UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH ADMINISTRATION
Bureau of Plant Industry,
Soils, and Agricultural Engineering



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# COMPARISON OF WINTER WHEAT VARIETIES GROWN IN COOPERATIVE PLOT AND NURSERY EXPERIMENTS IN THE HARD RED WINTER WHEAT REGION IN 1946

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Lincoln, Nebraska
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UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH ADMINISTRATION
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Soils, and Agricultural Engineering

(NOT FOR PUBLICATION WITHOUT PERMISSION)

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# CORRELATION OF

# WIRES WERE VARIETIES GROWN IN COOPERATIVE

# PLOT AND NURSERY EXPERIMENTS IN THE

# HARD RED WINTER WHEAT REGION

# IN 1934

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Madison, Wisconsin
June - April 6, 1934

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

## IN 1946

By

K. S. Quisenberry, Head Agronomist, 1/
Division of Cereal Crops and Diseases

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Contents



1/ The writer wishes to express his appreciation to Dorothy M. Wilson, Agent, and Ruben M. Heermann of Lincoln, Nebr., for their assistance in assembling the data, making calculations, typing, and stencilling this report. David J. Ward and Phillip E. Lyness, Student Assistants, helped with the calculations and in assembling the data.

## EXPERIMENTS IN 1946

The 1946 crop was the sixteenth one harvested since the cooperative hard red winter wheat improvement program was initiated in 1930. With the close of the war some of the cooperators returned from the service, help became more plentiful, and all operations became more nearly normal. Attention could again be directed to more fundamental research work, since during the war years much emphasis was placed on the increase and distribution of superior varieties.

Methods of operation continued much as before although the trend toward the use of machines continued. At some stations power seeders were used for nursery work, while several stations used mechanical harvesters.

Following the workers' conference held at Manhattan, Kans., in February, 1945, a planning committee was established. This committee, composed of 17 members appointed by the Experiment Station Directors in 8 states, has met several times to assemble a very complete report. This report covers work completed to date, additional work needing attention, and financial support required to handle the work in an adequate manner. The final report should be available in the near future.

The present report presents a summary of the 1946 data from all of the cooperating stations. Where possible, average yields for the 1945-46 period are presented, as well as averages for longer periods. Average yields for the period grown are also expressed as a percentage of Kharkof. The cooperating agencies, stations, and personnel concerned in these experiments are as follows:

### COOPERATING AGENCIES, STATIONS, AND PERSONNEL

(The asterisk (*) indicates Government field stations)

| | | |
|---|---|---|
| **BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING:** | | |
| Division of Cereal Crops and Diseases | | M. A. McCall |
| Wheat Investigations | | S. C. Salmon |
| Hard Red Winter Wheat | | K. S. Quisenberry |
| Rust and Smut | | C. O. Johnston |
| Milling and Baking | | J. A. Shellenberger and J. A. Johnson |
| **TEXAS AGRICULTURAL EXPERIMENT STATION:** | | |
| Agronomy (Corn and Small Grains) | | C. H. McDowell |
| College Station | Agricultural Experiment Station | E. S. McFadden |
| Denton | Substation No. 6 | I. M. Atkins |
| Chillicothe | Substation No. 12 | J. R. Quinby, I. M. Atkins |
| Iowa Park | Substation No. 16 | I. M. Atkins, L. E. Brooks |
| Bushland | Amarillo Experiment Station | David A. Reid |
| **OKLAHOMA AGRICULTURAL EXPERIMENT STATION:** | | |
| Field Crops and Soils | | H. F. Murphy |
| *Lawton | U. S. Dry Land Field Station 2/ | W. M. Osborn |
| Stillwater | A. & M. College | A. M. Schlehuber |
| *Woodward | Southern Great Plains Field Sta. 2/ | A. M. Schlehuber, F. E. Locher, Jr., J. B. Stephenson |
| Goodwell | Panhandle Agr. Exp. Station | Marvin Wakee |

| | | |
|---|---|---|
| **KANSAS AGRICULTURAL EXPERIMENT STATION:** | | |
| Agronomy | | R. I. Throckmorton |
| Manhattan | Kansas State College | H. H. Laude, L. P. Reitz, E. G. Heyne |
| Hays | Ft. Hays Branch Exp. Station | A. F. Swanson |
| Colby | Colby Branch Station | E. H. Coles |
| Garden City | Garden City Agr. Exp. Station | A. E. Lowe, L. M. Sloan |
| **COLORADO AGRICULTURAL EXPERIMENT STATION:** | | |
| Agronomy | | D. W. Robertson |
| *Akron | U. S. Dry Land Field Station 2/ | D. W. Robertson, J. F. Brandon |
| Fort Collins | State Agricultural College | D. W. Robertson |
| Hesperus | Fort Lewis Substation | D. W. Koonce |
| **IOWA AGRICULTURAL EXPERIMENT STATION:** | | |
| Ames | Iowa State College | L. C. Burnett, H. C. Murphy |
| **NEBRASKA AGRICULTURAL EXPERIMENT STATION:** | | |
| Agronomy | | F. D. Keim |
| Crops Research | | T. A. Kiesselbach |
| Lincoln | Agricultural Experiment Station | K. S. Quisenberry |
| North Platte | North Platte Substation | O. J. Webster, L. L. Zook |
| Alliance | Box Butte Experiment Farm | K. S. Quisenberry, Harold Chapman |
| **WYOMING AGRICULTURAL EXPERIMENT STATION:** | | |
| Agronomy | | A. F. Vass |
| Laramie | Agricultural Experiment Station | Dayton Klingman |
| *Sheridan | U. S. Dry Land Field Station 2/ | V. C. Hubbard |
| **SOUTH DAKOTA AGRICULTURAL EXPERIMENT STATION:** | | |
| Agronomy | | W. W. Worzella |
| Brookings | Agricultural Experiment Station | J. E. Grafius |
| **MINNESOTA AGRICULTURAL EXPERIMENT STATION:** | | |
| Agronomy and Plant Genetics | | H. K. Hayes |
| St. Paul | University Farm | E. R. Ausemus |
| Waseca | Southeast Experiment Station | R. E. Hodgson |
| Grand Rapids | | E. R. Ausemus |
| **NORTH DAKOTA AGRICULTURAL EXPERIMENT STATION:** | | |
| Agronomy | | T. E. Stoa |
| Dickinson | Dickinson Substation | R. W. Smith |
| **MONTANA AGRICULTURAL EXPERIMENT STATION:** | | |
| Agronomy | | A. H. Post |
| Bozeman | Montana Experiment Station | R. H. Bamberg |
| Moccasin | Judith Basin Branch Station | R. H. Bamberg |
| Havre | Northern Montana Branch Station | J. J. Sturm |

2/ Cooperation with Division of Dry Land Agriculture, Bureau of Plant Industry, Soils, and Agricultural Engineering, as well as with the State experiment stations.

David A. Reid returned to Bushland, Tex., after spending several years in the Navy. Dr. Atkins had kept the Bushland work going during the war period with the help of Dr. Whitfield, Superintendent of the Station. On October 1, 1946, Mr. Reid resigned to accept a position in Kentucky. Texas and the Region will miss the enthusiastic and efficient work of Mr. Reid.

V. C. Hubbard moved from Woodward, Okla., to Sheridan, Wyo., to become Superintendent of the Station. Mr. Hubbard continued to cooperate during the 1946 season, but he then resigned to return to a North Dakota farm. After so many years Vince will be missed as one of the "gang."

Dr. D. W. Robertson, Ft. Collins, Colo., was appointed Head of the Department of Agronomy of Colorado State College but continued with his wheat and barley work, and has been very active on the planning committee.

During the year Dr. A. M. Schlehuber took charge of the small grain improvement work in Oklahoma. Dr. Schlehuber had been away from small grain work for several years, but he soon remembered the things he had learned in Kansas, Washington, and Montana.

With the completion of this report the writer relinquishes active participation in this program, since a new assignment has moved him to Beltsville, Md. Mr. Louis P. Reitz of Manhattan, Kans., will take over the duties as coordinator, as well as the small grain improvement program in Nebraska, with headquarters at Lincoln. Mr. Reitz needs no introduction, and the program should continue to go forward under his guidance.

## ACCESSION NUMBERS ASSIGNED

The following C. I. 3/ numbers have been assigned to wheats of the Region during the past year.

| C. I. No. | Name | State No. |
|---|---|---|
| 12145 | (Comanche x Honor-Forward) x Hope-Mediterranean x Comanche | Texas sel. No. 171-43-29 |
| 12146 | Martin-Tenmarq x Chiefkan | Texas sel. No. 160-42-33 |
| 12147 | Martin-Tenmarq x Kharkof | Texas sel. No. 43-2142 |
| 12148 | Chiefkan x Oro-Tenmarq | Hays Cereal No. 45-51 |
| 12149 | Kanvale-Tenmarq x Comanche | Kans. No. 2791 |
| 12150 | Turkey (Colorado) | ..... |
| 12500 | Nebraska No. 60 x Medit.-Hope | Nebr. sel. No. 366-26 |
| 12501 | Compound Hybrid (Kanred-Red Rock x Turkey 1062) x Oro-Tilhard | Nebr. No. 1139 |
| 12532 | H44 x Minturki$^2$ | Minn. No. 2765 |

## NEW VARIETIES

One new variety was named during the year.

Minter, Minnesota No. 2713, C. I. No. 12138.

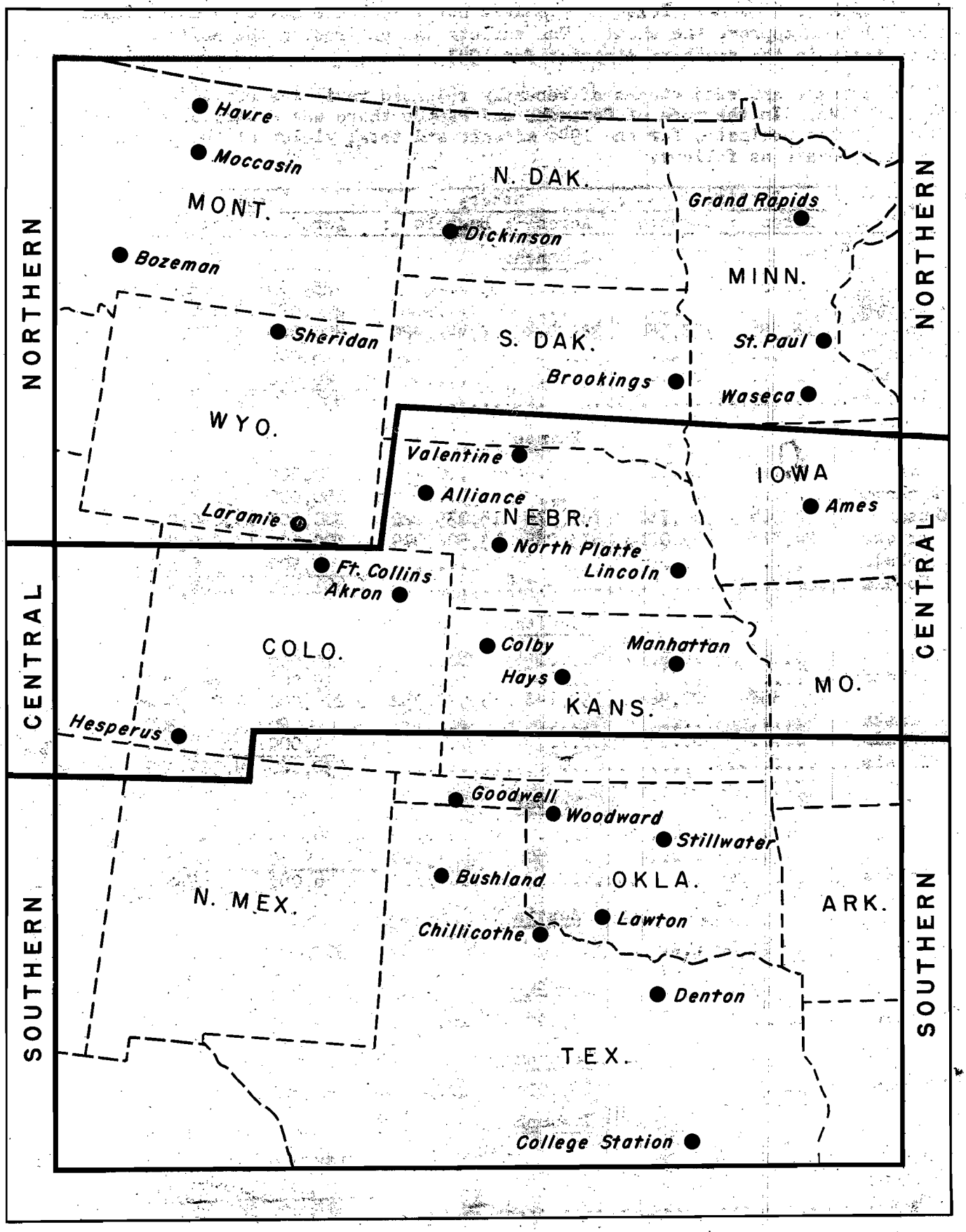
This variety was developed in cooperative tests in Minnesota. For many years it has been carried as H44 x Minturki$^2$ selection but it has developed that it was selected from a Hope x Minturki$^2$ cross. It is outstanding for yield, winterhardiness, rust resistance, and has satisfactory milling and baking characteristics.

3/ C. I. refers to accession numbers of the Division of Cereal Crops & Diseases

A rancher living near Spearman, Tex., was reported to have 50 acres of Blackhull x Hard Federation (C. I. 12120) and was anxious to release it because of its good performance. He was calling the variety "Black Wheat." After conferences with workers from Texas he promised not to release any seed until Texas and/or Oklahoma approve the wheat. The variety was entered in the uniform variety tests in the southern district for 1947.

The acreage and seed stocks of recently released varieties continued to increase in 1946. In the case of Comanche and Pawnee there was a surplus of certified seed. The estimates for the 1946 acreage and total yields of the principal new varieties are as follows:

| State | Certified | | Other | | Total | |
|---|---|---|---|---|---|---|
| | Acres | Bushels | Acres | Bushels | Acres | Bushels |
| **Comanche** | | | | | | |
| Texas | ..... | ..... | ..... | ..... | 325,000 | ..... |
| Oklahoma | ..... | ..... | ..... | ..... | 200,000 | 4,000,000 |
| Kansas | 18,586 | 557,580 | 381,414 | 7,442,420 | 400,000 | 8,000,000 |
| Nebraska | ..... | ..... | ..... | ..... | 5,000 | 100,000 |
| Colorado | ..... | ..... | ..... | ..... | 20,000 | 60,000 |
| Totals | | | | | 950,000 | 12,160,000 |
| **Pawnee** | | | | | | |
| Texas | ..... | ..... | ..... | ..... | 10,000 | ..... |
| Oklahoma | ..... | ..... | ..... | ..... | 150,000 | 3,000,000 |
| Kansas | 32,026 | 960,780 | 767,974 | 15,039,220 | 800,000 | 16,000,000 |
| Nebraska | 26,715 | 499,021 | 673,285 | 13,500,979 | 700,000 | 14,000,000 |
| Colorado | ..... | ..... | ..... | ..... | 1,500 | 4,500 |
| Totals | | | | | 1,661,500 | 33,004,500 |
| **Wichita** | | | | | | |
| Texas | ..... | ..... | ..... | ..... | 10,000 | ..... |
| Oklahoma | ..... | ..... | ..... | ..... | 19,000 | 380,000 |
| Kansas | 852 | 20,448 | 199,148 | 3,979,552 | 200,000 | 4,000,000 |
| Nebraska | ..... | ..... | ..... | ..... | 20 | 300 |
| Colorado | ..... | ..... | ..... | ..... | 1,000 | 2,000 |
| Totals | | | | | 230,020 | 4,382,300 |
| **Westar** | | | | | | |
| Texas | ..... | ..... | ..... | ..... | 6,000 | ..... |
| Kansas | ..... | ..... | 50 | 1,000 | 50 | 1,000 |
| Totals | | | | | 6,050 | 1,000 |
| **Austin** | | | | | | |
| Texas | ..... | ..... | ..... | ..... | 900,000 | ..... |
| **Cache** | | | | | | |
| Montana | ..... | ..... | 5,000 | ..... | 5,000 | ..... |
| **Wasatch** | | | | | | |
| Montana | ..... | ..... | 20,000 | ..... | 20,000 | ..... |
| **Triumph** | | | | | | |
| Texas | ..... | ..... | ..... | ..... | 125,000 | ..... |
| Oklahoma | ..... | ..... | ..... | ..... | 500,000 | 10,000,000 |
| Totals | | | | | 625,000 | 10,000,000 |


Havre
Moccasin
MONT.
N. DAK.
Grand Rapids
Dickinson
Bozeman
MINN.
Sheridan
S. DAK.
St. Paul
Brookings
Waseca
WYO.
Valentine
IOWA
Alliance
Ames
Laramie
NEBR.
North Platte
Lincoln
Ft. Collins
Akron
COLO.
Colby
Manhattan
Hays
MO.
KANS.
Hesperus
Goodwell
Woodward
Stillwater
Bushland
OKLA.
N. MEX.
ARK.
Lawton
Chillicothe
Denton
TEX.
College Station
NORTHERN
NORTHERN
CENTRAL
CENTRAL
SOUTHERN
SOUTHERN

## UNIFORM VARIETIES IN PLOTS

Because of the wide variation in environment encountered in the region from Texas to Montana, it has not seemed advisable to seed the same varieties at all stations. The region has been divided into three districts, as shown by the map on the opposite page, and the varieties grown uniformly at the cooperating experiment stations are somewhat different in each of the three districts. The varieties grown uniformly in each district in 1946 were as follows:

| Variety | C. I. No. | Southern | Central | Northern |
|---|---|---|---|---|
| Kharkof | 1442 | X | X | X |
| Tenmarq | 6936 | X | X | |
| Blackhull | 6251 | X | X | |
| Chiefkan | 11754 | X | X | |
| Comanche | 11673 | X | X | |
| Pawnee | 11669 | X | X | |
| Wichita | 11952 | X | X | |
| Red Chief | 12101 | X | X | |
| Cheyenne x Tenmarq | 11972 | X | X | |
| Early Blackhull | 8856 | | X | |
| Westar | 12110 | | X | |
| Cheyenne x Early Blackhull | 12122 | | X | |
| Nebred | 10094 | | X | |
| Cheyenne | 8885 | | X | |
| Minturki | 6155 | | | X |
| Ponca | 8033 | | | X |
| Rammount | 6700 | | | X |
| Marmin | 11502 | | | X |
| Mont.36-Beloglina x Kanred | 12108 | | | X |
| Minter | 12138 | | | X |
| Kanred x Minturki | 12139 | | | X |

The lists include the most widely grown commercial varieties of the region (considering Kharkof as representing the Turkey type) and some of the more promising new varieties and strains.

At all of the experiment stations, varieties of local interest, in addition to those in the uniform list, were grown. The data for all varieties reported as grown in replicated plots at each station are included in this report.

## PLOT DATA

Conditions for seeding wheat in the fall of 1945 were rather spotted since moisture was lacking in a number of cases. Rains were received in time to insure good stands at all cooperating stations, although in some cases seeding had to be delayed. In general, the behavior at the different stations reflected the condition of the wheat crop in the immediate vicinity. In the Central and Southern districts fall growth was much lighter than usual due to drought. The winter was mild and dry while in late winter and early spring there were threats of dust storms and a very poor crop. Spring rains came at opportune times to prevent failure, but not in time to give a good crop in the Texas and Oklahoma Panhandle Regions. Farther north rains were received in time to insure record yields. Although the winter wheat crop proved to be a record one, it was on the brink of disaster nearly all the way.

In Texas and Oklahoma spring development was rapid and harvest started earlier than ever recorded. Some combining in the Wichita Falls, Tex., area

was completed before May 15, and combining was general by May 30. Farther north heading of early varieties started extremely early but cold weather in early May slowed development. A hard freeze of May 8 to 12, after some wheat was well headed, caused considerable sterility in some fields in Nebraska and Kansas.

Varieties having colored glumes showed this color most clearly here and in Blackhull, Chiefkan, and Red Chief. This was true from Texas to Nebraska and made possible the detection of mixtures that had been missed for many years.

Diseases were not serious in 1946. Some leaf and stem rust were present but not in serious amounts. Loose smut was present in many fields and in some cases bunt was present where farmers had become careless as to seed treatment. Septoria was not as serious as in 1945. The crop in Texas and Oklahoma, while not record-breaking, was good. Kansas had a good crop while the dry Nebraska and Okla. set a new records. In general, farmers harvested from 5 to 20 bushels per acre more than they expected, since the short straw and thin stands caused them to underestimate yields. Plants had stooled just enough, and the small heads were large enough to make use of all moisture available so that test weights were high. Any more growth probably would have led to shriveled grain. As usually the case the 1946 crop was a very unusual one.

Varieties were seeded in yield tests at 26 stations in the fall of 1945. A new station, Cherokee, Okla., was added where data have been obtained in some earlier years. Drought and green bug damage ruined the yield tests at Bushland, and green bugs eliminated the Lawton test in that damage was so spotted. Pawnee suffered the most damage. Winterkilling eliminated the tests at Grand Rapids and Dickinson. Yield and other data for varieties grown at each of the remaining 22 stations are presented in table 1. The generalized standard nurseries for most stations are given and are summarized in table 2.

Data are given only for those characters that showed a contrasting reaction and that may have had an influence on yield. For each station the varieties are listed in order of yield for 1946, and where possible average yields for 1945-46 are shown. Long-time averages and percentages of Kharkof for the years grown are included. For the most part the data need little explanation.

At Denton heading dates ranged from April 6 to 25, and ripening from May 15 to 30. Leaf rust was heavy on susceptible varieties and no doubt had considerable influence on yields. Septoria notes were recorded, and there was some lodging and shattering. Test weights per bushel were low and yields ranged from 34.1 to 16.3 bushels per acre. A Hope-Mediterranean x Fulcaster 3 strain ranked first for yield and a Hope-Mediterranean x Comanche selection second. Westar, Comanche, Pawnee, Triumph, and Austin ranked in the order listed. The lowest yields were recorded for Clarkan, Tenmarq, and Wichita. Tenmarq ranks first for the 1931-46 period, while Comanche and Cheyenne x Tenmarq (C. I. 11972) are at the top for the last 2 years. Based on the percentage of Kharkof for the years grown, Comanche, Pawnee, Chiefkan, and Cheyenne x Tenmarq (C. I. 11972) are at the top of the list.

Heading and ripening dates were somewhat later at Iowa Park than at Denton. Test weights per bushel were higher at this station, and the yield range was from 36.4 to 19.8 bushels per acre. Leaf rust was present and there was a good differential reaction, with Westar and some Mediterranean x Hope hybrids being most resistant. Of the named varieties Kanred, Westar, Comanche, Pawnee, and Austin yielded in the order named, while Turkey, Early Blackhull, and Tenmarq were at the bottom of the list. Westar has yielded above Comanche and Pawnee for the last 2 years, while Wichita and Early Blackhull have been nearly equal.

At Chillicothe leaf rust was present but not heavy with the more resistant strains having readings of 5 percent or less. Test weights were rather high but the yield range was from 23.9 to 14.8 bushels per acre. A number of new hybrid strains ranked at or near the top for yield along with Westar, Kanred, and Chiefkan. Wichita, Triumph, and Early Blackhull were near the bottom for yield. For the period 1938-46 Comanche, Pawnee, and Tenmarq rank the highest, while for 1945-46 Westar, Cheyenne x Early Blackhull (C. I. 12122), Pawnee, and Cheyenne x Tenmarq (C. I. 11972) are at the top.

Seeding was late at Stillwater but fairly good stands were obtained. Straw was rather tall and leaf rust rather heavy. Reliant, Pawnee, and Kawvale had the lowest readings for leaf rust. Lodging was reported, with Cheyenne and Kawvale standing the best and Cheyenne x Early Blackhull (C. I. 12122), Early Blackhull, and Triumph going down badly. Test weights were high but yields were rather low. Pawnee, Cheyenne, and Reliant gave the highest yields, while Early Blackhull, Triumph, and Tenmarq were the lowest. Based on long-time yields, Pawnee, Cheyenne, Reliant, and Comanche are among the better varieties at this station.

Triumph, Westar, and Reliant had the highest average yields in the test at Cherokee. Early Blackhull was above Wichita, while Tenmarq, Turkey, and Kharkof were at the bottom of the list. At this station test weights were all above 60.0 pounds per bushel.

Harvest was early, straw very short, and test weights heavy at Woodward. Yields ranged from 31.1 to 21.1 bushels per acre with Wichita, Chiefkan, Red Chief, and Westar ranking the highest. Of the varieties tested for 15 years, Cheyenne and Tenmarq have had a slight yield advantage over Blackhull, Kharkof, and Early Blackhull. For the last 2 years Cheyenne x Early Blackhull (C. I. 12122), Wichita, Pawnee, and Blackhull x Hard Federation have had a slight advantage. Pawnee, grown for 9 years, has exceeded Kharkof check by 28.3 percent, and Wichita, grown for 5 years, has exceeded the check by 22.3 percent.

At Goodwell test weights were all above 60 pounds per bushel and the yield range was from 28.4 bushels for Cheyenne to 17.2 bushels for Early Blackhull. Cheyenne x Tenmarq (C. I. 11972), Cheyenne x Early Blackhull (C. I. 12122), and Blackhull had good yield records. Blackhull and Cheyenne have given the best long-time average yields. For shorter periods Wichita, Cheyenne x Tenmarq (C. I. 11972), Westar, Red Chief, and Comanche have yielded the highest.

At Manhattan very complete data were reported. Heading dates ranged from April 24 to May 12, while the varieties ripened between June 15 and 21, giving a long fruiting period. Loose smut was recorded as present in some varieties, and leaf rust was fairly heavy, with infections ranging from a trace to 47 percent. For the most part the varieties reacted to leaf rust as in previous tests. Pawnee and Westar, with yields of 31.7 bushels per acre, were at the top of the list, closely followed by Kawvale-Marquillo x Kawvale-Tenmarq (C. I. 12331) and Cheyenne x Tenmarq (C. I. 11972). Tenmarq, Triumph, Blackhull, Comanche, and Wichita were somewhat lower. A new Clark wheat, Super Deluxe Red Chief, yielded slightly less than Chiefkan, but higher than Red Chief. Of the varieties grown for more than one year, Pawnee, Mediterranean-Hope x Pawnee (C. I. 12287), Kawvale-Marquillo x Kawvale x Tenmarq (C. I. 12128), and Cheyenne x Early Blackhull (C. I. 12122) have the best yield records when expressed as a percentage of Kharkof check. Over a 9-year period Pawnee has outyielded Kharkof check by 55.8 percent, while for the same number of years Comanche has exceeded the check by 36.5 percent.

The crop was early at Hays, and the straw was of good height. Hail and frost injury (combined as one note) seemed to have had considerable influence on final yields. Yields were low, ranging from 24.2 bushels per acre for Cheyenne x Tenmarq

(C. I. 11972) to 11.4 bushels for Wichita. The very early varieties were hurt by the May freeze, while the later ones were benefited by the rains of early June. For the 15-year period Early Blackhull, Tenmarq, and Blackhull have had the best average yields, while for 1945-46 Cheyenne x Tenmarq (C. I. 11972), Blackhull x Cheyenne (C. I. 12101), and Chiefkan x Ponca x Tenmarq (C. I. 12133) are at the top of the list of those varieties grown for more than 3 years. Pawnee, Cheyenne x Tenmarq (C. I. 11972), Chiefkan, and Quivira x Tenmarq (C. I. 12116) have the highest yields when they are expressed as a percentage of Kharkof.

The May freeze was very severe at Garden City and caused considerable damage to the early varieties. Test weights were low, with only Red Chief having a weight above 60 pounds per bushel. Red Chief, Blackhull, and Chiefkan had the highest yields in 1946, and for the 2-year average (1945-46) Red Chief and Chiefkan are at the top. Such varieties as Early Blackhull, Westar, Quivira x Tenmarq (C. I. 12116), and Wichita had the lowest yields in 1946, undoubtedly due to the late freeze.

The crop at Colby was not so good as in the two previous years, although the yield range was from 49.7 to 30.8 bushels per acre. Triumph, Cheyenne x Early Blackhull (C. I. 12122), and Cheyenne x Tenmarq (C. I. 11972) gave the highest yields, while Turkey, Wichita, and Pawnee were at the bottom, showing no clear relationship between time of maturity and yield. Cheyenne and Blackhull have the highest average yields for a 10-year period. Of the varieties grown for more than 2 years, Cheyenne x Tenmarq (C. I. 11972), Pawnee, and Quivira x Tenmarq (C. I. 12116) have the highest yields expressed as a percentage of the check variety. After giving the highest average yield for 1944 and 1945, Pawnee was at the bottom of the list in 1946. Cheyenne x Tenmarq (C. I. 11972) appears to have promise at this station.

Winterkilling data were reported from Akron, with Nebred, Pawnee, and Wichita having the poorest survivals. No diseases were noted but frost damage was severe on Early Blackhull and Wichita. Yields ranged from 16.1 bushels per acre for Cheyenne x Tenmarq (C. I. 11972) to 2.1 bushels for Early Blackhull. Cheyenne, Kharkof, Kanred, and Blackhull all had fairly good yields in 1946. Based on the percentage of Kharkof, Kanred-Hard Federation x Minhardi-Minturki (C. I. 11970), Blackhull, Comanche, and Early Blackhull have the best long-time yield records.

Some winterkilling occurred at Ft. Collins, although the differences between varieties were not large. Frost damage was reported but it was heavy on only Wichita and Early Blackhull. Lodging was rather severe in some varieties, but Wichita had the lowest reading, which is surprising. A Colorado selection, Eureka-Minturki x Kanred (A-149) with a yield of 73.2 bushels per acre ranked first, with Cheyenne x Tenmarq (C. I. 11972) second, and Tenmarq third. Wichita and Early Blackhull were at the bottom for yield, due in part to freeze injury. Pawnee, Nebred, and Cheyenne x Tenmarq (C. I. 11972) have the highest 3-year averages (1944-46) and they are among the highest for the 2-year average (1945-46).

The Lincoln test was seeded late due to heavy rains on the normal date. No moisture of consequence was received after seeding until late spring and on several occasions the plants suffered from drought. Heading started early, May 6 for Triumph, and extended until May 25 for Nebraska No. 60. The crop was ripe between June 22 and 26. Culm counts indicate very thin shoots, and straw was unusually short. Leaf rust appeared late and became fairly heavy on susceptible varieties, although Pawnee and Marquillo x Oro (Ks. 38364) showed good resistance. Test weights were low, ranging from 56.9 to 60.8 pounds per bushel. Again Pawnee ranked first for yield followed by Cheyenne x Tenmarq (C. I. 11972) and Cheyenne. Wichita and Blackhull were intermediate for yield, while Nebred,

Triumph, and Turkey were at the bottom. Over a 10-year period Pawnee has exceeded Kharkof check in yield by 31.4 percent. Cheyenne x Tenmarq (C. I. 11972), Wichita, and Cheyenne are well above Kharkof in average yield for longer periods.

The North Platte crop was good with heavy stands, tall straw, and yields that were rather satisfactory. Hot winds just before harvest may have reduced test weights to a slight degree. Cheyenne x Early Blackhull (C. I. 12122) ranked first for yield, followed by Cheyenne x Tenmarq (C. I. 11972) and Local Turkey. Pawnee, Wichita, Tenmarq, and Nebred were lower and Triumph had the lowest yield. For the period 1931-46 Local Turkey and Cheyenne have averages that are nearly identical. Grown for 3 years Cheyenne x Tenmarq (C. I. 11972) has exceeded Kharkof by 24.4 percent. Of the varieties grown for longer periods Wichita, Red Chief, Chiefkan, Pawnee, Local Turkey, Cheyenne, and Comanche have all given good average yields.

The crop at Alliance was light with thin stands, short straw, good test weights, and only fair yields. Some winterkilling was reported with Blackhull and Comanche having the poorest survivals and Cheyenne x Hungarian Sel. (403858) the highest. Compound Hybrid (C. I. 12501) ranked first for yield, followed by Nebraska No. 60, Cheyenne, and Cheyenne x Turkey (C. I. 12142). This last strain is a smut-resistant wheat of the Cheyenne type. At this station later types such as Cheyenne, Nebraska No. 60, and Nebred do the best, with Cheyenne exceeding Kharkof check by 12.4 percent for 9 years.

Winterkilling was very heavy at Waseca, with survivals ranging from 8 percent for Blackhawk to 35 percent for H44 x Minturki (Minn. 2772), while Minturki had a survival of 34 percent. Yields were rather low, and as would be expected followed the survival data rather closely. Marmin x H44-Minhardi (Minn. 2768), Minard-Minhardi x H44-Minhardi (Minn. 2771), and Minturki had the highest average yields. Marmin was somewhat lower in yield and Blackhawk was at the bottom. Tested for 5 years Minter (C. I. 12138) has outyielded Minturki by 16.3 percent, and H44 x Minturki$^2$ (C. I. 12139) has yielded 4.1 percent more than Minturki.

Some winter injury was recorded at St. Paul, with Blackhawk, H44 x Minturki$^3$ (Minn. 2771), and H44 x Minturki$^2$ (C. I. 12532) having the lowest survivals. Leaf rust was rather light with Minturki and Marmin having the highest average infections of 17 and 13 percent, respectively. Three of the H44 x Minturki backcross strains outyielded Minturki and Marmin, while Blackhawk (a soft wheat) was considerably lower. Long-time yield records are not too conclusive since most of the varieties were harvested for the first time in 1946. From the limited data it would seem that some of the H44 x Minturki backcross strains have the yielding ability of Minturki and in addition more leaf rust resistance.

At Sheridan a very good crop was harvested. Cheyenne, Kanred, and H44 x Minturki$^2$ (C. I. 12139) gave the highest yields, while Yogo, Nebred, Karmont, Minturki, and Marmin were lower. Based on long-time averages the better yielding varieties at this station are Cheyenne, Kanred, Yogo, and Montana 36-Beloglina x Kanred (C. I. 12108). In fact, these are the only ones equal to or better than the Kharkof check.

Lodging was light at Bozeman, while test weights and yields were high as usual. Martin x Tenmarq$^3$ (C. I. 11804 and 11823), Yogo, and Martin x Tenmarq$^3$ (C. I. 11824) gave the highest yields. These Martin x Tenmarq selections have resistance to dwarf bunt, and the first two mentioned seem to have ability to

yield at Bozeman. Nebred and Yogo have the highest long-time yield records as expressed by the percentage of Kharkof.

The Moccasin crop was rather poor so far as yields were concerned but the test weights were very good. The highest yields were recorded for Yogo x Ofo Sel. 5, Nebred, and Karmont. At this station the Martin x Temmaro selections were not so outstanding for yield, although C. I. 11823 and 11824 have made good 2-year averages. Yogo has the highest long-time average and Montana 36-Beloglina x Kanred (C. I. 12108) has exceeded the Kharkof check by 6.2 percent for a 5-year period.

At Havre there was no winterkilling, straw was very short, test weights were all above 60 pounds per bushel, and the yield range was from 19.8 to 15.0 bushels per acre. In light of the standard error of the difference it is doubtful if the yield differences are significant. Yogo ranks first for average yield for the period 1931-46, or 14 crops harvested. Based on the 1945-46 average Martin x Temmaro3 (C. I. 11804) and H44 x Minturki5 (C. I. 12179) rank first and second for yield. Here Nebred and Marquis have the lowest long-time averages.

STANDARD ERRORS

Standard errors have been calculated for yields where possible. The accuracy of these errors may be open to question since the plots were not randomized at all of the stations, although random arrangements were used at some stations, especially those using nursery plots. Statisticians do not agree as to whether or not a generalized error obtained from non-randomized plots is of any use. From the agronomic standpoint it is felt that the statistic is of use, although it is realized that the value may not be entirely correct.

The analysis of variance was used for the 1946 yield data at each station. To obtain the standard error of the mean, the square root of the mean square due to error, or the standard deviation, was divided by the square root of the number of replications for each variety. The standard error of a difference was obtained by multiplying the standard error of a mean by $\sqrt{2}$.

The standard error is also expressed as a percentage of the mean yield. The summary of these standard errors is shown in table 2, together with the number of plots and average yields at each station. In this table a footnote indicates the stations at which nursery plots were used in place of field plots.

Table 1.--Agronomic and other data for winter wheat varieties grown in the cooperative variety test at 22 stations in the hard red winter wheat area in 1946 and average yields for various periods from 1931 to 1946.

