

UNITED STATES DEPARTMENT OF AGRICULTURE  
AGRICULTURAL RESEARCH SERVICE  
CROPS RESEARCH DIVISION

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COMPARISON OF  
WINTER WHEAT VARIETIES GROWN IN COOPERATIVE  
NURSERY EXPERIMENTS IN THE  
HARD RED WINTER WHEAT REGION  
IN 1959

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Preliminary report not for publication<sup>1/</sup>

<sup>1/</sup> This is a progress report of cooperative investigations containing data, the interpretation of which may be modified with additional experimentation. Therefore, publication, display, or distribution of any data or any statements herein should not be made without prior written approval of the Crops Research Division, ARS, USDA, and the cooperating agency or agencies concerned.

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IN 1959

By

V. A. Johnson<sup>1/</sup>

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## VARIETAL ABBREVIATIONS

The 1958 hard red winter wheat regional report carried rules for a system of wheat name abbreviations based on syllables. Abbreviations based on the rules were used throughout the report. Further changes in the rules governing abbreviations have since been made to overcome certain duplications and other problems associated with the initial system. The abbreviations in this report follow the revised rules which are as follows:

### Rules for Abbreviating Wheat Variety Names

The procedure for abbreviating is based on major and minor syllabic divisions of varietal names. Names with lower C. I. numbers are given precedence in the case of duplicate abbreviations. A third letter from the name with the higher C. I. number is added to the abbreviation to circumvent duplication. Periods are not used following abbreviations. Three- and four-letter names (Oro, Burt) are written in full, and are not listed with the variety name abbreviations.

Specific rules, with examples, are:

a. Use the first letter of the name and the first consonant of the second syllable (Ashkof = Ak).

1. If ~~there~~ is duplication add the next appearing consonant in the second or higher order syllable (Chancellor, C. I. 12333 = Cc; Cascade, C. I. 12376 = Ccd; Concho, C. I. 12517 = Cch). Note that lower C. I. numbers are given precedence.
2. When all consonants in the second or higher order syllable appear in duplicate abbreviations, use the first letter of the name, the final consonant of the first syllable, and the already used consonant of the second syllable (Honor = Hnr, Hr having been assigned to Huron).
3. If duplication still exists, use the final vowel of the name as the third letter of the abbreviation (Mentana = Mta).

b. When the second syllable is composed of a vowel only, the vowel is used with the first letter of the name (Wichita = Wi).

1. If there is duplication, add the first (or succeeding) consonant(s) in the third syllable (Ariette, C. I. 6243 = Ai; Alicel, C. I. 11700 = Aic).
2. If there are no consonants in the second or higher order syllables, use the vowels in order of appearance, along with the first letter of the name (Bowie = Bi; in case of duplication, Bowie would be Bie).

c. In the case of one-syllable names, the final consonant is used with the first letter (Baart = Bt).

1. If there is duplication the consonant preceding the final one is added (Baart would then be Brt).

d. When a name is compound, use the first letter of each word, capitalizing both letters (American Banner = AB).

1. When abbreviations of compound names are duplicated, add the first consonant of the second word to one name (Red Russian = RR; Red Rock = RRc).

e. A varietal name followed by a number is abbreviated according to the above rules. The number is written immediately after the abbreviation (Atlas 66 = Atl 66).

f. Underline the first letters of generic and specific names (Aegilops umbellulata = Au).

g. When two names are nearly identical, use the first distinguishing letter as the third letter of the abbreviation (Supreme = Spe; Supremo = Spo).

#### RANDOM NOTES FROM THE REGION

Dr. A. M. Schlehber, in charge of small grains investigations in Oklahoma, is on a year's leave of absence in Munich, Germany. He will return to his duties in Oklahoma in September, 1960.

The construction of a new building at Kansas State University to house the Department of Flour and Feed Milling Industry is progressing rapidly. A new pilot mill is included in the building.

The hard red winter wheat regional quality laboratory now is operating in new quarters. The facility occupies the former Meat Laboratory adjacent to Waters Hall, Kansas State University.

A wheat quality laboratory has been completed and is in operation at the University of Nebraska. The laboratory is financed by funds from the Nebraska Wheat Commission, and is supervised by Paul Mattern, formerly with the University Biochemistry and Nutrition Department.

#### PERSONNEL

Deaths - Hurley Fellows, A.R.S. Wheat Virus Research, K.S.U., Manhattan, Kansas.

- Joseph Danne, private plant breeder, El Reno, Oklahoma, originator of Triumph wheat.

Retirements - D. W. Robertson, Chairman, Agron. Dept., Colorado State University, Ft. Collins, Colorado.

- H. H. McKinney, A.R.S., Virus Research, Beltsville, Maryland.

- A. L. Clapp, Agronomist in charge of foundation seed, Kansas State University, Manhattan, Kansas.

#### Personnel changes

- Earl C. Gilmore replaced Dale Weibel as Agronomist in charge of wheat investigations at Denton, Texas.

- T. E. Walter, Colby Branch Station to Agronomy Dept., Kansas State University replacing A. L. Clapp.
- W. H. Paulson, Fort Lewis Substation, Hesperus, Colorado, to University of Wisconsin.
- J. L. Krall, Superintendent, Central Montana Branch Station, Moccasin, Montana, to Huntley Branch Station, Huntley, Montana.
- A. L. Dubbs, Agronomist, Central Montana Branch Station, Moccasin, Montana, to Superintendent.

COOPERATING AGENCIES, STATIONS, AND PERSONNEL

CROPS RESEARCH DIVISION:

Cereal Crops Research Branch

Wheat Section

Hard Red Winter Wheat

Rust, Smut, Mosaic

Wheat Quality

L. A. Tatum\*  
L. P. Reitz\*  
V. A. Johnson\*  
C. O. Johnston\*  
Lewis Browder\*  
W. Q. Loegering\*  
W. Bever  
J. A. Shellenberger  
K. F. Finney\*

TEXAS AGRICULTURAL EXPERIMENT STATION:

Agronomy

College Station, Texas A. & M. College

Denton Substation No. 6

Chillicothe Substation No. 12

Bushland Amarillo Exp. Station

W. O. Trogdon  
I. M. Atkins\* (State Leader)  
M. C. Futrell\*  
I. M. Atkins,\* E. C. Gilmore\*  
Keith Lahr  
K. B. Porter

NEW MEXICO AGRICULTURAL EXPERIMENT STATION:

Clovis Plains Substation

R. W. Livers

OKLAHOMA AGRICULTURAL EXPERIMENT STATION:

Field Crops and Soils

Stillwater Oklahoma State University

Cherokee Wheatland Conservation Station

Woodward Southern Plains Field Station

Goodwell Panhandle Agr. Exp. Station

M. D. Thorne  
A. M. Schlehuber (State Leader)  
H. C. Young  
R. C. Bellingham\*  
B. Curtis  
A. A. Garrett  
R. A. Hunter  
R. A. Peck

KANSAS AGRICULTURAL EXPERIMENT STATION:

Agronomy

Manhattan Kansas State University

Hays Ft. Hays Branch Station

Garden City Garden City Agr. Exp. Station

Colby Colby Branch Station

R. V. Olson  
E. G. Heyne  
A. W. Pauli  
R. H. Painter  
E. D. Hansing  
W. H. Sill  
W. M. Ross\*  
J. A. Wilson  
W. D. Stegmeier  
A. B. Erhart  
E. Banbury

COLORADO AGRICULTURAL EXPERIMENT STATION:

Agronomy		R. S. Whitney
Ft. Collins	Colorado State University	T. E. Haus
Akron	U. S. Dryland Field Station	C. E. Johnson*
		Floyd Frazier
Hesperus	Fort Lewis Substation	
Springfield	Southeastern Colo. Br. Exp. Sta.	H. O. Mann

IOWA AGRICULTURAL EXPERIMENT STATION:

Ames	Iowa State University	R. E. Atkins
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NEBRASKA AGRICULTURAL EXPERIMENT STATION:

Agronomy		D. G. Hanway
Lincoln	University of Nebraska	V. A. Johnson*
		J. W. Schmidt
North Platte	Agricultural Exp. Station	Paul Nordquist
Alliance	Box Butte Exp. Station	P. L. Ehlers

WYOMING AGRICULTURAL EXPERIMENT STATION:

Division of Plant Science		D. E. Bohmont
Laramie	University of Wyoming	B. J. Kolp
		G. H. Bridgmon
Archer	Archer Substation	T. L. Birch
Sheridan	U. S. Dryland Field Station	Alvin Gale
Gillette	Gillette Substation	L. R. Landers

SOUTH DAKOTA AGRICULTURAL EXPERIMENT STATION:

Agronomy		L. O. Fine
Brookings	South Dakota State College	Victor Dirks

MINNESOTA AGRICULTURAL EXPERIMENT STATION:

Agronomy and Plant Genetics		W. M. Meyers
St. Paul	Institute of Agriculture	E. R. Ausemus*
Waseca	Southeast Experiment Station	R. E. Hodgson
Grand Rapids	North Central Exp. Station	E. R. Ausemus*

NORTH DAKOTA AGRICULTURAL EXPERIMENT STATION:

Agronomy		T. E. Stoa
Dickinson	Dickinson Substation	T. J. Conlon

MONTANA AGRICULTURAL EXPERIMENT STATION:

Agronomy		A. H. Post
Bozeman	Montana State College	E. R. Hehn
Moccasin	Central Montana Branch Station	A. L. Dubbs
Havre	North Montana Branch Station	G. E. Geeseman
Huntley	Huntley Branch Station	D. E. Baldrige

CANADA DEPARTMENT OF AGRICULTURE:

Lethbridge	Alberta Agr. Exp. Station	J. E. Andrews
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\* Denotes Federal employees, full-time or part-time.

ACCESSION NUMBERS ASSIGNED

Several new hard red winter wheats were assigned C. I. numbers in 1959. When a number is assigned, seed of that variety is added to the permanent collection maintained by the Cereal Crops Research Branch at Beltsville, Maryland. C. I. numbers take precedence over state and local numbers in this report, and their use by wheat workers in published reports and correspondence is urged.

Hard red winter varieties assigned C. I. numbers in 1959 are as follows:

C. I. No.	Pedigree	State No.	Source
13194	H255-49-5-1-4 x Blackhawk	III-54-26	Minn.
13195	Nebred x Red Chief	533570	Nebr.
13198	South Dakota Selection	56-197	S. Dak.
13530	South Dakota Selection	56-292	S. Dak.
13531	South Dakota Selection	56-426	S. Dak.
13532	Pca x Mi-Hope-Pne	521896	Nebr.
13533	(Mql-Oro x Oro-Tm) x Mi-Hope-Pwn	F.C. 1262	Colo.
13534	(Cmn x Mi-Hope) x Iowin	55175	Iowa
13535	Kv x (Iwn x Tt-Wis 5)	55172	Iowa
13536	Wichita x Marquillo-Oro	218-53-15	Texas
13537	(RC x Tk-Oro-Fn) x Mql-Oro	240-51-A2	Texas
13538	Yogo x (Tk-Oro 221)-9	---	Mont.
13539	Yogo x (Tk-Oro 221)-14	---	Mont.
13540	Yogo x (Tk-Oro 221)-29	---	Mont.
13541	Yogo x (Tk-Oro 221)-60	---	Mont.
13542	Yogo x (Tk-Oro 221)-117	---	Mont.
13543	Yogo x (Yogo x Rescue 5)-1612	---	Mont.
13544	(Yogo x Rescue 21) x Marmin-1065	---	Mont.
13545	Marmin x (Yogo x Rescue 5)-342	---	Mont.

NEW VARIETIES

The 1959 Kansas Cereal Conference voted to distribute in Kansas C. I. 12804 and C. I. 12871. C. I. 12804 (Mi-Hope-Pwn x Oro-Il 1-Cmn) will be recommended for areas in Kansas infested with soil-borne mosaic. Infested areas are for the most part east of U. S. highway 81. C. I. 12871 (EB-Tm x Oro-Mi-Hope) is recommended for the same areas in Kansas as Wichita except northwestern Kansas. Oklahoma plans to join with Kansas in the release of C. I. 12871. Initial seed distribution to growers will be made in the fall of 1960.

The characteristics of C. I. 12804 can be summarized as follows:

- Resistant to leaf rust, stem rust (race 56), hessian fly, and soil-borne mosaic.
- Susceptible to bunt, loose smut and wheat streak mosaic.
- Has stiff straw in comparison to standard varieties.
- Slightly earlier maturing than Pawnee.
- Shatters only slightly.
- Yield is satisfactory but variable.
- Bushel weight equal to or better than Pawnee.
- Somewhat better than Ponca in winterhardiness.
- Quality, better than Pawnee for length of mixing time, but not as good as Ponca.

C. I. 12871 can be characterized as follows:

Resistant to leaf rust in the field.  
Resistant to bunt.  
Heterogeneous for reaction to race 56 of stem rust.  
Susceptible to loose smut, soil-borne mosaic, wheat streak mosaic and hessian fly.  
Lodges less and has less straw breakage than Wichita but does not have strong straw.  
Maturity like Wichita.  
Yield equal to Pawnee but more variable from season to season.  
Very high test weight, equal to RedChief.  
Quality good. Has mixing time longer than Ponca or Comanche.  
Winterhardiness probably equal to Ponca.

Two new hard red winter wheat varieties will be released in Nebraska in 1960. They are C. I. 13015 (Pawnee x Nebred) and C. I. 13190 (Pawnee x Cheyenne). C. I. 13015 will be distributed under the name "Omaha" in the three eastern cropping districts of the state. C. I. 13190 has been given the name Warrior and is intended for production in the panhandle of Nebraska.

C. I. 13015 has the following characteristics:

Resistant to bunt and soil-borne mosaic.  
Moderately resistant to loose smut.  
Tolerant to hessian fly.  
Susceptible to leaf and stem rust and streak mosaic.  
Maturity like Pawnee.  
Straw strength like Pawnee.  
Resistant to shattering.  
Winterhardiness equal to Cheyenne.  
Yield of grain equal to Pawnee.  
Bushel weight 1/2 pound better than Pawnee.  
Quality similar to Pawnee.

The characteristics of C. I. 13190 are:

Resistant to loose smut and moderately resistant to hessian fly (western strain).  
Susceptible to bunt, streak and soil-borne mosaic, stem rust, and leaf rust.  
Superior to Nebred and Cheyenne in yield.  
Matures one day earlier than Nebred.  
Good strength of straw (like Cheyenne).  
Very good resistance to shattering.  
Equal to Nebred in winterhardiness.  
Bushel weight 1/2 to one pound lighter than Nebred and Cheyenne.  
Excellent quality, intermediate to Nebred and Cheyenne in mixing time.

The release of C. I. 12865 (Mq1-Oro x Oro-Tk-Fn) under the name "Colorow" is planned for the dwarf bunt infested areas of western Colorado in 1960. The variety was selected from a cross made at Manhattan, Kansas, in 1940 and was tested extensively in Kansas, Nebraska, and Colorado. It carries resistance to ordinary smut as well as the strains of dwarf bunt common to western Colorado. It has been superior in yield to Wasatch and Cheyenne in western Colorado tests.



WEATHER AND CROP HIGHLIGHTS

The year 1959 was another bumper one in the hard red winter wheat region and the United States. Although the winter wheat crop was nearly 25 percent smaller than the record 1958 crop, it still was the fifth largest on record and more than a tenth above average.

Shortage of fall and winter moisture in portions of the region resulted in slow germination and frequently irregular stands. Fall growth was less than average over a large portion of the region. The lack of winter and spring moisture was particularly severe in South Dakota and adjacent areas. Spring rains were timely and locally excessive in the east-central and southeastern portions of the hard red winter wheat region.

