ADMINISTRATIVE, FOR STAFF USE
** - - **

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
CROPS RESEARCH DIVISION
Lincoln, Nebraska

**********

# COMPARISON OF WINTER WHEAT VARIETIES GROWN IN COOPERATIVE NURSERY EXPERIMENTS IN THE HARD RED WINTER WHEAT REGION IN 1964

**********

Preliminary report, not for publication[1/]

1/ 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.

Nebraska Agricultural Experiment Station
Lincoln, Nebraska

CR-26-65

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
Crops Research Division

# COMPARISON OF WINTER WHEAT VARIETIES GROWN IN COOPERATIVE NURSERY EXPERIMENTS IN THE HARD RED WINTER WHEAT REGION IN 1964

By

V. A. Johnson[1/]

CONTENTS

| | Page |
|---|---|
| Personnel changes | 1 |
| Cooperating agencies, stations, and personnel | 1 |
| Accession numbers assigned | 4 |
| New varieties | 4 |
| Wheat yields and production in the region | 4 |
| Uniform quality series | 5 |
| Southern regional performance nursery | 6 |
| Data obtained | 6 |
| Summary of nursery yields | 31 |
| Summary of agronomic data | 31 |
| Northern regional performance nursery | 36 |
| Data obtained | 36 |
| Summary of nursery yields | 50 |
| Summary of agronomic data | 50 |
| Uniform winterhardiness nursery | 54 |
| Disease nurseries | 55 |
| Quality data | 60 |

1/ The writer expresses appreciation to Dorothy M. Wilson, Mrs. Alyce Ann Schmidt, Robert Divoky, and Dale Stoltenberg for their assistance in preparing this report.

## PERSONNEL CHANGES

M. C. Futrell accepted an ARS assignment in Nigeria. He was replaced as ARS Cereal Pathologist at College Station by R. A. Kilpatrick.

C. F. Henderson, ARS Entomologist at Oklahoma State University for many years, retired on December 31, 1964.

A. W. Pauli and F. W. Stickler, formerly plant physiologists at Kansas State University, are now associated with Deere and Company, Moline, Illinois.

J. R. Burleigh (ARS) has joined the staff of the Botany Department, Kansas State University. He will conduct rust epidemiology studies.

V. B. Cardwell, Agronomist at Hesperus, Colorado, has resumed graduate study. He is replaced at Hesperus by K. Schliebe.

J. D. Eastin transferred from wheat quality research in Agronomy at the University of Nebraska to sorghum physiology (ARS) in the same department. Robert Johnson resigned as Agronomist at the North Platte station to accept a position at the School of Forestry, Bottineau, North Dakota.

R. C. Frohberg joined the wheat research group in the Agronomy Department, North Dakota State University, Fargo.

E. R. Hehn, formerly in charge of winter wheat improvement at Montana State College is now Chairman of the Agronomy Department. J. R. Welsh will direct the winter wheat research in the department. Bruce McCallum has resigned as Agronomist at the Havre station.

E. R. Ausemus, long-time ARS wheat breeder and geneticist at the University of Minnesota and since 1951 regional spring wheat improvement leader, retired from federal service at the end of July. He is now associated with Northrup-King as hybrid wheat consultant. K. L. Lebsock, Fargo, North Dakota, is the new Regional Spring Wheat Improvement Leader.

## COOPERATING AGENCIES, STATIONS, AND PERSONNEL
(The asterisk denotes U.S.D.A. employees)

CEREAL CROPS RESEARCH BRANCH, A.R.S., U.S.D.A.

| | |
|---|---|
| Wheat Investigations | L. P. Reitz* |
| Hard Red Winter Wheat Region | V. A. Johnson* |
| Rust Investigations | W. Q. Loegering* |
| Quality Investigations | K. F. Finney* |

TEXAS AGRICULTURAL EXPERIMENT STATION:

| | | |
|---|---|---|
| College Station | Texas A. & M. University | |
| Agronomy | | I. M. Atkins* (State Leader) |
| Plant Physiology and Pathology | | R. A. Kilpatrick* |
| Denton | Substation No. 6 | J. H. Gardenhire |
| Chillicothe | Substation No. 12 | K. A. Lahr |
| Bushland | Southwestern Great Plains Field Sta. | K. B. Porter<br>N. E. Daniels |

| | | |
|---|---|---|
| **NEW MEXICO AGRICULTURAL EXPERIMENT STATION:** | | |
| Clovis | Plains Substation | D. B. Ferguson |
| | | C. H. Hsi |
| **OKLAHOMA AGRICULTURAL EXPERIMENT STATION:** | | |
| Stillwater | Oklahoma State University | |
| Agronomy | | A. M. Schlehuber (State Leader) |
| | | B. Jackson |
| | | E. E. Sebesta* |
| | | B. B. Tucker |
| | | R. M. Oswalt |
| Botany and Plant Pathology | | H. C. Young |
| | | E. E. Saari |
| | | R. C. Bellingham* |
| Entomology | | C. F. Henderson* |
| | | E. A. Woods, Jr.* |
| Biochemistry | | D. C. Abbott |
| Cherokee | Wheat Land Conservation Station | E. G. Greer, Jr. |
| Woodward | Southern Gr. Plains Field Sta. | R. A. Hunter |
| Goodwell | Panhandle Agr. Exp. Station | R. A. Peck |
| **KANSAS AGRICULTURAL EXPERIMENT STATION:** | | |
| Manhattan | Kansas State University | |
| Agronomy | | E. G. Heyne |
| Botany and Plant Pathology | | W. H. Sill |
| | | E. D. Hansing |
| | | L. E. Browder* |
| | | J. R. Burleigh* |
| Entomology | | R. H. Painter |
| | | H. W. Somsen* |
| Flour and Feed Milling Industries | | J. A. Shellenberger |
| | | J. A. Johnson |
| | | A. B. Ward |
| Hays | Ft. Hays Branch Station | R. W. Livers |
| Garden City | Garden City Agr. Exp. Sta. | W. D. Stegmeier |
| Colby | Colby Branch Station | J. R. Lawless |
| **COLORADO AGRICULTURAL EXPERIMENT STATION:** | | |
| Ft. Collins | Colorado State University | |
| Agronomy | | B. C. Curtis |
| Akron | U.S. Central Gr. Plains Sta. | G. O. Hinze |
| Hesperus | San Juan Basin Branch Sta. | K. Schliebe |
| Springfield | Southeastern Colo.Branch Sta. | H. O. Mann |
| **IOWA AGRICULTURAL EXPERIMENT STATION:** | | |
| Ames | Iowa State University | |
| Agronomy | | R. E. Atkins |
| **NEBRASKA AGRICULTURAL EXPERIMENT STATION:** | | |
| Lincoln | University of Nebraska | |
| Agronomy | | V. A. Johnson* |
| | | J. W. Schmidt |
| | | M. R. Morris |
| | | P. J. Mattern |

| | | |
|---|---|---|
| North Platte | North Platte Exp. Sta. | J. C. Adams |
| | | K. P. Pruess |
| Alliance | Box Butte Exp. Station | P. L. Ehlers |
| | | C. R. Fenster |
| Concord | Northeast Nebr. Exp. Sta. | U. U. Alexander |

WYOMING AGRICULTURAL EXPERIMENT STATION:

| | | |
|---|---|---|
| Laramie | University of Wyoming | |
| Crops | | B. J. Kolp |
| Plant Pathology and Horticulture | | G. H. Bridgmon |
| Cheyenne | Archer Substation | A. F. Gale |
| Gillette | Gillette Substation | L. R. Landers |
| Sheridan | Sheridan Substation | L. R. Richardson |

SOUTH DAKOTA AGRICULTURAL EXPERIMENT STATION:

| | | |
|---|---|---|
| Brookings | South Dakota State University | |
| Agronomy | | D. G. Wells |
| Plant Pathology | | G. W. Buchenau |
| Highmore | Central Substation | Frank Holmes |
| Presho | South Central Research Farm | Harry Geise |

NORTH DAKOTA AGRICULTURAL EXPERIMENT STATION:

| | | |
|---|---|---|
| Fargo | North Dakota State University | |
| Agronomy | | G. S. Smith |
| | | R. C. Frohberg |
| Dickinson | Dickinson Substation | T. J. Conlon |

MONTANA AGRICULTURAL EXPERIMENT STATION:

| | | |
|---|---|---|
| Bozeman | Montana State College | |
| Agronomy and Soils | | J. R. Welsh |
| | | C. R. Haun* |
| | | C. A. Watson |
| Moccasin | Central Mont. Branch Sta. | H. R. Guenthner |
| Huntley | Huntley Branch Station | D. E. Baldridge |
| Havre | North Montana Branch Sta. | |

IDAHO AGRICULTURAL EXPERIMENT STATION:

| | | |
|---|---|---|
| Aberdeen | Aberdeen Branch Station | D. W. Sunderman* |
| Tetonia | Tetonia Branch Station | G. D. Ames |

MINNESOTA AGRICULTURAL EXPERIMENT STATION:

| | | |
|---|---|---|
| St. Paul | Institute of Agriculture | |
| Agronomy and Plant Genetics | | E. R. Ausemus* |
| | | D. R. Johnston |
| Waseca | Southern Experiment Sta. | J. R. Thompson |

ILLINOIS AGRICULTURAL EXPERIMENT STATION:

| | | |
|---|---|---|
| Urbana | University of Illinois | |
| Agronomy | | R. O. Weibel |
| Plant Pathology | | W. M. Bever |

MISSOURI AGRICULTURAL EXPERIMENT STATION:

| | | |
|---|---|---|
| Columbia | University of Missouri | |
| Field Crops | | C. F. Hayward |

CANADA DEPARTMENT OF AGRICULTURE:
Lethbridge Alberta Agr. Exp. Sta. M. N. Grant

## ACCESSION NUMBERS ASSIGNED

Hard red winter wheat varieties assigned C. I. numbers in 1964 are listed below. C. I. numbers take precedence over state and local numbers in this report, and their use by wheat workers is encouraged.

| C. I. No. | Pedigree | State No. | Source |
|---|---|---|---|
| 13866 | Hussar x Cheyenne$^3$ | 63M532+3 | Idaho |
| 13867 | (Rex-Rio x Cnn$^2$) x Cnn$^3$ | 63M2390 | do. |
| 13868 | Burt x Itana | Sel. 220 | Wash. |
| 13881 | Ky 58-Nth x (Cnn-Tm-Mi-Hope)$^2$ | N. 61975 | Nebr. |
| 13882 | Cnn-Pnc x Tk-Cnn | N. 61528 | do. |
| 13883 | MM-Ech-Rm$^3$ x Cnn$^2$ | N. 61930 | do. |
| 13884 | Cnn$^2$ x Selkirk | N. 61361 | do. |
| 13885 | Ottawa x Cheyenne$^2$ | N. 62378 | do. |
| 13886 | Scout Reselection | --- | Colo. |
| 13887 | Scout Reselection | --- | do. |
| 13888 | Cheyenne$^2$ x Kenya-Mentana | N. 61623 | Nebr. |
| 13889 | Quanah x Cimarron | Tx. 59D37 | Texas |
| 13890 | Svl-Wi-Hope-Cnn-Wi$^2$ x SS | Tx. 57D16082 | do. |
| 13993 | Cheyenne x Yogo BC Bulk | --- | Mont. |
| 13994 | Mtr-M2825 x H255 x Bkh | N.S. II-53-62 | Minn. |
| 13995 | II-36-3 x III-51-31 | N.S. II-53-72 | do. |
| 13996 | Scout Reselection | --- | Nebr. |
| 13997 | Cfk-Mt-Tm x Cnn | 611303 | N. Mex. |

## NEW VARIETIES

C. I. 13526 will be released in South Dakota under the name Hume. It possesses excellent winterhardiness, resistance to currently prevalent races of stem rust except 15B, short straw, good quality, and is moderately early maturing. It has bronze chaff color.

Two semi-dwarf experimental varieties are undergoing initial increase for possible release in Texas. They are Norin 10 x C. I. 12500 (C. I. 13855) and Svl-Wi-Hope-Cnn-Wi$^2$ x SS 27 (C. I. 13684). Both have short stiff straw, resistance to leaf rust and Hope resistance to stem rust. They lack test weight and are susceptible to straw collapse under heat and drought stress.

## WHEAT YIELDS AND PRODUCTION IN THE REGION

Yields of winter wheat were equal to or higher than the 5-year average in most of the hard winter wheat producing states in 1964. Only in Colorado and Kansas were yields substantially less than the 5-year average. Average yields were above 20 bushels in all states except Colorado and North Dakota. Abandonment of seeded acres ranged from a high of nearly 55 percent in New Mexico to only 2.5 percent in Illinois. Abandonments of 36.2, 24.6, and 21.8 occurred in Colorado, Texas, and North Dakota. The extent to which the high abandonments reflected over-seeding of acres in the fall is not known.

| State | Acres Seeded 1/ | Acres Harvested 1/ | Abandonment | 1964 production 1/ | 1964 av. acre yield 2/ | 1958-62 av. acre yield 2/ |
|---|---|---|---|---|---|---|
| | | | % | Bu. | Bu. | Bu. |
| Kansas | 10,641 | 9,576 | 10.0 | 215,460 | 22.5 | 25.5 |
| Oklahoma | 4,882 | 4,201 | 13.9 | 96,623 | 23.0 | 23.0 |
| Texas | 4,002 | 3,017 | 24.6 | 61,848 | 20.5 | 19.9 |
| Nebraska | 3,235 | 2,953 | 8.7 | 73,825 | 25.0 | 25.5 |
| Colorado | 2,761 | 1,761 | 36.2 | 27,296 | 15.5 | 23.3 |
| Montana | 2,045 | 1,834 | 10.3 | 52,269 | 28.5 | 23.4 |
| Illinois | 1,852 | 1,806 | 2.5 | 66,822 | 37.0 | 31.0 |
| Missouri | 1,621 | 1,429 | 11.8 | 46,442 | 32.5 | 27.8 |
| Idaho | 782 | 660 | 15.6 | 26,400 | 40.0 | 28.8 |
| So. Dakota | 601 | 541 | 10.0 | 14,336 | 26.5 | 21.2 |
| New Mexico | 293 | 132 | 54.9 | 2,772 | 21.0 | 20.7 |
| Wyoming | 227 | 200 | 11.9 | 4,800 | 24.0 | 23.2 |
| Iowa | 95 | 90 | 5.3 | 2,520 | 28.0 | 25.7 |
| No. Dakota | 55 | 43 | 21.8 | 731 | 17.0 | -- |
| Minnesota | 12 | 11 | 8.3 | 292 | 26.5 | 25.5 |

1/ In thousands.

2/ Based on harvested acres. Data taken from the 1963 Annual Summary, Crop Production, U. S. Dept. of Agriculture, Statistical Reporting Service, Crop Reporting Board.

## UNIFORM QUALITY SERIES

A limited number of advanced experimental varieties that are candidates for release and newly released varieties are grown with appropriate check varieties at most cooperating stations. Seed in the amount of 10 pounds of each variety is submitted to the Hard Winter Wheat Quality Laboratory at Manhattan, Kansas, for quality evaluation. Varieties in each district in 1964 were:

### Southern District

| | |
|---|---|
| Pawnee* | 11669 |
| Comanche* | 11673 |
| Caddo | 13536 |
| Gage | 13532 |
| Chiefkan x Tenmarq | K. 501097 |
| do. | K. 501099 |
| Qv-Tm x Mql-Oro | 12995 |

### Central District

| | |
|---|---|
| Pawnee* | 11669 |
| Comanche* | 11673 |
| Gage | 13532 |
| Scout | 13546 |
| Cmn x Mi-Hope-Pn-Oro-I1#1-Cmn | 13548 |
| Chiefkan x Tenmarq | K. 501097 |
| do. | K. 501099 |
| Qv-Tm x Mql-Oro | 12995 |

### Northern District

| | |
|---|---|
| Yogo* | 8033 |
| Warrior* | 13190 |
| Lancer | 13547 |
| Hume | 13526 |
| Winalta | 13670 |

* Check variety

## SOUTHERN REGIONAL PERFORMANCE NURSERY

Nineteen of 21 stations growing the southern regional nursery reported data. The nursery succumbed to drought during the winter and spring at Springfield, Colorado. At Chillicothe, Texas, the nursery was grown to maturity but its condition was poor and data were not reported. Pedigrees and C. I. numbers of entries in the 1964 nursery are as follows:

| Entry No. | Pedigree | C. I. No. | State submitting |
|---|---|---|---|
| 1 | Kharkof | 1442 | -- |
| 2 | Early Blackhull | 8856 | -- |
| 3 | Comanche | 11673 | -- |
| 4 | Triumph | 12132 | Okla. |
| 5 | Triumph 64 | 13679 | do. |
| 6* | Triumph x C. I. 12406 (61 Stw 8617) | 13847 | do. |
| 7* | do. ( 8620) | 13848 | do. |
| 8* | do. ( 8627) | 13849 | do. |
| 9* | do. ( 8631) | 13850 | do. |
| 10* | do. ( 8635) | 13851 | do. |
| 11* | do. ( 8637) | 13852 | do. |
| 12 | Scout | 13546 | Nebr. |
| 13 | Lancer | 13547 | do. |
| 14* | Wichita$^5$ x Cns + Au (K. 6317) | 13853 | Kans. |
| 15* | Bison x C. I. 9058 (K. 6322) | 13854 | do. |
| 16 | Caddo | 13536 | Texas |
| 17 | Svl-Wi-Hope-Cnn-Wi x SS 27 | 13684 | do. |
| 18* | Norin 10 x C. I. 12500 (Tx. 1826-1) | 13855 | do. |
| 19* | Cheyenne$^2$ x Ky-Mta (N. 61608) | 13856 | Nebr. |
| 20* | Nebred x Cnn-Ky-Mta (N. 61660) | 13857 | do. |

* New entry in 1964.

### Data Obtained

Performance data from reporting stations are given in table 1. Growing conditions reported by the stations are summarized.

Denton--The nursery was seeded in dry soil on November 9. The wheat had emerged by December 2 following 2/3-inch of precipitation on November 19. Growth was limited until precipitation and warm temperatures in March. Leaf rust centers were observed in the nursery on April 29 and stem rust was found the following week. The nursery was sprayed for army worm control on May 7.

Bushland--Moisture in the fall was adequate for wheat emergence although precipitation was below normal in October, November, and December. Total precipitation from January 1 to May 27 was only 1.19 inches--most of the total (1.04 inches) occurring as snow in early February. The dryland nursery was remarkably productive considering the lack of moisture. An irrigated nursery received water 5 times during the spring for a total of 17 inches of supplemental water. Diseases and insects were non-economic.

Stillwater--The main yield-depressing hazards were: (1) unseasonably high temperatures after seeding that resulted in an abnormal amount of plant growth in the fall and early winter, (2) moisture stress during April and early May combined with high winds, (3) leaf rust infection, (4) a few "soil spots"--probably a combination of nematodes and Olpidium that resulted in plant stunting and severe yield reduction in a few plots, and (5) stem rust on late-maturing varieties that may have reduced yields.

Woodward--In addition to high temperatures after seeding resulting in heavy fall growth and moisture stress in April and early May, the probable chief yield-depressing factors at Woodward were leaf rust and hail damage that was particularly severe on early varieties that were headed when the hail occurred.

Cherokee--Heavy fall growth associated with unseasonably high temperatures, moisture stress in April and early May combined with high winds, and leaf rust were the main factors affecting performance of the wheat at Cherokee in 1964.

Clovis--The dryland nursery was seeded on October 2; the irrigated nursery on October 15. Local showers contributed to good fall stands in both nurseries and snow cover during several periods in the winter helped maintain the nurseries in good condition. Severe spring drought combined with high temperatures produced a near crop failure of commercial dryland wheat in the area. The dryland nursery was located on a favored part of the station and produced good yields. Wheat streak mosaic was general in the Clovis area with some early seeded fields of Tascosa and Apache severely damaged. The disease was not a factor in the nurseries.