Iowa Park, Texas
(Rod-row plots; 4 replications)

| Variety | C. I. No. | Date Headed | Date Ripe | Leaf rust | Wt. per bu. | Av. acre yield | Average yield 1945-46 | No. years grown | Percent of Kharkof | Rank |
|---|---|---|---|---|---|---|---|---|---|---|
| | | April | | % | Lbs. | Bu. | Bu. | | | |
| Kanred | 5146 | 28 | 5/30 | 35 | 59 | 36.4 | .... | 1 | 142.2 | 1 |
| Martin-Ten. x Kharkof (42-2862) | .... | 28 | 5/30 | 40 | 57 | 35.9 | 29.5 | 2 | 126.6 | 7 |
| Westar | 12110 | 26 | 5/28 | T | 60 | 34.5 | 31.5 | 2 | 135.2 | 2 |
| Martin-Tenmarq x Kharkof (43-2142) | 12147 | 28 | 5/29 | 20 | 56 | 34.4 | 28.6 | 2 | 122.7 | 11 |
| Med.-Hope x Comanche (157-42-74) | .... | 25 | 5/27 | 0 | 61 | 33.5 | .... | 1 | 130.9 | 3 |
| Comanche Double Cross (171-43-54) | .... | 21 | 5/23 | 5 | 62 | 32.7 | .... | 1 | 127.7 | 5 |
| Martin-Tenmarq x Kharkof (42-2491) | .... | 28 | 5/30 | 30 | 58 | 32.7 | .... | 1 | 127.7 | 5 |
| Martin-Tenmarq x Chiefkan (160-42-358) | .... | 26 | 5/29 | 35 | 60 | 32.2 | .... | 1 | 125.8 | 9 |
| Cheyenne x Tenmarq | 11972 | 30 | 5/31 | 20 | 60 | 31.9 | 28.5 | 2 | 122.3 | 12 |
| Sel. 29-34-275 Double Cross (172-43-210) | .... | 24 | 5/25 | 10 | 61 | 31.8 | .... | 1 | 124.2 | 10 |
| Martin-Tenmarq x Chiefkan (160-42-333) | 12146 | 22 | 5/22 | 40 | 62 | 31.2 | .... | 1 | 121.9 | 14 |
| Cheyenne x Chiefkan (42-2519) | 12129 | 28 | 5/29 | 30 | 60 | 30.8 | 27.4 | 2 | 117.6 | 16 |
| Med.-Hope x Comanche (157-42-61) | .... | 21 | 5/22 | 20 | 60 | 30.4 | 30.0 | 2 | 128.8 | 4 |
| Comanche | 11673 | 23 | 5/25 | 35 | 60 | 28.8 | 26.2 | 2 | 112.4 | 17 |
| Martin-Tenmarq x Chiefkan (160-42-318) | .... | 26 | 5/29 | 25 | 60 | 28.6 | .... | 1 | 111.7 | 18 |
| Cheyenne x Early Blackhull | 12122 | 20 | 5/21 | 80 | 63 | 28.3 | 29.5 | 2 | 126.6 | 7 |
| Pawnee | 11669 | 27 | 5/26 | 15 | 61 | 28.1 | 28.2 | 2 | 121.0 | 15 |
| Austin | 12346 | 27 | 5/30 | 30 | 57 | 26.8 | 28.5 | 2 | 122.3 | 12 |
| Chiefkan | 11754 | 29 | 6/1 | 50 | 62 | 26.1 | 23.0 | 2 | 98.7 | 23 |
| Kharkof | 1442 | 30 | 6/1 | 35 | 59 | 25.6 | 23.3 | 2 | 100.0 | 22 |
| Triumph | 12132 | 18 | 5/18 | 75 | 61 | 24.9 | .... | 1 | 97.3 | 24 |
| Red Chief | 12109 | 28 | 6/1 | 35 | 63 | 24.8 | 23.5 | 2 | 100.9 | 21 |
| Denton | 8265 | 30 | 5/29 | 25 | 59 | 24.6 | 24.3 | 2 | 104.3 | 20 |
| Blackhull | 6251 | 28 | 5/30 | 40 | 62 | 23.9 | 25.0 | 2 | 107.3 | 19 |
| Wichita | 11952 | 18 | 5/18 | 95 | 61 | 23.6 | 21.1 | 2 | 90.6 | 28 |
| Martin-Tenmarq x Chiefkan (42-2374) | .... | 30 | 6/1 | 35 | 60 | 23.3 | .... | 1 | 91.0 | 27 |
| Med.-Hope x Comanche (157-42-183) | .... | 24 | 5/23 | 0 | 61 | 23.0 | 22.1 | 2 | 94.8 | 25 |
| Turkey | 1558 | 5/1 | 6/1 | 45 | 60 | 22.6 | 20.9 | 2 | 89.7 | 29 |
| Early Blackhull | 8856 | 17 | 5/20 | 75 | 63 | 22.1 | 21.5 | 2 | 92.3 | 26 |
| Tenmarq | 6936 | 29 | 5/31 | 35 | 58 | 19.8 | 20.2 | 2 | 86.7 | 30 |

Standard error of a difference between the mean yields of any two varieties = 4.30 bushels.

Table 1.--(Continued.)

Denton, Texas
(Rod-row plots, 8 replications)

| Variety | C. I. No. | Date Headed | Date Ripe | Ht. | Leaf rust | Septoria | Lodging | Shattering | Wt. per bu. | Av. acre yield | Av. yield 1931-1945 | Av. yield 1946 | No. years grown | Percent of Kharkof | Rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Apr. | May | In. | % | % | % | % | Lbs. | Bu. | Bu. | Bu. | | | |
| H.-Med. x Fulcaster 2 114-40-164-4 | ..... | 17 | 22 | 38 | T | 3-4 | 0 | 15 | 59.0 | 34.1 | ..... | ..... | 1 | 127.2 | 6 |
| H.-Med. x Comanche 157-42-183 | ..... | 17 | 21 | 39 | T | 3 | 2 | 2 | 57.0 | 33.5 | ..... | ..... | 1 | 125.0 | 7 |
| Westar | 12110 | 21 | 26 | 41 | 5 | 4-0 | 2 | 2 | 58.0 | 32.1 | ..... | 20.2 | 4 | 131.4 | 4 |
| Comanche | 11673 | 19 | 24 | 28 | 35 | 1-2 | 9 | T | 57.0 | 31.5 | ..... | 22.4 | 8 | 159.6 | 1 |
| Clarkan-Hd.Fed.xH.-Med.125-41-274 | ..... | 22 | 26 | 38 | 6 | 3 | 2 | T | 58.0 | 31.2 | ..... | ..... | 1 | 116.4 | 12 |
| H.-Med. x Fulcaster 2 114-40-166-2 | ..... | 20 | 24 | 37 | T | 3-4 | 0 | T | 59.0 | 30.9 | ..... | 20.5 | 2 | 118.5 | 11 |
| Clarkan-Hd.Fed.xH.-Med.125-40-268 | ..... | 21 | 27 | 39 | 6 | 3 | 40 | T | 58.0 | 30.5 | ..... | ..... | 1 | 113.8 | 15 |
| H.-Med. x Med. 3015-812 115-40-146-1 | ..... | 20 | 24 | 37 | T | 4 | 3 | 15 | 56.0 | 29.5 | ..... | ..... | 1 | 110.1 | 18 |
| Med.-Hd.Fed. x Hope-Med.124-41-103 | ..... | 17 | 25 | 36 | T | 4-0 | 10 | 2 | 59.0 | 29.0 | ..... | ..... | 1 | 108.2 | 21 |
| Pawnee | 11669 | 21 | 25 | 34 | 26 | 2 | 0 | T | 58.0 | 28.8 | ..... | 19.8 | 8 | 138.3 | 2 |
| Clarkan-Hd.Fed.xH.-Med.125-40-354-2 | ..... | 21 | 26 | 38 | 0-5 | 4 | 20 | 5 | 57.0 | 28.6 | ..... | 18.2 | 2 | 105.2 | 24 |
| Cheyenne x Tenmarq | 11972 | 25 | 25 | 35 | 29 | ..... | 42 | T | 58.0 | 28.4 | ..... | 20.9 | 4 | 131.4 | 4 |
| Triumph | 12132 | 6 | 15 | 31 | 86 | 3 | 25 | 2 | 56.0 | 27.2 | ..... | ..... | 1 | 101.5 | 27 |
| Austin | 12346 | 19 | 29 | 40 | 0-50 | 4 | 52 | 0 | 55.0 | 27.2 | ..... | 17.9 | 3 | 122.9 | 9 |
| Hope-Med. x Comanche 157-42-61 | ..... | 18 | 22 | 38 | 5 | 3 | 18 | 2 | 55.0 | 27.2 | ..... | ..... | 1 | 101.5 | 27 |
| Mediterranean sel. 3015-81 | 10086 | 21 | 26 | 38 | 22 | 2 | 20 | 2 | 57.0 | 27.1 | 22.1 | 18.2 | 15 | 106.3 | 23 |
| Kharkof | 1442 | 25 | 31 | 36 | 40 | 2-3 | 35 | 0 | 55.0 | 26.8 | 20.8 | 17.3 | 15 | 100.0 | 30 |
| Hope-Hd.Fed.xH.-Med. 124-41-238 | ..... | 21 | 26 | 38 | 10 | 2-3 | 52 | 12 | 56.0 | 26.8 | ..... | 17.5 | 2 | 101.2 | 29 |
| Denton | 8265 | 22 | 30 | 43 | 38 | 2-3 | 10 | T | 58.0 | 26.4 | 22.9 | 17.7 | 15 | 110.1 | 18 |
| Med.-Hd Fed.xH.-Med. 124-41-215 | ..... | 16 | 24 | 40 | 6 | 3-4 | 20 | 35 | 57.0 | 25.8 | ..... | 16.3 | 2 | 94.2 | 32 |
| Red May sel. 12501 | ..... | 19 | 22 | 36 | 50 | 3 | 5 | 12 | 56.0 | 25.8 | ..... | 17.7 | 6 | 109.4 | 20 |
| Hope-Med. x Comanche 157-42-44 | ..... | 21 | 26 | 37 | T | 4 | 12 | T | 57.0 | 25.3 | ..... | ..... | 1 | 94.4 | 31 |
| Med.-Hd.Fed. x H.-Med.124-41-130 | ..... | 20 | 24 | 41 | T | 4-5 | 50 | 22 | 57.0 | 25.1 | ..... | ..... | 1 | 93.7 | 33 |
| Med.-Hd.Fed. x H.-Med.124-41-196 | ..... | 14 | 23 | 38 | 12 | 2 | 8 | 2 | 57.0 | 25.0 | ..... | ..... | 1 | 93.3 | 34 |
| Cheyenne x Early Blackhull | 12122 | 15 | 19 | 34 | 68 | ..... | 25 | T | 57.5 | 24.9 | ..... | 18.7 | 2 | 108.1 | 22 |
| Kanred | 5146 | 24 | 27 | 36 | 72 | 4 | 10 | T | 55.0 | 24.2 | 24.1 | 16.7 | 15 | 115.9 | 13 |
| Cheyenne x Chiefkan | 12129 | 24 | 26 | 36 | 44 | ..... | 20 | 0 | 58.0 | 24.0 | ..... | ..... | 1 | 89.6 | 35 |
| Red Chief | 12109 | 20 | 26 | 40 | 50 | 2 | 0 | 0 | 60.0 | 23.7 | ..... | 15.4 | 4 | 110.3 | 17 |
| Early Blackhull | 8856 | 8 | 16 | 35 | 81 | ..... | 55 | 2 | 57.0 | 23.6 | 24.9 | 16.8 | 13 | 122.1 | 10 |
| Blackhull | 6251 | 24 | 30 | 37 | 20 | ..... | 25 | 0 | 56.0 | 23.5 | 23.1 | 16.1 | 15 | 111.1 | 16 |
| Fulcaster | 6471 | 21 | 26 | 42 | 79 | 1-2 | 10 | 8 | 57.5 | 22.5 | 21.4 | 15.6 | 15 | 102.9 | 26 |
| Chiefkan | 11754 | 24 | 28 | 39 | 49 | 2 | 20 | T | 57.0 | 22.3 | ..... | 15.5 | 8 | 137.6 | 3 |
| Clarkan | 8858 | 24 | 30 | 42 | 16 | 1 | 9 | 2 | 58.0 | 22.2 | ..... | 15.1 | 12 | 114.6 | 14 |
| Tenmarq | 6936 | 24 | 27 | 34 | 60 | 2 | 15 | T | 56.0 | 20.2 | 25.8 | 14.0 | 15 | 124.0 | 8 |
| Wichita | 11952 | 14 | 16 | 33 | 71 | ..... | 60 | 5 | 56.0 | 16.3 | ..... | 11.6 | 4 | 104.9 | 25 |

Standard error of a difference between the mean yields of any two varieties = 2.45 bushels.

1/ Degree of susceptibility 0 to 4.

Table 1.--(Continued.)

## Chillicothe, Texas

(Rod-row plots; 8 replications)

| Variety | C. I. No. | Date headed | Leaf rust | Wt. per bu. | Av. acre yield | Average yield 1938-1946 | Rank | 1945-1946 | Rank | No. years grown | Percent of Kharkof | Rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | April | % | Lbs. | Bu. | Bu. | | Bu. | | | | |
| Martin-Ten. x Kharkof (42-2862) | ..... | 25 | 25 | 60 | 23.9 | .... | .. | .... | .. | 1 | 123.2 | 4 |
| Westar | 12110 | 24 | 0 | 60 | 25.6 | .... | .. | 23.7 | 1 | 3 | 126.9 | 3 |
| Cheyenne x Chiefkan | 12129 | 26 | 20 | 63 | 23.4 | .... | .. | 21.6 | 5 | 2 | 132.5 | 2 |
| Kanred | 5146 | 26 | 20 | 60 | 23.2 | 17.3 | 7 | 18.4 | 11 | 9 | 104.8 | 19 |
| Chiefkan | 11754 | 24 | 10 | 62 | 23.0 | 17.6 | 6 | 19.9 | 7 | 9 | 106.7 | 17 |
| Martin-Tenmarq x Chiefkan | 12146 | 24 | 10 | 61 | 22.9 | .... | .. | .... | .. | 1 | 118.0 | 10 |
| Martin-Tenmarq x Chiefkan (160-42-318) | ..... | 26 | 5 | 61 | 22.7 | .... | .. | .... | .. | 1 | 117.0 | 11 |
| Martin-Tenmarq x Kharkof | 12147 | 24 | 20 | 61 | 21.9 | .... | .. | 19.8 | 8 | 2 | 121.5 | 6 |
| Martin-Ten. x Chiefkan (42-23-74) | ..... | 26 | 5 | 60 | 21.7 | .... | .. | 20.5 | 10 | 1 | 111.9 | 13 |
| Pawnee | 11669 | 23 | 5 | 60 | 21.6 | 19.5 | 2 | 23.0 | 3 | 9 | 118.2 | 8 |
| Martin-Ten. x Kharkof (42-2492) | ..... | 24 | 20 | 58 | 21.2 | .... | .. | 17.3 | 13 | 2 | 106.1 | 18 |
| Cheyenne x Early Blackhull | 12122 | 20 | 25 | 62 | 20.9 | .... | .. | 23.6 | 2 | 2 | 134.6 | 1 |
| Comanche | 11673 | 24 | 15 | 60 | 20.0 | 19.6 | 1 | 22.4 | 4 | 9 | 118.8 | 7 |
| Tenmarq | 6936 | 26 | 20 | 62 | 19.7 | 19.1 | 3 | 17.4 | 12 | 9 | 113.8 | 12 |
| Red Chief | 12109 | 24 | 15 | 63 | 19.6 | .... | .. | 18.7 | 10 | 5 | 109.4 | 15 |
| Cheyenne x Tenmarq | 11972 | 26 | 15 | 62 | 19.4 | .... | .. | 22.1 | 4 | 4 | 122.2 | 5 |
| Comanche x Med.-Hope (157-42-74) | ..... | 24 | 0 | 60 | 19.4 | .... | .. | 20.8 | 9 | 1 | 100.0 | 21 |
| Kharkof | 1442 | 26 | 30 | 62 | 19.4 | 16.5 | 9 | 16.3 | 15 | 9 | 100.0 | 21 |
| Blackhull | 6251 | 26 | 30 | 63 | 19.2 | 18.1 | 4 | 16.7 | 14 | 9 | 109.7 | 14 |
| Turkey | 1558 | 26 | 30 | 61 | 18.5 | 16.9 | 8 | 15.2 | 16 | 9 | 102.4 | 20 |
| Wichita | 11952 | 17 | 25 | 64 | 18.2 | .... | .. | 19.7 | 9 | 5 | 118.2 | 8 |
| Comanche x Med.-Hope (157-42-61) | ..... | 24 | 5 | 59 | 17.6 | .... | .. | .... | .. | 1 | 90.7 | 23 |
| Triumph | 12132 | 16 | 20 | 61 | 16.9 | .... | .. | .... | .. | 1 | 87.1 | 24 |
| Early Blackhull | 8856 | 16 | 20 | 63 | 16.3 | 17.8 | 5 | 20.6 | 6 | 9 | 107.9 | 16 |
| Comanche x Med.-Hope (157-42-183) | ..... | 24 | 0 | 58 | 14.8 | .... | .. | .... | .. | 1 | 76.3 | 25 |

Standard error of a difference between the mean yields of any two varieties = 2.39 bushels.

See Okla. exhibit bul. for data in other years

Table 1.--(Continued.)

Stillwater, Oklahoma

(Four, 1/95.7 acre plots, seeded Oct. 23)

| Variety | C. I. No. | Stand | Date Headed | Date Ripe | Ht. | Leaf rust 5/7 2/ Prevalence | Leaf rust 5/7 2/ Severity | Leaf rust 5/7 2/ Response | Lodging | Wt. per bu. | Av. acre yield | Av. yield 1931-1946 | Av. yield 1945-1946 | No. years grown | Percent of Kharkof | Rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | % | June | In. | % | % | 3/ | % | Lbs. | Bu. | Bu. | Bu. | | | |
| Pawnee | 11669 | 95 | 5/2 | 10 | 36 | 100 | 28 | S | 13 | 61.6 | 27.8 | ... | 29.0 | 6 | 122.1 | 1 |
| Cheyenne | 8885 | 85 | 5/8 | 13 | 36 | 100 | 79 | CS | 8 | 60.3 | 24.1 | 27.5 | 24.5 | 14 | 103.4 | 12 |
| Reliant | 12144 | 88 | 5/5 | 13 | 39 | 100 | 24 | S | 14 | 62.8 | 23.9 | ... | 24.9 | 4 | 121.6 | 2 |
| Red Chief | 12109 | 91 | 5/1 | 13 | 39 | 100 | 78 | CS | 10 | 62.4 | 23.5 | ... | 23.2 | 4 | 113.4 | 5 |
| Clarkan | 8858 | 93 | 5/4 | 13 | 44 | 100 | 53 | CS | 14 | 60.8 | 23.3 | ... | 21.6 | 10 | 105.1 | 10 |
| Chiefkan | 11754 | 85 | 5/4 | 13 | 40 | 100 | 73 | CS | 19 | 60.9 | 22.1 | ... | 22.4 | 8 | 104.0 | 11 |
| Cheyenne x Tenmarq | 11972 | 86 | 5/6 | 13 | 37 | 100 | 58 | CS | 15 | 60.2 | 21.5 | ... | 23.6 | 4 | 110.8 | 7 |
| Kawvale | 8180 | 89 | 5/8 | 13 | 38 | 100 | 29 | S | 9 | 59.2 | 21.1 | 26.4 | 22.0 | 14 | 99.2 | 15 |
| Blackhull | 6251 | 91 | 5/7 | 13 | 39 | 100 | 71 | CS | 26 | 60.5 | 20.8 | 27.0 | 22.3 | 13 | 102.3 | 13 |
| Westar 1/ | 12110 | 86 | 5/7 | 14 | 37 | 100 | 34 | I | 13 | 60.4 | 20.8 | ... | 22.1 | 2 | 113.3 | 6 |
| Chey. x Ta. Blackhull 1/ | 12282 | 91 | 4/30 | 11 | 35 | 100 | 51 | CS | 50 | 61.3 | 20.7 | ... | 19.5 | 1 | 110.1 | 9 |
| Wichita | 11952 | 83 | 4/28 | 5 | 35 | 100 | 88 | CS | 25 | 61.3 | 19.2 | ... | 18.9 | 3 | 115.3 | 4 |
| Comanche | 11673 | 93 | 5/4 | 11 | 37 | 100 | 76 | CS | 26 | 59.2 | 19.0 | ... | 20.4 | 6 | 115.6 | 3 |
| Kharkof | 1442 | 90 | 5/8 | 13 | 37 | 100 | 86 | CS | 19 | 59.7 | 18.8 | 26.6 | 19.5 | 14 | 100.0 | 14 |
| Early Blackhull | 8856 | 90 | 4/24 | 3 | 36 | 100 | 77 | CS | 43 | 62.1 | 18.1 | 24.8 | 23.2 | 14 | 93.2 | 17 |
| Triumph | 12132 | 89 | 4/23 | 2 | 32 | 100 | 79 | CS | 43 | 61.8 | 18.0 | ... | 22.2 | 4 | 110.8 | 7 |
| Tenmarq | 6936 | 88 | 5/7 | 13 | 36 | 100 | 95 | CS | 20 | 58.7 | 14.2 | 26.3 | 17.5 | 14 | 98.9 | 16 |

Standard error of a difference between the mean yields of any two varieties = 1.75 bushels.

1/ Seeded Nov. 3, 1945.

2/ Notes taken by Botany and Plant Pathology Dept., Oklahoma A. & M. College.

3/ S = susceptible; CS = completely susceptible; I = intermediate.

Table 1.--(Continued.)

Cherokee, Oklahoma

(Single drill strips - 4-rod rows harvested from each variety; seeded Nov. 8, 1945.)

| Variety | C. I. No. | Stage of maturity on June | Ht. | Weight per bushel | Av. yield per acre | No. years grown | Percent of Kharkof |
|---|---|---|---|---|---|---|---|
| | | | In. | Lbs. | Bu. | | |
| Triumph | 12132 | ripe | 30 | 63.8 | 35.1 | 1 | 182.8 |
| Westar | 12110 | 5% ripe | 31 | 62.2 | 34.2 | 1 | 178.1 |
| Reliant | 12144 | green | 32 | 63.4 | 32.5 | 1 | 169.3 |
| Early Blackhull | 8856 | 75% ripe | 36 | 63.4 | 31.5 | 1 | 164.1 |
| Cheyenne x Early Blackhull | 12122 | 15% ripe | 31 | 63.8 | 30.6 | 1 | 159.4 |
| Chiefkan | 11754 | green | 35 | 62.9 | 30.2 | 1 | 157.3 |
| Red Chief | 12109 | changing color | 36 | 63.6 | 30.2 | 1 | 157.3 |
| Cheyenne x Tenmarq | 11972 | green | 32 | 61.7 | 27.6 | 1 | 143.8 |
| Cheyenne | 8885 | very green | 33 | 61.4 | 25.6 | 1 | 133.3 |
| Pawnee | 11669 | 15-25% ripe | 29 | 61.8 | 25.3 | 1 | 131.8 |
| Wichita | 11952 | 25% ripe | 33 | 63.5 | 24.6 | 1 | 128.1 |
| Comanche | 11673 | 5-10% ripe | 31 | 60.4 | 24.2 | 1 | 126.0 |
| Blackhull | 6251 | green | 31 | 63.0 | 23.0 | 1 | 119.8 |
| Tenmarq | 6936 | green | 30 | 60.0 | 21.3 | 1 | 110.9 |
| Turkey | 1558 | very green | 32 | 61.0 | 19.8 | 1 | 103.1 |
| Kharkof | 1442 | green | 30 | 60.5 | 19.2 | 1 | 100.0 |

Standard errom of a difference between the mean yields of any two varieties = 2.39 bushels.

Table 1.--(Continued.)

Woodward, Oklahoma

(Four, 1/51st-acre plots, two on fallow, two on cropped land)

| Variety | C. I. No. | Date Headed | Date Ripe | Ht. | Wt. per bu. | Av. acre yield 1931-1946 | Av. yield 1945 | Av. yield 1946 | No. years grown | Percent of Kharkof | Rank |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | April | | In. | Lbs. | Bu. | Bu. | Bu. | | | |
| Wichita | 11952 | 15 | 5/20 | 27 | 61.8 | 31.1 | .... | 32.2 | 5 | 122.3 | 3 |
| Chiefkan | 11764 | 25 | 5/30 | 26 | 63.3 | 30.7 | .... | 29.4 | 10 | 112.4 | 8 |
| Red Chief | 12109 | 23 | 5/27 | 26 | 63.5 | 30.3 | .... | 30.8 | 5 | 117.7 | 6 |
| Westar | 12110 | 22 | 5/26 | 26 | 61.5 | 29.9 | .... | 30.9 | 3 | 110.1 | 10 |
| Triumph | 12132 | 14 | 5/20 | 27 | 62.3 | 28.6 | .... | 29.9 | 2 | 119.1 | 5 |
| Comanche | 11673 | 21 | 5/26 | 26 | 61.0 | 28.5 | .... | 30.3 | 9 | 121.0 | 4 |
| Pawnee | 11669 | 24 | 5/24 | 24 | 61.3 | 28.4 | .... | 31.3 | 9 | 128.3 | 2 |
| Blackhull x Hd. Federation | 12120 | 19 | 5/27 | 25 | 63.0 | 26.3 | .... | 31.3 | 4 | 110.5 | 9 |
| Early Blackhull | 8856 | 16 | 5/19 | 28 | 62.0 | 26.1 | 27.0 | 25.1 | 15 | 96.4 | 15 |
| Cheyenne | 8865 | 27 | 6/3 | 23 | 62.0 | 25.9 | 30.1 | 28.3 | 15 | 107.5 | 11 |
| Cheyenne x Tenmarq | 11972 | 25 | 5/27 | 23 | 61.5 | 25.9 | .... | 30.2 | 4 | 107.3 | 7 |
| Cheyenne x Early Blackhull | 12122 | 16 | 5/22 | 25 | 62.3 | 24.8 | .... | 32.5 | 2 | 129.5 | 1 |
| Blackhull | 6251 | 24 | 5/27 | 26 | 62.8 | 24.6 | 28.0 | 26.7 | 15 | 100.0 | 13 |
| Tenmarq | 6936 | 22 | 5/24 | 25 | 61.8 | 22.7 | 30.0 | 25.6 | 15 | 107.1 | 12 |
| Kharkof | 1442 | 29 | 6/4 | 23 | 62.0 | 21.1 | 28.0 | 25.1 | 15 | 100.0 | 13 |

Standard error of a difference between the mean yields of any two varieties = 3.65 bushels.

Table 1.--(Continued.)

Goodwell, Oklahoma

Five (~~Four~~, rod-row plots)

| Variety | C. I. No. | Weight per bushel | Av. acre yield 1931-1946 | Av. yield 1945-1946 | No. years grown | Percent of Kharkof | Rank |
|---|---|---|---|---|---|---|---|
| | | Lbs. | Bu. | Bu. | | | |
| Cheyenne | 8885 | 61.8 | 28.4 | 24.4 | 23.2 | 8 | 105.0 | 10 |
| Cheyenne x Tenmarq | 11972 | 62.1 | 28.0 | .... | 24.5 | 3 | 143.9 | 3 |
| Cheyenne x Early Blackhull | 12122 | 62.0 | 26.4 | .... | 22.8 | 2 | 147.4 | 2 |
| Blackhull | 6251 | 62.0 | 25.5 | 24.6 | 23.0 | 9 | 107.9 | 9 |
| Wichita | 11952 | 62.8 | 25.1 | .... | 23.4 | 3 | 149.7 | 1 |
| Westar | 12110 | 61.7 | 25.1 | .... | 21.9 | 3 | 134.8 | 4 |
| Chiefkan | 11754 | 62.1 | 25.0 | .... | 21.2 | 5 | 123.9 | 7 |
| Tenmarq | 6936 | 61.1 | 24.0 | 21.7 | 19.1 | 9 | 95.2 | 12 |
| Red Chief | 12109 | 62.7 | 23.8 | .... | 20.9 | 3 | 134.2 | 5 |
| Comanche | 11673 | 61.5 | 22.9 | .... | 22.4 | 5 | 129.5 | 6 |
| Pawnee | 11669 | 61.3 | 22.0 | .... | 19.8 | 5 | 122.7 | 7 |
| Kharkof | 1442 | 60.5 | 21.1 | 22.8 | 15.5 | 15 | 100.0 | 11 |
| Triumph | 12132 | 62.3 | 19.4 | .... | .... | 1 | 91.9 | 13 |
| Early Blackhull | 8856 | 61.4 | 17.2 | 19.8 | 17.4 | 9 | 86.8 | 14 |

Standard error of a difference between the mean yields of any two varieties = 2.33 bushels.

Table 1.--(Continued.)

Manhattan, Kansas

(Three, 1/50-acre plots; seeded Oct. 6; emerged Oct. 13)

| Variety | C. I. No. | Date Headed | Date Ripe | Ht. | Wt. per bu. | Av. acre yield 1946 | Av. yield 1931-1945, 1946 | No. years grown | % of Kharkof | Rank |
|---|---|---|---|---|---|---|---|---|---|---|
| | | May | June | Inches | Lbs. | Bu. | Bu. | | | |
| Pawnee | 11669 | 2 | 17 | 37 | 58.0 | 31.7 | .... 39.5 | 9 | 155.8 | 2 |
| Westar | 12110 | 7 | 20 | 41 | 57.6 | 31.7 | .... 36.1 | 2 | 139.9 | 12 |
| Kaw.-Mqo. x Kaw.-Teng. | 12351 | 5 | 17 | 37 | 58.9 | 31.4 | .... .... | 1 | 159.4 | 1 |
| Cheyenne x Tenmarq | 11978 | 10 | 21 | 38 | 58.7 | 31.3 | .... 35.5 | 7 | 140.5 | 11 |
| Tenmarq sel. | 12125 | 7 | 19 | 41 | 58.6 | 30.6 | .... 35.2 | 3 | 138.1 | 14 |
| Quivira x Tenmarq | 12116 | 5 | 17 | 39 | 60.0 | 30.3 | .... 35.4 | 4 | 133.2 | 19 |
| Tenmarq | 6936 | 7 | 19 | 41 | 57.5 | 30.1 | 32.6 32.3 | 15 | 114.8 | 26 |
| Med.-Hope x Pawnee (Ks.2788) | .... | 4 | 16 | 38 | 57.3 | 29.4 | .... .... | 1 | 149.2 | 4 |
| Chiefkan x Oro-Tenmarq | 12133 | 2 | 17 | 37 | 59.4 | 29.3 | .... .... | 1 | 148.7 | 5 |
| Cheyenne x E. Blackhull | 12114 | 4/26 | 16 | 33 | 58.9 | 29.2 | .... .... | 1 | 148.2 | 6 |
| Cheyenne x E. Blackhull | 12122 | 4/28 | 16 | 36 | 60.0 | 28.9 | .... 33.2 | 3 | 143.2 | 8 |
| Blackhull x Cheyenne | 12101 | 9 | 20 | 37 | 58.6 | 28.8 | .... 32.4 | 2 | 125.6 | 22 |
| Triumph | 12132 | 4/24 | 15 | 34 | 59.4 | 28.2 | .... .... | 1 | 143.1 | 9 |
| Blackhull | 6251 | 10 | 21 | 40 | 59.4 | 28.2 | 31.2 29.8 | 15 | 109.9 | 30 |
| Med.-Hope x Pawnee(Ks.2789) | .... | 4 | 17 | 36 | 57.8 | 28.1 | .... .... | 1 | 142.6 | 10 |
| Comanche | 11673 | 4 | 18 | 39 | 58.8 | 27.9 | .... 34.2 | 9 | 139.5 | 15 |
| Early Blackhull | 8856 | 4/24 | 15 | 38 | 60.3 | 27.6 | 30.8 29.3 | 15 | 108.5 | 31 |
| Chiefkan x Oro-Teng. | 12134 | 3 | 17 | 38 | 58.1 | 27.4 | .... .... | 1 | 139.1 | 13 |
| Kaw.-Mqo. x Kaw.-Teng. | 12128 | 5 | 18 | 36 | 59.3 | 27.2 | .... 37.9 | 2 | 146.9 | 7 |
| Chiefkan | 11754 | 6 | 20 | 43 | 59.2 | 27.1 | .... 30.3 | 9 | 123.2 | 23 |
| Super Deluxe R.C.(Ks.581) | .... | 4 | 19 | 41 | 61.1 | 26.7 | .... .... | 1 | 135.5 | 16 |
| Med.-Hope x Pawnee | 12287 | 3 | 16 | 37 | 57.7 | 26.6 | .... 39.4 | 2 | 152.7 | 3 |
| Mqo.-Teng. x Kaw.-Teng. | 12127 | 7 | 18 | 37 | 58.7 | 26.4 | .... 34.0 | 2 | 131.8 | 20 |
| Kanred | 5146 | 11 | 21 | 41 | 54.8 | 26.4 | 29.0 27.1 | 15 | 102.4 | 32 |
| Harvest Queen x Kawvale | 12284 | 6 | 19 | 41 | 56.9 | 26.3 | .... .... | 1 | 133.5 | 18 |
| Clarkan | 8858 | 9 | 20 | 45 | 55.5 | 26.1 | 32.2 30.2 | 15 | 113.4 | 29 |
| Kay | 12369 | 3 | 16 | 39 | 57.3 | 25.7 | .... .... | 1 | 130.5 | 21 |
| Cheyenne | 8885 | 10 | 20 | 37 | 55.6 | 25.6 | 32.7 30.3 | 15 | 115.1 | 27 |
| Kaw. x Oakley (Ks.2778) | .... | 5 | 17 | 41 | 56.1 | 24.8 | .... 30.8 | 2 | 119.4 | 25 |
| Wichita | 11952 | 4/27 | 15 | 37 | 57.8 | 24.6 | .... 30.2 | 7 | 133.6 | 17 |
| Turkey | 1558 | 12 | 21 | 40 | 56.7 | 24.5 | 28.8 25.8 | 15 | 101.4 | 33 |
| Red Chief | 12109 | 4 | 19 | 40 | 60.6 | 24.5 | .... 29.4 | 6 | 116.5 | 26 |
| Kharkof | 1442 | 12 | 21 | 39 | 53.3 | 19.7 | 28.4 25.8 | 15 | 100.0 | 34 |
| Kawvale | 8180 | 7 | 17 | 40 | 55.9 | 18.2 | 34.0 28.9 | 15 | 119.7 | 24 |

Standard error of a difference between the mean yields of any two varieties = 1.87 bushels.

Table 1.--(Continued.)

Manhattan, Kansas

(Additional agronomic data on winter wheat varieties grown on Agronomy Farm)

| C. I. No. | Loose smut | Leaf rust 1/ | No. culms per acre | Size of grain | Size of head: Number kernels | Size of head: Wt. of grain | Number kernels per acre |
|---|---|---|---|---|---|---|---|
| | | | 0000 | G. per 1000 | | Mgm. | 00000 |
| 11669 | 0.0 | 15 | 193 | 32.9 | 13.6 | 446 | 262 |
| 12110 | .1 | 2 | 147 | 36.5 | 16.1 | 587 | 236 |
| 12331 | 0.0 | T | 187 | 34.0 | 13.5 | 457 | 251 |
| 11972 | 2.0 | 15 | 171 | 34.7 | 14.3 | 496 | 245 |
| 12125 | .2 | 30 | 164 | 35.3 | 14.4 | 509 | 236 |
| 12116 | .3 | 12 | 166 | 32.1 | 15.5 | 496 | 257 |
| 6936 | 2.0 | 30 | 154 | 34.5 | 15.4 | 532 | 238 |
| Ks. 2788 | 2.0 | T | 178 | 33.2 | 13.6 | 450 | 242 |
| 12133 | .4 | 30 | 183 | 33.7 | 13.0 | 437 | 237 |
| 12114 | 2.0 | 23 | 198 | 34.7 | 11.6 | 400 | 229 |
| 12122 | .3 | 37 | 191 | 33.9 | 12.1 | 411 | 238 |
| 12101 | .2 | 40 | 179 | 31.5 | 13.9 | 438 | 248 |
| 12132 | .1 | 45 | 152 | 37.2 | 13.6 | 506 | 207 |
| 6251 | .5 | 33 | 167 | 31.3 | 14.7 | 458 | 245 |
| Ks. 2789 | 3.0 | T | 186 | 32.7 | 12.6 | 411 | 233 |
| 11673 | .2 | 7 | 139 | 34.3 | 15.9 | 545 | 221 |
| 8856 | .3 | 40 | 156 | 36.0 | 13.4 | 480 | 209 |
| 12134 | 1.0 | 22 | 166 | 33.8 | 13.3 | 449 | 220 |
| 12128 | 0.0 | T | 172 | 34.5 | 12.5 | 429 | 214 |
| 11754 | 2.0 | 20 | 137 | 33.1 | 16.3 | 540 | 223 |
| Ks. 581 | ... | 37 | 138 | 34.8 | 15.1 | 526 | 209 |
| 12287 | 2.0 | T | 189 | 32.2 | 11.9 | 383 | 225 |
| 12127 | T | 10 | 144 | 33.6 | 14.9 | 499 | 214 |
| 5146 | 2.0 | 15 | 158 | 31.2 | 14.6 | 455 | 230 |
| 12284 | .2 | 12 | 162 | 32.4 | 13.6 | 442 | 221 |
| 8858 | 3.0 | 30 | 121 | 35.8 | 16.4 | 588 | 198 |
| 12369 | 0.0 | 25 | 134 | 32.8 | 15.9 | 522 | 213 |
| 8885 | 1.0 | 18 | 175 | 31.6 | 12.6 | 398 | 220 |
| Ks. 2778 | 0.0 | 13 | 128 | 35.0 | 15.1 | 528 | 193 |
| 11952 | 1.0 | 47 | 118 | 36.6 | 15.5 | 566 | 183 |
| 1558 | 6.0 | 20 | 184 | 32.0 | 11.4 | 363 | 208 |
| 12109 | 1.0 | 37 | 145 | 34.3 | 13.4 | 460 | 195 |
| 1442 | 4.0 | 28 | 165 | 29.9 | 10.8 | 324 | 179 |
| 8180 | 0.0 | 12 | 143 | 31.1 | 11.2 | 347 | 159 |

1/ Notes on disease reaction obtained in cooperation with members of the Department of Plant Pathology.

Table 1.--(Continued.)