Stem rust generally was light throughout the region. Leaf rust overwintered to an unusual extent in Kansas and Oklahoma and became widespread early in the season. Stripe rust of wheat was observed in Texas and Wyoming. Serious infestations of streak mosaic occurred in Kansas and Nebraska. Hessian fly was locally severe in Kansas and Nebraska.

Wheat production data for the states in the hard red winter wheat region are compiled below.

State	Acres planted <sup>1/</sup>	Acres harvested <sup>1/</sup>	Abandon- ment %	1959 production <sup>1/</sup> Bu.	1959 average acre yields <sup>2/</sup> Bu.	1948-57 average acre yields <sup>2/</sup> Bu.
Texas	4,287	3,420	20.2	59,850	17.5	10.9
Oklahoma	5,034	4,573	9.2	89,174	19.5	12.8
New Mexico	280	223	20.4	3,791	17.0	8.0
Kansas	10,870	10,485	3.5	209,700	20.0	15.6
Nebraska	3,431	3,160	7.9	69,520	22.0	20.7
Colorado	2,802	2,573	8.2	54,033	21.0	15.8
Wyoming	240	216	10.0	4,752	22.0	18.0
Montana	2,099	1,854	11.7	46,350	25.0	21.8
South Dakota	603	450	25.4	6,750	15.0	16.2
Iowa	154	136	11.7	2,584	19.0	21.8
Minnesota	40	28	30.0	574	20.5	20.5
United States	44,612	40,523	9.2	923,449	22.8	19.2

<sup>1/</sup> In thousands.

<sup>2/</sup> Based on harvested acres. Data taken from the 1959 Annual Summary, Crop Production, U.S. Dept. of Agriculture, Agr. Marketing Service, Crop Reporting Board.

UNIFORM QUALITY SERIES

Reporting of field plot and variety test data has been discontinued in accordance with the recommendations of the Eighth Hard Red Winter Wheat Workers Conference. In its place a uniform quality series has been established for each district to permit the continued quality evaluation of advanced experimental strains and recently released varieties on a uniform basis. Ten pounds of seed of each variety from each location is submitted annually to the Hard Winter Wheat Quality Laboratory at Kansas State University for evaluation.

Varieties contained in the 1959 series in each district are shown below:

<u>Southern</u>		<u>Central</u>		<u>Northern</u>	
Pawnee*	11669	Pawnee*	11669	Minter*	12138
Comanche*	11673	Comanche*	11673	Yogo*	8033
Concho	12517	Concho	12517	Nebred*	10094
Crockett	12702	Bison	12518		
Aztec	13016	EB-Tm x Oro-Mi-Hope	12871		
EB-Tm x Oro-Mi-Hope	12871	Mi-Hope-Pwn x			
Tascosa	13023	Oro-Il 1-Cmn	12804		
		Pawnee x Nebred	13015		

\* Permanent check variety.

SOUTHERN REGIONAL PERFORMANCE NURSERY

The nursery was grown at 19 stations in 1959. Data were reported from 16. Prior to 1959, the nursery was designated the Uniform Yield Nursery. It contained the following varieties in 1959.

Entry No.:	Variety or pedigree	C. I. No.
1	Kharkof	1442
2	Blackhull	6251
3	Early Blackhull	8856
4	Pawnee	11669
5	Comanche	11673
6	Concho	12517
7	Tascosa	13023
8	Crn-Hope-Cnn x Cmn	13024
9	Improved BJ x Cmn	13185
10	Improved BJ x Cmn	13186
11	Bh-Oro x Pwn	13187
12	Aztec	13016
13	Cmn-Mi-Hope x Iow	13188
14	Pwn x Iow-Tt-WP5	13279
15	Quivira Hybrid	13285
16	Kr-HF-Tm-Mi-Hope x Crn	13189
17*	Crn-Hope-Cnn x Cmn	13191
18**	Warrior	13190

\* New entry in 1959.

\*\* Entered from Northern Regional Performance Nursery for 1 year only.

DATA OBTAINED

Nursery data from the 16 reporting stations are contained in table 1.

The nursery was grown on ground fallowed for one year at Denton. Good stands were obtained. Rainfall from October to May was below normal in every month and wheat on continuously cropped land was a failure. A large population of rats developed in the Denton area causing some damage to the nursery plots by cutting the straw. Leaf rust was moderately heavy to severe. A light mildew infection occurred in March. Stem rust was present in traces only. Yields and bushel weights were high in the nursery. No variety produced grain weighing less than 60 pounds per bushel and only C. I. 13185 produced less than 20 bushels per acre. The yield of ten varieties exceeded 30 bushels. C. I. 13279 and C. I. 13285 were the most resistant to leaf rust.

The nursery at Chillicothe was seeded on October 29 in limited surface moisture. Showers following seeding promoted germination and stand establishment. Rain on April 8 broke an 8-month period of sub-normal moisture. Widely fluctuating temperatures were recorded. The temperature dropped to 2° F. on January 4 causing heavy leaf burning. On April 22 the temperature fell to 32° F. and 3 days later reached a high of 106° F. Hail, causing an estimated 5-10 percent loss in the wheat, occurred on May 22. Leaf rust and Septoria occurred in trace amounts and stem rust became moderately heavy on some late maturing varieties. Brown wheat mites were present and greenbugs caused minor damage in April. All varieties produced grain weighing 60 pounds per bushel or more.

The southern regional performance nursery was grown on dryland and under irrigation at Bushland. Data from both series are reported. Only the dryland data will be used in regional and period-of-years averages. Moisture during the winter and spring was barely enough to keep the crop growing. Favorable May and June rains resulted in above-average yields. Insects and diseases were of no importance. Yields of grain in the dryland nursery ranged from 23 to 31 bushels. Low test weights (55.0-59.9 pounds) were recorded. The irrigated nursery was seeded on fallow ground and irrigated 3 times during the spring. The western wheat aphid (Brachycolus tritici) reported at the Clovis station two years ago built up in the nursery and caused severe stunting in small spots throughout the nursery. Wherever possible the affected spots were avoided in harvest. Greenbugs also were present but did not cause serious damage. Yields of grain were nearly twice the yields in the dryland nursery and the grain averaged approximately 1 pound heavier.

No appreciable moisture occurred at Clovis, New Mexico, from planting until May 1. The nursery was dependent on stored moisture during this period. Good rains in May and June permitted varieties in the nursery to finish well and produce fair to good yields of grain. Chemicals were used in March to eliminate a greenbug infestation. Damage from the infestation was light. Kharkof and Aztec were the only varieties that yielded more than 20 bushels per acre.

The nursery at Stillwater, Oklahoma, had ample moisture throughout the entire period from seeding to harvest. There was no winter damage or lodging. Leaf rust developed late and stem was present only in small localized areas. C.I. 13279 yielded 54.5 bushels per acre, high for the nursery, and was the most leaf rust resistant variety in the nursery. Only six varieties produced grain weighing less than 60 pounds per bushel.

The wheat growing season at Woodward, Oklahoma, was equally as good as that at Stillwater. Moisture was adequate; there was no lodging nor winter killing, and a late infection of leaf rust was the only disease of consequence. Bushel weights of all varieties exceeded 61 pounds. Concho had the highest yield in the nursery with 51.5 bushels. Early Blackhull was the least productive variety with a 33.8 bushel yield.

Heavy rank growth of the wheat occurred at Cherokee, Oklahoma. Moisture was ample throughout the season. Lodging, in combination with straw breakage beginning at or about heading time, was noted. The lodged condition persisted and led to heavy straw and head rotting in some varieties. An imbalance of the nitrogen-phosphorus ratio associated with the residual effects of the prior Austrian Winter Pea green manure crop has been suggested as the cause of the lodging and straw breakage. Some stunting attributed to root rot also was noted. Lodging and root rot appeared to be the major yield- and test-weight-depressing factors. Early Blackhull out-produced other varieties in the nursery by more than 7 bushels. It also was among 3 varieties that produced grain weighing 61 pounds or more. Of interest is the fact that Early Blackhull was the most lodged variety but had the least amount of broken straw. Good combined resistance to lodging and straw breakage was exhibited by Aztec, the two strains of Improved BlueJacket x Comanche, and C. I. 13191. C. I. 13279 was the only completely leaf-rust-resistant variety.

Yields at Manhattan, Kansas, ranged from 45.9 bushels made by Concho down to 26.7 bushels for C. I. 13185. Diseases were prevalent. Leaf rust came early and was more severe than the readings indicate. Barley Yellow Dwarf was present and may have been a yield-depressing factor. Head blighting diseases were severe. The complex included Septoria nodorum and Brown Necrosis. Pawnee and C. I. 13185 were the most severely affected. Lodging did not occur. Only Concho, Blackhull, Tascosa, and Aztec made test weights of 60 pounds or more. C. I. 13279 and C. I. 13285 in that order were the most resistant to leaf rust. Only C. I. 13024 among the experimental varieties showed any resistance to bunt. The overall bunt susceptibility of new materials in the region is cause for some concern.

The Southern Regional Performance Nursery was a failure at Hays, Kansas, in 1959. This was the fourth year in the last six that yield data failed to be obtained at Hays. Fall moisture was adequate for good stands but heavy rabbit grazing occurred on the nursery. The wheat apparently was severely weakened by repeated grazing and wheat streak mosaic and succumbed to the -23° F. temperature that occurred in January when there was no snow cover. A few plants were all that remained of many varieties by spring. Most of the surviving wheat on the station was severely infected with wheat streak mosaic.

Better-than-average conditions of moisture in the fall and winter prevailed at Garden City. Snow cover protected the wheat during periods of low temperature so winter damage did not occur. Heading and maturity were earlier than normal. Wheat streak mosaic caused severe stunting of plants in many varieties. Hot dry weather in the latter part of May and June forced ripening with resulting low test weights and lower-than-expected yields of grain. Wide differences in degree of tiller stunting due to streak mosaic were exhibited by varieties in the nursery. No relationship with yield was apparent. C. I. 13187, the most productive variety, had 96 percent of its tillers stunted. Some relationship of streak mosaic and test weight is suggested by the data. In general, the varieties with least stunting produced the heaviest grain, whereas the most severely stunted varieties had the lightest grain. Only three varieties made grain that weighed more than 55 pounds per bushel.

Winter wheat stands at Colby were spotty due to a dry seedbed at planting time. Fall growth was limited and some rabbit grazing occurred throughout the fall, winter, and spring. Tillering was relatively light. Drought, streak mosaic, date mites, and greenbugs all were yield-depressing factors. Where possible, large stand deficiencies were avoided in harvest. The yield level of the Colby nursery was nearly identical with that of the nursery at Garden City. Test weights at Colby averaged 4 to 5 pounds per bushel heavier, however. Varietal reaction to streak mosaic was similar. Concho, C. I. 13191, Tascosa, Aztec, and C. I. 13185 were among the least stunted varieties at both stations, whereas C. I. 13190, C. I. 13187, and Pawnee were heavily stunted.

The Southern Regional Performance Nursery at Akron, Colorado, was completely destroyed by hail.

The nursery at Ft. Collins was irrigated as needed during the spring and summer. Lodging was severe in some varieties and good differential ratings were obtained. C. I. 13285, C. I. 13191, C. I. 13186, and C. I. 13185 all lodged less than 4 percent and were among the five most productive varieties in the nursery. All varieties made test weights of 61.5 bushels or more.

This was the second year that the Southern Nursery was grown at Springfield in southeastern Colorado. Stored moisture at seeding time was sufficient to obtain good stands of wheat and carry it through a dry fall and winter. Moisture was short from mid-April to mid-May and again during the first two weeks of June. No insect or disease damage occurred. It was necessary to fence the nursery area to keep rabbits from grazing the wheat. Bushel weights were somewhat below normal. Only 4 varieties weighed more than 60 pounds per bushel. Yields were good with all varieties making more than 30 bushels per acre.

Yields ranging from 51.8 to 82.6 bushels per acre were reported from Hesperus, Colorado. Irrigation water was applied 4 times during the spring. No lodging occurred. Warrior (C. I. 13190) was the highest yielding and had the second highest test weight in the nursery.

For the first time since the initiation of the regional program, the regional nursery at Lincoln, Nebraska, had to be abandoned prior to harvest. The severest complexity of diseases on record occurred. Stem rust inoculum that was put out in adjacent breeding nurseries became epidemic as did naturally occurring leaf rust. Cool, moist conditions early in the spring promoted heavy infections of mildew and Septoria. These were followed by bacterial blight, brown necrosis, and barley yellow dwarf. To complete the picture, hessian fly was moderately heavy and nearly continuous rain during May caused early and repeated lodging with the result that all entries in the nursery except C. I. 13191 were completely and permanently lodged 2 to 3 weeks prior to maturity.

Conditions at North Platte, Nebraska, were as good as they were bad at Lincoln. Moisture was sufficient for high yields and test weights. Diseases were not a factor. Shattering became severe by harvest time. Some lodging occurred in the weakest strawed varieties. Only Kharkof and Warrior failed to make test weights of 60 pounds. Tascosa and C. I. 13024 showed the best resistance to shattering while C. I. 13285, C. I. 13188, and C. I. 13191 were the only varieties that did not lodge at all.

The nursery at Alliance suffered from the lack of moisture during the spring. Yields were materially lower than anticipated. Bushel weights, on the other hand, were average or above. A peculiar type of straw breakage seldom seen at Alliance

became severe. The breakage was characterized by the breaking over of the straw at about the third internode above the ground. C. I. 13187, C. I. 13188, and C. I. 13285 in that order were the most severely affected. The condition did not occur in Aztec, Tasocosa, Warrior, and the two strains of Improved BlueJacket x Comanche.

Sufficient moisture during the winter and early spring together with cool spring temperatures promoted heavy growth of the wheat at Ames. Fortunately, June was dry and lodging did not become severe. A heavy infection of leaf rust developed in early June. Stem rust development was arrested by the dry weather in June. Some evidence of soil-borne mosaic occurred with several plots showing numerous stunted plants. Light winter-killing was recorded for some varieties.

Table 1. Yield and other data for varieties grown in the southern regional performance nursery at 16 stations in the hard red winter wheat region in 1959, and period averages!

Denton, Texas  
Four replications

C. I. No.	Date		Plant height	Leaf rust <sup>1/</sup>	Weight per bushel	Av. acre yield			No. years grown	Percent of Kharkof
	Headed	Ripe				1959	1958-1959	1955-1959 <sup>2/</sup>		
	April	May	In.	%	Lb.	Bu.	Bu.	Bu.		
13024	21	28	33	25	63	37.9	26.3	18.0	4	102.1
13191	22	28	32	25	62	36.4	--	--	1	104.3
11673	24	28	32	20	62	35.5	25.8	17.8	19	132.7
1442	28	30	32	25	60	34.9	25.1	17.7	23	100.0
8856	19	27	32	25	63	34.0	26.2	18.9	23	130.4
12517	24	28	29	25	61	33.1	21.2	16.8	8	111.4
13279	27	30	26	5	62	32.8	31.2	--	2	124.4
13016	28	6-2	30	30	62	30.5	20.3	--	2	80.8
13187	20	28	28	30	62	30.3	18.1	--	2	72.3
13023	24	28	28	30	64	30.0	20.8	16.6	4	93.9
13189	23	28	32	35	63	29.6	22.0	--	2	87.8
6251	27	31	32	30	63	29.6	21.4	17.5	23	108.1
13186	28	30	28	35	63	29.4	21.5	--	2	85.6
13188	27	28	30	25	62	29.3	24.3	--	2	97.0
11669	28	28	27	25	61	27.6	19.8	15.5	20	123.9
13285	20	27	25	15	62	25.9	27.8	--	2	111.0
13190	30	31	26	30	60	20.4	--	--	1	58.5
13185	28	6-2	26	40	62	17.1	10.1	--	2	40.3

<sup>1/</sup> Average of readings on 5-14 and 5-21.

