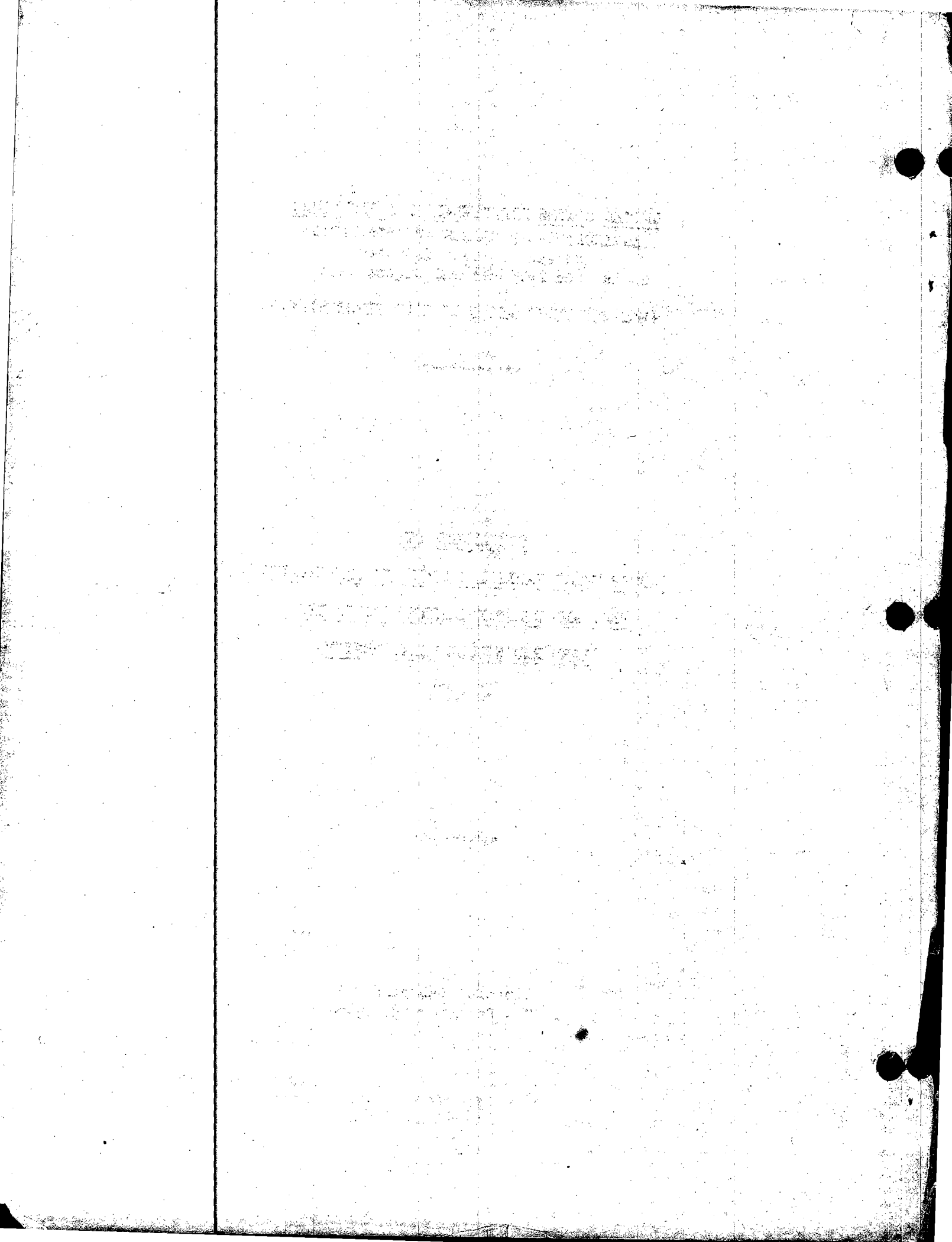


UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH ADMINISTRATION
Bureau of Plant Industry,
Soils, and Agricultural Engineering

(NOT FOR PUBLICATION WITHOUT PERMISSION)

COMPARISON OF
WINTER WHEAT VARIETIES GROWN IN COOPERATIVE
PLOT AND NURSERY EXPERIMENTS IN THE
HARD RED WINTER WHEAT REGION
IN 1944

Lincoln, Nebraska
1166 - December 15, 1944



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IN 1944

By

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Division of Cereal Crops and Diseases

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EXPERIMENTS IN 1944

The 1944 crop was the 14th harvested since the cooperative hard red winter wheat improvement program has been in operation. Plans have not been altered greatly since the beginning, but each year changes are made in the lists of varieties tested in both plot and nursery experiments. The cooperating stations have changed from time to time owing to re-organization of State and Federal work.

The shift from field plots to nursery plots for varietal evaluation has been continued, with several additional stations making the change. Where the nursery rows have been substituted, a single larger plot usually is grown for observation and a seed supply for milling and baking studies. At several stations a nursery plot consisting of four 10-foot rows is seeded in place of three 18-foot rows. At maturity the two center rows are trimmed to 8 feet and harvested, thus giving the usual 16 feet of row. Those using this system seem to like it very much.

