odin	21.0	65.0	13.3	2.90	164	199	138	0.0	96.5	0	O	99	S	99	S
Mean	48.6	78.7	12.8	2.88	146	191	117	7.3	92.7	14		42		66	
Coefficient of Variation	7.8	1.7	3.4	2.74	2.0	0.0	3.4	210	5.9	....		....		....	
Least Significant Difference 5%	5.4	1.9	0.6	0.11	4.0	00.	5.7	21.7	7.8	...		....		....	

Table 12. Agronomic and disease data for the 30 cultivars in the "1st International Winter Wheat Performance Nursery" grown at Reiti, Italy, 1969.

Cultivar	Septoria		Shrinking	No. of heads at ripening	Date of heading	Head fertility	Spikelet fertility	Sterile spikelets	1000 Seed wt.
	sev.	resp.	%	heads/mq.	Days from Jan. 1	Seeds/head	Seeds/spikelet	%	gm.
Felix	0	0	43	338	158	40.8	1.9	15.3	28.2
Heine VII	0	0	5	342	148	43.3	2.3	16.0	32.6
Odin	0	0	64	281	158	52.2	2.3	11.9	24.2
San Pastore	0	0	4	305	132	44.5	2.7	5.3	41.7
Cappell Desprez	0	0	11	316	158	35.3	2.0	20.2	38.2
Bezostaia	0	0	3	308	139	42.1	2.2	4.6	51.8
Bankuti 1201	0	0	3	389	142	39.5	2.2	10.7	40.2
Fertodi 293	0	0	3	409	142	33.9	2.0	12.4	43.3
Yung Kwang	0	0	6	307	138	43.2	2.4	9.9	50.0
Winalta	0	0	3	454	146	32.0	2.0	13.4	39.3
Blueboy	0	0	9	417	142	44.4	2.3	6.7	40.7
Benhur	0	0	1	323	136	40.8	2.5	8.0	41.2
Riley 67	0	0	12	358	139	39.8	2.2	8.6	34.3
Timwin	0	0	3	412	139	32.9	2.0	12.1	42.4
Stadler	0	0	8	317	139	47.2	2.2	6.7	30.3
Gaines	70	ms	64	499	146	34.5	2.0	13.6	27.2
Yorkstar	70	ms	18	321	146	47.6	2.4	8.4	29.7
Triumph 64	70	ms	3	407	132	30.0	2.1	11.5	44.2
Scout 66	0	0	3	478	139	31.8	2.1	13.4	45.1
Parker	30	ms	4	528	139	32.4	2.0	12.6	37.0
Gage	0	0	2	426	142	37.2	2.2	9.7	39.4
Sturdy	70	ms	4	481	136	31.9	2.3	9.9	41.9
Shawnee	0	0	5	501	142	38.3	2.2	12.3	42.2
Lancer	0	0	2	501	142	33.8	2.0	9.0	39.0
Atlas 66	30	ms	3	379	142	38.7	2.2	10.5	41.2
Purdue 4930A6-28-2-1	60	ms	2	383	139	32.7	1.9	13.4	42.5
NB 67730	80	ms	2	425	139	34.8	2.2	15.8	41.0
Arthur	0	0	2	376	138	37.2	2.3	7.2	45.6
na Rojo 64	80	ms	2	358	130	40.9	2.6	8.2	46.7
\ 66	99	s	3	266	126	45.5	3.0	10.7	44.0
n	22	—	10	387	141	38.6	2.2	10.9	39.5

YUGOSLAVIA

Novi Sad

Cooperator: Slavko Borojević

Date of planting: Oct. 17, 1968

Precipitation (or irrigation) during cycle of test: 436 mm.

Amount of irrigation applied: 70 mm.

Fertilizer used: N = 125 kg./ha.; P_2O_5 = 93 kg./ha.; K_2O = 80 kg./ha.

General description of climatic conditions during test: not favorable

Disease development in general: rather severe

Insect, weed or pest problems: None

Date of harvest: July 10, 1969

Area harvested for yield: 2 square meters

Dates when different notes were taken: none reported

Data in Table 13.

Table 13. Agronomic, grain quality and disease data for the 30 cultivars in the "1st International Winter Wheat Performance Nursery" grown in Novi Sad, Yugoslavia, 1969.

Cultivar	Yield	Test weight	Protein	Lysine	Date of flowering	Plant height	Lodging	Rust			
								Leaf		Stem	
	q/ha	kg/hl	%	% of Protein	Days from Jan. 1	cm.	%	sev.	resp.	sev.	resp.
Arthur	61.8	77.7	14.8	2.86	140	93	94.3	19	MS-X	0	O
Bezostaia	58.9	77.2	14.0	2.86	140	88	84.8	30	MS-S	0	O
Scout 66	57.7	76.6	14.2	2.91	143	103	99.0	28	MS	0	O
Parker	57.6	79.9	14.8	2.93	142	91	89.5	22	MR-MS	0	O
NB 67730	57.4	76.6	16.4	2.74	141	108	99.0	30	R-MR	0	O
Benhur	57.2	78.0	15.2	2.74	138	96	84.5	21	R-MR	0	O
San Pastore	56.9	73.7	13.2	2.91	138	89	79.8	94	S	2	S
Lerma Rojo 64	56.7	75.4	16.2	2.68	136	89	99.0	17	R	0	O
Yung Kwang	56.3	71.6	13.8	2.85	139	98	89.5	99	S	0	N
Gage	54.3	75.7	15.6	2.85	143	106	99.0	33	R-MR	2	MS
Purdue 4930A6-28-2-1	53.3	77.8	17.7	2.70	140	103	84.8	12	R-X	0	O
Stadler	53.0	78.2	13.7	2.91	140	102	99.0	15	R-X	2	S
Atlas 66	52.5	74.2	18.2	2.67	146	104	99.0	6	MS-X	2	MS
Sturdy	52.3	77.2	14.5	2.81	140	74	15.0	4	R-MR	0	O
Timwin	52.0	72.4	15.4	2.93	143	80	94.3	1	R-MR	0	O
Riley 67	51.7	75.3	15.2	2.88	139	103	99.0	3	S-X	5	S
Backa	50.9	74.5	15.2	2.77	139	81	85.0	76	S	0	O
Bankuti 1201	49.5	76.6	15.2	2.86	142	113	99.0	80	MS-S	0	O
Blueboy	49.1	68.1	14.5	2.86	143	92	74.8	99	S	0	O
Lancer	48.5	75.7	14.7	2.79	145	106	99.0	30	MR-MS	0	O
Triumph 64	48.2	78.2	14.4	2.86	138	97	99.0	65	MS-S	0	O
Shawnee	47.5	77.6	13.8	2.78	144	101	70.0	94	S	0	O
Fertodi 293	46.2	72.6	15.8	2.85	143	112	99.0	96	S	0	O
Gaines	37.6	65.9	14.4	2.94	147	71	30.3	88	S	0	O
Winalta	37.4	74.6	14.3	2.83	143	102	99.0	94	S	0	N
Yorkstar	37.3	64.3	14.4	3.03	146	101	99.0	94	S	0	O
Cappell Desprez	35.5	66.1	17.8	2.71	148	83	75.0	31	MS-X	1	S
Heine VII	35.3	67.0	15.9	2.83	148	92	60.0	96	S	0	O
Felix	27.6	64.6	15.5	2.85	150	91	10.0	99	S	0	N
Odin	23.3	64.0	16.2	2.91	154	104	15.0	78	S	2	S
Mean	48.8	73.6	15.2	2.84	143	96	80.6	51		2.3	
Coefficient of Variation	7.0	1.4	2.4	1.93	0.0	4.9	12.9	....		....	
Least Significant Difference, 5%	4.8	1.5	0.5	0.08	0.0	6.7	14.7	....		....	

ROMANIA

Fundulea

Cooperators: T. E. Muresan; Gh Ittu; N. Eustatin

Date of planting: Oct. 25, 1968

Precipitation during cycle of test: 892.3 mm. (Aug. 1, 1968 to July 31, 1969).

Amount of irrigation applied: None

Fertilizer used: NH_4NO_3 = 48 kg./ha.; P_2O_5 = 48 kg./ha.

General description of climatic conditions during test: Good fall conditions for emergence and growth; winter was not very cold but there was excessive snow; spring was dry but summer was excessively wet.

Disease development in general: Moderate attack of *Fusarium nivale* in the winter; heavy attack of leaf rust in late spring; moderate infections of stripe rust and moderate stem rust on late varieties.

Insect, weed or pest problems: Moderate *Eurygaster maura.*

Date of harvest: July 1–8, 1969.

Area harvested for yield: 3 square meters

Dates when different notes were taken: Winter survival—March 14, 1969; stripe rust—June 16, 1969; leaf rust—June 23, 1969; plant height—June 23, 1969; stem rust—July 1, 1969; lodging—June 30, 1969.

Data in Table 14.

Table 14. Agronomic, grain quality and disease data for the 30 cultivars in the "1st International Winter Wheat Performance Nursery" and 4 local cultivars grown at Fundulea, Romania, 1969.

Cultivar	Yield	Test weight	Protein	Lysine	Date of Flowering	Date of Ripening	Plant height	Lodging	Shattering	Winter survival	Rust: Stripe sev.	Rust: Stripe resp.	Rust: Leaf sev.	Rust: Leaf resp.	Rust: Stem sev.	Rust: Stem resp.	Frost damage
	q/ha	kg/hl	%	% of Protein	Days from Jan 1		cm.	%	%	%							0–9
Scout 66	27.6	81.0	15.2	2.74	142	181	85	10.0	0.2	99.0	0	O	61	S	0	O	1.0
Yorkstar	26.6	74.1	12.8	3.11	148	184	89	3.8	0.9	99.0	30	S	85	S	0	O	2.0
Fertodi 293	26.4	80.6	15.3	2.80	143	181	95	13.8	0.1	96.8	0	O	75	S	0	O	4.0
Lancer	25.3	82.3	14.8	2.79	144	183	88	8.8	0.3	99.0	0	O	56	S	0	O	0.0
Purdue 4930A6-28-2-1	24.5	79.6	18.0	2.77	143	181	92	6.3	2.1	99.0	20	S	20	MS-S	0	O	2.5
Bankuti 1201	23.1	80.5	16.0	2.72	144	181	95	22.5	0.0	99.0	0	O	76	S	0	O	1.5
Gage	22.6	80.4	15.8	2.78	143	182	79	0.0	2.7	99.0	21	S	28	MR-MS	0	O	1.0
Triumph 64	22.1	81.1	16.1	2.70	141	178	77	11.3	0.2	99.0	14	S	60	S	0	O	1.0
Timwin	21.7	79.4	16.1	2.88	144	181	75	3.8	0.1	96.8	11	MS-S	12	MS-X	0	O	1.5
Parker	21.7	82.4	16.1	2.74	142	182	71	0.0	0.2	99.0	3	MR	12	MR-MS	5	S	1.0
Shawnee	21.5	81.3	14.8	2.80	144	183	85	3.8	0.2	99.0	18	S	73	S	0	O	0.0
Stadler	21.5	80.8	15.0	2.90	143	181	86	5.0	0.1	99.0	41	S	8	MS	0	O	3.0
Winalta	20.9	81.6	14.4	2.86	147	182	97	10.0	0.0	99.0	0	O	66	S	0	O	0.0
Blueboy	20.8	74.7	15.3	2.79	148	185	81	0.0	0.1	99.0	0	O	83	S	0	O	4.0
NB 67730	20.1	80.3	17.5	2.74	142	182	88	8.8	0.3	99.0	0	O	9	R-MS	0	O	3.0
Benhur	19.9	79.9	16.0	2.74	140	179	77	2.5	0.1	99.0	6	S	12	MR-MS	0	O	2.0
Riley 67	19.4	78.1	17.2	2.80	143	180	82	2.5	2.6	99.0	12	S	0	O	0	O	1.5
Atlas 66	19.2	71.8	20.5	2.60	148	187	85	2.5	0.0	96.8	3	MR-S	5	MR-X	0	O	8.0
Yung Kwang	19.1	77.3	16.9	2.76	141	179	77	3.8	0.1	99.0	7	S	78	S	0	O	4.0
Arthur	19.1	79.5	15.2	2.87	142	181	70	5.0	1.3	99.0	1	MR	21	MS-S	0	O	3.0
San Pastore	18.1	77.4	15.2	2.88	141	181	66	0.0	4.1	99.0	18	S	61	S	0	O	5.0
Sturdy	16.5	80.6	16.7	2.66	143	183	59	0.0	0.1	99.0	0	O	43	MS-S	0	O	3.0
Moldova[a]	16.5	77.8	16.8	2.83	144	183	73	0.0	0.1	99.0	0	O	43	S	0	O	2.0
Bezostaia	16.4	79.1	14.8	2.82	143	185	71	2.5	0.0	86.3	0	O	65	S	0	O	4.0
Excelsior[a]	16.4	78.7	17.0	2.81	142	181	68	0.0	0.1	99.0	0	O	61	S	0	O	2.5
Dacia[a]	14.1	79.8	16.8	2.72	141	179	65	0.0	0.1	99.0	0	O	63	S	0	O	2.5
Favorit[a]	14.0	77.7	18.6	2.73	140	179	65	0.0	0.1	99.0	0	O	68	S	0	O	2.5
Heine VII	12.2	61.0	18.7	2.80	155	201	69	0.0	0.1	80.0	18	S	70	S	19	S	7.0
Gaines	11.2	71.9	14.4	2.93	148	187	56	0.0	0.2	99.0	12	S	76	S	0	O	1.0
Cappell Desprez	10.8	59.1	19.7	2.82	160	201	66	0.0	0.2	99.0	0	O	30	S	19	S	5.5
Felix	9.3	56.5	18.5	2.82	155	201	63	0.0	0.1	99.0	0	O	80	S	0	O	3.5
Odin	6.0	55.8	17.8	2.93	159	201	80	0.0	0.1	99.0	0	O	90	S	40	S	3.5
Lerma Rojo 64	...	.....	..	...	.. ..	. .		. . .	. .	0.0	....	....	....	.....	....	....	....
INIA 66	..	...	..	...	. .	. .	....	. . .		0.0	.	....	....	.....	....	..	....
Mean	18.9	76.3	16.3	2.30	145	184	78	3.9	0.6	92.0	8.0		49		3.0		2.7
Coefficient of Variation	23.6	1.1	3.4	1.81	0.1	0.1	8.1	147	191	2.4	....		....		....		47.0
Least Significant Difference, 5%	6.5	1.1	0.8	0.07	0.2	0.1	9.0	9.4	1.8	3.1	....		....		....		1.8

[a] Local cultivars

TURKEY

Eskisehir

Cooperators: Rifat Gerek; Huseyin Kutluk; H. P. H. Johnson

Date of planting: Oct. 16, 1968

Precipitation during cycle of test: 469.9 mm. annual (starting Sept. 1, 1968).

Amount of irrigation applied: None

Fertilizer used: P_2O_5 (superphosphate) = 60 kg./ha.; N (ammonium sulfate) = 20 kg./ha.

General description of climatic conditions during test: Favorable fall; mild and rainy winter; cool and rainy spring; unfavorably dry and early summer.

Disease development: Moderately severe stripe rust development, practically no leaf rust or stem rust.

Insect, weed or pest problems: 2,4-D herbicide applied twice.

Date of harvest: July 15, 1969

Area harvested for yield: 3 square meters

Dates when different notes were taken: Frost damage—Febr. 1 and March 1, 1969; flowering—May 20–30, 1969; ripening—July 3–15, 1969; plant height—July 5, 1969; lodging—July 5, 1969; shattering—Aug. 1, 1969; stripe rust—May 30, 1969; leaf rust—June 10, 1969; stem rust—June 20, 1969.

Data in Table 15.

Table 15. Agronomic, grain quality and disease data for the 30 cultivars in the "1st International Winter Wheat Performance Nursery" grown at Eskisehir, Turkey, 1969.