<sup>2/</sup> No data in 1957.

Standard error of a difference = 2.93 bushels.

Chillicothe, Texas  
Four replications

C. I. No.	Date		Forage value <sup>1/</sup> 3-23	Shattering score <sup>2/</sup>	Stem rust	Plant height	Weight per bushel	Av. acre yield			No. years grown	Percent of Kharkof
	Headed	Ripe						1959	1958-1959	1955-1959		
	April	May			%	In.	Lb.	Bu.	Bu.	Bu.		
13190	27	29	100	3	T	19	60.5	26.8	--	--	1	114.5
13016	5-2	6-6	90	2	25	22	62.0	24.0	29.6	--	3	128.3
13023	26	29	100	1	5	19	63.0	23.9	29.0	26.5	5	142.8
12517	27	30	100	4	5	21	62.0	23.6	27.6	24.0	10	120.2
13187	27	30	90	3	T	19	61.0	23.4	21.3	--	3	107.7
1442	5-4	6-8	90	2	5	20	60.5	23.4	25.0	18.5	21	100.0
13279	29	6-2	90	2	T	20	60.0	23.3	26.8	--	3	127.7
13024	25	28	110	2	T	21	61.5	22.7	27.2	23.6	5	127.1
13191	25	28	130	4	T	23	61.5	22.2	--	--	1	94.9
11669	28	30	90	2	5	20	61.0	22.2	25.8	25.6	21	120.9
13188	29	6-1	90	3	T	20	61.5	20.7	20.7	--	3	98.7
13186	5-2	6-5	80	1	15	18	61.0	20.1	22.0	--	3	102.6
13189	25	29	110	1	T	21	61.5	19.8	26.1	--	2	104.2
11673	26	29	100	3	T	20	60.0	19.6	27.1	24.9	21	118.1
13185	5-2	6-7	90	1	20	19	61.0	19.3	21.1	--	3	87.3
6251	5-2	6-6	100	2	T	20	61.5	19.1	24.8	20.8	21	104.3
13285	27	31	80	3	T	17	62.0	19.0	28.4	--	3	123.4
8856	23	28	90	1	T	21	61.0	14.2	20.7	20.7	21	104.8

<sup>1/</sup> Visual estimate of forage value; Comanche = 100%.

<sup>2/</sup> Score based on 1-5 scale; 1 = slight, 5 = severe.

Standard error of a difference = 1.78 bushels.



Bushland, Texas  
Four replications, dryland

C. I. No.	Date		Plant height In.	Weight per bushel Lb.	Av. acre yield			No. years grown	Percent of Kharkof
	Headed	Ripe			1959	1958- 1959	1955- 1959		
	May	June			Bu.	Bu.	Bu.		
13186	13	24	27	58.5	31.1	31.9	-- -	3	123.1
13190	13	24	25	56.0	30.2	-- -	-- -	1	115.3
12517	11	22	25	55.3	30.2	29.2	30.3	11	113.8
13188	12	25	26	57.1	30.0	28.5	-- -	3	111.2
13187	13	23	23	55.5	29.2	29.6	-- -	3	119.7
13279	14	25	26	55.0	29.2	31.2	-- -	3	125.1
6251	13	23	28	57.8	28.9	28.2	28.4	21	109.3
13189	12	23	25	57.5	28.3	31.8	-- -	2	121.9
11673	12	23	26	56.4	28.3	26.4	27.5	21	106.7
13016	17	26	27	59.9	28.1	28.4	-- -	3	114.9
11669	14	24	24	56.9	27.8	26.2	24.0	21	108.1
13024	12	23	25	57.2	27.6	27.8	27.1	5	104.5
13185	15	25	26	57.5	27.0	29.9	-- -	3	115.3
13191	13	24	26	57.5	26.7	-- -	-- -	1	101.9
13023	10	22	23	59.2	26.2	31.5	29.9	5	115.1
8856	10	21	27	58.4	26.2	28.1	25.6	21	97.4
1442	17	26	27	56.1	26.2	26.1	25.9	21	100.0
13285	11	22	23	58.8	23.0	26.8	-- -	3	114.6

Standard error of a difference = 1.69 bushels.

Bushland, Texas  
Three replications, irrigated

C. I. No.	Date		Plant height In.	Weight per bushel Lb.	Av. acre yield	
	Headed May	Ripe June			1959 Bu.	1958- 1959 Bu.
13189	11	24	37	59.6	58.5	48.7
13191	12	24	34	58.4	54.8	--
13279	14	25	37	58.1	54.1	46.3
13024	12	25	36	58.8	53.2	43.1
12517	12	24	37	57.8	52.1	45.4
13023	11	24	35	61.5	52.1	45.8
13190	13	24	35	57.1	50.8	--
13187	13	24	36	57.1	49.6	39.3
11673	14	25	35	58.4	48.5	42.2
11669	14	25	34	58.7	48.0	40.8
6251	15	26	36	58.4	47.5	41.1
13285	11	24	35	60.5	45.9	48.0
13188	14	25	36	57.1	45.8	40.0
13186	14	25	39	59.4	41.7	36.4
13185	15	25	38	60.5	41.1	39.0
13016	17	28	40	61.1	40.7	41.6
8856	7	20	36	58.9	40.6	41.0
1442	18	29	38	56.4	40.0	33.7

Standard error of a difference = 5.32 bushels.

Clovis, New Mexico  
Six replications

C. I. No.	Date Headed	Plant height	Shattering score <sup>1/</sup>	Weight per bushel	Av. acre yield			No. years grown	Percent of Kharkof
					1959	1958-1959	1955-1959		
	May	In.		Lb.	Bu.	Bu.	Bu.		
1442	22	24	2.7	57.8	23.1	28.9	19.2	7	100.0
13016	18	24	2.1	59.5	20.5	30.1	--	3	101.2
6251	16	24	2.2	58.1	19.7	28.2	18.2	7	97.8
13190	17	20	2.9	56.8	18.1	--	--	1	78.4
13185	18	24	2.2	59.4	17.9	27.1	--	3	91.0
11673	15	22	2.8	58.0	17.8	27.4	18.6	7	95.2
13188	16	24	2.9	58.8	17.2	27.7	--	3	93.0
13187	15	20	3.5	57.9	16.7	28.2	--	3	100.3
12517	15	22	3.1	58.9	16.1	26.3	18.4	7	99.7
13024	14	22	2.0	59.3	15.9	27.0	17.8	5	92.9
13191	17	22	2.2	58.6	15.7	--	--	1	68.0
13279	18	22	3.3	57.7	15.0	27.9	--	3	98.4
13186	17	22	2.5	58.1	15.0	25.8	--	3	87.9
13023	14	18	2.0	58.0	14.3	30.1	19.8	5	103.2
13189	14	21	2.5	59.0	14.2	27.5	--	2	95.3
8856	5	21	2.3	58.0	13.9	27.1	17.5	7	92.0
13285	14	17	3.5	59.2	12.9	27.4	--	3	94.4
11669	15	20	3.9	57.3	12.2	24.0	16.2	7	88.7

<sup>1/</sup> Based on 1-5 scale, 1 best.  
Standard error of a difference = 1.69 bushels.

Stillwater, Oklahoma  
Four replications

C. I. No.	Date headed	Plant height	Leaf rust		Weight per bushel	Av. acre yield			No. years grown	Percent of Kharkof
			Severity	Type		1959	1958-1959	1955-1959 <sup>1/</sup>		
	May	In.	%		Lb.	Bu.	Bu.	Bu.		
13279	4	34	Tr	0;-2	61.2	54.5	50.3	-- -	2	181.9
8856	4-27	39	33	4	63.5	47.5	45.3	30.0	25	113.9
13189	4-30	37	35	4	62.1	45.6	43.4	-- -	2	157.0
12517	3	37	23	4	61.6	45.5	41.2	28.4	10	132.3
13285	4-28	33	25	2-4	62.8	45.2	44.0	-- -	2	159.1
13188	4	35	38	4	59.5	43.8	41.6	-- -	2	150.5
13024	3	36	25	2-4	61.0	41.0	37.5	26.8	4	130.2
13191	3	35	25	4	61.6	40.8	-- -	-- -	1	131.6
13023	4-30	33	28	4	61.0	38.9	38.5	27.6	4	134.4
11673	3	35	28	4	59.4	38.6	36.7	25.7	20	117.4
13016	6	38	40	4	62.3	36.4	36.7	-- -	2	132.5
11669	4	34	48	4	59.5	36.3	34.3	25.5	22	120.2
6251	6	38	30	4	60.0	33.6	34.4	24.9	25	110.8
13187	3	34	45	4	59.8	33.3	29.5	-- -	2	106.5
13186	5	33	45	4	61.0	32.3	33.7	-- -	2	121.9
13190	5	31	45	4	56.9	31.6	-- -	-- -	1	101.9
1442	6	37	35	4	59.2	31.0	27.7	20.6	25	100.0
13185	6	34	50	4	61.9	29.8	28.3	-- -	2	102.4

<sup>1/</sup> No data in 1957.

Standard error of a difference = 2.57 bushels.

Woodward, Oklahoma  
Four replications

C. I. No.	Date headed	Plant height	Leaf rust		Weight per bushel	Av. acre yield			No. years grown	Percent or Kharkoi
			Severity	Type		1959	1958-1959	1955-1959		
	May	In.	%		Lb.	Bu.	Bu.	Bu.		
12517	4	34	10	4	63.0	51.5	40.6	30.4	11	126.5
13023	4	31	10	4	64.0	49.7	40.3	31.2	5	126.1
13279	5	34	3	0;-1	61.5	48.2	38.5	-- -	3	146.2
13189	3	33	20	4	62.2	47.9	43.4	-- -	2	136.1
13187	5	31	20	4	62.0	46.9	39.7	-- -	3	134.9
13016	9	40	10	2-4	63.0	46.6	38.4	-- -	3	120.5
13191	4	32	15	4	62.0	46.5	-- -	-- -	1	123.3
13024	4	33	20	4	63.0	45.1	36.6	29.2	5	118.0
13285	1	29	5	2	62.7	44.4	35.4	-- -	3	143.5
13190	8	33	15	4	61.4	44.0	-- -	-- -	1	116.7
13188	6	34	15	4	62.1	42.3	33.9	-- -	3	129.1
6251	10	37	10	4	62.0	40.1	32.6	27.1	28	106.5
11673	5	35	10	4	61.5	39.2	34.4	28.4	23	115.0
13185	8	37	20	4	63.2	39.0	31.5	-- -	3	105.0
1442	11	41	20	4	61.2	37.7	31.9	24.7	28	100.0
11669	5	30	15	4	62.0	37.5	29.5	26.7	25	117.3
13186	8	34	20	4	63.0	35.9	30.2	-- -	3	109.0
8856	4-29	35	15	4	62.0	33.8	30.5	26.8	28	105.5

Standard error of a difference = 4.52 bushels.

Cherokee, Oklahoma  
Four replications

C. I. No.	Plant height	Leaf rust		Lodging		Weight per bushel	Av. acre yield			No. years grown	Percent of Kharkof
		Severity	Type	Leaning straw	Broken straw		1959	1958-1959	1955-1959 <sup>1/</sup>		
	In.	%		%	%	Lb.	Bu.	Bu.	Bu.		
8856	43	50	4	74	14	61.0	37.8	41.3 <sup>2</sup>	30.2	12	132.7
13279	44	0	0;	16	38	57.2	30.5	36.7	--	3	229.5
13285	38	15	2-4	30	19	60.0	29.6	37.0	--	3	256.2
13189	42	60	4	29	23	59.0	26.9	34.1	--	2	186.8
13023	38	50	4	21	31	60.2	26.6	36.1	26.8	4	190.7
13191	43	35	0;-4	8	24	57.0	25.9	--	--	1	194.7
13186	46	50	4	0	20	61.4	24.1	30.8	--	3	188.5
13016	46	30	4	0	20	61.3	23.2	30.5	--	3	175.1
12517	42	40	4	36	33	58.0	22.3	31.0	23.1	10	147.7
11673	41	50	4	25	40	57.8	20.5	31.2	22.8	12	127.2
13185	47	60	4	3	23	60.5	20.3	27.2	--	3	154.4
13188	43	40	4	3	60	57.0	18.7	27.4	--	3	160.8
13024	42	50	4	13	71	58.0	18.2	30.5	22.9	4	162.8
6251	42	50	4	16	39	57.8	17.9	26.4	19.2	12	111.5
13190	43	50	4	1	65	53.5	15.7	--	--	1	118.0
13187	39	40	4	0	89	54.8	13.8	25.6	--	3	167.2
1442	44	50	4	0	46	56.2	13.3	18.3	14.1	12	100.0
11669	42	50	4	8	69	55.0	13.1	24.9	18.7	12	111.8

<sup>1/</sup> No data in 1955.

Standard error of a difference = 3.55 bushels

Manhattan, Kansas  
Four replications

C. I. No.	Date headed	Plant height	Leaf rust	Bunt <sup>1/</sup>	Weight per bushel	Av. acre yield			No. years grown	Percent of Kharkof
						1959	1958-1959	1955-1959		
	May	In.	%	%	Lb.	Bu.	Bu.	Bu.		
12517	18	37	22-60	7	60.2	45.9	40.5	37.2	11	124.6
13279	18	37	0	65	57.2	45.1	41.0	--	3	135.3
13016	20	40	43	90	60.2	40.6	36.9	--	3	112.7
13023	16	36	60	88	60.9	38.9	37.7	35.3	5	115.1
11673	18	38	40	2	58.8	38.6	34.5	34.5	23	120.1
8856	12	36	60	88	59.6	36.6	36.1	32.2	28	113.7
13191	17	34	10-48	96	58.9	36.4	--	--	1	132.4
11669	18	36	60	15	58.7	36.0	33.7	31.5	25	122.9
13189	16	35	50	52	59.9	35.6	34.9	--	2	112.1
13285	15	32	10	72	59.6	35.6	35.7	--	3	115.6
13186	19	37	60	52	59.4	34.8	34.4	--	3	109.9
13190	19	36	60	32	56.7	34.5	--	--	1	125.5
13188	19	37	50	42	57.3	33.9	34.1	--	3	118.7
13187	18	33	70	65	57.9	33.7	34.0	--	3	118.4
6251	20	42	40	72	60.1	32.0	33.8	33.1	28	113.0
13024	17	38	50	18	59.0	31.4	30.7	32.2	5	105.0
1442	21	38	63	62	57.6	27.5	31.1	30.7	28	100.0
13185	20	40	70	55	59.2	26.7	30.1	--	3	94.8

<sup>1/</sup> Bunt data furnished by E. O. Hansing from inoculated seed.  
Standard error of a difference = 3.82 bushels.