Manhattan--The fall and winter were dry. Satisfactory stands were obtained from seeding on October 5. Conditions of moisture and temperature were about average in April and wheat growth was excessive. A very dry May produced much drought damage. Moisture in June was too late to help. Heading, plant height, and ripening was about the same for all varieties. The heads of late-maturing Kharkof failed to exsert from the boot.

Hays--A normal fall with soil moisture to a depth of 3-4 feet, was followed by a dry winter and dry spring until mid-May. Nurseries were seeded on October 4. Rainfall was normal from mid-May through June. Spring infestation of hessian fly produced some straw breakage. Streak mosaic was present but not severe. Severe shattering of some varieties occurred from hail at the ripe stage.

Garden City--Warm temperatures and adequate subsoil moisture in late fall contributed to above-normal growth of the wheat from an October 3 seeding. Secondary root development was poor for lack of surface moisture. Available moisture was depleted rapidly during the fall and winter. Drought and dust storms during the spring injured the wheat. Rains in late May improved the yields of late-maturing varieties and permitted the grain of all varieties to fill well. Diseases and insects were not a problem.

Colby--Fall moisture at Colby was adequate but well below normal from October 1 through May. Active growth of the wheat continued in the fall into December. There was no winterkilling. Brown wheat mites were present until late May. Marked yellowing of some plots occurred in late April and May, with

C. I. 13546 and C. I. 13855 the most severely affected. Yellowing and other symptoms were suggestive of streak mosaic. The extent to which streak mosaic was the cause of the yellowing and otherwise poor condition of several varieties was not definitely established.

Ft. Collins--The nursery was seeded on September 16. Seed bed and soil moisture were excellent. Fall growth was about normal despite a long warm fall in which the first killing frost occurred on November 12, the latest on record. Top growth was killed back during the winter but there was no loss of plants. The wheat was nearly buried by blowing soil during high winds in early spring. A rotary hoe was used to provide aeration for the buried plants which eventually pushed through the soil with little apparent damage. Precipitation from January 1 to harvest on July 25 was only 4 inches. Cool spring temperatures allowed maximum development of the wheat on the limited moisture. Stem and leaf rust was present in traces only. Thrips caused flecking of leaves but with little apparent damage. Irrigation water was not applied.

Akron--Moisture was deficient throughout the season. The deficiency was intensified by high winds in the spring. Hail on June 13 sterilized many florets and in some cases entire heads. Severe yellowing similar to that noted at Colby, Kansas, was noted in several varieties including Scout. The nursery was highly variable due to the drought, and height notes were not taken.

Hesperus--Erratic emergence and plant development in the fall resulted from poor distribution of surface moisture due to ground leveling prior to seeding. The nursery survived the winter well but frost on May 23 and June 5 caused sterility estimated at 5 percent. Diseases and insects were not factors in performance.

Urbana--The nursery was seeded on October 2 in a dry seedbed. Emergence was spotty but stands appeared to be full by November 15. Little or no winter injury was noted. Early spring was favorable for growth but was followed by dry, hot weather until harvest. Both mildew and Septoria were present in the spring but the dry weather was unfavorable for their development. Both leaf and stem rust developed too late for readings.

Ames--A dry warm fall and relatively mild winter, followed by a cool moist spring, summarizes conditions at Ames. Mildew was present in early spring but failed to develop. Both leaf and stem rust were heavy and were factors in the performance of varieties. Lodging occurred in some varieties.

Lincoln--Fall, winter, and spring at Lincoln were near normal. Fall stands were good; no winterkilling occurred; and the wheat made good growth in the spring until hot windy weather in May. Hail on May 7 caused broken straw and spike damage, particularly in the earliest varieties. Some lodging occurred in all of the varieties except the Texas semi-dwarfs C. I. 13855, C. I. 13684, and Lancer. However, the straw of the semi-dwarfs broke over completely by harvest time. Stem rust was heavy and reduced the test weight of susceptible later maturing varieties.

North Platte--Fall stands were excellent. Soil moisture was adequate throughout the fall and winter. The spring was somewhat dry but the wheat developed well. Stem rust became heavy and was a factor in performance.

Alliance--Conditions similar to those at North Platte prevailed throughout the season. Heavy loss of top growth occurred during the winter and some loss of stands. The rusts did not develop.

Columbia--Information on growing conditions was not reported.

Table 1. Yield and other data for varieties grown in the Southern Regional Performance Nursery at 19 stations in the hard red winter wheat region in 1964.

Denton, Texas
Four Replications

| C. I. No. | Date headed | Plant height | Rust resistance: Leaf | Rust resistance: Stem | Weight per bushel | Av. acre yield: 1964 | Av. acre yield: 1963-1964 | No. years grown | Percent of Kharkof |
|---|---|---|---|---|---|---|---|---|---|
| | April | In. | % | % | Lbs. | Bu. | Bu. | | |
| 13853 | 26 | 40 | 0 | 5 | 61 | 35.0 | -- | 1 | 224.4 |
| 13857 | 21 | 32 | 30 | T | 59 | 34.5 | -- | 1 | 221.2 |
| 13536 | 29 | 38 | 10 | T-10 | 62 | 34.1 | 32.6 | 5 | 139.2 |
| 13852 | 21 | 34 | 60 | T-15 | 60 | 34.1 | -- | 1 | 218.6 |
| 13850 | 22 | 36 | 60 | T-5 | 60 | 34.0 | -- | 1 | 217.9 |
| 13679 | 22 | 35 | 60 | T-30 | 60 | 33.7 | 34.0 | 2 | 145.0 |
| 13847 | 22 | 37 | 60 | T-10 | 61 | 33.5 | -- | 1 | 214.7 |
| 13851 | 20 | 37 | 60 | T-5 | 61 | 33.3 | -- | 1 | 213.5 |
| 13684 | 22 | 26 | T | T | 58 | 32.0 | 27.3 | 2 | 116.4 |
| 13856 | 21 | 34 | 30 | T | 56 | 30.6 | -- | 1 | 196.2 |
| 13848 | 21 | 38 | 60 | T-40 | 61 | 30.5 | -- | 1 | 195.5 |
| 13849 | 25 | 38 | 60 | 5 | 61 | 30.2 | -- | 1 | 193.6 |
| 8856 | 22 | 40 | 60 | 5 | 62 | 29.6 | 30.0 | 28 | 128.7 |
| 12132 | 22 | 36 | 60 | T-30 | 60 | 29.4 | 29.2 | 4 | 115.7 |
| 13546 | 5-2 | 40 | 40 | T | 59 | 29.4 | 30.9 | 4 | 125.2 |
| 13547 | 5-6 | 39 | 40 | T | 58 | 27.7 | 30.0 | 2 | 127.7 |
| 13854 | 5-1 | 39 | 60 | T | 59 | 27.1 | -- | 1 | 173.7 |
| 11673 | 5-5 | 41 | 60 | 5 | 58 | 26.6 | 29.4 | 24 | 128.6 |
| 13855 | 23 | 25 | T | T | 59 | 26.4 | -- | 1 | 169.2 |
| 1442 | 5-12 | 42 | 80 | T | 54 | 15.6 | 23.5 | 28 | 100.0 |

$LSD_{.05}$ = 3.6 bushels; C.V. = 8.57%

Bushland, Texas
Five replications, dryland

| C. I. No. | Plant height | Weight per bushel | Av. acre yield 1964 | Percent of Kharkof |
|---|---|---|---|---|
| | In. | Lbs. | Bu. | |
| 12132 | 20 | 57.4 | 17.8 | 106.0 |
| 13851 | 19 | 61.1 | 17.1 | 101.8 |
| 13856 | 18 | 56.4 | 17.0 | 101.2 |
| 13546 | 19 | 56.1 | 16.8 | 100.0 |
| 1442 | 18 | 60.5 | 16.8 | 100.0 |
| 13679 | 18 | 59.1 | 16.4 | 97.6 |
| 13850 | 18 | 57.5 | 16.0 | 95.2 |
| 13852 | 19 | 57.0 | 15.4 | 91.7 |
| 13536 | 19 | 61.1 | 15.2 | 90.5 |
| 13853 | 19 | 56.3 | 15.1 | 89.9 |
| 13848 | 19 | 58.2 | 14.9 | 88.7 |
| 13847 | 18 | 59.6 | 14.8 | 88.1 |
| 13849 | 18 | 57.0 | 14.7 | 87.5 |
| 11673 | 18 | 58.4 | 14.6 | 86.9 |
| 13547 | 17 | 60.2 | 14.4 | 85.7 |
| 13855 | 17 | 55.4 | 14.4 | 85.7 |
| 13857 | 17 | 57.1 | 13.6 | 81.0 |
| 13854 | 20 | 56.5 | 13.6 | 81.0 |
| 13684 | 16 | 58.1 | 12.5 | 74.4 |
| 8856 | 19 | 57.5 | 12.0 | 71.4 |

$LSD_{.05}$ = 3.37 bushels; C.V. = 17.5%

Bushland, Texas
Three replications, irrigated

| C. I. No. | Date headed | Plant height | Weight per bushel | Av. acre yield 1964 | No. years grown | Percent of Kharkof |
|---|---|---|---|---|---|---|
| | May | In. | Lbs. | Bu. | | |
| 13546 | 8 | 33 | 63.0 | 69.8 | 2 | 119.6 |
| 13547 | 14 | 37 | 63.0 | 65.6 | 1 | 111.2 |
| 13854 | 12 | 35 | 62.6 | 62.6 | 1 | 106.1 |
| 13857 | 11 | 31 | 62.5 | 62.0 | 1 | 105.1 |
| 13684 | 11 | 29 | 61.6 | 61.4 | 1 | 104.1 |
| 13852 | 8 | 29 | 61.6 | 60.4 | 1 | 102.4 |
| 13849 | 12 | 35 | 61.2 | 59.7 | 1 | 101.1 |
| 1442 | 16 | 36 | 61.6 | 59.0 | 24 | 100.0 |
| 13856 | 11 | 33 | 62.6 | 58.6 | 1 | 99.3 |
| 13850 | 10 | 34 | 62.2 | 58.1 | 1 | 98.5 |
| 11673 | 13 | 34 | 61.5 | 57.9 | 24 | 105.3 |
| 13679 | 8 | 31 | 61.8 | 55.7 | 1 | 94.4 |
| 13848 | 8 | 33 | 62.3 | 55.6 | 1 | 94.2 |
| 13855 | 9 | 27 | 62.5 | 54.7 | 1 | 92.7 |
| 13847 | 10 | 35 | 61.5 | 52.7 | 1 | 89.3 |
| 13536 | 9 | 31 | 63.0 | 51.9 | 1 | 88.0 |
| 12132 | 8 | 30 | 62.2 | 51.8 | 2 | 93.2 |
| 8856 | 6 | 33 | 61.6 | 50.7 | 24 | 97.5 |
| 13853 | 10 | 32 | 62.0 | 47.8 | 1 | 81.0 |
| 13851 | 9 | 32 | 60.9 | 47.2 | 1 | 80.0 |

$LSD_{.05}$ = 8.29 bushels; C.V. = 8.87%

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 | | 1964 | 1963-1964 | | |
| | April | In. | % | | Lbs. | Bu. | Bu. | | |
| 13853 | 26 | 32 | 0-20 | 0-4 | 60.7 | 49.2 | -- | 1 | 156.2 |
| 13679 | 24 | 31 | 18 | 4 | 61.2 | 45.7 | 48.1 | 2 | 151.3 |
| 13536 | 26 | 31 | 5 | 1-2 | 62.5 | 45.1 | 42.3 | 5 | 127.1 |
| 13546 | 26 | 32 | 13 | 4 | 59.7 | 44.9 | 47.7 | 4 | 154.6 |
| 13856 | 24 | 29 | 18 | 4 | 58.3 | 44.0 | -- | 1 | 139.6 |
| 13852 | 23 | 30 | 15 | 4 | 60.4 | 43.3 | -- | 1 | 137.5 |
| 13857 | 25 | 30 | 20 | 4 | 59.4 | 42.9 | -- | 1 | 136.2 |
| 13855 | 25 | 24 | T | 4 | 59.3 | 42.2 | -- | 1 | 134.0 |
| 11673 | 5-1 | 31 | 12 | 4 | 59.8 | 42.0 | 41.5 | 24 | 113.6 |
| 12132 | 24 | 32 | 18 | 4 | 60.5 | 42.0 | 45.7 | 3 | 140.7 |
| 13850 | 24 | 31 | 18 | 4 | 60.8 | 41.9 | -- | 1 | 133.0 |
| 8856 | 24 | 34 | 18 | 4 | 61.9 | 41.6 | 43.8 | 30 | 116.8 |
| 13851 | 24 | 31 | 9 | 4 | 60.6 | 40.3 | -- | 1 | 127.9 |
| 13847 | 24 | 32 | 15 | 4 | 60.7 | 40.0 | -- | 1 | 127.0 |
| 13684 | 24 | 25 | 5 | 2 | 59.3 | 39.4 | 41.9 | 2 | 131.6 |
| 13848 | 24 | 31 | 13 | 4 | 60,7 | 39.4 | -- | 1 | 125.1 |
| 13854 | 29 | 31 | 18 | 4 | 61.0 | 37.9 | -- | 1 | 120.3 |
| 13849 | 25 | 31 | 13 | 4 | 59.6 | 35.2 | -- | 1 | 111.7 |
| 13547 | 30 | 30 | 10 | 4 | 60.2 | 34.1 | 34.2 | 2 | 107.5 |
| 1442 | 5-4 | 31 | 20 | 4 | 60.5 | 31.5 | 31.8 | 30 | 100.0 |

$LSD_{.05}$ = 4.81 bushels; C.V. = 8.27%

Woodward, Oklahoma
Four replications

| C. I. No. | Date headed | Plant height | Weight per bushel | Av. acre yield 1964 | Av. acre yield 1963-1964 | No. years grown | Percent of Kharkof |
|---|---|---|---|---|---|---|---|
| | April | In. | Lbs. | Bu. | Bu. | | |
| 13546 | 29 | 28 | 58.6 | 46.0 | 40.3 | 4 | 157.7 |
| 13536 | 29 | 28 | 62.5 | 43.9 | 35.5 | 5 | 135.4 |
| 13547 | 5-2 | 28 | 60.5 | 43.0 | 36.1 | 2 | 139.7 |
| 13856 | 28 | 26 | 59.3 | 42.9 | -- | 1 | 149.0 |
| 13679 | 27 | 27 | 60.8 | 42.3 | 36.7 | 2 | 142.1 |
| 11673 | 5-1 | 27 | 60.2 | 41.9 | 36.3 | 28 | 118.4 |
| 13852 | 27 | 26 | 59.6 | 39.9 | -- | 1 | 138.5 |
| 13857 | 30 | 27 | 60.5 | 39.8 | -- | 1 | 138.2 |
| 13853 | 28 | 28 | 58.0 | 39.5 | -- | 1 | 137.2 |
| 13855 | 28 | 22 | 58.7 | 38.8 | -- | 1 | 134.7 |
| 8856 | 26 | 27 | 61.2 | 38.4 | 31.1 | 33 | 109.8 |
| 13854 | 30 | 29 | 60.6 | 37.6 | -- | 1 | 130.6 |
| 13850 | 28 | 27 | 60.4 | 35.4 | -- | 1 | 122.9 |
| 13849 | 30 | 27 | 60.3 | 35.2 | -- | 1 | 122.2 |
| 13847 | 28 | 29 | 60.5 | 35.0 | -- | 1 | 121.5 |
| 12132 | 28 | 27 | 60.2 | 34.9 | 31.1 | 4 | 136.1 |
| 13848 | 27 | 27 | 60.2 | 34.3 | -- | 1 | 119.1 |
| 13851 | 28 | 28 | 60.3 | 32.9 | -- | 1 | 114.2 |
| 1442 | 5-5 | 28 | 59.8 | 28.8 | 25.8 | 33 | 100.0 |
| 13684 | 29 | 23 | 58.8 | 28.7 | 26.8 | 2 | 104.1 |

$LSD_{.05}$ = 4.48 bushels; C.V. = 8.33%

Cherokee, Oklahoma
Four replications

| C. I. No. | Date headed | Plant height | Weight per bushel | Av. acre yield | | No. years grown | Percent of Kharkof |
|---|---|---|---|---|---|---|---|
| | | | | 1964 | 1963-1964 | | |
| | April | In. | Lbs. | Bu. | Bu. | | |
| 13852 | 27 | 30 | 59.7 | 44.8 | -- | 1 | 196.5 |
| 13546 | 30 | 31 | 57.8 | 44.6 | 48.2 | 4 | 178.1 |
| 13547 | 5-3 | 28 | 59.7 | 42.7 | 45.3 | 2 | 155.0 |
| 8856 | 28 | 30 | 60.6 | 42.6 | 43.6 | 17 | 139.6 |
| 13679 | 28 | 28 | 59.8 | 42.3 | 46.2 | 2 | 158.0 |
| 13536 | 28 | 29 | 62.0 | 41.8 | 44.6 | 5 | 154.8 |
| 13857 | 5-1 | 29 | 59.5 | 41.4 | -- | 1 | 181.6 |
| 13856 | 28 | 27 | 58.7 | 39.9 | -- | 1 | 175.0 |
| 13848 | 28 | 28 | 60.2 | 39.6 | -- | 1 | 173.6 |
| 13854 | 5-3 | 32 | 59.3 | 39.5 | -- | 1 | 173.2 |
| 11673 | 5-3 | 29 | 57.5 | 38.3 | 42.0 | 17 | 130.9 |
| 12132 | 28 | 27 | 60.3 | 37.6 | 42.2 | 4 | 162.6 |
| 13849 | 30 | 30 | 59.6 | 36.0 | -- | 1 | 157.9 |
| 13850 | 28 | 28 | 60.0 | 35.9 | -- | 1 | 157.5 |
| 13851 | 28 | 28 | 60.6 | 35.7 | -- | 1 | 156.6 |
| 13684 | 29 | 25 | 58.1 | 34.2 | 38.8 | 2 | 132.9 |
| 13847 | 27 | 31 | 60.2 | 33.8 | -- | 1 | 148.2 |
| 13855 | 30 | 23 | 57.8 | 33.0 | -- | 1 | 144.7 |
| 13853 | 29 | 29 | 57.5 | 32.7 | -- | 1 | 143.4 |
| 1442 | 5-7 | 28 | 58.8 | 22.8 | 29.2 | 17 | 100.0 |

$LSD_{.05}$ = 4.25 bushels; C.V. = 7.93%

Clovis, New Mexico
Three replications, irrigated

| C. I. No. | Date headed | Plant height | Av. acre yield 1964 | Av. acre yield 1963-1964 | No. years grown | Percent of Kharkof |
|---|---|---|---|---|---|---|
| | May | In. | Bu. | Bu. | | |
| 13546 | 11 | 34 | 86.4 | 72.7 | 4 | 134.0 |
| 13547 | 15 | 28 | 75.9 | 62.0 | 2 | 109.8 |
| 13856 | 14 | 36 | 74.0 | -- | 1 | 112.5 |
| 12132 | 11 | 28 | 72.2 | 58.6 | 4 | 105.6 |
| 13679 | 11 | 33 | 70.2 | 58.1 | 2 | 103.0 |
| 13536 | 12 | 33 | 70.2 | 59.6 | 5 | 110.3 |
| 13854 | 14 | 37 | 69.2 | -- | 1 | 105.2 |
| 8856 | 9 | 34 | 68.2 | 56.1 | 12 | 100.5 |
| 13857 | 14 | 35 | 67.6 | -- | 1 | 102.7 |
| 13684 | 14 | 30 | 66.4 | 52.7 | 2 | 93.4 |
| 1442 | 20 | 41 | 65.8 | 56.4 | 12 | 100.0 |
| 13849 | 14 | 36 | 64.8 | -- | 1 | 98.5 |
| 13852 | 10 | 34 | 64.4 | -- | 1 | 97.9 |
| 13855 | 14 | 27 | 64.4 | -- | 1 | 97.9 |
| 13848 | 11 | 34 | 60.2 | -- | 1 | 91.5 |
| 11673 | 14 | 38 | 60.0 | 56.5 | 12 | 99.8 |
| 13850 | 12 | 35 | 59.8 | -- | 1 | 90.9 |
| 13851 | 12 | 36 | 54.6 | -- | 1 | 83.0 |
| 13847 | 12 | 38 | 54.4 | -- | 1 | 82.7 |
| 13853 | 11 | 36 | 43.2 | -- | 1 | 65.7 |