Cultivar	Yield	Test weight	Protein	Lysine	Date of Flowering	Date of Ripening	Plant height	Lodging	Shattering	Rust Stripe		Rust Leaf	Frost damage
	q/ha	kg/hl	%	% of Protein	Days from Jan. 1		cm	%	%	sev.	resp.	resp.	0–9
San Pastore	56.4	81.9	14.2	2.83	134	182	105	0.0	5.3	1	R	O	4
Parker	53.8	82.7	13.5	2 89	143	185	109	0.8	0.8	25	MR-MS	O	0
Fertodi 293	53.4	78.5	13.9	2.85	143	186	119	1.3	0.4	1	R	O	2
Sturdy	52.6	81.7	14.1	2.77	145	185	86	0.0	0.0	1	R	R	2
Lancer	52.4	81.9	12.4	2.93	139	183	119	5.0	1.0	2	R	O	0
Blueboy	52.4	77.8	13.3	2.93	148	192	103	5.5	0.0	25	MR-S	R	4
Cappell Desprez	51.2	78.6	14.9	2.79	149	194	103	0.0	0.2	1	R	O	2
Bankuti 1201	51.1	79.2	14.2	2.93	144	186	126	10.0	0.2	4	R-MR	O	2
Scout 66	50.6	83.9	12.8	2.88	141	185	123	8.8	0.1	5	R	O	2
Odin	50.1	74.8	13.5	3.06	153	197	111	0.0	0.2	0	O	O	2
Bezostaia	49.9	84.6	13.3	3.01	142	189	113	0 0	0.0	2	R-MR	R	0
Felix	47.8	80.8	13.9	2.90	149	194	100	0.0	1.3	0	O	O	2
Lerma Rojo 64	47.7	78.3	13.8	2.86	141	183	91	2.0	0.0	5	R-MS	R	6
Heine VII	46.7	82.6	14.9	2.77	149	193	111	0.0	0.1	0	O	O	2
Winalta	46.7	77.4	11.2	3.09	143	185	115	12.0	0.0	3	R-MR	O	0
Timwin	41.6	76.7	13.2	3.11	146	185	91	1.3	1.6	29	MS-S	N	2
Arthur	41.5	82.3	12.2	3.08	143	185	110	3.3	1.3	25	MS-S	N	2
Shawnee	41.1	80.0	12.3	3 01	141	183	116	5.0	0.1	28	R-S	N	0
Triumph 64	39.9	83.6	12.8	2.85	143	183	114	10.0	0.1	64	MS-S	N	2
Benhur	39.6	82.7	12.1	3.05	140	184	111	1.3	0.0	65	MS	N	2
Gage	39.2	81.9	11.7	3.06	144	185	115	6.5	0.3	25	MS-S	O	2
Riley 67	38.2	82.8	12.1	3.30	140	184	114	2.0	1.3	43	MS-S	N	2
NB 67730	38.1	83.2	13.6	2.93	140	184	126	12.5	0.0	11	MR-MS	O	0
Gaines	33.6	79.7	11.9	3.10	150	191	71	0.0	0.0	36	MR-MS	O	0
Yung Kwang	33.0	78.7	11.6	3.09	140	183	104	4.5	0.2	39	S	N	2
Stadler	32.3	80.0	12.1	3.15	138	185	110	4.5	0.0	55	S	N	2
Yorkstar	28.6	74.8	11.3	3.18	148	189	103	0.0	0.0	36	S	N	4
Purdue 4930A6-28-2-1	24.2	82.7	13.5	2.95	142	184	123	3.3	5.5	46	MS-S	N	4
INIA 66	24.0	83.3	12.9	2.89	141	182	73	0.0	0.0	11	MR-MS	O	8
Atlas 66	24.0	81.5	16.0	2.74	146	187	130	10.8	0.0	29	S	O	4
Mean	42.7	80.6	13.1	2.97	143	186	108	3.7	0.7	20			2.2
Coefficient of Variation	15.1	1.8	5.3	2.94	0.5	0.9	5.1	12.2	236	46			....
Least Significant Difference, 5%	9.1	2.1	1.0	0.12	0.9	2.4	7.9	6.3	2.2	13			....

TURKEY

Ankara

Cooperators: Ahmet Demirlicakmak; H. P. H. Johnson
Date of planting: Oct. 25, 1969
Precipitation during cycle of test: not reported
Amount of irrigation applied: not reported
Fertilizer used: 6-4-0; Type: P_2O_5–N.
General description of climatic conditions during test: not reported
Disease development: not reported
Insect, weed or pest problems: none mentioned
Date of harvest: not reported
Area harvested for yield: 3 square meters
Dates when different notes were taken: none reported

Data in Table 16.

Table 16. Agronomic, grain quality and disease data for the 30 cultivars in the "1st International Winter Wheat Performance Nursery" grown at Ankara, Turkey, 1969.

Cultivar	Yield	Test weight	Protein	Lysine	Date of Flowering[a]	Date of Ripening[a]	Plant height[a]	Rust Stripe[a]		Rust Leaf[a]		Rust Stem[a]	
	q/ha	kg/hl	%	% of Protein	Days from Jan. 1		cm.	sev.	resp.	sev.	resp.	sev.	resp.
Bezostaia	41.2	81.4	13.6	2.87	148	188	105	3	MR	1	MR	0	O
Scout 66	40.0	82.7	13.6	3.05	144	188	120	5	MR	2	MR	3	S
Timwin	37.5	78.0	14.2	3.00	149	188	94	60	S	0	O	1	MR
Fertodi 293	35.4	79.7	15.2	2.88	148	188	122	2	MR	1	MR	2	MS
San Pastore	34.7	80.9	13.3	2.96	143	188	100	0	O	2	MS	0	O
Triumph 64	32.1	83.9	14.6	2.87	142	188	112	20	S	0	O	2	MS
Lancer	30.2	82.7	12.7	3.03	150	188	92	2	MR	0	O	2	MS
Stu.dy	29.8	81.4	14.6	2.90	145	188	83	0	O	0	O	0	O
Parker	29.4	82.8	14.7	2.80	150	190	98	5	MR	1	MR	0	O
Riley 67	29.3	81.4	14.3	2.97	147	188	100	60	S	1	MR	4	S
Benhur	29.1	82.2	13.0	3.01	143	188	105	70	S	0	O	0	O
Gage	29.1	81.0	13.4	3.18	149	188	111	60	S	0	O	0	O
Shawnee	28.8	82.5	13.4	2.89	149	188	115	25	S	2	MR	0	O
Bankuti 1201	28.3	82.1	15.3	2.91	148	188	130	3	MS	2	MS	1	MR
NB 67730	27.6	81.9	15.6	2.88	148	188	121	2	MR	1	MR	0	O
Yorkstar	27.3	73.4	11.9	3.23	150	188	98	80	S	0	O	3	MR
Atlas 66	26.0	77.9	17.6	2.65	149	188	106	30	S	0	O	0	O
Arthur	25.8	81.5	13.4	2.96	146	188	111	60	S	0	O	0	O
Yung Kwang	25.7	77.8	13.8	2.97	148	188	110	60	S	0	O	2	MS
Heine VII	24.2	78.7	14.9	2.82	155	192	90	0	O	15	MS	2	MR
Blueboy	23.9	76.9	13.4	3.02	148	192	93	60	S	1	MR	0	O
Stadler	23.6	78.9	12.8	3.15	147	188	110	80	S	0	O	0	O
Felix	23.4	78.2	14.4	2.88	161	199	98	5	MR	10	MS	2	MS
Cappell Desprez	22.5	75.4	15.6	2.80	159	196	79	0	O	1	MR	0	O
Lerma Rojo 64	22.3	81.6	14.4	2.85	142	188	88	5	MS	1	MR	0	O
Purdue 4930A6-28-2-1	18.9	80.6	16.1	2.81	149	188	121	60	S	2	MR	0	O
Winalta	16.3	83.3	13.5	2.89	151	190	113	5	MS	2	MS	1	MR
Odin	13.5	79.3	14.4	2.96	157	199	117	0	O	1	MR	0	O
Gaines	11.0	76.8	12.5	3.14	159	195	61	40	S	1	MR	0	O
INIA 66	7.8	81.1	13.2	3.01	142	188	56	2	MR	1	MR	0	O
Mean	26.5	80.2	14.1	2.95	149	190	102	27		1.6		0.8	
Coefficient of Variation	15.4	0.3	1.6	2.22	.....	.....	.....	....		....		....	
Least Significant Difference, 5%	5.8	0.3	0.3	0.09	.....	.....	.....	....		....		....	

[a] One rep only.

IRAQ

Sulaimaniyha

Cooperators: C. L. Pan; Anwar I. Alaka

Date of planting: Nov. 11, 1968

Precipitation during cycle of test: 1172 mm.

Amount of irrigation applied: None

Fertilizer used: N = 80 kg./ha.; P_2O_5 = 40 kg./ha.

General description of climatic conditions during test: very wet winter

Disease development in general: Attacks of stripe rust, leaf rust and stem rust.

Insect, weed or pest problems: Bird injury on INIA 66 and Lerma Rojo 64 because of early flowering.

Date of harvest: June 10, 1969.

Area harvested for yield: 3 square meters

Dates when different notes were taken: Winter survival—Febr. 27, 1969: stripe rust—April 24, 1969; leaf rust—May 3, 1969; stem rust—May 8, 1969.

Data in Table 17.

Table 17. Agronomic, grain quality and disease data for the 30 cultivars in the "1st International Winter Wheat Performance Nursery" grown at Sulaimaniyha, Iraq, 1969.

Cultivar	Yield	Protein[a]	Lysine[a]	Date of Flowering	Date of Ripening	Plant height	Rust Stripe	Rust Leaf	Rust Stem
	q/ha	%	% of Protein	Days from Jan. 1		cm.	resp.	resp.	resp.
Sturdy	24.2	11.5	2 81	123	152	95	VR	VR	R-S
Lerma Rojo 64	23.8	12.7	2.87	104	145	114	VR	VR	R
Blueboy	23.7	11.7	3.11	124	155	106	MS-S	VR-R	MS-S
Bezostaia	21.6	10.6	3.15	123	153	108	VR	VR	R-VS
Timwin	20.2	12.0	3.08	124	153	101	VR-MS	VR-R	R
Arthur	20.2	11.5	2.98	121	150	110	MS-VS	VR-R	R
San Pastore	20.0	11.8	2.92	120	151	111	VR	MS-S	R-S
Gage	19.6	11.4	2.99	128	156	129	MS-VS	VR-R	R-MR
Fertodi 293	18.9	12.1	2.89	128	156	135	VR	VR-MR	R-S
Triumph 64	18.4	12.1	2.98	122	152	125	R-MS	MS-VS	R-MR
Benhur	17.6	12.3	2.93	121	151	115	S-VS	VR	R-MS
Parker	17.5	11.1	3.16	123	153	113	VR	R	MS-S
Lancer	17.3	12.6	3.00	132	159	124	VR	VR	R-MR
Scout 66	16.6	11.9	3.02	127	155	118	VR	VR	R-MR
Atlas 66	16.1	15.8	2.74	124	154	136	MR-MS	VR	R
NB 67730	16.1	15.0	2.83	127	154	138	MR-MS	VR	R
Bankuti 1201	15.2	13.5	2.88	130	157	140	VR-MR	VR-R	S-VS
Yorkstar	15.2	10.8	3.30	129	157	116	MS-VS	MS-VS	S-VS
Riley 67	14.8	11.0	3.28	123	150	118	MS-S	VR-MR	MR-VS
Shawnee	14.5	12.0	2.87	128	158	124	MR-MS	VR	R
Yung Kwang	13.3	12.4	2.75	126	156	109	VS	MS-VS	MR-S
Purdue 4930A6-28-2-1	13.2	14.3	2.99	126	154	125	MS-VS	VR-R	R-S
Heine VII	12.7	14.2	2.74	131	160	109	VR	MR-S	S-VS
INIA 66	12.7	13.6	2.72	101	146	94	VR	VR	R
Stadler	12.4	11.4	3.22	122	152	121	MS-VS	VR-MR	S
Winalta	11.9	12.8	2.91	132	158	120	VR	R-S	R-MS
Gaines	10.9	12.9	3.02	133	159	86	VR-S	MR	S-VS
Cappell Desprez	10.3	11.6	2.72	139	165	100	VR	VR-R	S-VS
Felix	8.2	16.2	2.89	139	163	99	VR	VR-MR	S
Odin	5.1	19.6	2.70	142	165	100	VR	R-MS	S-VS
Mean	16.1	12.8	2.95	126	155	115			
Coefficient of Variation	13.0	.....	.....	1.3	1.0	4.8			
Least Significant Difference 5%	3.0	.....	.....	2.4	2.1	7.8			

[a] One rep only.

IRAN

Karaj

Cooperators: H. C. Thorpe; Mohammed Ali Vahabian

Date of planting: Oct. 20, 1968.

Precipitation (or irrigation) during cycle of test: Irrigated six times.

Amount of irrigation applied: not reported

Fertilizer used: N = 130 kg./ha.; P_2O_5 = 70 kg./ha.; K_2O nil; urea and ammonium phosphate used.

General description of climatic conditions during test: Very severe winter with above-average rainfall in winter and spring.

Disease development: Severe epidemic of stripe rust.

Insect, weed or pest problems: None

Date of harvest: July 8, 1969

Area harvested for yield: 3 square meters

Dates when different notes were taken: none reported

Data in Table 18.

Table 18. Agronomic, grain quality and disease data for the 30 cultivars in the "1st International Winter Wheat Performance Nursery" grown at Karaj, Iran, 1969.

Cultivar	Yield	Protein	Lysine	Date of Flowering	Date of Ripening	Plant height	Lodging	Rust[a] Stripe sev.	Rust[a] Stripe resp.	Rust[a] Stem sev.	Rust[a] Stem resp.
	q/ha	%	% of Protein	Days from Jan. 1		cm.	%	sev.	resp.	sev.	resp.
1-44-1392[b]	46.0	15.7	2.74	130	163	106	0.0	63	MS-VS	...	X
Sturdy	45.8	13.7	2.91	131	168	80	0.0	52	MS-VS	10	MS
Yung Kwang	43.3	13.1	2.97	136	167	101	0.0	55	MS-VS	8	VS
Bankuti 1201	42.3	16.0	2.87	136	170	131	20.0	19	S-VS	8	VS
Fertodi 293	42.0	15.0	2.84	133	168	135	22.5	43	MS-VS	0	O
Parker	41.2	14.9	2.95	132	168	100	0.0	20	MS-VS	5	MS
NB 67730	41.0	17.7	2.79	134	167	131	60.0	21	MS-VS	0	O
Riley 67	40.6	14.9	2.93	130	166	101	0.0	26	MR-VS	....	X
Odin	40.4	17.0	2.99	147	175	104	0.0	44	MR-VS	0	O
Benhur	40.0	15.1	2.90	129	164	85	0.0	62	VS	...	X
San Pastore	40.0	14.0	2.98	124	163	96	0.0	45	MS-VS	9	S
Lancer	39.1	14.1	3.00	137	167	110	40.0	53	MS-VS	0	O
Blueboy	38.7	14.0	2.97	136	170	91	0.0	46	MS-VS	0	O
Cappell Desprez	37.9	16.0	2.79	145	174	101	0.0	20	MS-VS	10	S
Timwin	37.9	14.7	3.08	134	168	81	0.0	87	S-VS	....	X
Purdue 4930A6-28-2-1	37.5	17.1	2.86	130	166	116	17.5	36	MR-VS	....	X
Bezostaia	37.2	13.3	2.93	126	163	91	0.0	34	MS-VS	8	S-VS
Heine VII	36.4	16.5	2.87	141	172	100	0.0	56	VS	13	S
Stadler	36.2	13.0	3.16	132	166	95	0.0	52	MS-VS	0	O
Atlas 66	35.8	17.5	2.77	133	167	126	40.0	54	S-VS	0	O
Winalta	34.5	14.2	2.92	135	170	110	0.0	36	MS-VS	0	O
Lerma Rojo 64	34.4	14.6	2.77	117	163	95	32.5	19	S-VS	....	X
Gage	34.0	14.4	2.95	133	168	95	40.0	26	MS-VS	0	O
Arthur	33.7	14.0	2.90	131	164	95	0.0	44	S-VS	0	O
Triumph 64	33.3	15.2	2.86	131	167	100	21.3	57	MR-VS	0	O
Shawnee	33.1	13.9	2.98	128	162	100	20.0	81	VS	0	O
Felix	32.6	16.5	2.92	146	173	99	0.0	56	S-VS	11	S
Gaines	32.1	13.4	3.11	142	173	72	0.0	37	S-VS	5	VS
Scout 66	30.4	14.3	2.88	134	170	110	42.5	53	MS-VS	0	O
Yorkstar	26.8	13.3	3.16	140	171	85	0.0	93	VS	0	O
Mean	37.5	14.9	2.93	134	168	101	11.9	46		3.6	
Coefficient of Variation	22.4	6.1	3.08	0.6	1.7	1.2	19.1	....		....	
Least Significant Difference, 5%	11.8	1.3	0.13	1.1	4.1	1.7	3.3	....		....	

[a] Felix (MR) and Heine VII (S) were the only cultivars to show leaf rust response.
[b] Local cultivar in place of Inia 66

IRAN

Kermanshah

Cooperator: H. C. Thorpe

Date of planting: Nov. 20, 1968

Precipitation during cycle of test: 828.6 mm.

Amount of irrigation applied: None

Fertilizer used: Urea (46% N) = 20 kg./ha.

General description of climatic conditions during test: Very severe winter with above-average rainfall in winter and spring.

Disease development: Infections of stripe rust and leaf rust.

Insect, weed or pest problems: Birds were a problem.

Date of harvest: June 28, 1969

Area harvested for yield: 3 square meters

Dates when different notes were taken: none reported

Data in Table 19.

Table 19. Agronomic, grain quality and disease data for the 30 cultivars in the "1st International Winter Wheat Performance Nursery" grown at Kermanshah, Iran, 1969.

Cultivar	Yield	Protein	Lysine	Date of Flowering	Date of Ripening	Plant height	Rust Stripe sev.	Rust Stripe resp.	Rust Leaf sev.	Rust Leaf resp.
	q/ha	%	% of Protein	Days from Jan. 1		cm.	sev.	resp.	sev.	resp.
Bezostaia	21.9	14.3	3.00	139	169	91	0	O	0	O
Blueboy	21.0	14.3	2.83	143	169	89	4	MR	5	MR
Rashid[a]	20.8	13.6	2.76	137	171	103	5	R-MR	10	S
Parker	20.4	14.2	2.91	138	170	100	0	O	2	MR
Scout 66	19.7	13.2	2.96	139	171	110	0	O	4	R-MR
Triumph 64	19.6	13.9	2.95	131	152	107	10	MS-S	10	S
Lerma Rojo 64	18.7	14.1	2.75	131	160	85	5	MR	0	O
Heine V[illegible]	17.7	15.4	2.89	147	168	81	0	O	9	MR-MS
Sturdy	17.4	15.0	2.80	139	170	70	0	O	2	R
Lancer	17.3	13.7	2.96	157	172	96	0	O	0	O
San Pastore	16.6	14.0	2.96	135	164	90	0	O	10	S
Fertodi 293	16.5	14.3	2.93	142	171	102	0	O	4	MR
Bankuti 1201	16.4	14.7	2.98	143	171	118	5	MR	0	O
Timwin	15.7	14.9	3.04	141	167	79	10	S	1	R
Cappell Desprez	15.6	18.1	2.83	147	170	83	0	O	4	R
Shawnee	15.5	15.2	2.84	139	170	105	2	R	2	R
Winalta	15.3	14.1	2.82	147	171	107	0	O	5	MR
Gage	14.3	14.4	2.93	156	171	98	10	S	1	M[illegible]
Benhur	14.2	13.8	2.93	132	162	94	10	S	5	MR
Arthur	14.2	13.8	2.95	138	169	86	10	S	2	R-MR
NB 67730	13.8	15.9	2.86	153	169	104	5	R-MR	0	O
Riley 67	13.3	14.7	2.86	136	168	103	10	S	0	O
Atlas 66	13.2	18.5	2.74	155	172	110	5	MR	1	MR
Odin	13.2	17.7	2.99	149	171	81	0	O	4	MR
Purdue 4930A6-28-2-1	13.2	15.8	2.92	138	169	103	10	S	2	R
Yung Kwang	12.8	14.5	2.93	141	170	93	10	S	5	MR-MS
Yorkstar	12.7	13.5	3.13	156	170	92	10	S	10	S
Felix	12.3	17.3	2.93	150	170	71	0	O	8	MR
Gaines	11.2	14.0	3.03	157	172	64	2	R	0	O
Stadler	9.3	14.0	3.11	134	168	98	10	S	10	S
Mean	15.6	14.8	2.92	143	168	93	4.4		3.6	
Coefficient of Variation	20.4	6.1	1.94	1.6	0.5	7.3	....		....	
Least Significant Difference, 5%	4.5	1.3	0.08	3.3	1.1	9.6	....		....	