Garden City, Kansas
(Three plots)

| Variety | C. I. No. | Date Headed | Date Ripe | Ht. | Plants per acre | Wt. per bu. | Av. acre yield | Average yield 1945-46 | No. years grown | Percent of Turkey 1/ | Rank |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | June | In. | 000 | Lbs. | Bu. | Bu. | | | |
| Red Chief | 12109 | 5/9 | 18 | 27 | 195 | 60.6 | 28.7 | 31.6 | 2 | 127.4 | 1 |
| Blackhull | 6251 | 5/9 | 18 | 25 | 255 | 58.2 | 28.3 | 30.1 | 2 | 121.4 | 4 |
| Chiefkan | 11754 | 5/10 | 18 | 29 | 157 | 59.2 | 28.1 | 31.5 | 2 | 127.0 | 2 |
| Cheyenne x Tenmarq | 11972 | 5/12 | 18 | 20 | 216 | 58.7 | 27.4 | 31.4 | 2 | 126.6 | 3 |
| Comanche | 11673 | 5/6 | 16 | 25 | 182 | 57.9 | 23.1 | 28.6 | 2 | 115.3 | 5 |
| Tenmarq | 6936 | 5/9 | 18 | 25 | 199 | 57.9 | 22.4 | 27.4 | 2 | 110.5 | 7 |
| Tenmarq selection | 12125 | 5/9 | 18 | 25 | 171 | 58.3 | 22.0 | 26.9 | 2 | 108.5 | 8 |
| Chiefkan x Oro-Tenmarq | 12133 | 5/5 | 16 | 23 | 275 | 58.5 | 21.3 | .... | 1 | 101.9 | 11 |
| Turkey | 1558 | 5/16 | 20 | 24 | 184 | 56.7 | 20.9 | 24.8 | 2 | 100.0 | 13 |
| Pawnee | 11669 | 5/6 | 16 | 23 | 226 | 57.6 | 17.8 | 27.8 | 2 | 112.1 | 6 |
| Triumph | 12132 | 4/29 | 12 | 24 | 102 | 57.7 | 17.6 | .... | 1 | 84.2 | 14 |
| Cheyenne x Ea. Blackhull | 12122 | 5/3 | 15 | 21 | 285 | 57.9 | 17.1 | 26.9 | 2 | 108.5 | 8 |
| Early Blackhull | 8856 | 4/28 | 11 | 23 | 219 | 57.8 | 16.7 | 25.6 | 2 | 103.2 | 10 |
| Westar | 12110 | 5/6 | 16 | 23 | 253 | 57.4 | 13.6 | .... | 1 | 85.1 | 16 |
| Quivira x Tenmarq | 12116 | 5/4 | 15 | 23 | 240 | 58.3 | 13.4 | 24.9 | 2 | 100.4 | 12 |
| Wichita | 11952 | 4/30 | 13 | 23 | 256 | 58.2 | 12.3 | 20.4 | 2 | 82.3 | 15 |

Standard error of a difference between the mean yields of any two varieties = 2.50 bushels.

1/ Turkey (C. I. 1558) nc Kharkof.

Table 1.--(Continued.)

Hays, Kansas

(Four 1/50-acre plots; 2 on fallow, 2 on cropped land; seeded Oct. 3; emerged Oct. 10)

| Variety | C. I. No. | Date Headed | Date Ripe | Ht. | Hail & frost injury | Wt. per bu. | Yield per acre | Av. yield 1931-1946 | Av. yield 1945-1946 | No. years grown | Percent of Kharkof | Rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | June | In. | % | Lbs. | Bu. | Bu. | Bu. | | | |
| Cheyenne x Tenmarq | 11972 | 5/9 | 15 | 34 | 13 | 62.1 | 24.2 | .... | 23.5 | 6 | 145.1 | 2 |
| Cheyenne | 8885 | 5/9 | 18 | 36 | 13 | 61.4 | 22.9 | 21.4 | 20.0 | 15 | 113.2 | 18 |
| Blackhull x Cheyenne | 12101 | 5/9 | 17 | 33 | 10 | 62.1 | 22.8 | .... | 23.1 | 3 | 136.9 | 4 |
| Chiefkan x Oro-Tenmarq | 12133 | 5/4 | 16 | 33 | 25 | 60.8 | 20.1 | .... | 23.1 | 2 | 139.2 | 3 |
| Kharkof | 1442 | 5/9 | 18 | 36 | 18 | 60.6 | 19.9 | 18.9 | 16.6 | 15 | 100.0 | 21 |
| Kanred | 5146 | 5/9 | 18 | 36 | 13 | 60.4 | 19.6 | 19.6 | 18.1 | 14 | 107.1 | 19 |
| Tenmarq | 6936 | 5/8 | 18 | 31 | 18 | 61.2 | 19.5 | 23.1 | 17.6 | 15 | 122.2 | 14 |
| Triumph | 12132 | 4/26 | 12 | 29 | 27 | 60.6 | 19.0 | .... | .... | 1 | 95.5 | 22 |
| Chiefkan x Oro-Tenmarq | 12134 | 5/4 | 16 | 35 | 25 | 60.5 | 19.0 | .... | 20.0 | 2 | 120.5 | 15 |
| Comanche | 11673 | 5/5 | 18 | 33 | 25 | 61.4 | 18.4 | .... | 19.9 | 10 | 129.7 | 9 |
| Tenmarq sel. | 12125 | 5/8 | 17 | 36 | 13 | 61.3 | 18.3 | .... | .... | 1 | 92.0 | 24 |
| Tenmarq x Blackhull | 12126 | 5/7 | 17 | 35 | 15 | 61.4 | 18.3 | .... | 19.5 | 3 | 120.0 | 16 |
| Blackhull | 6251 | 5/8 | 17 | 35 | 15 | 61.7 | 18.2 | 21.7 | 19.1 | 15 | 114.8 | 17 |
| Turkey | 1558 | 5/9 | 18 | 36 | 23 | 59.9 | 18.1 | 19.2 | 14.8 | 15 | 101.6 | 20 |
| Kaw.-Marq. x Kaw.-Ten. | 12128 | 5/8 | 18 | 33 | 13 | 61.0 | 17.9 | .... | .... | 1 | 89.9 | 23 |
| Red Chief | 12109 | 5/8 | 18 | 32 | 20 | 62.4 | 17.8 | .... | 19.7 | 6 | 131.9 | 8 |
| Quivira x Tenmarq | 12116 | 5/4 | 16 | 36 | 20 | 61.2 | 17.3 | .... | 22.0 | 3 | 132.8 | 7 |
| Early Blackhull | 8856 | 4/26 | 12 | 32 | 33 | 61.0 | 16.8 | 23.8 | 21.3 | 15 | 125.9 | 10 |
| Chey. x Ea. Blackhull | 12114 | 4/27 | 12 | 32 | 50 | 61.4 | 16.7 | .... | 20.3 | 2 | 122.3 | 12 |
| Chiefkan | 11754 | 5/8 | 18 | 31 | 20 | 60.8 | 16.7 | .... | 22.4 | 11 | 135.8 | 5 |
| Westar | 12110 | 5/5 | 17 | 36 | 20 | 60.4 | 16.6 | .... | .... | 1 | 83.4 | 25 |
| Chey. x Ea. Blackhull | 12122 | 4/30 | 14 | 31 | 27 | 61.1 | 16.1 | .... | 21.3 | 3 | 133.8 | 6 |
| Pawnee | 11669 | 5/4 | 15 | 31 | 20 | 60.8 | 15.9 | .... | 19.7 | 9 | 146.2 | 1 |
| Chiefkan x Oro-Ten.H.C. | 43-111 | 5/5 | 16 | 35 | 23 | 61.2 | 15.6 | .... | 20.3 | 2 | 122.3 | 12 |
| Wichita | 11952 | 4/30 | 13 | 31 | 35 | 60.9 | 11.4 | .... | 15.6 | 6 | 125.8 | 11 |

Standard error of a difference between the mean yield of any two varieties = 1.70 bushels.

Table 1.--(Continued.)

Colby, Kansas

(Three plots)

| Variety | C. I. No. | Date headed | Ht. | Wt. per bu. | Av. yield 1931-1945 | Av. yield 1946 | No. years grown | Percent of Turkey | Rank |
|---|---|---|---|---|---|---|---|---|---|
| | | May | In. | Lbs. | Bu. | Bu. | Bu. | | |
| Triumph | 12132 | 4 | 32 | 60 | 49.7 | .... | .... | 1 145.3 | 1 |
| Cheyenne x E. Blackhull | 12122 | 11 | 33 | 59 | 48.9 | .... | 57.8 | 2 134.4 | 2 |
| Cheyenne x Tenmarq | 11972 | 18 | 33 | 60 | 48.6 | .... | 57.1 | 5 132.0 | 4 |
| Kaw.-Marq. x Kan.-Tenq. | 12128 | 14 | 34 | 58 | 45.3 | .... | .... | 1 132.5 | 3 |
| Blackhull | 6251 | 17 | 34 | 58 | 43.6 | 37.4 | 49.4 | 10 108.7 | 17 |
| Chiefkan x Oro-Tenq. | 12133 | 12 | 35 | 57 | 42.5 | .... | .... | 1 124.3 | 5 |
| Cheyenne x E. Blackhull | 12114 | 4 | 34 | 60 | 42.2 | .... | .... | 1 123.4 | 7 |
| Kanred | 5146 | 20 | 34 | 58 | 41.6 | 35.6 | 47.9 | 10 103.5 | 19 |
| Red Chief | 12109 | 18 | 37 | 58 | 41.3 | .... | 51.1 | 5 114.5 | 12 |
| Early Blackhull | 8856 | 4 | 34 | 60 | 41.4 | 35.7 | 48.5 | 10 103.8 | 18 |
| Chiefkan x Oro-Tenmarq | 12134 | 13 | 35 | 57 | 40.8 | .... | .... | 1 119.3 | 9 |
| Cheyenne | 8885 | 20 | 32 | 59 | 40.3 | 37.8 | 50.6 | 10 109.9 | 16 |
| Comanche | 11673 | 13 | 33 | 58 | 39.4 | .... | 51.5 | 7 118.9 | 10 |
| Tenmarq selection | 12125 | 17 | 33 | 58 | 37.8 | .... | .... | 1 110.5 | 15 |
| Chiefkan | 11754 | 18 | 37 | 59 | 37.2 | .... | 48.8 | 7 113.9 | 13 |
| Tenmarq | 6936 | 16 | 33 | 58 | 36.4 | .... | 48.7 | 9 113.5 | 14 |
| Quivira x Tenmarq | 12116 | 11 | 32 | 57 | 36.4 | .... | 53.6 | 3 122.5 | 8 |
| Westar | 12110 | 17 | 32 | 58 | 35.3 | .... | .... | 1 103.2 | 20 |
| Turkey | 1558 | 20 | 33 | 58 | 34.2 | 34.4 | 43.0 | 10 100.0 | 21 |
| Wichita | 11952 | 7 | 33 | 59 | 31.1 | .... | 46.8 | 6 117.0 | 11 |
| Pawnee | 11669 | 13 | 32 | 57 | 30.8 | .... | 51.8 | 6 123.8 | 6 |

Standard error of a difference between the mean yields of any two varieties = 3.31 bushels.

Table 1.--(Continued.)

Akron, Colorado

(Four, 1/41-acre plots; two on fallow; two on corn land; seeded September 20)

| Variety | C. I. No. | Winter survival | Date Headed | Date Ripe | Ht. | Wt. per bu. | Av. acre yield | Av. yield 1931-1946 | Av. yield 1945-1946 | No. years grown | Percent of Kharkof | Rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Pct. | July | | In. | Lbs. | Bu. | Bu. | Bu. | | | |
| Cheyenne x Tenmarq | 11972 | 88 | 5/27 | 2 | 29 | 58 | 16.1 | .... | 24.0 | 4 | 108.1 | 11 |
| Cheyenne | 8885 | 89 | 6/1 | 3 | 29 | 59 | 15.7 | 16.1 | 25.5 | 15 | 110.3 | 9 |
| Kharkof | 1442 | 88 | 6/2 | 3 | 29 | 58 | 15.1 | 14.6 | 23.0 | 15 | 100.0 | 15 |
| Kanred | 5146 | 86 | 6/1 | 3 | 30 | 57 | 14.2 | 15.7 | 22.7 | 15 | 107.5 | 12 |
| Blackhull | 6251 | 90 | 5/24 | 2 | 30 | 57 | 14.0 | 17.4 | 22.8 | 15 | 119.2 | 2 |
| Nebred | 10094 | 83 | 5/31 | 3 | 29 | 58 | 13.7 | .... | 24.4 | 10 | 115.5 | 7 |
| Minturki | 6155 | 86 | 6/4 | 3 | 31 | 57 | 13.1 | 13.4 | 21.4 | 15 | 91.8 | 16 |
| Tenmarq | 6936 | 89 | 5/26 | 2 | 30 | 55 | 12.0 | 16.9 | 22.3 | 15 | 115.8 | 6 |
| Chiefkan | 11754 | 90 | 5/23 | 2 | 31 | 59 | 11.0 | .... | 22.3 | 8 | 114.9 | 8 |
| Red Chief | 12109 | 89 | 5/23 | 2 | 30 | 60 | 10.1 | .... | 20.8 | 5 | 107.5 | 12 |
| Cheyenne x E. Blackhull | 12122 | 88 | 5/19 | 2 | 27 | 57 | 9.9 | .... | 23.7 | 2 | 103.0 | 14 |
| Kan.-Hard Fed. x Minh.-Mint. | 11970 | 89 | 5/21 | 2 | 30 | 56 | 9.8 | .... | 22.4 | 8 | 119.5 | 1 |
| Comanche | 11673 | 92 | 5/20 | 2 | 29 | 58 | 9.8 | .... | 23.8 | 8 | 118.4 | 3 |
| Alton | 1438 | 86 | 6/4 | 3 | 29 | 58 | 9.8 | 12.2 | 19.2 | 15 | 83.6 | 17 |
| Pawnee | 11669 | 84 | 5/21 | 2 | 27 | 56 | 6.9 | .... | 19.4 | 8 | 109.2 | 10 |
| Wichita | 11952 | 85 | 5/19 | 2 | 29 | 60 | 2.8 | .... | 19.4 | 6 | 116.1 | 5 |
| Early Blackhull | 8856 | 95 | 5/17 | 2 | 27 | 57 | 2.1 | 17.0 | 17.3 | 15 | 116.4 | 4 |

Standard error of a difference between the mean yields of any two varieties = 1.88 bushels.

Table 1.--(Continued.)

## Fort Collins, Colorado

(Rod-row plots, 7 replications; seeded Sept. 20)

| Variety | C. I. No. | Winter surv. | Date Headed | Date Ripe | Ht. | Frost damage 1/ | Lodging | Wt. per bu. | Av. acre yield 1946 | Av. yield 1944-1946 | Av. yield 1945-1946 | No. years grown | Percent of Kharkof | Rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | % | May | July | In. | % | % | Lbs. | Bu. | Bu. | Bu. | | | |
| Eureka-Minturki x Kan.(A149) | ..... | 90 | 27 | 18 | 44 | 1 | 30 | 63.2 | 73.2 | .... | .... | 1 | 142.1 | 1 |
| Cheyenne x Tenmarq | 11972 | 89 | 28 | 19 | 43 | T | 31 | 63.4 | 58.9 | 34.6 | 44.6 | 3 | 114.4 | 2 |
| Tenmarq | 6936 | 88 | 29 | 19 | 44 | 0 | 27 | 62.6 | 56.8 | 31.0 | 39.8 | 3 | 110.3 | 3 |
| Mutant 348 (A910) | ..... | 92 | 24 | 19 | 43 | T | 17 | 62.5 | 55.5 | .... | .... | 1 | 107.8 | 4 |
| Cheyenne x Early Blackhull | 12122 | 91 | 24 | 17 | 41 | 2 | 50 | 62.6 | 55.4 | .... | 42.4 | 2 | 107.6 | 5 |
| E.Bkhl. x Marmin x H.-Med.-5 | ..... | 89 | 27 | 17 | 48 | T | 69 | 62.5 | 54.6 | .... | .... | 1 | 106.0 | 6 |
| E.Bkhl. x Marmin x H.-Med.-25 | ..... | 87 | 25 | 17 | 48 | T | 37 | 61.7 | 54.3 | .... | .... | 1 | 105.4 | 7 |
| E.Bkhl. x Marmin x H.-Med.-73 | ..... | 89 | 29 | 14 | 44 | T | 51 | 60.7 | 53.7 | .... | .... | 1 | 104.3 | 8 |
| Cheyenne | 8885 | 85 | 6/1 | 21 | 43 | 0 | 20 | 62.5 | 53.6 | 29.5 | 39.1 | 3 | 104.1 | 9 |
| Nebred | 10094 | 90 | 28 | 19 | 44 | T | 38 | 63.3 | 53.3 | 34.6 | 42.6 | 3 | 103.5 | 10 |
| Cheyenne x Early Blackhull | 12124 | 87 | 22 | 16 | 40 | 4 | 50 | 63.1 | 51.7 | .... | .... | 1 | 100.4 | 11 |
| Kanred | 5146 | 92 | 30 | 20 | 43 | T | 53 | 62.4 | 51.5 | 29.8 | 39.0 | 3 | 100.0 | 12 |
| Kharkof | 1412 | 90 | 30 | 22 | 44 | 0 | 57 | 62.4 | 51.5 | .... | .... | 1 | 100.0 | 12 |
| Comanche | 11673 | 90 | 25 | 16 | 42 | 5 | 17 | 62.6 | 51.1 | 34.0 | 41.7 | 3 | 99.2 | 14 |
| Marmin | 11502 | 93 | 31 | 18 | 45 | 0 | 22 | 61.6 | 50.8 | .... | .... | 1 | 98.6 | 15 |
| Red Chief | 12109 | 89 | 26 | 18 | 47 | T | 19 | 63.6 | 50.5 | .... | 39.9 | 2 | 98.1 | 16 |
| E.Bkhl. x Marmin x H.-Med.-10 | ..... | 87 | 28 | 18 | 48 | 0 | 50 | 61.3 | 50.3 | .... | .... | 1 | 97.7 | 17 |
| E.Bkhl. x Marmin x H.-Med.-76 | ..... | 87 | 30 | 16 | 44 | T | 26 | 61.2 | 50.1 | .... | .... | 1 | 97.3 | 18 |
| Pawnee | 11669 | 87 | 26 | 15 | 41 | T | 12 | 63.0 | 49.7 | 35.5 | 43.8 | 3 | 96.5 | 19 |
| E.Bkhl. x Marmin x H.-Med.-15 | ..... | 86 | 29 | 19 | 47 | 0 | 46 | 62.3 | 48.8 | .... | .... | 1 | 94.8 | 20 |
| Chiefkan | 11751 | 84 | 28 | 19 | 47 | T | 34 | 62.0 | 48.7 | 33.4 | 40.6 | 3 | 94.6 | 21 |
| H.Fed.-Marq. x Marq.-Kan.(A276) | ..... | 90 | 23 | 13 | 41 | 4 | 11 | 62.8 | 48.3 | .... | .... | 1 | 93.8 | 22 |
| Blackhull | 6251 | 86 | 28 | 19 | 45 | T | 50 | 62.7 | 47.3 | 33.4 | 38.1 | 3 | 91.8 | 23 |
| Kanred x Hope-Hd.Federation | 12135 | 85 | 28 | 19 | 41 | T | 26 | 62.1 | 47.2 | .... | .... | 1 | 91.7 | 24 |
| H.Fed.-Marq. x Marq.-Kan.(A340) | ..... | 90 | 25 | 16 | 39 | 1 | 18 | 62.3 | 44.0 | .... | .... | 1 | 85.4 | 25 |
| Wichita | 11952 | 91 | 20 | 11 | 43 | 11 | 7 | 63.4 | 42.2 | 33.3 | 37.8 | 3 | 81.9 | 26 |
| Early Blackhull | 8856 | 93 | 18 | 12 | 42 | 19 | 17 | 63.3 | 35.7 | .... | 36.8 | 2 | 69.3 | 27 |

Standard error of a difference between the mean yields of any two varieties = 3.99 bushels.

1/ T = trace.

Table 1.--(Continued.)

## Lincoln, Nebraska

(Five, 1/77.73-acre plots; seeded Oct. 3; emerged Oct. 12)

| Variety | C. I. No. | Date Headed | Date Ripe | No. culms per A. | Ht. | Leaf rust | Wt. per bu. | Av. acre yield | Av. yield 1931-1946 | Av. yield 1946 | No. years grown | Percent of Kharkof | Rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | May | June | 000 | In. | % | Lbs. | Bu. | Bu. | Bu. | | | |
| Pawnee | 11669 | 15 | 24 | 1,817 | 28 | 8 | 60.2 | 36.3 | .... | 32.8 | 10 | 131.4 | 1 |
| Cheyenne x Tenmarq | 11972 | 21 | 26 | 1,416 | 29 | 33 | 58.9 | 35.5 | .... | 29.8 | 5 | 115.6 | 4 |
| Cheyenne | 8885 | 22 | 26 | 1,422 | 31 | 37 | 58.0 | 35.1 | 29.9 | 30.7 | 15 | 111.2 | 7 |
| Cheyenne x Early Blackhull | 12122 | 13 | 24 | 1,435 | 29 | 53 | 60.8 | 33.9 | .... | .... | 1 | 118.1 | 2 |
| Turkey x Cheyenne | 12142 | 20 | 26 | 1,619 | 27 | 13 | 57.1 | 33.3 | .... | .... | 1 | 116.0 | 3 |
| Clarkan | 8858 | 21 | 26 | 1,009 | 37 | 40 | 57.4 | 32.8 | .... | 26.9 | 11 | 108.8 | 10 |
| Compound Hybrid (Sel. 422186) | 12501 | 22 | 26 | 1,778 | 30 | 25 | 57.4 | 32.7 | .... | .... | 1 | 113.9 | 5 |
| Cheyenne x Blackhull | 12112 | 21 | 25 | 1,369 | 31 | 43 | 59.3 | 32.0 | .... | 28.1 | 4 | 106.6 | 12 |
| Wichita | 11952 | 12 | 23 | 1,075 | 30 | 53 | 60.5 | 31.5 | .... | 27.3 | 4 | 111.7 | 6 |
| Blackhull | 6251 | 20 | 25 | 1,486 | 30 | 32 | 58.3 | 31.5 | 26.8 | 26.4 | 15 | 99.6 | 17 |
| Tenmarq | 6936 | 21 | 25 | 1,654 | 30 | 28 | 57.3 | 31.4 | 28.3 | 27.1 | 15 | 105.2 | 13 |
| Marquillo x Oro (Ks. 383464) | | 20 | 26 | 1,551 | 28 | 8 | 57.1 | 31.1 | .... | .... | 1 | 108.4 | 11 |
| Nebr. No. 60 | 6250 | 25 | 27 | 1,361 | 33 | 38 | 57.6 | 30.5 | 25.9 | 25.1 | 15 | 96.3 | 20 |
| Red Chief | 12109 | 19 | 26 | 1,140 | 31 | 28 | 59.6 | 30.4 | .... | 24.5 | 4 | 102.4 | 15 |
| Comanche | 11673 | 17 | 25 | 1,153 | 29 | 18 | 59.7 | 30.4 | .... | 25.5 | 8 | 110.7 | 8 |
| Chiefkan | 11754 | 21 | 26 | 1,216 | 32 | 33 | 57.8 | 29.8 | .... | 24.7 | 8 | 109.8 | 9 |
| Kharkof | 1442 | 24 | 27 | 1,374 | 32 | 17 | 57.1 | 28.7 | 26.9 | 24.7 | 15 | 100.0 | 16 |
| Nebred | 10094 | 23 | 27 | 1,678 | 28 | 38 | 58.0 | 27.9 | 27.9 | 25.7 | 15 | 103.7 | 14 |
| Triumph | 12132 | 6 | 22 | 1,160 | 26 | 60 | 60.6 | 27.3 | .... | .... | 1 | 98.2 | 19 |
| Turkey | 12137 | 23 | 26 | 1,424 | 30 | 40 | 56.9 | 27.1 | 26.5 | 24.9 | 15 | 98.5 | 18 |

Standard error of a difference between the mean yields of any two varieties = 2.60 bushels.

Table 1.--(Continued.)

North Platte, Nebraska

(Four, 1/40-acre plots; seeded Oct. 3, 1945)

| Variety | C. I. No. | Date headed | Ht. | Weight per bushel | Average yield per acre 1931-1945 | Av. yield 1946 | No. years grown | Percent of Kharkof | Rank |
|---|---|---|---|---|---|---|---|---|---|
| | | May | In. | Lbs. | Bu. | Bu. | Bu. | | |
| Cheyenne x Early Blackhull | 12122 | 18 | 35 | 61.0 | 45.2 | 55.3 | 2 | 111.9 | 6 |
| Cheyenne x Tenmarq | 11972 | 24 | 37 | 60.5 | 44.7 | 57.2 | 3 | 124.4 | 1 |
| Turkey (local) | 12143 | 23 | 39 | 60.0 | 41.5 | 28.1 | 55.9 | 14 | 108.5 | 7 |
| Cheyenne | 8885 | 26 | 38 | 64.5 | 40.7 | 28.0 | 53.4 | 14 | 108.1 | 9 |
| Paymaster | 11669 | 19 | 34 | 59.0 | 39.5 | | 51.9 | 8 | 113.4 | 5 |
| Chiefkan | 11754 | 22 | 40 | 60.5 | 38.0 | | 53.2 | 8 | 116.4 | 4 |
| Comanche | 11675 | 19 | 36 | 59.0 | 37.3 | | 50.5 | 8 | 108.4 | 8 |
| Blackhull | 6251 | 20 | 40 | 60.0 | 36.8 | 25.8 | 48.4 | 14 | 99.6 | 13 |
| Kharkof | 1443 | 29 | 41 | 59.5 | 36.7 | 25.9 | 49.4 | 14 | 100.0 | 12 |
| Wichita | 11952 | 16 | 34 | 60.0 | 36.7 | | 53.2 | 4 | 122.7 | 2 |
| Nebr. No. 60 | 6250 | 29 | 39 | 59.0 | 36.5 | 25.8 | 47.3 | 14 | 99.6 | 13 |
| Tenmarq | 6936 | 22 | 38 | 58.5 | 35.0 | 26.2 | 50.2 | 14 | 101.2 | 11 |
| Red Chief | 12109 | 22 | 41 | 60.5 | 34.2 | | 49.6 | 4 | 121.3 | 3 |
| Nebred | 10094 | 27 | 37 | 59.5 | 32.8 | | 47.8 | 12 | 106.9 | 10 |
| Triumph | 12132 | 14 | 30 | 58.5 | 28.2 | | | 1 | 76.8 | 15 |

Standard error of a difference between the mean yields of any two varieties = 2.28 bushels.

Table 1.--(Continued.)

Alliance, Nebraska

(Rod-row plots, 7 replications; seeded Sept. 3)

| Variety | C. I. No. | Surv. | Date Headed | Date Ripe | Ht. | Wt. per bu. | Av. acre yield | Av. yield 1931-1945 | Av. yield 1946 | No. years grown | Percent of Kharkof | Rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | % | May | July | In. | Lbs. | Bu. | Bu. | Bu. | | | |
| Compound Hybrid (422186) | 12501 | 96 | 31 | 13 | 28 | 60.5 | 29.1 | .... | .... | 1 | 118.3 | 1 |
| Nebraska No. 60 | 6250 | 89 | 31 | 17 | 28 | 61.0 | 28.4 | 23.1 | 34.3 | 9 | 106.0 | 6 |
| Cheyenne | 8885 | 91 | 31 | 14 | 29 | 60.0 | 28.1 | 24.5 | 34.2 | 9 | 112.4 | 2 |
| Cheyenne x Turkey | 12142 | 91 | 29 | 13 | 28 | 60.0 | 27.1 | .... | 34.4 | 2 | 108.2 | 4 |
| Cheyenne x Hung. sel. (403858) | .... | 99 | 28 | 12 | 28 | 58.5 | 27.0 | .... | .... | 1 | 109.8 | 3 |
| Nebred | 10094 | 86 | 27 | 13 | 28 | 61.0 | 26.3 | .... | 31.9 | 7 | 105.1 | 8 |
| Cheyenne x Tenmarq | 11972 | 91 | 28 | 13 | 29 | 61.0 | 25.7 | .... | 33.2 | 3 | 106.8 | 5 |
| Cheyenne x Early Blackhull | 12122 | 91 | 26 | 13 | 28 | 62.0 | 25.5 | .... | 33.7 | 2 | 106.0 | 6 |
| Tenmarq | 6936 | 81 | 28 | 14 | 30 | 60.0 | 24.8 | 21.9 | 33.1 | 9 | 100.5 | 11 |
| Kharkof | 1442 | 82 | 6/3 | 16 | 29 | 60.5 | 24.6 | 21.8 | 31.8 | 9 | 100.0 | 12 |
| Chiefkan | 11754 | 87 | 28 | 14 | 31 | 61.0 | 24.3 | .... | 30.8 | 6 | 88.9 | 16 |
| Marquillo x Oro (Ks. 383464) | .... | 69 | 30 | 14 | 29 | 60.0 | 24.1 | .... | 30.8 | 2 | 96.9 | 13 |
| Red Chief | 12109 | 91 | 27 | 14 | 30 | 61.5 | 24.0 | .... | 27.4 | 4 | 85.4 | 18 |
| Comanche | 11673 | 71 | 27 | 13 | 29 | 60.0 | 23.8 | .... | 31.4 | 6 | 102.3 | 9 |
| Pawnee | 11669 | 79 | 26 | 12 | 29 | 59.5 | 22.8 | .... | 29.9 | 6 | 101.5 | 10 |
| Blackhull | 6251 | 67 | 29 | 14 | 29 | 61.5 | 22.5 | 21.0 | 30.8 | 9 | 96.3 | 14 |
| Wichita | 11952 | 76 | 24 | 10 | 29 | 61.5 | 22.4 | .... | 31.0 | 4 | 93.0 | 15 |
| Hung. sel. x Nebred (405304) | ..... | 86 | 30 | 14 | 30 | 59.0 | 21.3 | .... | .... | 1 | 86.6 | 17 |

Standard error of a difference between the mean yields of any two varieties = 1.51 bushels.

Table 1.--(Continued.)

Waseca, Minnesota

(Two, 1/40-acre plots)

| Variety | Number C. I. | Number Minn. | Winter survival | Date Headed | Date Ripe | Ht. | Grain texture 1/ | Wt. per bu. | Av. acre yield 1931-1945 | Av. yield 1946 | 1946 | No. years grown | Percent of Minturki | Rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | % | June | July | In. | % | Lbs. | Bu. | Bu. | Bu. | | | |
| Marmin x H44-Minhardi | ..... | 2768 | 33 | 12 | 13 | 37 | 68 | 61.0 | 16.0 | .... | .... | 1 | 106.0 | 2 |
| Minard-Minh. x H44-Minh. | ..... | 2771 | 33 | 14 | 16 | 37 | 53 | 60.5 | 15.9 | .... | .... | 1 | 105.3 | 3 |
| Minturki | 6155 | 1507 | 34 | 14 | 17 | 37 | 73 | 61.5 | 15.1 | 28.0 | 22.8 | 14 | 100.0 | 6 |
| H44 x Minturki[3] | ..... | 2772 | 35 | 15 | 16 | 37 | 68 | 61.3 | 14.1 | .... | .... | 1 | 93.4 | 7 |
| Minter | 12138 | 2713 | 22 | 14 | 15 | 35 | 83 | 61.5 | 11.4 | .... | 23.8 | 5 | 116.3 | 1 |
| Minard-Minh. x H44-Minh. | ..... | 2770 | 28 | 14 | 16 | 34 | 80 | 63.0 | 11.4 | .... | .... | 1 | 75.5 | 9 |
| H44 x Minturki[2] | 12139 | 2714 | 22 | 14 | 16 | 40 | 75 | 58.8 | 10.6 | .... | 22.1 | 5 | 104.1 | 4 |
| H44 x Minturki[3] | ..... | 2766 | 27 | 14 | 16 | 36 | 80 | 62.0 | 9.6 | .... | .... | 1 | 63.6 | 10 |
| Marmin | 11502 | 2614 | 17 | 13 | 16 | 37 | 65 | 61.3 | 8.5 | 27.0 | 19.9 | 12 | 103.1 | 5 |
| H44 x Minturki[2] | ..... | 2765 | 19 | 13 | 13 | 36 | 73 | 61.0 | 8.4 | .... | .... | 1 | 55.6 | 11 |
| Minard-Minh. x H44-Minh. | ..... | 2769 | 18 | 14 | 16 | 36 | 80 | 62.3 | 6.4 | .... | .... | 1 | 42.4 | 12 |
| H44 x Minturki[3] | ..... | 2767 | 15 | 14 | 16 | 36 | 80 | 60.5 | 5.5 | .... | .... | 1 | 36.4 | 13 |
| H44 x Minturki[4] | ..... | 2724 | 15 | 14 | 16 | 38 | 78 | 61.3 | 5.1 | .... | .... | 1 | 33.8 | 14 |
| Blackhawk | 12218 | 2725 | 8 | 16 | 17 | 38 | 68 | 60.0 | 3.0 | .... | 20.9 | 3 | 89.0 | 8 |

1/ All 95% plumpness except C.I. 12139 which was 90%.

2/ Lodged 45% at 20° angle.

Table 1.--(Continued.)

St. Paul, Minnesota

(Three, 1/40-acre plots)

| Variety | Number C. I. | Number Minn. | Winter survival | Date Headed | Date Ripe | Ht. | Leaf rust | Grain texture 1/ | Wt. per bu. | Av. acre yield | Av. yield 1937-1945-1946 | Av. yield 1946 | No. years grown | Percent of Minturki | Rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | % | June | July | In. | % | % | Lbs. | Bu. | Bu. | Bu. | | | |
| H44 x Minturki$^2$ | ..... | 2765 | 76 | 8 | 13 | 36 | T | 70 | 62.0 | 44.5 | .... | .... | 1 | 116.2 | 1 |
| H44 x Minturki$^4$ | ..... | 2724 | 80 | 8 | 13 | 36 | T | 77 | 62.5 | 40.8 | .... | .... | 1 | 106.5 | 2 |
| Minter | 12138 | 2713 | 99 | 6 | 15 | 35 | T | 75 | 62.2 | 40.3 | .... | 32.1 | 3 | 105.0 | 3 |
| Minturki | 6155 | 1507 | 85 | 8 | 15 | 38 | 17 | 60 | 61.7 | 38.3 | 34.3 | 31.0 | 8 | 100.0 | 6 |
| Marmin | 11502 | 2614 | 98 | 6 | 11 | 36 | 13 | 62 | 62.3 | 38.0 | 34.8 | 32.7 | 8 | 101.5 | 5 |
| Marmin x H44-Minhardi | ..... | 2768 | 88 | 7 | 13 | 35 | 2 | 67 | 61.3 | 36.4 | .... | .... | 1 | 95.0 | 8 |
| Minard-Minh. x H44-Minh. | ..... | 2769 | 82 | 8 | 14 | 36 | 3 | 77 | 63.7 | 36.2 | .... | .... | 1 | 94.5 | 9 |
| H44 x Minturki$^2$ | 12139 | 2714 | 84 | 8 | 14 | 35 | T- | 63 | 59.3 | 35.4 | .... | 31.9 | 3 | 105.0 | 3 |
| H44 x Minturki$^3$ | ..... | 2766 | 86 | 8 | 15 | 36 | T | 70 | 62.2 | 34.4 | .... | .... | 1 | 89.8 | 10 |
| H44 x Minturki$^3$ | ..... | 2772 | 98 | 8 | 12 | 36 | T | 72 | 61.8 | 34.3 | .... | .... | 1 | 89.6 | 11 |
| Minard-Minh. x H44-Minh. | ..... | 2770 | 97 | 9 | 13 | 34 | 7 | 77 | 63.7 | 34.0 | .... | .... | 1 | 88.8 | 12 |
| H44 x Minturki$^3$ | ..... | 2767 | 93 | 7 | 13 | 35 | T | 75 | 61.7 | 33.6 | .... | .... | 1 | 87.7 | 13 |
| Blackhawk | 12218 | 2725 | 71 | 14 | 15 | 39 | T | 62 | 61.5 | 32.3 | .... | 30.6 | 2 | 98.7 | 7 |
| H44 x Minturki$^3$ | ..... | 2771 | 72 | 12 | 16 | 36 | 7 | 72 | 61.0 | 29.1 | .... | .... | 1 | 76.0 | 14 |

Standard error of a difference between the mean yields of any two varieties = 4.21 bushels.

1/ All grain was 95% plump.

Table 1.--(Continued.)

Sheridan, Wyoming

(Three, 1/55-acre plots; seeded Oct. 11; emerged Oct. 31)

| Variety | C. I. No. | Date Headed | Date Ripe | Ht. | Weight per bushel | Av. yield per acre 1942 | Av. yield 1943 | Av. yield 1944 | No. years grown | Percent of Kanred | Rank |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | June | July | In. | Lbs. | Bu. | Bu. | Bu. | | | |
| Cheyenne | 8885 | 14 | 26 | 48 | 62.2 | 69.5 | 32.5 | 53.4 | 12 | 108.5 | 1 |
| Kanred | 5146 | 13 | 21 | 50 | 62.1 | 67.9 | 32.9 | 54.0 | 16 | 105.4 | 2 |
| H44 x Minturki[2] | 12139 | 16 | 26 | 51 | 59.3 | 64.2 | 30.4 | 43.8 | 2 | 90.7 | 11 |
| Yogo | 8033 | 17 | 26 | 52 | 62.3 | 62.9 | 32.4 | 47.6 | 16 | 100.6 | 3 |
| Mont.36-Bel. x Kanred | 12108 | 15 | 26 | 47 | 63.0 | 61.1 | 30.7 | 47.7 | 5 | 100.5 | 4 |
| Nebred | 10094 | 13 | 26 | 46 | 63.0 | 60.5 | 30.3 | 43.3 | 10 | 99.5 | 6 |
| Minter | 12138 | 15 | 24 | 53 | 61.4 | 59.2 | 30.8 | 43.9 | 2 | 90.9 | 10 |
| Kharkof | 1442 | 16 | 24 | 47 | 63.0 | 58.4 | 31.2 | 48.2 | 16 | 100.0 | 5 |
| Karmont | 6700 | 16 | 26 | 48 | 63.0 | 56.0 | 30.3 | 43.9 | 16 | 97.1 | 7 |
| Minturki | 6155 | 18 | 26 | 55 | 62.0 | 55.3 | 28.5 | 41.0 | 16 | 91.3 | 9 |
| Marmin | 11502 | 13 | 25 | 54 | 61.7 | 49.5 | ... | 43.3 | 11 | 92.7 | 8 |

Standard error of a difference between the mean yields of any two varieties = 4.71 bushels.

Table 1.--(Continued.)