Garden City, Kansas  
Four replications

C. I. No.	Date		Plant height	Streak mosaic (Stunted tillers)	Weight per bushel	Av. acre yield			No. years grown	Percent of Kharkof
	Headed	Ripe				1959	1958-1959	1955-1959		
	May	June	In.	%	Lb.	Bu.	Bu.	Bu.		
13187	24	18	31	96	49.6	29.4	31.7	-- -	3	140.2
13016	29	20	34	14	58.1	28.8	29.6	-- -	3	121.2
13186	28	20	33	55	57.5	27.8	28.6	-- -	3	117.7
13279	29	20	33	51	51.3	26.2	29.4	-- -	3	126.1
13190	28	21	32	95	50.5	26.2	-- -	-- -	1	129.1
13285	24	18	29	53	53.9	25.3	32.8	-- -	3	153.8
13185	29	20	34	16	58.5	25.0	28.2	-- -	3	115.3
13189	26	19	33	26	54.1	24.7	30.3	-- -	2	135.7
11673	28	20	33	31	52.9	24.5	28.6	24.6	6	109.9
6251	29	21	36	19	55.9	23.9	23.9	24.0	6	103.6
13188	29	21	32	40	52.2	23.0	23.5	-- -	3	102.4
13191	27	19	30	24	53.1	22.8	-- -	-- -	1	112.3
11669	27	19	33	94	51.4	22.7	26.6	24.0	6	106.1
12517	28	18	32	34	54.1	22.4	24.4	25.6	6	114.4
13024	27	20	32	65	52.1	22.3	30.2	25.5	5	115.0
13023	23	17	30	25	54.4	22.2	35.8	28.4	5	128.0
8856	24	17	33	80	54.9	21.4	29.9	25.3	6	108.0
1442	30	22	32	76	52.9	20.3	22.3	22.2	6	100.0

Standard error of a difference = 1.59 bushels.



Colby, Kansas  
Four replications

C. I. No.	Date headed	Plant height	Streak mosaic (Stunted tillers)	Weight per bushel	Av. acre yield			No. years grown	Percent of Kharkof
					1959	1958-1959	1955-1959 <sup>1/</sup>		
	May	In.	%	Lb.	Bu.	Bu.	Bu.		
8856	24	31	25	59.0	29.4	35.1	31.2	9	92.2
12517	27	29	13	57.0	29.2	32.6	34.5	7	116.1
13190	28	28	43	57.0	27.6	--	--	1	133.3
13191	27	29	13	57.0	27.5	--	--	1	132.9
13187	27	27	64	56.0	27.5	29.5	--	3	118.6
13023	27	28	24	58.0	27.4	35.8	36.2	4	121.1
13016	28	31	20	60.0	26.8	31.9	--	3	106.8
13186	28	29	21	59.0	26.7	30.7	--	3	108.9
6251	28	32	25	58.0	25.7	32.2	33.8	9	102.0
13188	28	28	24	56.0	24.6	31.6	--	3	118.3
11669	27	29	63	56.0	24.5	32.1	34.4	8	106.7
13279	28	29	24	55.0	24.2	31.9	--	3	118.5
13185	29	30	13	60.0	23.3	27.9	--	3	92.7
13189	27	30	21	58.0	23.2	31.8	--	2	110.2
13024	27	28	16	56.0	22.6	30.5	31.3	4	104.6
13285	26	24	69	58.0	22.6	32.0	--	3	127.0
11673	27	28	13	55.5	21.5	29.5	30.9	8	100.7
1442	31	30	18	56.0	20.7	28.8	29.9	9	100.0

<sup>1/</sup> No data in 1956.

Standard error of a difference = 1.52 bushels.

Fort Collins, Colorado  
Five replications

C. I. No.	Date headed	Plant height	Lodging	Weight per bushel	Av. acre yield			No. years grown	Percent of Kharkof
					1959	1958-1959	1955-1959 <sup>1/</sup>		
	June	In.	%	Lb.	Bu.	Bu.	Bu.		
13189	6	46	1	63.2	55.3	63.6	-- -	2	162.1
8856	6	48	64	63.5	50.0	50.3	50.4	23	100.5
13285	7	41	0	64.2	47.2	55.2	-- -	3	136.9
13186	11	43	2	64.1	46.3	46.9	-- -	3	121.6
13185	10	46	4	64.5	44.8	48.5	-- -	3	124.1
13188	10	45	34	63.1	44.0	48.6	-- -	3	131.4
13023	6	43	22	64.0	43.6	48.4	54.8	3	131.4
13016	12	44	24	63.7	42.4	46.5	-- -	3	123.6
13279	10	44	32	62.2	41.0	51.5	-- -	3	128.5
12517	7	44	78	61.5	39.3	46.7	49.7	7	124.2
13024	7	44	60	62.5	39.1	46.8	48.7	3	116.9
13191	8	42	16	62.0	37.9	-- -	-- -	1	100.8
1442	12	43	60	61.8	37.6	39.2	41.7	23	100.0
11673	9	43	66	61.5	36.5	45.2	48.9	19	109.4
6251	9	44	72	63.2	35.0	35.7	40.1	23	100.4
13187	8	42	20	63.6	34.1	32.9	-- -	3	105.5
13190	12	41	28	61.5	29.9	-- -	-- -	1	79.5
11669	11	43	34	63.3	28.2	37.0	43.0	21	107.8

<sup>1/</sup> No data in 1955 and 1956.

Standard error of a difference = 4.63 bushels.

Springfield, Colorado  
Five replications

C. I. No.	Date		Plant height	Weight per bushel	Av. acre yield		No. years grown	Percent of Kharkof
	Headed	Ripe			1959	1958-1959		
	May	July	In.	Lb.	Bu.	Bu.		
13188	28	3	32	58.7	38.3	38.1	2	108.4
13190	28	3	30	57.6	38.3	--	1	111.7
13023	25	6-30	30	58.1	37.8	40.5	2	115.2
8856	22	6-28	32	59.7	37.6	39.3	2	111.8
13279	29	3	31	57.5	37.3	38.9	2	110.5
13186	29	3	31	61.0	37.1	40.7	2	115.6
12517	27	2	31	57.4	36.8	39.1	2	111.1
13285	25	6-28	27	58.6	36.4	37.5	2	106.5
13187	26	6-29	29	57.0	35.5	38.3	2	108.8
6251	29	3	33	60.3	34.9	35.8	2	101.8
13191	27	2	31	56.7	34.6	--	1	100.9
11673	27	1	31	57.3	34.6	36.4	2	103.4
13016	30	4	33	61.4	34.4	36.1	2	102.7
1442	6-1	4	31	58.5	34.3	35.2	2	100.0
13189	25	6-30	31	58.0	34.3	37.0	2	105.3
13024	26	1	31	57.4	31.7	36.0	2	102.4
13185	29	3	31	60.8	31.3	34.4	2	97.9
11669	30	3	30	58.1	30.2	34.0	2	96.6

Standard error of a difference = 2.19 bushels.

Hesperus, Colorado  
Five replications

C. I. No.	Date		Plant height In.	Weight per bushel Lb.	Av. acre yield			No. years grown	Percent of Kharkof
	Headed June	Ripe July			1959 Bu.	1958- 1959 Bu.	1955- 1959 Bu.		
13190	10	18	36	62.4	82.6	--	--	1	106.7
11673	10	19	39	61.7	81.3	63.6	70.5	19	116.6
1442	11	20	42	60.5	77.4	62.8	64.3	19	100.0
13188	11	20	39	61.3	77.0	62.7	--	3	100.8
13191	10	19	38	61.8	75.1	--	--	1	97.0
6251	8	17	41	60.0	74.7	58.8	63.4	19	108.8
12517	8	16	37	61.8	73.8	59.2	70.6	9	108.9
13187	8	16	33	61.1	73.0	62.9	--	3	103.0
13279	11	19	36	60.8	71.8	57.5	--	3	105.9
13189	12	20	39	61.5	70.9	56.0	--	2	89.1
13023	4	12	36	62.7	69.4	59.3	63.9	5	99.4
11669	9	16	35	59.1	67.3	54.1	58.4	19	102.6
8856	5	13	39	58.8	66.1	52.8	61.5	19	100.9
13016	10	18	40	60.9	64.4	52.4	--	3	87.2
13185	13	21	42	62.0	62.9	54.7	--	3	91.9
13186	11	20	38	61.0	61.0	52.4	--	3	86.9
13024	7	15	37	61.1	55.8	45.0	57.0	5	88.7
13285	8	18	32	62.1	51.8	50.5	--	3	89.5

Standard error of a difference = 4.50 bushels.

North Platte, Nebraska  
Three replications

C. I. No.	Date headed	Plant height	Lodging	Shattering	Weight per bushel	Av. acre yield			No. years grown	Percent of Kharkof
						1959	1958-1959	1955-1959		
	May	In.	%	%	Lb.	Bu.	Bu.	Bu.		
13023	27	41	8	1	63.5	48.1	54.9	38.4	5	108.8
13189	26	44	5	4	62.6	47.6	55.5	--	2	129.5
13190	30	42	12	4	59.3	45.6	--	--	1	117.5
13285	27	41	0	15	61.6	45.5	54.7	--	3	129.7
11673	29	44	10	4	60.5	45.1	49.2	36.6	19	109.8
12517	27	44	21	35	61.4	44.7	48.6	37.4	11	114.4
13188	29	44	0	15	60.8	44.1	51.5	--	3	123.8
13279	30	44	7	15	60.5	44.1	52.2	--	3	126.0
13187	27	40	5	35	61.9	43.6	50.6	--	3	118.7
6251	30	47	36	4	62.9	43.1	46.4	34.4	22	96.8
11669	29	44	17	35	61.3	42.3	49.4	37.4	21	117.6
13016	31	45	10	8	62.2	42.1	49.0	--	3	111.9
8856	25	43	26	8	62.7	41.7	45.8	34.1	22	97.7
13024	27	43	12	1	61.8	40.4	47.2	37.0	5	104.9
13191	28	42	0	4	60.6	39.5	--	--	1	101.8
1442	6-1	46	21	4	59.8	38.8	42.9	35.3	22	100.0
13186	31	43	3	8	62.9	36.9	47.0	--	3	108.4
13185	30	44	6	4	62.9	36.3	44.3	--	3	97.2

Standard error of a difference = 2.59 bushels.

Alliance, Nebraska  
Three replications

C. I. No.	Date headed	Plant height	Straw breakage	Weight per bushel	Av. acre yield			No. years grown	Percent of Kharkof
					1959	1958-1959	1955-1959		
	June	In.	%	Lb.	Bu.	Bu.	Bu.		
12517	8	38	30	60.5	27.2	41.1	37.7	9	121.8
13279	10	33	33	60.0	23.7	41.1	-- -	3	129.1
13189	8	34	17	61.0	21.4	37.7	-- -	2	122.2
13024	8	37	30	61.0	21.1	33.5	32.6	5	111.3
13285	8	33	48	60.0	20.7	38.6	-- -	3	122.9
13185	9	37	0	62.0	20.3	36.7	-- -	3	104.3
13188	9	35	73	61.0	19.9	38.6	-- -	3	120.1
11673	8	37	32	58.0	19.7	34.4	30.7	19	99.5
13191	8	33	20	60.0	19.1	-- -	-- -	1	106.7
8856	7	39	10	61.0	18.4	32.9	31.2	22	92.6
6251	9	37	27	62.0	18.3	33.9	30.9	22	96.8
1442		32	17	60.0	17.9	33.6	29.3	22	100.0
13023	7	38	0	61.5	17.8	33.6	32.1	5	109.7
13187	8	36	77	60.0	17.7	37.3	-- -	3	121.6
13186	9	36	0	61.5	17.4	31.4	-- -	3	105.9
13190	10	32	0	58.5	16.5	-- -	-- -	1	92.2
13016	10	35	0	62.0	16.0	30.3	-- -	3	107.0
11669	8	38	23	58.0	15.8	34.3	34.0	19	105.8

Standard error of a difference = 4.28 bushels.

Ames, Iowa  
Three replications

C. I. No.	Date		Plant height In.	Winter Survival %	Lodging %	Rust			Weight per bushel Lb.	Av. acre yield			No. years grown	Percent of Kharkof
	Headed June	Ripe July				Stem rating	Leaf			1959 Bu.	1958- 1959 Bu.	1955- 1959 Bu.		
							Sev.	Type						
13279	3	7	41	100	13	S	T	1	60.3	58.1	75.4	-- -	3	157.3
13188	2	8	40	100	3	R-	70	4	59.4	46.8	61.7	-- -	3	125.0
13191	5-31	6	38	100	1	HS	10	1	59.8	45.4	-- -	-- -	1	126.5
12517	5-31	5	38	98	22	HS	70	4	56.3	45.3	59.7	49.7	9	135.1
8856	5-29	4	41	89	30	S-	80	3	62.3	42.0	52.7	44.6	17	111.3
11673	2	4	40	100	11	S	75	4	57.4	41.2	57.8	42.8	17	107.9
11669	5-31	4	38	99	6	S	85	4	58.6	40.6	53.8	45.0	17	119.0
13190	3	6	40	100	8	S	95	3	57.4	40.3	-- -	-- -	1	112.3
13016	3	5	44	100	12	HS	65	4	60.4	40.0	53.2	-- -	3	107.7
6251	4	8	45	93	38	S	85	4	62.3	37.7	53.1	42.8	17	105.0
13285	2	6	36	99	4	HS+	T	1	58.2	37.3	55.4	-- -	3	133.7
13189	4	6	40	92	16	HS	75	3	57.2	36.1	53.9	-- -	2	102.4
1442	7	9	45	100	16	HS	75	4	57.5	35.9	52.6	38.5	17	100.0
13024	1	5	40	98	21	S	65	3	57.4	35.4	51.6	44.4	5	115.3
13185	3	6	44	100	6	HS	95	4	59.8	33.8	44.5	-- -	3	100.1
13186	4	6	43	99	5	HS	85	4	59.8	33.6	48.5	-- -	3	100.9
13023	3	6	38	98	3	HS	75	3	58.7	33.3	54.6	49.1	5	127.6
13187	5-31	3	35	96	8	S	90	4	56.2	32.2	42.6	-- -	3	87.3

Standard error of a difference = 3.51 bushels.

### STANDARD ERRORS

Standard errors for the southern regional performance nursery are reported in table 2. Mean yields of tests exceeded 20 bushels per acre at all locations except Clovis and Alliance. Variability coefficients of less than 15 percent were reported from 12 tests and less than 10 percent from 6 tests.

### SUMMARY OF NURSERY YIELDS

The summary of yields and regional yield averages for the 18 varieties grown in the southern regional nursery appear in table 3. State averages and ranks also are shown. C. I. 13279 yielded well at locations in Texas, Oklahoma, Kansas, and Nebraska and had the highest 15- and 16-station regional averages. C. I. 13285 dropped from first place in 1958 to eleventh in 1959. Concho, on the other hand, had uniformly good performance throughout the region this year and jumped from seventh to second place. C. I. 13185, Pawnee, and Kharkof were the least productive varieties in the nursery in 1959.

Average yields for varieties grown in the nursery during the last two years were calculated. These are summarized in table 4. C. I. 13279 has been the most productive on a 2-year basis, averaging 2 bushels per acre more than second-ranked C. I. 13189. Tascosa, C. I. 13285, and Concho in that order were next highest in yield. Pawnee, Kharkof, and C. I. 13185 have the poorest 2-year average yields.

### SUMMARY OF AGRONOMIC DATA

Agronomic data other than yield for the varieties grown in the southern regional performance nursery are summarized in table 5. Varieties are listed according to bushel weight. Eight varieties produced grain with an average test weight of 60 pounds per bushel or more. Aztec, C. I. 13185, C. I. 13186, and Tascosa in that order had the highest weights. The lowest average test weight was made by Warrior. No experimental variety in the nursery headed or ripened as early as Early Blackhull. Quivira Hybrid, C. I. 13187, Tascosa, and Warrior had the shortest straw. The two selections of Improved BlueJacket x Comanche, C. I. 13191 and C. I. 13187, lodged the least. Least amount of broken straw at two reporting stations was shown by Aztec, C. I. 13186, C. I. 13185, and Early Blackhull. C. I. 13189, Tascosa, and C. I. 13185 were given the best shattering ratings. C. I. 13279 had an average leaf rust infection of only 2 percent at 4 reporting stations. Quivira Hybrid was next most resistant with a 14-percent average. C. I. 13185, Aztec, and C. I. 13191 had less than 20 percent stunted tillers at the two stations reporting wheat streak mosaic.