[a] Local cultivar in place of Inia 66

AFGHANISTAN

Kabul

Cooperators: Mir Mohammed Ayub; Halim Jan; Atif Hakim; E. V. Staker

Date of planting: Sept. 18–19, 1968

Precipitation (or irrigation) during cycle of test: No precise record of precipitation kept. However, from May until harvest practically no rainfall.

Amount of irrigation applied: Most varieties received six irrigations—two in fall of 1968—but varieties Felix, Odin, Heine VII, Cappell Desprez, Blueboy, Timwin and Gaines received one extra irrigation (approximately 4 in. of water applied at each irrigation).

Fertilizer used: 120-120-50 kg./ha.—N as urea (46% N); P_2O_5 as 18% superphosphate; K_2O as potassium chloride (60% K_2O).

General description of climatic conditions during test: Average annual precipitation in Kabul is about 362 mm., very little of which falls in late spring or summer months. Summer of 1969 was very dry at Darul Aman.

Disease development: Stripe rust was most serious disease with only 5 varieties not suceptible. Four varieties were susceptible to leaf rust and 6 to stem rust.

Insect, weed or pest problems: Armyworms present but controlled with sevin. Weed, rat, gopher or bird damage not serious.

Date of harvest: June 28 to July 12, 1969

Area harvested for yield: 3 square meters

Dates when different notes were taken: Frost damage—March 9, 1969; stripe rust—May 18 and June 7, 1969; leaf rust—June 21, 1969; stem rust—June 21, 1969; irrigations—Sept. 22 and 28, 1968 and April 7, May 26, June 4, 12, and 20, 1969; sprayed with sevin May 27, 1969.

Data in Table 20.

Table 20. Agronomic, grain quality and disease data for the 30 cultivars in the "1st International Winter Wheat Performance Nursery" grown in Kabul, Afghanistan, 1969.

Cultivar	Yield	Test weight	Protein	Lysine	Date of Flowering	Date of Ripening	Plant height	Lodging	Winter survival	Rust Stripe	Rust Leaf	Rust Stem
	q/ha	kg/hl	%	% of Protein	Days from Jan 1		cm	%	%	sev.	sev.	sev.
Bezostaia	75.1	83.9	11.7	3.08	136	177	105	31.3	56.3	8	0	0
Blueboy	67.9	76.9	10.7	3.28	136	180	101	6.3	75.0	65	3	6
Yorkstar	65.7	78.1	10.4	3.33	139	178	104	6.3	50.0	65	5	19
Shawnee	61.3	83.6	12.7	2.96	132	175	116	43.8	68.8	55	0	0
Heine VII	61.3	79.3	13.4	2.83	140	181	104	0.0	50.0	0	13	35
Bankuti 1201	60.5	82.8	14.1	2.95	132	174	127	62.5	75.0	43	5	20
Lancer	60.0	84.2	12.6	2.99	132	175	110	37.5	70.0	0	0	0
Timwin	59.4	77.7	13.1	3.17	134	176	94	18.8	72.5	55	0	0
Sturdy	58.3	82.8	12.7	2.76	127	173	96	0.0	53.8	0	0	0
Felix	58.2	77.1	12.5	2.99	153	190	105	0.0	61.3	0	13	40
Stadler	57.7	81.6	12.7	3.13	131	174	116	50.0	75.0	57	0	24
Cappell Desprez	55.8	77.7	14.9	2.86	149	182	98	0.0	68.8	0	4	8
Fertodi 293	55.3	81.3	13.5	2.91	132	171	123	18 8	60.0	1	3	6
Yung Kwang	54.3	78.2	11.4	3.14	132	173	117	43.8	72.5	75	0	4
Parker	54.0	84.4	13.6	2.90	128	174	107	12.5	62.5	48	0	0
Scout 66	53.9	84.5	13.6	2.80	127	169	111	50.0	72.5	0	0	0
Gage	53.6	82.3	15.1	2.79	128	172	113	43.5	75.0	23	0	0
NB 67730	52.6	81.4	17.1	2.78	129	172	123	62.3	75.0	10	0	0
Riley 67	49.8	82.4	14.5	2.95	132	171	110	32.0	56.3	80	0	28
Winalta	48.9	83.2	13.4	3.02	146	175	119	56.3	68.8	52	6	6
Benhur	47.8	82.3	14.4	2.91	126	168	111	18.8	61.3	85	0	0
Odin	46.3	76.2	13.3	3.10	153	186	117	0 0	53.8	0	8	15
Gaines	45.7	76.9	10.8	3.38	145	180	78	0.0	75.0	38	4	28
San Pastore	45.6	80.8	15.0	2.86	126	169	103	0.0	75.0	0	10	14
Atlas 66	43.9	80.5	16.5	2.71	132	170	119	6.3	60.0	18	0	0
Arthur	39.9	81.4	15.5	2.82	127	170	106	0.0	53.8	80	0	0
Purdue 4930A6-28-2-1	39.8	80.7	16.3	2.77	131	169	122	0.0	53.8	55	0	0
Triumph 64	35.3	83.9	17.2	2.72	125	168	110	0.0	66.3	10	0	0
INIA 66	29.9	81.9	15.0	2.71	120	171	77	0.0	0.0	0	0	0
Lerma Rojo 64	25.2	82.1	18.0	2.69	106	172	95	0.0	25.0	0	0	0
Mean	52.1	81.1	13.8	2.94	133	174	108	20.0	61.4	31	2.4	8.4
Coefficient of Variation	10.6	1.4	8.6	3.02	1.1	2.3	5.9	96.4	12.0	....	....	....
Least Significant Difference, 5%	7.8	1.6	1.7	0.13	2.0	5.6	9.0	27.3	10.4	....	....	....

KOREA

Suwon

Cooperators: Hyun Ok Cho; Dong Woo Ree

Date of planting: Oct. 11, 1968

Precipitation during cycle of test: 736.7 mm.

Amount of irrigation applied: None

Fertilizer used: Urea = 152 kg./ha.; double superphosphate = 90 kg./ha.; potassium chloride = 70 kg./ha.

General description of climatic conditions during test: Relatively good conditions prevailed in early part of growing season but heavy rain occurred in later part of season causing disease infection and delayed crop maturity.

Disease development in general: Severe stem rust infection was observed as compared to usual year, because of heavy rainfall this year.

Insect, weed or pest problems: Hand-weeded twice.

Date of harvest: Early July, 1969.

Area harvested for yield: 3 square meters

Dates when different notes were taken: Stem rust—June 20, 1969; lodging—June 25, 1969; plant height—June 10, 1969.

Data in Table 21.

Table 21. Agronomic, grain quality and disease data for the 30 cultivars in the "1st International Winter Wheat Performance Nursery" grown in Suwon, Korea, 1969.

Cultivar	Yield	Test weight	Protein	Lysine	Date of Flowering	Date of Ripening	Plant height	Lodging	Winter survival	Stem rust
	q/ha	kg/hl	%	% of Protein	Days from Jan. 1		cm.	%	%	sev.
Bezostaia	51.3	75.6	12.6	2.89	145	181	105	20.0	80.0	25
Blueboy	50.7	70.0	13.0	2.83	145	181	107	25.0	80.0	40
Yung Kwang	42.1	71.3	14.8	2.79	141	179	111	55.0	80.0	20
Arthur	41.8	76.3	13.7	2.85	143	178	114	44.8	80.0	15
Purdue 4930A6-28-2-1	40.9	74.0	16.5	2.70	145	179	125	45.0	80.0	30
Sturdy	39.5	70.3	13.8	2.82	139	180	90	35.0	80.0	20
San Pastore	39.2	71.5	11.5	3.01	139	178	100	30.0	70.0	40
Timwin	37.7	72.0	13.5	2.84	145	179	94	25.0	80.0	20
Benhur	37.7	71.0	13.6	2.79	140	165	112	30.0	80.0	45
Atlas 66	36.9	70.8	15.9	2.64	148	181	122	25.0	30.0	30
Parker	36.3	77.0	12.9	2.98	141	179	109	25.0	80.0	25
Shawnee	36.1	75.0	13.2	2.89	145	179	119	35.0	75.0	25
Gage	36.0	74.9	13.1	2.85	145	179	110	35.0	80.0	25
Riley 67	35.5	71.1	12.7	2.91	145	179	113	45.0	80.0	25
Yorkstar	34.8	63.5	10.6	3.18	149	180	114	25.0	80.0	50
Stadler	34.5	71.4	12.6	2.99	144	178	118	40.0	80.0	25
NB 67730	32.6	72.0	15.4	2.70	141	177	120	45.0	80.0	10
Heine VII	31.0	66.3	13.2	2.93	154	191	108	20.0	75.0	55
Fertodi 293	29.8	70.8	14.1	2.86	146	181	115	35.0	75.0	25
Winalta	28.4	73.8	12.4	2.94	149	181	113	45.0	80.0	20
Lancer	27.3	73.9	13.4	2.93	147	164	112	45.0	80.0	40
Triumph 64	26.2	73.8	13.6	2.78	139	177	104	45.0	75.0	45
Scout 66	25.7	73.5	13.2	2.89	140	178	113	45.0	80.0	20
Bankuti 1201	25.4	72.3	13.5	2.88	146	181	124	35.0	80.0	35
Cappell Desprez	24.7	55.8	14.0	2.91	160	193	101	25.0	55.0	50
Gaines	18.5	59.3	11.8	3.11	150	182	84	20.0	80.0	30
Odin	15.0	50.9	14.1	2.97	161	193	122	20.0	80.0	65
Felix	14.5	50.5	13.6	2.95	162	192	106	25.0	65.0	80
Lerma Rojo 64	.....	.....	.....	.....	.....	.....	.....	.....	0.0	...
INIA 66	.....	.....	.....	.....	.....	.....	.....	.....	0.0	....
Mean	33.2	69.6	13.4	2.89	146	180	110	33.7	70.7	33
Coefficient of Variation	6.6	1.8	5.5	3.18	0.6	4.2	3.6	40.3	7.5	...
Least Significant Difference, 5%	3.1	1.7	1.1	0.13	1.2	10.7	5.5	19.2	7.4	....

JAPAN

Sapporo

Cooperators: T. Kumagai and H. Araki

Date of planting: Sept. 9, 1968

Precipitation during cycle of test: Sept. 9, 1968 to July 25, 1969 = 563 mm. Sept. 9, 1968 to Aug. 8, 1969 = 907.5 mm.

Amount of irrigation applied: None

Fertilizer used: NH_4SO_4 = 314 kg./ha.; superphosphate = 453 kg./ha.; KSO_4 = 40 kg./ha.

General description of climatic conditions during test: Temperature in May and June averaged below normal. Precipitation in July and August was very limited Winterkilling was severe but survival of check variety 'Hokuei' was normal.

Disease development in general: Rusts were present but became established too late to do extensive damage. A 1 in 140 lime and sulphur compound was sprayed on June 12 and July 3 for controlling rusts. For control of winter disease, PCP was applied at a rate of 1 kg. per 1000 m^2 and was spread with a sprayer on Nov. 14, 1968.

Insect, weed or pest problems: Crop losses were small.

Date of harvest: July 25–Aug. 8, 1969

Area harvested for yield: 2.25 square meters

Dates when different notes were taken: none reported

Data in Table 22.

Table 22. Agronomic, grain quality and disease data for the 30 cultivars in the "1st International Winter Wheat Performance Nursery" grown at Sapporo, Japan, 1969.

Cultivar	Yield	Test weight	Protein	Lysine	Date of Flowering	Date of Ripening	Plant height	Lodging	Winter survival	Rust Leaf	Rust Stem
	q/ha	kg/hl	%	% of Protein	Days from Jan. 1		cm.	%	%	sev.	sev.
Hokuei*	57.6	78.0	13.9	2.71	176	212	118	15	96.0	45	10
Timwin	51.3	77.0	15.3	2.70	177	213	106	0	90.5	10	0
Riley 67	50.6	77.5	15.0	2.66	175	210	116	0	84.3	20	10
Stadler	49.5	79.0	13.8	2.75	177	210	133	0	95.8	60	55
Yorkstar	48.6	74.0	13.3	2.86	178	214	123	50	86.3	50	30
Bezostaia	48.1	77.0	14.3	2.70	176	211	106	10	85.5	35	0
Benhur	41.8	78.5	16.6	2.56	174	210	115	0	93.8	15	10
Arthur	39.1	78.5	16.3	2.74	176	210	110	0	83.8	45	0
Triumph 64	34.9	78.0	17.6	2.66	172	206	116	20	93.8	45	10
Winalta	33.2	77.0	14.6	2.53	177	211	123	10	80.0	60	0
Odin	31.4	71.5	14.2	2.74	185	219	140	0	92.0	45	10
Sturdy	29.8	..	16.3	2.52	175	214	93	0	62.5	15	10
Felix	29.7	..	14.2	2.69	181	218	105	0	83.8	65	60
Purdue 4930A6-28-2-1	28.7	....	18.9	2.59	175	210	122	0	66.3	5	0
Scout 66	17.3	..	15.8	2.72	176	210	100	0	37.5	30	0
Blueboy	16.2	....	15.3	2.66	179	216	105	0	21.3	55	45
Yung Kwang	15.2	....	17.5	2.52	178	214	100	0	11.0	80	0
Lancer	13.3	.....	16.0	2.56	177	214	108	0	13.8	25	10
NB 67730	13.1	.....	17.7	2.59	176	212	113	40	23.8	0	0
Shawnee	12.9	....	15.9	2.46	178	214	114	0	16.0	35	5
Parker	9.9	.....	16.4	2.61	176	215	96	0	5.3	20	0
Fertodi 293	8.2	.....	17.5	2.58	178	216	105	0	12.5	45	0
Gage	7.8	....	16.2	2.57	178	215	91	0	4.0	35	0
Heine VII	7.6	.....	18.3	2.50	183	217	93	0	5.5	35	5
Bankuti 1201	4.3	.....	17.5	2.60	179	217	114	0	1.8	35	30
San Pastore	4.2	.....	17.0	2.64	178	214	84	0	1.3	55	30
Gaines	3.2	.....	15.4	2.70	181	215	80	0	1.8	60	50
Cappell Desprez	0	.....	18.0	2.55	179	218	92	0	0.0	40	0
Atlas 66	0	.....	21.5	2.45	178	216	86	0	0.0	30	0
Lerma Rojo 64	0	.....	.....	....	....	....	.....	....	0.0	..	....
Mean	25.0	77.9	16.2	2.62	177	213	108	5	45.0	39	14
Coefficient of Variation	17.6	.....	3.7	2.25	0.4	0.5	4.2	....	20.3	....	....
Least Significant Difference, 5%	6.2	.....	0.8	0.08	1.0	1.6	6.5	....	12.7	....	....

* Local cultivar in place of Inia 66

Table 23. Summary of average yields in quintals per hectare for cultivars grown in the 1969 IWWPN.