More stations are using combines for harvesting the plots, with very satisfactory results. Several men have perfected mechanical harvesters for nursery rows, and these machines appear to have considerable promise. By using all possible mechanical aids, and cutting corners, the improvement program is being carried on in fine shape in spite of the labor shortage. It is really remarkable that the program has been maintained at such a high standard during this emergency, but this has been made possible by the untiring effort of all the cooperators.

This report is a summary of the 1944 data from all cooperating stations as well as the yield data for various periods ending in 1944. An attempt has been made to summarize the yields for the entire period during which the varieties have been grown, by expressing the average for each variety in terms of Kharkof check grown during the same years. 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

Wheat Investigations

Hard Red Winter Wheat

Rust and Smut

Milling and Baking

M. A. McCall

S. C. Solomon

K. S. Quisenberry

C. O. Johnston

E. C. Bayfield

TEXAS AGRICULTURAL EXPERIMENT STATION:

Agronomy (Corn and Small Grains)

College Station Agricultural Exp. Station

✓ Denton Substation No. 6

Chillicothe Substation No. 12

C. H. McDowell

E. S. McFadden

I. M. Atkins

J. R. Quinby,

I. M. Atkins

I. M. Atkins

Bushland Amarillo Experiment Station

OKLAHOMA AGRICULTURAL EXPERIMENT STATION:

Field Crops and Soils

*Lawton U. S. Dry Land Field Station^{2/}

✓ Stillwater A. & M. College

✓ *Woodward Southern Great Plains Field Sta.^{2/}

H. F. Murphy

W. M. Osborn

C. B. Cross

V. C. Hubbard,

J. B. Sieglinger

Goodwell Panhandle Agr. Exp. Station

Marvin McKee

add Law Park

KANSAS AGRICULTURAL EXPERIMENT STATION:

Agronomy

✓Manhattan

Kansas State College

✓Hays

Colby

Ft. Hays Branch Exp. Station
Colby Branch Station

R. I. Throckmorton
H. H. Laude, L. P.
Reitz, E. G. Heyne
A. F. Swanson
E. H. Coles

add N.C.

COLORADO AGRICULTURAL EXPERIMENT STATION:

Agronomy

*Akron

U. S. Dry Land Field Station

✓Fort Collins

Hesperus

State Agricultural College
Fort Lewis Substation

Alvin Kezer
D.W. Robertson, J.F.
Brandon, S.F. Callahan
D. W. Robertson
D. W. Koonce

IOWA AGRICULTURAL EXPERIMENT STATION:

✓Ames

Iowa State College

L.C. Burnett, H.C. Murphy

NEBRASKA AGRICULTURAL EXPERIMENT STATION:

Agronomy

Crops Research

Lincoln

North Platte

Alliance

Valentine

Agricultural Experiment Station
North Platte Substation
Box Butte Experiment Farm
Valentine Substation

F. D. Keim
T. A. Kiesselbach
K. S. Quisenberry
O. J. Webster, L.L. Zook
K. S. Quisenberry
E. M. Brouse

WYOMING AGRICULTURAL EXPERIMENT STATION:

Agronomy

Laramie

*Sheridan

Agricultural Experiment Station
U. S. Dry Land Field Station

A. F. Vass
Dayton Klingman
R. S. Towle

SOUTH DAKOTA AGRICULTURAL EXPERIMENT STATION:

Agronomy

Brookings

Agricultural Experiment Station

W. W. Wortella
J. E. Grafius

MINNESOTA AGRICULTURAL EXPERIMENT STATION:

Agronomy and Plant Genetics

St. Paul

Waseca

Grand Rapids

University Farm
Southeast Experiment Station

H. K. Hayes
E. R. Auserus
R. E. Hodgson
E. R. Auserus

NORTH DAKOTA AGRICULTURAL EXPERIMENT STATION:

Agronomy

Dickinson

Dickinson Substation

T. E. Stoa
R. W. Smith

MONTANA AGRICULTURAL EXPERIMENT STATION:

Agronomy

Bozeman

Moccasin

Havre

Montana Experiment Station
Judith Basin Branch Station
Northern Montana Branch Station

A. H. Post
R. H. Hamberg
R. H. Hamberg
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.

ACCESSION NUMBERS ASSIGNED

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

<u>C. I. No.</u>	<u>Name</u>	<u>State No.</u>
12127	Marquillo-Tenmarq x Kawvale-Ten.	Kans. No. 2773
12128	Kawvale-Marquillo x Kawvale-Ten.	Kans. No. 2775
12129	Cheyenne x Chiefkan	Denton No. 42-2519
12130	Chiefkan x Martin-Tenmarq	Denton No. 42-2882
12131	Chiefkan x Martin-Tenmarq	Denton No. 42-2887
12132	Early Triumph	
12133	Chiefkan x Oro-Tenmarq	Hays Cereal No. 43-112
12134	Chiefkan x Oro-Tenmarq	Hays Cereal No. 43-113
12135	Kanred x Hope-Hard Federation	Akron No. 536
12136	Kanred x Hope-Hard Federation	Akron No. 869
12137	Turkey	Nebraska No. 1
12138	H44 x Minturki ²	Minn. No. 2713
12139	H44 x Minturki ²	Minn. No. 2714

NEW VARIETIES

Mediterranean x Hope, Texas sel. 41-16-3-3, C. I. 12346, was named Austin and distributed in Texas in the fall of 1942. Austin is a soft wheat and is recommended for the eastern third of Texas.