Table 2. Number of replications, mean yields, and standard errors for the southern regional performance nursery at the reporting stations in 1959.

State and Station	No. reps.	No. varieties	Av. yield all varieties	Standard error of		Coefficient of variability
				Diff. in means	Mean	
			Bu.	Bu.	Bu.	%
TEXAS						
Denton	4	38	32.9	2.93	2.07	12.6
Chillicothe	4	18	21.5	1.78	1.26	11.7
Bushland (dryland)	4	36	27.5	1.69	1.19	8.7
do. (irrigated)	3	36	47.2	5.32	3.76	13.8
NEW MEXICO						
Clovis	6	18	16.5	1.69	1.20	17.8
OKLAHOMA						
Stillwater	4	18	39.2	2.57	1.82	9.3
Woodward	4	18	43.1	4.52	3.20	14.8
Cherokee	4	18	22.1	3.55	2.51	22.7
KANSAS						
Manhattan	4	18	35.8	3.82	2.70	15.1
Garden City	4	18	24.4	1.59	1.13	9.2
Colby	4	18	25.3	1.52	1.08	8.5
COLORADO						
Ft. Collins	5	18	40.7	4.63	3.28	18.0
Springfield	5	18	35.3	2.19	1.55	9.8
Hesperus	5	18	69.8	4.50	3.18	10.2
NEBRASKA						
North Platte	3	18	42.8	2.59	1.83	7.4
Alliance	3	18	19.4	n.s.	n.s.	27.0
IOWA						
Ames	3	54	42.1	3.51	2.48	10.2

Table 3. Summary of average yields in bushels per acre made by 18 varieties grown in the southern regional performance nursery at 16 stations in 1959, with state averages and rank.

Variety	C. I. No.	Texas					New Mexico		Oklahoma					Iowa	
		Denton	Chillicothe	Bushland	Av.	Rank	Clovis	Rank	Stillwater	Woodward	Cherokee	Av.	Rank	Ames	Rank
Pwn x Iow-Tt-WP5	13279	32.8	23.3	29.2	28.4	3-4	15.0	13	54.5	48.2	30.5	44.4	1	58.1	1
Concho	12517	33.1	23.6	30.2	29.0	2	16.1	9	45.5	51.5	22.3	39.8	3	45.3	4
Kr-HF-Tm-Mi-Hope x Crn	13189	29.6	19.8	28.3	25.9	12	14.2	15	45.6	47.9	26.9	40.1	2	36.1	12
Cmn-Mi-Hope x Iow	13188	29.3	20.7	30.0	26.7	11	17.2	7	43.8	42.3	18.7	34.9	9	46.8	2
Crn-Hope-Cnn x Cmn	13191	36.4	22.2	26.7	28.4	3-4	15.7	11	40.8	46.5	25.9	37.7	7	45.4	3
Early Blackhull	8856	34.0	14.2	26.2	24.8	16	13.9	16	47.5	33.8	37.8	39.7	5	42.0	5
Tascosa	13023	30.0	23.9	26.2	26.7	10	14.3	14	38.9	49.7	26.6	38.4	6	33.3	17
Aztec	13016	30.5	24.0	28.1	27.5	8	20.5	2	36.4	46.6	23.2	35.4	8	40.0	9
Comanche	11673	35.5	19.6	28.3	27.8	6	17.8	6	38.6	39.2	20.5	32.8	11	41.2	6
Warrior	13190	20.4	26.8	30.2	25.8	15	18.1	4	31.6	44.0	15.7	30.4	15	40.3	8
Qv Hybrid	13285	25.9	19.0	23.0	22.6	17	12.9	17	45.2	44.4	29.6	39.7	4	37.3	11
Bh-Oro x Pwn	13187	30.3	23.4	29.2	27.6	7	16.7	8	33.3	46.9	13.8	31.3	12	32.2	18
Blackhull	6251	29.6	19.1	28.9	25.9	13-14	19.7	3	33.6	40.1	17.9	30.5	14	37.7	10
Imp. BJ x Cmn	13186	29.4	20.1	31.1	26.9	9	15.0	12	32.3	35.9	24.1	30.8	13	33.6	16
Crn-Hope-Cnn x Cmn	13024	37.9	22.7	27.6	29.4	1	15.9	10	41.0	45.1	18.2	34.8	10	35.4	14
Kharkof	1442	34.9	23.4	26.2	28.2	5	23.1	1	31.0	37.7	13.3	27.3	18	35.9	13
Pawnee	11669	27.6	22.2	27.8	25.9	13-14	12.2	18	36.3	37.5	13.1	29.0	17	40.6	7
Imp. BJ x Cmn	13185	17.1	19.3	27.0	21.1	18	17.9	5	29.8	39.0	20.3	29.7	16	33.8	15

Table 3. (concluded)

C. I. No.	Kansas					Colorado					Nebraska				15-station <sup>1/</sup>		16 station av.
	Manhattan	Garden City	Colby	Av.	Rank	Fort Collins	Springfield	Hesperus	Av.	Rank	North Platte	Alliance	Av.	Rank	Av.	Rank	
13279	45.1	26.2	24.2	31.8	3	41.0	71.8	37.3	50.0	7-8	44.1	23.7	33.9	3	35.5	1	37.8
12517	45.9	22.4	29.2	32.5	1	39.3	73.8	36.8	50.0	7-8	44.7	27.2	36.0	1	34.2	2	36.7
13189	35.6	24.7	23.2	27.8	11-12	55.3	70.9	34.3	53.5	1	47.6	21.4	34.5	2	32.7	3	35.1
13188	33.9	23.0	24.6	27.2	15	44.0	77.0	38.3	53.1	2	44.1	19.9	32.0	7	31.8	7-8	34.6
13191	36.4	22.8	27.5	28.9	9	37.9	75.1	34.6	49.2	10	39.5	19.1	29.3	13	31.8	7-8	34.5
8856	36.6	21.4	29.4	29.1	8	50.0	66.1	37.6	51.2	3	41.7	18.4	30.1	12	32.3	4	34.4
13023	38.9	22.2	27.4	29.5	6	43.6	69.4	37.8	50.3	5-6	48.1	17.8	33.0	5	31.9	6	34.3
13016	40.6	28.8	26.8	32.1	2	42.4	64.4	34.4	47.1	14	42.1	16.0	29.1	14-15	32.0	5	34.1
11673	38.6	24.5	21.5	28.2	10	36.5	81.3	34.6	50.8	4	45.1	19.7	32.4	6	30.7	10	33.9
13190	34.5	26.2	27.6	29.4	7	29.9	82.6	38.3	50.3	5-6	45.6	16.5	31.1	8	29.7	14	33.0
13285	35.6	25.3	22.6	27.8	11-12	47.2	51.8	36.4	45.1	16	45.5	20.7	33.1	4	31.4	9	32.7
13187	33.7	29.4	27.5	30.2	4	34.1	73.0	35.5	47.5	13	43.6	17.7	30.7	10-11	29.8	13	32.5
6251	32.0	23.9	25.7	27.2	14	35.0	74.7	34.9	48.2	11	43.1	18.3	30.7	10-11	29.3	15	32.1
13186	34.8	27.8	26.7	29.8	5	46.3	61.0	37.1	48.1	12	36.9	17.4	27.2	18	29.9	12	31.8
13024	31.4	22.3	22.6	25.4	16	39.1	55.8	31.7	42.2	17	40.4	21.1	30.8	9	30.2	11	31.8
1442	27.5	20.3	20.7	22.8	18	37.6	77.4	34.3	49.8	9	38.8	17.9	28.4	16	28.2	16	31.3
11669	36.0	22.7	24.5	27.7	13	28.2	67.3	30.2	41.9	18	42.3	15.8	29.1	14-15	27.8	17	30.3
13185	26.7	25.0	23.3	25.0	17	44.8	62.9	31.3	46.3	15	36.3	20.3	28.3	17	27.5	18	29.7

<sup>1/</sup> Hesperus yields omitted from average.

Table 4. Summary of two-year average yields in bushels per acre for 16 varieties grown in the southern regional performance nursery at 16 stations in 1958 and 1959 with state averages and rank.

Variety	C. I. No.	Texas					New Mexico		Oklahoma					Iowa	
		Dent- on	Chilli- cothe	Bush- land	Av.	Rank	Clovis	Rank	Still- water	Wood- ward	Chero- kee	Av.	Rank	Ames	Rank
Pwn x Iow-Tt-WP5	13279	31.2	26.8	31.2	29.7	1	27.9	6	50.3	38.5	36.7	41.8	1	75.4	1
Kr-HF-Tm-Mi-Hope x Crn	13189	22.0	26.1	31.8	26.6	5	27.5	8	43.4	43.4	34.1	40.3	2	53.9	7
Tascosa	13023	20.8	29.0	31.5	27.1	3-4	30.1	1-2	38.5	40.3	36.1	38.3	5	54.6	6
Quivira Hybrid	13285	27.8	28.4	26.8	27.7	2	27.4	9-10	44.0	35.4	37.0	38.8	4	55.4	5
Concho	12517	21.2	27.6	29.2	26.0	8	26.3	14	41.2	40.6	31.0	37.6	6	59.7	3
Cmn-Mi-Hope x Iow	13188	24.3	20.7	28.5	24.5	13	27.7	7	41.6	33.9	27.4	34.3	9	61.7	2
Early Blackhull	8856	26.2	20.7	28.1	25.0	11	27.1	11-12	45.3	30.5	41.3	39.0	3	52.7	11
Comanche	11673	25.8	27.1	26.4	26.4	6	27.4	9-10	36.7	34.4	31.2	34.1	10	57.8	4
Aztec	13016	20.3	29.6	28.4	26.1	7	30.1	1-2	36.7	38.4	30.5	35.2	7	53.2	9
Crn-Hope-Cnn x Cmn	13024	26.3	27.2	27.8	27.1	3-4	27.0	13	37.5	36.6	30.5	34.9	8	51.6	13
Imp. BJ x Cmp	13186	21.5	22.0	31.9	25.1	10	25.8	15	33.7	30.2	30.8	31.6	11-12	48.5	14
Bh-Oro x Pwn	13187	18.1	21.3	29.6	23.0	15	28.2	4-5	29.5	39.7	25.6	31.6	11-12	42.6	16
Blackhull	6251	21.4	24.8	28.2	24.8	12	28.2	4-5	34.4	32.6	26.4	31.1	13	53.1	10
Pawnee	11669	19.8	25.8	26.2	23.9	14	24.0	16	34.3	29.5	24.9	29.6	14	53.8	8
Kharkof	1442	25.1	25.0	26.1	25.4	9	28.9	3	27.7	31.9	18.3	26.0	16	52.6	12
Imp. BJ x Cmn	13185	10.1	21.1	29.9	20.4	16	27.1	11-12	28.3	31.5	27.2	29.0	15	44.5	15

Table 4. (concluded)

C. I. No.	Kansas					Colorado					Nebraska				15-station		16 station av.
	Manhattan	Garden City	Colby	Av.	Rank	Fort Collins	Springfield	Hesperus	Av.	Rank	North Platte	Alliance	Av.	Rank	Av.	Rank	
13279	41.0	29.4	31.9	34.1	2	51.5	38.9	57.5	49.3	4	52.2	41.1	46.7	1-2	40.3	1	41.3
13189	34.9	30.3	31.8	32.3	7	63.6	37.0	56.0	52.2	1	55.5	37.7	46.6	3	38.2	2	39.3
13023	37.7	35.8	35.8	36.4	1	48.4	40.5	59.3	49.4	3	54.9	33.6	44.3	6	37.8	4	39.2
13285	35.7	32.8	32.0	33.5	4	55.2	37.5	50.5	47.7	7	54.7	38.6	46.7	1-2	37.9	3	38.7
12517	40.5	24.4	32.6	32.5	6	46.7	39.1	59.2	48.3	6	48.6	41.1	44.9	5	36.7	5	38.1
13188	34.1	23.5	31.6	29.7	14	48.6	38.1	62.7	49.8	2	51.5	38.6	45.1	4	35.5	7	37.2
8856	36.1	29.9	35.1	33.7	3	50.3	39.3	52.8	47.5	8	45.8	32.9	39.4	14	36.1	6	37.1
11673	34.5	28.6	29.5	30.9	10	45.2	36.4	63.6	48.4	5	49.2	34.4	41.8	9	35.0	9	36.8
13016	36.9	29.6	31.9	32.8	5	46.5	36.1	52.4	45.0	12	49.0	30.3	39.7	13	35.2	8	36.2
13024	30.7	30.2	30.5	30.5	12	46.8	36.0	45.0	42.6	15	47.2	33.5	40.4	11	34.6	10	35.3
13186	34.4	28.6	30.7	31.2	9	46.9	40.7	52.4	46.7	9	47.0	31.4	39.2	15	33.6	11	34.8
13187	34.0	31.7	29.5	31.7	8	32.9	38.3	62.9	44.7	13	50.6	37.3	44.0	7	32.6	13	34.5
6251	33.8	23.9	32.2	30.0	13	35.7	35.8	58.8	43.4	14	46.4	33.9	40.2	12	32.7	12	34.4
11669	33.7	26.6	32.1	30.8	11	37.0	34.0	54.1	41.7	16	49.4	34.3	41.9	8	32.4	14	33.7
1442	31.1	22.3	28.8	27.4	16	39.2	35.2	62.8	45.7	11	42.9	33.6	38.3	16	31.2	16	33.2
13185	30.1	28.2	27.9	28.7	15	48.5	34.4	54.7	45.9	10	44.3	36.7	40.5	10	31.3	15	32.8

Table 5. Summary of agronomic data other than yield for varieties grown in the southern regional performance nursery in 1959.

Variety	C. I. No.	Date		Plant height	Lodging	Broken straw	Shattering <sup>1/</sup>	Leaf rust	Stunted tillers (Streak Mosaic)	Weight per bushel
		Headed	Ripe							
		May	June	In.	%	%		%	%	Lb.
Number of stations -----		15	7	16	4	2	3	4	2	16
Aztec	13016	23	24	36	12	10	2	31	17	61.2
Imp. BJ x Cmn	13185	23	25	35	5	12	1	45	15	61.0
Imp. BJ x Cmn	13186	22	24	34	3	10	2	40	38	60.8
Tascosa	13023	19	20	32	14	16	1	32	25	60.7
Early Blackhull	8856	16	19	35	49	12	2	33	53	60.5
Blackhull	6251	22	24	36	41	33	2	28	22	60.3
Quivira Hybrid	13285	18	21	30	9	34	3	14	61	60.2
Kr-HF-Tm-Mi-Hope x Crn	13189	19	22	34	13	20	1	35	24	60.0
Crn-Hope-Cmn x Cmn	13024	19	21	34	27	51	2	30	41	59.5
Concho	12517	20	21	34	39	32	4	25	24	59.4
Crn-Hope-Cmn x Cmn	13191	20	22	33	6	22	2	24	19	59.4
Cmn-Mi-Hope x Iow	13188	22	24	34	10	67	3	32	32	59.2
Comanche	11673	20	22	34	28	36	2	25	22	58.7
Pwn x Iow-Tt-WP5	13279	22	24	33	17	36	3	2	38	58.7
Pawnee	11669	21	22	33	16	46	4	37	79	58.6
Kharkof	1442	23	25	35	24	32	2	36	47	58.5
Bh-Oro x Pwn	13187	20	21	31	8	83	4	41	80	58.5
Warrior	13190	22	23	32	12	33	2	38	69	57.9

<sup>1/</sup> Shattering based on 1-5 scale, 1 best.