Cultivar	Bordenave, Argentina	Temuco, Chile	N. Carolina, USA	Oklahoma, USA	California, USA	Svalöf Sweden	Wageningen, Netherlands	Milano, Italy	Rieti, Italy	Novi Sad, Yugoslavia	Fundulea, Romania
Bezostaia	24.2	22.1	39.4	41.5	45.2	69.1	48.1	45.2	60.8	58.9	16.4
Blueboy	28.4	27.9	46.9	32.8	30.4	59.9	48.5	61.2	68.5	49.1	20.8
San Pastore	24.4	20.6	41.6	34.4	46.3	57.6	50.3	48.0	51.3	56.9	18.1
Sturdy	24.5	35.1	31.5	31.2	46.8	58.9	46.8	46.6	50.3	52.3	16.5
Timwin	18.4	17.2	30.7	30.4	40.4	56.1	42.0	54.5	60.8	52.0	21.7
Parker	26.7	19.3	34.0	38.4	38.5	56.6	37.6	46.6	52.4	57.7	21.7
Fertodi 293	20.8	31.7	32.9	33.0	34.6	58.8	43.3	46.3	55.2	46.2	26.4
Benhur	20.9	22.5	34.8	37.7	41.7	54.0	45.0	44.4	55.9	57.2	19.9
Scout 66	25.1	28.4	34.1	38.3	43.0	45.7	37.1	38.7	55.0	57.7	27.7
Yung Kwang	13.4	4.3	33.5	31.3	40.9	57.4	44.3	48.3	53.9	56.3	19.1
Arthur	15.4	16.4	42.8	44.9	50.6	44.4	41.6	48.3	52.4	61.8	19.1
Gage	23.2	18.1	36.3	35.6	29.1	51.2	40.8	43.1	54.1	54.4	22.6
Stadler	12.4	2.8	42.1	31.4	35.6	67.9	43.3	47.8	40.9	53.0	21.5
Heine VII	5.0		38.0	25.6	37.3	70.1	49.2	49.1	39.7	35.3	12.3
Lancer	15.4	23.1	34.0	27.5	36.3	53.3	34.2	34.9	47.5	48.5	25.3
Shawnee	19.4	15.1	39.7	31.9	31.0	49.4	34.8	42.6	54.7	47.5	21.5
Riley 67	12.3	10.3	37.3	33.1	33.5	58.7	45.0	38.6	42.5	51.7	19.4
Yorkstar	12.8	12.0	44.2	26.6	27.4	59.1	51.3	50.6	38.0	37.3	26.6
Bankuti 1201	20.1	13.5	31.4	28.9	26.4	44.1	40.8	39.2	47.6	49.5	23.1
Triumph 64	25.2	8.5	33.3	38.3	49.9	47.2	33.7	41.5	50.1	48.3	22.1
NB 67730	21.6	17.4	32.4	31.7	29.5	48.4	34.7	33.3	47.8	57.4	20.1
Atlas 66	20.4	23.3	32.7	20.8	29.1	46.3	42.7	42.6	52.6	52.5	19.2
Purdue 4930A6-28-2-1	12.7	12.3	34.6	31.8	25.2	45.2	37.1	38.5	48.6	53.3	24.5
Winalta	18.5	25.7	30.2	28.5	28.7	48.8	33.3	37.0	48.3	37.4	20.9
Cappell Desprez	13.3	12.8	25.1	20.8	21.0	65.2	46.2	38.8	31.1	35.5	10.8
Gaines	15.6	15.5	38.9	24.9	37.4	53.1	45.8	44.0	34.9	37.6	11.2
Felix	1.8	.	24.7	14.3	27.0	66.7	43.5	39.1	24.1	27.6	9.3
Odin			26.9	10.8	10.1	73.4	37.1	35.7	21.0	23.3	6.0
Lerma Rojo 64	15.0	12.3	28.1	.	56.7	40.6	46.7	43.9	58.2	56.7	.
INIA 66	12.1	17.4	.	.	49.7	11.8	21.8	30.5	51.9		. .
Mean	17.9	18.0	34.9	30.6	35.5	54.0	41.6	43.3	48.3	48.7	19.4

Table 23. (Continued)

Cultivar	Eskisehir, Turkey	Ankara, Turkey	Sulaimaniyha, Iraq	Karaj, Iran	Kermanshah, Iran	Kabul, Afghanistan	Suwon, Korea	Sapporo, Japan	Mean	
									19 loc.	16 loc.
Bezostaia	49.9	41.2	21.6	37.2	21.9	75.1	51.3	48.1	43.0	45.2
Blueboy	52.4	23.9	23.7	38.7	21.0	67.9	50.7	16.2	40.5	43.5
San Pastore	56.4	34 7	20.0	40.0	16 7	45.6	39.2	4.2	37.2	41.1
Sturdy	52.6	29 8	24.2	45.8	17.4	58.3	39.5	29 8	38 8	40.5
Timwin	41.6	37.5	20.2	37.9	15.7	59.4	37.8	51.3	38.2	39.9
Parker	53.8	29.4	17.5	41.2	20.4	54.0	36.3	9.9	36.4	39.8
Fertodi 293	53.5	35.4	18.9	42.0	16.5	55.3	29.8	8.2	36.3	39.3
Benhur	39.6	29.1	17.7	40.0	14.2	47.8	37.7	41.8	36.9	38.5
Scout 66	50 6	40.0	16.6	30.4	19.7	53.9	25.7	17.3	36.1	38.4
Yung Kwang	33.0	25.7	13.3	43.3	12.8	54.3	42.1	15.2	33.8	38.1
Arthur	41.5	25.8	20.2	33.7	14.2	39.9	41.9	39.1	35.8	38.1
Gage	39.2	29.1	19.7	34.1	14.3	53.6	36.0	7.3	33 8	37.1
Stadler	32.3	23.6	12.4	36.2	9.3	57.7	34.5	49.5	34.4	36.9
Heine VII	46.7	24.2	12.7	36.4	17.7	61.3	31.0	7.6		36.8
Lancer	52.4	30.2	17.3	39.1	17.3	60.0	27.3	13.3	33.5	36.6
Shawnee	41.1	28.8	14.5	33.1	15.5	61.3	36.1	12.9	33.2	36.5
Riley 67	38.2	29.4	14.8	40.6	13.3	49.8	35.5	50 6	34.5	36.3
Yorkstar	28.6	27.4	15.2	26.8	12.7	65.7	34.8	48.6	34.0	35.8
Bankuti 1201	51.1	28.3	15.2	42.3	16.4	60.5	25.4	4.3	32 0	35.6
Triumph 64	39.9	32.1	18.4	33.3	19.7	35.3	26.3	34.9	33.6	35.6
NB 67730	38.1	27.6	16.1	41.0	13.7	52.6	32.6	13.1	32.1	34.8
Atlas 66	24.0	25.0	16.1	35.8	13.2	43.9	36.9			33.4
Purdue 4930A6-28-2-1	24.2	13.9	13.2	37.5	13.2	39.8	41.0	28.8	30.5	32.9
Winalta	46.7	16.3	11.9	34.6	15.3	48.9	28.4	33.2	31.2	32.2
Cappell Desprez	51.2	22.5	10.3	37.9	15.6	55.8	24.7	.	.	32.0
Gaines	33.6	11.0	10.9	32.1	11.2	45.7	18.5	3.2	27.6	30.7
Felix	47.3	23.4	8.2	32.6	12.3	58.2	14.5	29.8		29.6
Odin	50.1	13.5	5.1	40.4	13.2	46.3	15.0	31.4	.. .	26.7
Lerma Rojo 64	47.7	22.3	23.8	34.4	18.7	25.2	.....	.. ..	.....	35.4[a]
INIA 66	24.0	7.8	12.7	.....	.....	29.9	.....	.....	.....	24.5[b]
Mean	42.7	26.5	16.1	37.2	15.6	52.1	33.2	25.0	33.7	36.2

[a] Mean of 15 locations only for which Bezostaia averaged 44.0 q/ha.
[b] Mean of 11 locations only for which Bezostaia averaged 45.7 q/ha.

Table 24. Summary of yield rankings for cultivars grown in the 1969 IWWPN.

Cultivar	Bordenave, Argentina	Temuco, Chile	N. Carolina, USA	Oklahoma, USA	California, USA	Svalöf Sweden	Wageningen, Netherlands	Milano, Italy	Rieti, Italy	Novi Sad, Yugoslavia	Fundulea, Romania
Bezostaia	7	9	7	2	6	3	5	12	2	2	23
Blueboy	1	4	1	11	20	7	4	1	1	18	14
San Pastore	6	10	5	8	5	12	2	7	15	7	21
Sturdy	5	1	22	17	4	9	6	9	16	14	22
Timwin	16	15	24	18	10	15	17	2	2	15	9
Parker	2	11	16	3	11	14	21	9	12	4	9
Fertodi 293	11	2	19	10	17	10	14	11	6	22	3
Benhur	10	8	12	6	8	16	10	13	5	6	16
Scout 66	4	3	14	4	7	25	23	23	7	3	1
Yung Kwang	21	26	17	16	9	13	12	6	10	9	19
Arthur	18	16	3	1	14	27	18	5	12	1	19
Gage	8	12	11	7	22	19	19	16	9	10	7
Stadler	25	27	4	15	16	4	14	8	24	12	12
Heine VII	28	.	9	23	13	2	3	4	25	27	24
Lancer	19	7	15	21	15	17	27	28	22	19	4
Shawnee	14	18	6	12	19	20	25	17	3	21	11
Riley 67	26	24	10	9	18	11	10	24	23	16	17
Yorkstar	23	23	2	22	25	8	1	3	27	25	2
Bankuti 1201	13	19	23	19	27	28	19	20	21	17	6
Triumph 6[illegible]	3	25	18	4	2	23	28	19	17	20	8
NB 67730	9	13	21	14	21	22	26	29	20	5	15
Atlas 66	12	6	20	25	22	24	16	18	11	13	18
Purdue 4980A6-28-2-1	24	21	13	13	28	26	22	25	18	11	5
Winalta	15	5	25	20	24	21	29	26	19	24	13
Cappell Desprez	22	20	28	25	29	6	8	22	26	26	26
Gaines	17	17	8	24	12	18	9	14	28	23	25
Felix	29	.	29	27	26	5	13	21	29	28	27
Odin	30		27	28	30	1	24	27	30	29	28
Lerma Rojo 64	20	22	26	29	1	29	7	15	4	8	.
INIA 66	27	14	30	30	3	30	30	30	14	.	..

Table 24. (Continued)

Cultivar	Eskisehir, Turkey	Ankara, Turkey	Sulaimaniyha, Iraq	Karaj, Iran	Kermanshah, Iran	Kabul, Afghanistan	Suwon, Korea	Sapporo, Japan	Mean	
									19 locations	16 locations
Bezostaia	11	1	4	16	1	1	1	5	1	1
Bluebov	6	21	3	12	2	2	2	15	2	2
San Pastore	1	5	7	10	10	24	7	25	5	3
Sturdy	4	8	1	1	8	9	6	11	3	4
Timwin	16	3	5	14	13	8	8	1	4	5
Parker	2	9	12	5	3	15	11	20	7	6
Fertodi 293	3	4	9	4	11	13	19	21	8	7
Benhur	20	11	11	9	18	21	9	6	6	8
Scout 66	9	2	14	28	4	16	23	14	9	9
Yung Kwang	25	19	21	2	25	14	3	16	14	10
Arthur	17	18	5	23	18	26	4	7	10	10
Gage	21	12	8	22	17	17	13	22	14	12
Stadler	26	22	25	18	29	11	16	3	12	13
Heine VII	14	20	23	17	7	4	18	23	....	14
Lancer	5	7	13	11	9	7	21	17	17	15
Shawnee	18	13	20	25	15	4	12	19	18	16
Riley 67	22	10	19	7	21	19	14	2	11	17
Yorkstar	27	16	17	29	26	3	15	4	13	18
Bankuti 1201	8	14	17	3	12	6	24	24	20	19
Triumph 64	19	6	10	24	5	28	22	8	16	19
NB 67730	23	15	15	6	20	18	17	18	19	21
Atlas 66	30	17	15	19	22	25	10	....	....	22
Purdue 4930A6-28-2-1	28	26	22	15	22	27	5	13	22	23
Winalta	15	27	26	20	16	20	20	9	[illegible]	24
Cappell Desprez	7	24	28	13	14	12	25	....	....	25
Gaines	24	29	27	27	28	23	26	26	23	26
Felix	12	23	29	26	27	10	28	12	....	27
Odin	10	28	30	8	22	22	27	10	....	28
Lerma Rojo 64	13	25	2	21	6	30	....	....	....	....
INIA 66	29	30	24	....	....	29	....	....	....	....

Table 25. Summary of test weight (kg/hl) data for cultivars grown in the 1969 IWWPN.

Cultivar	Bordenave, Argentina	Temuco, Chile	N. Carolina, USA	Oklahoma, USA	Svalöf Sweden	Wageningen, Netherlands	Milano, Italy	Reiti, Italy
Parker	81.1	75.7	81.0	82.0	83.1	83.6	83.1	84.6
Bezostaia	80.4	72.5	79.7	80.8	83.0	82.7	81.6	83.9
Triumph 64	80.6	72.3	80.6	81.7	80.5	81.9	79.8	82.1
Shawnee	80.1	75.7	80.1	80.6	82.3	81.9	81.0	83.3
Lancer	75.0	77.3	79.3	79.7	82.4	82.9	78.9	82.8
Scout 66	80.3	75.5	79.9	79.7	80.3	82.3	79.3	82.7
Arthur	77.8	76.8	79.7	80.1	80.3	81.5	79.9	82.3
Purdue 4930A6-28-2-1	77.4	78.6	78.2	80.0	80.6	83.1	81.8	82.4
Winalta	79.4	77.9	79.7	79.6	80.9	82.3	81.6	83.0
Benhur	73.9	77.5	78.0	79.3	81.7	82.0	80.3	82.6
Gage	78.8	73.7	79.1	79.2	79.9	82.6	80.2	82.9
Bankuti 1201	81.1	74.1	80.0	80.6	79.1	82.6	81.5	81.9
NB 67730	79.4	76.3	78.7	78.3	78.6	82.6	81.1	83.0
Sturdy	79.1	75.0	78.7	77.4	80.9	83.3	80.4	81.3
Stadler	69.6		80.0	80.9	84.2	83.7	80.1	75.3
Riley 67	71.8	75.0	77.4	78.8	81.7	82.5	77.8	77.6
Fertodi 293	71.9	73.2	78.2	77.7	83.7	80.8	80.6	81.4
San Pastore	73.0	67.3	75.5	75.7	81.3	80.0	77.4	78.9
Atlas 66	75.4	73.7	76.1	76.1	80.6	83.0	78.4	82.3
Timwin	68.8	75.9	75.7	72.1	81.1	77.2	79.2	81.6
Yung Kwang	71.3	.	76.0	72.5	79.9	80.0	79.0	78.9
Blueboy	73.4	69.2	74.2	69.1	80.8	76.4	65.7	77.3
Heine VII			75.6	72.5	78.9	78.9	73.7	72.9
Yorkstar	68.4	65.0	73.7	70.3	79.8	76.8	72.6	67.6
Gaines	65.3	63.0	76.9	65.9	78.7	76.2	72.5	65.0
Cappell Desprez	62.0	65.0	71.0	66.6	79.2	76.2	73.7	69.5
Felix	—		72.1	67.5	79.9	78.9	.1.4	65.4
Odin	...		72.2	65.8	82.6	76.7	73.3	65.0
Lerma Rojo 64	75.2	69.6	78.7		79.7	84.0	79.8	81.8
INIA 66	76.0	71.2	.		79.6	78.8	77.5	80.6
Mean	75.0	73.1	77.4	76.1	80.7	80.8	78.4	78.7

Table 25. (Continued)

Cultivar	Novi Sad, Yugoslavia	Fundulea, Romania	Eskisehir, Turkey	Ankara, Turkey	Kabul, Afghanistan	Suwon, Korea	Mean	
							14 loc.	12 loc.
Parker	79.9	82.4	82.7	82.8	84.4	77.0	81.7	82.2
Bezostaia	77.2	79.1	84.6	81.4	83.9	75.6	80.5	81.1
Triumph 64	78.2	81.1	83.6	83.9	83.9	73.8	80.3	80.9
Shawnee	77.6	81.3	80.0	82.5	83.6	75.0	80.4	80.8
Lancer	75.7	82.3	81.9	82.7	84.2	73.9	79.9	80.6
Scout 66	76.6	81.0	83.9	82.7	84.5	73.5	80.2	80.5
Arthur	77.7	79.5	82.3	81.5	81.4	76.3	79.8	80.2
Purdue 4930A6-26-2-1	77.8	79.6	82.7	80.6	80.7	74.0	79.8	80.1
Winalta	74.6	81.6	77.4	83.3	83.2	73.8	79.9	80.1
Benhur	78.0	79.9	82.7	82.2	82.3	71.0	79.4	80.0
Gage	75.7	80.4	81.9	81.0	82.3	74.9	79.5	80.0
Bankuti 1201	76.6	80.5	79.2	82.1	82.8	72.3	79.6	79.9
NB 67730	76.6	80.3	83.2	81.9	81.4	72.0	79.5	79.8
Sturdy	77.2	80.6	81.7	81.4	82.8	70.3	79.3	79.7
Stadler	78.2	80.8	80.0	78.9	81.6	71.4		79.6
Riley 67	75.3	78.1	82.8	81.4	82.4	71.1	78.1	78.9
Fertodi 293	72.6	80.6	78.5	79.7	81.3	70.8	77.7	78.6
San Pastore	73.7	77.4	81.9	80.9	80.8	71.5	76.8	77.9
Atlas 66	74.2	71.8	81.5	77.9	80.5	70.8	77.3	77.8
Timwin	72.4	79.4	76.7	78.0	77.7	72.0	76.3	76.9
Yung Kwang	71.6	77.3	78.7	77.8	78.2	71.3	.	76.8
Blueboy	68.1	74.7	77.8	76.9	76.9	70.0	74.3	74.8
Heine VII	67.0	61.0	82.6	78.7	79.3	66.3	...	74.0
Yorkstar	64.3	74.1	74.8	73.4	78.1	63.5	71.6	72.4
Gaines	65.9	71.9	79.7	76.8	76.9	59.3	71.0	72.1
Cappell Desprez	66.1	59.1	78.6	75.4	77.7	55.8	69.7	70.7
Felix	64.6	56.5	80.8	78.2	77.1	50.5	.. .	70.2
Odin	64.0	55.8	74.8	79.3	78.2	50.9	.. ..	69.9
Lerma Rojo 64	75.4	.. ...	78.3	81.6	82.1	. ....	.....	78.7[a]
INIA 66	74.5	. .	83.3	81.1	81.9	.....	.....	78.5[b]
Mean	73.6	76.0	80.6	80.2	81.1	69.6	77.9	77.7

[a] Mean of 11 locations for which Bezostaia averaged 81.0 kg/hl.
[b] Mean of 10 locations for which Bezostaia averaged 81.1 kg/hl.

Table 26. Summary of average percent protein for cultivars grown in the 1969 IWWPN.