Bozeman, Montana

(Rod-row plots; five replications)

| Variety | C. I. No. | Date Headed | Date Ripe | Lodging | Bunt | Weight per bushel | Average acre yield 1931-1946 | Av. yield 1945-1946 | No. years grown | Percent of Kharkof | Rank |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | June | | Pct. | Pct. | Lbs. | Bu. | Bu. | Bu. | | | |
| Martin x Tenmarq[3] | 11804 | 18 | 7/31 | 0 | 23 | 62.0 | 63.7 | .... | 64.1 | 2 | 119.1 | 1 |
| Martin x Tenmarq[3] | 11823 | 19 | 7/31 | 0 | 23 | 62.2 | 61.9 | .... | 61.2 | 2 | 113.8 | 2 |
| Yogo | 8033 | 24 | 8/3 | 11 | 25 | 63.7 | 61.8 | 64.0 | 57.1 | 13 | 102.9 | 4 |
| Martin x Tenmarq[3] | 11824 | 18 | 8/2 | 0 | 20 | 62.8 | 61.3 | .... | 55.0 | 2 | 102.2 | 5 |
| Karmont | 6700 | 21 | 8/1 | 8 | 40 | 63.5 | 60.5 | .... | 57.7 | 11 | 98.6 | 8 |
| Cache | 11599 | 21 | 8/3 | 9 | 0 | 64.5 | 58.8 | .... | 51.5 | 5 | 89.2 | 15 |
| Kharkof | 1442 | 22 | 8/3 | 15 | 10 | 63.9 | 58.4 | 62.2 | 53.8 | 13 | 100.0 | 7 |
| Compound Hybrid | 11744 | 21 | 8/1 | 4 | 11 | 63.3 | 57.2 | .... | 53.0 | 2 | 98.5 | 9 |
| Nebred | 10094 | 21 | 8/1 | 2 | 13 | 63.8 | 57.0 | .... | 59.2 | 8 | 108.2 | 3 |
| H44 x Minturki[2] | 12139 | 23 | 8/2 | 0 | 18 | 62.1 | 55.7 | .... | 51.7 | 2 | 96.1 | 10 |
| Wasatch | 11925 | 21 | 8/1 | 0 | 0.5 | 63.6 | 55.7 | .... | 53.1 | 3 | 91.5 | 14 |
| Minturki | 6155 | 22 | 8/1 | 3 | 23 | 63.1 | 54.3 | 59.6 | 51.5 | 13 | 95.8 | 11 |
| Newturk | 6935 | 20 | 7/31 | 2 | 10 | 63.4 | 53.8 | 58.3 | 53.5 | 13 | 93.7 | 12 |
| Marmin | 11502 | 21 | 8/2 | 2 | 13 | 63.6 | 51.9 | .... | 45.3 | 9 | 88.7 | 16 |
| Mont. 36-Bel. x Kanred | 12108 | 22 | 7/31 | 2 | 3 | 63.8 | 51.9 | .... | 52.2 | 4 | 101.0 | 6 |
| Yogo x Oro (Sel. 5) | ..... | 24 | 8/1 | 4 | 13 | 63.9 | 48.5 | .... | 50.2 | 3 | 93.2 | 13 |
| Minter | 12138 | 22 | 7/31 | 4 | 23 | 63.7 | 46.6 | .... | 45.2 | 2 | 84.0 | 17 |

Standard error of a difference between the mean yields of any two varieties = 4.04 bushels.

Table 1.--(Continued.)

Moccasin, Montana

(Rod-row plots; five replications; seeded October 1)

| Variety | C. I. No. | Date ripe | Ht. | Wt. per bu. | Av. acre yield 1932-1946 | Av. yield 1945-1946 | No. years grown | % of Khar-kof | Rank |
|---|---|---|---|---|---|---|---|---|---|
| | | Aug. | In. | Lbs. | Bu. | Bu. | Bu. | | | |
| Yogo x Oro (Sel. 5) | ..... | 10 | 27 | 62.6 | 19.8 | .... | 25.2 | 5 | 102.9 | 8 |
| Nebred | 10094 | 10 | 28 | 62.9 | 17.4 | .... | 28.8 | 8 | 99.2 | 14 |
| Karmont | 6700 | 9 | 29 | 62.2 | 17.1 | 24.0 | 26.0 | 12 | 102.1 | 9 |
| Compound Hybrid | 11744 | 11 | 30 | 62.1 | 16.9 | .... | 26.1 | 5 | 100.4 | 10 |
| Minter | 12138 | 10 | 27 | 62.5 | 15.9 | .... | 24.9 | 2 | 100.4 | 10 |
| Kharkof | 1442 | 10 | 28 | 61.9 | 15.8 | 23.5 | 24.8 | 12 | 100.0 | 12 |
| Marmin | 11502 | 10 | 30 | 62.4 | 15.8 | .... | 24.1 | 6 | 91.6 | 15 |
| Yogo | 8033 | 11 | 28 | 62.5 | 15.7 | 25.0 | 23.2 | 12 | 106.4 | 4 |
| Newturk[1] | 6935 | 8 | 29 | 62.7 | 15.6 | .... | ....[1] | 11 | 105.3 | 6 |
| Martin x Tenmarq[3] | 11823 | 10 | 26 | 61.3 | 15.2 | .... | 28.4 | 2 | 114.5 | 1 |
| Minturki | 6155 | 11 | 29 | 62.1 | 14.8 | 23.4 | 25.2 | 12 | 99.6 | 13 |
| Kharkof x Ridit(Huntley Sel.4A) | | 10 | 28 | 62.0 | 14.3 | .... | .... | 1 | 90.5 | 16 |
| Mont.36-Beloglina x Kanred | 12108 | 11 | 27 | 62.4 | 13.7 | .... | 25.2 | 5 | 106.2 | 5 |
| H44 x Minturki[2] | 12139 | 11 | 28 | 60.8 | 13.5 | .... | 26.4 | 2 | 106.5 | 3 |
| Martin x Tenmarq[3] | 11804 | 11 | 28 | 61.2 | 13.1 | .... | 28.4 | 2 | 114.5 | 1 |
| Martin x Tenmarq[3] | 11824 | 10 | 29 | 61.9 | 12.5 | .... | 26.1 | 2 | 105.2 | 7 |

Standard error of a difference between the mean yields of any two varieties = 1.71 bushels.

1/ No average yield for 1945.

Table 1.--(Concluded.)

Havre, Montana

(Five, 1/50-acre plots; seeded October 3; emerged October 12)

| Variety | C. I. No. | Date Headed | Date Ripe | Ht. | Weight per bushel | Av. acre yield | Av. yield 1931-1945 | Av. yield 1946 | No. years grown | Percent of Kharkof | Rank |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | June | July | In. | Lbs. | Bu. | Bu. | Bu. | | | |
| H44 x Minturki[2] | 12139 | 9 | 20 | 22 | 60.2 | 19.8 | .... | 16.4 | 3 | 102.8 | 9 |
| Martin x Tenmarq[3] | 11804 | 8 | 21 | 22 | 60.2 | 19.8 | .... | 18.7 | 2 | 123.8 | 1 |
| Yogo | 8033 | 9 | 19 | 21 | 61.3 | 19.7 | 18.0 | 16.3 | 14 | 111.8 | 2 |
| Karmont | 6700 | 9 | 20 | 21 | 61.7 | 18.5 | 16.6 | 15.9 | 14 | 103.1 | 8 |
| Minturki | 6155 | 9 | 20 | 22 | 61.6 | 18.2 | 16.7 | 16.0 | 14 | 103.7 | 7 |
| Minter | 12138 | 8 | 20 | 22 | 61.5 | 18.0 | .... | 16.3 | 3 | 98.9 | 12 |
| Martin x Tenmarq[3] | 11824 | 9 | 20 | 21 | 61.0 | 17.5 | .... | 15.4 | 2 | 102.0 | 10 |
| Yogo x Oro (Mont. 5) | ..... | 8 | 20 | 22 | 61.2 | 17.5 | .... | 16.3 | 2 | 107.9 | 3 |
| Kharkof x Ridit(Huntley 4A) | ..... | 8 | 20 | 21 | 61.5 | 17.5 | .... | .... | 1 | 107.4 | 4 |
| Marmin | 11502 | 9 | 20 | 21 | 61.7 | 17.0 | .... | 14.5 | 9 | 85.3 | 14 |
| Nebred | 10094 | 9 | 20 | 19 | 61.2 | 16.7 | .... | 15.6 | 9 | 88.9 | 13 |
| Mont.36 x Belog.-Kanred | 12108 | 9 | 20 | 21 | 62.2 | 16.5 | .... | 15.0 | 5 | 105.2 | 5 |
| Kharkof | 1442 | 9 | 20 | 22 | 61.6 | 16.3 | 16.1 | 15.1 | 14 | 100.0 | 11 |
| Compound Hybrid | 11744 | 9 | 20 | 23 | 61.3 | 15.0 | .... | 15.8 | 2 | 104.6 | 6 |

Note: Stands at harvest 95%; no apparent winterkilling.

Standard error of a difference between the mean yields of any two varieties = 2.01 bushels.

Table 2.--Number of plots, average yield, and standard errors for the variety test at each cooperating station, 1946.

| Station | No. of plots | Average yield of varieties | Standard error of a Single plot | Difference between means | Mean in Bushels | Mean in Percent |
|---|---|---|---|---|---|---|
| | | Bu. | Bu. | Bu. | | |
| Texas: | | | | | | |
| Denton 1/ | 8 | 26.61 | 4.89 | 2.45 | 1.73 | 6.50 |
| Iowa Park 1/ | 4 | 28.44 | 6.07 | 4.30 | 3.04 | 10.69 |
| Chillicothe 1/ | 8 | 20.36 | 4.77 | 2.39 | 1.69 | 8.30 |
| Oklahoma: | | | | | | |
| Stillwater | 4 | 21.00 | 2.47 | 1.75 | 1.24 | 5.90 |
| Cherokee | 1 | 27.19 | 3.38 | 2.39 | 1.69 | 6.22 |
| Woodward | 4 | 26.98 | 5.16 | 3.65 | 2.58 | 9.56 |
| Goodwell 1/ | 5 | 23.85 | 3.70 | 2.33 | 1.65 | 6.92 |
| Kansas: | | | | | | |
| Manhattan | 3 | 27.37 | 2.29 | 1.87 | 1.32 | 4.84 |
| Hays | 4 | 18.27 | 2.39 | 1.70 | 1.20 | 6.57 |
| Garden City | 3 | 20.66 | 3.06 | 2.50 | 1.77 | 8.57 |
| Colby | 3 | 40.20 | 4.06 | 3.31 | 2.34 | 5.82 |
| Colorado: | | | | | | |
| Akron | 4 | 10.93 | 2.66 | 1.88 | 1.33 | 12.17 |
| Ft. Collins | 7 | 51.44 | 7.46 | 3.99 | 2.82 | 5.48 |
| Nebraska: | | | | | | |
| Lincoln | 5 | 31.45 | 4.12 | 2.60 | 1.84 | 5.85 |
| North Platte | 4 | 37.59 | 3.21 | 2.28 | 1.61 | 4.28 |
| Alliance 1/ | 7 | 25.07 | 2.82 | 1.51 | 1.07 | 4.27 |
| Minnesota: | | | | | | |
| Waseca | 2 | 10.07 | .... | .... | .... | .... |
| St. Paul | 3 | 36.26 | 5.14 | 4.21 | 2.97 | 8.19 |
| Wyoming: | | | | | | |
| Sheridan | 3 | 60.41 | 5.76 | 4.71 | 3.33 | 5.51 |
| Montana: | | | | | | |
| Bozeman 1/ | 5 | 56.40 | 6.39 | 4.04 | 2.86 | 5.07 |
| Moccasin 1/ | 35 | 15.45 | 2.70 | 1.71 | 1.21 | 7.83 |
| Havre | 5 | 17.72 | 3.18 | 2.01 | 1.42 | 8.01 |

1/ Nursery plots.

## SUMMARY OF YIELDS

The yields of the uniform as well as other varieties grown in cooperative experiments have been summarized for the different districts and States. Where possible, the average yields for the last 2 years (1945-46) are also given.

### Districts

Summaries of the yield data for the uniform varieties grown in 1946 and the 1945-46 averages where available are presented in tables 3 to 8.

In the Southern District in 1946 yields were reported from 7 stations with 13 varieties being grown uniformly (table 3). Westar gave the highest average

yield for the district having a 2.5 bushel advantage over Cheyenne x Tenmarq (C. I. 11972) which ranked second. Pawnee had an average of .1 of a bushel lower than the variety in second place and a .4 bushel advantage over Chiefkan which ranked fourth. Chiefkan ranked slightly above Red Chief and both of these varieties had yields that exceeded that of Blackhull. Comanche had an average one bushel less than that of Pawnee. Among the extremely early varieties Triumph ranked first, Wichita second, and Early Blackhull third, although they were not among the leading varieties for yield. The lowest average yields were made by Kharkof and Tenmarq. The unusually low ranking of Tenmarq is somewhat surprising.

Table 3.--Summary of average yields of the uniform winter wheat varieties grown in plot tests at 7 stations in the southern district, 1946.

| Variety | C. I. No. | Average yield in bushels per acre at: Den-ton | Towa Park | Chillicothe | Stillwater | Chero-kee | Woodward | Goodwell | Av. |
|---|---|---|---|---|---|---|---|---|---|
| Westar | 12110 | 32.1 | 34.5 | 23.6 | 20.8 | 34.2 | 29.9 | 25.1 | 28.6 |
| Cheyenne x Tenmarq | 11972 | 28.4 | 31.9 | 19.4 | 21.5 | 27.6 | 25.9 | 28.0 | 26.1 |
| Pawnee | 11669 | 28.8 | 28.1 | 21.6 | 27.8 | 25.3 | 28.4 | 22.0 | 26.0 |
| Chiefkan | 11754 | 22.3 | 26.1 | 23.0 | 22.1 | 30.2 | 30.7 | 25.0 | 25.6 |
| Cheyenne x E. Blackhull | 12122 | 24.9 | 28.3 | 20.9 | 20.7 | 30.6 | 24.8 | 26.4 | 25.2 |
| Red Chief | 12109 | 23.7 | 24.8 | 19.6 | 23.5 | 30.2 | 30.3 | 23.8 | 25.1 |
| Comanche | 11673 | 31.5 | 28.8 | 20.0 | 19.0 | 24.2 | 28.5 | 22.9 | 25.0 |
| Triumph | 12132 | 27.2 | 24.9 | 16.9 | 18.0 | 35.1 | 28.6 | 19.4 | 24.3 |
| Blackhull | 6251 | 23.5 | 23.9 | 19.2 | 20.8 | 23.0 | 24.6 | 25.5 | 22.9 |
| Wichita | 11952 | 16.3 | 23.6 | 18.2 | 19.2 | 24.6 | 31.1 | 25.1 | 22.6 |
| Early Blackhull | 8856 | 23.6 | 22.1 | 16.3 | 18.1 | 31.5 | 26.1 | 17.2 | 22.1 |
| Kharkof | 1442 | 26.8 | 25.6 | 19.4 | 18.8 | 19.2 | 21.1 | 21.1 | 21.7 |
| Tenmarq | 6936 | 20.2 | 19.8 | 19.7 | 14.2 | 21.3 | 22.7 | 24.0 | 20.3 |

The yield data for the 2-year period 1945-46 are summarized in table 4 with averages being shown for 8 stations with a total of 14 station years. In this case Westar and Cheyenne x Early Blackhull (C. I. 12122) rank at the top of the list with identical average yield. Pawnee ranks third and Cheyenne x Tenmarq (C. I. 11972) fourth. Red Chief and Chiefkan have averages that are nearly identical and both are slightly higher than Blackhull. Early Blackhull and Wichita have averages only .2 of a bushel apart but both are considerably lower than Westar. Kharkof and Tenmarq have the lowest average yields.

In the Central District yields were reported from 9 stations and these are presented and summarized in table 5. Cheyenne x Tenmarq (C. I. 11972) ranked first with a 1.7 bushel advantage over Cheyenne which is in second place. Cheyenne x Early Blackhull (C. I. 12122) ranked third. It is of interest to note that these three leading varieties all carry Cheyenne germ plasm. Blackhull and Tenmarq averaged slightly above Red Chief and Comanche. Kharkof and Pawnee each had averages of 27.9 bushels per acre and at the bottom of the list is Wichita with an average of 23.9 bushels per acre. Triumph was not grown uniformly at all stations. The low average yield of Pawnee is worthy of special note but no explanation is at hand for its poor showing this year. It was among the lower yielding varieties at all stations except Manhattan and Lincoln. It shattered badly at Colby and may have been injured by the May freeze at other stations.

Table 4.--Summary of average yields of winter wheat varieties grown in the plot tests at 8 stations in the southern district for all or part of the period 1945-46.

| Variety | C. I. No. | Average yield in bushels per acre at: Denton | Iowa Park | Chillicothe | Lawton | Stillwater | Cherokee | Woodward | Goodwell | Av. |
|---|---|---|---|---|---|---|---|---|---|---|
| No. of years grown | | 2 | 2 | 2 | 1 | 2 | 1 | 2 | 2 | 14 |
| Westar | 12110 | 20.2 | 31.5 | 23.7 | 28.7 | 22.1 | 34.2 | 30.9 | 21.9 | 26.0 |
| Chey. x E.Blackhull | 12122 | 18.7 | 29.5 | 23.6 | 33.1 | 20.7 1/ | 30.6 | 32.5 | 22.8 | 26.0 2/ |
| Pawnee | 11669 | 19.8 | 28.2 | 23.0 | 29.3 | 29.0 | 25.3 | 31.3 | 19.8 | 25.5 |
| Cheyenne x Tenmarq | 11972 | 20.9 | 28.5 | 22.1 | 26.5 | 23.6 | 27.6 | 30.2 | 24.5 | 25.3 |
| Comanche | 11673 | 22.4 | 26.2 | 22.1 | 28.9 | 24.4 | 24.2 | 30.3 | 22.4 | 24.9 |
| Red Chief | 12109 | 15.4 | 23.5 | 18.7 | 18.9 | 23.2 | 30.2 | 30.8 | 20.9 | 22.4 |
| Chiefkan | 11754 | 15.5 | 23.0 | 19.9 | 18.6 | 22.4 | 30.2 | 29.4 | 21.2 | 22.3 |
| Blackhull | 6251 | 16.4 | 25.0 | 16.7 | 21.9 | 22.3 | 23.0 | 26.7 | 23.0 | 21.8 |
| Early Blackhull | 8856 | 16.8 | 21.5 | 20.6 | .... | 23.2 | 31.5 | 25.1 | 17.4 | 21.6 2/ |
| Wichita | 11952 | 11.6 | 21.1 | 19.7 | 21.0 | 18.9 | 24.6 | 32.2 | 23.4 | 21.4 |
| Kharkof | 1442 | 17.3 | 23.3 | 16.3 | 21.7 | 19.5 | 19.2 | 25.1 | 15.5 | 19.6 |
| Tenmarq | 6936 | 14.0 | 20.2 | 17.4 | 17.8 | 17.5 | 21.3 | 25.6 | 19.1 | 19.1 |

1/ 1946 yield only.

2/ Thirteen station years.

Table 5.--Summary of average yields of the uniform winter wheat varieties grown in plot tests at 9 stations in the central district, 1946.

| Variety | C. I. No. | Average yield in bushels per acre at: Manhattan | Garden City | Hays | Colby | Akron | Fort Collins | Lincoln | North Platte | Alliance | Av. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chey. x Tenmarq | 11972 | 31.3 | 27.4 | 24.2 | 46.6 | 16.1 | 58.9 | 35.5 | 44.7 | 25.7 | 34.5 |
| Cheyenne | 8885 | 25.6 | .... | 22.9 | 40.3 | 15.7 | 53.6 | 35.1 | 40.7 | 28.1 | 32.8 |
| Chey. x E.Bkhl. | 12122 | 28.9 | 17.1 | 16.1 | 46.9 | 9.9 | 55.4 | 33.9 | 45.2 | 25.5 | 31.2 |
| Blackhull | 6251 | 28.2 | 28.3 | 18.2 | 47.6 | 14.0 | 47.3 | 31.5 | 36.8 | 22.5 | 30.0 |
| Tenmarq | 6936 | 30.1 | 22.4 | 19.5 | 36.4 | 12.6 | 56.8 | 31.4 | 35.0 | 24.8 | 29.8 |
| Red Chief | 12109 | 24.5 | 28.7 | 17.8 | 41.4 | 10.1 | 50.5 | 30.4 | 34.2 | 24.0 | 29.1 |
| Comanche | 11673 | 27.9 | 23.1 | 18.4 | 39.4 | 9.8 | 51.1 | 30.4 | 37.3 | 23.8 | 29.0 |
| Chiefkan | 11754 | 27.1 | 28.1 | 16.7 | 37.2 | 11.0 | 48.7 | 29.8 | 38.0 | 24.3 | 29.0 |
| Kharkof | 1442 | 19.7 | 20.9 1/ | 19.9 | 34.2 1/ | 15.1 | 51.5 | 28.7 | 36.7 | 24.6 | 27.9 |
| Pawnee | 11669 | 31.7 | 17.8 | 15.9 | 30.8 | 6.9 | 49.7 | 36.3 | 39.5 | 22.8 | 27.9 |
| Wichita | 11952 | 24.6 | 12.3 | 11.4 | 31.1 | 2.8 | 42.2 | 31.5 | 36.7 | 22.4 | 23.9 |
| Triumph | 12132 | 28.2 | 17.6 | 19.0 | 49.7 | .... | .... | 27.3 | 28.2 | .... | .... |
| Nebred | 10094 | .... | .... | .... | .... | 13.7 | 53.3 | 27.9 | 32.8 | 26.3 | .... |

1/ Yield of Turkey used.

For the 2-year period data are shown for 9 stations in the Central District with a total of 17 station years, results (table 6) Cheyenne x Tenmarq (C. I. 11972) ranked first, Cheyenne x Early Blackhull (C. I. 12122) second, and Cheyenne third. Pawnee, Comanche, and Tenmarq ranked in the order listed. At the bottom of the list is Kharkof which had a yield .3 of a bushel lower than Wichita.

Table 6.--Summary of average yields of winter wheat varieties grown in plot tests at 9 stations in the central district for all or part of the period 1945-46.

| Variety | C. I. No. | Average yield in bushels per acre at: Manhattan | Garden City | Hays | Colby | Akron | Fort Collins | Lincoln | North Platte | Alliance | Av. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No. yrs. grown | | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 17 |
| Chey. x Tenmarq | 11972 | 35.5 | 31.4 | 23.5 | 57.1 | 24.0 | 44.6 | 35.5 | 57.2 | 33.2 | 38.1 |
| Chey. x E.Blkhl. | 12122 | 33.2 | 26.9 | 21.3 | 57.8 | 23.7 | 42.4 | 33.9 | 55.3 | 33.7 | 36.6 |
| Cheyenne | 8885 | 30.3 | .... | 20.0 | 50.6 | 25.5 | 39.1 | 35.1 | 53.4 | 34.2 | 36.1 |
| Pawnee | 11669 | 39.5 | 27.8 | 19.7 | 51.8 | 19.4 | 43.8 | 36.3 | 51.9 | 29.9 | 35.5 |
| Comanche | 11673 | 34.2 | 28.6 | 19.9 | 51.5 | 23.8 | 41.7 | 30.4 | 50.5 | 31.4 | 34.9 |
| Chiefkan | 11754 | 30.3 | 31.5 | 22.4 | 48.8 | 22.3 | 40.6 | 29.8 | 53.2 | 30.8 | 34.7 |
| Tenmarq | 6936 | 32.3 | 27.4 | 17.6 | 48.7 | 22.3 | 39.8 | 31.4 | 50.2 | 33.1 | 33.8 |
| Red Chief | 12109 | 29.4 | 31.6 | 19.7 | 51.1 | 20.8 | 39.9 | 30.4 | 49.6 | 27.4 | 33.5 |
| Blackhull | 6251 | 29.8 | 30.1 | 19.1 | 49.4 | 22.8 | 38.1 | 31.5 | 48.4 | 30.8 | 33.4 |
| Wichita | 11952 | 30.2 | 20.4 | 15.6 | 46.8 | 19.4 | 37.8 | 31.5 | 53.2 | 31.0 | 31.8 |
| Kharkof | 1442 | 25.8 | 24.8 1/ | 16.6 | 43.0 1/ | 23.0 | 39.0 2/ | 28.7 | 49.4 | 31.8 | 31.5 |

1/ Yield of Turkey used.

2/ Yield of Kanred used.

In the Northern District 4 varieties were grown uniformly at each of 7 stations (table 7). The average yields show no great differences, but H44 x Minturki$^2$ (C. I. 12139) has shown a slight advantage over Minturki while Minter (C. I. 12138) and Marmin have been somewhat lower. For the 2-year period in this same district the data are summarized in table 8. The varieties ranked in exactly the same order as for the 1946 averages.

Table 7.--Summary of average yields of varieties of winter wheat grown in plot tests at 6 stations in the northern district in 1946.

| Variety | C. I. No. | Average yield in bushels per acre at: Waseca | St. Paul | Sheridan | Bozeman | Moccasin | Havre | Average |
|---|---|---|---|---|---|---|---|---|
| H44 x Minturki$^2$ | 12139 | 10.6 | 35.4 | 64.2 | 55.7 | 13.5 | 19.8 | 33.2 |
| Minturki | 6155 | 15.1 | 38.3 | 55.3 | 54.3 | 14.8 | 18.2 | 32.7 |
| Minter | 12138 | 11.4 | 40.3 | 59.3 | 46.6 | 15.9 | 18.0 | 31.9 |
| Marmin | 11502 | 8.5 | 38.0 | 49.5 | 51.9 | 15.8 | 17.0 | 30.1 |

Table 8.--Summary of average yields of varieties of winter wheat grown in plot tests at 6 stations in the northern district for the period 1945-46.

| Variety | C. I. No. | Average yield in bushels per acre at: Waseca | St. Paul | Sheridan | Bozeman | Moccasin | Havre | Average |
|---|---|---|---|---|---|---|---|---|
| H44 x Minturki$^2$ | 12139 | 22.1 | 31.9 | 43.8 | 51.7 | 26.4 | 16.4 | 32.1 |
| Minturki | 6155 | 22.8 | 31.0 | 41.0 | 51.5 | 25.2 | 16.0 | 31.3 |
| Minter | 12138 | 23.8 | 32.1 | 43.9 | 45.2 | 24.9 | 16.3 | 31.0 |
| Marmin | 11502 | 19.9 | 32.7 | 43.3 | 45.3 | 24.1 | 14.5 | 30.0 |

States

In several States there were two or more cooperating stations from which data were received in 1946. At some of these stations only the uniform varieties were grown, while at others additional ones were included. It has been the practice to summarize the data by States by averaging yields from all stations within the State. In 1946 data were reported from more than one station in Texas, Oklahoma, Kansas, Colorado, Nebraska, Minnesota, and Montana and summaries have been made up for these. Where possible 2-year average yields have also been shown.

In Texas 18 varieties were grown at 3 stations with the average yields being shown in table 9. For 1946 Westar had the highest average followed by Kanred, Comanche, and Cheyenne x Tenmarq (C. I. 11972). Such varieties as Triumph, Red Chief, Blackhull, Tenmarq, and Wichita were at the bottom of the list. For the 2-year period Westar ranks first, Cheyenne x Early Blackhull (C. I. 12122) second, and Cheyenne x Tenmarq (C. I. 11972) third.

Table 9.--Average yield in bushels per acre of winter wheat varieties grown in plot tests in Texas in 1946, and weighted averages for 1945-46.

| Variety | C. I. No. | Average yield in bushels: 1946 (3 stations) | 1945-46 (6 station yrs.) | 2-year average rank |
|---|---|---|---|---|
| Westar | 12110 | 30.1 | 25.1 | 1 |
| Kanred | 5146 | 27.9 | .... | .. |
| Comanche | 11673 | 26.8 | 23.6 | 5 |
| Cheyenne x Tenmarq | 11972 | 26.6 | 23.8 | 3 |
| Pawnee | 11669 | 26.2 | 23.7 | 4 |
| Cheyenne x Chiefkan | 12129 | 26.1 | .... | .. |
| Comanche x Hope-Medit. (Texas sel. 157-42-74) | .... | 26.1 | .... | .. |
| Comanche x Hope-Medit. (Texas sel. 157-42-61) | .... | 25.1 | .... | .. |
| Cheyenne x Early Blackhull | 12122 | 24.7 | 23.9 | 2 |
| Kharkof | 1142 | 23.9 | 19.0 | 10 |
| Comanche x Hope-Medit. (Texas sel. 157-42-183) | .... | 23.8 | .... | .. |
| Chiefkan | 11754 | 23.8 | 19.5 | 7 |
| Triumph | 12132 | 23.0 | .... | .. |
| Red Chief | 12109 | 22.7 | 19.2 | 9 |
| Blackhull | 6251 | 22.2 | 19.3 | 8 |
| Early Blackhull | 8856 | 20.7 | 19.6 | 6 |
| Tenmarq | 6936 | 19.9 | 17.2 | 12 |
| Wichita | 11952 | 19.4 | 17.5 | 11 |

In Oklahoma data were reported from 4 stations with 14 varieties being grown uniformly. These data are presented in table 10. For 1946 Westar ranked first followed by Chiefkan, Red Chief, Cheyenne, and Pawnee. Of the early varieties Triumph slightly outyielded Wichita and both of these varieties were above Early Blackhull. For the 1945-46 average Cheyenne x Early Blackhull (C. I. 12122) ranks first, Pawnee second, and Westar third.

Table 10.--Average yield in bushels per acre of winter wheat varieties grown in plot tests in Oklahoma in 1946, and weighted averages for 1945-46.

| Variety | C. I. No. | Average yield in bushels: 1946 (4 stations) | 1945-46 (6 station yrs.) | 2-year average rank |
|---|---|---|---|---|
| Westar | 12110 | 27.5 | 26.6 | 3 |
| Chiefkan | 11754 | 27.0 | 24.4 | 8 |
| Red Chief | 12109 | 27.0 | 24.9 | 7 |
| Cheyenne | 8885 | 26.0 | 25.1 | 6 |
| Pawnee | 11669 | 25.9 | 26.9 | 2 |
| Cheyenne x Tenmarq | 11972 | 25.8 | 26.3 | 4 |
| Cheyenne x Early Blackhull | 12122 | 25.6 | 29.1 | 1 |
| Triumph | 12132 | 25.3 | .... | .. |
| Wichita | 11952 | 25.0 | 24.3 | 9 |
| Comanche | 11673 | 23.7 | 25.9 | 5 |
| Blackhull | 6251 | 23.5 | 23.6 | 10 |
| Early Blackhull | 8856 | 23.2 | 23.3 | 11 |
| Tenmarq | 6936 | 20.6 | 20.4 | 12 |
| Kharkof | 1442 | 20.1 | 20.1 | 13 |

Sixteen varieties were grown uniformly at 4 stations in Kansas and at these Cheyenne x Tenmarq (C. I. 11972) had the highest average yield (table 11). Blackhull ranked second, Triumph third, and Chiefkan x Oro-Tenmarq (C. I. 12133) fourth. The 3 lowest yielding varieties were Westar, Pawnee, and Wichita. For the 2-year average yields Cheyenne x Tenmarq (C. I. 11972) ranked first, Cheyenne x Early Blackhull (C. I. 12122) second, and Pawnee third. No explanation is at hand for the low yield of Pawnee in 1946 other than the effect of the May freeze and shattering, especially at Colby.

Table 11.--Average yield in bushels per acre of winter wheat varieties grown in plot tests in Kansas in 1946, and weighted averages for 1945-46.

| Variety | C. I. No. | Average yield in bushels: 1946 (4 stations) | 1945-46 (8 station yrs.) | 2-year average rank |
|---|---|---|---|---|
| Cheyenne x Tenmarq | 11972 | 32.4 | 36.9 | 1 |
| Blackhull | 6251 | 29.6 | 32.1 | 8 |
| Triumph | 12132 | 28.6 | .... | .. |
| Chiefkan x Oro-Tenmarq | 12133 | 28.3 | .... | .. |
| Red Chief | 12109 | 28.1 | 33.0 | 7 |
| Cheyenne x Early Blackhull | 12122 | 27.8 | 34.8 | 2 |
| Chiefkan | 11754 | 27.3 | 33.3 | 6 |
| Comanche | 11673 | 27.2 | 33.6 | 5 |
| Tenmarq selection | 12125 | 27.2 | .... | .. |
| Tenmarq | 6936 | 27.1 | 31.5 | 9 |
| Early Blackhull | 8856 | 25.6 | 31.2 | 10 |
| Turkey | 1558 | 24.4 | 27.1 | 12 |
| Quivira x Tenmarq | 12116 | 24.4 | 34.0 | 4 |
| Westar | 12110 | 24.3 | .... | .. |
| Pawnee | 11669 | 24.1 | 34.7 | 3 |
| Wichita | 11952 | 19.9 | 28.3 | 11 |

In Colorado data were reported from 2 stations (table 12) and at these Cheyenne x Tenmarq (C. I. 11972) ranked first followed by Cheyenne, Tenmarq, and Nebred. Pawnee, Wichita, and Early Blackhull were at the bottom of the list. For the 2-year period Cheyenne x Tenmarq (C. I. 11972) ranked first followed by Nebred, Cheyenne x Early Blackhull (C. I. 12122), and Comanche.

Table 12.--Average yield in bushels per acre of winter wheat varieties grown in plot tests in Colorado in 1946, and weighted averages for 1945-46.

| Variety | C. I. No. | Average yield in bushels: 1946 (2 stations) | 1945-46 (4 station yrs.) | 2-year average rank |
|---|---|---|---|---|
| Cheyenne x Tenmarq | 11972 | 37.5 | 34.3 | 1 |
| Cheyenne | 8885 | 34.7 | 32.3 | 5 |
| Tenmarq | 6936 | 34.4 | 31.1 | 8 |
| Nebred | 10094 | 33.5 | 33.5 | 2 |
| Kharkof | 1442 | 33.3 | .... | .... |
| Kanred | 5146 | 32.9 | 30.9 | 9 |
| Cheyenne x Early Blackhull | 12122 | 32.7 | 33.1 | 3 |
| Blackhull | 6251 | 30.7 | 30.5 | 10 |
| Comanche | 11673 | 30.5 | 32.8 | 4 |
| Red Chief | 12109 | 30.3 | 30.4 | 11 |
| Chiefkan | 11754 | 29.9 | 31.5 | 7 |
| Pawnee | 11669 | 28.3 | 31.6 | 6 |
| Wichita | 11952 | 22.5 | 28.6 | 12 |
| Early Blackhull | 8856 | 18.9 | 27.1 | 13 |

Data were reported from 3 stations in Nebraska (table 13). Cheyenne x Tenmarq (C. I. 11972), Cheyenne x Early Blackhull (C. I. 12122), Cheyenne, and Pawnee had the highest average yields. Again it should be pointed out that the three leading varieties have Cheyenne germ plasm. The same 4 varieties had the highest average yields for the 2-year period, 1945-46.

Table 13.--Average yield in bushels per acre of winter wheat varieties grown in plot tests in Nebraska in 1946, and weighted averages for 1945-46.

| Variety | C. I. No. | Average yield in bushels: 1946 (3 stations) | 1945-46 (5 station yrs.) | 2-year average rank |
|---|---|---|---|---|
| Cheyenne x Tenmarq | 11972 | 35.3 | 43.3 | 1 |
| Cheyenne x Early Blackhull | 12122 | 34.9 | 42.4 | 2 |
| Cheyenne | 8885 | 34.6 | 42.1 | 3 |
| Pawnee | 11669 | 32.9 | 40.0 | 4 |
| Nebraska No. 60 | 6250 | 31.8 | 38.7 | 9 |
| Chiefkan | 11754 | 30.7 | 39.6 | 7 |
| Comanche | 11673 | 30.5 | 38.8 | 8 |
| Tenmarq | 6936 | 30.4 | 39.6 | 6 |
| Blackhull | 6251 | 30.3 | 38.0 | 11 |
| Wichita | 11952 | 30.2 | 40.0 | 5 |
| Kharkof | 1442 | 30.0 | 38.2 | 10 |
| Red Chief | 12109 | 29.5 | 36.9 | 13 |
| Nebred | 10094 | 29.0 | 37.5 | 12 |

Data were reported from 2 stations in Minnesota (table 14) with 13 varieties being grown uniformly. For the most part the varieties are H44 x Minturki backcrosses, but none of them equalled the yield of the parent Minturki. Marmin averaged about 3 bushels less than Minturki and Blackhawk was at the bottom of the list. For the 2-year period Minter (C. I. 12138) ranked first and H44 x Minturki$^2$ (C. I. 12139) second.

Table 14.--Average yield in bushels per acre of winter wheat varieties grown in plot tests in Minnesota in 1946, and weighted averages for 1945-46.

| Variety | Minn. No. | C.I. No. | Average yield in bushels: 1946 (2 stations) | 1945-46 (4 station yrs.) | 2-year average rank |
|---|---|---|---|---|---|
| Minturki | .... | 6155 | 26.7 | 26.9 | 3 |
| H44 x Minturki$^2$ | 2765 | 12532 | 26.5 | .... | .. |
| Marmin x H44-Minhardi | 2768 | .... | 26.2 | .... | .. |
| Minter | 2713 | 12138 | 25.9 | 27.9 | 1 |
| H44 x Minturki$^3$ | 2772 | .... | 24.2 | .... | .. |
| Marmin | 2614 | 11502 | 23.3 | 26.3 | 4 |
| H44 x Minturki$^2$ | 2714 | 12139 | 23.0 | 27.0 | 2 |
| H44 x Minturki$^4$ | 2724 | .... | 23.0 | .... | .. |
| Minard-Minh. x H44-Minhardi | 2770 | .... | 22.7 | .... | .. |
| H44 x Minturki$^3$ | 2771 | ..... | 22.5 | .... | .. |
| H44 x Minturki$^3$ | 2766 | ..... | 22.0 | .... | .. |
| Minard-Minh. x H44-Minhardi | 2769 | ..... | 21.3 | .... | .. |
| H44 x Minturki$^3$ | 2767 | ..... | 19.6 | .... | .. |
| Blackhawk | 2725 | 12218 | 17.7 | 25.8 | 5 |

In Montana 13 varieties were grown uniformly at 3 stations and the averages are shown in table 15. Yogo had the highest average yield, although its advantage over Martin x Tenmarq$^3$ (C. I. 11804) was only .2 of a bushel. Karmont, Nebred, and Marmin gave yields that were somewhat lower and they ranked in the order named. For the 2-year period including 6 station years' results Martin x Tenmarq$^3$ (C. I. 11804) ranks first, Nebred second, and Karmont third.