$LSD_{.05}$ = 13.26 bushels; C.V. = 12.4%

Clovis, New Mexico
Three replications, dryland

| C. I. No. | Date | | Plant height | Av. acre yield 1964 |
|---|---|---|---|---|
| | Headed | Ripe | | |
| | May | June | In. | Bu. |
| 13849 | 11 | 10 | 20 | 21.4 |
| 1442 | 20 | 18 | 22 | 21.3 |
| 13546 | 12 | 12 | 20 | 20.8 |
| 13848 | 8 | 10 | 20 | 20.3 |
| 13679 | 8 | 8 | 21 | 20.3 |
| 13852 | 8 | 10 | 20 | 20.1 |
| 12132 | 8 | 10 | 20 | 20.0 |
| 11673 | 12 | 12 | 20 | 19.5 |
| 13536 | 9 | 10 | 19 | 18.3 |
| 13856 | 12 | 9 | 16 | 18.3 |
| 13547 | 15 | 14 | 17 | 18.1 |
| 13854 | 11 | 10 | 20 | 17.8 |
| 13851 | 10 | 12 | 20 | 17.8 |
| 13850 | 9 | 10 | 20 | 17.8 |
| 13847 | 10 | 10 | 20 | 17.5 |
| 13857 | 12 | 10 | 17 | 17.0 |
| 8856 | 10 | 10 | 20 | 17.0 |
| 13855 | 10 | 9 | 14 | 16.7 |
| 13853 | 8 | 11 | 20 | 16.6 |
| 13684 | 10 | 12 | 16 | 15.4 |

$LSD_{.05}$ = 5.44 bushels; C.V. = 17.9%

Manhattan, Kansas
Four replications

| C. I. No. | Date headed 1/ | Loose smut 2/ | Weight per bushel | Av. acre yield 1964 | Av. acre yield 1963-1964 | No. years grown | Percent of Kharkof |
|---|---|---|---|---|---|---|---|
| | May | | Lbs. | Bu. | Bu. | | |
| 13847 | 12 | 0 | 54.9 | 22.8 | -- | 1 | 167.6 |
| 13679 | 10 | 0 | 49.8 | 22.3 | 32.4 | 2 | 132.0 |
| 8856 | 11 | 0 | 53.1 | 21.6 | 30.9 | 33 | 112.6 |
| 13851 | 12 | 3 | 52.0 | 21.1 | -- | 1 | 155.1 |
| 13852 | 10 | 0 | 50.7 | 20.5 | -- | 1 | 150.7 |
| 13857 | 14 | 6 | 52.0 | 20.4 | -- | 1 | 150.0 |
| 13850 | 12 | 0 | 51.5 | 20.3 | -- | 1 | 149.3 |
| 12132 | 10 | 0 | 50.4 | 20.2 | 31.8 | 4 | 117.3 |
| 11673 | 15 | 5 | 52.2 | 20.0 | 28.2 | 28 | 120.4 |
| 13856 | 13 | 19 | 51.3 | 19.7 | -- | 1 | 144.9 |
| 13547 | 17 | 11 | 55.0 | 19.6 | 28.7 | 2 | 116.7 |
| 13546 | 14 | 0 | 49.6 | 19.4 | 32.3 | 4 | 129.2 |
| 13848 | 10 | 9 | 50.8 | 19.2 | -- | 1 | 141.2 |
| 13849 | 14 | 1 | 51.6 | 18.6 | -- | 1 | 136.8 |
| 13536 | 14 | 12 | 53.2 | 18.4 | 29.9 | 5 | 113.0 |
| 13853 | 15 | 3 | 50.0 | 18.3 | -- | 1 | 134.6 |
| 13854 | 16 | 2 | 54.0 | 16.7 | -- | 1 | 122.8 |
| 13684 | 13 | 0 | 49.2 | 16.5 | 26.7 | 2 | 108.5 |
| 1442 | -- | 0 | 57.0 | 13.6 | 24.6 | 33 | 100.0 |
| 13855 | 14 | 13 | 46.9 | 13.2 | -- | 1 | 97.1 |

1/ 1/2 bloom

2/ No. of heads per 100 ft. of row

$LSD_{.05}$ = 3.37 bushels; C.V. = 12.54%

Hays, Kansas
Four replications

| C. I. No. | Date headed | Plant height | Shattering 1/ | Estimated loss from hail | Weight per bushel | Av. acre yield 1964 |
|---|---|---|---|---|---|---|
| | May | In. | | % | Lbs. | Bu. |
| 13854 | 16 | 30 | 2.0 | 8.8 | 61.2 | 34.0 |
| 13546 | 14 | 29 | 2.1 | 13.8 | 60.5 | 32.7 |
| 13547 | 16 | 28 | 3.4 | 23.8 | 60.7 | 30.8 |
| 13852 | 12 | 28 | 2.0 | 17.5 | 60.6 | 30.4 |
| 13536 | 14 | 30 | 2.0 | 7.5 | 61.8 | 29.2 |
| 13857 | 16 | 28 | 2.6 | 22.5 | 60.1 | 28.1 |
| 13684 | 14 | 25 | 2.5 | 10.0 | 59.1 | 26.2 |
| 13856 | 16 | 28 | 3.1 | 38.8 | 59.9 | 25.6 |
| 8856 | 12 | 29 | 2.4 | 18.8 | 60.9 | 25.6 |
| 11673 | 16 | 29 | 3.0 | 25.0 | 59.8 | 25.0 |
| 13850 | 13 | 28 | 2.2 | 22.5 | 60.4 | 24.6 |
| 13849 | 14 | 28 | 2.8 | 25.0 | 60.5 | 24.6 |
| 13848 | 12 | 29 | 2.6 | 23.8 | 60.3 | 24.5 |
| 13855 | 14 | 23 | 2.2 | 7.5 | 59.0 | 23.8 |
| 12132 | 12 | 29 | 2.2 | 21.2 | 60.8 | 23.4 |
| 13679 | 11 | 28 | 2.2 | 28.8 | 61.0 | 21.8 |
| 13847 | 13 | 29 | 2.5 | 28.8 | 60.6 | 21.6 |
| 13851 | 13 | 28 | 2.8 | 43.8 | 60.8 | 21.4 |
| 13853 | 14 | 29 | 2.8 | 40.0 | 59.7 | 19.0 |
| 1442 | 19 | 28 | 3.2 | 38.8 | 60.0 | 18.8 |

1/ 1 = No shattering; 5 = Severe shattering
2/ Based on 1964 yield

$LSD_{.05}$ = 3.6 bushels; C.V. = 10.1%

Garden City, Kansas
Four replications

| C. I. No. | Date Headed | Date Ripe | Plant height | Weight per bushel | Av. acre yield 1964 | Av. acre yield 1963-1964 | No. years grown | Percent of Kharkof |
|---|---|---|---|---|---|---|---|---|
| | May | June | In. | Lbs. | Bu. | Bu. | | |
| 13547 | 18 | 18 | 23 | 60.5 | 31.1 | 26.9 | 2 | 102.5 |
| 13546 | 16 | 19 | 23 | 61.8 | 30.0 | 32.2 | 4 | 123.3 |
| 13536 | 16 | 18 | 25 | 64.5 | 28.7 | 27.0 | 5 | 105.7 |
| 13857 | 17 | 18 | 22 | 62.1 | 28.6 | -- | 1 | 109.6 |
| 13854 | 18 | 19 | 25 | 62.9 | 28.4 | -- | 1 | 108.8 |
| 13856 | 16 | 18 | 22 | 61.7 | 27.9 | -- | 1 | 106.9 |
| 11673 | 18 | 20 | 24 | 62.4 | 27.6 | 26.6 | 11 | 105.6 |
| 13679 | 13 | 14 | 22 | 63.0 | 27.4 | 26.7 | 2 | 101.5 |
| 1442 | 21 | 22 | 24 | 61.3 | 26.1 | 26.3 | 11 | 100.0 |
| 13847 | 15 | 16 | 24 | 62.2 | 25.2 | -- | 1 | 96.5 |
| 13852 | 12 | 14 | 22 | 62.2 | 24.9 | -- | 1 | 95.4 |
| 13849 | 16 | 19 | 24 | 62.3 | 24.7 | -- | 1 | 94.6 |
| 12132 | 14 | 17 | 22 | 62.0 | 24.4 | 25.6 | 4 | 107.1 |
| 13853 | 17 | 18 | 24 | 64.0 | 23.0 | -- | 1 | 88.1 |
| 13848 | 14 | 15 | 24 | 62.1 | 23.0 | -- | 1 | 88.1 |
| 13684 | 18 | 18 | 20 | 59.9 | 23.0 | 20.3 | 2 | 89.5 |
| 13851 | 15 | 18 | 24 | 62.5 | 22.4 | -- | 1 | 85.8 |
| 13850 | 14 | 17 | 22 | 61.8 | 22.3 | -- | 1 | 85.4 |
| 13855 | 16 | 17 | 18 | 61.0 | 22.2 | -- | 1 | 85.1 |
| 8856 | 14 | 17 | 24 | 63.5 | 21.6 | 23.4 | 11 | 100.9 |

$LSD_{.05}$ = 5.32 bushels; C.V. = 14.6%

Colby, Kansas
Four replications

| C. I. No. | Date Headed | Date Ripe | Plant height | Weight per bushel | Av. acre yield 1964 | Av. acre yield 1963-1964 | No. years grown | Percent of Kharkof |
|---|---|---|---|---|---|---|---|---|
| | May | June | In. | Lbs. | Bu. | Bu. | | |
| 13857 | 22 | 26 | 19 | 61.5 | 22.3 | -- | 1 | 116.8 |
| 13547 | 23 | 27 | 18 | 61.5 | 22.0 | 24.6 | 2 | 123.3 |
| 13856 | 22 | 26 | 19 | 62.0 | 20.8 | -- | 1 | 108.9 |
| 1442 | 27 | 30 | 24 | 59.0 | 19.1 | 20.0 | 13 | 100.0 |
| 13854 | 23 | 27 | 21 | 61.5 | 18.6 | -- | 1 | 97.4 |
| 13536 | 22 | 27 | 20 | 63.0 | 18.0 | 25.3 | 4 | 113.4 |
| 8856 | 19 | 26 | 21 | 62.5 | 17.9 | 24.4 | 13 | 96.1 |
| 11673 | 23 | 27 | 19 | 61.5 | 17.0 | 23.1 | 12 | 101.9 |
| 13853 | 22 | 27 | 19 | 61.0 | 16.0 | -- | 1 | 83.8 |
| 13849 | 20 | 26 | 19 | 61.0 | 15.8 | -- | 1 | 82.7 |
| 13684 | 21 | 26 | 17 | 60.0 | 15.3 | 20.1 | 2 | 100.8 |
| 13848 | 18 | 26 | 21 | 61.5 | 14.9 | -- | 1 | 78.0 |
| 13851 | 19 | 26 | 20 | 61.0 | 14.4 | -- | 1 | 75.4 |
| 13546 | 22 | 27 | 19 | 61.0 | 14.3 | 24.0 | 3 | 121.5 |
| 13679 | 18 | 26 | 20 | 60.5 | 14.1 | 22.0 | 2 | 110.0 |
| 13852 | 18 | 26 | 19 | 60.5 | 13.9 | -- | 1 | 72.8 |
| 13847 | 19 | 26 | 19 | 61.0 | 13.2 | -- | 1 | 69.1 |
| 13850 | 19 | 26 | 19 | 58.5 | 11.9 | -- | 1 | 62.3 |
| 13855 | 23 | 27 | 16 | 58.5 | 11.4 | -- | 1 | 59.7 |
| 12132 | 18 | 26 | 20 | 58.0 | 10.1 | 19.9 | 3 | 100.3 |

$LSD_{.05}$ = 3.4 bushels; C.V. = 15.0%

## Ft. Collins, Colorado
Five replications

| C. I. No. | Date Headed | Date Ripe | Plant height | Weight per bushel | Av. acre yield 1964 | Av. acre yield 1963-1964 | No. years grown | Percent of Kharkof |
|---|---|---|---|---|---|---|---|---|
| | June | July | In. | Lbs. | Bu. | Bu. | | |
| 13546 | 2 | 18 | 37 | 61.9 | 51.6 | 70.7 | 4 | 139.0 |
| 13856 | 5 | 17 | 36 | 62.1 | 47.9 | -- | 1 | 103.9 |
| 13536 | 5 | 19 | 37 | 63.4 | 47.6 | 64.8 | 5 | 125.8 |
| 13547 | 6 | 18 | 37 | 62.3 | 46.1 | 61.7 | 3 | 98.9 |
| 1442 | 12 | 22 | 40 | 61.5 | 46.1 | 62.4 | 28 | 100.0 |
| 13857 | 6 | 17 | 37 | 62.7 | 43.8 | -- | 1 | 95.0 |
| 13853 | 3 | 16 | 38 | 61.4 | 41.9 | -- | 1 | 90.9 |
| 8856 | 2 | 16 | 37 | 62.3 | 41.8 | 55.1 | 28 | 101.7 |
| 11673 | 5 | 18 | 37 | 62.0 | 41.4 | 57.7 | 24 | 109.0 |
| 13854 | 6 | 19 | 36 | 61.8 | 39.4 | -- | 1 | 85.5 |
| 13849 | 5 | 17 | 36 | 62.4 | 38.1 | -- | 1 | 82.6 |
| 13684 | 6 | 17 | 28 | 59.7 | 36.8 | 52.9 | 2 | 84.7 |
| 13852 | 5-31 | 16 | 33 | 62.0 | 36.2 | -- | 1 | 78.5 |
| 13847 | 3 | 18 | 37 | 62.1 | 33.8 | -- | 1 | 73.3 |
| 13848 | 2 | 18 | 35 | 62.9 | 33.7 | -- | 1 | 73.1 |
| 12132 | 1 | 15 | 35 | 61.6 | 32.1 | 51.9 | 4 | 111.9 |
| 13851 | 2 | 19 | 35 | 62.1 | 32.0 | -- | 1 | 69.4 |
| 13855 | 5 | 17 | 26 | 60.0 | 30.7 | -- | 1 | 66.6 |
| 13679 | 1 | 15 | 32 | 62.0 | 29.7 | 51.4 | 2 | 82.4 |
| 13850 | 2 | 16 | 34 | 61.4 | 24.9 | -- | 1 | 54.0 |

$LSD_{.05}$ = 5.53 bushels; C.V. = 11.3%

Akron, Colorado
Four replications

| C. I. No. | Date headed | Weight per bushel | Av. acre yield | | No. years grown | Percent of Kharkof |
|---|---|---|---|---|---|---|
| | | | 1964 | 1963-1964 | | |
| | June | Lbs. | Bu. | Bu. | | |
| 1442 | 10 | 59.5 | 15.7 | 16.7 | 22 | 100.0 |
| 13536 | 6 | 61.7 | 15.7 | 17.3 | 4 | 112.1 |
| 13854 | 8 | 60.3 | 15.0 | -- | 1 | 95.5 |
| 13546 | 4 | 60.0 | 13.9 | 18.5 | 4 | 118.2 |
| 13853 | 5 | 60.5 | 13.3 | -- | 1 | 84.7 |
| 8856 | 4 | 60.4 | 12.4 | 19.1 | 22 | 110.3 |
| 11673 | 5 | 59.7 | 11.5 | 14.9 | 19 | 107.1 |
| 13855 | 5 | 58.1 | 11.4 | -- | 1 | 72.6 |
| 13547 | 5 | 60.6 | 10.7 | 16.5 | 2 | 98.5 |
| 13852 | 6 | 59.0 | 10.7 | -- | 1 | 68.1 |
| 13848 | 4 | 59.1 | 10.7 | -- | 1 | 68.1 |
| 13684 | 5 | 58.0 | 9.6 | 17.3 | 2 | 103.9 |
| 13857 | 5 | 59.7 | 9.6 | -- | 1 | 61.1 |
| 13851 | 6 | 58.9 | 9.4 | -- | 1 | 59.9 |
| 13850 | 5 | 57.4 | 9.0 | -- | 1 | 57.3 |
| 13679 | 4 | 58.5 | 8.8 | 16.0 | 2 | 95.5 |
| 13849 | 4 | 58.4 | 8.3 | -- | 1 | 52.9 |
| 13847 | 4 | 57.5 | 8.1 | -- | 1 | 51.6 |
| 13856 | 6 | 60.5 | 6.4 | -- | 1 | 40.8 |
| 12132 | 4 | 58.0 | 4.0 | 12.4 | 4 | 89.7 |

$LSD_{.05}$ = 6.31 bushels; C.V. = 41.7%

Hesperus, Colorado
Five replications

| C. I. No. | Date headed | Plant height | Weight per bushel | Av. acre yield 1964 | Av. acre yield 1963-1964 | No. years grown | Percent of Kharkof |
|---|---|---|---|---|---|---|---|
| | June | In. | Lbs. | Bu. | Bu. | | |
| 13852 | 21 | 39 | 60.4 | 72.4 | -- | 1 | 151.5 |
| 13547 | 25 | 42 | 58.9 | 66.9 | 69.7 | 2 | 132.3 |
| 13546 | 23 | 41 | 58.8 | 65.5 | 71.4 | 3 | 135.7 |
| 13536 | 22 | 43 | 61.3 | 63.9 | 68.4 | 5 | 115.8 |
| 13850 | 22 | 42 | 58.6 | 62.9 | -- | 1 | 131.6 |
| 13848 | 22 | 43 | 60.6 | 62.8 | -- | 1 | 131.4 |
| 13679 | 20 | 42 | 60.5 | 62.1 | 61.0 | 2 | 115.9 |
| 13855 | 25 | 27 | 58.6 | 62.1 | -- | 1 | 129.9 |
| 13856 | 27 | 43 | 58.8 | 60.7 | -- | 1 | 127.0 |
| 13849 | 24 | 41 | 60.0 | 59.7 | -- | 1 | 124.9 |
| 13684 | 23 | 34 | 57.2 | 58.8 | 62.4 | 2 | 118.4 |
| 13853 | 21 | 43 | 58.2 | 57.5 | -- | 1 | 120.3 |
| 13854 | 23 | 44 | 60.2 | 56.7 | -- | 1 | 118.6 |
| 12132 | 23 | 41 | 56.0 | 55.6 | 54.5 | 4 | 104.1 |
| 8856 | 22 | 46 | 59.3 | 54.8 | 56.7 | 24 | 101.4 |
| 11673 | 25 | 42 | 59.0 | 54.6 | 58.7 | 24 | 114.4 |
| 13847 | 23 | 45 | 59.4 | 53.2 | -- | 1 | 111.3 |
| 13851 | 21 | 41 | 59.8 | 51.5 | -- | 1 | 107.7 |
| 13857 | 26 | 40 | 57.0 | 48.9 | -- | 1 | 102.3 |
| 1442 | 28 | 42 | 60.3 | 47.8 | 52.6 | 24 | 100.0 |