Cultivar	Bordenave, Argentina	Temuco, Chile	N. Carolina, USA	Oklahoma, USA	California, USA	Svalöf Sweden	Wageningen, Netherlands	Versailles, France	Milano, Italy	Keiti, Italy	Novi Sad, Yugoslavia
Atlas 66	17.4	14.2	18.9	19.5	18.8	18.9	14 6	16.0	14.7	16.1	18.2
Purdue 4930A6-28-2-1	16.0	16.0	18.1	19.4	17.0	19.5	14.7	15.9	14.3	15.5	17.7
NB 67730	16.1	14.4	17.0	19 0	18.2	20.5	14.5	14.8	13.6	15.2	16.4
Cappell Desprez	16.2	13.9	18.1	18.4	17.8	14.3	14.6	12.4	12.5	13.1	17.8
Odin			17.6	19 4	17.9	14.8	13.6	11.9	10.5	13.2	16.2
Bankuti 1201	13.7	13.2	16.5	17.4	15.1	17.9	13.8	13.0	13.0	14.3	15.2
Felix	18.1	16.2	18.5	18.4	18.3	13.9	12.7	10.6	10.1	12.5	15.5
Heine VII	16.3		17.2	16.6	15.8	14.2	13.3	12.2	10.2	11.7	15.9
Fertodi 293	14.6	11.5	15.9	16.6	15.9	17.0	14.1	14.4	11.9	13.7	15.8
Triumph 64	13.3	12.3	14.3	15.9	13.7	16.7	15.2	14.4	13.2	14.3	14.4
Benhur	15.0	12.9	14.8	16.3	15.2	17.5	12.8	13.7	12.5	13.5	15.2
Parker	12.2	13.5	16.2	16.2	15.4	[illegible]	13.9	13.2	11.7	12.5	14.8
G ge	11.8	12.4	15.8	16.3	17.1	17.5	13.2	12.5	12.2	13.3	15.6
Sturdy	13.8	12.3	16.0	15 7	14.5	15 3	12.9	13.4	12.9	13.7	14.5
Yung Kwang	13.8	11.2	17.6	16 8	15.1	17.8	12.2	11.9	12.0	12.3	13.8
Timwin	15.7	13.5	15.4	17.5	14.5	15.7	13.0	12.0	11.2	12.3	15.4
Riley 67	14.6	13.2	15.5	16.5	15.4	16.8	13.4	12.8	10.7	10.8	15.2
Scout 66	13.3	12.3	15.1	15.4	13.2	13.3	14.4	14.6	12.1	13.5	14.2
Arthur	14.3	13.0	15.7	15.6	13.9	17.4	13.1	12.1	11.7	12.9	14.8
Lancer	13.6	12.1	15.4	15.3	14.6	16.2	14.1	13.8	12.6	13.2	14.7
Winalta	12.8	11.6	14.7	15.2	15.5	16.4	13.7	13.8	11.3	12.4	14.3
Shawnee	12.6	11.4	14.9	15.3	14.8	16.6	12.0	11.1	11.8	12.8	13.8
San Pastore	13.1	14.2	14.8	15.4	14.3	13.6	13.2	12.5	10.5	10.7	13.2
Blueboy	12.4	12.4	15.0	15.3	16.4	17.3	11.7	12.0	10.0	11.8	14.5
Bezostaia	13.7	13.0	14.8	14.4	14.7	14.1	12.6	12.9	11.8	12.8	14.0
Stadler	14.3	12.5	14.6	16.0	14.4	15.0	12.2	10.3	10.2	10.1	13.7
Gaines	13.2	11.6	13.8	15.4	14.4	13.9	11.8	12.4	9.4	10.5	14.4
Yorkstar	13.0	11.5	14.5	15.1	15.5	15.1	11.5	10.5	9.4	9.3	14.4
Lerma Rojo 64	14.9	15.2	16.2	.	13.7	16.5	12.9	15.0	12.8	13.1	14.8
INIA 66	15.2	13.6	17.0	..	16.2	15 8	14.6	13.9	14.8	12.8	.. .
Mean	14.3	12.9	16.0	16.6	15.6	16.4	13.3	13.0	11.8	12.8	15.2

Table 26. (Continued)

Cultivar	Fundulea, Romania	Eskisehir, Turkey	Ankara, Turkey	Sulaimaniyha, Iraq	Karaj, Iran	Kermanshah, Iran	Kabul, Afghanistan	Suwon, Korea	Sapporo, Japan	Mean	
										20 loc.	18 loc.
Atlas 66	20.5	16.0	17.6	15 8	17.5	18.5	16.5	15.9	21.5	17.4	17.5
Purdue 49?0A6-28-2-1	18.0	13.5	16.1	14.3	17.1	15.8	16.3	16.5	18.9	16.5	16.6
NB 67730	17.5	13.6	15.6	15.0	17.7	15.9	17.1	15.4	17.7	16.3	16.4
Cappell Desprez	19.7	14.9	15.6	18.1	16.1	18.1	14.9	14.0	18.0	15.9	16.0
Odin	17.8	13.5	14.4	19.6	17.0	17.7	13.3	14.1	14.2	. .	15.4
Bankuti 1201	16.0	14.2	15.3	13.5	16 0	14.7	14.1	13.5	17.5	14.9	15.1
Felix	18.5	13.9	14.4	16.2	16.5	17.3	12.5	13.7	14.3	15.1	14.9
Heine VII	18.7	14.9	14.9	14.2	16.6	15.4	13.4	13.2	18.3	.	14.8
Fertodi 235	15.3	13.9	15.2	12.1	15.0	14.3	13.5	14.2	17.5	14.6	14.8
Triumph 64	16.1	12.8	14.6	12.1	15.2	13.9	17.2	13.6	17.6	14.5	14.7
Benhur	16.0	12.1	13.0	12.3	15.1	13.8	14.4	13.6	16.6	14.3	14.4
Parker	16.1	13.5	14.7	11.1	15.0	14.2	13.6	12.9	16.4	14.2	14.4
Gage	15.8	11.7	13.4	11.4	14.4	14.4	15.2	13.1	16.2	14.2	14.4
Sturdy	16.7	14.1	14.6	11.5	13.7	15.0	12.7	13.8	16.4	14.2	14.3
Yung Kwang	16.9	11.6	13.8	12.4	13.1	14.5	11.4	14.8	17.5	14.0	14.2
Timwin	16.1	13.2	14.2	12.0	14.7	14.9	13.2	13.5	15.3	14.2	14.1
Riley 67	17.2	12.1	14.3	11.0	14.9	14.7	14.5	12.7	15.0	14.1	14.1
Scout 66	15.2	12.8	13.7	11.9	14.3	13.3	13.6	13.2	15.8	14.0	14.1
Arthur	15.2	12.2	13.4	11.5	14.0	13.8	15.5	13.7	16.3	14.0	14.1
Lancer	14.8	12.4	12.7	12.6	14.1	13.7	12.6	13.4	16.0	13.9	14.0
Winalta	14.4	11.2	13.5	12.8	14.2	14.1	13.4	12.4	14.6	13.6	13.8
Shawnee	14.8	12.3	13.4	12.0	13.9	15.2	12.7	13.2	15.9	13.5	13.7
San Pastore	15.2	14.2	13.3	11.8	14.0	14.0	15.0	11.5	17.0	13.6	13.6
Blueboy	15.3	13.3	13.4	11.7	14.0	14.3	10.7	13.0	15.3	13.5	13.6
Bezostaia	14.8	13.3	13.6	10.6	13.3	14.3	11.7	12.6	14.3	13.4	13.4
Stadler	15.0	12.1	12.8	11.4	13.0	14.0	12.7	12.6	13.8	13.0	13.0
Gaines	14.4	11.9	12.5	12.9	13.4	14.0	10.8	11.8	15.4	12.9	13.0
Yorksta.	12.8	11.3	11.9	10.8	13.3	13.5	10.4	10.6	13.3	12.4	12.4
Lerma Rojo 64	. .	13.8	14.4	12.7	14.6	14.1	18.0	.....	.. ..	.....	14.5[a]
INIA 66	.. ..	12.9	13.2	13.6	.. ...	.....	15.0	.....	.....	.....	14.5[b]
Mean	16.2	13.1	14.1	12.8	14.9	14.8	13.8	13.4	16.2	14.4	14.4

[a] Mean of 16 locations for which Bezostaia averaged 13.2%.

[b] Mean of 13 locations for which Bezostaia averaged 13.1%.

Table 27. Summary of average lysine (expressed as % of protein and unadjusted) for cultivars grown in the 1969 IWWPN.

Cultivar	Bordenave, Argentina	Temuco, Chile	N. Carolina, USA	Oklahoma, USA	California, USA	Svalöf Sweden	Wageningen, Netherlands	Versailles, France	Milano, Italy	Reiti, Italy	Novi Sad, Yugoslavia
Yorkstar	3.15	3.36	2.87	2.93	2.89	2.84	3.39	3.50	3.37	3.30	3.03
Gaines	3.09	3.22	2.85	2.97	2.96	2.92	3.29	3.27	3.36	3.29	2.94
Stadler	2.98	3.20	2.68	2.78	3.05	2.86	3.28	3.39	3.22	3.31	2.91
Timwin	2.91	3.02	2.88	2.81	2.90	2.87	3.20	3.02	3.20	2.94	2.93
Riley 67	2.89	3.07	2.79	2.82	2.85	2.80	3.08	2.94	3.24	3.13	2.88
Odin			2.84	2.78	2.97	2.83	3.13	3.16	3.23	2.90	2.91
Blueboy	2.96	3.09	2.75	2.81	2.83	2.78	3.30	3.17	3.28	2.96	2.86
Felix	2.86		2.83	2.82	2.89	2.95	3.22	3.26	3.09	2.99	2.85
San Pastore	2.95	2.93	2.88	2.79	2.86	2.98	3.11	2.84	3.25	3.05	2.92
Arthur	2.94	3.18	2.88	2.84	2.90	2.77	3.16	3.01	3.10	2.79	2.86
Bezostaia	2.91	2.87	2.84	2.79	2.81	2.81	3.16	2.82	2.84	2.76	2.86
Parker	3.07	3.04	2.75	2.76	2.86	2.70	3.06	3.04	3.05	2.96	2.93
Lancer	2.98	3.21	2.84	2.90	2.82	2.75	3.05	2.85	2.97	2.81	2.79
Gage	3.16	3.17	2.79	2.83	2.76	2.66	3.07	2.99	2.92	2.89	2.85
Scout 66	2.98	3.08	2.74	2.88	2.91	2.66	2.97	2.92	2.98	2.85	2.91
Triumph 64	3.04	3.15	2.69	2.81	2.96	2.68	3.00	2.82	3.87	2.78	2.86
Winalta	2.95	3.03	2.84	2.81	2.81	2.80	3.02	2.89	3.04	2.80	2.83
Yung Kwang	2.83	3.34	2.62	2.66	2.78	2.75	3.15	3.18	2.95	2.82	2.85
Shawnee	3.07	3.23	2.82	2.76	2.88	2.69	3.15	3.10	2.98	2.76	2.78
Benhur	2.83	3.02	2.79	2.71	2.84	2.63	3.09	2.78	2.90	2.72	2.74
Fertodi 293	2.89	3.13	2.77	2.86	2.78	2.79	3.06	2.78	2.97	2.74	2.85
Bankuti 1201	2.98	2.93	2.87	2.86	2.68	2.72	3.03	2.92	2.82	2.66	2.86
Heine VII	2.73		2.73	2.63	2.78	2.67	3.10	2.82	3.14	2.99	2.83
Purdue 4930A6-28-2-1	2.90	2.95	2.78	2.72	2.92	2.61	3.01	2.78	2.86	2.76	2.70
Sturdy	2.93	3.12	2.70	2.74	2.90	2.68	3.10	2.80	2.84	2.89	2.81
Cappell Desprez	2.79	2.84	2.72	2.74	2.69	2.85	2.96	2.84	2.85	2.72	2.71
NB 67730	2.81	3.08	2.71	2.65	2.80	2.51	3.04	2.94	2.85	2.71	2.74
Atlas 66	2.73	3.09	2.68	2.66	2.71	2.60	2.97	2.68	2.74	2.61	2.67
Lerma Rojo 64	2.78	2.91	2.73	.	2.87	2.71	3.09	2.70	2.89	2.80	2.68
INIA 66	2.78	2.92	2.73	.	2.76	2.73	2.95	2.82	2.74	2.73	.....
Mean	2.93	3.08	2.78	2.79	2.85	2.75	3.11	2.97	3.02	2.88	2.84

Table 27. (Continued)

Cultivar	Fundulea, Romania	Eskisehir, Turkey	Ankara, Turkey	Sulaimaniyha, Iraq	Karaj, Iran	Kermanshah, Iran	Kabul, Afghanistan	Suwon, Korea	Sapporo, Japan	Mean	
										20 loc.	18 loc.
Yorkstar	3.11	3.18	3.23	3.30	3.16	3.13	3.33	3.18	2.86	3.16	3.14
Gaines	2.93	3.10	3.14	3.02	3.11	3.03	3.38	3.11	2.70	3.08	3.08
Stadler	2.90	3.15	3.15	3.22	3.16	3.11	3.13	2.99	2.75	3.06	3.06
Timwin	2.88	3.11	3.00	3.08	3.08	3.04	3.17	2.84	2.70	2.98	2.98
Riley 67	2.80	3.30	2.97	3.28	2.93	2.86	2.95	2.91	2.66	2.96	2.96
Odin	2.93	3.06	2.96	2.70	2.99	2.99	3.10	2.97	2.74	.	2.96
Blueboy	2.79	2.93	3.02	3.11	2.97	2.83	3.28	2.83	2.66	2.96	2.95
Felix	2.82	2.90	2.88	2.89	2.92	2.93	2.99	2.95	2.69		2.94
San Pastore	2.88	2.83	2.96	2.92	2.98	2.96	2.86	3.01	2.64	2.93	2.93
Arthur	2.87	3.08	2.96	2.98	2.90	2.95	2.82	2.85	2.74	2.93	2.91
Bezostaia	2.82	3.01	2.87	3.15	2.93	3.00	3.03	2.89	2.70	2.90	2.90
Parker	2.74	2.89	2.80	3.16	2.95	2.91	2.90	2.98	2.61	2.91	2.89
Lancer	2.79	2.93	3.03	3.00	3.00	2.96	2.99	2.93	2.56	2.91	2.89
Gage	2.78	3.06	3.18	2.99	2.95	2.93	2.79	2.85	2.57	2.91	2.88
Scout 66	2.74	2.88	3.05	3.02	2.88	2.96	2.80	2.89	2.72	2.89	2.88
Triumph 64	2.70	2.85	2.87	2.98	2.86	2.95	2.72	2.78	2.66	2.90	2.88
Winalta	2.86	3.09	2.89	2.91	2.92	2.82	3.02	2.94	2.53	2.89	2.88
Yung Kwang	2.76	3.09	2.97	2.75	2.97	2.93	3.14	2.79	2.52	2.89	2.87
Shawnee	2.80	3.01	2.89	2.87	2.98	2.84	2.96	2.89	2.46	2.90	2.87
Benhur	2.74	3.06	3.01	2.93	2.90	2.93	2.91	2.79	2.56	2.74	2.84
Fertodi 293	2.80	2.85	2.88	2.89	2.84	2.93	2.91	2.8[illegible]	2.58	2.86	2.84
Bankuti 1201	2.72	2.93	2.91	2.88	2.87	2.98	2.95	2.88	2.60	2.85	2.84
Heine VII	2.80	2.77	2.82	2.74	2.87	2.89	2.83	2.93	2.50	.	2.82
Purdue 4930A6-28-2-1	2.77	2.95	2.81	2.99	2.86	2.92	2.77	2.70	2.53	2.82	2.81
Sturdy	2.66	2.77	2.90	2.81	2.91	2.80	2.76	2.82	2.52	2.82	2.80
Cappell Desprez	2.82	2.79	2.80	2.72	2.79	2.83	2.86	2.91	2.55	2.79	2.79
NB 67730	2.74	2.93	2.88	2.83	2.79	2.86	2.78	2.70	2.59	2.78	2.75
Atlas 66	2.60	2.74	2.65	2.74	2.77	2.74	2.71	2.64	2.45	2.71	2.69
Lerma Rojo 64	..	2.86	2.85	2.87	2.77	2.75	2.69		. .		2.81[a]
INIA 66	. .	2.89	3.01	2.72	. . ..	.	2.71	..	.. ...	. .	2.81[b]
Mean	2.80	2.97	2.95	2.95	2.93	2.92	2.94	2.89	2.62	2.91	2.89

[a] Mean of 16 locations for which Bezostaia averaged 2.92%.
[b] Mean of 13 locations for which Bezostaia averaged 2.92%.

Table 28. Summary of average lysine (expressed as % of protein and adjusted to a common protein percentage) for cultivars grown in the 1969 IWWPN.