Table 15.--Average yield in bushels per acre of winter wheat varieties grown in plot tests in Montana in 1946, and weighted averages for 1945-46.

| Variety | C. I. No. | Average yield in bushels: 1946 (3 stations) | 1945-46 (6 station yrs.) | 2-year average rank |
|---|---|---|---|---|
| Yogo | 8033 | 32.4 | 32.2 | 4 |
| Martin x Tenmarq$^3$ | 11804 | 32.2 | 37.1 | 1 |
| Karmont | 6700 | 32.0 | 33.2 | 3 |
| Martin x Tenmarq$^3$ | 11824 | 30.4 | 32.2 | 5 |
| Nebred | 10094 | 30.4 | 34.5 | 2 |
| Kharkof | 1442 | 30.2 | 31.2 | 8 |
| Compound Hybrid | 11744 | 29.7 | 31.6 | 6 |
| H44 x Minturki$^2$ | 12139 | 29.1 | 31.5 | 7 |
| Minturki | 6155 | 29.1 | 30.9 | 9 |
| Yogo x Oro Sel. 5 | .... | 28.5 | 30.6 | 11 |
| Marmin | 11502 | 28.3 | 28.0 | 13 |
| Mont. 36-Beloglina x Kanred | 12108 | 27.4 | 30.8 | 10 |
| Minter | 12138 | 26.8 | 28.8 | 12 |

## SUMMARY OF AGRONOMIC DATA

The agronomic (other than yield) and disease data have been summarized for each district for 1946 in tables 16 to 18. In each case the data are averaged for as many varieties and as many stations as possible. The number of stations entering the averages is shown at the top of each column.

Thirteen varieties were grown uniformly at the southern stations, the data being shown in table 16. Triumph and Early Blackhull had the earliest heading dates which were 3 days ahead of Wichita, and 5 days ahead of Cheyenne x Early Blackhull (C. I. 12122). All varieties headed earlier than Kharkof. The varieties matured in much the same order as they headed, although the range was not so great. Triumph proved to have the shortest straw, while Red Chief and Chiefkan were the tallest, the difference being 5 inches. Lodging data from 2 stations showed Red Chief, Pawnee, and Westar to have the strongest straw, and Wichita, Early Blackhull, and Cheyenne x Early Blackhull (C. I. 12122) the weakest. Leaf rust data were averaged from 4 stations with Westar showing the most resistance. Pawnee ranked second and Cheyenne x Tenmarq (C. I. 11972) third. Triumph and Early Blackhull had the highest average leaf rust readings. Test weights per bushel were averaged from 6 stations. Red Chief had an average of 62.6 pounds per bushel, while Early Blackhull and Cheyenne x Early Blackhull (C. I. 12122) had averages of 61.7 pounds. All varieties except Kharkof, Tenmarq, and Comanche had average test weights above 60 pounds per bushel.

Table 16.--Summary of agronomic data other than yield for winter wheat varieties grown at cooperating stations in the southern district in 1946.

| Variety | C. I. No. | Average Date Headed | Average Date Ripe | Average Height | Average Lodging | Average Leaf rust | Average Weight per bushel |
|---|---|---|---|---|---|---|---|
| | | April | | In. | % | % | Lbs. |
| Number of stations | | 5 | 4 | 4 | 2 | 4 | 6 |
| Kharkof | 1442 | 30 | 6/5 | 32 | 27 | 48 | 59.8 |
| Blackhull | 6251 | 28 | 6/2 | 33 | 26 | 40 | 61.3 |
| Tenmarq | 6936 | 27 | 6/1 | 31 | 18 | 53 | 59.7 |
| Early Blackhull | 8856 | 15 | 5/22 | 34 | 39 | 63 | 61.7 |
| Pawnee | 11669 | 25 | 5/29 | 31 | 7 | 19 | 60.7 |
| Comanche | 11673 | 24 | 5/29 | 31 | 18 | 40 | 59.9 |
| Chiefkan | 11754 | 27 | 6/3 | 35 | 20 | 46 | 61.5 |
| Wichita | 11952 | 18 | 5/23 | 32 | 43 | 70 | 61.5 |
| Cheyenne x Tenmarq | 11972 | 28 | 6/4 | 32 | 29 | 31 | 60.8 |
| Red Chief | 12109 | 25 | 6/4 | 35 | 5 | 15 | 62.6 |
| Westar | 12110 | 26 | 5/31 | 34 | 8 | 10 | 60.5 |
| Cheyenne x Early Blackhull | 12122 | 20 | 5/26 | 31 | 38 | 56 | 61.7 |
| Triumph | 12132 | 15 | 5/22 | 30 | 24 | 65 | 61.1 |

In the Central District winterkilling was reported from 3 stations (table 17). The range in average survivals was not wide with Blackhull having the lowest (81 percent), while Red Chief and Cheyenne x Early Blackhull (C. I. 12122) had survivals of 90 percent. Average heading dates ranged from May 10 for Wichita to May 23 for Kharkof and Cheyenne. Cheyenne x Early Blackhull (C. I. 12122) averaged 2 days later than Wichita, while Pawnee and Comanche

were 5 days later. Wichita had an average ripening date of June 25, compared with Kharkof July 1 and Cheyenne July 2. For plant height Chiefkan and Red Chief were the tallest with averages of 36 and 35 inches, respectively, while Pawnee and Cheyenne x Early Blackhull (C. I. 12122) were the shortest with averages of 31 inches. Frost damage data from 2 stations indicated that Wichita, Cheyenne x Early Blackhull (C. I. 12122), and Comanche were injured the most by the May freeze. Leaf rust data were rather fragmentary but showed Pawnee and Comanche to be the most resistant and Wichita the most susceptible. Culm counts from 3 stations showed Cheyenne x Early Blackhull (C. I. 12122) and Pawnee as having the greatest number of culms per acre and Chiefkan the lowest. Comanche and Red Chief also had thin stands. Test weight data from 9 stations indicated only fair quality with averages ranging from 58.5 to 60.8 pounds per bushel. Red Chief ranked first and Cheyenne x Early Blackhull (C. I. 12122) second. Kharkof and Tenmarq had the lowest average bushel weights.

Table 17.--Summary of agronomic data other than yield for winter wheat varieties grown at cooperating stations in the central district in 1946.

| Variety | C. I. No. | Average | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Winter surv. | Date Headed | Date Ripe | Ht. | Frost damage | Leaf rust | No. culms per A. | Wt. per bu. |
| | | % | May | | In. | % | % | (000) | Lbs. |
| Number of stations | | 3 | 9 | 7 | 9 | 2 | 2 | 3 | 9 |
| Kharkof | 1442 | 87 | 23 | 7/1 | 34 | 9 | 23 | 1621 | 58.5 |
| Blackhull | 6251 | 81 | 18 | 6/29 | 34 | 8 | 33 | 1902 | 59.6 |
| Tenmarq | 6936 | 86 | 18 | 6/29 | 34 | 9 | 29 | 1728 | 58.7 |
| Cheyenne | 8885 | 88 | 23 1/ | 7/2 1/ | 34 1/ | 7 | 28 | 1586 1/ | 59.6 1/ |
| Pawnee | 11669 | 83 | 15 | 6/27 | 31 | 10 | 12 | 2002 | 59.0 |
| Comanche | 11673 | 84 | 15 | 6/28 | 33 | 15 | 13 | 1454 | 59.5 |
| Chiefkan | 11754 | 87 | 18 | 6/30 | 36 | 10 | 27 | 1385 | 59.8 |
| Wichita | 11952 | 84 | 10 | 6/25 | 32 | 23 | 50 | 1605 | 60.1 |
| Cheyenne x Tenmarq | 11972 | 89 | 20 | 6/29 | 32 | 7 | 24 | 1762 | 60.1 |
| Red Chief | 12109 | 90 | 17 | 6/29 | 35 | 10 | 33 | 1513 | 60.8 |
| Cheyenne x Early Blackhull | 12122 | 90 | 12 | 6/27 | 31 | 15 | 45 | 2065 | 60.2 |

1/ One less station than indicated.

Agronomic data for the four varieties grown uniformly in the Northern District are shown in table 18. Minturki and Minter had the higher winter survival figures. Marmin headed one day earlier on the average, while Minter ripened one day earlier than the other three varieties. Minter showed the highest texture score, and it had a slight advantage in test weight per bushel.

Table 18.--Summary of agronomic data other than yield for winter wheat varieties grown at cooperating stations in the northern district, 1946.

| Variety | C. I. No. | Average | | | | | |
|---|---|---|---|---|---|---|---|
| | | Winter surv. | Date Headed | Date Ripe | Height | Texture | Weight per bushel |
| | | % | June | July | In. | % | Lbs. |
| Number of stations | | 2 | 5 | 6 | 5 | 2 | 6 |
| Minturki | 6155 | 60 | 14 | 25 | 36 | 67 | 62.0 |
| Marmin | 11502 | 57 | 12 | 25 | 36 | 63 | 62.1 |
| Minter | 12138 | 60 | 13 | 24 | 35 | 79 | 62.2 |
| H44 x Minturki 2 | 12139 | 53 | 14 | 25 | 35 | 69 | 60.1 |

## SUMMARY OF PLOT DATA

Southern District:

Average yields of the winter wheat varieties were slightly higher than in 1945. Insect damage (aphids) was present at Lawton and Bushland, and in some cases drought reduced yields. Some leaf rust was present, but there was little or no stem rust.

Westar ranked first for yield in 1946, with an average of 28.6 bushels per acre at 7 stations.

Cheyenne x Tenmarq (C. I. 11972) ranked second with an average of 26.1 bushels, and Pawnee third with 26.0 bushels per acre.

Triumph, an early variety, outyielded both Wichita and Early Blackhull.

Tenmarq gave very poor yields and ranked below Kharkof.

Westar, Cheyenne x Early Blackhull (C. I. 12122), and Pawnee rank in the order named for yield during the last 2 years.

Varieties headed from 7 to 10 days earlier than in 1945.

Westar displayed the best resistance to leaf rust.

Red Chief and varieties of the Blackhull group had the highest test weights per bushel.

Central District:

Yields were not as high as some stations as in 1945, and as a result the general averages were lower. There was little disease damage, but a freeze of early May reduced the yields of early varieties at some stations.

Cheyenne x Tenmarq (C. I. 11972) ranked first with an average yield at 9 stations of 34.5 bushels.

Cheyenne was in second place, followed by Cheyenne x Early Blackhull (C. I. 12122), Blackhull, and Tenmarq.

Kharkof, Pawnee, and Wichita were at the bottom of the list for yield.

Cheyenne x Tenmarq (C. I. 11972), Cheyenne x Early Blackhull (C. I. 12122), Cheyenne, and Pawnee rank in the order listed for the 1945-46 average yields.

The crop was earlier than in 1945, in some cases as much as 2 weeks.

The early varieties and Red Chief had the highest test weights per bushel.

Northern District:

Four varieties were grown uniformly at 7 stations in the Northern District.

H44 x Minturki[2] (C. I. 12139) had the best average yield in 1946 and for the 1945-46 period.

Minter (C. I. 12138), the recently named variety developed in Minnesota, was slightly below Minturki for both the 1946 and 1945-46 average yields. It showed good winterhardiness, was fairly early in maturity, had the best average texture score, and a slight advantage in test weight per bushel. In Minnesota, Minter has ranked first for yield during the last 2 years.

In Montana, Yogo ranked first in 1946, but for the 2-year period Martin x Tenmarq$^3$ (C. I. 11804) has the best average yield.

## UNIFORM YIELD NURSERY

In the fall of 1945 the uniform yield nursery was seeded at the same 14 stations in the Central and Southern districts as in the previous fall. The 1945-46 nursery included 23 varieties and strains, and at each station was seeded in three- or four-row plots, with from 3 to 5 replications. The varieties making up this test, together with State and C. I. numbers, are shown in table 19.

Table 19.--Varieties of hard red winter wheat grown in the uniform yield nursery, 1946.

| Variety | State or hybrid No. | C. I. No. |
|---|---|---|
| Kharkof | ..... | 1442 |
| Blackhull | ..... | 6251 |
| Early Blackhull | ..... | 8856 |
| Pawnee | ..... | 11669 |
| Comanche | ..... | 11673 |
| Wichita | ..... | 11952 |
| Cheyenne x Early Blackhull | Woodward No. 1127 | 12000 |
| Blackhull x Cheyenne | Hays Cereal No. 40-102 | 12101 |
| Westar | ..... | 12110 |
| Cheyenne x Early Blackhull | Hays Cereal No. 40-91 | 12114 |
| Quivira x Tenmarq | Kans. No. 2762 | 12116 |
| Blackhull x Hard Federation | Woodward No. 36h769-150 | 12120 |
| Cheyenne x Early Blackhull | Hays Cereal No. 40-95 | 12122 |
| Cheyenne x Tenmarq | Kans. No. 2758 | 12123 |
| Tenmarq selection | Kans. No. 2770 | 12125 |
| Tenmarq x Blackhull | Hays Cereal No. 40-118 | 12126 |
| Marquillo-Tenmarq x Kawvale-Tenmarq | Kans. No. 2773 | 12127 |
| Kawvale-Marquillo x Kawvale-Tenmarq | Kans. No. 2775 | 12128 |
| Cheyenne x Chiefkan | Denton No. 42-2519 | 12129 |
| Chiefkan x Martin-Tenmarq | Denton No. 42-2882 | 12130 |
| Triumph | ..... | 12132 |
| Chiefkan x Oro-Tenmarq | Hays Cereal No. 43-112 | 12133 |
| Chiefkan x Oro-Tenmarq | Hays Cereal No. 43-113 | 12134 |
| Kanred x Hope-Hard Federation | Akron No. 536 | 12135 |
| Kanred x Hope-Hard Federation | Akron No. 869 | 12136 |
| **New Strains** | | |
| Oro x Mediterranean-Hope | Oklahoma 21 | 12140 |
| Mediterranean-Hope x Pawnee | Kans. No. 2789 | 12141 |
| Cheyenne x Turkey 1062 | North Platte No. 40410 | 12142 |

A comparison of the 1946 list with that for 1945 will show that a number of changes were made. Six strains were discontinued and 3 new ones added as follows:

| Name | C. I. No. | Remarks |
|---|---|---|
| Oro x Mediterranean-Hope | 12140 | Developed in Oklahoma from material supplied by Kansas. Very resistant to leaf and stem rust. |
| Mediterranean-Hope x Pawnee | 12141 | A rust-resistant, early strain similar to yield of Pawnee but better with respect to rust resistance. |
| Cheyenne x Turkey 1062 | 12142 | A later wheat of the Cheyenne type, but resistant to many races of bunt. Good in Nebraska. |

As soon as a strain is shown to be lacking in some important character, it is omitted from the nursery although very often it may be continued at an individual station. Strains having the best performance in the nursery are advanced to the plot trials. At present there are a number of duplications between the so-called plot tests and the yield nursery but as rapidly as possible these are being eliminated.

## DATA OBTAINED

The data from 13 nurseries are presented in table 20. The Bushland, Tex., nursery, being severely injured by drought and greenbugs, was not harvested. For each station the varieties are listed in order of the 1946 yields. Only C. I. numbers are shown for identification. Average yields for the 2-year period, 1945-46, are given and the yields are also expressed in percentage of Kharkof check for the years grown. Data on characters other than yield are given when the information showed differences that might explain the behavior of the varieties.

At Denton, development was much the same as explained for the variety test. Heading and ripening were early and leaf rust was rather heavy on all varieties except C. I. Numbers 12128, 12110 (Westar), 12140, and T2114. There seemed to be some relationship between resistance to leaf rust and yield since the higher yields were made by the resistant strains. Test weights were only fair, but the yields of grain were rather high. The highest yielding varieties were C. I. Numbers 12141, 12128, 12110 (Westar), 12140, and 12101 in the order named. The 1945-46 average yields follow much the same order as those for 1946. Pawnee (C. I. 11669), Comanche (C. I. 11673), and Early Blackhull (C. I. 8856) have the best long-time records when the yields are expressed as a percentage of Kharkof check.

Leaf rust was present at Chillicothe, although the infection was not so heavy as at Denton, since the highest readings were 35 percent. In this case the relation between leaf rust infection and yield was not close. Zero rust readings were recorded for C. I. Numbers 12110 (Westar), 12140, and 12128, and a trace for C. I. 12141. Test weights were high and the yields ranged from 21.6 to 12.3 bushels per acre. The highest yields were recorded for C. I. Numbers 12129, 12110 (Westar), 12101, 12140, and 11669 (Pawnee). Based on the average yields for two or more years, as expressed by the percentage of Kharkof, C. I. Numbers 12128, 12122, 11673 (Comanche), and 12129 are at the top of the list at this station.

Very complete leaf rust readings were reported from Stillwater with highly resistant reactions being recorded for C. I. Numbers 12128, 12141, and 12140, while Pawnee (C. I. 11669) was marked intermediate and Comanche (C. I. 11673) as completely susceptible. Lodging was due in part to damage from hessian fly. The least lodging was reported for C. I. Numbers 12127, 12142, 12141, and 11669 (Pawnee). Lodging was heaviest for C. I. Numbers 11673 (Comanche), 12140, 12132 (Triumph), and 12110 (Westar). The yields ranged from 26.0 to 7.6 bushels per acre, with C. I. Numbers 12128, 12141, 11669 (Pawnee), and 12120 being at the top of the list. Of the strains grown for 2 or more years the following have had the highest average yields: C. I. Numbers 12128, 12120, 12122, 12000, and 12110 (Westar). Grown for 2 years Triumph (C. I. 12132) has not yielded as well as either Early Blackhull (C. I. 8856) or Wichita (C. I. 11952).

At Woodward no diseases were recorded, maturity was early, test weights heavy, and the yields high. C. I. Numbers 12132 (Triumph), 12122, 12126, and 12000 had the best yield records and ranked in the order listed. When the yields are expressed as a percentage of Kharkof check, C. I. Numbers 12101, 12128, 12000, and 11669 (Pawnee) have the best records of the varieties grown for 2 or more years. At this station new material seems to have an advantage over varieties now being recommended.

The crop at Manhattan was early, with heading starting on April 26 for Triumph (C. I. 12132) and continuing until May 15. Ripening occurred from June 11 to 20. Growth was heavy, straw tall, and there was a severe leaf rust epidemic that caused reductions in yield. Infections ranged from 0 to 100 percent with only three strains having readings below 15 percent, i.e., C. I. Numbers 12128, 12141, and 12140. The smut counts refer to the number of heads of loose smut per row. Some strains lodged badly, especially C. I. Numbers 8856 (Early Blackhull), 12132 (Triumph), and 11952 (Wichita). C. I. Number 12127 showed 48 percent of shattering in guard rows two weeks after full maturity. Test weights were high and the yield range was from 53.4 to 26.7 bushels per acre. C. I. Numbers 12128, 12141, 12140, and 12116 had the highest yields, while the two early wheats Triumph (C. I. 12132) and Early Blackhull (C. I. 8856) had the lowest yield records. The varieties rank much the same for the 1945-46 average as for the 1946 yields. Grown for 2 or more years the following strains have the highest percentages of Kharkof check: C. I. Numbers 12128, 11669 (Pawnee), 12127, 12110 (Westar), and 11952 (Wichita).

At Hays there were no diseases present but the May freeze undoubtedly caused some damage since all of the wheats were headed at the time. Yields were rather low with C. I. Numbers 12128, 12141, 12134, and 12130 ranking the highest. At this station, C. I. 11952 (Wichita) gave the lowest yield of any variety in the nursery. Based on the 2-year average yields C. I. Number 12133 ranks first, followed by C. I. Numbers 12120, 12122, and 12128. Grown for 3 years C. I. Number 12122 has outyielded Kharkof check by 53.3 percent. This Cheyenne x Early Blackhull strain is one of the newer early wheats with considerable yielding ability but weak straw.

Stands at Akron were good and fairly uniform, straw of medium height, but yields were not as high as expected. C. I. Numbers 12135, 12126, 12129, and 12133 yielded in the order listed. The 1946 yields do not agree too well with those in 1945 since the varieties rank differently based on the 1945-46 average yields. In this case the five highest yielding strains were C. I. Numbers 12114, 12000, 12116, 12129, and 12135. C. I. 8856 (Early Blackhull) has exceeded the check by 20.8 percent over a 12-year period, while C. I. Number 11952 (Wichita) has had a 19.3 percent advantage for a 7-year period.

At Fort Collins there was some winterkilling with strains such as C. I. Numbers 12110 (Westar) and 12129 surviving only 70 percent. Maturity was much earlier than in 1945 and no rust was reported. The May freeze damaged some of the early wheats such as C. I. Numbers 12132 (Triumph), 11952 (Wichita), and 8856 (Early Blackhull). Lodging was rather heavy in the case of C. I. Numbers 12142, 1442 (Kharkof) and 6251 (Blackhull). C. I. Numbers 12142, 12125, 12114, and 1442 (Kharkof) had the highest yields, and in general the later varieties outyielded the earlier ones. Based on the 1945-46 averages C. I. Numbers 12129, 12114, and 1442 (Kharkof) rank in the order listed. It should be noted that when yields are expressed as percentages of the check only 10 wheats have values above 100. This is somewhat different than at most stations.

The range of ripening dates at Hesperus was from July 16 to 21. At this station straw was tall but no lodging was reported. Test weights ranged from 59.5 to 62.0 pounds per bushel, and the yield range was from 78.1 to 42.1 bushels per acre. At the top of the list for yield were C. I. Numbers 8856 (Early Blackhull), 11673 (Comanche), and 11669 (Pawnee). C. I. Numbers 8856 (Early Blackhull), 12122, and 11673 (Comanche) have the highest yields for the 1944 and 1946, 2-year average. Grown for 8 years Comanche (C. I. 11673) has outyielded Kharkof (C. I. 1442) check by 27.2 percent.

Winterkilling was reported from Ames, but in no case was it severe. Both stem and leaf rust were reported with C. I. Numbers 12140, 12141, and 12128 showing only 5 percent infection for each rust. Stinking smut data show the average infections from artificial inoculation using two methods. Test weights were rather low in some cases, while the yields ranged from 42.7 to 30.8 bushels per acre. The highest yields were recorded for C. I. Numbers 12122, 12142, 11669 (Pawnee), and 12140. Blackhull (C. I. 6251), Kharkof (C. I. 1442), and Comanche had the lowest yields. The 1945-46 average yields follow rather closely those for 1946. Grown for 7 years Comanche has not equalled Kharkof, but Pawnee has exceeded the check by 14.4 percent.

At Lincoln the early varieties started to head on May 5, while the later ones were not headed until May 18 and 19. The range of ripening was much shorter. Mildew notes showed C. I. Numbers 12110 (Westar) and 12142 to be most susceptible. Leaf rust was fairly heavy with the most resistance being displayed by C. I. Numbers 12128, 12141, and 12140. The freeze of May 10 and 11 caused considerable sterility, especially to the early varieties. These notes were obtained by counting the sterile florets on 100 heads of each variety. There seems to be some relation between freeze injury and yield, those varieties that were headed before the freeze being injured the most and yielding very low. The highest yields were recorded for C. I. Numbers 12128, 11669 (Pawnee), 12141, and 12114. C. I. Numbers 12132 (Triumph) and 11952 (Wichita) gave the lowest yields. Grown for 12 years Pawnee (C. I. 11669) has exceeded the check by 37.5 percent, while Early Blackhull grown for 15 years has yielded 27.8 percent more than Kharkof.

Neither winterkilling nor diseases were noted at North Platte. Test weights were rather light due to the moisture supply running low before maturity was reached. C. I. Numbers 12142, 12129, 12114, and 12000 gave the highest yields. Such varieties as Wichita (C. I. 11952), Early Blackhull (C. I. 8856), Pawnee (C. I. 11669), and Kharkof (C. I. 1442) were near the bottom of the list. The agreement between the 1945 and 1946 yields was rather good as shown by the ranking of the varieties based on the 2-year average yield. Grown for 3 years C. I. 12114 has exceeded the check by 52.9 percent.

At Alliance some winterkilling was reported with C. I. Numbers 12120, 8856 (Early Blackhull), and 12126 having the lowest survivals. Yields were low and the range rather narrow. Four strains, C. I. Numbers 12125, 12114, 12133, and 12128, ranked above Kharkof (C. I. 1442), while Pawnee (C. I. 11669) was at the bottom of the list. The 1945-46 average yields and those expressed as a percentage of the check do not agree too well with the ranking based on the 1946 yields. Grown for 4 years C. I. 12114 has outyielded Kharkof by 18.3 percent.

Table 20.--Yield and other data for the uniform winter wheat varieties grown in replicated nursery plots in cooperative experiments at 13 stations in the hard red winter wheat area in 1946, and average yields for 1945-46.

Denton, Texas

(Four plots)

| C. I. No. | Date Headed | Date Ripe | Ht. | Leaf rust | Sep-toria 1/ | Shat-tering | Wt. per bu. | Av. acre yield 1946 | Average yield 1945-46 | No. years grown | Percent of Kharkof | Rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | April | May | In. | % | | | Lbs. | Bu. | Bu. | | | |
| 12141 | 19 | 24 | 36 | 4 | 4 | 3 | 56.0 | 34.2 | ... | 1 | 132.0 | 10 |
| 12188 | 19 | 25 | 38 | 1 | 4 | 5 | 58.5 | 33.0 | 24.5 | 2 | 140.0 | 8 |
| 12110 | 21 | 26 | 41 | 6 | 4 | 2 | 58.0 | 31.4 | 21.2 | 4 | 140.2 | 7 |
| 12140 | 21 | 26 | 38 | 0 | 3 | 0 | 58.0 | 30.7 | ... | 1 | 118.5 | 15 |
| 12101 | 25 | 30 | 34 | 36 | 0 | 0 | 58.0 | 29.0 | 20.8 | 5 | 118.2 | 16 |
| 12127 | 19 | 24 | 37 | 25 | 4 | 5 | 56.0 | 28.0 | 21.9 | 2 | 125.1 | 12 |
| 12133 | 19 | 23 | 33 | 70 | 2-3 | 0 | 58.0 | 27.6 | 20.8 | 2 | 118.9 | 14 |
| 12123 | 21 | 24 | 37 | 46 | 0 | 0 | 57.0 | 27.4 | 20.4 | 3 | 141.7 | 6 |
| 12122 | 15 | 19 | 34 | 68 | 0 | T | 57.5 | 27.3 | 20.3 | 3 | 146.0 | 4 |
| 12120 | 19 | 25 | 34 | 39 | 0 | 0 | 59.0 | 26.6 | 19.1 | 3 | 133.7 | 9 |
| 12134 | 20 | 24 | 36 | 56 | 2 | T | 57.0 | 26.4 | 20.1 | 2 | 114.9 | 20 |
| 11673 | 19 | 24 | 28 | 33 | 1-2 | T | 57.0 | 26.2 | 19.8 | 9 | 167.5 | 2 |
| 1442 | 25 | 31 | 36 | 40 | 0 | 0 | 55.0 | 25.9 | 17.5 | 13 | 100.0 | 24 |
| 11669 | 21 | 23 | 34 | 26 | 2 | T | 58.0 | 25.5 | 19.6 | 9 | 193.3 | 1 |
| 12125 | 23 | 26 | 38 | 34 | 0 | T | 59.0 | 25.5 | 18.9 | 3 | 128.2 | 11 |
| 12130 | 20 | 26 | 39 | 45 | 2 | T | 57.0 | 25.3 | 18.6 | 2 | 106.3 | 22 |
| 12000 | 13 | 18 | 34 | 65 | 0 | 5 | 56.0 | 24.6 | 19.8 | 5 | 116.5 | 18 |
| 6251 | 24 | 30 | 37 | 20 | 0 | 0 | 56.0 | 23.0 | 17.1 | 13 | 117.8 | 17 |
| 12132 | 6 | 15 | 31 | 86 | 3 | 2 | 56.0 | 22.3 | 16.2 | 2 | 92.6 | 25 |
| 8856 | 8 | 16 | 35 | 71 | 0 | 2 | 57.0 | 22.0 | 17.2 | 13 | 147.0 | 3 |
| 12116 | 20 | 24 | 38 | 53 | 0 | 3 | 58.0 | 21.9 | 16.5 | 4 | 114.0 | 21 |
| 12126 | 21 | 26 | 39 | 43 | 0 | 0 | 58.0 | 21.9 | 16.3 | 3 | 115.3 | 19 |
| 12142 | 22 | 26 | 34 | 81 | 0 | 5 | 55.0 | 21.4 | ... | 1 | 82.6 | 28 |
| 12114 | 23 | 25 | 35 | 49 | 0 | 3 | 57.5 | 21.3 | 17.1 | 4 | 119.6 | 13 |
| 12129 | 24 | 26 | 36 | 44 | 0 | 0 | 58.0 | 21.0 | 17.8 | 2 | 101.7 | 23 |
| 12135 | 19 | 22 | 34 | 36 | 3 | 10 | 54.0 | 20.7 | 15.0 | 2 | 85.7 | 27 |
| 12136 | 18 | 23 | 36 | 71 | 3 | 3 | 55.0 | 20.5 | 15.1 | 2 | 86.3 | 26 |
| 11952 | 14 | 16 | 33 | 81 | 0 | 5 | 56.0 | 16.5 | 12.3 | 7 | 142.0 | 5 |

Standard error of a difference between the mean yields of any two varieties = 3.41 bushels.

1/ Degree of susceptibility 0 to 4.

Table 20 -(Continued)

Childress, Texas

(Four plots)

| C. I. No. | Date headed | Leaf rust | Weight per bushel | Average acre yield | Average yield 9 tests | No. years grown | Percent of Kharkof | Rank |
|---|---|---|---|---|---|---|---|---|
| | April | % | Lbs. | Bu. | Bu. | | | |
| 12129 | 26 | 20 | 630 | 21.6 | 22.6 | 2 | 127.6 | 4 |
| 12110 | 24 | 0 | 600 | 20.7 | 22.4 | 4 | 126.1 | 5 |
| 12101 | 26 | 25 | 620 | 20.0 | 20.5 | 5 | 121.5 | 9 |
| 12140 | 26 | 0 | 610 | 20.0 | ... | 1 | 109.9 | 19 |
| 11669 | 23 | 50 | 600 | 19.5 | 20.7 | 8 | 121.0 | 10 |
| 12141 | 24 | 70 | 600 | 19.1 | ... | 1 | 104.9 | 23 |
| 12128 | 23 | 0 | 610 | 19.0 | 26.0 | 2 | 146.1 | 1 |
| 12125 | 24 | 35 | 620 | 19.0 | 19.0 | 3 | 109.1 | 20 |
| 11673 | 24 | 15 | 600 | 18.9 | 22.7 | 8 | 131.8 | 3 |
| 11442 | 26 | 30 | 620 | 18.2 | 17.8 | 8 | 100.0 | 26 |
| 12142 | 26 | 5 | 590 | 18.2 | ... | 1 | 100.0 | 26 |
| 6251 | 26 | 30 | 630 | 17.9 | 15.9 | 8 | 111.9 | 18 |
| 11952 | 17 | 25 | 640 | 17.7 | 19.7 | 7 | 114.6 | 14 |
| 12126 | 24 | 35 | 610 | 17.7 | 17.6 | 3 | 103.7 | 24 |
| 12122 | 20 | 25 | 620 | 17.5 | 24.9 | 3 | 132.1 | 2 |
| 12114 | 20 | 25 | 620 | 17.2 | 18.3 | 4 | 108.0 | 21 |
| 12130 | 24 | 20 | 610 | 16.8 | 21.7 | 2 | 121.9 | 8 |
| 12123 | 24 | 10 | 620 | 16.6 | 22.0 | 3 | 120.3 | 11 |
| 12120 | 24 | 10 | 630 | 16.3 | 21.2 | 3 | 120.3 | 11 |
| 12127 | 23 | 20 | 600 | 16.1 | 19.0 | 2 | 109.7 | 22 |
| 12135 | 24 | 15 | 580 | 16.1 | 17.5 | 2 | 98.3 | 28 |
| 12116 | 24 | 5 | 610 | 15.9 | 20.8 | 4 | 113.8 | 17 |
| 12133 | 24 | 25 | 620 | 15.2 | 22.0 | 2 | 123.6 | 6 |
| 12136 | 24 | 5 | 580 | 15.0 | 18.4 | 2 | 103.4 | 25 |
| 12134 | 24 | 35 | 610 | 14.7 | 20.4 | 2 | 114.6 | 14 |
| 12000 | 17 | 25 | 630 | 14.5 | 22.6 | 5 | 122.6 | 7 |
| 8856 | 16 | 20 | 630 | 12.7 | 19.7 | 8 | 114.2 | 16 |
| 12132 | 16 | 20 | 610 | 12.3 | 20.6 | 2 | 115.7 | 13 |

Standard error of a difference between the mean yields of any two varieties = 3.42 bushels.

Table 20.--(Continued)

Stillwater, Oklahoma

(Four plots)

| C. I. No. | Date Headed | Date Ripe | Ht. | Leaf rust 1/ Prevalence | Leaf rust 1/ Severity | Leaf rust 1/ Response | Lodging 2/ | Weight per bushel | Av. acre yield | Average yield 1945-46 | No. years grown | Percent of Kharkof | Rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | June | In. | % | % | | % | Lbs. | Bu. | Bu. | | | |
| 12128 | 5/4 | 12 | 35 | 58 | 22 | HR | 9 | 60.0 | 26.0 | 27.7 | 2 | 245.1 | 2 |
| 12141 | 5/3 | 11 | 35 | 26 | 13 | HR | 6 | 59.5 | 24.8 | .... | 1 | 302.4 | 1 |
| 11669 | 5/3 | 11 | 35 | 88 | 15 | I | 6 | 59.5 | 24.5 | 25.2 | 10 | 137.2 | 23 |
| 12120 | 5/2 | 11 | 32 | 84 | 36 | I(CS) | 9 | 62.0 | 23.9 | 23.6 | 2 | 208.8 | 4 |
| 8856 | 4/24 | 3 | 34 | 96 | 40 | CS | 10 | 62.0 | 22.5 | 23.8 | 13 | 113.2 | 26 |
| 12130 | 5/2 | 12 | 37 | 88 | 42 | CS | 10 | 59.0 | 20.3 | 21.7 | 2 | 192.0 | 9 |
| 12126 | 5/6 | 10 | 35 | 100 | 58 | CS | 11 | 59.5 | 19.9 | 21.5 | 2 | 190.3 | 10 |
| 12142 | 5/7 | 13 | 36 | 90 | 27 | I(CS) | 6 | 58.0 | 19.8 | .... | 1 | 241.5 | 3 |
| 12110 | 5/4 | 13 | 38 | 89 | 22 | R(CS) | 26 | 59.0 | 19.2 | 23.0 | 4 | 194.0 | 7 |
| 12127 | 5/4 | 11 | 33 | 96 | 38 | R(CS) | 4 | 60.0 | 18.5 | 21.8 | 2 | 192.9 | 8 |
| 12122 | 4/29 | 8 | 34 | 100 | 28 | CS | 14 | 61.0 | 18.2 | 23.6 | 2 | 208.8 | 4 |
| 12000 | 4/28 | 9 | 32 | 100 | 26 | CS | 15 | 60.0 | 18.0 | 23.2 | 4 | 198.0 | 6 |
| 11952 | 4/26 | 7 | 32 | 100 | 43 | CS | 11 | 61.0 | 18.0 | 19.2 | 6 | 161.0 | 17 |
| 12129 | 5/5 | 13 | 37 | 100 | 38 | I | 21 | 58.0 | 17.9 | 19.4 | 2 | 171.7 | 15 |
| 12123 | 5/2 | 11 | 35 | 100 | 38 | CS | 16 | 61.0 | 17.7 | 21.3 | 2 | 188.5 | 12 |
| 12132 | 4/22 | 2 | 30 | 100 | 57 | CS(I) | 26 3/ | 61.0 | 17.4 | 21.1 | 2 | 186.7 | 13 |
| 12114 | 5/7 | 12 | 36 | 100 | 41 | CS | 14 | 60.5 | 17.3 | 19.4 | 4 | 159.0 | 18 |
| 12134 | 5/3 | 11 | 36 | 100 | 46 | CS(I) | 16 | 58.5 | 16.2 | 19.6 | 2 | 173.5 | 14 |
| 6251 | 5/7 | 13 | 38 | 100 | 38 | CS | 13 | 59.0 | 15.8 | 17.2 | 13 | 110.0 | 27 |
| 12101 | 5/7 | 13 | 34 | 100 | 63 | CS | 16 | 59.5 | 15.1 | 16.7 | 4 | 141.0 | 22 |
| 12116 | 5/4 | 12 | 35 | 96 | 36 | CS(I) | 23 | 58.5 | 15.0 | 19.2 | 3 | 189.8 | 11 |
| 12136 | 5/3 | 11 | 34 | 96 | 44 | CS | 21 3/ | 55.5 | 14.6 | 17.4 | 2 | 154.0 | 19 |
| 12140 | 5/9 | 13 | 37 | 26 | 21 | HR | 28 | 56.5 | 13.8 | .... | 1 | 168.3 | 16 |
| 12125 | 5/7 | 12 | 36 | 90 | 46 | CS | 21 | 58.0 | 13.5 | 17.1 | 2 | 151.3 | 20 |
| 11673 | 5/4 | 11 | 35 | 100 | 32 | CS | 35 | 55.5 | 13.4 | 17.6 | 8 | 126.4 | 23 |
| 12133 | 5/2 | 11 | 34 | 100 | 58 | CS | 18 | 57.0 | 12.7 | 16.7 | 2 | 147.8 | 21 |
| 1442 | 5/9 | 13 | 35 | 100 | 55 | CS | 24 | 54.5 | 8.2 | 11.3 | 13 | 100.0 | 28 |
| 12135 | 5/7 | 12 | 35 | 100 | 52 | CS | 26 | 50.5 | 7.6 | 12.9 | 2 | 114.2 | 25 |

Standard error of a difference between the mean yields of any two varieties = 1.56 bu.

1/ Readings made by Botany & Plant Pathology Dept., Oklahoma A. & M. College.