$LSD_{.05}$ = 8.46 bushels; C.V. = 11.35%

Urbana, Illinois
Three replications

| C. I. No. | Date headed | Plant height | Weight per bushel | Av. acre yield | | No. years grown | Percent of Kharkof |
|---|---|---|---|---|---|---|---|
| | | | | 1964 | 1963-1964 | | |
| | May | In. | Lbs. | Bu. | Bu. | | |
| 13546 | 21 | 36 | 63.1 | 62.9 | 60.0 | 4 | 112.5 |
| 11673 | 25 | 36 | 62.9 | 59.1 | 58.8 | 4 | 115.8 |
| 13856 | 22 | 35 | 64.4 | 58.5 | -- | 1 | 106.4 |
| 13852 | 25 | 33 | 63.8 | 57.9 | -- | 1 | 105.3 |
| 13850 | 18 | 35 | 63.7 | 56.5 | -- | 1 | 102.7 |
| 13684 | 20 | 28 | 62.6 | 56.3 | 55.6 | 2 | 104.0 |
| 13679 | 18 | 34 | 62.3 | 56.2 | 57.1 | 2 | 106.2 |
| 13547 | 25 | 33 | 62.5 | 55.2 | 51.3 | 2 | 95.4 |
| 1442 | 27 | 39 | 62.4 | 55.0 | 53.7 | 4 | 100.0 |
| 13855 | 20 | 25 | 63.5 | 54.9 | -- | 1 | 99.8 |
| 13857 | 20 | 32 | 63.5 | 54.8 | -- | 1 | 99.6 |
| 8856 | 19 | 37 | 64.4 | 53.7 | 50.8 | 4 | 95.3 |
| 13536 | 21 | 36 | 63.1 | 53.3 | 56.2 | 4 | 106.2 |
| 13849 | 21 | 33 | 63.5 | 53.1 | -- | 1 | 96.5 |
| 12132 | 19 | 34 | 64.0 | 52.7 | 52.9 | 4 | 96.8 |
| 13854 | 25 | 36 | 62.9 | 52.6 | -- | 1 | 95.6 |
| 13853 | 21 | 36 | 63.7 | 50.7 | -- | 1 | 92.2 |
| 13851 | 21 | 35 | 63.5 | 50.6 | -- | 1 | 92.0 |
| 13847 | 20 | 35 | 63.4 | 48.8 | -- | 1 | 88.7 |
| 13848 | 19 | 34 | 63.5 | 44.0 | -- | 1 | 80.0 |

$LSD_{.05}$ = 6.45 bushels; C.V. = 7.28%

Ames, Iowa
Three replications

| C. I. No. | Date Headed | Date Ripe | Plant height | Lodging | Winter survival | Leaf rust Severity | Leaf rust Type | Stem rust | Weight per bushel | Yield 1964 | No. years grown | Percent of Kharkof |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | May | July | In. | % | % | % | | % | Lbs. | Bu. | | |
| 13546 | 30 | 5 | 36 | 2 | 100 | 40 | 3 | 5 | 55.5 | 45.6 | 3 | 190.7 |
| 13679 | 26 | 2 | 32 | 0 | 100 | 25 | 2 | 25 | 54.7 | 41.9 | 1 | 974.4 |
| 13855 | 27 | 6 | 26 | 0 | 100 | T | 1 | 2 | 56.5 | 40.3 | 1 | 937.2 |
| 13857 | 30 | 5 | 31 | 2 | 100 | 45 | 3 | T | 57.9 | 40.3 | 1 | 937.2 |
| 13856 | 30 | 7 | 33 | 2 | 100 | 40 | 2 | T | 56.9 | 39.9 | 1 | 927.9 |
| 13852 | 26 | 2 | 31 | 0 | 100 | 35 | 2 | 30 | 52.6 | 37.9 | 1 | 881.4 |
| 13851 | 28 | 4 | 34 | 0 | 100 | 35 | 2 | 50 | 54.6 | 36.1 | 1 | 839.5 |
| 13847 | 27 | 3 | 32 | 2 | 100 | 35 | 2 | 35 | 54.6 | 35.7 | 1 | 830.2 |
| 13547 | 6-4 | 7 | 39 | 6 | 100 | 50 | 3 | 3 | 55.8 | 35.3 | 1 | 820.9 |
| 13684 | 28 | 5 | 28 | 0 | 96 | 25 | 2 | 45 | 51.9 | 34.9 | 1 | 811.6 |
| 13850 | 28 | 3 | 32 | 0 | 100 | 35 | 2 | 35 | 52.6 | 33.9 | 1 | 788.4 |
| 13848 | 26 | 2 | 33 | 0 | 98 | 35 | 2 | 45 | 53.4 | 33.2 | 1 | 772.1 |
| 13536 | 30 | 6 | 35 | 0 | 100 | 30 | 2 | 55 | 52.7 | 32.9 | 4 | 187.4 |
| 12132 | 27 | 2 | 32 | 0 | 99 | 45 | 2 | 40 | 51.3 | 29.5 | 3 | 264.3 |
| 8856 | 28 | 4 | 36 | 15 | 98 | 45 | 3 | 35 | 53.6 | 29.5 | 21 | 120.1 |
| 13849 | 30 | 3 | 34 | 1 | 100 | 50 | 2 | 45 | 50.2 | 29.2 | 1 | 679.0 |
| 13853 | 6-1 | 4 | 36 | 13 | 100 | 55 | 3 | 50 | 48.0 | 25.7 | 1 | 597.8 |
| 13854 | 6-3 | 6 | 38 | 30 | 100 | 55 | 3 | 45 | 45.1 | 21.4 | 1 | 497.6 |
| 11673 | 6-4 | 4 | 38 | 22 | 100 | 65 | 3 | 55 | 40.0 | 16.1 | 21 | 113.3 |
| 1442 | 6-3 | 4 | 37 | 45 | 100 | 75 | 3 | 60 | -- | 4.3 | 21 | 100.0 |

$LSD_{.05}$ = 5.11 bushels; C.V. = 9.72%

Lincoln, Nebraska
Four replications

| C. I. No. | Date headed | Plant height | Stem rust | Lodging | Weight per bushel | Av. acre yield 1964 | Av. acre yield 1963-1964 | No. years grown | Percent of Kharkof |
|---|---|---|---|---|---|---|---|---|---|
| | May | In. | % | % | Lbs. | Bu. | Bu. | | |
| 13855 | 20 | 29 | 10 | T | 58.2 | 42.1 | -- | 1 | 236.5 |
| 13547 | 22 | 35 | 5 | 0 | 59.1 | 40.5 | 39.4 | 2 | 149.0 |
| 13856 | 20 | 34 | T | 0 | 60.0 | 39.3 | -- | 1 | 220.8 |
| 13679 | 19 | 35 | 40 | 35 | 60.8 | 38.4 | 31.6 | 2 | 119.5 |
| 13857 | 20 | 34 | T | 25 | 59.4 | 38.3 | -- | 1 | 215.2 |
| 13546 | 20 | 35 | 5 | 25 | 58.0 | 37.9 | 42.2 | 4 | 189.7 |
| 13851 | 19 | 36 | 40 | 5 | 60.4 | 37.7 | -- | 1 | 211.8 |
| 13684 | 20 | 30 | 20 | 0 | 56.9 | 37.3 | 29.8 | 2 | 112.7 |
| 13852 | 19 | 35 | 20 | 25 | 60.4 | 37.2 | -- | 1 | 208.9 |
| 12132 | 19 | 36 | 40 | 25 | 60.3 | 35.8 | 33.1 | 4 | 145.3 |
| 13850 | 19 | 35 | 40 | 25 | 60.2 | 35.6 | -- | 1 | 200.0 |
| 13536 | 20 | 36 | 40 | 25 | 61.9 | 35.5 | 35.6 | 5 | 156.1 |
| 13848 | 19 | 36 | 40 | 10 | 60.8 | 35.4 | -- | 1 | 198.9 |
| 13847 | 19 | 36 | 40 | 10 | 60.3 | 34.1 | -- | 1 | 191.6 |
| 13849 | 20 | 35 | 40 | 15 | 59.0 | 32.4 | -- | 1 | 182.0 |
| 13854 | 22 | 36 | 60 | 25 | 57.6 | 31.2 | -- | 1 | 175.3 |
| 11673 | 23 | 36 | 40 | 25 | 55.4 | 30.7 | 35.4 | 27 | 120.6 |
| 8856 | 27 | 36 | 60 | 5 | 61.2 | 26.9 | 27.7 | 32 | 122.3 |
| 13853 | 20 | 35 | 20 | 90 | 57.5 | 24.1 | -- | 1 | 135.4 |
| 1442 | 27 | 36 | 60 | 5 | 50.5 | 17.8 | 26.5 | 32 | 100.0 |

$LSD_{.05}$ = 4.98 bushels; C.V. = 10.23%

North Platte, Nebraska
Four replications

| C. I. No. | Date headed | Plant height | Stem rust | Weight per bushel | Av. acre yield 1964 | Av. acre yield 1963-1964 | No. years grown | Percent of Kharkof |
|---|---|---|---|---|---|---|---|---|
| | May | In. | % | Lbs. | Bu. | Bu. | | |
| 13536 | 27 | 35 | 31 | 60.8 | 43.7 | 41.7 | 5 | 154.2 |
| 13546 | 29 | 38 | 10 | 59.8 | 43.7 | 46.3 | 4 | 228.6 |
| 13547 | 6-2 | 39 | 2 | 60.3 | 42.9 | 39.0 | 2 | 178.3 |
| 13684 | 28 | 30 | 34 | 59.2 | 38.6 | 32.8 | 2 | 149.9 |
| 13857 | 6-1 | 37 | 15 | 60.5 | 38.2 | -- | 1 | 166.1 |
| 13856 | 6-2 | 36 | 9 | 58.7 | 38.1 | -- | 1 | 165.7 |
| 8856 | 27 | 39 | 50 | 59.3 | 37.4 | 36.3 | 27 | 104.0 |
| 13851 | 28 | 37 | 63 | 59.2 | 37.2 | -- | 1 | 161.7 |
| 13848 | 27 | 36 | 61 | 59.4 | 35.2 | -- | 1 | 153.0 |
| 13853 | 28 | 39 | 28 | 58.4 | 35.2 | -- | 1 | 153.0 |
| 13679 | 27 | 34 | 70 | 58.1 | 35.1 | 34.2 | 2 | 156.5 |
| 11673 | 6-2 | 39 | 36 | 58.0 | 34.4 | 38.4 | 24 | 116.3 |
| 13847 | 27 | 38 | 49 | 58.0 | 34.1 | -- | 1 | 148.3 |
| 12132 | 27 | 33 | 60 | 56.8 | 33.9 | 35.9 | 4 | 169.9 |
| 13849 | 28 | 37 | 50 | 58.9 | 33.7 | -- | 1 | 146.5 |
| 13852 | 27 | 35 | 65 | 58.2 | 33.3 | -- | 1 | 144.8 |
| 13855 | 29 | 27 | 7 | 58.2 | 33.2 | -- | 1 | 144.3 |
| 13850 | 26 | 36 | 55 | 57.0 | 30.4 | -- | 1 | 132.2 |
| 13854 | 6-1 | 41 | 31 | 57.0 | 27.7 | -- | 1 | 120.4 |
| 1442 | 6-6 | 40 | 50 | 55.2 | 23.0 | 21.9 | 27 | 100.0 |

$LSD_{.05}$ = 5.76 bushels; C.V. = 11.7%

Alliance, Nebraska
Four replications

| C. I. No. | Date headed | Plant height | Winter survival | Weight per bushel | Av. acre yield | | No. years grown | Percent of Kharkof |
|---|---|---|---|---|---|---|---|---|
| | | | | | 1964 | 1963-1964 | | |
| | June | In. | % | Lbs. | Bu. | Bu. | | |
| 13546 | 6 | 36 | 80 | 62.3 | 50.5 | 36.3 | 3 | 130.9 |
| 13547 | 8 | 36 | 90 | 62.4 | 45.8 | 36.3 | 2 | 126.3 |
| 13856 | 7 | 34 | 75 | 61.3 | 39.9 | -- | 1 | 127.9 |
| 11673 | 7 | 36 | 85 | 61.3 | 38.7 | 27.6 | 23 | 100.0 |
| 13851 | 6 | 34 | 75 | 61.2 | 38.6 | -- | 1 | 123.7 |
| 13857 | 7 | 36 | 80 | 60.8 | 37.3 | -- | 1 | 119.6 |
| 13854 | 7 | 36 | 70 | 60.8 | 36.7 | -- | 1 | 117.6 |
| 13853 | 6 | 38 | 55 | 61.0 | 34.6 | -- | 1 | 110.9 |
| 13679 | 5 | 36 | 65 | 60.9 | 34.1 | 23.4 | 2 | 81.7 |
| 13849 | 6 | 34 | 70 | 60.9 | 34.0 | -- | 1 | 109.0 |
| 13848 | 5 | 34 | 80 | 61.6 | 33.9 | -- | 1 | 108.7 |
| 12132 | 5 | 35 | 65 | 61.6 | 33.2 | 23.5 | 3 | 94.8 |
| 13852 | 6 | 34 | 60 | 60.9 | 33.0 | -- | 1 | 105.8 |
| 8856 | 5 | 34 | 70 | 62.0 | 32.8 | 24.5 | 26 | 92.7 |
| 13536 | 7 | 36 | 45 | 62.3 | 31.6 | 24.7 | 4 | 95.9 |
| 13684 | 5 | 30 | 65 | 60.9 | 31.6 | 23.8 | 2 | 82.9 |
| 13847 | 6 | 35 | 75 | 60.3 | 31.4 | -- | 1 | 100.6 |
| 1442 | 11 | 37 | 90 | 59.8 | 31.2 | 28.7 | 26 | 100.0 |
| 13850 | 6 | 33 | 60 | 60.1 | 30.2 | -- | 1 | 96.8 |
| 13855 | 6 | 26 | 65 | 59.1 | 25.4 | -- | 1 | 81.4 |

$LSD_{.05}$ = 4.98 bushels; C.V. = 10%

Columbia, Missouri
Four replications

| C. I. No. | Date headed | Plant height | Lodging | Leaf rust | Hessian fly | Mildew | Weight per bushel | Av. acre yield | Percent of Kharkof |
|---|---|---|---|---|---|---|---|---|---|
| | May | In. | % | % | % | % | Lbs. | Bu. | |
| 8856 | 9 | 42 | 19 | 40 | 95 | 60 | 62.0 | 48.8 | 186.3 |
| 13679 | 9 | 39 | 12 | 55 | 100 | 50 | 60.5 | 45.9 | 175.2 |
| 13546 | 12 | 42 | 19 | 45 | 76 | 30 | 59.5 | 44.9 | 171.4 |
| 13852 | 9 | 38 | 13 | 50 | 95 | 40 | 59.5 | 44.1 | 168.3 |
| 12132 | 10 | 40 | 16 | 63 | 77 | 80 | 60.5 | 43.2 | 164.9 |
| 13850 | 10 | 40 | 12 | 45 | 90 | 40 | 60.5 | 42.8 | 163.4 |
| 13851 | 9 | 41 | 11 | 55 | 90 | 40 | 60.0 | 41.6 | 158.8 |
| 13848 | 10 | 41 | 12 | 60 | 100 | 70 | 61.0 | 40.9 | 156.1 |
| 13856 | 11 | 40 | 17 | 65 | 100 | 40 | 58.0 | 40.9 | 156.1 |
| 13849 | 12 | 42 | 17 | 60 | 33 | 60 | 61.0 | 40.4 | 154.2 |
| 13853 | 13 | 43 | 29 | 20 | 58 | 40 | 58.5 | 39.8 | 151.9 |
| 13854 | 14 | 43 | 24 | 65 | 100 | 60 | 60.5 | 39.6 | 151.1 |
| 13847 | 10 | 42 | 19 | 55 | 100 | 50 | 60.0 | 39.3 | 150.0 |
| 13547 | 15 | 42 | 15 | 43 | 45 | 40 | 60.0 | 39.0 | 148.9 |
| 13536 | 12 | 40 | 11 | 35 | 78 | 60 | 59.0 | 37.7 | 143.9 |
| 13857 | 12 | 39 | 14 | 65 | 100 | 40 | 60.0 | 37.6 | 143.5 |
| 11673 | 14 | 42 | 29 | 28 | 86 | 60 | 59.5 | 36.1 | 137.8 |
| 13684 | 12 | 34 | 6 | 1 | 50 | 40 | 57.5 | 34.9 | 133.2 |
| 13855 | 11 | 31 | 7 | 1 | 100 | 60 | 57.0 | 29.9 | 114.1 |
| 1442 | 19 | 43 | 21 | 63 | 90 | 40 | 57.5 | 26.2 | 100.0 |

$LSD_{.05}$ = 4.59 bushels; C.V. = 8.17%

## Summary of Nursery Yields

Grain yields of varieties at individual locations and their state and regional average yields are assembled in table 2. Yields from Hays, Kansas, are excluded from the summary because of the hail at harvest time. Both dryland and irrigated yields from Clovis, New Mexico, and Bushland, Texas, were included.

Scout again was superior in performance ranking first in every state except Kansas and Missouri. Its 41.9 average yield was 3.1 bushels better than second-ranked Lancer. The latter variety was entered from the northern regional nursery in 1963 where it was tested prior to its release by Nebraska. $Cnn^2$ x Ky-Mta (C. I. 13856) and Caddo ranked third and fourth, respectively.

Two-year average yields (table 3) show Scout with an average 4.5-bushel yield advantage over second-ranked Caddo. Third most productive on a 2-year basis was Lancer with a 40.1 yield average.

## Summary of Agronomic Data

Data other than yield for varieties in the southern regional nursery are summarized in table 4. Varieties are listed according to their average test weight.

Caddo had the high average test weight of 61.1 pounds compared with 60.5 for Early Blackhull and 60.1 for Lancer. Caddo had the poorest average winter survival at 2 reporting stations and Lancer and Kharkof the best survival. The Texas semi-dwarfs C. I. 13855 and 13684 had the shortest straw, the best leaf rust resistance, and the least lodging but had the lowest test weight grain. The best stem rust resistance was shown by C. I. 13856, Lancer, C. I. 13857, Scout, and C. I. 13855 all with average readings of 5 percent or less. Susceptibility at Ames was mainly responsible for the higher than expected average leaf rust on C. I. 13853 and Caddo.