Cultivar	Bordenave, Argentina	Temuco, Chile	N. Carolina USA	Oklahoma, USA	California, USA	Svalöf Sweden	Wageningen, Netherlands	Versailles, France	Milano, Italy	Rieti, Italy	Novi Sad, Yugoslavia
Yorkstar	3.13	3.25	2.93	3.02	3.00	2.93	3.29	3.31	3.15	3.07	3.09
Gaines	3.07	3.12	2.87	3.08	3.01	2.95	3.20	3.33	3.14	3.13	3.00
Odin	. .		3.07	3.11	3.21	2.90	3.14	3.06	3.07	2.89	3.06
Stadler	3.03	3.14	2.74	2.92	3.10	2.95	3.21	3.19	3.05	3.12	2.92
Timwin	3.04	3.03	2.99	3.03	2.96	2.99	3.18	2.97	3.08	2.87	3.04
Felix	3.12		3.11	3.09	3.16	2.97	3.18	3.12	2.90	2.94	2.97
Riley 67	2.96	3.05	2.90	2.99	2.96	2.98	3.08	2.90	3.09	2.99	2.97
Purdue 4930A6-28-2-1	3.04	3.09	3.04	3.05	3.11	2.95	3.09	2.89	2.91	2.88	2.93
Blueboy	2.90	3.03	2.84	2.91	2.99	2.99	3.20	3.15	3.09	2.87	2.91
Arthur	2.99	3.16	3.00	2.96	2.93	2.99	3.14	2.93	3.00	2.76	2.94
NB 67730	2.96	3.14	2.90	2.95	3.06	2.90	3.10	3.02	2.86	2.81	2.90
San Pastore	2.92	2.97	2.95	2.90	2.91	2.98	3.09	2.81	3.09	2.90	2.90
Parker	3.00	3.05	2.90	2.91	2.97	2.90	3.08	2.99	2.95	2.91	3.00
Gage	3.08	3.12	2.92	2.99	2.96	2.88	3.06	2.95	2.86	2.88	2.97
Bankuti 1201	2.99	2.91	3.04	3.08	2.77	2.96	3.06	2.86	2.80	2.71	2.96
Cappell Desprez	2.94	2.86	2.98	3.01	2.93	2.90	3.03	2.80	2.80	2.71	2.95
Lancer	2.99	3.14	2.95	3.00	2.88	2.90	3.02	2.84	2.92	2.79	2.86
Atlas 66	2.95	3.14	2.98	2.99	3.00	2.90	3.04	2.83	2.81	2.76	2.94
Scout 66	2.97	3.02	2.83	2.99	2.90	2.92	3.02	2.96	2.91	2.85	2.95
Yung Kwang	2.85	3.22	2.85	2.84	2.89	2.99	3.08	3.08	2.86	2.76	2.87
Fertodi 293	2.96	3.02	2.90	3.03	2.91	2.98	3.10	2.81	2.88	2.75	2.98
Heine VII	2.89		2.94	2.80	2.91	2.71	3.09	2.74	2.96	2.89	2.96
Winalta	2.91	2.93	2.91	2.91	2.92	2.96	3.04	2.87	2.92	2.75	2.88
Triumph 64	3.03	3.09	2.74	2.94	2.97	2.86	3.10	2.91	2.85	2.83	2.91
Benhur	2.92	2.99	2.86	2.87	2.94	2.85	3.05	2.78	2.86	2.73	2.84
Bezostaia	2.92	2.85	2.91	2.84	2.88	2.85	3.11	2.78	2.76	2.73	2.89
Shawnee	3.02	3.12	2.90	2.86	2.95	2.86	3.07	2.99	2.89	2.72	2.79
Sturdy	2.95	3.05	2.84	2.86	2.96	2.79	3.07	2.77	2.81	2.91	2.87
Lerma Ropo 64	2.87	3.01	2.88		2.88	2.88	3.06	2.78	2.85	2.78	2.84
INIA 66	2.87	2.93	2.92		2.91	2.86	3.02	2.83	2.82	2.69	. .
Mean	2.97	3.05	2.92	2.96	2.96	2.91	3.10	2.94	2.93	2.85	2.93

Table 28. (Continued)

Cultivar	Fundulea, Romania	Eskisehir, Turkey	Ankara, Turkey	Sulaimaniyha, Iraq	Karaj Iraq	Kermanshah, Iran	Kabul, Afghanistan	Suwon, Korea	Sapporo, Japan	Mean	
										20 loc.	18 loc.
Yorkstar	3.07	3.07	3.15	3.15	3.16	3.14	3.17	3.03	2.85	3.10	3.09
Gaines	2.99	3.02	3.09	2.98	3.11	3.06	3.23	3.02	2.81	3.06	3.06
Odin	3.17	3.07	3.01	3.03	3.19	3.23	3.09	3.01	2.78		3.06
Stadler	2.98	3.07	3.12	3.10	3.13	3.14	3.09	2.95	2.77	3.04	3.03
Timwin	3.03	3.10	3.04	3.00	3.15	3.12	3.16	2.84	2.80	3.02	3.02
Felix	3.10	2.92	2.90	3.03	3.09	3.15	2.93	2.96	2.74		3.02
Riley 67	3.00	3.22	3.02	3.14	3.01	2.93	3.01	2.87	2.75	2.99	2.99
Purdue 4930A6-28-2-1	3.02	2.95	2.95	3.03	3.06	3.04	2.93	2.87	2.89	2.99	2.98
Blueboy	2.89	2.93	3.01	3.01	3.00	2.88	3.13	2.80	2.76	2.96	2.96
Arthur	2.96	3.01	2.95	2.87	2.93	2.97	2.93	2.87	2.90	2.96	2.95
NB 67730	2.96	2.94	3.00	2.91	3.02	2.99	2.98	2.80	2.82	2.95	2.94
San Pastore	2.98	2.87	2.95	2.83	3.01	2.99	2.95	2.91	2.84	2.94	2.94
Parker	2.88	2.90	2.87	3.03	3.03	2.92	2.91	2.95	2.77	2.95	2.94
Gage	2.90	2.97	3.17	2.87	3.00	2.98	2.88	2.84	2.72	2.95	2.93
Bankuti 1201	2.87	2.97	3.02	2.88	3.01	3.05	2.99	2.88	2.83	2.93	2.93
Cappell Desprez	3.16	2.87	2.92	2.97	2.93	3.08	2.94	2.94	2.80	2.93	2.93
Lancer	2.86	2.87	2.99	2.95	3.03	2.98	2.95	2.93	2.69	2.93	2.92
Atlas 66	2.99	2.88	2.88	2.87	2.99	3.02	2.88	2.77	2.89	2.93	2.91
Scout 66	2.84	2.84	3.06	2.93	2.92	2.95	2.81	2.88	2.85	2.92	2.91
Yung Kwang	2.95	2.99	3.00	2.69	2.95	2.99	3.03	2.87	2.75	2.93	2.91
Bertodi 293	2.90	2.87	2.98	2.81	2.92	2.98	2.91	2.90	2.80	2.92	2.91
Heine VII	3.09	2.85	2.90	2.78	3.04	3.00	2.83	2.91	2.77		2.90
Winalta	2.91	2.97	2.90	2.87	2.96	2.86	3.02	2.88	2.59	2.90	2.90
Triumph 64	2.84	2.81	2.93	2.90	2.96	2.98	2.92	2.79	2.89	2.91	2.90
Benhur	2.88	2.98	2.99	2.86	2.99	2.96	2.96	2.80	2.73	2.89	2.89
Bezostaia	2.90	3.00	2.88	2.99	2.92	3.04	2.98	2.84	2.74	2.89	2.89
Shawnee	2.87	2.95	2.90	2.78	3.01	2.93	2.92	2.88	2.59	2.90	2.88
Sturdy	2.84	2.80	2.96	2.70	2.93	2.88	2.71	2.84	2.68	2.86	2.85
Lerma Rojo 64	.	2.88	2.91	2.83	2.83	2.79	2.94	.	.	....	2.88[a]
INIA 66	.	2.86	3.00	2.72	..	....	2.79	..	....	....	2.86[b]
Mean	2.96	2.95	2.98	2.92	3.01	3.00	2.97	2.89	2.77	2.95	2.94

[a] Mean of 16 locations for which Bezostaia averaged 2.91%.
[b] Mean of 15 locations for which Bezostaia averaged 2.90%.

Table 29. Summary of winter survival (%) for cultivars grown in the 1969 IWWPN.

Cultivar	Svalöf Sweden	Wageningen, Netherlands	Milano, Italy	Reiti, Italy	Fundulea, Romania	Ankara, Turkey	Kabul, Afghanistan	Suwon, Korea	Sapporo, Japan	Mean 9 locations
Atlas 66	72.5	91.2	94.2	90.8	96.8	99.0	60.0	30.0	1.0	70.6
Heine VII	89.8	95.7	93.2	95.3	80.0	99.0	50.0	75.0	5.5	75.9
Cappell Desprez	84.8	88.7	97.2	99.0	99.0	99.0	68.7	55.0	1.0	76.9
San Pastore	72.5	91.2	92.7	92.3	99.0	99.0	75.0	70.0	1.3	77.0
Parker	87.3	88.7	97.5	89.0	99.0	99.0	62.5	80.0	5.3	78.7
Shawnee	94.3	78.7	90.0	89.3	99.0	99.0	68.7	75.0	16.0	78.9
Fertodi 293	99.0	90.0	95.5	95.5	96.8	99.0	60.0	65.0	12.5	80.4
Gaines	89.8	90.0	97.2	93.0	99.0	99.0	75.0	80.0	1.8	80.5
Gage	92.3	88.7	96.5	94.8	99.0	99.0	75.0	80.0	4.0	81.0
Yung Kwang	89.8	88.7	95.5	92.8	99.0	99.0	72.5	80.0	11.3	81.0
Lancer	94.3	87.5	96.5	92.5	99.0	99.0	70.0	80.0	13.8	81.4
Bankuti 1201	99.0	91.2	96.0	95.5	99.0	99.0	75.0	80.0	1.8	81.8
Blueboy	82.5	88.7	96.5	96.0	99.0	99.0	75.0	80.0	21.3	82.0
NB 67730	96.8	90.0	95.2	93.3	99.0	99.0	75.0	80.0	23.8	83.6
Purdue 4930A6-28-2-1	92.3	88.7	93.2	90.3	99.0	99.0	53.7	80.0	66.3	84.7
Sturdy	89.8	92.5	94.0	92.0	99.0	99.0	53.7	80.0	62.5	84.7
Scout 66	96.8	92.5	95.7	94.0	99.0	99.0	72.5	80.0	37.5	85.2
Bezostaia	92.0	90.0	92.0	96.5	86.3	99.0	56.2	80.0	85.5	86.4
Arthur	91.0	88.7	92.7	90.8	99.0	99.0	53.7	80.0	83.8	86.5
Yorkstar	93.5	91.2	95.2	93.3	99.0	99.0	50.0	80.0	86.3	87.5
Riley 67	87.5	87.5	96.0	97.8	99.0	99.0	56.2	80.0	84.3	87.5
Felix	94.5	93.2	97.5	99.0	99.0	99.0	61.2	65.0	83.8	88.0
Timwin	94.3	85.0	96.5	82.0	96.8	99.0	72.5	80.0	90.5	88.5
Stadler	90.0	86.2	95.7	83.0	99.0	99.0	75.0	80.0	95.8	89.3
Benhur	96.8	92.5	94.7	87.5	99.0	99.0	61.2	80.0	93.8	89.4
Winalta	96.5	88.7	95.7	97.5	99.0	99.0	68.7	80.0	80.0	89.5
Odin	98.0	92.5	94.7	96.5	99.0	99.0	53.7	80.0	92.0	89.5
Triumph 64	94.5	95.0	97.0	89.5	99.0	99.0	66.2	75.0	93.8	89.9
Lerma Rojo 64	57.5	63.7	89.2	94.8	0.0	80.0	25.0	0.0	0.0	45.6
INIA 66	15.0	50.0	89.7	87.3	0.0	20.0	0.0	0.0	.....	32.8[a]
Mean	87.5	87.6	94.8	92.7	91.1	95.7	61.4	70.7	43.3	80.5

[a] Mean of 8 locations only for which Bezostaia averaged 86.5%.

Table 30. Summary of frost damage[a] for cultivars grown in the 1969 IWWPN.

Cultivar	Bordenave, Argentina	Wageningen, Netherlands	Milano, Italy	Fundulea, Romania	Eskisehir, Turkey	Mean 5 locations
Gaines	0.0	4.0	2.0	1.0	0.0	1.4
Winalta	0.0	4.5	4.0	0.0	0.0	1.7
Triumph 64	0.0	2.0	4.0	1.0	2.0	1.8
Lancer	0.0	5.0	4.0	0.0	0.0	1.8
Parker	0.0	4.5	4.5	1.0	0.0	2.0
Scout 66	0.0	2.5	4.5	1.0	2.0	2.0
Benhur	0.0	2.5	4.0	2.0	2.0	2.1
NB 67730	0.0	4.0	3.5	3.0	0.0	2.1
Shawnee	0.3	6.5	4.5	0.0	0.0	2.2
Bankuti 1201	0.5	3.5	4.0	1.5	2.0	2.3
Gage	0.0	4.5	4.0	1.0	2.0	2.3
Sturdy	0.0	3.0	4.0	3.0	2.0	2.4
Stadler	0.0	4.5	4.0	3.0	2.0	2.7
Timwin	0.0	5.5	4.5	1.5	2.0	2.7
Odin	1.0	3.0	4.0	3.5	2.0	2.7
Bezostaia	0.0	4.0	6.0	4.0	0.0	2.8
Purdue 4930A6-28-2-1	0.0	4.0	4.0	2.5	4.0	2.9
Riley 67	0.0	5.0	6.0	1.5	2.0	2.9
Felix	1.8	3.0	4.0	3.5	2.0	2.9
Yung Kwang	0.0	4.5	4.5	4.0	2.0	3.0
Yorkstar	0.0	3.5	5.5	2.0	4.0	3.0
Arthur	0.0	4.5	6.0	3.0	2.0	3.1
Heine VII	1.0	2.0	5.0	7.0	2.0	3.4
Fertodi 293	0.8	4.0	7.0	4.0	2.0	3.6
Cappell Desprez	1.8	4.5	4.5	5.5	2.0	3.7
San Pastore	1.5	3.5	4.5	5.0	4.0	3.7
Blueboy	1.3	4.5	5.5	4.0	4.0	3.9
Atlas 66	2.3	3.5	4.5	8.0	4.0	4.5
Lerma Rojo 64	5.3	6.5	4.5	.....	6.0	5.6[b]
INIA 66	6.8	8.0	8.0	.....	8.0	7.7[b]
Mean	0.8	4.2	4.6	2.7	2.2	3.0

[a] Coded damage 0–9.
[b] Mean of 4 locations for which Bezostaia averaged 2.5.

Table 31. Summary of days to flowering (days from Jan. 1) for cultivars grown in the 1969 IWWPN.

Cultivar	Bordenave, Argentina	Oklahoma, USA	California, USA	S[illegible]of S[illegible]den	Wageningen, Netherlands	Versailles, France	Milano, Italy	Reiti, Italy	Novi Sad, Yugoslavia	Fundulea, Romania
San Pastore	304	112	121	165	159	133	134	136	138	141
Benhur	322	113	128	164	156	134	135	139	138	140
Triumph 64	315	117	125	164	158	134	135	136	138	141
Sturdy	313	118	128	165	[illegible]	134	136	139	140	143
Arthur	318	117	128	166	161	140	137	142	140	142
Purdue 4930A6-28-2-1	322	122	131	166	160	141	138	143	140	143
Parker	316	120	126	165	161	140	137	143	142	142
Scout 66	316	121	129	165	160	140	139	143	143	142
Stadler	325	120	128	167	163	141	139	142	140	143
Riley 67	325	119	128	168	163	143	138	143	139	143
Yung Kwang	322	122	131	163	158	142	137	143	139	141
Bezostaia	318	120	128	168	162	142	137	143	140	143
NB 67730	315	122	128	164	159	140	138	143	141	142
Shawnee	315	123	133	166	163	143	141	148	144	144
Timwin	325	121	130	168	163	143	140	143	143	144
Fertodi 293	319	123	133	166	[illegible]	145	140	148	143	143
Bankuti 1201	323	124	137	166	[illegible]	143	141	148	142	144
Blueboy	317	122	133	168	164	146	140	146	143	148
Gage	315	122	133	165	163	145	140	148	143	143
Atlas 66	316	123	133	167	163	144	140	148	146	148
Lancer	324	124	135	167	164	146	142	148	145	144
Winalta	323	129	140	168	164	149	143	150	143	147
Yorkstar	324	125	135	169	164	150	141	150	146	148
Gaines	323	129	137	168	165	149	142	150	147	148
Heine VII	321	129	141	170	167	148	146	153	148	155
Cappell Desprez	327	131	140	170	167	145	147	156	148	160
Felix	340	136	142	173	168	149	147	164	150	155
Odin	...	138	147	174	169	150	151	164	154	159
Lerma Rojo 64	294	.....	115	162	159	129	133	135	136	..
INIA 66	.....	.....	113	160	152	125	131	132	..	.....
Mean	319	123	131	167	162	142	140	146	143	146

Table 31. (Continued)

Cultivar	Eskisehir, Turkey	Ankara, Turkey	Sulaimaniyha, Iraq	Karaj, Iran	Kermanshah, Iran	Kabul, Afghanistan	Suwon, Korea	Sapporo, Japan	Mean	
									18 loc.	17 loc.
San Pastore	134	143	120	124	135	126	139	178	147	138
Benhur	140	143	121	129	132	126	140	174	149	138
Triumph 64	143	142	122	131	131	125	139	172	148	138
Sturdy	145	145	123	131	139	127	139	175	150	140
Arthur	143	146	121	131	138	127	143	176	151	141
Purdue 4930A6-28-2-1	142	149	126	130	138	131	145	175	152	142
Parker	143	150	123	132	138	128	141	176	151	142
Scout 66	141	144	127	134	140	127	140	176	152	142
Stadler	138	147	122	132	134	131	144	177	152	142
Riley 67	140	147	123	130	136	132	145	175	152	142
Yung Kwang	140	148	126	136	141	132	141	178	152	142
Bezostaia	142	148	123	126	139	136	145	176	152	142
NB 67730	140	148	127	134	153	129	141	176	152	143
Shawnee	141	149	128	128	139	132	145	178	153	144
Timwin	146	149	124	134	141	134	145	177	154	144
Fertodi 293	143	148	128	133	142	132	146	178	154	144
Bankuti 1201	144	148	130	136	143	132	146	179	155	145
Blueboy	143	148	124	136	143	136	145	179	155	145
Gage	144	149	128	133	156	128	145	178	154	145
Atlas 66	146	149	124	133	155	132	148	178	155	146
Lancer	139	150	132	137	157	132	147	177	156	146
Winalta	143	151	132	135	147	146	149	177	158	148
Yorkstar	148	150	129	140	156	139	150	178	158	148
Gaines	150	159	133	142	157	145	150	181	160	150
Heine VII	149	155	131	141	147	149	154	183	160	151
Cappell Desprez	149	159	139	145	147	149	160	179	162	152
Felix	149	161	139	146	150	153	162	181	165	154
Odin	153	157	142	147	149	153	161	185		156
Lerma Rojo 64	141	142	104	117	131	106	.....	.. ..		143[a]
INIA 66	141	142	101	.....	.....	120	.....	.....	....	132[b]
Mean	144	149	126	134	143	133	146	178	154	145

[a] Mean of 14 locations only for which Bezostaia averaged 154 days.
[b] Mean of 10 locations only for which Bezostaia averaged 143 days.