2/ Largely broken culms due to Hessian fly injury.

3/ Mostly actual lodging.

Table 20.--(Continued.)

Woodward, Oklahoma

(Four plots)

| C. I. No. | Date Headed | Date Ripe | Ht. | Weight per bushel | Av. yield | Average yield 1945-46 | No. years grown | Percent of Kharkof | Rank |
|---|---|---|---|---|---|---|---|---|---|
| | April | May | In. | Lbs. | Bu. | Bu. | | | |
| 12132 | 12 | 21 | 29 | 64.0 | 46.7 | 35.3 | 2 | 119.3 | 8 |
| 12122 | 16 | 22 | 29 | 64.0 | 46.2 | 37.1 | 3 | 109.3 | 14 |
| 12126 | 21 | 24 | 31 | 63.0 | 42.6 | 35.6 | 3 | 109.9 | 13 |
| 12000 | 15 | 22 | 29 | 62.5 | 42.0 | 35.5 | 6 | 130.3 | 3 |
| 12128 | 20 | 23 | 30 | 62.0 | 42.0 | 39.3 | 2 | 132.8 | 2 |
| 12114 | 22 | 25 | 29 | 63.5 | 41.8 | 36.9 | 5 | 123.1 | 6 |
| 8856 | 9 | 18 | 31 | 64.0 | 41.3 | 34.0 | 15 | 104.9 | 20 |
| 12101 | 23 | 27 | 29 | 63.0 | 40.5 | 33.7 | 6 | 146.5 | 1 |
| 12120 | 19 | 27 | 31 | 65.0 | 40.4 | 36.0 | 3 | 108.7 | 15 |
| 12116 | 18 | 23 | 32 | 64.0 | 40.1 | 32.2 | 4 | 110.8 | 12 |
| 12133 | 19 | 23 | 30 | 63.0 | 40.1 | 30.1 | 2 | 101.7 | 24 |
| 12127 | 19 | 23 | 29 | 60.5 | 39.7 | 33.2 | 2 | 112.2 | 11 |
| 12110 | 21 | 26 | 33 | 62.0 | 39.5 | 34.1 | 5 | 114.8 | 9 |
| 12140 | 22 | 26 | 30 | 62.5 | 38.7 | ... | 1 | 113.2 | 10 |
| 12130 | 21 | 25 | 31 | 62.5 | 38.3 | 31.9 | 2 | 104.7 | 21 |
| 12134 | 19 | 23 | 30 | 63.0 | 37.9 | 30.8 | 2 | 104.4 | 16 |
| 12135 | 19 | 27 | 29 | 61.0 | 37.2 | 30.5 | 2 | 103.0 | 22 |
| 11952 | 14 | 17 | 30 | 63.0 | 37.1 | 33.7 | 8 | 123.4 | 5 |
| 12141 | 19 | 27 | 28 | 61.5 | 36.1 | ... | 1 | 105.8 | 17 |
| 11673 | 20 | 27 | 29 | 62.0 | 36.0 | 31.2 | 10 | 119.7 | 6 |
| 12142 | 22 | 26 | 27 | 61.5 | 35.9 | ... | 1 | 105.0 | 19 |
| 12129 | 24 | 30 | 30 | 63.0 | 35.4 | 29.2 | 2 | 98.6 | 26 |
| 12136 | 19 | 27 | 30 | 62.0 | 35.1 | 31.1 | 2 | 103.1 | 18 |
| 6251 | 23 | 30 | 31 | 63.0 | 34.5 | 29.4 | 15 | 102.9 | 23 |
| 1442 | 26 | 6/1 | 29 | 62.0 | 34.2 | 29.6 | 15 | 100.0 | 25 |
| 11669 | 20 | 23 | 29 | 62.5 | 33.7 | 30.5 | 12 | 127.0 | 4 |
| 12123 | 19 | 25 | 30 | 63.0 | 33.2 | 30.4 | 3 | 98.2 | 27 |
| 12125 | 22 | 26 | 31 | 61.5 | 30.6 | 28.4 | 3 | 91.3 | 28 |

Standard error of a difference between the mean yields of any two varieties = 2.73 bushels.

Table 20.--(Continued.)

Manhattan, Kansas

(Three plots)

| C. I. No. | Date Headed | Date Ripe | Ht. | Disease: Leaf rust | Disease: Smut | Lodging | Shattering | Wt. per bu. | Av. yield per acre 1945-46 | Average yield 10 years | No. years grown | Percent of Kharkof | Rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | May | June | In. | % | % | % | % | Lbs. | Bu. | Bu. | | | |
| 12128 | 8 | 15 | 44 | 7 | T | 3 | 2 | 61.7 | 53.4 | 40.5 | 2 | 166.0 | 1 |
| 12141 | 8 | 15 | 45 | 12 | 14 | 0 | 8 | 61.0 | 49.6 | ..... | 1 | 151.2 | 6 |
| 12140 | 13 | 16 | 48 | 2 | 0 | 0 | 1 | 61.0 | 48.1 | .... | 1 | 146.6 | 7 |
| 12116 | 7 | 15 | 44 | 70 | 4 | 0 | 2 | 61.8 | 47.1 | 37.9 | 4 | 139.2 | 10 |
| 12127 | 8 | 15 | 42 | 50 | 1 | 0 | 48 | 61.7 | 46.1 | 37.7 | 2 | 154.5 | 3 |
| 12110 | 9 | 16 | 45 | 28 | 1 | 27 | 2 | 60.6 | 44.9 | 36.9 | 5 | 151.8 | 4 |
| 12123 | 8 | 16 | 43 | 50 | T | 22 | 1 | 61.8 | 44.3 | 34.4 | 3 | 128.9 | 14 |
| 11673 | 8 | 16 | 43 | 55 | 1 | 27 | T | 60.0 | 43.4 | 33.2 | 10 | 134.7 | 11 |
| 11669 | 8 | 15 | 44 | 33 | 0 | 2 | 2 | 61.1 | 43.4 | 40.2 | 12 | 157.1 | 2 |
| 12000 | 1 | 14 | 41 | 100 | 5 | 13 | 0 | 62.6 | 42.8 | 32.0 | 6 | 140.8 | 9 |
| 12134 | 8 | 15 | 46 | 90 | 10 | 2 | 1 | 61.3 | 42.4 | 35.3 | 2 | 144.7 | 8 |
| 12133 | 8 | 17 | 44 | 83 | 8 | 3 | T | 60.9 | 40.2 | 32.7 | 2 | 134.0 | 12 |
| 12129 | 13 | 17 | 47 | 87 | 2 | 7 | 0 | 60.4 | 39.1 | 25.5 | 2 | 104.5 | 24 |
| 12142 | 14 | 18 | 45 | 100 | 0 | 5 | T | 57.4 | 38.4 | .... | 1 | 117.1 | 21 |
| 12101 | 13 | 17 | 44 | 93 | 1 | 5 | T | 61.2 | 37.3 | 26.3 | 6 | 121.3 | 18 |
| 11952 | 1 | 12 | 43 | 97 | 12 | 37 | 17 | 62.4 | 37.1 | 33.9 | 8 | 151.7 | 5 |
| 6251 | 14 | 17 | 47 | 87 | 11 | 25 | T | 61.7 | 37.0 | 25.2 | 15 | 111.4 | 22 |
| 12130 | 9 | 16 | 45 | 97 | 2 | 8 | T | 59.6 | 36.5 | 32.3 | 2 | 132.4 | 13 |
| 12114 | 12 | 17 | 43 | 97 | 4 | 7 | 2 | 61.3 | 36.1 | 29.4 | 5 | 123.4 | 16 |
| 12122 | 4 | 14 | 40 | 93 | 6 | 28 | 0 | 61.9 | 36.0 | 28.3 | 3 | 122.1 | 17 |
| 12120 | 8 | 16 | 40 | 87 | 4 | 2 | T | 63.4 | 35.8 | 27.9 | 3 | 118.9 | 19 |
| 12126 | 9 | 16 | 43 | 97 | 0 | 28 | T | 60.0 | 34.5 | 26.4 | 3 | 106.4 | 23 |
| 12125 | 12 | 17 | 46 | 90 | T | 7 | T | 59.7 | 33.3 | 27.3 | 3 | 105.6 | 24 |
| 1442 | 15 | 20 | 45 | 97 | 15 | 28 | 1 | 59.2 | 32.8 | 24.4 | 15 | 100.0 | 27 |
| 12135 | 10 | 17 | 42 | 90 | T | 13 | 0 | 58.3 | 31.7 | 23.1 | 2 | 94.7 | 28 |
| 12136 | 8 | 17 | 42 | 93 | 3 | 13 | 1 | 60.0 | 30.7 | 25.5 | 2 | 104.5 | 24 |
| 12132 | 4/26 | 11 | 40 | 93 | 0 | 57 | 0 | 62.5 | 30.5 | 30.7 | 2 | 125.8 | 15 |
| 8856 | 4/27 | 12 | 43 | 100 | 1 | 80 | 0 | 63.0 | 26.7 | 24.7 | 15 | 118.0 | 20 |

Standard error of a difference between the mean yields of any two varieties = 4.45 bushels.

Table 20.--(Continued.)

Hays, Kansas

(Three plots)

| C. I. No. | Date Headed | Ripe | Ht. | Weight per bushel | Av. acre yield | Average yield 1945-46 | No. years grown | Percent of Kharkof | Rank |
|---|---|---|---|---|---|---|---|---|---|
| | | June | In. | Lbs. | Bu. | Bu. | | | |
| 12128 | 5/5 | 16 | 33 | 59 | 27.2 | 22.0 | 2 | 142.9 | 10 |
| 12141 | 5/5 | 18 | 31 | 58 | 25.3 | .... | 1 | 174.5 | 22 |
| 12134 | 5/4 | 15 | 35 | 59 | 25.1 | 21.1 | 2 | 137.0 | 12 |
| 12130 | 5/5 | 18 | 36 | 60 | 25.1 | 20.4 | 2 | 132.5 | 14 |
| 12120 | 5/4 | 18 | 31 | 61 | 24.9 | 22.9 | 3 | 150.0 | 3 |
| 12133 | 5/4 | 15 | 33 | 59 | 24.2 | 23.5 | 2 | 152.6 | 2 |
| 12132 | 4/27 | 13 | 29 | 58 | 24.1 | 21.1 | 2 | 137.0 | 12 |
| 12122 | 5/1 | 15 | 31 | 60 | 24.1 | 22.1 | 3 | 153.3 | 1 |
| 11673 | 5/5 | 17 | 33 | 57 | 22.4 | 21.1 | 10 | 133.0 | 14 |
| 12126 | 5/5 | 17 | 35 | 60 | 22.3 | 19.4 | 3 | 128.6 | 16 |
| 1442 | 5/5 | 18 | 36 | 58 | 22.1 | 15.4 | 14 | 100.0 | 23 |
| 6251 | 5/5 | 18 | 35 | 60 | 22.0 | 16.1 | 14 | 116.1 | 21 |
| 12129 | 5/6 | 18 | 36 | 60 | 22.0 | 19.0 | 2 | 123.4 | 19 |
| 12114 | 4/28 | 13 | 32 | 60 | 21.9 | 18.0 | 5 | 148.8 | 4 |
| 11669 | 5/5 | 16 | 31 | 58 | 21.9 | 18.3 | 11 | 141.0 | 11 |
| 12101 | 5/5 | 16 | 33 | 60 | 21.2 | 18.1 | 6 | 145.7 | 9 |
| 12125 | 5/5 | 18 | 36 | 58 | 21.0 | 16.5 | 3 | 126.4 | 18 |
| 12142 | 5/9 | 16 | 34 | 58 | 20.7 | .... | 1 | 93.7 | 25 |
| 12140 | 5/4 | 18 | 35 | 57 | 20.7 | .... | 1 | 93.7 | 25 |
| 12135 | 5/5 | 18 | 35 | 58 | 20.2 | 14.2 | 2 | 92.2 | 28 |
| 8856 | 4/27 | 13 | 32 | 59 | 20.2 | 20.9 | 14 | 116.7 | 20 |
| 12127 | 5/5 | 18 | 31 | 56 | 20.1 | 14.4 | 2 | 93.5 | 27 |
| 12136 | 5/4 | 18 | 34 | 57 | 18.3 | 14.8 | 2 | 96.1 | 24 |
| 12116 | 5/5 | 17 | 34 | 60 | 16.2 | 19.7 | 4 | 147.1 | 7 |
| 12000 | 4/28 | 14 | 31 | 59 | 14.3 | 18.8 | 6 | 147.4 | 6 |
| 12123 | 5/5 | 14 | 32 | 60 | 16.5 | 18.1 | 3 | 128.6 | 16 |
| 12110 | 5/5 | 18 | 36 | 59 | 16.4 | 19.5 | 5 | 146.9 | 8 |
| 11952 | 5/1 | 14 | 31 | 58 | 12.4 | 13.0 | 8 | 147.8 | 5 |

Standard error of a difference between the mean yields of any two varieties = 3.08 bushels.

Table 20.--(Continued.)

Akron, Colorado

(Five plots; seeded September 25)

| C. I. No. | Stand 4/46 | Date Headed 1/ | Ht. | Av. acre yield | Av. yield 1945-1946 | Rank | No. years grown | Percent of Kharkof | Rank |
|---|---|---|---|---|---|---|---|---|---|
| | % | | In. | Bu. | Bu. | | | | |
| 12135 | 91 | 5/27 | 35 | 28.6 | 35.9 | 4 | 2 | 123.4 | 1 |
| 12126 | 91 | 5/28 | 35 | 27.2 | 34.9 | 6 | 3 | 116.3 | 12 |
| 12129 | 81 | 5/29 | 35 | 26.8 | 35.9 | 4 | 2 | 123.4 | 1 |
| 12133 | 85 | 5/25 | 33 | 25.6 | 34.1 | 12 | 2 | 117.2 | 10 |
| 12101 | 84 | 5/30 | 32 | 25.6 | 32.8 | 14 | 6 | 114.0 | 15 |
| 12114 | 90 | 5/29 | 31 | 25.3 | 37.1 | 1 | 5 | 119.5 | 5 |
| 12132 | 84 | 5/21 | 32 | 24.7 | 30.6 | 21 | 2 | 105.2 | 22 |
| 12123 | 89 | 5/29 | 34 | 24.1 | 34.9 | 6 | 3 | 115.2 | 14 |
| 12134 | 83 | 5/25 | 34 | 24.0 | 34.2 | 11 | 2 | 117.5 | 9 |
| 12120 | 84 | 5/24 | 33 | 23.7 | 34.6 | 9 | 3 | 116.0 | 13 |
| 12140 | 91 | 5/30 | 35 | 23.6 | .... | .. | 1 | 108.3 | 20 |
| 12116 | 91 | 5/25 | 33 | 22.2 | 36.1 | 3 | 4 | 116.6 | 11 |
| 8856 | 90 | 5/20 | 35 | 22.2 | 32.6 | 15 | 12 | 120.8 | 4 |
| 12000 | 86 | 5/21 | 33 | 22.0 | 36.5 | 2 | 6 | 122.8 | 3 |
| 12127 | 88 | 5/28 | 31 | 21.9 | 30.0 | 22 | 2 | 103.1 | 23 |
| 12125 | 87 | 5/29 | 35 | 21.8 | 33.9 | 13 | 3 | 110.9 | 18 |
| 1442 | 85 | 6/2 | 35 | 21.8 | 29.1 | 24 | 12 | 100.0 | 26 |
| 12122 | 86 | 5/24 | 32 | 21.5 | 34.7 | 8 | 3 | 118.7 | 7 |
| 12142 | 90 | 6/1 | 32 | 20.6 | .... | .. | 1 | 94.5 | 27 |
| 12128 | 84 | 5/27 | 34 | 20.4 | 29.9 | 23 | 2 | 102.7 | 24 |
| 11952 | 88 | 5/22 | 34 | 20.2 | 31.6 | 17 | 7 | 119.3 | 6 |
| 11669 | 87 | 5/27 | 33 | 20.1 | 34.4 | 10 | 10 | 118.5 | 8 |
| 12136 | 90 | 5/26 | 32 | 19.8 | 31.2 | 18 | 2 | 107.2 | 21 |
| 12141 | 84 | 5/28 | 32 | 19.6 | .... | .. | 1 | 89.9 | 28 |
| 11673 | 86 | 5/28 | 34 | 19.1 | 31.2 | 18 | 9 | 112.4 | 17 |
| 12130 | 83 | 5/26 | 36 | 18.4 | 31.8 | 16 | 2 | 109.3 | 19 |
| 12110 | 91 | 5/29 | 35 | 17.6 | 30.8 | 20 | 5 | 101.1 | 25 |
| 6251 | 87 | 5/31 | 32 | 14.8 | 28.9 | 25 | 12 | 112.7 | 16 |

1/ All ripe July 8.

Standard error of a difference between the mean yields of any two varieties = 2.33 bushels.

Table 20.--(Continued.)

Fort Collins, Colorado

(Five plots; seeded September 19)

| C. I. No. | Winter survival | Date Headed | Date Ripe | Ht. | Frost damage 1/ | Lodging | Weight per bushel | Av. acre yield | Av. yield 1945-1946 | Rank | No. years grown | Percent of Kharkof | Rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % | May | July | In. | % | % | Lbs. | Bu. | Bu. | | | | |
| 12142 | 94 | 29 | 17 | 41 | 0 | 28 | 61.7 | 62.8 | .... | .. | 1 | 117.8 | 2 |
| 12125 | 86 | 27 | 17 | 43 | T | 17 | 62.6 | 57.1 | 43.5 | 5 | 3 | 99.1 | 16 |
| 12114 | 85 | 27 | 16 | 44 | T | 19 | 64.5 | 56.9 | 45.6 | 2 | 5 | 119.9 | 1 |
| 1442 | 82 | 28 | 19 | 42 | T | 32 | 62.3 | 53.3 | 44.7 | 3 | 14 | 100.0 | 11 |
| 12140 | 90 | 28 | 15 | 41 | 0 | 7 | 62.1 | 53.0 | .... | .. | 1 | 99.4 | 14 |
| 12116 | 77 | 23 | 15 | 42 | T | 15 | 63.8 | 51.7 | 41.1 | 14 | 4 | 99.2 | 15 |
| 12130 | 83 | 26 | 15 | 42 | 1 | 8 | 63.0 | 51.6 | 43.9 | 4 | 2 | 98.2 | 17 |
| 12133 | 72 | 23 | 15 | 40 | 3 | 11 | 62.7 | 51.4 | 43.1 | 6 | 2 | 96.4 | 18 |
| 12126 | 78 | 23 | 15 | 41 | 2 | 29 | 63.7 | 50.9 | 41.6 | 12 | 3 | 109.9 | 5 |
| 12135 | 83 | 26 | 18 | 41 | T | 14 | 61.7 | 50.7 | 41.8 | 10 | 2 | 93.5 | 21 |
| 12129 | 70 | 28 | 17 | 42 | T | 7 | 62.7 | 49.7 | 47.4 | 1 | 2 | 106.0 | 9 |
| 12122 | 68 | 21 | 18 | 40 | 2 | 18 | 63.8 | 49.5 | 42.4 | 9 | 3 | 113.0 | 4 |
| 12101 | 84 | 28 | 18 | 43 | 0 | 10 | 63.2 | 49.4 | 41.3 | 13 | 6 | 99.5 | 12 |
| 12000 | 86 | 21 | 17 | 40 | 5 | 22 | 64.0 | 48.5 | 41.8 | 10 | 6 | 115.5 | 3 |
| 12141 | 91 | 25 | 13 | 39 | T | 1 | 61.5 | 46.9 | .... | .. | 1 | 88.0 | 25 |
| 12134 | 79 | 26 | 15 | 42 | T | 10 | 63.2 | 46.4 | 41.0 | 15 | 2 | 91.7 | 22 |
| 12136 | 84 | 25 | 17 | 40 | 2 | 4 | 62.5 | 46.3 | 36.2 | 21 | 2 | 81.0 | 27 |
| 12110 | 70 | 27 | 17 | 41 | 1 | 5 | 62.8 | 45.0 | 35.0 | 24 | 5 | 88.4 | 23 |
| 11673 | 83 | 24 | 14 | 41 | 4 | 7 | 62.5 | 44.1 | 38.5 | 19 | 10 | 106.1 | 8 |
| 11669 | 80 | 25 | 13 | 40 | 1 | 1 | 62.8 | 44.0 | 39.6 | 16 | 12 | 107.2 | 7 |
| 12128 | 84 | 25 | 14 | 40 | 1 | 5 | 63.0 | 43.1 | 43.1 | 6 | 2 | 96.4 | 18 |
| 12120 | 86 | 22 | 14 | 39 | 2 | 1 | 64.8 | 42.2 | 39.4 | 18 | 3 | 107.4 | 6 |
| 12123 | 84 | 24 | 17 | 40 | 1 | 4 | 63.3 | 42.0 | 35.8 | 22 | 3 | 84.2 | 26 |
| 12132 | 91 | 17 | 11 | 38 | 18 | 4 | 63.5 | 41.1 | 39.5 | 17 | 2 | 88.4 | 23 |
| 6251 | 84 | 26 | 17 | 45 | T | 34 | 63.2 | 41.0 | 43.1 | 6 | 14 | 99.5 | 12 |
| 11952 | 88 | 18 | 11 | 42 | 14 | 7 | 63.7 | 39.8 | 37.2 | 20 | 8 | 104.9 | 10 |
| 12127 | 87 | 23 | 14 | 40 | 4 | 0 | 63.1 | 38.8 | 34.4 | 25 | 2 | 77.0 | 28 |
| 8856 | 88 | 17 | 10 | 41 | 20 | 10 | 62.9 | 31.9 | 35.4 | 23 | 14 | 95.4 | 20 |

Standard error of a difference between the mean yields of any two varieties = 4.50 bu.

1/ T means trace.

Table 20.--(Continued.)

Hesperus, Colorado

(Five plots; seeded Sept. 21)

| C. I. No. | Date ripe | Height | Weight per bushel | Av. acre yield | Av. yield 1944-1946 1/ | Rank | No. years grown | Percent of Kharkof | Rank |
|---|---|---|---|---|---|---|---|---|---|
| | July | In. | Lbs. | Bu. | Bu. | | | | |
| 8856 | 20 | 44 | 60.5 | 78.1 | 60.9 | 1 | 8 | 106.0 | 21 |
| 11673 | 20 | 44 | 61.0 | 76.2 | 59.2 | 3 | 8 | 127.2 | 5 |
| 11669 | 21 | 44 | 61.0 | 73.7 | 56.0 | 7 | 8 | 109.9 | 19 |
| 12130 | 21 | 45 | 61.0 | 72.7 | .... | .. | 1 | 154.4 | 1 |
| 12101 | 17 | 41 | 61.0 | 66.0 | 54.6 | 11 | 5 | 117.7 | 13 |
| 12122 | 16 | 41 | 61.0 | 65.7 | 60.7 | 2 | 2 | 138.0 | 2 |
| 12110 | 19 | 44 | 62.0 | 64.3 | 56.7 | 6 | 4 | 119.9 | 11 |
| 12129 | 18 | 45 | 61.0 | 63.6 | .... | .. | 1 | 135.0 | 3 |
| 12116 | 19 | 43 | 61.5 | 61.1 | 55.8 | 9 | 3 | 114.5 | 16 |
| 12114 | 17 | 42 | 61.0 | 60.1 | 57.1 | 4 | 4 | 128.9 | 4 |
| 12125 | 18 | 42 | 61.0 | 59.0 | 55.9 | 8 | 2 | 127.0 | 6 |
| 12126 | 18 | 42 | 60.0 | 59.0 | 55.4 | 10 | 2 | 125.9 | 7 |
| 12128 | 18 | 45 | 61.0 | 59.0 | .... | .. | 1 | 125.3 | 8 |
| 12142 | 19 | 42 | 60.0 | 55.8 | .... | .. | 1 | 118.5 | 12 |
| 12134 | 18 | 42 | 60.0 | 54.6 | .... | .. | 1 | 115.9 | 15 |
| 12000 | 17 | 40 | 60.0 | 53.8 | 57.1 | 4 | 5 | 123.7 | 9 |
| 11952 | 16 | 39 | 61.5 | 53.5 | 54.4 | 12 | 8 | 93.3 | 25 |
| 12140 | 21 | 44 | 60.0 | 52.9 | .... | .. | 1 | 112.3 | 17 |
| 12132 | 17 | 39 | 61.0 | 50.7 | .... | .. | 1 | 107.6 | 20 |
| 12120 | 19 | 42 | 62.0 | 50.5 | 51.6 | 14 | 2 | 117.3 | 14 |
| 6251 | 21 | 42 | 61.0 | 48.6 | 52.3 | 13 | 8 | 123.1 | 10 |
| 12123 | 16 | 38 | 61.0 | 47.4 | 48.7 | 15 | 2 | 110.7 | 18 |
| 1442 | 20 | 41 | 59.5 | 47.1 | 44.0 | 16 | 8 | 100.0 | 22 |
| 12136 | 19 | 42 | 59.5 | 46.9 | .... | .. | 1 | 99.6 | 23 |
| 12141 | 19 | 42 | 59.5 | 44.1 | .... | .. | 1 | 93.6 | 24 |
| 12135 | 18 | 42 | 58.0 | 43.2 | .... | .. | 1 | 91.7 | 26 |
| 12127 | 18 | 43 | 60.5 | 43.0 | .... | .. | 1 | 91.3 | 27 |
| 12133 | 18 | 41 | 61.0 | 42.1 | .... | .. | 1 | 89.4 | 28 |

1/ No data for 1945.

Standard error of a difference between the mean yields of any two varieties = 5.77 bushels.

Table 20.--(Continued.)

Ames, Iowa

(Three plots)

| C. I. No. | Winter survived | Date ripe | Ht. | Rust: Stem | Rust: Leaf | Rust: Bunt 1/ | Wt. per bu. | Av. acre yield 1945 | Yield: Average | Yield: Rank | No. years grown | Percent of Kharkof | Rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % | July | In. | % | % | % | Lbs. | Bu. | Bu. | | | | |
| 12122 | 93 | 3 | 38 | 5 | 10 | 40.5 | 61.0 | 42.7 | 38.4 | 3 | 3 | 117.4 | 5 |
| 12142 | 98 | 4 | 39 | 5 | 30 | .... | 58.8 | 42.2 | .... | .. | 1 | 135.3 | 1 |
| 11669 | 98 | 1 | 40 | 5 | 10 | 5.5 | 59.2 | 41.2 | 40.6 | 1 | 7 | 114.4 | 7 |
| 12140 | 97 | 5 | 42 | 5 | 5 | .... | 59.1 | 40.8 | .... | .. | 1 | 130.8 | 2 |
| 12141 | 100 | 4 | 38 | 5 | 5 | .... | 58.1 | 40.7 | .... | .. | 1 | 130.4 | 3 |
| 12114 | 97 | 4 | 39 | 5 | 10 | 42.8 | 60.0 | 40.2 | 36.0 | 5 | 5 | 111.8 | 8 |
| 11952 | 100 | 1 | 38 | 5 | 10 | 12.9 | 58.3 | 39.8 | 38.9 | 2 | 7 | 108.7 | 11 |
| 12129 | 99 | 5 | 43 | 10 | 10 | 0.0 | 60.3 | 39.7 | 37.7 | 6 | 2 | 118.6 | 4 |
| 12116 | 94 | 2 | 41 | 30 | 5 | 20.0 | 59.6 | 39.5 | 36.9 | 8 | 4 | 92.7 | 26 |
| 12101 | 100 | 4 | 40 | 40 | 10 | 4.2 | 60.0 | 39.3 | 37.3 | 7 | 6 | 105.2 | 15 |
| 12133 | 96 | 2 | 41 | 5 | 10 | 62.8 | 59.4 | 38.7 | 34.0 | 16 | 2 | 106.9 | 13 |
| 12126 | 100 | 2 | 41 | 5 | 20 | 0.0 | 60.1 | 38.0 | 36.9 | 8 | 3 | 111.3 | 9 |
| 12000 | 98 | 2 | 37 | 5 | 20 | 33.3 | 60.0 | 37.2 | 38.1 | 4 | 6 | 106.7 | 14 |
| 12130 | 96 | 1 | 45 | 20 | 10 | 0.0 | 59.0 | 36.3 | 35.3 | 12 | 2 | 111.0 | 10 |
| 12120 | 95 | 5 | 38 | 5 | 20 | 16.7 | 60.6 | 36.0 | 31.0 | 23 | 3 | 86.2 | 28 |
| 8856 | 97 | 4 | 41 | 5 | 15 | 31.2 | 59.4 | 35.7 | 36.1 | 11 | 7 | 97.7 | 20 |
| 12128 | 97 | 2 | 39 | 5 | 5 | 70.9 | 58.6 | 35.3 | 36.7 | 10 | 2 | 115.4 | 6 |
| 12136 | 98 | 5 | 39 | 5 | 30 | .... | 57.1 | 35.0 | 33.1 | 18 | 2 | 104.1 | 16 |
| 12127 | 98 | 2 | 35 | 5 | 10 | 0.0 | 57.2 | 34.8 | 33.0 | 19 | 2 | 103.8 | 17 |
| 12132 | 97 | 1 | 35 | 5 | 10 | 44.4 | 59.5 | 34.7 | 32.5 | 20 | 2 | 102.2 | 18 |
| 12134 | 98 | 2 | 41 | 20 | 10 | 51.6 | 58.8 | 34.3 | 34.3 | 15 | 2 | 107.9 | 12 |
| 12110 | 92 | 5 | 40 | 20 | 5 | 6.9 | 57.0 | 33.3 | 34.4 | 14 | 5 | 97.0 | 22 |
| 12135 | 95 | 6 | 43 | 15 | 5 | 29.4 | 57.4 | 33.2 | 30.5 | 24 | 2 | 95.9 | 23 |
| 12123 | 93 | 1 | 38 | 20 | 10 | 20.8 | 59.2 | 33.0 | 32.4 | 21 | 3 | 94.3 | 24 |
| 12125 | 91 | 5 | 42 | 20 | 10 | 0.0 | 57.6 | 32.7 | 33.7 | 17 | 3 | 97.5 | 21 |
| 6251 | 92 | 3 | 40 | 5 | 15 | 41.4 | 59.8 | 31.3 | 34.5 | 13 | 7 | 94.3 | 24 |
| 1442 | 95 | 5 | 40 | 15 | 10 | 67.2 | 58.0 | 31.2 | 31.8 | 22 | 7 | 100.0 | 19 |
| 11673 | 94 | 2 | 38 | 5 | 20 | 66.6 | 56.7 | 30.8 | 29.4 | 25 | 7 | 91.6 | 27 |

Standard error of a difference between the mean yields of any two varieties = 4.36 bushels.

1/ Artificial inoculation; 2 methods, 4 tests; special nursery.

Table 20.--(Continued.)

Lincoln, Nebraska

(Five plots; seeded Sept. 24; emerged Oct. 4)

| C. I. No. | Date Headed | Date Ripe | Ht. | Mildew 1/ | Leaf rust | Freeze injury | Wt. per bu. | Av. acre yield 1945-46 | Average yield | No. years grown | Percent of Kharkof | Rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | May | June | In. | | % | % | Lbs. | Bu. | Bu. | | | |
| 12128 | 16 | 22 | 40 | 0 | 8 | 7.8 | 59.7 | 55.4 | 40.8 | 2 | 147.3 | 1 |
| 11669 | 15 | 22 | 38 | 0 | 33 | 10.9 | 59.3 | 48.7 | 37.8 | 12 | 137.5 | 3 |
| 12141 | 15 | 23 | 40 | 0 | 13 | 18.9 | 57.2 | 48.7 | .... | 1 | 127.5 | 9 |
| 12114 | 17 | 24 | 40 | L | 50 | 4.1 | 60.0 | 48.4 | 34.0 | 5 | 115.6 | 21 |
| 12120 | 13 | 23 | 38 | L | 40 | 13.7 | 61.0 | 47.8 | 34.7 | 3 | 136.1 | 4 |
| 12134 | 14 | 23 | 40 | 0 | 50 | 6.7 | 59.0 | 47.6 | 35.9 | 2 | 129.6 | 6 |
| 12140 | 19 | 24 | 41 | 0 | 5 | 9.3 | 58.8 | 46.4 | .... | 1 | 121.5 | 12 |
| 12110 | 16 | 23 | 40 | M | 20 | 10.0 | 58.9 | 46.0 | 36.0 | 5 | 110.4 | 25 |
| 12133 | 15 | 23 | 40 | L | 55 | 6.3 | 60.1 | 45.8 | 34.0 | 2 | 122.7 | 11 |
| 12126 | 15 | 23 | 41 | L | 50 | 15.5 | 59.5 | 45.6 | 32.4 | 3 | 132.4 | 5 |
| 11673 | 15 | 23 | 39 | L | 40 | 9.5 | 59.7 | 45.5 | 33.7 | 10 | 110.0 | 26 |
| 12135 | 16 | 25 | 40 | L | 55 | 15.7 | 57.3 | 45.3 | 29.6 | 2 | 106.9 | 27 |
| 12116 | 15 | 23 | 41 | L | 35 | 8.8 | 60.3 | 45.2 | 39.6 | 4 | 121.0 | 15 |
| 12125 | 18 | 24 | 43 | L | 35 | 15.0 | 58.7 | 45.1 | 34.3 | 3 | 128.2 | 7 |
| 12142 | 19 | 23 | 39 | M | 40 | 15.7 | 57.8 | 44.8 | .... | 1 | 117.3 | 19 |
| 12127 | 14 | 22 | 38 | 0 | 38 | 13.6 | 59.7 | 44.7 | 33.5 | 2 | 120.9 | 16 |
| 12122 | 11 | 22 | 39 | L | 43 | 18.7 | 60.7 | 44.4 | 34.8 | 3 | 145.8 | 2 |
| 12123 | 16 | 23 | 38 | 0 | 45 | 12.4 | 60.0 | 45.0 | 35.0 | 3 | 126.9 | 10 |
| 12136 | 14 | 23 | 38 | L | 45 | 15.5 | 58.1 | 43.3 | 31.5 | 2 | 113.7 | 22 |
| 12101 | 17 | 24 | 41 | L | 50 | 12.5 | 60.0 | 43.2 | 30.2 | 6 | 121.3 | 13 |
| 12129 | 18 | 24 | 41 | L | 35 | 7.2 | 60.4 | 42.8 | 33.5 | 2 | 120.9 | 16 |
| 12130 | 18 | 24 | 41 | L | 45 | 3.4 | 58.5 | 42.1 | 31.4 | 2 | 113.4 | 23 |
| 12000 | 9 | 22 | 38 | L | 45 | 33.9 | 60.3 | 41.7 | 34.1 | 6 | 120.5 | 18 |
| 6251 | 19 | 25 | 44 | L | 43 | 9.9 | 58.7 | 41.0 | 28.4 | 15 | 112.3 | 24 |
| 8856 | 5 | 19 | 40 | L | 55 | 34.3 | 58.4 | 39.4 | 37.6 | 15 | 127.8 | 8 |
| 1442 | 19 | 25 | 43 | L | 50 | 14.5 | 58.5 | 38.2 | 27.7 | 15 | 100.0 | 28 |
| 12132 | 5 | 18 | 36 | 0 | 45 | 33.9 | 59.3 | 37.0 | 33.6 | 2 | 121.3 | 13 |
| 11952 | 8 | 21 | 38 | L | 40 | 39.3 | 59.8 | 36.2 | 28.5 | 8 | 117.1 | 20 |

Standard error of a difference between the mean yields of any two varieties = 1.89 bushels.

1/ 0 = none; L = light; M = medium.

Table 20.--(Continued.)

North Platte, Nebraska

(Three plots)

| C. I. No. | Date Headed | Date Ripe | Height | Weight per bushel | Av. acre yield 1945-1946 | Rank | No. years grown | Percent of Kharkof | Rank |
|---|---|---|---|---|---|---|---|---|---|
| | May | June | In. | Lbs. | Bu. | Bu. | | | | |
| 12142 | 19 | 29 | 39 | 59.4 | 48.1 | .... | 1 | 159.8 | 1 |
| 12129 | 21 | 29 | 39 | 60.4 | 47.7 | 47.6 | 2 | 145.6 | 6 |
| 12114 | 20 | 29 | 35 | 60.5 | 46.4 | 50.3 | 1 | 152.9 | 2 |
| 12000 | 16 | 28 | 35 | 58.0 | 44.2 | 43.2 | 10 | 147.5 | 5 |
| 12130 | 20 | 28 | 38 | 59.1 | 44.1 | 46.0 | 5 | 140.7 | 8 |
| 12128 | 17 | 28 | 35 | 58.0 | 43.4 | 46.2 | 4 | 141.3 | 7 |
| 12126 | 17 | 28 | 37 | 58.0 | 43.2 | 36.1 | 22 | 125.7 | 20 |
| 12133 | 18 | 28 | 36 | 59.4 | 43.2 | 44.5 | 6 | 136.1 | 11 |
| 12122 | 16 | 28 | 35 | 57.0 | 41.3 | 44.2 | 7 | 152.9 | 2 |
| 12101 | 20 | 29 | 37 | 59.5 | 41.2 | 47.1 | 3 | 148.6 | 4 |
| 12134 | 19 | 28 | 39 | 57.8 | 41.1 | 43.8 | 8 | 133.9 | 12 |
| 12135 | 18 | 28 | 38 | 56.0 | 39.5 | 42.8 | 12 | 130.9 | 14 |
| 12140 | 20 | 28 | 39 | 59.0 | 38.9 | .... | 1 | 129.2 | 17 |
| 12125 | 18 | 29 | 40 | 58.0 | 38.6 | 41.1 | 15 | 122.6 | 21 |
| 12136 | 17 | 28 | 36 | 58.2 | 37.7 | 42.5 | 13 | 130.0 | 16 |
| 12116 | 16 | 28 | 34 | 58.5 | 37.4 | 43.4 | 9 | 129.2 | 17 |
| 11673 | 17 | 28 | 36 | 57.5 | 37.2 | 34.6 | 20 | 126.6 | 19 |
| 12110 | 17 | 29 | 35 | 57.1 | 37.1 | 40.0 | 18 | 122.2 | 22 |
| 12123 | 17 | 28 | 35 | 58.2 | 36.9 | 43.2 | 10 | 138.1 | 8 |
| 11952 | 15 | 25 | 36 | 58.0 | 36.4 | 41.1 | 14 | 130.7 | 15 |
| 8856 | 13 | 25 | 37 | 58.0 | 35.7 | 37.1 | 19 | 112.5 | 23 |
| 6251 | 21 | 7/1 | 41 | 58.0 | 34.7 | 36.9 | 21 | 102.3 | 25 |
| 11669 | 17 | 28 | 35 | 56.0 | 34.6 | 40.4 | 17 | 138.0 | 10 |
| 12132 | 15 | 25 | 35 | 57.8 | 34.5 | 32.0 | 25 | 97.9 | 27 |
| 12120 | 17 | 28 | 35 | 57.9 | 33.5 | 40.5 | 16 | 133.1 | 13 |
| 12127 | 17 | 27 | 33 | 56.5 | 31.7 | 36.0 | 23 | 110.1 | 24 |
| 1442 | 21 | 7/1 | 40 | 59.0 | 30.1 | 32.7 | 24 | 100.0 | 26 |
| 12141 | 16 | 27 | 32 | 52.5 | 25.2 | .... | 1 | 83.7 | 28 |

Standard error of a difference between the mean yields of any two varieties = 2.84 bushels.