Kanred-Hard Federation x Tenmarq, Amarillo No. 25-34-116, C. I. 12110, was named Westar, and is being increased in Texas with a limited distribution having been made in the fall of 1944. Westar is recommended for the Panhandle area of Texas.

The recommendations of the various States for the distribution of Comanche, Pawnee, and Wichita were presented in the 1943 report. During the year some changes have been made in these recommendations.

Comanche

Colorado - Dry-land sections of the State.

Pawnee

Oklahoma - Entire hard wheat area.

Wichita

Kansas - South-central part of State as a replacement for Early Blackhull.

Colorado - Dry-land sections of the State.

^{3/} C. I. refers to accession number of the Division of Cereal Crops and Diseases.

The estimated seed stocks of these new varieties in the fall of 1944 were as follows:

Comanche

Kansas:
Certified 558 acres 15,000 bushels
Uncertified impossible to trace

Oklahoma:
Certified 335 acres 4,225 bushels
Uncertified 865 acres 9,000

Texas:
Certified 112 acres
Uncertified 8,000 acres 168,000 bushels

Pawnee

Nebraska:
Certified 1,100 acres 30,000 bushels

Kansas:
Certified 723 acres 23,000 bushels

Oklahoma:
Certified 38 acres

Wichita

Texas:
Chillicothe 9 acres 200 bushels
Denton 7 acres 123 bushels (mixed)

Oklahoma:
Lawton 1.5 acres 50 bushels
Stillwater 3.3 acres

Kansas:
Pure 29 bushels

Westar

Texas:
Denton 1 acre 25 bushels
Amarillo 4.5 acres 120 bushels

Austin

Texas:
Denton area 900 acres
Sulphur 7000

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 following 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 1944 were as follows:

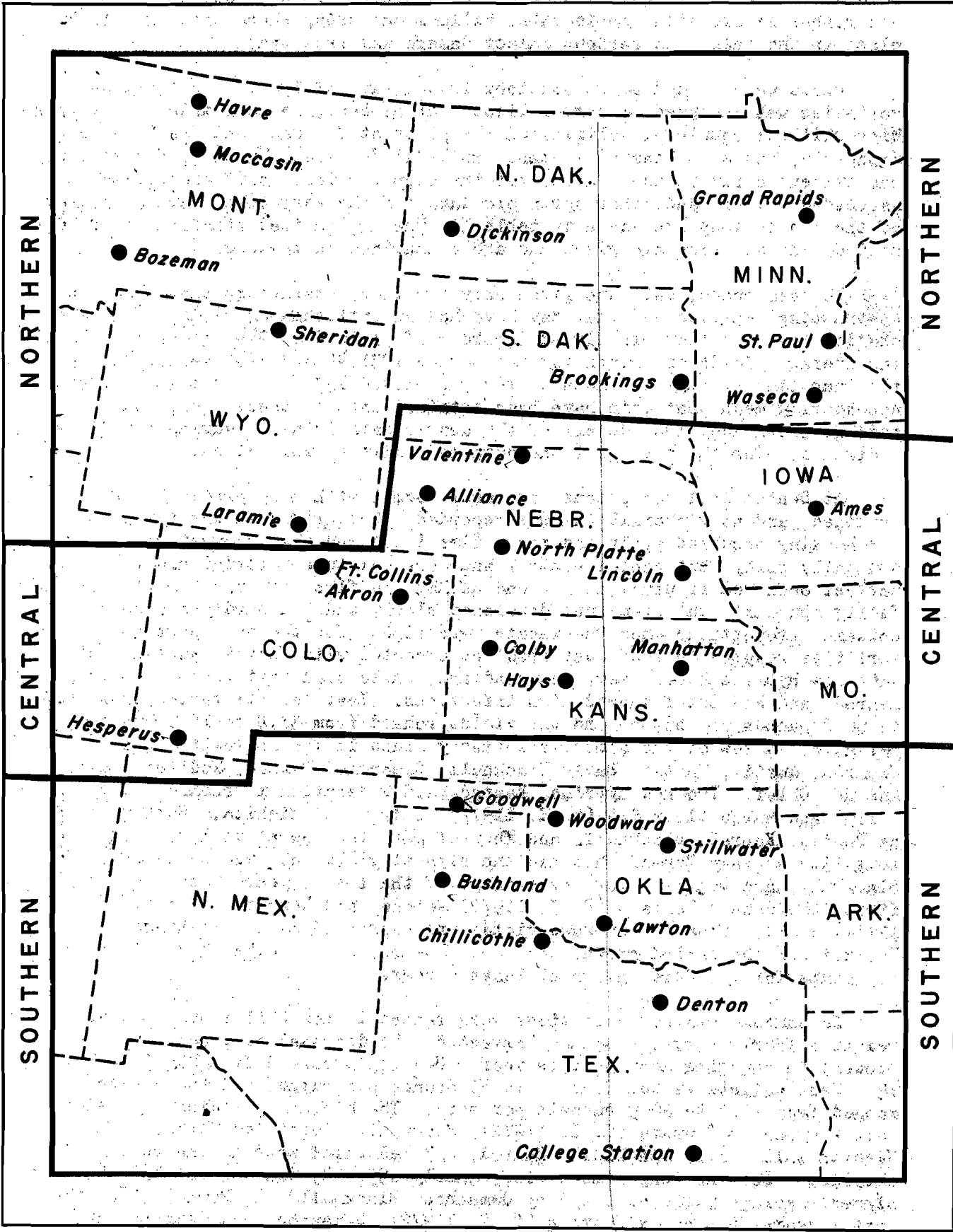
<u>Variety</u>	<u>C. I. No.</u>	<u>Southern</u>	<u>Central</u>	<u>Northern</u>
Kharkof	1442	X	X	X
Tenmarq	6936	X	X	
Blackhull	6251	X	X	
Chiefkan	11754	X	X	
Comanche	11673	X	X	
Pawnee	11669	X	X	
Wichita	11952	X	X	
Red Chief	12109	X	X	
Cheyenne x Tenmarq	11972	X	X	
Early Blackhull	8856	X		
Westar	12110	X		
Nebred	10094			X
Cheyenne	8885		X	
Minturki	6155			X
Yogo	8033			X
Karmont	6700			X
Marmir	11502			X
Mont. 36-Beloglina x Kanred	12108			X
H44 x Minturki ²	12138			X
H44 x Minturki ²	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