Table 32. Summary of days to ripening (days from Jan. 1) for cultivars grown in the 1969 IWWPN.

Cultivar	Bordenave, Argentina	Oklahoma, USA	California, USA	Svalof, Sweden	Wageningen, Netherlands	Milano, Italy	Reiti, Italy	Fundulea, Romania	Eskisehir, Turkey
Triumph 64	352	145	146	213	203	178	188	178	183
Benhur	360	146	152	217	203	181	189	179	184
San Pastore	345	152	142	213	206	178	181	181	182
Riley 67	362	148	152	219	185	181	188	180	184
Stadler	365	151	154	219	185	185	188	181	185
Timwin	361	154	156	219	181	188	191	181	185
Scout 66	355	152	154	213	205	184	189	181	185
Purdue 4930A6-28-2-1	356	155	157	216	204	184	189	181	184
NB 67730	354	154	152	213	204	184	191	182	184
Arthur	357	151	154	218	206	183	191	181	185
Sturdy	354	151	152	215	206	183	188	183	185
Parker	357	151	152	219	206	185	191	182	185
Yung Kwang	359	155	157	212	203	188	191	179	183
Bezostaia	358	153	154	222	212	188	191	185	189
Fertodi 293	358	156	161	215	208	185	193	181	186
Gage	355	154	153	217	207	185	192	182	185
Shawnee	352	154	156	220	207	189	188	183	183
Lancer	363	157	160	216	206	189	192	183	183
Winalta	360	159	154	218	209	186	192	182	185
Bankuti 1201	360	158	156	215	208	189	193	181	186
Yorkstar	363	161	161	219	212	191	188	184	189
Atlas 66	354	160	156	226	207	189	197	187	187
Blueboy	358	156	153	228	212	188	199	185	192
Gaines	362	166	165	223	212	186	188	187	191
Heine VII	369	162	166	223	217	191	199	201	193
Cappell Desprez	363	165	164	222	217	190	199	201	194
Felix	372	169	174	226	217	191	197	201	194
Odin	.	169	176	230	217	194	199	201	197
Lerma Rojo 64	345	.	140	212	204	178	182	. ..	183
INIA 66	344	. . .	135	213	204	177	181	. ..	182
Mean	358	156	155	218	206	186	191	185	186

Table 32. (Continued)

Cultivar	Ankara, Turkey	Sulaimaniyha, Iraq	Karaj, Iran	Kermanshah, Iran	Kabul, Afghanistan	Suwon, Korea	Sapporo, Japan	Mean	
								16 loc.	15 loc.
Triumph 64	188	152	167	152	168	177	206	187	176
Benhur	188	151	164	162	168	165	210	189	177
San Pastore	188	151	163	164	169	178	214	188	177
Riley 67	188	150	166	168	171	179	210	189	178
Stadler	188	152	166	168	174	178	210	191	179
Timwin	188	153	168	167	176	179	213	191	180
Scout 66	188	155	170	171	169	178	210	191	180
Purdue 4930A6-28-2-1	188	154	166	169	169	179	210	191	180
NB 67730	188	154	167	169	172	177	212	191	180
Arthur	188	150	164	169	170	178	210	191	180
Sturdy	188	152	168	170	173	180	214	191	181
Parker	190	153	168	170	174	179	215	192	181
Yung Kwang	188	156	167	170	173	179	214	192	181
Bezostaia	188	153	163	169	177	181	211	193	182
Fertodi 293	188	156	168	171	171	181	216	193	182
Gage	188	156	168	171	172	179	215	192	182
Shawnee	188	158	162	170	175	179	214	192	182
Lancer	188	159	167	172	175	164	214	193	182
Winalta	190	158	170	171	175	181	211	194	183
Bankuti 1201	188	157	170	171	174	181	217	194	183
Yorkstar	188	157	171	170	178	180	214	195	184
Atlas 66	188	154	167	172	170	181	216	194	184
Blueboy	192	155	170	169	180	181	216	196	185
Gaines	195	159	173	172	180	182	215	197	186
Heine VII	192	160	172	168	181	191	217	200	189
Cappell Desprez	196	165	174	170	182	193	218	201	190
Felix	199	163	173	170	190	192	218	203	192
Odin	199	165	175	171	186	193	219		193
Lerma Rojo 64	188	145	163	160	172	.		189[a]	. .
INIA 66	188	146	163	171	171	.	212	191[b]	.....
Mean	190	155	168	169	175	180	213	193	182

[a] Mean of 12 locations only for which Bezostaia averaged 197 days.
[b] Mean of 13 locations only for which Bezostaia averaged 198 days.

Table 33. Summary of average plant height (cm.) for cultivars grown in the 1969 IWWPN.

Cultivar	Bordenave, Argentina	Temuco, Chile	N. Carolina, USA	Oklahoma, USA	California, USA	Svalöf Sweden	Wageningen, Netherlands	Milano, Italy	Reiti, Italy	Novi Sad, Yugoslavia	Fundulea, Romania
Gaines	84	80	78	84	85	69	80	74	87	71	56
Sturdy	93	90	93	94	80	69	100	74	81	74	59
Timwin	86	80	95	84	90	76	102	85	95	80	75
Cappell Desprez	88	80	98	94	95	80	112	94	107	83	66
Felix	68	.	90	86	105	85	113	92	103	91	63
San Pastore	93	85	108	94	95	75	108	95	102	89	66
Blueboy	94	95	102	97	95	89	104	92	107	92	81
Heine VII	78		99	97	110	89	119	97	112	92	69
Bezostaia	94	75	109	99	105	79	103	94	108	88	71
Arthur	90	90	112	97	105	81	119	101	113	93	70
Parker	103	115	117	04	105	79	111	99	117	91	71
Yung Kwang	99	80	116	109	110	81	126	104	115	98	77
Benhur	101	105	116	109	105	86	115	104	115	96	77
Yorkstar	95	95	107	112	115	89	106	101	119	101	89
Gage	113	115	113	107	120	81	125	115	127	102	79
Riley 67	96	95	121	109	110	85	124	107	126	103	82
Triumph 64	113	105	119	104	115	84	127	113	121	97	77
Odin	70		111	91	95	109	146	120	138	104	80
Lancer	113	110	116	107	130	85	130	118	133	106	88
Shawnee	115	110	122	114	120	91	127	116	134	101	85
Scout 66	120	125	121	109	120	84	128	118	128	103	85
Stadler	109	100	122	114	125	95	126	117	128	102	86
Winalta	113	110	112	112	125	88	132	121	137	102	97
Atlas 66	123	115	117	107	125	90	136	129	135	104	85
Fertodi 293	116	115	117	11.	120	92	133	122	136	112	95
Purdue 4930A6-28-2-1	113	90	128	114	125	90	132	122	139	103	92
NB 67730	124	115	121	114	125	96	139	123	137	108	88
Bankuti 1201	123	110	131	119	135	93	145	134	145	113	95
Lerma Rojo 64	83	80	97	..	105	70	114	87	92	89	. .
INIA 66	69	80		...	80	60	90	73	86		....
Mean	99	98	111	103	109	84	119	105	117	96	79

Table 33. (Continued)

Cultivar	Eskisehir, Turkey	Ankara, Turkey	Sulaimaniyha, Iraq	Karaj, Iran	Kermanshah, Iran	Kabul, Afghanistan	Suwon, Korea	Sapporo, Japan	Mean	
									19 loc.	18 loc.
Gaines	71	61	86	72	64	78	84	80	76	76
Sturdy	86	83	95	80	70	96	90	93	84	84
Timwin	91	94	101	81	79	94	94	106	89	89
Cappell Desprez	103	79	100	101	83	98	101	92	92	93
Felix	100	98	99	99	71	105	106	105	.	93
San Pastore	105	100	111	96	90	103	100	84	95	95
Blueboy	106	93	106	91	89	101	107	103	97	97
Heine VII	111	90	109	100	81	104	108	93	.	98
Bezostaia	113	105	108	91	91	105	105	106	97	99
Arthur	110	111	110	95	86	106	114	110	101	101
Parker	109	98	113	100	100	107	109	96	102	102
Yung Kwang	104	110	109	101	93	117	111	100	103	104
Benhur	111	105	115	85	94	111	112	115	104	104
Yorkstar	103	98	116	85	92	104	114	123	103	104
Gage	115	111	129	95	98	113	110	91	109	108
Riley 67	114	100	118	101	103	110	113	116	107	108
Triumph 64	114	112	125	100	107	110	104	116	109	109
Odin	111	117	100	104	81	117	122	140		109
Lancer	119	92	124	110	96	110	112	108	111	111
Shawnee	116	113	124	100	105	116	119	114	113	113
Scout 66	123	126	118	110	110	111	113	100	113	113
Stadler	110	110	121	95	98	116	118	133	112	113
Winalta	115	113	120	110	107	119	113	123	114	114
Atlas 66	130	106	136	126	110	119	122	86	116	116
Fertodi 293	119	122	135	135	102	123	115	105	117	117
[illegible]ue 4930A6-28-2-1	123	121	125	116	103	122	125	122	116	118
[illegible]57730	126	121	138	131	104	123	120	113	119	120
Ba[illegible]uti 1201	126	130	140	131	118	127	124	114	124	125
Lerma Rojo 64	91	88	114	95	85	95	...	...	...	92[a]
INIA 66	73	56	94	...	...	77	.....	...	...	76[b]
Mean	108	102	115	101	93	108	110	107	105	104

[a] Mean of 15 locations only for which Bezostaia averaged 97.9 cms.
[b] Mean of 11 locations only for which Bezostaia averaged 99.0 cms.

Table 34. Summary of lodging (%) data for cultivars grown in the 1969 IWWPN.

Cultivar	Temuco, Chile	N. Carolina, USA	Oklahoma, USA	Svalöf Sweden	Wageningen, Netherlands	Versailles, France	Milano, Italy	Reiti, Italy
Sturdy	10.0	0.0	10.0	0.0	0.0	25.0	0.0	0.0
Felix		0.0	10.0	0.0	0.0	85.0	0.0	0.0
San Pastore	10.0	0.0	20.0	5.0	0.0	25.0	0.0	0.0
Odin		0.0	30.0	12.5	0.0	85.0	0.0	0.0
Cappell Desprez	10.0	0.0	5.0	10.0	0.0	75.0	0.0	0.0
Blueboy	10.0	0.0	5.0	10.0	0.0	75.0	0.0	0.0
Heine VII		0.0	5.0	37.5	0.0	85.0	0.0	0.0
Gaines	10.0	0.0	60.0	7.5	0.0	95.0	0.0	0.0
Parker	30.0	3.8	20.0	5.0	0.0	95.0	2.5	0.0
Bezostaia	20.0	0.0	20.0	10.0	0.0	95.0	0.0	0.0
Benhur	10.0	0.0	30.0	7.5	0.0	95.0	1.3	0.0
Yorkstar	20.0	0.0	10.0	50.0	0.0	95.0	1.3	0.0
Arthur	20.0	2.5	10.0	27.5	0.0	95.0	30.0	0.0
Timwin	10.0	0.0	30.0	50.0	0.0	95.0	2.5	0.0
Shawnee	30.0	0.0	5.0	15.0	0.0	95.0	43.8	0.0
Purdue 4930A6-28-2-1	10.0	5.0	20.0	42.5	0.0	95.0	27.5	0.0
Stadler	10.0	3.8	20.0	40.0	0.0	95.0	18.8	0.0
Fertodi 293	40.0	0.0	5.0	37.5	17.5	95.0	27.5	25.0
Riley 67	10.0	2.5	60.0	42.5	12.5	95.0	27.5	0.0
Yung Kwang	20.0	1.3	60.0	45.0	12.5	95.0	15.0	0.0
Atlas 66	90.0	26.3	40.0	30.0	52.5	25.0	75.0	0.0
Gage	40.0	1.3	30.0	15.0	27.5	85.0	53.8	0.0
Winalta	60.0	1.3	10.0	25.0	92.5	85.0	72.5	31.3
Lancer	20.0	20.0	5.0	60.0	97.5	25.0	75.0	25.0
Triumph 64	40.0	40.0	70.0	42.5	85.0	95.0	75.0	12.5
Bankuti 1201	40.0	17.5	10.0	57.5	77.5	85.0	75.0	43.8
Scout 66	40.0	25.0	60.0	55.0	61.3	35.0	75.0	50.0
NB 67730	40.0	53.8	50.0	50.0	55.0	25.0	65.0	31.3
Lerma Rojo 64	20.0	0.0		47.5	0.0	25.0	5.0	0.0
INIA 66	20.0			2.5	0.0	25.0	12.5	0.0
Mean	25.6	7.0	25.4	28.0	19.7	73.3	26.1	7.3

Table 34. (Continued)

Cultivar	Novi Sad, Yugoslavia	Fundulea, Romania	Eskisehir, Turkey	Karaj, Iran	Kabul, Afghanistan	Suwon, Korea	Mean	
							14 loc.	15 loc.
Sturdy	15.0	0.0	0.0	0.0	0.0	35.0	6.8	6.5
Felix	10.0	0.0	0.0	0.0	0.0	25.0		10.0
San Pastore	79.8	0.0	0.0	0.0	0.0	30.0	12.1	12.3
Odin	15.0	0.0	0.0	0.0	0.0	20.0		12.5
Cappell Desprez	75.0	0.0	0.0	0.0	0.0	25.0	14.3	14.6
Blueboy	74.8	0.0	5.5	0.0	6.3	25.0	15.1	15.5
Heine VII	60.0	0.0	0.0	0.0	0.0	20.0		16.0
Gaines	30.3	0.0	0.0	0.0	0.0	20.0	15.9	16.4
Parker	89.5	0.0	0.8	0.0	12.5	25.0	20.3	19.5
Bezostaia	84.8	2.5	0.0	0.0	31.3	20.0	20.3	20.3
Benhur	84.5	2.5	1.3	0.0	18.8	30.0	20.1	20.8
Yorkstar	99.0	3.8	0.0	0.0	6.3	25.0	22.2	22.3
Arthur	94.3	5.0	3.3	0.0	0.0	44.8	23.7	24.0
Timwin	94.3	3.8	1.3	0.0	18.8	25.0	23.6	24.7
Shawnee	70.0	3.8	5.0	20.0	43.8	35.0	26.2	25.9
Purdue 4930A6-28-2-1	84.8	6.3	3.3	17.5	0.0	45.0	25.5	26.7
Stadler	99.0	5.0	4.5	0.0	50.0	40.0	27.6	28.9
Fertodi 293	99.0	13.8	1.3	22.5	18.8	35.0	31.3	30.6
Riley 67	99.0	2.5	2.0	0.0	32.0	45.0	30.8	32.3
Yung Kwang	89.5	3.8	4.5	0.0	43.8	55.0	31.8	32.7
Atlas 66	99.0	2.5	10.8	40.0	6.3	25.0	37.3	33.3
Gage	99.0	0.0	6.5	40.0	43.5	35.0	34.0	33.6
Winalta	99.0	10.0	12.0	0.0	56.3	45.0	42.9	41.5
Lancer	99.0	8.8	5.0	40.0	37.5	45.0	40.2	41.8
Triumph 64	99.0	11.3	10.0	21.3	0.0	45.0	46.2	46.7
Bankuti 1201	99.0	22.5	10.0	20.0	62.5	35.0	46.8	47.2
Scout 66	99.0	10.0	8.8	42.5	50.0	45.0	46.9	47.4
NB 67730	99.0	8.8	12.5	60.0	62.3	45.0	47.0	47.5
Lerma Rojo 64	99.0	...	2.0	32.5	0.0	...	...	21.0[a]
INIA 66	...	...	0.0	...	0.0	...	...	7.5[b]
Mean	80.6	4.5	3.7	12.3	20.0	33.7	28.4	26.0

[a] Mean of 11 locations only for which Bezostaia averaged 21.9%.
[b] Mean of 8 locations only for which Bezostaia averaged 19.5%.

Table 35. Summary of shattering (%) data for cultivars grown in the 1969 IWWPN.

Cultivar	Bordenave, Argentina	Svalöf Sweden	Wageningen, Netherlands	Fundulea, Romania	Eskisehir, Turkey	Mean 5 locations
Winalta	0.0	0 0	5.0	0.0	0.0	1.0
Sturdy	0.0	0.0	5.0	0.1	0.0	1.0
Bezostaia	0.0	0.0	7.5	0 0	0.0	1.5
Heine VII	0.0	0.0	7.5	0.1	0.1	1.5
Felix	0.0	0.0	10 0	0.1	1.3	2.3
Blueboy	0.0	1.6	10 0	0 1	0.0	2.3
NB 67730	0.0	0.0	13.8	0.3	0.0	2.8
Timwin	0.0	0.0	15.0	0.1	1.6	3.3
Benhur	0.0	0.0	16.3	0.1	0.0	3.3
Triumph 64	0.0	0.0	17.5	0.2	0.1	3.6
Yung Kwang	0.0	0.0	17.5	0.1	0.2	3.6
Odin	0.0	0.9	17.5	0.1	0.2	3.7
Parker	0.0	0.0	17.5	0.2	0.8	3.7
Shawnee	0.0	0.0	18.8	0.2	0.1	3.8
Cappell Desprez	0.0	0.0	18.8	0.2	0.2	3.8
Fertodi 293	0.0	0.0	18 8	0.1	0.4	3.9
Gaines	0.0	0.0	20.0	0.2	0.0	4.0
Atlas 66	0.0	2 0	18.8	0.0	0.0	4.2
Stadler	0.0	0.7	20.0	0.1	0.0	4.2
Yorkstar	0.0	1.9	18.8	0.9	0 0	4.3
Lancer	0.0	0.0	21.3	0.3	1.0	4.5
Riley 67	0.0	0.0	20.0	2.6	1.3	4.8
Bankuti 1201	0.0	0.0	23.8	0.0	0.2	4.8
Gage	0.0	0.0	21.3	2.7	0.3	4.9
Scout 66	0.0	0.0	26.3	0.2	0.1	5.3
Arthur	10.0	2.9	26.3	1.3	1.3	8.4
San Pastore	10.0	4.1	28.8	4.1	5.3	10.5
Purdue 4930A6-28-2-1	20.0	4.1	23.8	2.1	5.5	11.1
Lerma Rojo 64	0.0	0.0	20.0	.	0.0	5.0[a]
INIA 66	0.0	0.0	21.3	.....	0.0	5.3[a]
Mean	1.3	0.6	17.6	0.6	0.7	4.2

[a] Mean of 4 locations only for which Bezostaia averaged 1.9%.