Table 20.--(Concluded.)

Alliance, Nebraska

(Three plots; seeded September 4)

| C. I. No. | Winter survival | Date Headed | Date Ripe | Ht. | Wt. per bu. | Av. acre yield | Av. yield 1945-1946 | Rank | No. years grown | Percent of Kharkof | Rank |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | % | May | July | In. | Lbs. | Bu. | Bu. | | | | |
| 12125 | 92 | 28 | 18 | 32 | 58.5 | 23.2 | 28.0 | 11 | 2 | 108.5 | 9 |
| 12114 | 93 | 28 | 16 | 29 | 58.0 | 23.1 | 32.7 | 1 | 4 | 118.3 | 1 |
| 12133 | 95 | 25 | 16 | 27 | 59.0 | 23.0 | 29.0 | 5 | 2 | 112.4 | 4 |
| 12128 | 82 | 28 | 16 | 26 | 59.0 | 22.6 | 30.0 | 3 | 2 | 116.3 | 2 |
| 1442 | 97 | 29 | 16 | 30 | 58.5 | 22.3 | 25.8 | 20 | 11 | 100.0 | 16 |
| 6251 | 97 | 29 | 16 | 30 | 59.0 | 22.1 | 27.1 | 17 | 11 | 95.2 | 24 |
| 12142 | 98 | 30 | 16 | 28 | 59.0 | 21.5 | .... | .. | 1 | 96.4 | 23 |
| 12129 | 82 | 28 | 16 | 28 | 61.5 | 21.4 | 28.2 | 10 | 2 | 109.3 | 8 |
| 12000 | 97 | 24 | 17 | 26 | 59.0 | 21.3 | 28.6 | 7 | 5 | 99.3 | 19 |
| 12127 | 88 | 26 | 16 | 28 | 58.0 | 21.2 | 28.5 | 9 | 2 | 110.5 | 7 |
| 12130 | 88 | 28 | 16 | 30 | 59.0 | 21.0 | 28.8 | 6 | 2 | 111.6 | 5 |
| 12135 | 87 | 27 | 16 | 27 | 58.0 | 20.9 | 26.8 | 18 | 2 | 103.9 | 14 |
| 12101 | 98 | 28 | 16 | 28 | 59.0 | 20.9 | 28.6 | 7 | 5 | 104.7 | 13 |
| 12126 | 83 | 26 | 17 | 27 | 60.0 | 20.8 | 30.0 | 3 | 2 | 116.3 | 2 |
| 12110 | 93 | 26 | 17 | 29 | 58.0 | 20.8 | 30.5 | 2 | 4 | 111.2 | 6 |
| 12140 | 85 | 30 | 15 | 28 | 60.0 | 20.8 | .... | .. | 1 | 93.3 | 25 |
| 11952 | 90 | 24 | 18 | 23 | 59.0 | 20.7 | 27.9 | 12 | 7 | 97.6 | 21 |
| 12122 | 100 | 25 | 16 | 27 | 60.0 | 20.5 | 27.6 | 14 | 2 | 107.0 | 11 |
| 12134 | 95 | 26 | 17 | 28 | 59.0 | 20.5 | 27.2 | 16 | 2 | 105.4 | 12 |
| 11673 | 85 | 27 | 16 | 30 | 57.0 | 20.2 | 26.7 | 19 | 8 | 98.4 | 20 |
| 12123 | 87 | 25 | 17 | 27 | 58.0 | 19.4 | 25.8 | 20 | 2 | 100.0 | 16 |
| 12136 | 85 | 26 | 16 | 27 | 57.5 | 19.3 | 24.9 | 23 | 2 | 96.5 | 22 |
| 12120 | 60 | 26 | 18 | 26 | 61.0 | 18.7 | 27.9 | 12 | 2 | 108.1 | 10 |
| 12132 | 88 | 23 | 18 | 27 | 59.0 | 18.1 | 25.7 | 22 | 2 | 99.6 | 18 |
| 12116 | 92 | 24 | 18 | 27 | 60.5 | 17.5 | 27.6 | 14 | 3 | 74.3 | 27 |
| 8856 | 80 | 25 | 15 | 28 | 60.0 | 17.4 | 24.5 | 24 | 11 | 85.0 | 26 |
| 12141 | 97 | 26 | 16 | 25 | 56.5 | 16.1 | .... | .. | 1 | 72.2 | 28 |
| 11669 | 97 | 25 | 17 | 28 | 56.0 | 15.9 | 24.4 | 25 | 8 | 102.8 | 15 |

Standard error of a difference between the mean yields of any two varieties = 2.35 bushels.

## STANDARD ERRORS

Standard errors were calculated for each station as outlined on page 36 of this report. In table 21 will be found the number of plots, average yields, and standard errors for the uniform yield nursery grown at each of the 13 stations.

Table 21.--Number of plots, average yield, and standard errors for the uniform yield nursery at several cooperating stations in 1946.

| Station | No. of plots | Average yield of varieties | Standard error of a | | | |
|---|---|---|---|---|---|---|
| | | | Single plot | Difference between means | Mean in Bushels | Mean in Percent |
| | | Bu. | Bu. | Bu. | | |
| Texas: | | | | | | |
| Denton | 4 | 25.23 | 4.82 | 3.41 | 2.41 | 9.55 |
| Chillicothe | 4 | 17.34 | 4.83 | 3.42 | 2.42 | 13.96 |
| Oklahoma: | | | | | | |
| Stillwater | 4 | 17.48 | 2.20 | 1.56 | 1.10 | 6.29 |
| Woodward | 4 | 38.44 | 3.86 | 2.73 | 1.93 | 5.02 |
| Kansas: | | | | | | |
| Manhattan | 3 | 39.25 | 5.45 | 4.45 | 3.15 | 8.03 |
| Hays | 3 | 21.36 | 3.78 | 3.08 | 2.18 | 10.21 |
| Colorado: | | | | | | |
| Akron | 5 | 22.25 | 3.69 | 2.33 | 1.65 | 7.42 |
| Ft. Collins | 5 | 47.47 | 7.11 | 4.50 | 3.18 | 6.70 |
| Hesperus | 5 | 56.88 | 9.12 | 5.77 | 4.08 | 7.17 |
| Iowa: | | | | | | |
| Ames | 3 | 36.70 | 5.34 | 4.36 | 3.08 | 8.39 |
| Nebraska: | | | | | | |
| Lincoln | 5 | 44.44 | 3.00 | 1.89 | 1.34 | 3.02 |
| North Platte | 3 | 38.70 | 3.48 | 2.84 | 2.01 | 5.19 |
| Alliance | 3 | 20.40 | 2.88 | 2.35 | 1.66 | 8.14 |

## SUMMARY OF NURSERY YIELDS

The yields of the 28 varieties of winter wheat grown at the 13 stations are summarized in table 22 where the varieties are listed in order of their 13-nursery average yields. These averages are of interest only insofar as they show the general adaptation of the varieties. A more detailed study is possible as the varieties have also been averaged and ranked by states. Kawvale-Marquillo x Kawvale-Tenmarq (C. I. 12128) with an average yield of 36.9 bushels per acre ranked first, exceeding the second strain Cheyenne x Early Blackhull (C. I. 12114) by 1.8 bushels per acre. It will be remembered that this strain also ranked first in 1945, its first year in the nursery. Its performance in 1946 was quite consistent in that it ranked first in Oklahoma, Kansas, and Nebraska and third in Texas, but it was rather far down the list in Colorado and Iowa. This strain was able to make this good yield record for a second year partly because of outstanding resistance to leaf rust. It is also resistant to stem rust, bunt, and to Hessian fly. Cheyenne x Early Blackhull (C. I. 12122) ranked third with a yield of 35.0 bushels per acre. This is a very early strain but seems to have ability to give a good yield,

although it is known to be rather susceptible to lodging. Cheyenne x Chiefkan (C. I. 12129) and Cheyenne x Turkey 1062 (C. I. 12142) ranked fourth with identical averages. Cheyenne x Turkey 1062 (C. I. 12142) is a Cheyenne type strain having resistance to certain races of bunt. Its good yield is somewhat surprising in that it is later than many of the varieties in this test and is not resistant to rust. A total of 6 strains outyielded Pawnee, the highest yielding of the standard varieties. Such standard varieties as Westar, Comanche, Early Blackhull, Kharkof, and Blackhull ranked in the order listed and were considerably lower than the leading strains. Early Blackhull had an average yield of 31.2 bushels per acre, while the average for Wichita was 29.6. Observations made during the summer indicated that this was not a good year for Wichita. The early variety, Triumph, had an average yield of 30.3 bushels per acre, slightly higher than Wichita but lower than Early Blackhull. These early wheats were injured rather seriously at some of the stations by the May freeze. Blackhull x Hard Federation (C. I. 12120) was considerably lower in yield than either Pawnee or Comanche. This is the wheat that has been yielding rather well at Woodward and a Texas farmer is much interested in its increase and distribution. Based on its 1946 yield record it does not seem to have a very wide adaptation.

Twenty-five varieties have been grown in the nursery for the 2-year period 1945-46 at 12 stations. These average yields are presented in table 23 where the yields are again averaged by states and the varieties listed in the order of average yield at all stations. Kawvale-Marquillo x Kawvale-Tenmarq (C. I. 12128) ranked first with an average of 33.9 bushels per acre, exceeding Cheyenne x Early Blackhull (C. I. 12122) by 2.4 bushels. The performance of the leading strain has been consistent for the 2-year period in that it has ranked first in Texas, Oklahoma, Kansas, and Nebraska and somewhat lower in Colorado and Iowa. Four selections had average yields higher than that of Pawnee and 3 of these are from the cross Cheyenne x Early Blackhull. Ranking somewhat lower than Pawnee are Westar, Comanche, Triumph, Wichita, Blackhull, and at the bottom of the list Kharkof. Based on these 2-year average yields Wichita is slightly below Triumph and Early Blackhull. Again Blackhull x Hard Federation (C. I. 12120) did not equal Pawnee but it was slightly better than Comanche. Marquillo-Tenmarq x Kawvale-Tenmarq (C. I. 12127) was originally thought to be equal in yielding ability to C. I. 12128 but it now appears that this is not the case, since its average is 5.3 bushels lower.

Table 22.--Summary of the average yields of the 28 varieties grown as uniform yield nurseries at 13 stations in the hard red winter wheat region, 1946.

| Variety | C. I. No. | Bushels per acre | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Texas | | | | Oklahoma | | | | Kansas | | | |
| | | Denton | Chillicothe | Av. | Rank | Stillwater | Woodward | Av. | Rank | Manhattan | Hays | Av. | Rank |
| Kaw.-Marquillo x Kaw.-Ten. | 12128 | 33.0 | 19.0 | 26.0 | 3 | 26.0 | 42.0 | 34.0 | 1 | 53.4 | 27.2 | 40.3 | 1 |
| Cheyenne x Early Blackhull | 12114 | 21.3 | 17.2 | 19.3 | 22 | 17.3 | 41.8 | 29.6 | 9 | 36.1 | 21.9 | 29.0 | 20 |
| Cheyenne x Early Blackhull | 12122 | 27.3 | 17.5 | 22.4 | 8 | 18.2 | 46.2 | 32.2 | 2 | 36.0 | 24.1 | 30.1 | 15 |
| Cheyenne x Chiefkan | 12129 | 21.0 | 21.6 | 21.3 | 15 | 17.9 | 35.4 | 26.7 | 19 | 39.1 | 22.8 | 31.0 | 10 |
| Cheyenne x Turkey 1062 | 12142 | 21.4 | 18.2 | 19.8 | 20 | 19.8 | 35.9 | 27.9 | 14 | 38.4 | 20.7 | 29.6 | 17 |
| Chiefkan x Martin-Tenmarq | 12130 | 25.3 | 16.8 | 21.1 | 16 | 20.3 | 38.3 | 29.3 | 11 | 36.5 | 25.1 | 30.8 | 11 |
| Pawnee | 11669 | 25.5 | 19.5 | 22.5 | 6 | 24.5 | 33.7 | 29.1 | 12 | 43.4 | 21.9 | 32.7 | 7 |
| Oro x Mediterranean-Hope | 12140 | 30.7 | 20.0 | 25.4 | 4 | 13.8 | 38.7 | 26.3 | 21 | 48.1 | 20.7 | 34.4 | 3 |
| Tenmarq x Blackhull | 12126 | 21.9 | 17.7 | 19.8 | 20 | 19.9 | 43.6 | 31.3 | 6 | 34.5 | 22.3 | 28.4 | 21 |
| Blackhull x Cheyenne | 12101 | 29.0 | 20.0 | 24.5 | 5 | 15.1 | 40.5 | 27.8 | 15 | 37.3 | 21.2 | 29.3 | 19 |
| Westar | 12110 | 31.4 | 20.7 | 26.1 | 2 | 19.2 | 39.5 | 29.4 | 10 | 44.9 | 16.4 | 30.7 | 12 |
| Comanche | 11673 | 26.1 | 18.9 | 22.5 | 6 | 13.4 | 36.0 | 24.7 | 25 | 43.4 | 22.4 | 32.9 | 6 |
| Quivira x Tenmarq | 12116 | 21.9 | 15.9 | 18.9 | 23 | 15.0 | 40.1 | 27.6 | 16 | 47.1 | 18.2 | 32.7 | 7 |
| Chiefkan x Oro-Tenmarq | 12134 | 26.4 | 14.7 | 20.6 | 17 | 16.2 | 37.9 | 27.1 | 18 | 42.4 | 25.1 | 33.8 | 4 |
| Chiefkan x Oro-Tenmarq | 12133 | 27.6 | 15.2 | 21.4 | 14 | 12.7 | 40.1 | 26.4 | 20 | 40.2 | 24.2 | 32.2 | 9 |
| Mediterranean-Hope x Pawnee | 12141 | 34.2 | 19.1 | 26.7 | 1 | 24.8 | 36.1 | 30.5 | 7 | 49.6 | 25.3 | 37.5 | 2 |
| Cheyenne x Early Blackhull | 12000 | 24.6 | 14.5 | 20.0 | 19 | 18.0 | 42.0 | 30.0 | 8 | 42.8 | 17.3 | 30.1 | 15 |
| Blackhull x Hd. Federation | 12120 | 26.6 | 16.3 | 21.5 | 13 | 23.9 | 40.4 | 32.2 | 2 | 35.8 | 24.9 | 30.4 | 13 |
| Tenmarq selection | 12125 | 25.5 | 19.0 | 22.3 | 9 | 13.5 | 30.6 | 22.1 | 27 | 33.3 | 21.0 | 27.2 | 24 |
| Early Blackhull | 8856 | 22.0 | 12.7 | 17.4 | 26 | 22.5 | 41.3 | 31.9 | 5 | 26.7 | 20.2 | 23.5 | 28 |
| Marquillo-Ten. x Kaw.-Ten. | 12127 | 28.0 | 16.1 | 22.1 | 10 | 18.5 | 39.7 | 29.1 | 12 | 46.1 | 20.1 | 33.1 | 5 |
| Cheyenne x Tenmarq | 12123 | 27.4 | 16.6 | 22.0 | 12 | 17.7 | 33.2 | 25.5 | 22 | 44.3 | 16.5 | 30.4 | 13 |
| Kanred x Hope-Hd.Federation | 12135 | 20.7 | 16.1 | 18.4 | 24 | 7.6 | 37.2 | 22.4 | 26 | 34.7 | 20.2 | 26.0 | 25 |
| Triumph | 12132 | 22.3 | 12.3 | 17.3 | 27 | 17.4 | 46.7 | 32.1 | 4 | 30.5 | 24.1 | 27.3 | 23 |
| Kharkof | 1442 | 25.9 | 18.2 | 22.1 | 10 | 8.2 | 34.2 | 21.2 | 28 | 32.8 | 22.1 | 27.5 | 22 |
| Wichita | 11952 | 16.5 | 17.7 | 17.1 | 28 | 18.0 | 37.1 | 27.6 | 16 | 37.1 | 12.4 | 24.8 | 26 |
| Blackhull | 6251 | 23.0 | 17.9 | 20.5 | 18 | 15.8 | 34.5 | 25.2 | 23 | 37.0 | 22.0 | 29.5 | 18 |
| Kanred x Hope-Hd.Federation | 12136 | 20.5 | 15.0 | 17.8 | 25 | 14.6 | 35.1 | 24.9 | 24 | 30.7 | 18.3 | 24.5 | 27 |

Table 22.--(Concluded.)

| Variety | C. I. No. | Bushels per acre | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Colorado | | | | | Iowa | | Nebraska | | | | | Average of 13 stations |
| | | Akron | Fort Collins | Hesperus | Av. | Rank | Ames | Rank | Lincoln | North Platte | Alliance | Av. | Rank | |
| Kaw.-Marquillo x Kaw.-Ten. | 12128 | 20.4 | 43.1 | 59.0 | 40.8 | 17 | 35.3 | 17 | 55.4 | 43.4 | 22.6 | 40.5 | 1 | 36.9 |
| Cheyenne x Early Blackhull | 12114 | 25.3 | 56.9 | 60.1 | 47.4 | 2 | 40.2 | 6 | 48.4 | 46.4 | 23.1 | 39.3 | 2 | 35.1 |
| Cheyenne x Early Blackhull | 12122 | 21.5 | 49.5 | 65.7 | 45.6 | 10 | 42.7 | 1 | 44.4 | 41.3 | 20.5 | 35.4 | 11 | 35.0 |
| Cheyenne x Chiefkan | 12129 | 26.8 | 49.7 | 63.6 | 46.7 | 4 | 39.7 | 8 | 42.8 | 47.7 | 21.4 | 37.3 | 4 | 34.6 |
| Cheyenne x Turkey 1062 | 12142 | 20.6 | 62.8 | 55.8 | 46.4 | 6 | 42.2 | 2 | 44.8 | 48.1 | 21.5 | 38.1 | 3 | 34.6 |
| Chiefkan x Martin-Tenmarq | 12130 | 18.4 | 51.6 | 72.7 | 47.6 | 1 | 36.3 | 14 | 42.1 | 44.1 | 21.0 | 35.7 | 8 | 34.5 |
| Pawnee | 11669 | 20.1 | 44.0 | 73.7 | 45.9 | 8 | 41.2 | 3 | 48.7 | 34.6 | 15.9 | 33.1 | 20 | 34.4 |
| Oro x Mediterranean-Hope | 12140 | 22.2 | 53.0 | 52.9 | 42.7 | 13 | 40.8 | 4 | 46.4 | 38.9 | 20.8 | 35.4 | 11 | 34.4 |
| Tenmarq x Blackhull | 12126 | 27.2 | 50.9 | 59.0 | 45.7 | 9 | 38.0 | 12 | 45.6 | 43.2 | 20.8 | 36.5 | 6 | 34.1 |
| Blackhull x Cheyenne | 12101 | 25.6 | 49.4 | 66.0 | 47.0 | 3 | 39.3 | 10 | 33.2 | 41.2 | 20.9 | 31.8 | 23 | 33.7 |
| Westar | 12110 | 17.6 | 45.0 | 64.3 | 42.3 | 14 | 33.3 | 22 | 46.0 | 37.1 | 20.8 | 34.6 | 14 | 33.6 |
| Comanche | 11673 | 19.1 | 44.1 | 76.2 | 46.5 | 5 | 30.8 | 28 | 45.5 | 37.2 | 20.2 | 34.3 | 15 | 33.3 |
| Quivira x Tenmarq | 12116 | 22.2 | 51.7 | 61.1 | 45.0 | 11 | 39.5 | 9 | 45.2 | 37.4 | 17.5 | 33.4 | 16 | 33.3 |
| Chiefkan x Oro-Tenmarq | 12134 | 24.0 | 46.4 | 54.6 | 41.7 | 15 | 34.3 | 21 | 47.6 | 41.1 | 20.5 | 36.4 | 7 | 33.2 |
| Chiefkan x Oro-Tenmarq | 12133 | 25.6 | 51.4 | 42.1 | 39.7 | 20 | 38.7 | 11 | 45.8 | 43.2 | 23.0 | 37.3 | 4 | 33.1 |
| Mediterranean-Hope x Pawnee | 12141 | 19.6 | 46.9 | 44.1 | 36.9 | 26 | 40.7 | 5 | 48.7 | 25.2 | 16.1 | 30.0 | 27 | 33.1 |
| Cheyenne x Early Blackhull | 12000 | 22.0 | 48.5 | 53.8 | 41.4 | 16 | 37.2 | 13 | 41.7 | 44.2 | 21.3 | 35.7 | 8 | 32.9 |
| Blackhull x Hd.Federation | 12120 | 23.7 | 42.2 | 50.5 | 38.8 | 21 | 36.0 | 15 | 47.8 | 33.5 | 18.7 | 33.3 | 19 | 32.3 |
| Tenmarq selection | 12125 | 21.8 | 57.1 | 59.0 | 46.0 | 7 | 32.7 | 25 | 45.1 | 38.6 | 23.2 | 35.6 | 10 | 32.3 |
| Early Blackhull | 8856 | 22.2 | 31.9 | 78.1 | 44.1 | 12 | 35.7 | 16 | 39.4 | 35.7 | 17.4 | 30.8 | 25 | 31.2 |
| Marquillo-Ten. x Kaw.-Ten. | 12127 | 21.9 | 38.8 | 43.0 | 34.6 | 28 | 34.8 | 19 | 44.7 | 31.7 | 21.2 | 32.5 | 22 | 31.1 |
| Cheyenne x Tenmarq | 12123 | 24.1 | 42.0 | 47.4 | 37.8 | 23 | 33.0 | 24 | 44.0 | 36.9 | 19.4 | 33.4 | 16 | 31.0 |
| Kanred x Hope-Hd.Federation | 12135 | 28.6 | 50.7 | 43.2 | 40.8 | 17 | 33.2 | 23 | 45.3 | 39.5 | 20.9 | 35.2 | 13 | 30.4 |
| Triumph | 12132 | 24.7 | 41.1 | 50.7 | 38.8 | 21 | 34.7 | 20 | 37.0 | 34.5 | 18.1 | 29.9 | 28 | 30.3 |
| Kharkof | 1442 | 21.8 | 53.3 | 47.1 | 40.7 | 19 | 31.2 | 27 | 38.2 | 30.1 | 22.3 | 30.2 | 26 | 29.6 |
| Wichita | 11952 | 20.2 | 39.8 | 53.5 | 37.8 | 23 | 39.8 | 7 | 36.2 | 36.4 | 20.7 | 31.1 | 24 | 29.6 |
| Blackhull | 6251 | 14.8 | 41.0 | 48.6 | 34.8 | 27 | 31.3 | 26 | 41.0 | 34.7 | 22.1 | 32.6 | 21 | 29.5 |
| Kanred x Hope-Hd.Federation | 12136 | 19.8 | 46.3 | 46.9 | 37.7 | 25 | 35.0 | 18 | 43.3 | 37.7 | 19.3 | 33.4 | 16 | 29.4 |

Table 23.--Summary of average yields of 25 winter wheat varieties grown in uniform yield nurseries at 12 stations in the hard red winter wheat region, 1945 and 1946.

| Variety | C. I. No. | Bushels per acre | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Texas | | | | Oklahoma | | | | Kansas | | | |
| | | Denton | Chillicothe | Av. | Rank | Stillwater | Woodward | Av. | Rank | Manhattan | Hays | Av. | Rank |
| Kaw.-Marquillo x Kaw.-Ten. | 12128 | 24.5 | 26.0 | 25.3 | 1 | 27.7 | 39.3 | 33.5 | 1 | 40.5 | 22.0 | 31.3 | 1 |
| Cheyenne x Early Blackhull | 12122 | 20.3 | 24.9 | 22.6 | 2 | 23.6 | 37.1 | 30.4 | 2 | 28.3 | 22.1 | 25.2 | 14 |
| Cheyenne x Early Blackhull | 12114 | 17.1 | 18.3 | 17.7 | 19 | 19.4 | 36.9 | 28.2 | 8 | 29.4 | 18.0 | 23.7 | 15 |
| Cheyenne x Early Blackhull | 12000 | 19.8 | 22.5 | 21.2 | 6 | 23.2 | 35.5 | 29.4 | 3 | 32.0 | 18.8 | 25.4 | 12 |
| Pawnee | 11669 | 19.6 | 20.7 | 20.2 | 11 | 25.2 | 30.5 | 27.9 | 10 | 40.2 | 18.3 | 29.3 | 2 |
| Quivira x Tenmarq | 12116 | 16.5 | 20.8 | 18.7 | 16 | 19.2 | 32.2 | 25.7 | 16 | 37.9 | 19.7 | 28.8 | 3 |
| Chiefkan x Oro-Tenmarq | 12133 | 20.8 | 22.0 | 21.4 | 4 | 16.7 | 30.1 | 23.4 | 22 | 32.7 | 23.5 | 28.1 | 6 |
| Chiefkan x Oro-Tenmarq | 12134 | 20.1 | 20.4 | 20.3 | 10 | 19.6 | 31.8 | 25.7 | 16 | 35.3 | 21.1 | 28.2 | 4 |
| Cheyenne x Chiefkan | 12129 | 17.8 | 22.6 | 20.2 | 11 | 19.4 | 29.2 | 24.3 | 20 | 25.5 | 19.0 | 22.3 | 19 |
| Westar | 12110 | 21.2 | 22.4 | 21.8 | 3 | 23.6 | 34.1 | 28.8 | 6 | 36.9 | 19.5 | 28.2 | 4 |
| Chiefkan x Martin-Tenmarq | 12130 | 18.6 | 21.7 | 20.2 | 11 | 21.7 | 31.0 | 26.4 | 14 | 32.3 | 20.4 | 26.4 | 8 |
| Blackhull x Hd.-Federation | 12120 | 19.1 | 21.2 | 20.2 | 11 | 23.6 | 35.0 | 29.3 | 4 | 27.9 | 22.9 | 25.4 | 12 |
| Cheyenne x Tenmarq | 12123 | 20.0 | 22.0 | 21.2 | 6 | 21.3 | 30.4 | 25.9 | 15 | 34.1 | 18.1 | 26.3 | 9 |
| Blackhull x Cheyenne | 12101 | 20.8 | 20.5 | 20.7 | 8 | 16.7 | 33.7 | 25.2 | 18 | 26.3 | 18.1 | 22.2 | 20 |
| Tenmarq x Blackhull | 12126 | 16.4 | 17.6 | 17.0 | 21 | 21.5 | 35.6 | 28.6 | 6 | 26.4 | 19.4 | 22.9 | 17 |
| Early Blackhull | 8856 | 17.2 | 19.7 | 18.5 | 17 | 23.8 | 34.0 | 28.9 | 5 | 24.7 | 20.9 | 22.8 | 18 |
| Marquillo-Ten. x Kaw.-Ten. | 12127 | 21.9 | 19.0 | 20.5 | 9 | 21.8 | 33.2 | 27.5 | 12 | 37.7 | 14.4 | 26.1 | 10 |
| Comanche | 11673 | 19.8 | 22.7 | 21.3 | 5 | 17.6 | 31.2 | 24.4 | 19 | 33.2 | 21.1 | 27.2 | 7 |
| Tenmarq selection | 12125 | 18.9 | 19.0 | 18.9 | 15 | 17.1 | 28.4 | 22.8 | 11 | 27.3 | 16.5 | 21.9 | 21 |
| Triumph | 12132 | 16.2 | 20.6 | 18.4 | 18 | 21.1 | 35.3 | 28.2 | 8 | 30.7 | 21.1 | 25.9 | 11 |
| Wichita | 11952 | 12.3 | 19.7 | 16.0 | 25 | 19.2 | 33.7 | 26.5 | 13 | 33.9 | 13.0 | 23.5 | 16 |
| Kanred x Hope-Hd.Federation | 12136 | 15.1 | 18.4 | 16.8 | 22 | 17.4 | 31.1 | 24.3 | 20 | 25.5 | 14.8 | 20.2 | 23 |
| Blackhull | 6251 | 17.1 | 15.9 | 16.5 | 23 | 17.2 | 29.4 | 23.3 | 23 | 25.2 | 16.1 | 20.7 | 22 |
| Kanred x Hope-Hd.Federation | 12135 | 15.0 | 17.5 | 16.3 | 24 | 12.9 | 30.5 | 21.7 | 24 | 23.1 | 14.2 | 18.7 | 25 |
| Kharkof | 1442 | 17.5 | 17.8 | 17.7 | 19 | 11.3 | 29.6 | 20.5 | 25 | 24.4 | 15.4 | 19.9 | 24 |

Table 23.--(Concluded.)

| Variety | C. I. No. | Bushels per acre: Colorado: Akron | Colorado: Fort Collins | Colorado: Av. | Colorado: Rank | Iowa: Ames | Iowa: Rank | Nebraska: Lincoln | Nebraska: North Platte | Nebraska: Alliance | Nebraska: Av. | Nebraska: Rank | Average of 12 stations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Kaw.-Marquillo x Kaw.-Ten. | 12128 | 29.9 | 43.1 | 36.5 | 16 | 36.7 | 10 | 40.8 | 46.2 | 30.0 | 39.0 | 1 | 33.9 |
| Cheyenne x Early Blackhull | 12122 | 34.7 | 42.4 | 38.6 | 6 | 38.4 | 3 | 34.8 | 44.2 | 27.6 | 35.5 | 7 | 31.5 |
| Cheyenne x Early Blackhull | 12114 | 37.1 | 45.6 | 41.4 | 2 | 38.0 | 5 | 34.0 | 50.3 | 32.7 | 39.0 | 1 | 31.4 |
| Cheyenne x Early Blackhull | 12000 | 36.5 | 41.8 | 39.2 | 3 | 38.1 | 4 | 34.1 | 43.2 | 28.6 | 35.3 | 10 | 31.2 |
| Pawnee | 11669 | 34.4 | 39.6 | 37.0 | 13 | 40.6 | 1 | 37.8 | 40.4 | 24.4 | 34.2 | 15 | 31.0 |
| Quivira x Tenmarq | 12116 | 36.1 | 41.1 | 38.6 | 6 | 36.9 | 8 | 39.6 | 43.4 | 27.6 | 36.9 | 3 | 30.9 |
| Chiefkan x Oro-Tenmarq | 12133 | 34.1 | 43.1 | 38.6 | 6 | 34.0 | 16 | 34.0 | 44.5 | 29.0 | 35.8 | 5 | 30.4 |
| Chiefkan x Oro-Tenmarq | 12134 | 34.2 | 41.0 | 37.6 | 11 | 34.3 | 15 | 35.9 | 43.8 | 27.2 | 35.6 | 6 | 30.4 |
| Cheyenne x Chiefkan | 12129 | 35.9 | 47.4 | 41.7 | 1 | 37.7 | 6 | 33.5 | 47.6 | 28.2 | 36.4 | 4 | 30.3 |
| Westar | 12110 | 30.8 | 35.0 | 32.9 | 24 | 34.4 | 14 | 36.0 | 40.0 | 30.5 | 35.5 | 7 | 30.3 |
| Chiefkan x Martin-Tenmarq | 12130 | 31.8 | 43.9 | 37.9 | 10 | 35.3 | 12 | 31.4 | 46.0 | 28.8 | 35.4 | 9 | 30.2 |
| Blackhull x Hd.-Federation | 12120 | 34.6 | 39.4 | 37.0 | 13 | 31.0 | 23 | 34.7 | 40.5 | 27.9 | 34.4 | 14 | 29.8 |
| Cheyenne x Tenmarq | 12123 | 34.9 | 35.8 | 35.4 | 18 | 32.4 | 21 | 35.0 | 43.2 | 25.8 | 34.7 | 12 | 29.5 |
| Blackhull x Cheyenne | 12101 | 32.8 | 41.3 | 37.1 | 12 | 37.3 | 7 | 30.2 | 47.1 | 28.6 | 35.3 | 10 | 29.5 |
| Tenmarq x Blackhull | 12126 | 34.9 | 41.6 | 38.3 | 9 | 36.9 | 8 | 32.4 | 36.1 | 30.0 | 32.8 | 19 | 29.1 |
| Early Blackhull | 8856 | 32.6 | 35.4 | 34.0 | 22 | 36.1 | 11 | 37.6 | 37.7 | 24.5 | 33.3 | 16 | 28.7 |
| Marquillo-Ten. x Kaw.-Ten. | 12127 | 30.0 | 34.4 | 32.2 | 25 | 33.0 | 19 | 33.5 | 36.0 | 28.5 | 32.7 | 20 | 28.6 |
| Comanche | 11673 | 31.2 | 38.5 | 34.9 | 20 | 29.4 | 25 | 33.7 | 37.6 | 26.7 | 32.7 | 20 | 28.6 |
| Tenmarq selection | 12125 | 33.9 | 43.5 | 38.7 | 5 | 33.7 | 17 | 34.3 | 41.1 | 28.0 | 34.5 | 13 | 28.5 |
| Triumph | 12132 | 30.6 | 39.5 | 35.1 | 19 | 32.5 | 20 | 33.6 | 32.0 | 25.7 | 30.4 | 24 | 28.3 |
| Wichita | 11952 | 31.6 | 37.2 | 34.4 | 21 | 38.9 | 2 | 28.5 | 41.4 | 27.9 | 32.6 | 21 | 28.1 |
| Kanred x Hope-Hd.Federation | 12136 | 31.2 | 36.2 | 33.7 | 23 | 33.1 | 18 | 31.5 | 42.5 | 24.9 | 33.0 | 18 | 26.8 |
| Blackhull | 6251 | 28.9 | 43.1 | 36.0 | 17 | 34.5 | 13 | 28.4 | 36.9 | 27.1 | 30.8 | 23 | 26.7 |
| Kanred x Hope-Hd.Federation | 12135 | 35.9 | 41.8 | 38.9 | 4 | 30.5 | 24 | 29.6 | 42.8 | 26.8 | 33.1 | 17 | 26.7 |
| Kharkof | 1442 | 29.1 | 44.7 | 36.9 | 15 | 31.8 | 22 | 27.7 | 32.7 | 25.8 | 28.7 | 25 | 25.7 |

## SUMMARY OF AGRONOMIC DATA

Data for characters other than yield are averaged and presented in table 24. Since all stations did not report the same data, the number of stations entering the averages is shown at the top of each column.

Winterkilling was reported from only 3 stations and the range in survivals was not wide. Mediterranean-Hope x Pawnee (C. I. 12141) and Cheyenne x Turkey (C. I. 12142) had the highest survivals, while Blackhull x Hard Federation (C. I. 12120), Cheyenne x Chiefkan (C. I. 12129), and Westar had the lowest. Heading dates were reported from 11 stations, and at these Early Blackhull and Triumph headed first and on the same date. Wichita and Cheyenne x Early Blackhull (C. I. 12000 and C. I. 12122) were slightly later. Pawnee and Comanche headed 8 days later than Early Blackhull, while the late varieties were 11 or 12 days later. Ripening dates averaged from 11 stations ranged from June 19 to June 26, considerably earlier than in 1945. The varieties ripened in about the same order as they headed. Plant heights were reported from 12 stations and the averages ranged from 33 inches for Triumph to 39 inches for Blackhull and two new hybrids.

Lodging data averaged from 2 stations showed a rather wide range. The varieties standing best were Marquillo-Tenmarq x Kawvale-Tenmarq (C. I. 12127), Mediterranean-Hope x Pawnee (C. I. 12141), Pawnee, and Blackhull x Hard Federation (C. I. 12120). Early Blackhull and Triumph showed the most lodging. Shattering data from 2 stations showed no great differences except for Marquillo-Tenmarq x Kawvale-Tenmarq (C. I. 12127) which was decidedly the worst.

Leaf rust readings from 6 stations differentiated the varieties rather clearly. The most resistant were Oro x Mediterranean-Hope (C. I. 12140), Kawvale-Marquillo x Kawvale-Tenmarq (C. I. 12128), Mediterranean-Hope x Pawnee (C. I. 12141), Westar, and Pawnee in the order named. Triumph was the most susceptible.

Average test weights per bushel from 12 stations ranged from 57.4 to 61.7 pounds per bushel. The highest averages were shown for Blackhull x Hard Federation (C. I. 12120), Cheyenne x Early Blackhull (C. I. 12122), Cheyenne x Chiefkan (C. I. 12129), and Cheyenne x Early Blackhull (C. I. 12114). A total of 15 varieties had averages above 60 pounds per bushel and 13 were below.

## DATA FROM THE DISEASE NURSERIES

For convenience, the data from the uniform winter wheat rust and bunt nurseries are included in this summary. These data are secured in cooperation with agronomists and plant pathologists working in the district. These reports are included with no change in table numbers.