In the fall of 1943 conditions for seeding winter wheat throughout the area were somewhat spotted. In the Southern District it was possible to make the seedings on time and fairly good stands were obtained, while in parts of the Central District seedbeds were so dry that germination was slow and emergence did not occur until late in the season. At some stations in the Northern District, emergence did not occur until spring. In general, the behavior at the different stations reflected the general condition of the wheat crop in the immediate vicinity. Fall growth was normal to heavy at stations in the Southern District and the resulting crop was very good. Rust did not develop rapidly in the spring and for the most part did very little damage at these stations. In the Central District, fall growth was somewhat spotted, and, due to a very cool, late spring, development was retarded and maturity delayed from 10 days to 2 weeks. This gave stem rust



an opportunity to develop and at some of the stations in Nebraska and Colorado did a great deal of damage. At the northern stations the winter was rather severe with considerable killing occurring where emergence took place in the fall. No serious insect damage was reported.

Plots were seeded at 23 stations in the fall of 1943. A uniform set of varieties was included at Fort Collins, but no seedings were made at Valentine. Winterkilling completely eliminated the plots at St. Paul and Grand Rapids, Minnesota, and at Moccasin, Montana, while at Sheridan, Wyoming, severe damage was evident early in the season, but the crop recovered sufficiently to be harvested. Yield and other agronomic data for the varieties grown at each of the 18 stations are given in table 1. The generalized standard errors for most of the stations are given and are summarized in table 2.

To save space, 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 1944 and where possible the average yields are given for the period 1931-44 and 1943-44. In table 1 the long-time average is shown as for the period 1931-44, but this does not necessarily mean that data have been obtained each of these years, but the average shown does include all of the usable data obtained during the years indicated. For the most part the data need little explanation.

At Denton fall conditions were near normal with good growth being obtained, and no winterkilling was recorded. Spring growth was fairly rapid and heading occurred early and for a time it seemed that harvest would be unusually early, but cooler weather and more moisture retarded growth so that harvest occurred as usual at the end of May and first of June. Leaf rust was fairly abundant, but stem rust developed slowly and had hardly reached epidemic proportions when the wheats were ripe. For the most part the varieties reacted to leaf rust about as expected with Westar, Austin, and some new hybrids having very low readings, while such varieties as Kharkof, Kanred, and Red Chief showed high infections. Test weights varied from 54.0 to 60.0 pounds per bushel and the yields ranged from 31.8 to 18.6 bushels per acre. A few of the named varieties yielded in the following order: Wichita, Austin, Westar, Early Blackhull, Comanche, Pawnee, Mediterranean, and Red Chief. Two new hybrids, Kanred-Hard Federation x Tenmarq (C. I. 12115) and Marquillo x Oro (C. I. 11979), outyielded Wichita. Such varieties as Denton, Kanred, Blackhull, and Kharkof gave the lowest yields. For the long-time average Tenmarq has had the highest yield followed by Kanred, Blackhull, and Denton. For the average of the last 2 years Westar ranks first, Cheyenne x Tenmarq (C. I. 11972) second, and Tenmarq x Oro (C. I. 12111) third. When the average yields are expressed as a percentage of Kharkof for the period grown, Comanche, Pawnee, and Chiefkan have the highest ranks for varieties grown at least 6 years.

No unusual weather conditions were reported from Chillicothe and as a result a fairly normal crop was harvested. No diseases or insects were present in damaging amounts this year. Heading occurred from May 9 to May 19. Test weights varied from 57 to 60 pounds per bushel and the yields ranged from 27.7 to 20.9 bushels per acre. The highest yielding varieties were Cheyenne x Tenmarq (C. I. 11972), Blackhull, Certified Turkey, and Wichita while Early Blackhull, Kanred, and Red Chief were at the bottom of the list. For the long-time period, namely 1938-44, Tenmarq has had the highest average yield followed by Comanche, Blackhull, and Pawnee. For the last 2 years Cheyenne x Tenmarq (C. I. 11972), Comanche, and Tenmarq have given the highest averages.