Table 2. Summary of average yields in bushels per acre made by 20 varieties grown in the southern regional performance nursery at 18 stations in 1964 with state averages and rank.

| Variety | C. I. No. | Texas | | | | | Oklahoma | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Denton | Bushland Irr. | Bushland Dry | Average | Rank | Stillwater | Woodward | Chero-kee | Average | Rank |
| Scout | 13546 | 29.4 | 69.8 | 16.8 | 38.7 | 1 | 44.9 | 46.0 | 44.6 | 45.2 | 1 |
| Lancer | 13547 | 27.7 | 65.6 | 14.4 | 35.9 | 5 | 34.1 | 43.0 | 42.7 | 39.9 | 10 |
| Cnn[2] x Ky-Mta | 13856 | 30.6 | 58.6 | 17.0 | 35.4 | 6 | 44.0 | 42.9 | 39.9 | 42.3 | 5 |
| Wichita x Mql-Oro | 13536 | 34.1 | 51.9 | 15.2 | 33.7 | 11-13 | 45.1 | 43.9 | 41.8 | 43.6 | 2 |
| Triumph x C.I.12406 | 13852 | 34.1 | 60.4 | 15.4 | 36.6 | 3 | 43.3 | 39.9 | 44.8 | 42.7 | 4 |
| Triumph 64 | 13679 | 33.7 | 55.7 | 16.4 | 35.3 | 7-8 | 45.7 | 42.3 | 42.3 | 43.4 | 3 |
| Nebred x Cnn-Ky-Mta | 13857 | 34.5 | 62.0 | 13.6 | 36.7 | 2 | 42.9 | 39.8 | 41.4 | 41.4 | 6 |
| Early Blackhull | 8856 | 29.6 | 50.7 | 12.0 | 30.8 | 19 | 41.6 | 38.4 | 42.6 | 40.9 | 7 |
| Bison[5] x C.I.9058 | 13854 | 27.1 | 62.6 | 13.6 | 34.4 | 10 | 37.9 | 37.6 | 39.5 | 38.3 | 11 |
| Comanche | 11673 | 26.6 | 57.9 | 14.6 | 33.0 | 14-15 | 42.0 | 41.9 | 38.3 | 40.7 | 8 |
| Triumph x C.I.12406 | 13849 | 30.2 | 59.7 | 14.7 | 34.9 | 9 | 35.2 | 35.2 | 36.0 | 35.5 | 18 |
| Svl-Wi-Hope-Cnn-Wi[2] x SS | 13684 | 32.0 | 61.4 | 12.5 | 35.3 | 7-8 | 39.4 | 28.7 | 34.2 | 34.1 | 19 |
| Triumph x C.I.12406 | 13848 | 30.5 | 55.6 | 14.9 | 33.7 | 11-13 | 39.4 | 34.3 | 39.6 | 37.8 | 14 |
| Triumph | 12132 | 29.4 | 51.8 | 17.8 | 33.0 | 14-15 | 42.0 | 34.9 | 37.6 | 38.2 | 12 |
| Triumph x C.I.12406 | 13850 | 34.0 | 58.1 | 16.0 | 36.0 | 4 | 41.9 | 35.4 | 35.9 | 37.7 | 15 |
| do | 13851 | 33.3 | 47.2 | 17.1 | 32.5 | 17 | 40.3 | 32.9 | 35.7 | 36.3 | 16-17 |
| Norin 10 x C.I.12500 | 13855 | 26.4 | 54.7 | 14.4 | 31.8 | 18 | 42.2 | 38.8 | 33.0 | 38.0 | 13 |
| Wichita[5] x Cns x Au | 13853 | 35.0 | 47.8 | 15.1 | 32.6 | 16 | 49.2 | 39.5 | 32.7 | 40.5 | 9 |
| Kharkof | 1442 | 15.6 | 59.0 | 16.8 | 30.5 | 20 | 31.5 | 28.8 | 22.8 | 27.7 | 20 |
| Triumph x C.I.12406 | 13847 | 33.5 | 52.7 | 14.8 | 33.7 | 11-13 | 40.0 | 35.0 | 33.8 | 36.3 | 16-17 |

Table 2. Concluded

| C. I. No. | Kansas | | | | | Illinois | | Colorado | | | | | Iowa | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Manhattan | Garden City | Colby | Average | Rank | Urbana | Rank | Ft. Collins | Akron | Hesperus | Average | Rank | Ames | Rank |
| 13546 | 19.4 | 30.0 | 14.3 | 21.2 | 7-8 | 62.9 | 1 | 51.6 | 13.9 | 65.5 | 43.7 | 1 | 45.6 | 1 |
| 13547 | 19.6 | 31.1 | 22.0 | 24.2 | 1 | 55.2 | 8 | 46.1 | 10.7 | 66.9 | 41.2 | 3 | 35.3 | 9 |
| 13856 | 19.7 | 27.9 | 20.8 | 22.8 | 3 | 58.5 | 3 | 47.9 | 6.4 | 60.7 | 38.3 | 5 | 39.9 | 5 |
| 13536 | 18.4 | 28.7 | 18.0 | 21.7 | 4 | 53.3 | 13 | 47.6 | 15.7 | 63.9 | 42.4 | 2 | 32.9 | 13 |
| 13852 | 20.5 | 24.9 | 13.9 | 19.8 | 11 | 57.9 | 4 | 36.2 | 10.7 | 72.4 | 39.8 | 4 | 37.9 | 6 |
| 13679 | 22.3 | 27.4 | 14.1 | 21.3 | 6 | 56.2 | 7 | 29.7 | 8.8 | 62.1 | 33.5 | 16 | 41.9 | 2 |
| 13857 | 20.4 | 28.6 | 22.3 | 23.8 | 2 | 54.8 | 11 | 43.8 | 9.6 | 48.9 | 34.1 | 15 | 40.3 | 3-4 |
| 8856 | 21.6 | 21.6 | 17.9 | 20.4 | 9-10 | 53.7 | 12 | 41.8 | 12.4 | 54.8 | 36.3 | 9 | 29.5 | 14-15 |
| 13854 | 16.7 | 28.4 | 18.6 | 21.2 | 7-8 | 52.6 | 16 | 39.4 | 15.0 | 56.7 | 37.0 | 7 | 21.4 | 18 |
| 11673 | 20.0 | 27.6 | 17.0 | 21.5 | 5 | 59.1 | 2 | 41.4 | 11.5 | 54.6 | 35.8 | 10 | 16.1 | 19 |
| 13849 | 18.6 | 24.7 | 15.8 | 19.7 | 12 | 53.1 | 14 | 38.1 | 8.3 | 59.7 | 35.4 | 12 | 29.2 | 16 |
| 13684 | 16.5 | 23.0 | 15.3 | 18.3 | 17 | 56.3 | 6 | 36.8 | 9.6 | 58.8 | 35.1 | 13 | 34.9 | 10 |
| 13848 | 19.2 | 23.0 | 14.9 | 19.0 | 16 | 44.0 | 20 | 33.7 | 10.7 | 62.8 | 35.7 | 11 | 33.2 | 12 |
| 12132 | 20.2 | 24.4 | 10.1 | 18.2 | 18-19 | 52.7 | 15 | 32.1 | 4.0 | 55.6 | 30.6 | 20 | 29.5 | 14-15 |
| 13850 | 20.3 | 22.3 | 11.9 | 18.2 | 18-19 | 56.5 | 5 | 24.9 | 9.0 | 62.9 | 32.3 | 17 | 33.9 | 11 |
| 13851 | 21.1 | 22.4 | 14.4 | 19.3 | 14 | 50.6 | 18 | 32.0 | 9.4 | 51.5 | 31.0 | 19 | 36.1 | 7 |
| 13855 | 13.2 | 22.2 | 11.4 | 15.6 | 20 | 54.9 | 10 | 30.7 | 11.4 | 62.1 | 34.7 | 14 | 40.3 | 3-4 |
| 13853 | 18.3 | 23.0 | 16.0 | 19.1 | 15 | 50.7 | 17 | 41.9 | 13.3 | 57.5 | 37.6 | 6 | 25.7 | 17 |
| 1442 | 13.6 | 26.1 | 19.1 | 19.6 | 13 | 55.0 | 9 | 46.1 | 15.7 | 47.8 | 36.5 | 8 | 4.3 | 20 |
| 13847 | 22.8 | 25.2 | 13.2 | 20.4 | 9-10 | 48.8 | 19 | 33.8 | 8.1 | 53.2 | 31.7 | 18 | 35.7 | 8 |

| C. I. No. | Nebraska | | | | | Missouri | | New Mexico | | | | 20 test average |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Lincoln | North Platte | Alliance | Average | Rank | Columbia | Rank | Clovis Irr. | Clovis Dry | Average | Rank | |
| 13546 | 37.9 | 43.7 | 50.5 | 44.0 | 1 | 44.9 | 3 | 86.4 | 20.8 | 53.6 | 1 | 41.9 |
| 13547 | 40.5 | 42.9 | 45.8 | 43.1 | 2 | 39.0 | 14 | 75.9 | 18.1 | 47.0 | 2 | 38.8 |
| 13856 | 39.3 | 38.1 | 39.9 | 39.1 | 3 | 40.9 | 8-9 | 74.0 | 18.3 | 46.2 | 3 | 38.3 |
| 13536 | 35.5 | 43.7 | 31.6 | 36.9 | 6 | 37.7 | 15 | 70.2 | 18.3 | 44.2 | 6 | 37.4 |
| 13852 | 37.2 | 33.3 | 33.0 | 34.5 | 11 | 44.1 | 4 | 64.4 | 20.1 | 42.2 | 12 | 37.2 |
| 13679 | 38.4 | 35.1 | 34.1 | 35.9 | 7 | 45.9 | 2 | 70.2 | 20.3 | 45.2 | 5 | 37.1 |
| 13857 | 38.3 | 38.2 | 37.3 | 37.9 | 4 | 37.6 | 16 | 67.6 | 17.0 | 42.3 | 11 | 36.9 |
| 8856 | 26.9 | 37.4 | 32.8 | 32.4 | 16 | 48.8 | 1 | 68.2 | 17.0 | 42.6 | 10 | 35.0 |
| 13854 | 31.2 | 27.7 | 36.7 | 31.9 | 18 | 39.6 | 12 | 69.2 | 17.8 | 43.5 | 7-8 | 34.5 |
| 11673 | 30.7 | 34.4 | 38.7 | 34.6 | 10 | 36.1 | 17 | 60.0 | 19.5 | 39.8 | 16 | 34.4 |
| 13849 | 32.4 | 33.7 | 34.0 | 33.4 | 14 | 40.4 | 10 | 64.8 | 21.4 | 43.1 | 9 | 34.3 |
| 13684 | 37.3 | 38.6 | 31.6 | 35.8 | 8 | 34.9 | 18 | 66.4 | 15.4 | 40.9 | 13 | 34.2 |
| 13848 | 35.4 | 35.2 | 33.9 | 34.8 | 9 | 40.9 | 8-9 | 60.2 | 20.3 | 40.2 | 15 | 34.1 |
| 12132 | 35.8 | 33.9 | 33.2 | 34.3 | 12 | 43.2 | 5 | 72.2 | 20.0 | 46.1 | 4 | 34.0 |
| 13850 | 35.6 | 30.4 | 30.2 | 32.1 | 17 | 42.8 | 6 | 59.8 | 17.8 | 38.8 | 17 | 34.0 |
| 13851 | 37.7 | 37.2 | 38.6 | 37.8 | 5 | 41.6 | 7 | 54.6 | 17.8 | 36.2 | 18 | 33.6 |
| 13855 | 42.1 | 33.2 | 25.4 | 33.6 | 13 | 29.9 | 19 | 64.4 | 16.7 | 40.6 | 14 | 33.4 |
| 13853 | 24.1 | 35.2 | 34.6 | 31.3 | 19 | 39.8 | 11 | 43.2 | 16.6 | 29.9 | 20 | 33.0 |
| 1442 | 17.8 | 23.0 | 31.2 | 24.0 | 20 | 26.2 | 20 | 65.8 | 21.3 | 43.5 | 7-8 | 29.4 |
| 13847 | 34.1 | 34.1 | 31.4 | 33.2 | 15 | 39.3 | 13 | 54.4 | 17.5 | 36.0 | 19 | 28.5 |

Table 3. Summary of 2-year average yields for 9 varieties grown in the southern regional performance nursery at 15 stations in 1963 and 1964 with state averages and rank.

| Variety | C.I. No. | Texas | | Oklahoma | | | | | New Mexico | | Illinois | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Denton | Rank | Stillwater | Woodward | Cherokee | Average | Rank | Clovis Irr. | Rank | Urbana | Rank |
| Scout | 13546 | 30.9 | 3 | 47.7 | 40.3 | 48.2 | 45.4 | 1 | 72.7 | 1 | 60.0 | 1 |
| Caddo | 13536 | 32.6 | 2 | 42.3 | 35.5 | 44.6 | 40.8 | 3 | 59.6 | 3 | 56.2 | 4 |
| Lancer | 13547 | 30.0 | 4-5 | 34.2 | 36.1 | 45.3 | 38.5 | 7 | 62.0 | 2 | 51.3 | 8 |
| Triumph 64 | 13679 | 34.0 | 1 | 48.1 | 36.7 | 46.2 | 43.7 | 2 | 58.1 | 5 | 57.1 | 3 |
| Comanche | 11673 | 29.4 | 6 | 41.5 | 36.3 | 42.0 | 39.9 | 4 | 56.5 | 6 | 58.8 | 2 |
| Early Blackhull | 8856 | 30.0 | 4-5 | 43.8 | 31.1 | 43.6 | 39.5 | 6 | 56.1 | 8 | 50.8 | 9 |
| Triumph | 12132 | 29.2 | 7 | 45.7 | 31.1 | 42.2 | 39.7 | 5 | 58.6 | 4 | 52.9 | 7 |
| Sv1-Wi-H-Cnn-Wi$^2$ x SS | 13684 | 27.3 | 8 | 41.9 | 26.8 | 38.8 | 35.8 | 8 | 52.7 | 9 | 55.9 | 5 |
| Kharkof | 1442 | 23.5 | 9 | 31.8 | 25.8 | 29.2 | 28.9 | 9 | 56.4 | 7 | 53.7 | 6 |

| C.I. No. | Kansas | | | | | Colorado | | | | | Nebraska | | | | | 15 station average |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Manhattan | Garden City | Colby | Average | Rank | Ft. Collins | Akron | Hesperus | Average | Rank | Lincoln | North Platte | Alliance | Average | Rank | |
| 13546 | 32.3 | 32.2 | 24.0 | 29.5 | 1 | 70.7 | 18.5 | 71.4 | 53.5 | 1 | 42.2 | 46.3 | 36.3 | 41.6 | 1 | 44.9 |
| 13536 | 29.9 | 27.0 | 25.3 | 27.4 | 2 | 64.8 | 17.3 | 68.4 | 50.2 | 2 | 35.6 | 41.7 | 24.7 | 34.0 | 3 | 40.4 |
| 13547 | 28.7 | 26.9 | 24.6 | 26.7 | 4 | 61.7 | 16.5 | 69.7 | 49.3 | 3 | 39.4 | 39.0 | 36.3 | 38.2 | 2 | 40.1 |
| 13679 | 32.4 | 26.7 | 22.0 | 27.0 | 3 | 51.4 | 16.0 | 61.0 | 42.8 | 8 | 31.6 | 34.2 | 23.4 | 29.7 | 6 | 38.6 |
| 11673 | 28.2 | 26.6 | 23.1 | 26.0 | 6 | 57.7 | 14.9 | 58.7 | 43.8 | 6 | 35.4 | 38.3 | 27.6 | 33.8 | 4 | 38.3 |
| 8856 | 30.9 | 23.4 | 24.4 | 26.2 | 5 | 55.1 | 19.1 | 56.9 | 43.7 | 7 | 27.7 | 36.3 | 24.5 | 29.5 | 7 | 36.9 |
| 12132 | 31.8 | 25.6 | 19.9 | 25.8 | 7 | 51.9 | 12.4 | 54.5 | 39.6 | 9 | 33.1 | 35.9 | 23.5 | 30.8 | 5 | 36.6 |
| 13684 | 26.7 | 20.3 | 20.1 | 22.4 | 9 | 52.9 | 17.3 | 62.4 | 44.2 | 4 | 29.8 | 32.8 | 23.8 | 28.8 | 8 | 35.3 |
| 1442 | 24.6 | 26.3 | 20.0 | 23.6 | 8 | 62.4 | 16.7 | 52.6 | 43.9 | 5 | 26.5 | 21.9 | 28.7 | 25.7 | 9 | 33.3 |

Table 4. Summary of agronomic data other than yield for varieties grown in the southern regional performance nursery in 1964.

| Variety | C.I. No. | Date Headed | Date Ripe | Plant height | Rust Leaf | Rust Stem | Lodging | Winter survival | Weight per bushel |
|---|---|---|---|---|---|---|---|---|---|
| | | May | | in. | % | % | % | % | Lbs. |
| Number of stations | | 20 | 4 | 18 | 3 | 4 | 3 | 2 | 18 |
| Caddo | 13536 | 18 | 7-2 | 32 | 20 | 33 | 12 | 72 | 61.1 |
| Early Blackhull | 8856 | 16 | 7-1 | 32 | 41 | 38 | 16 | 84 | 60.5 |
| Lancer | 13547 | 21 | 7-2 | 31 | 36 | 3 | 7 | 95 | 60.1 |
| Triumph x CI 12406 | 13851 | 17 | 7-2 | 31 | 40 | 39 | 5 | 88 | 60.0 |
| do | 13848 | 16 | 6-30 | 31 | 42 | 42 | 7 | 89 | 60.0 |
| do | 13847 | 17 | 7-1 | 32 | 41 | 32 | 10 | 88 | 59.9 |
| Triumph 64 | 13679 | 16 | 6-29 | 30 | 40 | 38 | 16 | 82 | 59.8 |
| Nbr x Cnn-Ky-Mta | 13857 | 19 | 7-2 | 30 | 40 | 4 | 14 | 90 | 59.7 |
| $Cnn^2$ x Ky-Mta | 13856 | 19 | 7-2 | 30 | 38 | 2 | 6 | 88 | 59.6 |
| Triumph x CI 12406 | 13852 | 16 | 6-30 | 30 | 40 | 31 | 13 | 80 | 59.4 |
| do | 13849 | 18 | 7-1 | 32 | 46 | 35 | 11 | 85 | 59.4 |
| Scout | 13546 | 18 | 7-2 | 32 | 34 | 5 | 15 | 90 | 59.3 |
| $Bsn^5$ x CI 9058 | 13854 | 20 | 7-3 | 33 | 50 | 34 | 26 | 85 | 59.2 |
| Triumph x CI 12406 | 13850 | 17 | 6-30 | 31 | 40 | 33 | 12 | 80 | 59.2 |
| Triumph | 12132 | 16 | 6-30 | 30 | 46 | 39 | 14 | 82 | 59.0 |
| $Wi^5$ x Cns x Au | 13853 | 18 | 7-1 | 32 | 21 | 26 | 44 | 78 | 58.8 |
| Kharkof | 1442 | 25 | 7-4 | 33 | 60 | 42 | 24 | 95 | 58.8 1/ |
| Comanche | 11673 | 21 | 7-2 | 32 | 41 | 34 | 25 | 92 | 58.4 |
| Nrn 10 x CI 12500 | 13855 | 18 | 7-2 | 24 | 1 | 5 | 2 | 82 | 58.3 |
| Svl-Wi-Hope-Cnn-$Wi^2$ x SS | 13684 | 18 | 7-2 | 26 | 8 | 25 | 2 | 80 | 58.2 |

1/ Average based on one less station than indicated

## NORTHERN REGIONAL PERFORMANCE NURSERY

Seventeen varieties comprised the northern regional nursery in 1964. The data were reported from 12 of 15 stations that grew the nursery.

| Entry No. | Pedigree | C. I. No. | State submitting |
|---|---|---|---|
| 1 | Kharkof | 1442 | --- |
| 2 | Minter | 12138 | --- |
| 3 | Yogo | 8033 | --- |
| 4 | Warrior | 13190 | --- |
| 5 | Cheyenne | 8885 | --- |
| 6 | Winalta | 13670 | Alberta |
| 7 | Frontana x Minter$^2$ | 13682 | Minn. |
| 8* | (H44 x Minturki$^2$) x Minter (Minn. 2939) | 13858 | do. |
| 9 | Lancer | 13547 | Nebr. |
| 10 | Yogo x (Tk-Oro 221)-117 (Reselected) | 13542 | Mont. |
| 11* | Yogo x Rushmore 57-135 | 13859 | do. |
| 12* | do. 57-27 | 13860 | do. |
| 13* | Yogo x Cheyenne 1-1-2-1 | 13861 | do. |
| 14* | do. 11-5-3 | 13862 | do. |
| 15* | Bulk Winterhardiness 1376-8 | 13863 | do. |
| 16* | Ky 58-Nth x (Cnn-Tm-Mi-Hope)$^2$ | 13864 | Nebr. |
| 17** | Gage | 13532 | do. |

* New entry in 1964.

** Entered from the Southern Regional Nursery.

### Data Obtained

St. Paul--The nursery was seeded on September 11. Soil moisture was adequate in the fall but was below normal throughout the winter and spring. There were no diseases of significance due to the dry spring.