NORTHERN REGIONAL PERFORMANCE NURSERY

This nursery prior to 1959 was designated the uniform winter-hardiness nursery. It contained 23 entries this year and was grown at 15 stations. Replicated nursery plots were used at 11 stations. Data were reported from 12 stations. They are contained in table 6. The nursery at Alliance, Nebraska, was destroyed by hail. At Dickinson, North Dakota, the nursery was abandoned for lack of stands in the fall. An observation nursery grown at Lincoln, Nebraska, was abandoned for reasons described in connection with the southern regional nursery. Entries with state and C. I. numbers are listed below.

Entry No.	Variety or pedigree	State No.	C. I. No.
1	Kharkof		1442
2	Minter		12138
3	Yogo		8033
4	Nebred		10094
5	Pawnee x Nebred		13015
6	Pawnee x Cheyenne		13190
7	Pwn x Iow-Tt-WP5		13279
8	Cheyenne		8885
9	Cheyenne Selection		13192
10	Cheyenne Selection		13193
11	Minnesota Selection		13505
12	do.		13506
13	do.		13280
14	do.		13281
15*	do.	III-54-10	13552
16*	Yogo x (Tk-Oro 221)-66	---	13427
17**	Aztec		13016
18**	Tascosa		13023
19*	South Dakota Selection	56-45	13199
20*	do.	56-53	13526
21*	do.	56-281	13527
22*	do.	56-514	13528
23*	do.	56-825	13529

\* New entry in 1959.

\*\* Entered from Southern Regional Performance Nursery for 1 year only.

DATA OBTAINED

Yields at Ames ranged from 28.6 to 58.1 bushels per acre. Four varieties exceeded 50 bushels. They included C. I. 13279 and three Minnesota experimentals --- C. I. 13280, C. I. 13552, and C. I. 13505. Without exception, the eight highest yielding varieties were resistant to leaf rust and/or stem rust. In addition, all produced grain weighing more than 60 pounds per bushel, whereas only three of the other 15 varieties in the test made 60-pound test weights. All varieties lodged slightly with Tascosa, C. I. 13529 and C. I. 13427 the least lodged.

Early maturing varieties were the most productive at North Platte. Tascosa headed earliest, yielded the most, and had the highest test weight. C. I. 13279, Warrior, Aztec, and Omaha also headed in May and were next highest in yield. Shattering became severe in the nursery by harvest. The relatively poor performance of many of the Minnesota and South Dakota Selections undoubtedly was associated with loss of grain from shattering. Warrior, Omaha, C. I. 13427, and Yogo shattered the least. Some lodging occurred. C. I. 13529 was the only variety that did not lodge at all although 12 varieties lodged less than 10 percent.

Severe drought persisted at Brookings throughout the fall and spring growing periods. Some loss of stands due to winter-killing occurred in every variety. Tascosa, a Texas variety entered in the nursery for one year only, survived with only 2 percent stand. C. I. 13279 had the next lowest survival with 20 percent stand. Yields of grain ranged up to 26.5 bushels per acre made by C. I. 13528 which together with Minter, Yogo, and C. I. 13526 were the only varieties that survived the winter with as much as 75 percent stands. Leaf rust infections of more than 20 percent were reported for all varieties in the nursery. Stem rust in trace amounts only was recorded for C. I. 13505, C. I. 13281, C. I. 13280, and C. I. 13506.

Very high yields of grain and bushel weights were made in an irrigated nursery at Laramie. No winter-killing occurred. Warrior, Cheyenne, and the two Wyoming selections from Cheyenne all produced more than 80 bushels per acre. In contrast to its performance at eastern and southern stations in the region, Warrior produced grain with a test weight of 62.7 pounds per bushel. Lowest test weight in the nursery was only 61.7 pounds. Leaf rust, stem rust, and stripe rust all were present in the nursery. The Minnesota selections showed excellent combined resistance to the three forms of rust. Kharkof, Minter, Yogo, and C. I. 13505 lodged partially.

The nursery at Archer, Wyoming, ran out of water in June, Yields of grain ranged from 12.1 bushels down to only 4.3 bushels. The 10 least productive varieties produced insufficient grain for bushel weight determinations. South Dakota Selections C. I. 13526, C. I. 13527, and C. I. 13199, Warrior and Omaha were highest yielding, all producing more than 10 bushels per acre.

Winter wheat at Sheridan was seeded in somewhat dry surface soil. Fall stands were spotty throughout the nursery but improved somewhat with fall snows and rain. Winter moisture was good and no winter-killing occurred. A dry and hot June and July reduced yields. Cheyenne, C. I. 13529, and C. I. 13193 in that order were highest in yield. Bushel weights were unusually high, ranging from 60.5 pounds to 65.0 pounds. The grain of Warrior weighed 64.5 pounds, the third highest in the nursery. Tascosa and C. I. 13528 both produced grain that weighed 65 pounds per bushel. Because of variable stands and droughty conditions, varietal yield differences were not significant.

High winds during the week prior to harvest caused severe shattering of grain at Havre, Montana. Yields reported are to a considerable extent a reflection of shattering differences exhibited by the varieties. Almost without exception, the low yielding varieties were the ones that shattered the most. C. I. 13427, Yogo, Nebred, C. I. 13526, Warrior, Tascosa and Omaha all showed good resistance to shattering. C. I. 13526 was the best of the South Dakota Selections for shattering resistance as it was at North Platte. C. I. 13192, due to a seed mix-up, was not grown. Insufficient seed was harvested from C. I. 13280 for test weight determination. C. I. 13529, Tascosa, and Warrior in that order had the highest bushel weights.



Yields in the northern performance nursery at Lethbridge were about normal. No winterkilling occurred. Five varieties including the Cheyenne selections, C. I. 13427, Warrior, Cheyenne, and Yogo all yielded more than 40 bushels per acre. Bushel weights (Imperial weights) ranged from 63 to 67 pounds.

Rod-row plots in 2 replications of entries in the northern nursery were grown at Clovis, New Mexico. Yields ranging from 10.5 to 21.6 bushels were reported. Minter, Aztec, Cheyenne, and C. I. 13193 all yielded more than 20 bushels per acre. Aztec had the highest test weight with 59.9 pounds per bushel. Next highest were Tascosa, Nebred, and Warrior in that order.

Observation nursery plots of entries in the northern performance nursery were grown at St. Paul and Waseca, Minnesota, as in former years. Good differential winter survivals occurred at Waseca. Leaf and stem rust became heavy. Varieties with the highest winter survival were C. I. 13528, C. I. 13280, Yogo, and Minter in that order. C. I. 13279 was resistant to leaf rust and C. I. 13280, C. I. 13526, C. I. 13506, and C. I. 13281 were the most resistant to stem rust.

The highest winter survival readings at St. Paul were reported for Minter, Yogo, and C. I. 13528. All survived 75 percent or more. C. I. 13280 and C. I. 13279 were the most resistant to leaf rust. Varieties with the lowest stem rust readings included C. I. 13280, C. I. 13506, and C. I. 13526.

The northern performance nursery was grown for the first time at Colby, Kansas, in duplicated single observation rows. Streak mosaic was prevalent in the nursery and caused light to moderate stunting of tillers. Least stunted varieties included Tascosa, Kharkof, Aztec, Cheyenne, and C. I. 13427, all with readings of 15 percent or less.

Table 6. Yield and other data for varieties grown in the northern regional performance nursery at 12 locations in 1959, with period-of-years averages.

Ames, Iowa  
Three replications

C. I. No.	Date		Plant height In.	Lodging %	Rust			Weight per bushel Lb.	Av. acre yield			No. years grown	Percent of Kharkof
	Headed June	Ripe July			Stem	Leaf			1959 Bu.	1958- 1959 Bu.	1955- 1959 <sup>1/</sup> Bu.		
						Sev. %	Type						
13279	3	7	41	13	S	T	1	60.3	58.1	72.6	--	2	147.3
13280	5	7	43	13	R	T	1	60.9	51.3	62.6	--	2	126.9
13552	6	8	44	10	R	T	1	61.3	50.9	--	--	1	141.8
13505	7	9	44	20	R	T	1	60.5	50.4	59.0	--	2	119.7
13281	8	9	44	18	R	T	1	60.6	49.4	54.3	--	2	110.0
13527	2	7	45	4	R-	75	3	60.2	47.8	--	--	1	133.1
13506	6	9	44	12	R	T	1	60.6	47.0	57.3	--	2	116.1
13526	3	5	40	10	R	70	3	60.8	45.8	--	--	1	127.6
13199	3	6	43	8	S	T	1	60.3	43.0	--	--	1	119.8
13529	3	7	43	4	S-	75	3	61.6	42.6	--	--	1	118.7
13190	3	6	40	8	S	95	3	57.4	40.3	55.0	--	2	111.5
13016	3	5	44	12	HS	65	4	60.4	40.0	--	--	1	111.4
13528	5	8	42	7	S-	65	3	60.1	38.8	--	--	1	108.1
12138	7	8	45	11	R-	60	3	59.3	38.2	48.8	47.5	7	102.9
13015	5-31	3	38	14	HS	95	4	59.6	37.4	48.6	46.1	4	95.3
13192	5	6	42	12	S	75	3	57.6	36.7	48.8	--	2	99.0
13193	5	7	44	16	S	65	3	58.2	36.0	52.0	--	2	105.4
1442	7	9	45	16	HS	75	4	57.5	35.9	49.3	48.4	7	100.0
8885	5	7	43	12	S	70	3	57.5	34.9	54.0	--	2	109.5
10094	4	6	42	23	S	85	4	58.3	34.9	48.2	46.2	7	97.9
13023	3	6	38	3	HS	75	3	58.7	33.3	--	--	1	92.8
8033	7	9	47	12	S	75	3	58.4	32.3	44.1	44.3	7	89.1
13427	7	9	44	5	S	70	4	57.0	28.6	--	--	1	79.7

<sup>1/</sup> No data in 1957

Standard error of a difference = 3.51 bushels.

North Platte, Nebraska  
Three replications

C. I. No.	Date headed	Plant height	Lodging	Shattering	Weight per bushel	Average acre yield
	May	In.	%	%	Lb.	Bu.
13023	28	43	5	4	62.1	44.2
13279	31	45	7	8	60.0	39.0
13190	31	44	7	1	58.2	36.4
13016	31	47	8	8	62.1	36.0
13015	30	44	7	1	60.9	35.3
8885	6-2	46	13	4	59.0	34.6
13192	6-2	44	5	8	58.0	34.2
10094	6-2	45	15	4	59.7	34.0
13529	6-2	47	0	25	60.6	31.9
13193	6-2	46	13	4	58.0	31.5
13505	6-5	47	13	8	59.1	31.3
13552	6-4	47	7	15	59.3	30.8
13526	6-1	46	12	15	58.3	30.6
13281	6-5	46	13	25	58.8	30.0
13528	6-2	46	3	25	60.0	29.6
13527	6-1	50	5	35	60.8	29.0
13280	6-4	46	7	50	60.0	28.1
13199	6-2	47	2	35	58.0	28.1
1442	6-3	47	22	4	58.5	27.9
12138	6-5	47	12	4	59.5	27.2
13427	6-5	49	12	1	58.0	25.2
13506	6-4	47	5	50	60.0	24.2
8033	6-6	49	22	1	58.0	23.0

Standard error of a difference = 1.60 bushels.

Brookings, South Dakota  
Three replications

C. I. No.	Date headed	Plant height	Winter survival	Rust		Weight per bushel	Av. acre yield			No. years grown	Percent of Kharkof
				Leaf	Stem		1959	1958-1959	1955-1959		
	June	In.	%	%	%	Lb.	Bu.	Bu.	Bu.		
13528	8	26	75	27	10	58.8	26.5	--	--	1	135.9
13505	7	26	50	33	T	57.9	25.4	26.6	--	2	97.8
13281	9	28	48	30	T	58.9	25.2	35.4	--	3	135.3
13199	5	27	53	50	37	58.9	24.0	--	--	1	123.1
13280	8	25	47	23	T	58.7	23.7	30.1	--	3	117.5
12138	9	27	75	40	9	58.2	22.9	33.3	30.9	7	124.5
13529	4	27	68	27	11	60.5	22.5	--	--	1	115.4
13506	9	29	40	27	T	58.4	21.5	24.5	--	2	90.2
13526	3	24	78	33	3	59.2	20.7	--	--	1	106.2
13016	4	28	43	40	27	59.6	20.2	--	--	1	103.6
13527	4	28	50	30	29	56.8	20.2	--	--	1	103.6
13015	3	24	57	40	17	58.7	20.1	21.4	23.1	5	90.2
13193	5	26	65	53	32	57.4	20.1	25.1	--	2	92.4
1442	9	26	58	50	37	55.5	19.5	27.2	25.6	7	100.0
8033	12	28	78	50	33	54.6	19.0	33.7	28.6	7	114.5
13552	9	26	42	27	8	58.1	18.2	--	--	1	93.3
8885	6	27	38	60	40	56.4	16.7	23.6	--	3	92.1
13190	6	24	37	57	37	55.6	16.1	20.4	--	3	85.9
13192	6	28	53	37	47	56.2	15.9	25.8	--	3	95.3
10094	5	25	48	47	25	57.7	15.8	26.8	27.7	7	107.9
13279	6	27	20	33	40	56.4	13.4	25.1	--	3	110.5
13427	13	31	45	37	37	51.7	13.2	--	--	1	67.7
13023	7	24	2	50	24	--	0.4	--	--	1	2.1

Standard error of a difference = 1.14 bushels.

Laramie, Wyoming  
Three replications, irrigated

C. I. No.	Date headed	Plant height	Lodging	Rust			Weight per bushel	Av. acre yield			No. years grown	Percent of Kharkof
				Leaf	Stem	Stripe		1959	1958-1959	1955-1959		
	June	In.	%	%	%	%	Lb.	Bu.	Bu.	Bu.		
13190	21	40	0	5	30	50	62.7	86.3	81.5	-- -	3	115.0
13192	24	41	0	25	45	0	63.4	82.9	81.2	-- -	3	116.4
13193	23	42	0	25	40	0	63.0	82.9	81.0	-- -	2	110.2
8885	24	44	0	20	30	0	62.9	81.1	81.8	-- -	3	114.5
13427	24	45	5	10	20	10	62.6	76.6	-- -	-- -	1	101.6
13279	22	39	0	0	10	35	62.1	75.6	70.2	-- -	3	101.6
1442	25	44	30	10	40	0	62.2	75.4	73.5	59.3	8	100.0
13280	23	42	0	0	0	0	62.8	75.3	73.4	-- -	3	102.8
12138	25	42	25	15	10	0	62.4	74.9	73.9	60.1	8	92.7
10094	22	40	0	15	30	0	63.1	72.6	70.1	56.3	8	89.4
13505	25	43	15	T	0	10	62.5	72.1	68.1	-- -	2	92.6
13552	24	40	0	0	0	0	62.2	72.0	-- -	-- -	1	95.5
13528	24	41	0	20	15	0	62.9	71.0	-- -	-- -	1	94.2
13527	22	38	0	10	10	T	62.0	69.7	-- -	-- -	1	92.4
8033	27	44	20	10	40	40	62.1	68.6	69.2	59.0	8	94.9
13281	25	42	0	0	0	0	61.8	68.3	66.6	-- -	3	90.8
13016	22	44	0	10	20	0	62.3	65.6	-- -	-- -	1	87.0
13015	21	37	0	25	25	T	62.2	64.6	58.1	42.3	5	71.4
13506	25	43	0	T	0	T	61.7	64.6	59.0	-- -	2	80.3
13526	22	39	0	20	T	T	63.4	62.5	-- -	-- -	1	82.9
13199	24	41	0	10	15	20	62.5	62.3	-- -	-- -	1	82.6
13529	22	40	0	15	10	20	62.9	61.7	-- -	-- -	1	81.8
13023	20	32	0	T	0-15	10	62.0	54.0	-- -	-- -	1	71.6

Standard error of a difference = 4.07 bushels.