Table 36. Summary of stripe rust severity and response for cultivars grown in the 1969 IWWPN.

Cultivar	Bordenave, Argentina		Temuco, Chile		California, USA		Wageningen, Netherlands	Versailles, France	Rieti, Italy		Fundulea, Romania	
Coppell Desprez	1	R	10	MS	0		R	R	0		0	
Odin	6	MS-S	0		0		R	0	0		0	
Bezostaia	2	R-MR	0		10	R	R-S	MS	0		0	
Fertodi 293	2	R	10	MS	0		R	0	0		0	
Felix	0		10	MS	0		R	0	0		0	
Sturdy	5	R	10	MS	5	R	R	0	0		0	
Lancer	2	R	10	MS	10	R	R-VS	0	0		0	
NB67730	18	MS	10	MS	5	R	S	S	0		0	
Bankuti 1201	10	MS	5	MS	0		S	MS	0		0	
Heine VII	0		0		20	MR	R-S	0	0		18	S
Scout 66	4	R	10	S	20	MR	S	0	0		0	
Winalta	1	R	1	MS	5	R	S	MS	0		0	
Parker	4	R	1	MS	20	MR	S-VS	S	0		3	MR
San Pastore	0		70	S	5	R	S	MR	0		18	S
Gaines	6	R-MR	10	MS	30	MR	S	S	0		12	S
Atlas 66	16	MS	40	S	5	R	S	0	30	MS	3	MR-S
Gage	40	S	40	MS	10	R	S	S	0		21	S
Triumph 64	10	MS	30	S	50	MS	S	S	30	MS	14	S
Blueboy	15	S	90	MS	80	S	S-VS	0	0		0	
Riley 67	60	S	50	S	40	MS	S	MS	0		12	S
Timwin	7	MS	30	S	50	S	S-VS	S	60	MS	11	MS-S
Benhur	21	MS	30	S	60	MS	S-VS	MS	0		6	S
Purdue 4930A6-28-2-1	50	S	70	S	60	S	R-S	S	60	MS	20	S
Yung Kwang	72	S	60	S	90	S	S-VS	S	0		7	S
Arthur	72	S	20	MS	90	S	S-VS	S	80	S	1	MR
Stadler	5	MS	20	S	70	S	S-VS	S	80	MS	41	S
Shawnee	52	S	50	S	80	S	VS	S	80	MS	18	S
Yorkstar	77	S	50	S	80	S	S	S	0		30	S
Lerma Rojo 64	7	MS	70	S	5	R	S	0	0		.	
INIA 66	0		70	S	10	R	S	0	0		. .	
Mean	18.8		27.2		30.3				14.0		8.4	

Table 36. (Continued)

Cultivar	Eskisehir, Turkey		Ankara, Turkey		Sulaimaniyha, Iraq	Karaj, Iran		Kermanshah, Iran		Kabul, Afghanistan	Mean Severity 10 locations
Cappell Desprez	1	R	0		VR	20	MS-VS	0		0	3.2
Odin	0		0		VR	44	MR-VS	0		0	5.0
Bezostaia	2	R-MR	3	MR	VR	34	MS-VS	0		8	5.9
Fertodi 293	1	R	2	MR	VR	43	MS-VS	0		1	5.9
Felix	0		5	MR	VR	56	S-VS	0		0	7.1
Sturdy	1	R	0		VR	52	MS-VS	0		0	7.3
Lancer	2	R	2	MR	VR	53	MS-VS	0		0	7.9
NB 67730	11	MR-MS	2	MR	MR-MS	21	MS-VS	5	R-MR	10	8.2
Bankuti 1201	4	R-MR	3	MS	VR-MR	19	S-VS	5	MR	43	8.9
Heine VII	0		0		VR	56	VS	0		0	9.4
Scout 66	5	R	5	MR	VR	53	MS-VS	0		0	9.7
Winalta	3	R-MR	5	MS	VR	36	MS-VS	0		52	10.3
Parker	25	MR-MS	5	MR	VR	20	MS-VS	0		48	12.6
San Pastore	1	R	0		VR	45	MS-VS	0		0	13.9
Gaines	36	MR-MS	40	S	VR-S	37	S-VS	2	R	38	21.1
Atlas 66	29	S	30	S	MR-MS	54	S-VS	5	MR	18	23.0
Gage	25	MS-S	60	S	MS-VS	26	MS-VS	10	S	23	25.5
Triumph 64	64	MS-S	20	S	R-MS	57	MR-VS	10	MS-S	10	29.5
Blueboy	25	MR-S	60	S	MS-S	46	MS-VS	4	MR	65	31.5
Riley 67	43	MS-S	60	S	MS-S	26	MR-VS	10	S	80	39.1
Timwin	29	MS S	60	S	VR-MS	87	S-VS	10	S	55	39.9
Benhur	65	MS	70	S	S-VS	62	VS	10	S	85	40.9
Purdue 4930A6-28-2-1	46	MS-S	60	S	MS-VS	36	MR-VS	10	S	55	46.7
Yung Kwang	39	S	60	S	VS	55	MS-VS	10	S	75	46.8
Arthur	25	MS-S	60	S	MS-VS	44	S-VS	10	S	80	48.2
Stadler	55	S	80	S	MS-VS	52	MS-VS	10	S	57	47.0
Shawnee	28	R-S	25	S	MR-MS	81	VS	2	R	55	47.1
Yorkstar	36	S	80	S	MS-VS	93	VS	10	S	65	52.1
Lerma Rojo 64	5	R-MS	5	MS	VR	19	S-VS	5	MR	0	12.9[a]
INIA 66	11	MR-MS	2	MR	VR	63	MS-VS	5	R-MR	0	17.9[a]
Mean	20.6		26.8			46.3		4.4		30.8	22.8

[a] Mean of 9 locations for which Bezostaia averaged 6.5%.

Table 37. Summary of leaf rust severity and response for cultivars grown in the 1969 IWWPN.

Cultivar	Bordenave, Argentina		Pergamino, Argentina		Oklahoma, USA		Milano, Italy		Reiti, Italy		Novi Sad, Yugoslavia		Fundulea, Romania	
NB 67730	4	R	20	S	1	R	15	MR-MS	0		30	R-MR	9	R-MS
Sturdy	1	R	10	S	1	MR	10	MR	0		4	R-MR	43	MS-S
Benhur	2	R	10	S	10	MS	15	MR	0		21	R-MR	12	MR-MS
Bezostaia	3	R-MR	0		1	MR	3	MR	0		30	MS-S	65	S
Parker	0		20	S	20	MS	10	MR	30	MR	22	MR-MS	12	MR-MS
Atlas 66	5	MR-MS	80	S	1	S	9	R-MR	0		6	MS-X	5	MR-X
Purdue 4930A6-28-2-1	1	MR	60	MR	20	MS	15	MR	0		12	R-X	20	MS-S
Timwin	11	MR-MS	80	S	30	S	14	R-MR	23	MR	1	R-MR	12	MS-X
Riley 67	0		80	S	0		75	MS	10	MR-MS	3	S-X	0	
Stadler	5	MR	60	S	5	MS	18	MR	30	MS	15	R-X	8	MS
Gage	1	R-MR	0		10	MS	25	MR	80	MS	33	R MR	28	MR-MS
Cappell Desprez	17	MR	0		1	R	2	R-MR	99	S	31	MS-X	30	S
Arthur	0		80	S	5	MR	11	MR	60	MS	19	MS-X	21	MS-S
Lancer	21	MS	60	S	50	S	15	MR	0		30	MR-MS	56	S
Shawnee	11	MS-S	10	S	50	S	3	R-MR	30	MR	94	S	73	S
Scout 66	16	S	80	S	50	S	13	MR	30	MR	28	MS	61	S
Bankuti 1201	13	MS	50	S	40	S	8	MR	10	MS	80	MS-S	76	S
Fertodi 293	21	MS	0		40	S	7	MR	30	MS	96	S	75	S
Blueboy	11	S	25	S	50	S	8	MR	30	MR	99	S	83	S
Triumph 64	16	MS	80	S	50	S	6	MR	60	MS	65	MS-S	60	S
Gaines	0	R	80	S	20	S	14	R-MR	60	MS	88	S	76	S
Odin	53	S	10	S	15	S	8	MR	99	S	78	S	90	S
Heine VII	37	S	0		20	S	58	MR-MS	90	S	96	S	70	S
San Pastore	25	S	5	S	30	S	73	MS-S	90	S	94	S	61	S
Felix	37	S	5	S	30	S	63	MS-S	99	S	99	S	80	S
Winalta	18	S	80	S	60	S	29	MR	99	S	94	S	66	S
Yorkstar	7	MS-S	30	S	60	S	53	MS-S	99	S	94	S	85	S
Yung Kwang	16	S	80	S	80	S	23	MR	80	MS	99	S	78	S
Lerma Rojo 64	8	S	1	S	...		28	MR-MS	30	MR	17	R	...	
INIA 66	10	S	5	S	....		11	MR	0		76	S	.	
Mean	12.3		36.7		26.8		21.4		42.3		51.8		48.4	

Table 37. (Continued)

Cultivar	Eskisehir, Turkey	Ankara, Turkey	Sulaimaniyha, Iraq	Kermanshah, Iran	Kabul, Afghanistan,	Sapporo, Japan	Mean severity 11 locations
NB 67750	O	1 MR	VR	0	0	0	7.3
Sturdy	R	0	VR	2 R	0	15	7.3
Benhur	N	0	VR	5 MR	0	15	8.2
Bezostaia	R	1 MR	VR	0	0	35	12.5
Parker	O	1 MR	R	2 MR	0	20	12.5
Atlas 66	O	0	VR	1 MR	0	30	12.5
Purdue 4930A6-28-2-1	N	2 MR	VR-R	2 R	0	5	12.5
Timwin	N	0	VR-R	1 R	0	10	16.5
Riley 67	N	1 MR	VR-MR	0	0	20	17.2
Stadler	N	0	VR-MR	10 S	0	60	19.2
Gage	O	0	VR-R	1 MR	0	35	19.4
Cappell Desprez	O	1 MR	VR-R	4 R	4	40	20.8
Arthur	N	0	VR-R	2 R-MR	0	45	22.1
Lancer	O	0	VR	0	0	25	23.4
Shawnee	N	2 MR	VR	2 R	0	35	28.2
Scout 66	O	2 MR	VR	4 R-MR	0	30	28.5
Bankuti 1201	O	2 MS	VR-R	0	5	35	29.0
Fertodi 293	O	1 MR	VR-MR	4 MR	3	45	29.3
Blueboy	R	1 MR	VR-R	5 MR	3	55	33.6
Triumph 64	N	0	MS-VS	10 S	0	45	35.6
Gaines	O	1 MR	MR	0	4	60	36.6
Odin	O	1 MR	R-MS	4 MR	8	45	37.4
Heine VII	O	15 MS	MR-S	9 MR-MS	13	35	40.3
San Pastore	O	2 MS	MS-S	10 S	10	55	41.4
Felix	O	10 MS	VR-MR	8 MR	13	65	46.3
Winalta	O	2 MS	R-S	5 MR	6	60	47.2
Yorkstar	N	0	MS-VS	10 S	5	80	47.5
Yung Kwang	N	0	MS-VS	5 MR-MS	0	80	49.2
Lerma Rojo 64	R	1 MR	VR	0	0	.	10.6[a]
INIA 66	O	1 MR	VR	10 S	0	45	17.5[b]
Mean		1.6		3.9	2.5	38.8	25.7

[a] Mean of 8 locations only for which Bezostaia averaged 6.2%.
[b] Mean of 9 locations only for which Bezostaia averaged 8.0%.

Table 38. Summary of stem rust severity and response for cultivars grown in the 1969 IWWPN.

Cultivar	Bordenave, Argentina	Oklahoma, USA	Versailles, France	Milano, Italy	Reiti, Italy	Fundulea, Romania	Ankara, Turkey
Timwin	0	0	MS	0	8 MR	0	1 MR
Arthur	11 S	0	S	8 MR	0	0	0
Purdue 4930A6-28-2-1	7 S	1 MS	S	9 R	0	0	0
Yung Kwang	15 S	20 S	S	0	0	0	2 MS
Shawnee	6 MS-S	1 MS	S	0	30 MR	0	0
Atlas 66	7 S	1 S	S	9 R	40 MS	0	0
Bezostaia	22 S	20 S	MS	10 R	10 MS	0	0
NB 67730	4 MS-S	0	S	15 R-MR	70 MS	0	0
Lancer	11 S	1 S	S	20 MR	30 MS	0	2 MS
Winalta	7 S	1 S	MS	13 MR	80 MS	0	1 MR
Fertodi 293	5 MS-S	1 S	MR	16 [illegible]MR	80 MS	0	2 MS
Scout 66	5 MS-S	0	S	13	99 MS	0	3 S
Triumph 64	6 S	1 S	S	[illegible]	80 MR	0	2 MS
Sturdy	8 S	20 S	S	10 MR	80 MS	0	0
Gage	7 MS-S	1 MS	S	19 MR	99 MS	0	[illegible]
Park[illegible]r	15 S	1 S	S	20 MR	99 S	5 S	0
Benhur	4 MS	1 S	S	46 MS	90 S	0	0
Bankuti 1201	10 S	1 S	MR	44 MR	99 MS	0	1 MR
San Pastore	10 S	1 S	S	58 S	99 MS	0	0
Cappell Desprez	8 S	1 S	S	85 S	99 S	19 S	0
Blueboy	25 S	1 S	MR	58 S	99 S	0	0
Riley 67	15 S	5 S	MS	91 MS	99 S	0	4 S
Yorkstar	22 S	1 S	S	97 MS-S	99 MS-VS	0	3 MR
Stadler	25 S	10 S	S	88 MS	99 VS	0	0
Heine VII	25 S	20 S	S	80 MS-S	99 S	19 S	2 MR
Gaines	42 S	5 S	S	99 MS	99 VS	0	0
Odin	25 S	10 S	S	90 S	99 S	40 S	0
Felix	47 S	5 S	S	92 MS-S	99 S	0	2 MS
Lerma Rojo 64	0	....	S	4 R	0	...	0
INIA 66	0	....	S	0	0	...	0
Mean	13.1	4.6		36.6	66..	3.0	0.8

Table 38. (Continued)

Cultivar	Sulaimaniyha, Iraq	Karaj, Iran	Kabul, Afghanistan	Suwon, Korea	Sapporo, Japan	Mean severity	
						10 locations	9 locations
Tinwin	R	X	0	20	0	.....	3.2
Arthur	R	0	0	15	0	3.4	3.8
Purdue 4930A6-28-2-1	R-S	X	0	30	0	...	5.2
Yung Kwang	MR-S	8 VS	4	20	0	6.9	6.8
Shawnee	R	0	0	25	5	6.7	7.4
Atlas 66	R	0	0	30	0	8.7	9.7
Bezostaia	R-VS	8 S-VS	0	25	0	9.5	9.7
NB 67730	R	0	0	10	0	9.9	11.0
Lancer	R-MR	0	0	40	10	11.4	12.7
Winalta	R-MS	0	6	20	0	12.8	14.2
Fertodi 293	R-S	0	6	25	0	13.5	15.0
Scout 66	R-MR	0	0	20	0	14.0	15.6
Triumph 64	R-MR	0	0	45	10	14.7	16.3
Sturdy	R-S	10 MS	0	20	10	15.8	16.4
Gage	R-MR	0	0	25	0	15.1	16.8
Parker	MS-S	5 MS	0	25	0	17.0	18.3
Benhur	R-MS	... X	0	45	10	...	21.8
Bankuti 1201	S-VS	8 VS	20	35	30	24.8	25.7
San Pastore	R-S	9 S	14	40	30	26.1	27.9
Cappelli Desprez	S-VS	10 S	8	50	0	28.0	30.0
Blueboy	MS-S	0	6	40	45	27.4	30.4
Riley 67	MR-VS	 X	28	25	10	...	30.8
Yorkstar	S-VS	0	19	50	30	32.1	35.7
Stadler	S	0	24	25	55	32.6	36.2
Heine VII	S-VS	13 S	35	55	5	35.3	37.8
Gaines	S-VS	5 VS	28	30	50	35.8	39.2
Odin	S-VS	0	15	65	10	35.4	39.3
Felix	S	11 S	40	80	60	43.6	47.2
Lerma Rojo 64	R	 X	0	....	...	...	0.8[a]
INIA 66	R	 X	0	....	10	.....	1.7[b]
Mean		3.6	8.4	32.5	13.1	20.0	20.9

[a] Mean of 5 locations for which Bezostaia averaged 8.4%.
[b] Mean of 6 locations for which Bezostaia averaged 7.0%.