Conditions were very favorable at Amarillo and an unusually good crop developed without irrigation. Development was normal and the varieties headed in about the usual order. Although the development of stem rust was not detected early, considerable infection was present by harvesttime. The earlier varieties such as Early Blackhull and Wichita showed very little infection, but some of the later ones such as Cheyenne and Kharkof had considerable infection. It is rather apparent that stem rust may have had some influence on test weights, although Red Chief with 38 percent rust reading had grain testing 63.0 pounds per bushel. The highest yielding varieties were Pawnee, Chiefkan, Comanche, and Westar. Near the bottom of the list were such varieties as Turkey, Cheyenne, Early Blackhull, Wichita, and Kharkof. For the long-time period Tenmarq has had the highest yield, with Blackhull and Kanred averaging only slightly less. Based on the 1943-44 average Chiefkan, Westar, Comanche, and Pawnee have yielded in the order listed. Although Early Blackhull outyielded Wichita in 1944, it would seem that Wichita has a slight advantage for a longer period. Comanche has a rather significant advantage over Tenmarq and for the period grown Westar is equal to or slightly higher than Comanche.

Seeding occurred at about the usual time at Lawton and very good fall growth was obtained. For a time in the spring moisture was short, but before harvest sufficient rain came to insure a good crop. Leaf rust started late but developed rather rapidly so that definite varietal differentiation occurred. Westar showed its resistance while such varieties as Wichita, Early Blackhull, and Cheyenne had heavy infections. Just before harvest stem rust developed on some of the late varieties. Test weights per bushel were all above 60 pounds per bushel, and the yield range was from approximately 40 to 30 bushels per acre. Wichita, Pawnee, and Comanche had the highest yields and Cheyenne, Kharkof, and Red Chief the lowest. For the long period Tenmarq has had the highest yield record, while for the last 2 years Wichita ranks first followed by Cheyenne x Tenmarq (C. I. 11972), Tenmarq, and Pawnee. At this station Comanche has a slight advantage over Pawnee for the period grown and Wichita is definitely superior to Early Blackhull. Based on a single season's results Westar does not seem to be especially adapted in this region.

Conditions were unusually favorable at Woodward and with almost a complete absence of damage by any disease or insects, very high yields were obtained. Growth was heavy with heights ranging up to 44 inches and harvest being just a little late. The later varieties such as Cheyenne, Red Chief, and Kharkof gave fairly good yields while earlier wheats like Pawnee, Wichita, and Early Blackhull were far down the list. For the longer period Tenmarq, Cheyenne, and Kharkof have had the highest average yields. For the last 2 years a new hybrid, Cheyenne x Early Blackhull (C. I. 11999), ranks first, Red Chief, second, and Cheyenne, third. Expressed in a percentage of Kharkof for the period grown, Pawnee and Comanche have had very good yield performances. Again Wichita outyielded Early Blackhull and apparently the variety is considerably superior at this station.

From Stillwater test weight and yield data were reported, with the test weights ranging from 58.6 to 61.8 pounds per bushel. The highest yielding variety was Clarkan with an average of 33.4 bushels closely followed by Pawnee, Comanche, and Reliant. The lower yielding varieties were Early Premium, Blackhull, and two strains of Turkey. No serious disease or insect damage was reported from this station. For the longer period Denton and Sibley 81 have had the best average yields. For the period of years grown, as expressed in the percentage of Kharkof, Pawnee, Comanche, and Clarkan ranked the highest.

At Goodwell the variety test was grown in nursery rows under irrigation. Some rust developed at this station, but it did not seem to have much effect on yields, although the test weights ranged from 52.5 to 61.0 pounds per bushel. There was no close association between time of maturity and yield since the four ranking varieties yielded in the following order--Nebred, Wichita, Red Chief, and Pawnee. Blackhull, Kharkof, Cheyenne, and Tenmarq have had the highest average yields for the long-time period. Of the varieties having a yield record extending for more than 1 year, Comanche, Pawnee, Chiefkan, and Nebred seem to have a slight advantage.

At Manhattan a normal crop was harvested, although maturity was somewhat later than usual. Considerable lodging was reported with such varieties as Pawnee, Cheyenne, Jobred selection, and Kawvale showing the most resistance. Leaf rust was heavy on susceptible varieties, with the only marked resistance being shown by Kawvale-Marquillo x Tenmarq (C. I. 12330), although Pawnee and Cheyenne x Tenmarq (C. I. 12123) had low readings. Stem rust developed very rapidly near harvesttime and some of the later, susceptible varieties were injured. Early Blackhull, Wichita, and Early Blackhull x Tenmarq (C. I. 12124) apparently escaped infection, while Pawnee and several other strains had low readings. Stands were heavy with Pawnee, Cheyenne x Tenmarq (C. I. 12123), and Cheyenne having the highest culm counts. Test weights ranged from 55.1 to 61.5 pounds per bushel, and yields from 17.4 to 37.6 bushels per acre. Pawnee, Wichita, Cheyenne x Early Blackhull (C. I. 12122), and Early Blackhull x Tenmarq (C. I. 12124) had the highest average yields. Comanche gave a higher yield than did Tenmarq, while Cheyenne, Kanred, and Turkey gave the lowest yields. When the yields for the period 1931-44 are averaged, Kawvale ranks first, Cheyenne second, Tenmarq third, and Clarkan fourth. For the 2-year period, 1943-44, Pawnee has had the highest average yield, followed rather closely by Cheyenne x Tenmarq (C. I. 12123 and C. I. 11972). When the average yields are expressed as a percentage of Kharkof check, Pawnee, Wichita, Comanche, and Cheyenne x Tenmarq (C. I. 12123) have figures ranging from 38 to 57 percent higher than the check.