Archer, Wyoming  
Four replications

C. I. No.	Date headed	Plant height	Weight per bushel	Av. acre yield			No. years grown	Percent of Kharkof
				1959	1958-1959	1956-1959		
	June	In.	Lb.	Bu.	Bu.	Bu.		
13526	16	21	59	12.1	--	--	1	131.5
13190	18	20	58	11.8	24.4	--	3	110.6
13527	19	22	58	11.7	--	--	1	127.2
13015	16	20	60	11.6	22.4	23.4	4	96.9
13199	16	24	58	10.4	--	--	1	113.0
13506	22	25	58	10.2	19.2	--	2	88.2
13280	19	22	59	9.6	21.0	--	3	93.5
13193	24	21	62	9.6	22.5	--	2	103.7
13023	16	24	59	9.4	--	--	1	102.2
13528	19	22	60	9.3	--	--	1	101.1
1442	22	20	60	9.2	21.7	24.1	5	100.0
13427	24	21	57	9.1	--	--	1	98.9
13281	22	23	59 <sup>1/</sup>	9.0	21.4	--	3	97.8
10094	18	20	-- <sup>1/</sup>	8.8	24.7	24.8	5	101.7
13529	19	23	--	8.5	--	--	1	92.4
13016	19	22	--	8.2	--	--	1	89.1
13552	22	21	--	8.1	--	--	1	88.0
13505	22	23	--	5.8	17.9	--	2	82.3
13192	25	19	--	5.4	22.4	--	3	105.0
13279	22	20	--	5.1	21.2	--	3	92.0
8885	24	20	--	4.6	20.2	--	3	96.3
8033	25	19	--	4.4	19.2	22.7	5	93.8
12138	22	20	--	4.3	20.4	22.3	5	92.4

<sup>1/</sup> Insufficient seed for test weight determination.  
Standard error of a difference = 2.13 bushels.

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Sheridan, Wyoming  
Four replications

C. I. No.	Plant height	Weight per bushel	Average acre yield			No. years grown	Percent of Kharkof
			1959	1958-1959	1955-1959 <sup>1/</sup>		
	In.	Lb.	Bu.	Bu.	Bu.		
8885	31	64.0	35.3	36.0	-- -	3	123.8
13529	32	64.0	32.6	-- -	-- -	1	103.8
13193	31	63.0	32.4	36.3	-- -	2	116.2
13552	31	62.0	31.5	-- -	-- -	1	100.3
1442	32	63.0	31.4	31.2	25.3	8	100.0
12138	33	62.5	31.0	31.2	27.9	8	103.0
13023	32	65.0	30.8	-- -	-- -	1	98.1
10094	29	63.0	30.5	31.0	30.3	8	108.5
8033	34	64.0	30.2	31.5	27.8	8	106.5
13016	33	62.5	29.9	-- -	-- -	1	95.2
13427	33	62.5	29.7	-- -	-- -	1	94.6
13279	32	64.0	29.3	30.9	-- -	3	118.7
13190	30	64.5	29.0	33.6	-- -	3	118.2
13505	32	63.0	27.7	28.5	-- -	2	91.3
13281	32	60.5	27.6	29.3	-- -	3	104.6
13506	32	62.0	26.9	28.6	-- -	2	91.7
13192	28	61.5	26.5	33.2	-- -	3	117.5
13015	31	62.5	25.7	24.2	24.8	4	97.8
13528	32	65.0	25.3	-- -	-- -	1	80.6
13280	31	62.0	25.2	30.9	-- -	3	105.1
13199	35	63.0	23.6	-- -	-- -	1	75.2
13526	31	63.5	22.4	-- -	-- -	1	71.3
13527	31	62.5	22.2	-- -	-- -	1	70.7

<sup>1/</sup> No data in 1956.

Standard error of a difference = non-significant.

Havre, Montana  
Four replications

C. I. No.	Date headed	Plant height	Shattering	Weight per bushel	Av. acre yield			No. years grown	Percent of Kharkof
					1959	1958-1959	1955-1959 <sup>1/</sup>		
	June	In.	%	Lb.	Bu.	Bu.	Bu.		
13427	19	25	13	62.0	24.2	--	--	1	154.1
8033 <sub>2/</sub>	19	24	8	62.5	23.9	25.9	32.9	7	98.1
----- <sub>2/</sub>	19	27	8	62.6	22.5	--	--	-	---
10094	16	22	15	63.8	20.2	25.3	30.3	7	94.4
13526	15	25	13	63.6	19.7	--	--	1	125.5
13193	17	23	40	64.0	19.3	23.9	--	2	104.6
13190	15	24	13	64.4	18.5	24.6	--	2	107.7
8885	16	23	25	64.2	17.9	23.7	--	2	103.7
13015	12	23	5	63.0	17.5	20.3	27.1	3	93.6
13527	15	25	25	63.4	17.4	--	--	1	110.8
13016	17	25	33	64.0	16.7	--	--	1	106.4
13505	21	24	38	62.2	16.6	23.1	--	2	101.1
13023	12	22	3	64.8	16.3	--	--	1	103.8
13279	14	26	35	64.2	15.9	19.5	--	2	85.1
1442	16	25	37	63.6	15.7	22.9	29.0	7	100.0
12138	18	26	40	63.4	15.1	22.1	28.5	7	88.0
13281	20	25	35	61.4	14.6	21.7	--	2	95.0
13199	15	26	35	63.6	13.4	--	--	1	85.4
13528	16	22	53	64.2	13.2	--	--	1	84.1
13552	17	24	55	63.2	12.7	--	--	1	80.9
13529	16	25	35	64.8	9.3	--	--	1	59.2
13506	21	25	63	61.6	8.6	17.4	--	2	76.1
13280	27	24	80	--	5.2	16.5	--	2	72.2

<sup>1/</sup> No data in 1956 and 1957.

<sup>2/</sup> Unidentified variety grown in place of C. I. 13192.

Standard error of a difference = 2.62 bushels.



Lethbridge, Alberta  
Four replications

C. I. No.	Date		Plant height	Weight per bushel <sup>1/</sup>	Av. acre yield			No. years grown	Percent of Kharkof
	Headed	Ripe			1959	1958-1959	1955-1959		
	June	Aug.	In.	Lb.	Bu.	Bu.	Bu.		
13193	23	2	31	67.0	43.7	42.9	-- -	2	109.2
13427	25	2	34	65.0	43.3	-- -	-- -	1	109.9
13190	20	1	30	66.0	42.4	39.4	-- -	3	99.7
13192	23	2	30	67.0	42.4	40.1	-- -	3	101.9
8885	23	2	31	66.0	42.0	39.9	-- -	3	103.8
8033	25	2	32	64.0	41.4	38.2	38.3	6	106.7
1442	23	1	31	66.0	39.4	39.3	35.2	6	100.0
10094	22	1	29	66.0	39.2	35.6	33.9	6	97.2
13279	18	1	31	67.0	39.1	36.0	-- -	3	93.9
13505	27	2	32	64.0	38.5	36.4	-- -	2	92.7
13016	21	1	31	65.0	37.5	-- -	-- -	1	95.2
13552	24	2	31	65.0	36.9	-- -	-- -	1	93.7
13526	21	7-30	29	66.0	36.7	-- -	-- -	1	93.1
13281	25	2	32	65.0	36.3	36.7	-- -	3	93.5
12138	23	1	32	66.0	36.1	34.9	35.8	6	102.1
13527	21	1	32	64.0	35.6	-- -	-- -	1	90.4
13528	22	1	31	65.0	35.6	-- -	-- -	1	90.4
13023	20	7-30	25	66.0	33.7	-- -	-- -	1	85.5
13280	22	2	32	65.0	32.4	35.2	-- -	3	92.4
13529	21	7-30	30	66.0	30.4	-- -	-- -	1	77.2
13199	21	7-31	30	65.0	30.3	-- -	-- -	1	76.9
13015	16	7-28	27	63.0	30.1	28.7	25.9	5	73.6
13506	24	2	31	65.0	27.5	32.3	-- -	2	82.3

<sup>1/</sup> Imperial bushel weights.

Standard error of a difference = 1.33 bushels.

Clovis, New Mexico  
Two replications

C. I. No.	Date headed	Plant height	Shattering score <sup>1/</sup>	Weight per bushel	Average acre yield
	May	In.		Lb.	Bu.
12138	19	22	2.7	57.6	21.6
13016	20	21	2.5	59.9	21.5
8885	20	20	2.0	57.8	20.6
13193	21	22	2.5	57.6	20.2
10094	21	22	2.0	58.6	19.7
1442	22	24	3.0	57.5	19.5
13427	21	23	2.0	56.8	18.9
13192	19	21	3.0	57.8	18.6
13505	15	21	3.5	57.2	18.5
13506	20	22	2.0	56.4	17.6
13528	18	24	2.7	56.6	17.5
13552	16	24	2.2	56.2	16.4
13190	16	23	3.5	58.4	16.0
8033	21	24	3.2	56.6	15.6
13023	22	22	2.2	58.8	15.6
13280	13	21	2.2	55.8	15.2
13281	21	25	2.5	56.4	14.7
13279	18	25	2.0	57.4	14.5
13199	18	23	2.5	55.7	14.4
13529	16	21	3.0	54.5	11.7
13015	13	19	2.0	56.1	10.6
13526	23	23	2.0	43.9	10.5
13527	17	21	2.7	56.8	10.5

<sup>1/</sup> Based on 1-5 scale; 1 best.

Standard error of a difference = 2.72 bushels.

Waseca, Minnesota  
Three rows, six feet long

C. I. No.	Date		Plant height	Winter survival	Rust	
	Headed	Ripe			Leaf	Stem
	June	July	In.	%	%	%
1442	15	21	32	27	70	50
12138	15	19	32	63	80	10
8033	15	19	30	65	90	50
10094	11	16	28	37	70	60
13015	8	16	27	53	70	15
13190	9	19	28	37	60	60
13279	13	21	26	15	T	40
8885	14	19	28	33	60	60
13192	13	19	31	38	70	60
13193	15	19	29	37	70	50
13505	15	21	32	43	60	10
13506	15	21	30	40	50	5
13280	9	17	31	68	30	0
13281	15	21	29	33	30	5
13552	15	21	29	18	30	30
13427	15	20	33	30	80	70
13016	9	17	30	37	60	50
13023	--	--	--	22	--	--
13199	13	19	28	30	30	40
13526	9	14	28	60	50	0
13527	10	18	31	53	60	10
13528	9	15	31	82	50	15
13529	10	18	31	58	50	40

St. Paul Minnesota  
Three rows, six feet long

C. I. No.	Date headed	Winter Survival	Rust	
			Leaf	Stem
	June	%	%	%
1442	12	23	60	60
12138	11	80	55	45
8033	12	78	60	65
10094	10	50	60	55
13015	8	40	60	55
13190	9	37	65	75
13279	10	17	10	75
8885	12	30	70	75
13192	12	33	75	75
13193	12	47	55	65
13505	13	28	35	25
13506	13	28	25	5
13280	11	33	5R	T-5
13281	14	17	20	45
13552	13	13	50	55
13427	13	43	65	65
13016	12	17	70	65
13023	--	0	--	--
13199	9	53	25	65
13526	8	47	30	15
13527	9	42	65	45
13528	10	75	55	30
13529	11	53	55	50

Colby, Kansas  
Two rows, 10 feet long

C. I. No.	Date headed	Plant height	Stunted tillers <sup>1/</sup>
	May	In.	%
13023	25	33	13
13016	28	37	15
13279	28	37	18
13190	26	35	38
13193	29	36	20
8885	29	37	15
13015	25	34	33
1442	31	36	13
13192	29	35	23
13552	30	35	25
13281	6-1	37	28
13505	6-1	37	30
13527	28	38	48
10094	28	35	43
8033	6-1	36	23
13427	31	38	15
12138	6-1	37	35
13526	28	34	33
13529	28	37	55
13199	28	37	43
13528	28	35	33
13506	6-1	37	23
13280	6-1	34	25

<sup>1/</sup> Stunting associated with wheat streak mosaic.

### STANDARD ERRORS

Mean yields and standard errors for the northern regional performance nursery are reported in table 7. Yields ranged from 8.6 bushels per acre at Archer, Wyoming, to 71.2 bushels in an irrigated nursery at Laramie, Wyoming. Coefficients of variability of less than 10 percent were reported from 4 of 9 stations.

### SUMMARY OF NURSERY YIELDS

Yields made by varieties in the northern performance nursery at nine reporting stations are summarized in table 8. State averages and ranks also are recorded. Warrior had the highest 9-station average yield of 33.0 bushels per acre. It was followed closely by Cheyenne selections C. I. 13193 and C. I. 13192, C. I. 13279, and Cheyenne in that order. Tascosa was the least productive variety. The average yields of the Minnesota and South Dakota selections were hurt by heavy loss of grain from shattering at North Platte and Havre.

Fourteen varieties have been tested since 1958. Their 2-year yields from 7 reporting stations appear in table 9. The same varieties with the highest average yields in 1959 also have the best 2-year yields. C. I. 13192 cannot be compared directly with other varieties since its yield is based on one less reporting station.

### SUMMARY OF AGRONOMIC DATA

Agronomic data other than yield for varieties tested in the northern regional performance nursery are reported in table 10. Varieties are ranked according to test weight. Data reported for Tascosa and C. I. 13192 in several cases cannot be compared directly with data for other varieties since they are based on fewer reporting stations. Aztec and two South Dakota selections had the highest test weight among varieties harvested at 8 stations. Minnesota selections C. I. 13280, C. I. 13506 and C. I. 13505, and C. I. 13526 from South Dakota were the most resistant to stem rust. C. I. 13279 and C. I. 13280 in that order exhibited the best leaf rust resistance. C. I. 13526 was the most resistant to shattering among the South Dakota entries. C. I. 13505 was best among the Minnesota group. Overall, the varieties Omaha, Tascosa, Yogo, Warrior, and C. I. 13427 shattered the least. As a group, the South Dakota selections showed excellent resistance to lodging. The Minnesota strains also were good. South Dakota selection C. I. 13528 had the highest average winter survival in the nursery, being slightly better than Minter and Yogo. It matured 2 days earlier than either of the latter two varieties. C. I. 13526 and C. I. 13529 also survived well.

### UNIFORM WINTER-HARDINESS NURSERY

This nursery formerly was designated the supplementary winter-hardiness nursery. In 1959, it consisted of 200 entries grown in duplicated observation rows at Alliance, Nebr.; Brookings, South Dakota; Watertown, S. Dak.; St. Paul, Minn.; Fargo, N. Dak.; Laramie, Wyo.; and Moccasin, Mont. Winter-killing did not occur at Alliance and Laramie. There was no survival at Watertown. A few rows survived partially at Fargo but were inadvertently disked up before they could be identified. Differential killing was reported at Brookings, Moccasin, and St. Paul. Data from these stations were summarized and distributed to the cooperators in a separate report.