Waseca--Seeding was done on September 12 in good soil moisture. Although the winter was moderately cold and open there was no killing in the nursery. Moisture was excellent throughout the season. Both stem and leaf rust became heavy sufficiently early to reduce test weights and yields of susceptible varieties.

Brookings--Irregular stands resulted from the nursery seeding on September 3. The late winter and spring were very wet and the nursery became excessively weedy. Data were not reported.

Presho--Seeding on September 17 was late for that area. Although winterkilling was not severe the condition of the nursery was poor during the spring. The nursery became extremely weedy by harvest time. Both yields and test weights were low.

Highmore--Good stands were established in the fall from seeding on September 17. There was little winterkilling. Streak mosaic was severe in the nursery in the spring. Leaf and stem rust became heavy. Grain yields were generally good but test weights were well below normal.

Lincoln--The nursery at Lincoln consisted of a single rod-row plot of each entry. Good stem rust and bunt information were obtained.

North Platte--Conditions throughout the season at North Platte were excellent. There was no winterkilling. Stem rust became heavy sufficiently early to reduce test weight of susceptible varieties. Yields, however, were high.

Alliance--The winter was severe enough to cause some loss of stands in the most tender materials grown at Alliance in 1964. Killing in the northern regional nursery was negligible. Growth was excessive in the fall with crown and root rots and streak mosaic prevalent in the area.

Archer--The nursery was seeded on September 12 in fair moisture. The wheat survived the winter without loss of stands. Drought throughout the spring growing season sharply depressed yields.

Sheridan--Overall conditions were good. Fall moisture was adequate for excellent stand establishment and all entries survived the winter well. There was no apparent insect or disease damage. Yields, although high, probably were reduced by lack of moisture from mid-June until harvest.

Havre--Seeding on September 24 was very late. A relatively mild winter produced no measurable killing. Timely precipitation in the spring pointed to a high yielding crop but hail on July 15 caused heavy damage in the nursery. Some damage resulted from a late buildup of grasshoppers and high winds prior to harvest caused additional loss of grain from shattering.

Dickinson--Loss of stand during the winter was severe. Killing was 100 percent in all replications except one in which there was partial survival of the most winterhardy entries. No data were reported.

Lethbridge--Fall stands were excellent. The winter was mild and all entries survived without loss of plants. Wheat streak mosaic became severe in the fall and the disease destroyed the nursery in the spring. There were no data reported.

Tetonia--The nursery was seeded on September 10. Growing conditions throughout the season were not reported.

Clovis--An irrigated nursery was seeded on October 15. Insects and diseases were not a problem in the nursery. Yields were high. Test weights were not reported.

Table 5. Yield and other data for varieties grown in the northern regional performance nursery at 12 stations in the hard red winter wheat region in 1964.

St. Paul, Minnesota
Three replications

| C. I. No. | Date headed | Plant height | Weight per bushel | Av. acre yield 1964 | Av. acre yield 1963-1964 | No. years grown | Percent of Kharkof |
|---|---|---|---|---|---|---|---|
| | June | In. | Lbs. | Bu. | Bu. | | |
| 13861 | 7 | 39 | 64.3 | 44.7 | -- | 1 | 129.9 |
| 13862 | 7 | 39 | 64.5 | 37.8 | -- | 1 | 109.9 |
| 13190 | 4 | 34 | 63.3 | 37.2 | -- | 1 | 108.1 |
| 13542 | 7 | 39 | 63.7 | 36.3 | 34.5 | 4 | 122.7 |
| 8885 | 7 | 34 | 64.0 | 36.1 | 22.6 | 4 | 106.2 |
| 13682 | 8 | 36 | 63.0 | 36.1 | 35.0 | 2 | 165.3 |
| 13532 | 3 | 34 | 61.8 | 35.8 | -- | 1 | 104.1 |
| 13863 | 8 | 37 | 63.7 | 34.9 | -- | 1 | 101.4 |
| 1442 | 8 | 36 | 63.0 | 34.4 | 21.2 | 4 | 100.0 |
| 8033 | 9 | 36 | 63.2 | 34.2 | 33.6 | 4 | 134.7 |
| 12138 | 8 | 38 | 63.0 | 33.8 | 30.9 | 4 | 140.0 |
| 13670 | 6 | 36 | 63.8 | 33.6 | 24.6 | 2 | 115.8 |
| 13859 | 6 | 38 | 63.2 | 32.8 | -- | 1 | 95.3 |
| 13864 | 7 | 36 | 64.0 | 32.0 | -- | 1 | 93.0 |
| 13547 | 4 | 33 | 62.8 | 31.9 | 19.2 | 3 | 102.4 |
| 13858 | 8 | 36 | 63.7 | 31.6 | -- | 1 | 91.9 |
| 13860 | 7 | 38 | 62.5 | 31.3 | -- | 1 | 91.0 |

$LSD_{.05}$ = not significant; C.V. = 12.8%

Waseca, Minnesota
Three replications

| C. I. No. | Date Headed | Date Ripe | Lodging class 1/ | Plant height | Rust Leaf | Rust Stem | Weight per bushel | Av. acre yield 1964 | Av. acre yield 1963-1964 | No. years grown | Percent of Kharkof |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | June | July | | In. | % | % | Lbs. | Bu. | Bu. | | |
| 13532 | 3 | 8 | 1.0 | 39 | 10 | 30S | 63.3 | 54.6 | -- | 1 | 143.7 |
| 13864 | 6 | 10 | 2.0 | 42 | 60 | T | 63.5 | 51.8 | -- | 1 | 136.3 |
| 13547 | 6 | 10 | 1.0 | 39 | 70 | T | 63.0 | 49.7 | 39.8 | 4 | 133.1 |
| 13682 | 10 | 12 | 2.0 | 43 | 70 | T | 62.2 | 47.6 | 44.4 | 3 | 149.5 |
| 13858 | 10 | 12 | 2.0 | 44 | 70 | T | 63.0 | 47.4 | -- | 1 | 124.7 |
| 12138 | 9 | 13 | 2.0 | 45 | 60 | 10S | 62.3 | 46.2 | 39.8 | 4 | 121.6 |
| 13670 | 8 | 11 | 2.0 | 41 | 70 | 5 2/ | 61.7 | 45.3 | 36.4 | 3 | 132.2 |
| 13859 | 7 | 11 | 1.7 | 40 | 70 | 50S | 61.0 | 41.3 | -- | 1 | 108.7 |
| 8885 | 8 | 12 | 1.7 | 42 | 80 | 70S | 59.0 | 39.0 | 29.6 | 4 | 82.0 |
| 13190 | 5 | 11 | 1.7 | 40 | 60 | 70S | 58.0 | 38.6 | -- | 1 | 101.6 |
| 13860 | 8 | 11 | 2.0 | 45 | 70 | 20S | 61.7 | 38.5 | -- | 1 | 101.3 |
| 1442 | 7 | 11 | 1.7 | 42 | 80 | 80S | 58.0 | 38.0 | 33.2 | 4 | 100.0 |
| 13861 | 7 | 12 | 2.0 | 42 | 70 | 60S | 60.7 | 37.2 | -- | 1 | 97.9 |
| 13862 | 8 | 11 | 2.0 | 42 | 80 | 60S | 58.5 | 35.4 | -- | 1 | 93.2 |
| 13863 | 11 | 13 | 2.0 | 42 | 80 | 60S | 57.0 | 33.2 | -- | 1 | 87.4 |
| 8033 | 11 | 13 | 2.3 | 44 | 60 | 70S | 58.3 | 32.8 | 28.0 | 4 | 94.0 |
| 13542 | 9 | 11 | 2.0 | 44 | 70 | 70S | 58.0 | 31.5 | 29.0 | 4 | 76.3 |

$LSD_{.05}$ = 5.2 bushels; C.V. = 7.6%

1/ Based on 1-9 scale; 1 = erect, 9 = flat

2/ Infection ranged from Trace - 40S; average infection = 5%.

Presho, South Dakota
Four replications

| C. I. No. | Weight per bushel | Av. acre yield 1964 | Av. acre yield 1963-1964 | No. years grown | Percent of Kharkof |
|---|---|---|---|---|---|
| | Lbs. | Bu. | Bu. | | |
| 13532 | 57.0 | 19.7 | -- | 1 | 169.8 |
| 13547 | 56.0 | 16.9 | 22.4 | 2 | 121.1 |
| 13861 | 57.0 | 15.8 | -- | 1 | 136.2 |
| 13670 | 56.0 | 14.5 | 20.6 | 2 | 111.4 |
| 12138 | 55.0 | 14.1 | 19.6 | 2 | 105.9 |
| 13863 | 53.0 | 13.7 | -- | 1 | 118.1 |
| 13862 | 55.1 | 13.3 | -- | 1 | 114.6 |
| 13190 | 55.0 | 12.8 | -- | 1 | 110.3 |
| 13682 | 52.8 | 12.8 | 17.8 | 2 | 96.2 |
| 13858 | 54.0 | 12.7 | -- | 1 | 109.5 |
| 1442 | 51.4 | 11.6 | 18.5 | 2 | 100.0 |
| 8033 | 50.1 | 11.3 | 17.4 | 2 | 94.0 |
| 13542 | 50.0 | 9.4 | 16.8 | 2 | 90.8 |
| 13860 | 51.1 | 8.6 | -- | 1 | 74.1 |
| 13859 | 50.9 | 8.5 | -- | 1 | 73.3 |
| 13864 | 54.6 | 8.3 | -- | 1 | 71.6 |
| 8885 | 51.0 | 8.1 | 17.4 | 2 | 94.0 |

$LSD_{.05}$ = 5.1 bushels; C.V. = 29.0%

Highmore, South Dakota
Four replications

| C. I. No. | Rust | | Weight per bushel | Av. acre yield | | No. years grown | Percent of Kharkof |
|---|---|---|---|---|---|---|---|
| | Leaf 7-1 | Stem 7-1 | | 1964 | 1963-1964 | | |
| | % | % | Lbs. | Bu. | Bu. | | |
| 8885 | 65S | 65S | 57.0 | 39.4 | 31.0 | 2 | 105.6 |
| 1442 | 65S | 65S | 57.0 | 37.3 | 30.6 | 2 | 100.0 |
| 13547 | 65S | OR | 56.1 | 34.8 | 34.8 | 2 | 113.7 |
| 13190 | 65S | 25S | 55.1 | 31.8 | -- | 1 | 85.2 |
| 13532 | OR | OR | 58.1 | 31.7 | -- | 1 | 85.0 |
| 13862 | 65S | 40S | 57.5 | 31.0 | -- | 1 | 83.1 |
| 13864 | 1X | OR | 55.5 | 29.9 | -- | 1 | 80.2 |
| 13863 | 65S | 65S | 54.8 | 28.4 | -- | 1 | 76.1 |
| 13670 | 65S | 10S | 56.4 | 28.1 | 26.9 | 2 | 87.9 |
| 13542 | 65S | 10S | 53.2 | 26.7 | 22.6 | 2 | 73.8 |
| 13858 | 65S | OR | 55.8 | 26.3 | -- | 1 | 70.5 |
| 13860 | 65S | 65S | 55.8 | 25.6 | -- | 1 | 68.6 |
| 13861 | 65S | 40S | 57.0 | 25.4 | -- | 1 | 68.1 |
| 8033 | 65S | 65S | 53.1 | 24.9 | 20.9 | 2 | 68.4 |
| 13682 | 40S | 1R | 55.0 | 24.8 | 24.0 | 2 | 78.7 |
| 12138 | 65S | 5S | 51.1 | 22.8 | 23.4 | 2 | 76.4 |
| 13859 | 65S | 40S | 56.5 | 20.7 | -- | 1 | 55.5 |

$LSD_{.05}$ = 1.7 bushels; C.V. = 5.44%

Lincoln, Nebraska
Single plot

| C. I. No. | Date headed | Plant height | Stem rust | Bunt 1/ |
|---|---|---|---|---|
| | May | In. | % | % |
| 13864 | 25 | 36 | TR | 28 |
| 13532 | 21 | 34 | TR-20S | 20 |
| 13547 | 23 | 33 | TR | 7 |
| 13670 | 26 | 37 | 10MR-30S | 10 |
| 13858 | 27 | 38 | 30S | 0 |
| 13682 | 27 | 37 | 30S | 0 |
| 13860 | 27 | 39 | 30S | 0 |
| 13859 | 23 | 36 | 80S | 1 |
| 12138 | 27 | 38 | 30S | 2 |
| 13190 | 24 | 34 | 70S | 6 |
| 8885 | 25 | 38 | 70S | 23 |
| 13861 | 27 | 37 | 80S | 0 |
| 1442 | 25 | 37 | 60S | 14 |
| 13863 | 30 | 36 | 80S | 0 |
| 8033 | 29 | 39 | 60S | 1 |
| 13862 | 28 | 38 | 80S | 3 |
| 13542 | 30 | 37 | 80S | 1 |

1/ Data from an artificially inoculated nursery.

North Platte, Nebraska
Four replications

| C. I. No. | Date headed | Plant height | Stem rust | Weight per bushel | Av. acre yield 1964 | Av. acre yield 1963-1964 | No. years grown | Percent of Kharkof |
|---|---|---|---|---|---|---|---|---|
| | June | In. | % | Lbs. | Bu. | Bu. | | |
| 13532 | 5-31 | 38 | 2 | 58.5 | 49.2 | -- | 1 | 166.2 |
| 13547 | 2 | 38 | 4 | 60.0 | 44.6 | 38.2 | 4 | 184.2 |
| 13190 | 3 | 38 | 25 | 58.7 | 41.7 | -- | 1 | 140.9 |
| 13864 | 4 | 40 | 0 | 59.6 | 40.6 | -- | 1 | 137.2 |
| 13670 | 5 | 39 | 4 | 60.2 | 37.0 | 39.0 | 3 | 142.9 |
| 13858 | 5 | 41 | 0 | 60.1 | 36.1 | -- | 1 | 122.0 |
| 13860 | 5 | 43 | 5 | 59.8 | 35.4 | -- | 1 | 103.4 |
| 13682 | 10 | 40 | 0 | 58.9 | 35.4 | 29.2 | 3 | 119.7 |
| 13861 | 4 | 41 | 20 | 59.7 | 35.2 | -- | 1 | 118.9 |
| 13859 | 4 | 41 | 20 | 58.9 | 33.7 | -- | 1 | 113.8 |
| 8885 | 4 | 40 | 35 | 57.6 | 34.8 | 34.4 | 6 | 120.9 |
| 13862 | 5 | 40 | 65 | 58.4 | 31.4 | -- | 1 | 106.1 |
| 12138 | 9 | 42 | 5 | 58.0 | 30.6 | 28.8 | 6 | 124.7 |
| 1442 | 6 | 42 | 6 | 56.8 | 29.6 | 28.3 | 6 | 100.0 |
| 13863 | 10 | 40 | 60 | 56.3 | 28.4 | -- | 1 | 95.9 |
| 13542 | 7 | 42 | 70 | 55.5 | 26.9 | 27.2 | 5 | 102.7 |
| 8033 | 9 | 41 | 25 | 53.6 | 26.0 | 31.7 | 6 | 97.6 |

$LSD_{.05}$ = 4.02 bushels; C.V. = 8.1%

Alliance, Nebraska
Four replications

| C. I. No. | Plant height | Weight per bushel | Av. acre yield 1964 | Av. acre yield 1963-1964 | No. years grown | Percent of Kharkof |
|---|---|---|---|---|---|---|
| | In. | Lbs. | Bu. | Bu. | | |
| 8885 | 37 | 61.4 | 42.1 | 35.8 | 6 | 113.4 |
| 13190 | 36 | 61.2 | 40.8 | -- | 1 | 113.0 |
| 13532 | 35 | 61.1 | 38.9 | -- | 1 | 107.8 |
| 13542 | 40 | 58.8 | 38.5 | 32.6 | 4 | 102.3 |
| 13861 | 38 | 61.5 | 37.8 | -- | 1 | 104.7 |
| 13862 | 39 | 60.3 | 37.3 | -- | 1 | 103.3 |
| 8033 | 39 | 59.3 | 37.1 | 34.0 | 12 | 92.3 |
| 13864 | 38 | 60.6 | 36.8 | -- | 1 | 101.9 |
| 13670 | 37 | 61.5 | 36.7 | 32.6 | 2 | 106.2 |
| 1442 | 40 | 60.1 | 36.1 | 30.6 | 12 | 100.0 |
| 13547 | 35 | 61.9 | 35.8 | 29.2 | 3 | 101.3 |
| 13858 | 39 | 58.7 | 35.3 | -- | 1 | 97.8 |
| 13860 | 40 | 59.2 | 34.8 | -- | 1 | 96.4 |
| 13859 | 38 | 61.1 | 34.1 | -- | 1 | 94.4 |
| 13863 | 39 | 57.8 | 33.1 | -- | 1 | 91.7 |
| 12138 | 39 | 59.6 | 32.5 | 31.0 | 12 | 93.7 |
| 13682 | 38 | 59.4 | 30.8 | 30.4 | 2 | 99.0 |

$LSD_{.05}$ = 4.2 bushels; C.V. = 8.2%

Archer, Wyoming
Four replications

| C. I. No. | Date headed | Plant height | Weight per bushel | Av. acre yield | | No. years grown | Percent of Kharkof |
|---|---|---|---|---|---|---|---|
| | | | | 1964 | 1963-1964 | | |
| | June | In. | Lbs. | Bu. | Bu. | | |
| 13859 | 18 | 26 | 61.0 | 18.6 | -- | 1 | 106.9 |
| 13542 | 18 | 27 | 60.0 | 18.6 | 22.1 | 4 | 103.4 |
| 8885 | 14 | 23 | 61.0 | 18.3 | 20.7 | 7 | 101.2 |
| 13547 | 12 | 23 | 62.5 | 17.9 | 21.6 | 3 | 101.3 |
| 13861 | 17 | 23 | 62.0 | 17.7 | -- | 1 | 101.7 |
| 13863 | 19 | 26 | 59.0 | 17.7 | -- | 1 | 101.7 |
| 1442 | 18 | 24 | 59.0 | 17.4 | 19.6 | 9 | 100.0 |
| 8033 | 18 | 24 | 59.5 | 17.1 | 20.0 | 9 | 94.6 |
| 13860 | 17 | 26 | 60.0 | 16.9 | -- | 1 | 97.1 |
| 13670 | 18 | 24 | 60.0 | 15.8 | 19.0 | 3 | 104.0 |
| 12138 | 18 | 24 | 59.0 | 15.5 | 18.6 | 9 | 94.4 |
| 13858 | 18 | 25 | 60.0 | 15.4 | -- | 1 | 88.5 |
| 13190 | 12 | 21 | 61.0 | 15.3 | -- | 1 | 87.9 |
| 13864 | 18 | 24 | 60.0 | 15.0 | -- | 1 | 86.2 |
| 13862 | 17 | 22 | 60.5 | 14.2 | -- | 1 | 81.6 |
| 13682 | 18 | 28 | 60.0 | 14.2 | 18.7 | 3 | 93.6 |
| 13532 | 12 | 22 | 59.0 | 13.2 | -- | 1 | 75.9 |