No unusual conditions were reported from Hays and, as a result, yields ranged from 35.8 to 25.1 bushels per acre, and test weights ranged as high as 66 pounds per bushel for Red Chief. The crop headed late in May and was ripe from June 22 to 25. Pawnee, Cheyenne x Early Blackhull (C. I. 12122), Early Blackhull, and Wichita had the highest average yields. Some of the other named varieties yielded in the following order--Red Chief, Comanche, Chiefkan, Tenmarq, and Kharkof. For the long-time average Early Blackhull ranks first, Tenmarq second, and Blackhull third, while for the last 2 years, Pawnee, Wichita, and Chiefkan have had the best records. Expressed in percentage of Kharkof for the years grown, Pawnee ranks first and Cheyenne x Tenmarq (C. I. 11972) second.

For the second year in succession an unusually heavy crop was harvested at Colby, with test weights ranging from 57 to 64 pounds per bushel and yields from 42.9 to 55.9 bushels per acre. The highest yielding strains were two Cheyenne x Tenmarq selections (C. I. Nos. 12123 and 11972). Wichita and another Early Blackhull x Tenmarq strain (C. I. 12124) gave yields slightly above those of Comanche and Pawnee. The lowest yielding varieties were Kanred, Turkey, and Red Chief. For the longer period at this station, Tenmarq, Cheyenne, Blackhull, and Early Blackhull have yielded in the order named, while the last 2 years Cheyenne x Tenmarq (C. I. 11972) has ranked first, Wichita second, Comanche third, and Pawnee fourth.

Some winter injury was reported from Akron, but again the survivals do not follow the general behavior of these varieties when tested for cold resistance. Pawnee had the lowest survival which is probably in line with previous information, but it is doubtful whether this variety is less winter hardy than Wichita as the data would indicate. Harvest was somewhat later than usual and heavy epidemics of leaf and stem rust were present. The epidemic of stem rust was one of the heaviest noted at Akron in recent years and probably had considerable influence on test weight and yield. Wichita, Chiefkan, and Early Blackhull gave the highest yields while Pawnee, Kharkof, and Minturki gave the lowest. For the long-time period Early Blackhull, Blackhull, and Tenmarq have definitely outyielded such varieties as Cheyenne, Kanred, and Kharkof at this station. A new strain, Kanred-Hard Federation x Minhardi-Minturki (C. I. 11970), developed in Colorado, has given a very good yield over a 6-year period as expressed in the terms of percentage of Kharkof. This strain is exceeded only by Wichita. Comanche, grown for 6 years, has performed very satisfactorily.

A nearly complete list of the uniform varieties was grown in nursery plots at Fort Collins and the data are included in this summary. It should be noted that there was an extremely heavy leaf and stem rust epidemic present on this material. It is reported that the 1944 rust epidemic at Fort Collins was the heaviest since 1923, and from the data it will be seen that all varieties were hit extremely hard by both rusts. The early varieties were able to produce fair yields, but the later, more susceptible wheats were practically ruined. The yields ranged from 24.5 bushels per acre for Wichita to 10.2 bushels per acre for Cheyenne which will be recognized as being very low for this station. Blackhull, Chiefkan, Pawnee, and Comanche yielded in the order named.

Fall growth at Lincoln was rather light and some winterkilling was observed in some of the plots. While no variety was severely injured, Red Chief and Blackhull may have been reduced in yield because of poor spring stands. Heading occurred in late May and early June and harvest was completed by July 4. Considerable leaf rust developed, but the stem rust epidemic was very spotted and infection became heavy only on Clarkan. Culm counts are again reported with Nebred showing the heaviest stand, being slightly above Pawnee. Turkey and Cheyenne also had high culm counts. Test weights ranged from 56.6 to 61.4 pounds per bushel. The yields ranged from 29.2 to 18.6 bushels per acre which was considerably lower than for the past 2 years. Again Pawnee ranked at the top of the list with a yield 3 bushels per acre higher than Cheyenne which ranked second. Nebred, Wichita, Tenmarq, Blackhull, Comanche, Chiefkan, and Red Chief yielded in the order named. For the long-time average Cheyenne continues to have the highest average yield with Tenmarq, Nebred, and Kharkof ranking in the order named. For the shorter periods Pawnee is decidedly the outstanding wheat. For the last 2 years Cheyenne x Tenmarq (C. I. 11972) and Wichita have given yields ranking next to Pawnee, but about 6 bushels lower. Comanche has not made an outstanding yield record at Lincoln.