Table 7. Number of replications, mean yields, and standard errors for the northern regional performance nursery at the reporting stations in 1959.

State and Station	No. reps	No. varieties	Av. yield all varieties	Standard error of		Coefficient of variability
				Diff. in means	Mean	
			Bu.	Bu.	Bu.	%
IOWA						
Ames	3	54	42.1	3.51	2.48	10.2
NEBRASKA						
North Platte	3	23	31.4	1.60	1.13	6.3
NEW MEXICO						
Clovis	2	23	16.6	2.72	1.92	16.4
WYOMING						
Laramie	3	24	71.2	4.07	2.88	7.0
Archer	4	24	8.6	2.13	1.50	34.9
Sheridan	4	24	28.4	N.S.	N.S.	19.6
SOUTH DAKOTA						
Brookings	3	25	18.5	1.14	0.80	7.5
MONTANA						
Havre	4	23	16.3	2.62	1.85	22.8
ALBERTA						
Lethbridge	4	23	37.0	1.33	0.94	5.1

Table 8. Summary of average yields in bushels per acre made by 23 varieties grown in the northern regional performance nursery at 9 stations in 1959, with state averages and rank.

Variety	C. I. No.	New Mexico		Iowa		Nebraska	
		Clovis	Rank	Ames	Rank	North Platte	Rank
Warrior	13190	16.0	13	40.3	11	36.4	3
Cheyenne selection	13193	20.2	4	36.0	17	31.5	10
Cheyenne selection	13192	18.6	8	36.7	16	34.2	7
Pwn x Iow-Tt-WP5	13279	14.5	18	58.1	1	39.0	2
Cheyenne	8885	20.6	3	34.9	19	34.6	6
Minnesota selection	13505	18.5	9	50.4	4	31.3	11
Minnesota selection	13552	16.4	12	50.9	3	30.8	12
Nebred	10094	19.7	5	34.9	20	34.0	8
Minnesota selection	13281	14.7	17	49.4	5	30.0	14
Aztec	13016	21.5	2	40.0	12	36.0	4
Kharkof	1442	19.5	6	35.9	18	27.9	19
Minter	12138	21.6	1	38.2	14	27.2	20
Yogo x (Tk-Oro 221)-66	13427	18.9	7	28.6	23	25.2	21
Minnesota selection	13280	15.2	16	51.3	2	28.1	17
South Dakota sel.	13528	17.5	11	38.8	13	29.6	15
South Dakota sel.	13527	10.5	23	47.8	6	29.0	16
South Dakota sel.	13526	10.5	22	45.8	8	30.6	13
Yogo	8033	15.6	14-15	32.3	22	23.0	23
Omaha	13015	10.6	21	37.4	15	35.3	5
South Dakota sel.	13529	11.7	20	42.6	10	31.9	9
South Dakota sel.	13199	14.4	19	43.0	9	28.1	18
Minnesota selection	13506	17.6	10	47.0	7	24.2	22
Tascosa	13023	15.6	14-15	33.3	21	44.2	1



Table 8. (continued)

C. I. No.	Wyoming					South Dakota		Montana		Alberta		9 station Av.
	Laramie	Sheridan	Archer	Av.	Rank	Brookings	Rank	Havre	Rank	Lethbridge	Rank	
13190	86.3	29.0	11.8	42.4	1	16.1	18	18.5	7	42.4	3	33.0
13193	82.9	32.4	9.6	41.6	2	20.1	13	19.3	6	43.7	1	32.9
13192	82.9	26.5	5.4	38.3	6	15.9	19	--	--	42.4	4	32.8 <sup>1/</sup>
13279	75.6	29.3	5.1	36.7	11	13.4	21	15.9	14	39.1	9	32.2
8885	81.1	35.3	4.6	40.3	3	16.7	17	17.9	8	42.0	5	32.0
13505	72.1	27.7	5.8	35.2	12-13	25.4	2	16.6	12	38.5	10	31.8
13552	72.0	31.5	8.1	37.2	8	18.2	16	12.7	20	36.9	12	30.8
10094	72.6	30.5	8.8	37.3	7	15.8	20	20.2	4	39.2	8	30.6
13281	68.3	27.6	9.0	35.0	14	25.2	3	14.6	17	36.3	14	30.6
13016	65.6	29.9	8.2	34.6	15	20.2	10	16.7	11	37.5	11	30.6
1442	75.4	31.4	9.2	38.7	4	19.5	14	15.7	15	39.4	7	30.4
12138	74.9	31.0	4.3	36.7	9	22.9	6	15.1	16	36.1	15	30.1
13427	76.6	29.7	9.1	38.5	5	13.2	22	24.2	1	43.3	2	29.9
13280	75.3	25.2	9.6	36.7	10	23.7	5	5.2	23	32.4	19	29.6
13528	71.0	25.3	9.3	35.2	12-13	26.5	1	13.2	19	35.6	17	29.6
13527	69.7	22.2	11.7	34.5	16	20.2	11	17.4	10	35.6	16	29.3
13526	62.5	22.4	12.1	32.3	21	20.7	9	19.7	5	36.7	13	29.0
8033	68.6	30.2	4.4	34.4	17	19.0	15	23.9	2	41.4	6	28.7
13015	64.6	25.7	11.6	34.0	19	20.1	12	17.5	9	30.1	22	28.1
13529	61.7	32.6	8.5	34.3	18	22.5	7	9.3	21	30.4	20	27.9
13199	62.3	23.6	10.4	32.1	22	24.0	4	13.4	18	30.3	21	27.7
13506	64.6	26.9	10.2	33.9	20	21.5	8	8.6	22	27.5	23	27.6
13023	54.0	30.8	9.4	31.4	23	0.4	23	16.3	13	33.7	18	26.4

<sup>1/</sup> Average yield based on 8 reporting stations.

Table 9. Summary of two-year average yields for 14 varieties grown in the northern regional performance nursery at 7 stations in 1958 and 1959, with state averages and rank.

Variety	C. I. No.	Iowa		Wyoming					South Dakota		Montana		Alberta		7 station Av.
		Ames	Rank	Lara- mie	Shari- dan	Archer	Av.	Rank	Brook- ings	Rank	Havre	Rank	Leth- bridge	Rank	
Cheyenne selection	13192	48.8	10-11	81.2	33.2	22.4	45.6	4	25.8	8	--	--	40.1	2	41.9 <sup>1/</sup>
Cheyenne selection	13193	52.0	8	81.0	36.3	22.5	46.6	1	25.1	9-10	23.9	4	42.9	1	40.5
Cheyenne	8885	54.0	7	81.8	36.0	20.2	46.0	3	23.6	12	23.7	5	39.9	3	39.9
Warrior	13190	55.0	5	81.5	33.6	24.4	46.5	2	20.4	14	24.6	3	39.4	4	39.8
Pwn x Iow-Tt-WP5	13279	72.6	1	70.2	30.9	21.2	40.8	9	25.1	9-10	19.5	11	36.0	9	39.4
Minnesota selection	13280	62.6	2	73.4	30.9	21.0	41.8	7-8	30.1	4	16.5	13	35.2	11	38.5
Kharkof	1442	49.3	9	73.5	31.2	21.7	42.1	5	27.2	5	22.9	7	39.3	5	37.9
Minnesota selection	13281	54.3	6	66.6	29.3	21.4	39.1	11	35.4	1	21.7	9	36.7	7	37.9
Minter	12138	48.8	10-11	73.9	31.2	20.4	41.8	7-8	33.3	3	22.1	8	34.9	12	37.8
Yogo	8033	44.1	14	69.2	31.5	19.2	40.0	10	33.7	2	25.9	1	38.2	6	37.4
Nebred	10094	48.2	13	70.1	31.0	24.7	41.9	6	26.8	6	25.3	2	35.6	10	37.4
Minnesota selection	13505	59.0	3	68.1	28.5	17.9	38.2	12	26.6	7	23.1	6	36.4	8	37.1
Minnesota selection	13506	57.3	4	59.0	28.6	19.2	35.6	13	24.5	11	17.4	12	32.3	13	34.0
Omaha	13015	48.6	12	58.1	24.2	22.4	34.9	14	21.4	13	20.3	10	28.7	14	32.0

<sup>1/</sup> Average yield based on 6 stations only.

Table 10. Summary of agronomic data other than yield for varieties grown in the northern regional performance nursery in 1959.

Variety	C. I. No.	Date		Plant height In.	Winter Survival %	Lodging %	Shat- tering %	Rust		Weight per bushel Lb.
		Headed June	Ripe July					Leaf %	Stem %	
Number of stations -----		12	3	11	3	3	2	5	4	8
Tascosa	13023	7 <sup>1/</sup>	18 <sup>3/</sup>	30 <sup>1/</sup>	8	3	4	42 <sup>5/</sup>	16 <sup>3/</sup>	62.5 <sup>6/</sup>
Aztec	13016	9	18	33	32	7	21	49	41	62.0
South Dakota selection	13529	9	18	32	60	1	30	44	28	61.9
South Dakota selection	13528	9	18	32	77	3	39	43	18	61.6
Pwn x Iow-Tt-WP5	13279	8	20	32	17	7	22	9	41	61.4
Nebred	10094	9	18	31	45	13	10	55	43	61.3
Minter	12138	12	20	33	73	16	22	50	19	61.1
Cheyenne	8885	11	20	32	34	8	15	56	51	61.0
Cheyenne selection	13193	11	20	32	50	10	22	54	47	61.0
Minnesota selection	13552	11	21	32	24	6	35	22	23	60.9
Warrior	13190	8	19	31	37	5	7	56	51	60.9
South Dakota selection	13199	9	19	33	45	3	35	23	39	60.9
Omaha	13015	6	16	29	50	7	3	58	28	60.8
Minnesota selection	13505	12	21	33	40	16	23	26	9	60.8
South Dakota selection	13527	8	19	33	48	3	30	48	24	60.8
Minnesota selection	13506	12	21	33	36	6	57	21	3	60.7
Minnesota selection	13280	10	19	32	49	7	65	12	1	60.7 <sup>6/</sup>
Kharkof	1442	11	21	33	36	23	21	53	47	60.5
Minnesota selection	13281	12	21	33	33	10	30	16	13	60.4
Cheyenne selection	13192	10 <sup>2/</sup>	19	32 <sup>1/</sup>	41	6	8 <sup>4/</sup>	56	57	60.2 <sup>6/</sup>
Yogo	8033	13	20	33	74	18	5	57	47	60.0
South Dakota selection	13526	8	16	31	62	7	14	41	5	59.8
Yogo x (Tk-Oro 221)-66	13427	12	21	34	39	7	7	52	48	59.5

<sup>1/</sup> 10 - station average.  
<sup>2/</sup> 11 - station average.

<sup>3/</sup> 2 - station average.  
<sup>4/</sup> Based on 1 station only.

<sup>5/</sup> 3 - station average.  
<sup>6/</sup> 7 - station average.

### DISEASE NURSERIES

The uniform bunt nursery was grown at 7 stations in the region. It contained 29 entries. Seed of the new entries also was sent to the Smut Laboratory at Pullman, Washington, for testing against dwarf bunt. Data are being compiled in a separate report for distribution to the cooperators.

A limited number of varieties from the hard red winter wheat region are grown at Urbana, Illinois, each year for evaluation against soil-borne mosaic. Strains totaling 122 were submitted for testing this year. The nursery was covered with an ice sheet during part of the winter and did not survive.

The uniform and international rust nurseries are grown annually at several stations in the region. Data from these nurseries are distributed by Dr. Loegering at Beltsville, Maryland.

A regional streak mosaic nursery has been grown at several locations since 1957. This year it was composed of 20 varieties and was grown at Stillwater, Manhattan, Hays, Lincoln, Archer, and Moccasin. The nursery was not inoculated at Lincoln and Moccasin. It did not survive the winter at Archer. Data were reported from Stillwater, Manhattan, and Hays which are summarized in table 11.

The most resistant variety tested in 1959 was Wheat-Rye x Ivcl-Cmn (M.438). M.428 was given ratings equally as good as M.438 at the Kansas stations but was rated as susceptible at Stillwater, Oklahoma. Among the named varieties tested, BlueJacket, Bison, and Triumph were rated best. P. I. 166472 had slightly the lowest rating (most tolerant) of the three introductions in the nursery. Other varieties with noteworthy tolerance to streak mosaic include Ctr x Mi-Hope-Pwn (R.6002), Mql-Oro-Tm x Pwn (52A1), and Ap x Cfk-Oro-Tm (53H586).

### QUALITY DATA

Grain samples from the regional nurseries are submitted each year to the Hard Winter Wheat Quality Laboratory in the following amounts:

Uniform Quality Series --	10 pounds from each location
Southern Regional Performance Nursery --	1 pound from each location
Northern Regional Performance Nursery --	1 pound from each location

Results of evaluation of samples are reported annually to the cooperators by Karl Finney.

Table 11. Information obtained from the cooperative streak mosaic nursery in 1959.

Variety	C. I. or Sel. No.	Manhattan, Kansas			Hays, Kansas			Stillwater <sup>2/</sup> Oklahoma <sup>2/</sup>	3 station average
		Stunting	Yellowing	Combined rating <sup>1/</sup>	Stunting	Yellowing	Combined rating <sup>1/</sup>		
Pawnee	11669	4	4	4.0	4	4	4.0	4.5	4.2
Blue Jacket	12502	2	3	2.5	2	3	2.5	3.0	2.7
Kansas Sel. 462666	-----	5	5	5.0	5	5	5.0	4.5	4.8
Wheat-Rye x Ivcl-Cmn	M.438	2	2	2.0	2	2	2.0	1.0	1.7
do.	M.428	2	2	2.0	2	2	2.0	4.0	2.7
Introduction	181457	4	4	4.0	3	4	3.5	3.0	3.5
do.	166472	3	4	3.5	3	4	3.5	2.0	3.0
do.	H.511	4	4	4.0	3	3	3.0	3.0	3.3
Ctr. x Mi-Hope-Pwn	R.6002	2	3	2.5	3	3	3.0	3.0	2.8
Kansas Sel. 462666	-----	5	5	5.0	5	5	5.0	5.0	5.0
Ctr x Mi-Hope-Pwn	R.6073	3	4	3.5	3	4	3.5	4.0	3.7
Mql-Oro-Tm x Pwn	52A1	2	3	2.5	3	3	3.0	3.5	3.0
Concho	12517	2	4	3.0	3	4	3.5	3.5	3.3
Triumph	12132	2	3	2.5	2	3	2.5	3.5	2.8
Comanche	11673	2	3	2.5	3	4	3.5	3.5	3.2
Bison	12518	2	3	2.5	2	3	2.5	3.0	2.7
Ap x Cfk-Oro-Tm	53H586	2	-	2.0	3	-	3.0	4.0	3.0
Pawnee	11669	4	4	4.0	4	4	4.0	5.0	4.3
Blue Jacket	12502	2	3	2.5	2	3	2.5	3.5	2.8
Kansas Sel. 462666	-----	5	5	5.0	5	5	5.0	5.0	5.0

Note: Ratings based on a 1 to 5 scale; 1 = resistant, 5 = fully susceptible, 3 or better = some field tolerance.

<sup>1/</sup> Average of stunting and yellowing ratings. Equal value given to each.

<sup>2/</sup> Single rating based on degree of stunting and yellowing.