$LSD_{.05}$ = 6.8 bushels; C.V. = 29.4%

Sheridan, Wyoming
Four replications

| C. I. No. | Date headed | Plant height | Weight per bushel | Av. acre yield 1964 | Av. acre yield 1963-1964 | No. years grown | Percent of Kharkof |
|---|---|---|---|---|---|---|---|
| | June | In. | Lbs. | Bu. | Bu. | | |
| 8885 | 13 | 46 | 61.0 | 53.7 | 42.6 | 8 | 111.3 |
| 13542 | 17 | 49 | 59.0 | 53.4 | 41.5 | 5 | 98.0 |
| 8033 | 16 | 49 | 60.0 | 52.9 | 43.0 | 13 | 104.8 |
| 13547 | 12 | 42 | 61.0 | 51.0 | 37.8 | 4 | 97.3 |
| 1442 | 16 | 46 | 59.0 | 49.5 | 42.2 | 13 | 100.0 |
| 13190 | 15 | 43 | 60.0 | 48.0 | -- | 1 | 97.0 |
| 13682 | 16 | 46 | 59.0 | 46.9 | 39.8 | 3 | 93.1 |
| 13862 | 15 | 46 | 60.0 | 46.9 | -- | 1 | 94.7 |
| 13863 | 18 | 48 | 60.0 | 44.0 | -- | 1 | 88.9 |
| 12138 | 17 | 45 | 60.0 | 43.9 | 32.3 | 13 | 93.9 |
| 13859 | 15 | 43 | 58.0 | 43.7 | -- | 1 | 88.3 |
| 13532 | 10 | 39 | 58.0 | 43.4 | -- | 1 | 87.7 |
| 13860 | 16 | 47 | 58.0 | 38.6 | -- | 1 | 78.0 |
| 13670 | 14 | 46 | 60.0 | 38.1 | 39.0 | 3 | 94.3 |
| 13858 | 17 | 50 | 60.0 | 37.6 | -- | 1 | 76.0 |
| 13861 | 15 | 46 | 60.0 | 36.4 | -- | 1 | 73.5 |
| 13864 | 15 | 39 | 57.0 | 25.8 | -- | 1 | 52.1 |

$LSD_{.05}$ = 9.7 bushels; C.V. = 15.8%

Havre, Montana
Three replications

| C. I. No. | Date headed | Plant height | Hail damage | Weight per bushel | Av. acre yield 1964 | Percent of Kharkof |
|---|---|---|---|---|---|---|
| | June | In. | % | Lbs. | Bu. | |
| 13542 | 15 | 29 | 7 | 60.6 | 15.8 | 138.6 |
| 12138 | 17 | 28 | 10 | 60.0 | 14.0 | 122.8 |
| 8033 | 17 | 28 | 4 | 60.0 | 13.6 | 119.3 |
| 13860 | 16 | 30 | T | 59.3 | 13.3 | 116.7 |
| 13670 | 14 | 24 | 11 | 60.3 | 13.1 | 114.9 |
| 13862 | 15 | 27 | 8 | 60.3 | 12.2 | 107.0 |
| 13858 | 16 | 30 | 10 | 59.3 | 12.2 | 107.0 |
| 13859 | 13 | 25 | 15 | 60.3 | 11.4 | 100.0 |
| 1442 | 13 | 27 | 20 | 60.0 | 11.4 | 100.0 |
| 13682 | 16 | 27 | 17 | 59.0 | 11.2 | 98.2 |
| 8885 | 15 | 26 | 10 | 60.0 | 11.0 | 96.5 |
| 13861 | 14 | 27 | 5 | 60.6 | 10.5 | 92.1 |
| 13863 | 15 | 28 | 5 | 60.0 | 9.7 | 85.1 |
| 13864 | 13 | 25 | 13 | 59.3 | 9.2 | 80.7 |
| 13532 | 12 | 23 | 23 | 58.6 | 8.1 | 71.0 |
| 13547 | 12 | 23 | 17 | 60.6 | 7.6 | 66.7 |
| 13190 | 12 | 21 | 34 | 60.0 | 5.4 | 47.4 |

$LSD_{.05}$ = 4.62 bushels; C.V. = 25.2%

Tetonia, Idaho
Four replications

| C. I. No. | Date headed | Plant height | Weight per bushel | Av. acre yield | | No. years grown | Percent of Kharkof |
|---|---|---|---|---|---|---|---|
| | | | | 1964 | 1963-1964 | | |
| | July | In. | Lbs. | Bu. | Bu. | | |
| 13190 | 6 | 47 | 60.8 | 49.2 | -- | 1 | 126.2 |
| 13542 | 10 | 52 | 61.3 | 47.0 | 41.8 | 2 | 112.1 |
| 8885 | 9 | 50 | 59.8 | 46.0 | 44.1 | 2 | 118.2 |
| 13670 | 9 | 48 | 62.1 | 45.2 | 41.8 | 2 | 112.1 |
| 13547 | 5 | 46 | 60.3 | 44.0 | 41.4 | 2 | 111.0 |
| 13682 | 10 | 51 | 60.2 | 43.6 | 38.2 | 2 | 102.4 |
| 13532 | 4 | 42 | 61.3 | 43.0 | -- | 1 | 110.2 |
| 13860 | 8 | 52 | 60.9 | 42.4 | -- | 1 | 108.7 |
| 13859 | 7 | 50 | 61.6 | 41.9 | -- | 1 | 107.4 |
| 13863 | 10 | 47 | 61.0 | 41.7 | -- | 1 | 106.9 |
| 8033 | 10 | 51 | 60.9 | 40.8 | 37.0 | 2 | 99.2 |
| 1442 | 8 | 49 | 61.1 | 39.0 | 37.3 | 2 | 100.0 |
| 12138 | 9 | 48 | 61.3 | 38.5 | 37.2 | 2 | 99.7 |
| 13858 | 10 | 50 | 58.4 | 38.5 | -- | 1 | 98.7 |
| 13862 | 9 | 48 | 60.2 | 37.3 | -- | 1 | 95.6 |
| 13864 | 7 | 45 | 60.6 | 37.2 | -- | 1 | 95.4 |
| 13861 | 9 | 51 | 61.3 | 36.1 | -- | 1 | 92.6 |

$LSD_{.05}$ = 6.3 bushels; C.V. = 10.6%

Clovis, New Mexico
Three replications, irrigated

| C. I. No. | Date headed | Plant height | Av. acre yield 1964 | Av. acre yield 1963-1964 | No. years grown | Percent of Kharkof |
|---|---|---|---|---|---|---|
| | May | In. | Bu. | Bu. | | |
| 13670 | 18 | 39 | 77.4 | 67,7 | 3 | 113.6 |
| 13547 | 16 | 38 | 70.4 | 61.7 | 4 | 105.8 |
| 13682 | 22 | 38 | 68.2 | 56.6 | 3 | 90.4 |
| 13190 | 16 | 36 | 66.8 | -- | 1 | 108.4 |
| 13532 | 12 | 35 | 66.6 | -- | 1 | 108.1 |
| 13863 | 23 | 40 | 65.0 | -- | 1 | 105.5 |
| 13864 | 18 | 38 | 63.6 | -- | 1 | 103.2 |
| 13859 | 17 | 38 | 62.6 | -- | 1 | 101.6 |
| 1442 | 24 | 40 | 61.6 | 55.3 | 6 | 100.0 |
| 13542 | 24 | 40 | 60.2 | 55.6 | 5 | 94.0 |
| 13862 | 23 | 42 | 57.6 | -- | 1 | 93.5 |
| 12138 | 23 | 40 | 56.8 | 52.9 | 6 | 87.1 |
| 8885 | 22 | 40 | 55.2 | 56.1 | 6 | 100.1 |
| 8033 | 23 | 41 | 55.0 | 53.0 | 6 | 88.3 |
| 13858 | 22 | 41 | 55.0 | -- | 1 | 89.3 |
| 13861 | 20 | 40 | 54.8 | -- | 1 | 89.0 |
| 13860 | 23 | 42 | 48.0 | -- | 1 | 77.9 |

$LSD_{.05}$ = 13.4 bushels; C.V. = 13.4%

## Summary of Nursery Yields

Average yields made by varieties in the northern regional nursery in 1964 are summarized in table 6. Gage with high average yields in Minnesota, South Dakota, and Nebraska ranked first on a regional basis with a 39.6-bushel yield. Lancer, ranking no lower than fifth in any state, was the second-most-productive variety. Warrior, Cheyenne, and Winalta in that order were next high in regional performance. Winalta has been slightly more productive in the region than Lancer on a 2-year basis (table 7). Its 2-year average yield of 34.8 bushels was 0.2 bushel higher than Lancer and 1.4 bushels higher than Cheyenne, the third-ranked variety.

## Summary of Agronomic Data

The best field resistance to stem rust was shown by C. I. 13684 and Lancer (table 8). Fair resistance was exhibited by 5 other varieties. Gage was the only variety in the nursery with good combined resistance to both leaf and stem rust. Some resistance to leaf rust also was shown by C. I. 13684. Lancer and C. I. 13861 were highest in test weight; Gage had the shortest straw and was earliest maturing.

Table 6. Summary of average yields in bushels per acre made by 17 varieties grown in the northern regional performance nursery at 10 stations in 1964 with state averages and rank.

| Variety | C.I. No. | Minnesota | | | | South Dakota | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | St. Paul | Waseca | Average | Rank | Presho | Highmore | Average | Rank |
| Gage | 13532 | 35.8 | 54.6 | 45.2 | 1 | 19.7 | 31.7 | 25.7 | 2 |
| Lancer | 13547 | 31.9 | 49.7 | 40.8 | 5 | 16.9 | 34.8 | 25.8 | 1 |
| Warrior | 13190 | 37.2 | 38.6 | 37.9 | 9 | 12.8 | 31.8 | 22.3 | 5 |
| Cheyenne | 8885 | 36.1 | 39.0 | 37.6 | 10 | 8.1 | 39.4 | 23.8 | 4 |
| Winalta | 13670 | 33.6 | 45.3 | 39.4 | 8 | 14.5 | 28.1 | 21.3 | 7 |
| Frontana x Minter$^2$ | 13682 | 36.1 | 47.6 | 41.8 | 3 | 12.8 | 24.8 | 18.8 | 12 |
| Kharkof | 1442 | 34.4 | 38.0 | 36.2 | 13 | 11.6 | 37.3 | 24.4 | 3 |
| Yogo x (Tk-Oro 221)-117 | 13542 | 36.3 | 31.5 | 33.9 | 16 | 9.4 | 26.7 | 18.0 | 15 |
| Yogo x Cheyenne 11-5-3 | 13862 | 37.8 | 35.4 | 36.6 | 12 | 13.3 | 31.0 | 22.2 | 6 |
| Yogo x Cheyenne 1-1-2-1 | 13861 | 44.7 | 37.2 | 41.0 | 4 | 15.8 | 25.4 | 20.6 | 9 |
| Ky58-Nth x (Cnn-Tm-Mi-Hope)$^2$ | 13864 | 32.0 | 51.8 | 41.9 | 2 | 8.3 | 29.9 | 19.1 | 11 |
| Bulk Winterhardiness 1376-8 | 13863 | 34.9 | 33.2 | 34.0 | 14 | 13.7 | 28.4 | 21.0 | 8 |
| Yogo x Rushmore 57-135 | 13859 | 32.8 | 41.3 | 37.0 | 11 | 8.5 | 20.7 | 14.6 | 17 |
| (H44 x Minturki$^2$) x Minter | 13858 | 31.6 | 47.4 | 39.5 | 7 | 12.7 | 26.3 | 19.5 | 10 |
| Minter | 12138 | 33.8 | 46.2 | 40.0 | 6 | 14.1 | 22.8 | 18.4 | 13 |
| Yogo | 8033 | 34.2 | 32.8 | 33.5 | 17 | 11.3 | 24.9 | 18.1 | 14 |
| Yogo x Rushmore | 13860 | 31.3 | 38.5 | 34.9 | 15 | 8.6 | 25.6 | 17.1 | 16 |

| C.I. No. | Wyoming | | | | Nebraska | | | | Idaho | | New Mexico | | 10 station average |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Archer | Sheridan | Average | Rank | North Platte | Alliance | Average | Rank | Tetonia | Rank | Clovis | Rank | |
| 13532 | 13.2 | 43.4 | 28.3 | 12 | 49.2 | 38.9 | 44.0 | 1 | 43.0 | 7 | 66.6 | 5 | 39.6 |
| 13547 | 17.9 | 51.0 | 34.4 | 4 | 44.6 | 35.8 | 40.2 | 3 | 44.0 | 5 | 70.4 | 2 | 38.9 |
| 13190 | 15.3 | 48.0 | 31.6 | 6 | 41.7 | 40.8 | 41.2 | 2 | 49.2 | 1 | 66.8 | 4 | 38.2 |
| 8885 | 18.3 | 53.7 | 36.0 | 1-2 | 34.8 | 42.1 | 38.4 | 5 | 46.0 | 3 | 55.2 | 13 | 37.3 |
| 13670 | 15.8 | 38.1 | 27.0 | 14-15 | 37.0 | 36.7 | 36.8 | 6 | 45.2 | 4 | 77.4 | 1 | 37.2 |
| 13682 | 14.2 | 46.9 | 30.6 | 9-10 | 35.4 | 30.8 | 33.1 | 11 | 43.6 | 6 | 68.2 | 3 | 36.0 |
| 1442 | 17.4 | 49.5 | 33.4 | 5 | 29.6 | 36.1 | 32.8 | 12 | 39.0 | 12 | 61.6 | 9 | 35.4 |
| 13542 | 18.6 | 53.4 | 36.0 | 1-2 | 26.9 | 38.5 | 32.7 | 13 | 47.0 | 2 | 60.2 | 10 | 34.8 |
| 13862 | 14.2 | 46.9 | 30.6 | 9-10 | 31.4 | 37.3 | 34.4 | 16 | 37.3 | 15 | 57.6 | 11 | 34.2 |
| 13861 | 17.7 | 36.4 | 27.0 | 14-15 | 35.2 | 37.8 | 36.5 | 7 | 36.1 | 17 | 54.8 | 16 | 34.1 |
| 13864 | 15.0 | 25.8 | 20.4 | 17 | 40.6 | 36.8 | 38.7 | 4 | 37.2 | 16 | 63.6 | 7 | 34.1 |
| 13863 | 17.7 | 44.0 | 30.8 | 8 | 28.4 | 33.1 | 30.8 | 17 | 41.7 | 10 | 65.0 | 6 | 34.0 |
| 13859 | 18.6 | 43.7 | 31.2 | 7 | 33.7 | 34.1 | 33.9 | 10 | 41.9 | 9 | 62.6 | 8 | 33.8 |
| 13858 | 15.4 | 37.6 | 26.5 | 16 | 36.1 | 35.3 | 35.7 | 8 | 38.5 | 13-14 | 55.0 | 14-15 | 33.6 |
| 12138 | 15.5 | 43.9 | 29.7 | 11 | 30.6 | 32.5 | 31.6 | 14-15 | 38.5 | 13-14 | 56.8 | 12 | 33.5 |
| 8033 | 17.1 | 52.9 | 35.0 | 3 | 26.0 | 37.1 | 31.6 | 14-15 | 40.8 | 11 | 55.0 | 14-15 | 33.2 |
| 13860 | 16.9 | 38.6 | 27.8 | 13 | 35.4 | 34.8 | 35.1 | 9 | 42.4 | 8 | 48.0 | 17 | 32.0 |

Table 7. Summary of 2-year average yields for 8 varieties grown in the northern regional performance nursery at 10 stations in 1963 and 1964, with state averages aand rank.

| Variety | C.I. No. | Minnesota | | | | South Dakota | | | | Idaho | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | St. Paul | Waseca | Average | Rank | Presho | Highmore | Average | Rank | Tetonia | Rank |
| Winalta | 13670 | 24.6 | 36.4 | 30.5 | 5 | 20.6 | 26.8 | 23.7 | 4 | 41.8 | 2-3 |
| Lancer | 13547 | 19.2 | 39.8 | 29.5 | 6 | 22.4 | 34.8 | 28.6 | 1 | 41.4 | 4 |
| Cheyenne | 8885 | 22.6 | 29.6 | 26.1 | 8 | 17.4 | 31.0 | 24.2 | 3 | 44.1 | 1 |
| Frontana x Minter[2] | 13682 | 35.0 | 44.4 | 39.7 | 1 | 17.8 | 24.0 | 20.9 | 6 | 38.2 | 5 |
| Yogo x(Tk-Oro 221)-117 | 13542 | 34.5 | 29.0 | 31.8 | 3 | 16.8 | 22.6 | 19.7 | 7 | 41.8 | 2-3 |
| Yogo | 8033 | 33.6 | 28.0 | 30.8 | 4 | 17.4 | 20.9 | 19.2 | 8 | 37.0 | 8 |
| Kharkof | 1442 | 21.2 | 33.2 | 27.2 | 7 | 18.5 | 30.6 | 24.6 | 2 | 37.3 | 6 |
| Minter | 12138 | 30.9 | 39.8 | 35.4 | 2 | 19.6 | 23.4 | 21.5 | 5 | 37.2 | 7 |

| C.I. No. | Wyoming | | | | Nebraska | | | | New Mexico | | 10 station average |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Archer | Sheridan | Average | Rank | North Platte | Alliance | Average | Rank | Clovis | Rank | |
| 13670 | 19.0 | 39.0 | 29.0 | 7 | 39.0 | 32.6 | 35.8 | 1 | 67.7 | 1 | 34.8 |
| 13547 | 21.6 | 37.8 | 29.7 | 5 | 38.2 | 29.2 | 33.7 | 3 | 61.7 | 2 | 34.6 |
| 8885 | 20.7 | 42.6 | 31.6 | 2 | 34.4 | 35.8 | 35.1 | 2 | 56.1 | 4 | 33.4 |
| 13682 | 18.7 | 39.8 | 29.2 | 6 | 29.2 | 30.4 | 29.8 | 7 | 56.6 | 3 | 33.4 |
| 13542 | 22.1 | 41.5 | 31.8 | 1 | 27.2 | 32.6 | 29.9 | 5-6 | 55.6 | 5 | 32.4 |
| 8033 | 20.0 | 43.0 | 31.5 | 3 | 31.7 | 34.0 | 32.8 | 4 | 53.0 | 7 | 31.9 |
| 1442 | 19.6 | 42.2 | 30.9 | 4 | 28.3 | 30.6 | 29.4 | 8 | 55.3 | 6 | 31.7 |
| 12138 | 18.6 | 32.3 | 25.4 | 8 | 28.8 | 31.0 | 29.9 | 5-6 | 52.9 | 8 | 31.4 |

Table 8. Summary of agronomic data other than yield for varieties grown in the northern regional performance nursery in 1964.

| Variety | C.I. No. | Date headed | Plant height | Rust | | Weight per bushel |
|---|---|---|---|---|---|---|
| | | | | Leaf | Stem | |
| | | June | In. | % | % | Lbs. |
| Number of stations | | 9 | 10 | 2 | 4 | 10 |
| Lancer | 13547 | 7 | 35 | 68 | 1 | 60.4 |
| Yogo x Cheyenne 1-1-2-1 | 13861 | 10 | 38 | 68 | 50 | 60.4 |
| Winalta | 13670 | 9 | 37 | 68 | 10 | 60.2 |
| Gage | 13532 | 5 | 34 | 5 | 11 | 59.7 |
| Yogo x Cheyenne 11-5-3 | 13862 | 12 | 38 | 72 | 61 | 59.5 |
| Ky58-Nth x (Cnn-Tm-Mi-Hope)$^2$ | 13864 | 9 | 36 | 30 | 0 | 59.5 |
| Warrior | 13190 | 7 | 35 | 62 | 48 | 59.3 |
| (H44 x Minturki$^2$) x Minter | 13858 | 11 | 39 | 68 | 8 | 59.3 |
| Cheyenne | 8885 | 9 | 38 | 72 | 60 | 59.2 |
| Yogo x Rushmore 57-135 | 13859 | 9 | 38 | 68 | 48 | 59.2 |
| Frontana x Minter$^2$ | 13682 | 12 | 38 | 55 | 8 | 59.0 |
| Minter | 12138 | 12 | 39 | 62 | 12 | 58.9 |
| Yogo x Rushmore 57-27 | 13860 | 11 | 40 | 68 | 30 | 58.8 |
| Kharkof | 1442 | 10 | 38 | 72 | 53 | 58.5 |
| Bulk Winterhardiness 1376-8 | 13863 | 12 | 38 | 72 | 66 | 58.3 |
| Yogo x (Tk-Oro 221)-117 | 13542 | 12 | 40 | 68 | 58 | 58.0 |
| Yogo | 8033 | 12 | 39 | 62 | 55 | 57.8 |

## UNIFORM WINTERHARDINESS NURSERY

The nursery was composed of 2 sections. The northern section with 55 entries was grown at 7 locations. The larger southern section contained 197 entries and also was grown at 7 locations. Differential killing occurred at 3 stations growing the northern section and at 4 stations growing the southern. The data were summarized and distributed to cooperators prior to harvest.