At North Platte a very good crop was harvested from fallow, but on corn ground some varieties were almost a failure. Harvest was slightly later than usual and the epidemic of leaf and stem rust was unusually heavy on practically all of the varieties. Stem rust, undoubtedly, was the cause of the low test weights reported. Wichita gave the highest average yield of 33.6 bushels per acre followed by Minturki x Blackhull (C. I. 11817), Cheyenne x Tenmarq (C. I. 11972), Chiefkan, and Red Chief. Nebred, Pawnee, Comanche, Cheyenne, and Kharkof gave lower yields and ranked in the order listed. For the long-time average Cheyenne has had the best record followed by Turkey,

Tenmarq, Nebraska 60, Blackhull, and Kharkof. When the yields for the 2-year period are expressed as a percentage of Kharkof, Chiefkan, Nebred, Pawnee, and Comanche have given very good results.

Winterkilling was extremely severe at Waseca with H44 x Minturki² (C. I. 12138) and Mont. 36-Beloglina x Kanred (C. I. 12108) having the best survivals. A number of new varieties showed resistance to both leaf and stem rust, while such varieties as Minturki, Marmin, and Mont. 36-Beloglina x Kanred were rather susceptible. Test weights were low and yields ranged from 12.2 to 3.4 bushels per acre. One strain, H44 x Minturki² (C. I. 12138), outyielded Minturki but all the other strains were below. The performance of some of the new rust-resistant Minturki backcrosses is extremely pleasing, and they will be watched very closely.

At Dickinson winterkilling was rather severe, but sufficient stands remained to allow the crop to stand for harvest. Here again leaf and stem rust was heavy, but the two H44 x Minturki² strains showed considerable resistance. Minturki, Kharkof, and Yogo gave the highest yields while Karmont and Nebred were the lowest. For the long-time period Yogo, Minturki, and Kharkof have yielded the highest. Although grown for a shorter period, Marmin and Mont. 36-Beloglina x Kanred have equalled or exceeded the yield of Yogo.

A severe hailstorm occurred at Sheridan on July 9 and at the time it was thought the crop was ruined, but later it recovered and the varieties were harvested on August 7 to 9. Test weights ranged from 58 to 60 pounds per bushel and yields from 19.6 to 12.2 bushels per acre. Karmont, Cheyenne, and Kharkof gave the highest yields and Marmin and Minturki the lowest. For the long-time average, Kanred ranks first followed by Yogo, Kharkof, and Karmont. For the average of the last 2 years, Nebred, Yogo, and Minturki have the best records. Based on a 10-year average and expressed as a percentage of Kharkof, Cheyenne ranks the highest, followed by Kanred and Nebred.

At Havre emergence did not occur until April 3 and the stands were somewhat variable. Heading occurred from June 8 to 14 and the crop ripened from July 21 to 24. Test weights were nearly all above 60 pounds per bushel. Yogo and Karmont gave the highest yields of 23.6 and 23.3 bushels per acre, respectively. Wasatch and Cache, two wheats resistant to low bunt, were included in this test, but did not yield too well as was also true of the two H44 x Minturki² strains from Minnesota. For the longer periods Yogo continues to rank first for yield although for shorter periods Mont. 36-Beloglina x Kanred has made a fairly good record. This variety, however, showed a decided tendency to shatter this year.

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. 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 1944 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 replicated plots in cooperative experiments at 18 experiment stations in the hard red winter wheat area in 1944, and average yields from 1931-44.

Denton, Texas

(Row-row plots, 8 replications)

Variety	C. I. No.	Date		Rust		Wt. per bu.	Av. yield	Yield		No. years grown	Percent of Kharkof	Rank	
		Head ed	Ripe	Ht. in.	Leaf %			Stem %	1931-44				1943-44
Kanred-Hd. Fed. x Tenmarq	12115	4/27	5/30	39	39	T	60.0	31.8	....	27.3	2	145.5	7
Marquillo x Oro	11979	5/1	6/4	38	9	0	56.0	28.6	....	....	1	173.3	1
Wichita	11952	4/22	5/26	36	51	0	60.0	28.1	....	26.8	2	137.4	13
Kan.-Hd. Fed. x Tenmarq 33-37-36.....	....	4/29	6/1	37	33	T	59.0	27.4	....	....	1	166.1	2
Austin	12346	4/27	6/1	40	T	0	57.0	26.9	....	....	1	163.0	3
Westar	12110	5/1	6/2	39	3	2	59.0	26.5	....	29.3	2	143.4	10
Tenmarq x Oro	12111	5/2	6/2	40	43	T	58.0	26.3	....	27.9	2	138.4	12
Campbell Medit. T.S. 23250	....	5/1	6/4	41	20-60	2	59.0	26.0	....	23.3	7	127.3	17
Early Blackhull	8856	4/19	5/26	36	64	0	60.0	25.6	....	26.5	11	130.7	14
Comanche	11673	4/29	6/1	40	45	T	57.0	25.5	....	25.9	6	157.9	4
Pawnee	11669	4/29	5/30	35	24	0	59.5	24.8	....	24.0	6	146.5	6
Cheyenne x Tenmarq	11972	5/4	6/5	39	63	2	58.8	24.7	....	29.2	2	139.9	11
Mediterranean	10086	4/30	6/31	40	29	5	58.0	24.6	22.7	20.7	13	106.1	23
Red Chief	12109	4/29	5/30	39	66	T	60.0	24.3	....	26.1	2	128.8	16
Red May sel. T.S. 7250-1	....	4/29	5/30	35	40	5	57.0	24.3	....	22.2	2	115.7	20
Tenmarq	6936	5/1	6/4	40	55	2	57.5	24.2	27.6	25.7	13	129.0	15
Chiefkan	11754	5/1	6/3	43	55	T	59.0	24.1	....	25.2	6	147.2	5
Fulcaster ² x Hope-Med. 114-40-169	....	4/29	6/1	38	T	0	57.0	24.0	....	....	1	145.5	8
Clarkan-H. F. x Hope-Med. 125-40-396	....	5/5	6/5	37	6	0	59.0	23.9	....	....	1	144.8	9
Clarkan	8858	5/4	6/5	44	43	5	59.0	22.2	....	24.1	10	119.4	18
Fulcaster	6471	5/1	6/3	43	64	5	57.0	22.2	22.3	21.0	13	104.2	24
Denton	8265	5/3	6/4	43	29	5	57.5	22.0	23.7	21.9	13	110.7	22
Kanred	5146	5/5	6/5	39	64	T	55.0	20.2	25.2	25.1	13	117.8	19
Blackhull	6251	5/4	6/2	40	55	T	58.0	17.4	24.2	23.7	13	113.1	21
Kharkof	1442	5/6	6/5	39	69	T	54.0	16.5	21.4	22.3	13	100.0	25