Table 24.--Summary of agronomic data other than yield for varieties of winter wheat grown as uniform yield nurseries at 13 stations in the hard red winter wheat region, 1946.

| Variety | C. I. No. | Average | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Winter survival | Date Headed | Date Ripe | Ht. | Lodging | Shattering | Leaf rust | Weight per bushel |
| | | % | May | June | In. | % | % | % | Lbs. |
| Number of stations | | 3 | 11 | 11 | 12 | 3 | 2 | 6 | 12 |
| Kharkof | 1442 | 91 | 13 | 26 | 38 | 28 | 1 | 47 | 58.9 |
| Blackhull | 6251 | 91 | 12 | 25 | 39 | 24 | T | 39 | 60.2 |
| Early Blackhull | 8856 | 88 | 1 | 19 | 37 | 33 | 1 | 50 | 60.6 |
| Pawnee | 11669 | 92 | 9 | 23 | 36 | 3 | 1 | 20 | 59.5 |
| Comanche | 11673 | 87 | 9 | 23 | 36 | 23 | T | 34 | 58.8 |
| Wichita | 11952 | 93 | 4 | 20 | 35 | 18 | 11 | 49 | 60.4 |
| Cheyenne x Early Blackhull | 12000 | 94 | 4 | 22 | 35 | 17 | 3 | 47 | 60.4 |
| Blackhull x Cheyenne | 12101 | 94 | 12 | 24 | 36 | 10 | T | 46 | 60.5 |
| Westar | 12110 | 85 | 10 | 24 | 38 | 19 | 2 | 14 | 59.4 |
| Cheyenne x Early Blackhull | 12114 | 92 | 9 | 23 | 36 | 13 | 3 | 45 | 60.7 |
| Quivira x Tenmarq | 12116 | 88 | 8 | 23 | 37 | 13 | 3 | 34 | 60.6 |
| Blackhull x Hard Federation | 12120 | 80 | 8 | 24 | 35 | 4 | T | 39 | 61.7 |
| Cheyenne x Early Blackhull | 12122 | 87 | 6 | 22 | 35 | 20 | T | 45 | 60.8 |
| Cheyenne x Tenmarq | 12123 | 88 | 9 | 23 | 36 | 14 | 1 | 38 | 60.4 |
| Tenmarq selection | 12125 | 90 | 11 | 24 | 39 | 15 | T | 42 | 59.6 |
| Tenmarq x Blackhull | 12126 | 87 | 10 | 23 | 37 | 23 | T | 51 | 60.2 |
| Marquillo-Ten. x Kaw.-Tenmarq | 12127 | 91 | 9 | 22 | 35 | 1 | 27 | 30 | 59.1 |
| Kaw.-Marquillo x Kaw.-Tenmarq | 12128 | 88 | 9 | 23 | 37 | 6 | 4 | 7 | 60.1 |
| Cheyenne x Chiefkan | 12129 | 84 | 12 | 25 | 38 | 12 | 0 | 39 | 60.7 |
| Chiefkan x Martin-Tenmarq | 12130 | 89 | 10 | 24 | 39 | 9 | T | 43 | 59.9 |
| Triumph | 12132 | 92 | 1 | 19 | 33 | 29 | 1 | 52 | 60.2 |
| Chiefkan x Oro-Tenmarq | 12133 | 88 | 8 | 23 | 36 | 11 | T | 50 | 60.1 |
| Chiefkan x Oro-Tenmarq | 12134 | 91 | 9 | 23 | 37 | 9 | 1 | 48 | 59.8 |
| Kanred x Hope-Hd.Federation | 12135 | 88 | 10 | 24 | 37 | 18 | 5 | 42 | 57.4 |
| Kanred x Hope-Hd.Federation | 12136 | 89 | 9 | 24 | 36 | 13 | 2 | 48 | 58.4 |
| Oro x Mediterranean-Hope | 12140 | 91 | 12 | 24 | 38 | 12 | 1 | 6 | 59.6 |
| Mediterranean-Hope x Pawnee | 12141 | 96 | 9 | 23 | 35 | 2 | 6 | 18 | 58.4 |
| Cheyenne x Turkey 1062 | 12142 | 97 | 13 | 24 | 36 | 13 | 3 | 47 | 58.8 |

## UNIFORM WINTER WHEAT RUST NURSERIES

The following is a summary report of results obtained in the 1946 winter wheat uniform rust nurseries in cooperative studies conducted by members of the Divisions of Cereal Crops and Diseases, Bureau of Plant Industry, Soils, and Agricultural Engineering, and the Plant Disease Control, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, and State Agricultural Experiment Stations. This report, prepared by M. M. Rodenhiser, is preliminary to a more complete one in which the data will be presented on the basis of coefficients of infection and will contain information on the physiologic races identified from the rust collections made in the different nurseries.

Data on leaf rust infection presented in table 1 were obtained on 29 varieties and selections in each of 21 nurseries. In the soft red wheat group the average percentages for the different varieties and selections ranged from 4.4 to 67.3. Hope-Hussar-Trumbull x Fulhio-Purkof was the most resistant of the group and Trumbull the most susceptible. Of the semihard red wheats Hope-Hussar had the least rust, 11.8 percent, as compared with 47.3 in Kawvale. There were marked differences in reaction to leaf rust among the 15 hard red wheats tested. Five selections averaged less than 5 percent, namely, Mediterranean-Hope x Pawnee (2.5), Oro x Med.-Hope (2.8), Ed. Federation-Kawvale x Med.-Hope (3.2), Comanche x Med.-Hope (3.7), and Marquillo-Oro x Oro-Tenmarq (C. I. 12407) (4.7). Kharkof, a susceptible check variety, averaged 51.8 percent.

Stem rust infection, for the area as a whole, was relatively light in 1946. Good differential reactions were obtained, however, at 8 of 11 stations reporting any rust development. The data are presented in table 2. Only Hope-Hussar-Trumbull x Fulhio-Purkof (8.5 percent), and Hope x Hussar (7.0 percent) among the soft red and semihard red wheats, respectively, had averages of less than 10 percent infection. In these two groups averages of 53.7 and 48 percent infections were obtained on Fulcaster and Hussar, respectively. Percentages of infection in the hard red wheats ranged from 1.2 for the most resistant selection, namely, Hard Federation-Kawvale x Med.-Hope, to 42.9 for the most susceptible selection, Kawvale-Marquillo x Kawvale-Tenmarq. Four other wheats had averages of less than 5 percent infection, namely, Nebred x Med.-Hope (1.3), Comanche x Med.-Hope (2.3), Comanche x Hope-Hussar (3.3), and Med.-Hope x Pawnee (4.7).

A few wheats had fairly low average percentages of infection to both leaf and stem rust. In this respect Hope-Hussar-Trumbull x Fulhio-Purkof had the best performance record of the 9 soft wheats tested. Of the hard red wheats Hard Federation-Kawvale x Med.-Hope, Comanche x Med.-Hope, and Med.-Hope x Pawnee all had averages of less than 5 percent infection with each of the two rusts. There is some evidence, however, that the first wheat of this series may not hold up under all conditions for it will be noted that at Wolf Creek, W. Va., it had 40 percent leaf rust.

Table 1.--Severity of leaf rust infection on winter wheat varieties grown in uniform rust nurseries in 1946.

| Class, variety, or cross | C. I. No. | Percent severity of leaf rust infection at: Manhattan Kans. | Stillwater Okla. | Denton Tex. | Col. Sta. Tex. | Fayetteville Ark. | Columbia Mo. | Lincoln Nebr. | Ames Iowa | Kanawha Iowa | Madison Wis. | Urbana Ill. | Lafayette Ind. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Soft Red** | | | | | | | | | | | | | |
| Hope-Hus.-Trum. x Fulhio-Purkof | 12400 | 2 | 25 | T | 5 | T | 3 | 25 | T | 5 | 1 | 5 | T |
| Trumbull x (W38 x Fultz-Hung.128) | 12454 | 2 | 8 | T | 15 | T | T | 1 | 10 | 10 | 3 | 10 | 2 |
| Trumbull x Hope-Hussar | 12458 | 10 | 5 | 10 | 5 | 10 | 18 | 30 | 5 | 25 | 1 | 5 | T |
| Trumbull$^3$ x Hope-Hussar | 12457 | 45 | 65 | 15 | 5 | 90 | 15 | 30 | 10 | .. | 5 | 8 | 5 |
| Wabash | 11384 | 5 | 1 | T | 80 | 5 | 10 | 3 | 5 | 25 | 3 | 20 | 20 |
| Trumbull$^2$ x Wabash-Hope-Hussar | 12456 | 40 | 25 | 10 | T | T | 40 | 35 | 5 | 15 | 5 | 20 | 20 |
| Mediterranean | 3332 | 70 | 60 | 25 | 25 | 90 | 60 | 20 | 20 | 85 | .. | 35 | 65 |
| Fulcaster | 6471 | 80 | 80 | 80 | 50 | 90 | 90 | 25 | 30 | 75 | .. | 35 | 95 |
| Trumbull | 5657 | 85 | 100 | 50 | 95 | 90 | 75 | 40 | 25 | 75 | .. | 30 | 100 |
| **Semihard Red** | | | | | | | | | | | | | |
| Hope-Hussar | 11682 | 10 | 40 | 60 | 15 | 50 | 10 | 10 | 5 | 5 | T | 3 | 1 |
| Harvest Queen x Kawvale | 12284 | 40 | 35 | 15 | 20 | 65 | 15 | 10 | 20 | 30 | 20 | 25 | 25 |
| Hussar | 4843 | 25 | 100 | 40 | 100 | 50 | 15 | 20 | 5 | 45 | 10 | 30 | 25 |
| Kawvale | 8180 | 40 | 10 | 30 | 25 | 90 | 45 | 5 | 10 | 35 | 5 | 30 | 25 |
| Minturki | 6155 | 70 | 75 | 60 | 25 | 50 | 75 | 35 | 20 | 70 | 3 | 25 | 90 |
| **Hard Red** | | | | | | | | | | | | | |
| Med.-Hope x Pawnee | 12287 | 5 | T | T | T | 10 | T | 15 | T | T | T | 3 | T |
| Oro x Medit.-Hope | 12460 | 2 | 10 | T | 2 | 10 | 2 | 15 | 0 | T | T | 3 | T |
| Hard Fed.-Kaw. x Medit.-Hope | 12459 | T | T | 0 | T | 0 | T | 5 | T | .. | T | 3 | T |
| Comanche x Medit.-Hope | 12329 | 2 | T | T | T | 40 | 15 | 2 | 0 | T | T | 5 | T |
| Marquillo-Oro x Oro-Tenmarq | 12407 | 10 | 5 | 5 | 5 | .. | T | 2 | T | 8 | 1 | 8 | 10 |
| Nebred x Medit.-Hope | 12404 | 10 | 40 | 15 | 10 | .. | 2 | 20 | 5 | 5 | 3 | 5 | T |
| Kawvale-Marq. x Kawvale-Tenmarq | 12331 | 5 | 3 | T | 40 | .. | 3 | T | 5 | 3 | T | 3 | T |
| Comanche x Hope-Hussar | 12405 | 45 | 10 | 15 | 5 | .. | 3 | 25 | T | 20 | 1 | 5 | T |
| Marquillo-Oro x Oro-Tenmarq | 12406 | 40 | 30 | 20 | 15 | 35 | 10 | 10 | T | 5 | 1 | 10 | 35 |
| Westar | 12110 | 45 | 25 | T | 10 | 10 | 5 | 10 | T | 25 | 2 | 30 | 20 |
| H-44 x Minturki$^2$ | 12327 | 25 | 65 | 40 | 30 | 75 | 15 | 20 | 10 | 25 | 1 | 5 | 10 |
| H-44 x Minturki$^2$ | 12326 | 15 | 80 | 40 | 40 | 50 | 10 | 35 | 10 | 25 | 1 | 12 | 10 |
| Kanred | 5146 | 50 | 25 | 20 | 25 | 50 | 40 | 40 | 15 | 75 | 3 | 20 | 75 |
| Kharkof | 1442 | 70 | 80 | 60 | 60 | 90 | 65 | 50 | 30 | 80 | 50 | 20 | 65 |
| Malakof | 4898 | 80 | 80 | 20 | 90 | 90 | 60 | 30 | 10 | 75 | 15 | 15 | 25 |

Table 1.--(Concluded).

| Class, variety, or cross | C. I. No. | Percent severity of leaf rust infection at: Evansville Ind. | Bedford Ind. | Wooster Ohio | Beltsville Md. | Wolf Creek W. Va. | Whyteville Va. | Westminster S. C. | Experiment Ga. | Quincy Fla. | Average all stations |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Soft Red** | | | | | | | | | | | |
| Hope-Hus.-Trum. x Fulhio-Purkof | 12400 | T | T | 3 | T | T | 2 | 5 | 5 | 5 | 4.4 |
| Trumbull x (W38 x Fultz-Hung.128) | 12454 | T | 10 | 20 | 5 | 70 | 5 | 5 | 5 | 65 | 11.8 |
| Trumbull x Hope-Hussar | 12458 | T | T | T | 1 | 65 | 70 | 5 | 5 | 10 | 13.4 |
| Trumbull$^3$ x Hope-Hussar | 12457 | T | 10 | 5 | 1 | 2 | 30 | 5 | 5 | 25 | 18.8 |
| Wabash | 11384 | 10 | 35 | 25 | 40 | 30 | 5 | 5 | 75 | 25 | 20.3 |
| Trumbull$^2$ x Wabash-Hope-Hussar | 12456 | 20 | 75 | 20 | 10 | 1 | 40 | 5 | 25 | 25 | 20.8 |
| Mediterranean | 3332 | 100 | 100 | 40 | 85 | 10 | 40 | 5 | 75 | 65 | 53.8 |
| Fulcaster | 6471 | 100 | .. | 40 | 80 | 30 | 50 | .. | 75 | 25 | 62.8 |
| Trumbull | 5657 | 100 | 100 | 30 | 80 | 20 | 20 | 65 | 100 | 65 | 67.3 |
| **Semihard Red** | | | | | | | | | | | |
| Hope-Hussar | 11682 | T | T | 5 | 1 | 10 | 2 | 10 | 5 | 5 | 11.8 |
| Harvest Queen x Kawvale | 12284 | 75 | 75 | 30 | 25 | 5 | 20 | 5 | 25 | 40 | 29.5 |
| Hussar | 4843 | T | 25 | 15 | 5 | 30 | 5 | 40 | 5 | 65 | 31.2 |
| Kawvale | 8180 | 80 | 100 | 40 | 55 | 5 | 5 | 5 | 50 | 25 | 34.0 |
| Minturki | 6155 | 100 | 10 | 25 | 60 | 2 | 50 | 25 | 75 | .. | 47.3 |
| **Hard Red** | | | | | | | | | | | |
| Med.-Hope x Pawnee | 12287 | T | T | 3 | 1 | 1 | 1 | 5 | 1 | 5 | 2.5 |
| Oro x Medit.-Hope | 12460 | T | T | T | T | T | 2 | 5 | 5 | 2 | 2.8 |
| Hard Fed.-Kaw. x Medit.-Hope | 12459 | 0 | T | 3 | T | 40 | 1 | 5 | T | 5 | 3.2 |
| Comanche x Medit.-Hope | 12329 | T | T | 3 | T | T | T | 5 | 1 | 2 | 3.7 |
| Marquillo-Oro x Oro-Tenmarq | 12407 | T | 10 | 5 | 3 | 2 | 5 | 5 | 5 | 5 | 4.7 |
| Medit. x Medit.-Hope | 12404 | T | T | T | T | T | T | 5 | 5 | 5 | 6.6 |
| Kawvale-Marq. x Kawvale-Tenmarq | 12331 | 10 | 5 | 3 | 5 | 20 | 1 | 5 | 5 | 40 | 7.8 |
| Comanche x Hope-Hussar | 12405 | T | T | T | T | T | 1 | 5 | 25 | 0 | 8.1 |
| Marquillo-Oro x Oro-Tenmarq | 12406 | T | 10 | 5 | 3 | 2 | 2 | 5 | 25 | 5 | 12.8 |
| Westar | 12110 | T | 10 | 7 | 10 | 50 | 10 | 5 | 5 | 5 | 13.6 |
| H-44 x Minturki$^2$ | 12327 | T | 10 | 5 | T | T | T | 5 | 100 | 5 | 21.5 |
| H-44 x Minturki$^2$ | 12326 | 10 | T | 15 | 20 | T | 2 | 5 | 75 | 10 | 22.2 |
| Kanred | 5146 | 50 | 50 | 5 | 15 | 5 | 10 | 10 | 25 | .. | 30.4 |
| Kharkof | 1442 | 50 | 100 | 30 | 15 | 15 | 25 | 5 | 75 | .. | 51.8 |
| Malakof | 4898 | 50 | 50 | 25 | 15 | 60 | 20 | 5 | 25 | .. | 42.0 |

Table 2.--Severity of stem rust infection on winter wheat varieties grown in uniform rust nurseries in 1946.

| Class, variety, or cross | C. I. No. | Percent severity of stem rust infection at: Coll. Sta. Tex. | Lex-ington Ky. | Man-hattan Kans. | Ames Iowa | Kana-wha Iowa | Cha-tham Mich. | Lafay-ette Ind. | Bed-ford Ind. | Wolf Creek W.Va. | Whythe-ville Va. | Quincy Fla. | Average all stations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Soft Red** | | | | | | | | | | | | | |
| Hope-Hus.-Trum. x Fulhio-Purkof | 12400 | 15 | T | T | 10 | T | 20 | I | 0 | 2 | 40 | 5 | 8.5 |
| Trumbull$^2$ x Wabash-Hope-Hussar | 12456 | 10 | 40 | T | 10 | 5 | 10 | T | 0 | 40 | 30 | 100 | 22.3 |
| Trumbull$^3$ x Hope-Hussar | 12457 | 50 | 30 | 5 | 30 | .. | 5 | 60 | 1 | 90 | 70 | 65 | 42.6 |
| Trumbull | 5657 | 100 | T | T | 65 | 5 | 15 | 75 | 5 | 95 | 85 | 100 | 49.6 |
| Trumbull x (W38 x Fultz-Hung.128) | 12454 | 100 | 20 | 1 | 80 | 5 | 30 | 60 | 5 | 95 | 60 | 100 | 50.5 |
| Mediterranean | 3332 | 95 | 10 | T | 65 | 5 | 35 | 85 | 1 | 95 | 65 | 100 | 50.6 |
| Trumbull x Hope-Hussar | 12458 | 40 | 60 | 5 | 70 | 5 | 25 | 70 | 2 | 100 | 100 | 100 | 52.5 |
| Wabash | 11384 | 100 | 20 | T | 80 | 3 | 35 | 75 | 5 | 95 | 65 | 100 | 52.6 |
| Fulcaster | 6471 | 90 | 10 | T | 50 | 2 | 25 | 85 | .. | 95 | 80 | 100 | 53.7 |
| **Semihard Red** | | | | | | | | | | | | | |
| Hope x Hussar | 11682 | 54 | T | 0 | 5 | T | T | T | 0 | 10 | 5 | 2 | 7.0 |
| Minturki | 6155 | 80 | 10 | T | 40 | T | 25 | 25 | T | 95 | 60 | ... | 33.6 |
| Kawvale | 8180 | 100 | T | 0 | 30 | T | 20 | 65 | T | 95 | 30 | 65 | 36.9 |
| Harvest Queen x Kawvale | 12284 | 100 | T | T | 35 | T | T | 40 | 0 | 95 | 70 | 100 | 40.1 |
| Hussar | 4843 | 100 | 10 | T | 65 | 3 | 20 | 85 | 10 | 95 | 40 | 100 | 48.0 |
| **Hard Red** | | | | | | | | | | | | | |
| Hard Fed.-Kaw. x Med.-Hope | 12459 | 2 | 0 | 0 | 0 | .. | 0 | T | 0 | T | 10 | 0 | 1.2 |
| Nebred x Med.-Hope | 12404 | 2 | 0 | 0 | T | T | 0 | T | 0 | 1 | 1 | 10 | 1.3 |
| Comanche x Med.-Hope | 12329 | 5 | 0 | 0 | T | 0 | 0 | T | 0 | 5 | 10 | 5 | 2.3 |
| Comanche x Hope-Hussar | 12405 | T | 0 | T | 5 | 0 | 0 | T | 0 | 25 | 1 | 5 | 3.3 |
| Med.-Hope x Pawnee | 12287 | 15 | 0 | 0 | 0 | 0 | 1 | T | 0 | 5 | 25 | 5 | 4.7 |
| H-44 x Minturki$^2$ | 12326 | 5 | T | 0 | 10 | 0 | 0 | T | 0 | 5 | 5 | 40 | 5.9 |
| Oro x Med.-Hope | 12460 | 25 | T | 0 | 5 | 0 | 1 | T | 0 | 1 | 30 | 5 | 6.1 |
| Marquillo-Oro x Oro-Tenmarq | 12407 | 15 | 0 | 0 | 15 | T | 0 | 10 | 0 | 30 | T | 5 | 6.9 |
| H-44 x Minturki$^2$ | 12327 | 2 | 0 | 0 | 0 | 0 | T | T | 0 | 80 | 5 | 5 | 8.4 |
| Marquillo-Oro x Oro-Tenmarq | 12406 | 90 | T | 0 | 20 | 0 | 0 | 10 | 0 | 10 | 1 | 5 | 12.4 |
| Kanred | 5146 | 75 | T | 0 | 60 | T | 2 | 25 | T | 30 | 50 | .. | 24.3 |
| Westar | 12110 | 100 | T | T | 80 | T | 0 | 85 | 0 | 80 | 30 | 0 | 34.1 |
| Malakof | 4898 | 100 | T | 0 | 60 | 1 | 15 | 60 | 2 | 80 | 75 | .. | 39.3 |
| Kharkof | 1442 | 100 | 10 | T | 60 | 1 | 40 | 85 | T | 50 | 50 | .. | 39.6 |
| Kawvale-Marq. x Kaw.-Tenmarq | 12331 | 90 | 0 | T | 50 | 1 | T | 75 | 0 | 95 | 95 | 65 | 42.9 |

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH ADMINISTRATION
BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING
(NOT FOR PUBLICATION)

# SUMMARY OF RESULTS OF THE GREAT PLAINS UNIFORM WINTER WHEAT BUNT NURSERIES, 1946

By C. O. Johnston, Pathologist, Wheat Investigations, and K. S. Quisenberry, Head Agronomist, Division of Cereal Crops and Diseases

The uniform winter wheat bunt nurseries for the hard red winter wheat area were continued in 1946 in the same manner as outlined for 1943, 1944, and 1945. Data were obtained on the ordinary bunt at eight stations and on dwarf bunt at one station in 1946. This report presents a summary of those data, together with the averages for certain varieties and selections grown for periods of varying length during the period 1932 to 1946, inclusive.

A total of 58 varieties and selections were sown in duplicate 8-foot rows in each of the 9 nurseries. All of the nurseries except those at Bozeman, Mont., and Beltsville, Md., are in the principal hard red winter wheat growing area. Each station represents a state or a distinct region including parts of several states. The data obtained are presented and summarized in table 1.

The inoculum of ordinary bunt used at each station was composed of a mixture of approximately equal parts of the physiologic races known to be present in the area represented by the station, except at Beltsville, Md., where it was a composite of the races used at all other stations. Inoculum of the races of ordinary bunt was furnished by Dr. C. S. Holton, Pullman, Wash. The composites of races were prepared at Manhattan, Kans., and sent to Lincoln, Nebr., where the seed for the various nurseries was packeted, inoculated, and forwarded to the station cooperators who made the sowings. The races used in preparing the composites were the same as those used in the three preceding years. Only races of Tilletia foetida were used for stations in Texas, Oklahoma, Kansas, Colorado, and Nebraska. A mixture of races of T. foetida and T. caries was used at Bozeman, Mont., and Beltsville, Md.

The dwarf bunt nursery was grown at Bozeman, Mont., on soil that was naturally infested. In this nursery clean seed was sown, the infection resulting entirely from soil-carried spores. Partly for that reason and partly due to the fact that there was considerable winterkilling due to snow mold in some rows, the data from the dwarf bunt nursery are not included in the average infection for 1946 shown in table 1.

The average infections for the stations shown at the bottom of table 1 indicate that relatively light infections were obtained in the nurseries at Denton, Tex., Manhattan, Kans., and North Platte, Nebr., although heavy infections were obtained on the very susceptible Red Chief at those stations. Moderate average infections were obtained in the nurseries at Woodward, Okla., Lincoln, Nebr., and Fort Collins, Colo. The highest average infection was obtained in the ordinary bunt and dwarf bunt nurseries at Bozeman, Mont. The high average in the dwarf bunt nursery was due to moderate to heavy infection on most of the varieties.

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Manhattan, Kansas
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The data in table 4 show that the selection Hope-Turkey x Turkey (Ks. sel. 44762) with an average infection of 1.4 percent of ordinary bunt was the most resistant of all the selections grown in 1946. Although two other selections had average infections of less than 2.0 percent, it is interesting to note that 34 selections had average infections of less than 10 percent while 5 selections had less than 10 percent at all stations where ordinary bunt was used. It is obvious, therefore, that the program of breeding for bunt resistance in hard red winter wheat area has produced many promising materials. Besides resistance to bunt many of the selections having Hope, Hope, and Marquillo in their parentage have strong resistance to leaf rust and stem rust, those with Marquillo parentage have resistance to Hessian fly, and those with Turkey parentage have resistance to loose smut.

The progress made in breeding for bunt resistance is emphasized by the fact that 7 of the 12 selections maintained in the nursery continuously during the four-year period 1943-1946 had average infections of less than 10 percent for that period, while 5 of 7 selections had 15-year averages below 10 percent.

Most of the selections were susceptible or only slightly resistant to dwarf bunt although 7 were highly resistant with infections ranging between 1 and 5 percent. Relief and Hussar each had only 1 percent infection but both were damaged by snow mold. The low infections in Chiefkan x Oro-Tenmarq (H.C. 43-141), Martin-Tenmarq x Kharkof (Denton 42-2062 and Denton 43-2174), and Chiefkan x Martin-Tenmarq (Denton 160-42-333 and Denton 43-2374) are of special interest in that they add to the rather meager supply of resistant stocks among hard red winter wheats.

Table 1.--Summary of bunt infection in 58 varieties and strains of winter wheat grown in the Great Plains uniform winter wheat bunt nursery at 9 stations in 1946 and average bunt infections for the period 1932-1946.

| Variety or cross | C. I. or selection No. | Average percentage of bunt at: Den-ton Tex. | Wd.-ward Okla. | Man-hattan Kans. | Lin-coln Nebr. | North Platte Nebr. | Fort Collins Colo. | Boze-man Mont. | Belts-ville Md. | Bozeman Mont. (Dwf. bunt)1/ | Weighted av. 1946 av. | 1945 & 1946 | 1943 to 1946 | 1932 to 1946 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hope-Turkey x Turkey | Ks.Sel. 44762 | 0 | 2 | 0 | 0 | 0 | 1 | 4 | 2 | 25* | 1.1 | ... | ... | ... |
| Relief | 10082 | 0 | 4 | 1 | 1 | 0 | 0 | 8 | 0 | 1* | 1.8 | 1.9 | 1.8 | ... |
| Turkey x Turkey-Chey. | Nebr.Sel.383130 | 0 | 1 | T | 3 | 0 | 3 | 6 | 2 | 40 | 1.9 | 1.9 | ... | ... |
| Sibley 81 x Yogo | Nebr.Sel.392678 | 0 | 1 | 0 | 5 | 1 | 1 | 7 | 2 | 30* | 2.1 | 1.8 | ... | ... |
| Ridit | 6703 | 0 | 6 | 1 | 1 | 1 | 1 | 5 | 2 | 10* | 2.1 | 16.5 | 10.9 | 5.7 |
| Turkey x Blackhull | Wd.39h-3283-30-3 | 0 | 1 | T | 2 | 0 | 5 | 15 | T | 25* | 2.9 | 2.4 | ... | ... |
| "Fire" | Wd.38B-1-8 | 0 | T | 0 | 1 | 0 | 6 | 15 | 2 | 50* | 3.0 | 2.8 | ... | ... |
| Hussar | 4843 | 1 | 1 | 2 | 7 | 1 | 0 | 13 | T | 1* | 3.2 | 2.3 | 2.7 | 3.0 |
| Hope-Turk. x Turkey | Ks.Sel.44767 | 1 | 2 | 0 | 3 | 0 | 2 | 11 | 7 | 20* | 3.3 | ... | ... | ... |
| Oro x Marquillo-Ten. | Ks.Sel.431339 | 0 | 1 | 0 | 0 | 0 | 10 | 13 | 2 | 20 | 3.3 | 3.5 | ... | ... |
| Marquillo-Oro x Oro-Ten. | Ks.Sel.43636 | 1 | 2 | 1 | 7 | 0 | 3 | 10 | 3 | 10* | 3.4 | 3.5 | ... | ... |
| Oro x Marquillo-Ten. | Ks.Sel.431354 | 0 | 1 | 0 | 0 | 0 | 9 | 20 | T | 10* | 3.8 | 3.4 | ... | ... |
| Blackhull-Oro x Pawnee | Wd.43h1-89 | 0 | 1 | 0 | 1 | 0 | 7 | 20 | 5 | 38 | 4.2 | ... | ... | ... |
| "Fire" | Wd.38B1-7 | 0 | T | T | 2 | 0 | 10 | 11 | 12 | 40* | 4.5 | 4.2 | ... | ... |
| H44 x Minturki2 | Minn. 2710 | 2 | 11 | 0 | 4 | 4 | 1 | 18 | 1 | 55 | 5.1 | 3.7 | 4.2 | ... |
| Hope-Turkey x Turkey | Ks.Sel.44771 | 4 | 13 | T | 1 | 0 | 7 | 13 | 6 | 25* | 5.5 | ... | ... | ... |
| Oro x Medit.-Hope | Ks.Sel.425930 | 1 | 9 | 1 | 1 | 0 | 5 | 20 | 11 | 40* | 6.0 | 8.0 | ... | ... |
| Oro x Turkey | Wd. 37B9-3 | 1 | 5 | 2 | 1 | 0 | 6 | 23 | 16 | 33 | 6.8 | 6.1 | ... | ... |
| Cheyenne x Turkey 1062 | 12142 | 2 | 6 | 1 | 9 | 2 | 12 | 13 | 10 | 33 | 6.9 | 5.6 | ... | ... |
| Hope-Turkey x Turkey | Ks.Sel.44761 | 1 | 12 | 0 | 22 | 0 | 2 | 12 | 7 | 40* | 7.0 | 7.1 | ... | ... |
| Coman x Blkhl.-Hd.Fed. | Wd. 43h2-329 | 1 | 2 | T | 1 | 0 | 18 | 25 | 9 | 50* | 7.0 | ... | ... | ... |
| Coman x Hope-Hussar | 12405 | 1 | 6 | 0 | 4 | 0 | 6 | 33 | 8 | 25* | 7.3 | 7.0 | ... | ... |
| Minturki | 6155 | 1 | 14 | 3 | 6 | 1 | 6 | 23 | 5 | 20* | 7.4 | 4.7 | 7.1 | 6.2 |
| Oro | 8220 | 2 | 6 | 2 | 6 | 4 | 7 | 20 | 12 | 25* | 7.4 | 6.9 | 7.6 | 7.6 |
| Blackhull-Oro x Pawnee | Wd. 43h1-400 | 0 | 1 | 0 | 1 | 0 | 8 | 40 | 11 | 40 | 7.6 | ... | ... | ... |
| Medit.-Hope x Pawnee | Ks.Sel.44741 | 3 | 10 | 2 | 18 | 4 | 5 | 20 | 2 | 40* | 8.0 | ... | ... | ... |
| Chiefkan x Oro-Tenmarq | HC 43-111 | 1 | 2 | 0 | 2 | 0 | 11 | 35 | 16 | 4 | 8.4 | 8.6 | ... | ... |
| Marquillo x Oro | Nebr.Sel.392616 | 4 | 23 | 2 | 15 | 1 | 3 | 18 | 7 | 40* | 9.1 | ... | ... | ... |
| Hope x Minturki | Minn.II-31-78 | 3 | 18 | 4 | 7 | 14 | 2 | 23 | 2 | 40* | 9.1 | ... | ... | ... |
| Chiefkan x Oro-Tenmarq | HC 45-51 | 2 | 1 | 0 | 1 | 1 | 15 | 33 | 20 | 28 | 9.1 | ... | ... | ... |
| Blackhull-Oro x Pawnee | Wd.43h1-399 | 0 | 1 | 0 | 3 | 0 | 13 | 33 | 24 | 35 | 9.3 | ... | ... | ... |
| Chiefkan x Oro-Tenmarq | 12134 | T | 3 | 0 | 4 | 1 | 17 | 33 | 16 | 40 | 9.3 | 10.2 | ... | ... |

Table 1.--(Concluded.)

| Variety or cross | C. I. or selection No. | Average percentage of bunt at: Den-ton Tex. | Wd.-ward Okla. | Man-hattan Kans. | Lin-coln Nebr. | North Platte Nebr. | Fort Collins Colo. | Boze-man Mont. | Belts-ville Md. | Bozeman (Dwf: bunt)1/ | Weighted av.: 1946 av. | 1945 & 1946 | 1943 to 1946 | 1932 to 1946 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Martin-Tenmarq x Kharkof | Dent. 42-2862 | 04 | 18 | 07 | 16 | 02 | 00 | 13 | 17 | 01 | 9.6 | 11.1 | ... | ... |
| Nebred | a0094 | 02 | 10 | 01 | 16 | 03 | 16 | 35 | 06 | 50* | 9.9 | 7.7 | 5.9 | 3.7 |
| Blackhull-Oro x Pawnee | Wd. 4-01-398 | 17 | 14 | 00 | 03 | 00 | 21 | 23 | 26 | 23 | 10.5 | ... | ... | ... |
| Marquillo x Oro | Nebr. Sel. 383464 | 16 | 26 | 02 | 13 | 02 | 02 | 25 | 10 | 40* | 10.8 | ... | ... | ... |
| Comanche x Blkhl.-Hope Fed. | Wd. 4-41-315 | 12 | 09 | 02 | 10 | 00 | 29 | 35 | 12 | 25* | 11.1 | ... | ... | ... |
| Comanche x Blkhl.-Hope Fed. | Wd. 4-42-423 | 12 | 01 | 07 | 04 | 00 | 25 | 40 | 24 | 25* | 12.0 | ... | ... | ... |
| Pawnee x [illegible] | 11669 | 03 | 32 | 03 | 08 | 15 | 04 | 33 | 06 | 35* | 13.0 | 13.2 | 13.8 | ... |
| Coman. x Chey.-Blkhull | Wd. 4-43-86 | 01 | 24 | 00 | 03 | 00 | 29 | 40 | 27 | 30* | 13.0 | ... | ... | ... |
| Comanche [illegible] | 14687 | 13 | 05 | 01 | 08 | 02 | 23 | 45 | 20 | 20* | 13.4 | 9.8 | 5.2 | ... |
| Martin-Tenmarq x Kharkof | Dent. 43-2174 | 05 | 30 | 12 | 09 | 12 | 10 | 30 | 16 | 03 | 14.3 | ... | ... | ... |
| Chiefkan x Ore-Tenmarq | 12133 | 03 | 05 | 00 | 03 | 00 | 33 | 43 | 35 | 33 | 15.3 | 15.9 | ... | ... |
| Coman. x Chey.-Blkhull | Wd. 4-43-81 | 01 | 11 | 02 | 11 | 00 | 19 | 33 | 44 | 50* | 16.4 | ... | ... | ... |
| Chiefkan x Martin-Ten. | Dent. 160-42-333 | 03 | 04 | 15 | 35 | 21 | 00 | 55 | 12 | 5* | 18.1 | ... | ... | ... |
| Medit.-Hope x Pawnee | K.S. Sel. 55-46 | 13 | 37 | 05 | 22 | 12 | 10 | 33 | 16 | 15* | 18.5 | ... | ... | ... |
| Medit.-Hope x Pawnee | 12140 | 12 | 36 | 04 | 38 | 16 | 08 | 35 | 08 | 40* | 19.6 | ... | ... | ... |
| Chiefkan x Martin-Ten. | Dent. 160-42-318 | 12 | 24 | 15 | 40 | 14 | 01 | 45 | 40 | 15* | 23.9 | ... | ... | ... |
| Coman. x Chey.-Blkhull | Wd. 4-43-98 | 20 | 36 | 25 | 24 | 00 | 17 | 73 | 18 | 40* | 25.4 | ... | ... | ... |
| Nebr. 60 x Medit.-Hope | Nebr. Sel. 366-93 | 30 | 44 | 30 | 40 | 09 | 10 | 53 | 03 | 50* | 27.4 | ... | ... | ... |
| Chiefkan x Martin-Ten. | Dent. 43-2374 | 16 | 43 | 40 | 36 | 07 | 00 | 45 | 50 | 02 | 29.6 | ... | ... | ... |
| Tenmarq | 6936 | 10 | 55 | 25 | 55 | 11 | 27 | 35 | 19 | 60* | 29.6 | 29.6 | ... | ... |
| Kawvale | C.I. 8180 | 25 | 05 | 30 | 52 | 27 | 30 | 63 | 30 | 60 | 32.8 | 28.7 | ... | ... |
| Westar | Kans. Sel. 12-10 | 40 | 67 | 55 | 70 | 27 | 20 | 28 | 23 | 50 | 41.3 | 34.1 | ... | ... |
| Kharkof | Nebr. Sel. 40-10 | 20 | 75 | 45 | 55 | 23 | 49 | 63 | 27 | 25* | 44.6 | 44.0 | 41.1 | 41.7 |
| Blackhull x Cheyenne | 12091 | 37 | 74 | 45 | 53 | 28 | 29 | 50 | 43 | 50 | 44.9 | ... | ... | ... |
| Cheyenne | 8885 | 18 | 89 | 45 | 62 | 44 | 33 | 68 | 40 | 55 | 49.9 | 43.5 | 44.4 | 44.0 |
| Red Chief | 12109 | 75 | 91 | 75 | 65 | 70 | 71 | 85 | 72 | 55 | 75.5 | 69.3 | 70.0 | ... |
| Station average | | 7.1 | 17.3 | 8.7 | 15.2 | 6.6 | 12.0 | 29.6 | 14.8 | 30.9 | 13.7 | | | |

1/ Bunt percentages at Bozeman not used in averages.

* Severely damaged or killed out by snow mold.