Varieties in the southern and northern regional performance nurseries also are evaluated in the southern section of the uniform winterhardiness nursery. They are listed for each nursery in decreasing order of survival in the tabulation that follows:

Southern Regional Nursery

| Pedigree | C. I. No. | % surv. UWHN |
|---|---|---|
| Lancer | 13547 | 63 |
| Kharkof | 1442 | 63 |
| Nebred (UWHN Check) | 10094 | 61 |
| Scout | 13546 | 58 |
| Comanche | 11673 | 56 |
| Triumph x C. I. 12406 | 13847 | 51 |
| do. | 13848 | 51 |
| Bison$^5$ x C. I. 9058 | 13854 | 51 |
| Pawnee (UWHN Check) | 11669 | 49 |
| Triumph x C. I. 12406 | 13852 | 48 |
| do. | 13849 | 46 |
| Nebred x Cnn-Ky-Mta | 13857 | 46 |
| Triumph x C. I. 12406 | 13851 | 45 |
| Triumph 64 | 13679 | 44 |
| Wichita$^5$ x Cns + Au | 13853 | 43 |
| Svl-Wi-Hope-Cnn-Wi$^2$ x SS27 | 13684 | 40 |
| Triumph x C. I. 12406 | 13850 | 40 |
| Caddo | 13536 | 35 |
| Cnn$^2$ x Ky-Mta | 13856 | 35 |
| Triumph | 12132 | 34 |
| Norin 10 x C. I. 12500 | 13855 | 33 |
| Early Blackhull | 8856 | 29 |

Northern Regional Nursery

| Pedigree | C. I. No. | % surv. UWHN |
|---|---|---|
| Minter | 12138 | 72 |
| Yogo | 8033 | 68 |
| Frontana x Minter$^2$ | 13682 | 67 |
| Yogo x (Tk-Oro 221)-117 | 13542 | 64 |
| Bulk Winterhardiness | 13863 | 64 |
| Lancer | 13547 | 63 |
| Kharkof | 1442 | 63 |
| Winalta | 13670 | 62 |
| Nebred (UWHN Check) | 10094 | 61 |
| (H44 x Minturki$^2$) x Minter | 13858 | 59 |
| Yogo x Cheyenne 1-1-2-1 | 13861 | 58 |
| Warrior | 13190 | 55 |
| Cheyenne | 8885 | 55 |
| Yogo x Cheyenne 11-5-3 | 13862 | 54 |
| Gage | 13532 | 50 |
| Pawnee (UWHN Check) | 11669 | 49 |
| Yogo x Rushmore 57-135 | 13859 | 48 |
| K58-Nth x(Cnn-Tm-Mi-Hope)$^2$ | 13864 | 38 |
| Yogo x Ruxhmore 57-27 | 13860 | 31 |

The general level of hardiness is clearly lower in the southern regional nursery than in the northern. Only 2 southern nursery entries survived better than Nebred. Thirteen southern nursery varieties were less hardy than Pawnee but only 3 northern nursery varieties were poorer than Pawnee. No variety was more hardy than Kharkof in the southern nursery and no experimental appeared to be as hardy as Comanche in the nursery. Several of the Triumph x C. I. 12406 selections were clearly more hardy than Triumph itself. In the northern nursery no experimental variety survived as well as Minter and Yogo. The Yogo x Cheyenne strains from Montana were like Cheyenne in survival and the Yogo x Rushmore strains appeared to be distinctly less hardy than Cheyenne.

## DISEASE NURSERIES

Varieties in the southern and northern regional performance nurseries were tested in the seedling stage against races of Puccinia recondita by L. E. Browder, Manhattan, Kansas. Reaction data are contained in tables 9 and 10. Only 2 varieties in the southern nursery, C. I. 13853 and C. I. 13855, showed resistance to more than 2 races. C. I. 13853 was susceptible only to UN 6: C. I. 13855 was susceptible to UN 6, UN 2, and UN 13. Thirteen varieties were susceptible to all of the races used. Broadest resistance in the northern regional nursery was shown by Gage.

Concho x Ts-$Pn^2$ (Stw 59R2350) and Scout had the best average ratings in the regional streak mosaic nursery (table 11). Mql-Oro x Pn (C. I. 12851) was the most susceptible. Twelve varieties and selections were given better ratings than Bison although only Stw. 59R2350 and Scout were substantially better. In addition to the locations reporting data the nursery also was grown at Manhattan, Garden City, and Colby, Kansas. At Manhattan a part of the nursery was inoculated with a mixture of wheat streak and brome mosaic viruses and the data could not be used. At Garden City the drought was sufficiently severe to make readings impossible. Drought at Colby also interfered with virus symptoms and readings made were of questionable value.

The hard red winter wheat uniform bunt nursery was grown at 8 locations in the region. Seed of each entry also was sent to the Smut Laboratory at Pullman, Washington, for reaction to common bunt tester races. Data received from 5 regional locations and from the Smut Laboratory are summarized in table 12. In the past these data have been distributed in a separate report. They will be a part of the regional report in 1964 and future years.

Only one experimental strain, K 58307, was resistant at all locations in the region and to the 4 bunt tester races as well. Burt x P. I. 178383-C61-9 was highly resistant to the tester races and at all regional locations except Ft. Collins where 20 percent of the heads were smutty. Reasons for the susceptibility of this highly resistant strain at Ft. Collins are not known. Seed mixture may have occurred during packaging or at seeding. A total of 14 varieties and selections were resistant at all locations in the region except Ft. Collins. The high infection of Oro and Oro or Turkey derivatives at Ft. Collins indicates the presence of race L-8 in the inoculum. According to its smut reaction at Ft. Collins and to the tester races, the check variety listed as Ridit is misidentified. Ridit should resist races T-1, T-15, and T-16 as does Wasatch which derives its resistance from Ridit. The presence of L-7 in the inoculum at Bushland, Stillwater, and Manhattan is suggested by the infection of Hussar and to a lesser extent Relief at these stations. The susceptibility of Caddo at the regional stations and to tester race T-1 indicates that it does not carry the smut gene from its Oro parent.

Table 9. Seedling reaction data to physiologic races of Puccinia recondita of the 1964 Southern Regional Performance Nursery.1/

| Variety | C. I. No. | Seedling reaction to P. recondita race: UN1 | UN6 | UN3 | UN9 | UN17 | UN2 | UN2 Ot Vir | UN13 | UN5 | UN10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Kharkof | 1442 | 3 | 3+ | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 0;,4 |
| Early Blackhull | 8856 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Comanche | 11673 | 2+ | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 0;,4 |
| Triumph | 12132 | 3 | 4 | 4 | 4 | 4 | 4 | 3+ | 4 | 4 | 4 |
| Triumph 64 | 13679 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Triumph x CI 12406 61 Stw 8617 | 13847 | 2+ | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Triumph x CI 12406 61 Stw 8620 | 13848 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Triumph x CI 12406 61 Stw 8627 | 13849 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Triumph x CI 12406 61 Stw 8631 | 13850 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Triumph x CI 12406 61 Stw 8635 | 13851 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Triumph x CI 12406 61 Stw 8637 | 13852 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Scout | 13546 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Lancer | 13547 | 2+ | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| $Wi^5$ x Cns + Au (K.6317) | 13853 | 0; | 4 | 0;,4 | 0;,4 | 0-0; | 0;4 | 0 | 0; | 0; | 0;-4 |
| $Bsn^5$ x CI 9058 (K.6322) | 13854 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Caddo | 13536 | 1+ | 4 | 4 | 4 | 1-4,4 | 4 | 4 | 4 | 4 | 0;-2,4 |
| Svl-Wi-Hope-Cnn-$Wi^2$ x Seu Seun | 13684 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Norin 10 x CI 12500 (Tx 1826-1) | 13855 | 0; | 4 | 0;,0;-2 | 0; | 0;,4 | 4 | 0; | 3 | 0;-1+ | 0;,4 |
| $Cnn^2$ x Ky-Mta (N.61608) | 13856 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Nbr. x Cnn-Ky-Mta (N 61660) | 13857 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |

1/ Data from L. E. Browder (ARS), Manhattan, Kansas.

Table 10. Seedling reaction data to physiologic races of Puccinia recondita of the 1964 Northern Regional Performance Nursery.1/

| Variety | C. I. No. | Seedling reaction to P. recondita race: UN1 | UN6 | UN3 | UN9 | UN17 | UN2 | UN2 Ot Vir | UN13 | UN5 | UN10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Kharkof | 1442 | 3 | 4 | 4 | 3+ | 4 | 3+ | 4 | 4 | 4 | 0;-2,4 |
| Minter | 12138 | 3 | 4 | 4 | 4 | 4 | 3+ | 4 | 4 | 4 | 4 |
| Yogo | 8033 | 3 | 4 | 4 | 4 | 4 | 3+ | 4 | 4 | 4 | 4 |
| Warrior | 13190 | 0; | 4 | 4 | 0; | 4 | 4 | 4 | 4 | 4 | 0;-2+ |
| Cheyenne | 8885 | 3 | 4 | 4 | 3+ | 4 | 3+ | 3+ | 4 | 4 | 4 |
| Winalta | 13670 | 3 | 4 | 4 | 3+ | 4 | 3+ | 4 | 4 | 4 | 4 |
| Frontana x Minter$^2$ | 13682 | 3 | 4 | 4 | 3+ | 4 | 3+ | 4 | 4 | 4 | 4 |
| (H44 x Minturki$^2$ x Minter (Minn. 2939) | 13858 | 3 | 4 | 4 | 4 | 4 | 3+ | 4 | 4 | 4 | 4 |
| Lancer | 13547 | 3 | 4 | 4 | 0;,4 | 4 | 3+ | 0? | 4 | 4 | 4 |
| Yogo x (Tk-Oro 221)-117 (Reselected seed) | 13542 | 4 | 4 | 4 | 4 | 4 | 3+ | 4 | 4 | 4 | 4 |
| Yogo x Rushmore 57-135 | 13859 | 3 | 4 | 4 | 0;,4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Yogo x Rushmore 57-27 | 13860 | 3 | 4 | 4 | 0;,4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Yogo x Cheyenne 1-1-2-1 | 13861 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Yogo x Cheyenne 11-5-3 | 13862 | 3 | 4 | 4 | 3+ | 4 | 4 | 4 | 4 | 4 | 4 |
| Bulk Winterhardiness 1376-8 | 13863 | 3 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 |
| Ky 58-Nth x (Cnn-Tm-Mi-Hope)$^2$ (N. 61976) | 13864 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Gage | 13532 | 0; | 0;-3,4 | 3 | 0;,4 | 1-3 | 2+,4 | 4 | 4 | 0;-2+ | 0; |

1/ Data from L. E. Browder (ARS), Manhattan, Kansas.

Table 11. Reaction to streak mosaic of 25 varieties and selections of hard red winter wheat in the regional streak mosaic nursery.

| Pedigree | C. I. or Sel. No. | Mosaic rating (stunting) 1/ | | | | |
|---|---|---|---|---|---|---|
| | | Still-water | Lincoln | Alliance | Hays | 4-sta. average |
| Concho x Ts-Pn$^2$ | Stw59R2350 | 0.5 | 1.5 | 1.0 | 2.0 | 1.3 |
| Scout | 13546 | 2.0 | 1.5 | 0 | 2.0 | 1.4 |
| Concho x Ts-Pn$^2$ | Stw59R2417 | 1.5 | 2.0 | 1.0 | 3.0 | 1.9 |
| Cns$^2$-Ae-Pn x Kiowa | N. 61917 | 2.0 | 2.0 | 1.0 | 3.0 | 2.0 |
| Concho x Ts-Pn$^2$ | Stw59R2420 | 1.5 | 3.0 | 1.0 | 3.0 | 2.1 |
| BlueJacket | 12502 | 2.5 | 2.0 | 1.5 | 3.0 | 2.3 |
| Bsn x Mql-Oro-Tnf-Pn | N. 631454 | 2.0 | 2.0 | 2.0 | 3.0 | 2.3 |
| Bsn x Mql-Oro-Tnf-Pn | N. 631472 | 2.0 | 2.0 | 1.5 | 4.0 | 2.4 |
| Mql-Oro x Oro-Tm | 12406 | 3.0 | 2.5 | 2.0 | 2.0 | 2.4 |
| Cmn x Mi-Hope-Pn-Oro-Ill-Cmn | 13548 | 3.0 | 3.0 | 1.0 | 3.0 | 2.5 |
| Cnn-Pnc x Tk-Cnn | N. 61527 | 3.0 | 3.0 | 1.0 | 3.0 | 2.5 |
| Bison$^5$ x C. I. 9058 | 13854 | 3.0 | 3.0 | 1.0 | 3.0 | 2.5 |
| Bison | 12518 | 2.5 | 2.0 | 3.0 | 3.0 | 2.6 |
| Cnn-Pnc x Tk-Cnn | N. 61528 | 3.0 | 3.0 | 1.5 | 3.0 | 2.6 |
| Cnn-Pnc x Tk-Cnn | N. 61524 | 3.0 | 3.0 | 1.0 | 4.0 | 2.8 |
| Cns$^2$-Ae-Pn x Tmp-Kv-Mql-Kv-Tm | K. 61360 | 3.0 | 4.0 | 1.0 | 3.0 | 2.8 |
| Cimarron x Concho | 54A2-58-A2 | 3.0 | 4.0 | 1.0 | 3.0 | 2.8 |
| Cnn-Pnc x Tk-Cnn | N. 61516 | 3.0 | 3.0 | 2.0 | 3.0 | 2.8 |
| Triumph | 12132 | 2.5 | 3.0 | 3.5 | 2.0 | 2.8 |
| Caddo | 13536 | 2.0 | 3.5 | 3.0 | 3.0 | 2.9 |
| Concho | 12517 | 3.0 | 3.0 | 2.5 | 3.0 | 2.9 |
| Cimarron x Concho | 54A2-58-A1 | 2.5 | 3.0 | 3.5 | 3.0 | 3.0 |
| Pawnee | 11669 | 4.0 | 4.0 | 2.5 | 4.0 | 3.6 |
| Wheat-Ae x Pn | K. 61408 | 4.0 | 5.0 | 4.0 | 3.0 | 4.0 |
| Mql-Oro x Pn | 12851 | 3.5 | 5.0 | 4.5 | 4.0 | 4.3 |

1/ Ratings based on 0-5 scale; 0 = no stunting, 5 = completely stunted.

Table 12. Percent of common bunt in varieties and selections of hard red winter wheat grown in the Uniform Bunt Nursery in 1964 and reaction to selected tester races of common bunt.

| Variety or Selection | C. I. or Sel. No. | Av. percent infection at: Bush-land | Still-water | Man-hattan | Lin-coln | Ft. Collins | Av. infection: 1964 1/ | 1963-1964 | Av. percent infection 2/ T-1 | T-13 | T-15 | T-16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Wasatch | 11925 | 3 | 0 | 0 | 0 | T | 0.7 | 0.4 | 0 | 60 | T | 0 |
| Rex-Rio x Mql-Oro-Oro-Tk-Fn | K58307 | 4 | 0 | 0 | T | 2 | 1.0 | 0.7 | 0 | 1 | 2 | 0 |
| Relief | 10082 | 4 | 5 | 4 | 0 | 5 | 3.6 | 4.3 | 0 | 40 | 33 | 3 |
| Burt x P.I. 178383-C61-9 | --- | 1 | 0 | 0 | 2 | 20? | 4.5 | 2.3 | 0 | 0 | 0 | 0 |
| C.I.12711-Hope-Cnn x Pnc | N63361 | 4 | 5 | 2 | 0 | 50 | 12.2 | | 0 | T | 0 | 40 |
| do. | N63366 | 15 | 1 | 0 | 0 | 48 | 12.7 | | T | 3 | 1 | 65 |
| $Cns^2$-Ae-Pn x Kiowa | N61917 | 1 | 0 | 0 | 0 | 65 | 13.1 | 6.9 | T | 3 | 0 | 15 |
| Hussar | 4843 | 27 | 10 | 9 | 0 | 23 | 13.6 | 7.1 | 0 | 33 | 55 | 2 |
| Cnn-Pnc x Tk-Cnn | N61528 | 7 | T | 0 | T | 70 | 15.4 | | 0 | 2 | 1 | 55 |
| do. | N61527 | 7 | T | T | 0 | 78 | 16.8 | | 0 | 0 | 0 | 73 |
| Ridit | 6703 | 7 | 0 | T | 2 | 77 | 17.1 | 9.6 | 4 | 2 | 12 | 16 |
| Ottawa x Renacimiento | 13517 | 9 | T | 2 | T | 83 | 18.6 | 11.3 | 4 | 2 | 9 | 70 |
| Cnn-Pnc x Tk-Cnn | N61524 | 13 | T | 0 | 0 | 83 | 19.0 | | 0 | 3 | 0 | 68 |
| Oro-Mi-Hope-Ky x Kiowa | K60314 | 11 | T | T | 0 | 85 | 19.2 | 14.3 | 6 | 2 | T | 87 |
| Maria Escobar x Pawnee | K58235 | 8 | T | 2 | T | 88 | 19.4 | 11.6 | 2 | 8 | 7 | 80 |
| Cnn-Pnc x Tk-Cnn | N61516 | 6 | 2 | T | 0 | 90 | 19.6 | | 0 | 0 | 0 | 88 |
| MM-Ech-Rm x $(Hope-Tk-Cnn)^2$ | N61924 | 7 | 5 | 3 | 2 | 85 | 20.4 | 14.7 | 0 | 3 | 0 | 68 |
| Cmn x Mi-Hope-Pn-Oro-Il 1-Cmn | 13548 | 9 | T | 0 | T | 95 | 20.7 | 12.1 | T | 1 | 2 | 93 |
| Mql-Oro-Oro-Tm x KK | K62217 | 16 | T | T | 0 | 90 | 21.1 | | 0 | 2 | 2 | 90 |
| $Bison^5$ x C.I. 9058 | 13854 | 15 | T | 0 | 0 | 95 | 21.9 | | 2 | T | 0 | 90 |
| Oro | 8220 | 20 | 1 | 1 | 6 | 85 | 22.6 | 13.8 | 5 | 6 | 7 | 43 |
| Caddo | 13536 | 8 | 30 | 38 | 22 | 88 | 37.2 | 36.2 | 45 | 58 | 65 | 45 |
| RedChief | 12109 | 66 | 95 | 80 | 53 | 97 | 78.0 | 80.5 | 53 | 60 | 78 | 80 |

1/ Averages calculated before station averages were rounded.

2/ Data from the Regional Cereal Disease Research Laboratory, Pullman, Washington. Infection percentages are an average of Pullman, Wash. and Pendleton, Ore. data.

## QUALITY DATA

Grain samples from regional nurseries are submitted each year to the Hard Winter Wheat Quality Laboratory. Where the amount of available seed permits, amounts as follows are submitted from each location.

| | |
|---|---|
| Uniform Quality Series | 10 pounds |
| Southern Regional Performance Nursery | 1 pound |
| Northern Regional Performance Nursery | 1 pound |

Quality Series samples are evaluated individually from each location. Evaluation of composite samples from each district also is made. Northern and southern regional performance nursery samples are composited from all locations before evaluation. Results are reported to the cooperators by Karl Finney.