Standard error of a difference between the mean yields of any two varieties = 1.74 bushels.

Table 1.--(Continued)

Chillicothe, Texas
(Four, 1/60-acre plots)

Variety	C. I. No.	Date : head : ed : May	Weight : per : bushel : Lbs.	Average : acre : yield : Bu.	Yield		No. : years : grown	Percent : of : Kharkof	Rank		
					Average : 1938-44 : Bu.	Average : 1943-44 : Bu.					
Cheyenne x Tenmarq	11972	17	59	27.7	....	..	29.5	1	2	118.0	2
Blackhull	6251	18	59	24.2	18.6	3	24.1	9	7	112.7	5
Certified Turkey	1558	19	60	23.9	17.3	5	25.2	4	7	104.8	8
Wichita	11952	10	59	23.9	....	..	24.2	8	3	117.2	3
Westar	12110	17	58	23.5	....	..	....	..	1	101.3	12
Comanche	11673	17	58	23.4	18.9	2	27.5	2	7	114.5	4
Kharkof	1442	19	58	23.2	16.5	9	25.0	6	7	100.0	13
Kanred-Hd.Fed. x Tenmarq	12115	17	58	23.1	....	..	....	..	1	99.6	14
Chiefkan	11754	18	60	22.9	16.9	8	18.8	12	7	102.4	11
Pawnee	11669	17	58	22.8	18.5	4	24.8	7	7	112.1	6
Tenmarq	6936	18	57	22.6	19.6	1	25.9	3	7	118.8	1
Early Blackhull	8856	9	58	22.0	17.0	6	23.1	10	7	103.0	9
Kanred	5146	19	58	21.5	17.0	7	25.1	5	7	103.0	9
Red Chief	12109	18	59	20.9	....	..	22.2	11	3	106.3	7

Standard error of a difference between the mean yields of any two varieties = 1.78 bushels.

Table 1.--(Continued)

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

Variety	C. I. No.	Date			Stem rust	Wt. per bu.	Av. acre yield	Yield		No. years grown	Percent of Kharkof	Rank
		Head ed	Ripe	Ht. In.				Average 1931-44	Average 1943-44			
		May		%	Lbs.	Bu.	Bu.	Bu.				
Pawnee	11669	18	6/26	25	15	60.0	38.6	....	26.0	7	119.3	4
Chiefkan	11754	19	6/28	28	35	62.0	37.8	....	26.8	8	120.3	3
Comanche	11673	19	6/28	25	24	59.0	37.3	....	26.1	7	118.8	5
Westar	12110	18	6/28	26	36	59.5	36.6	....	26.2	3	125.5	1
Kan.-H. Fed. x Tenmarq (33-37-36)	....	17	6/27	25	30	59.5	35.5	....	....	1	115.6	6
Chief. x Martin-Ten. (42-2500)	....	20	6/29	26	34	60.0	35.1	....	....	1	114.3	8
(Quivira x Martin-Ten.) x Hope-Mediterranean (42-2469)	....	18	6/27	24	18	60.0	35.0	....	....	1	114.0	9
Red Chief	12109	19	6/27	25	38	63.0	34.8	....	25.3	3	114.7	7
Kanred	5146	22	6/30	26	26	59.0	34.6	17.5	23.8	10	103.6	14
Blackhull	6251	20	6/29	26	20	60.5	34.5	17.9	25.7	10	105.9	13
Cheyenne x Tenmarq	11972	21	6/29	24	31	60.0	33.9	....	25.7	2	120.7	2
Tenmarq	6936	21	6/29	25	30	58.5	33.5	18.0	24.1	10	106.5	12
Kan.-Hard Federation x Tenmarq	12115	18	6/27	26	26	60.0	33.2	....	22.7	2	106.6	11
Turkey	1558	22	7/2	28	30	59.5	31.9	....	23.6	9	97.7	18
Cheyenne	8885	22	6/30	25	36	59.0	31.6	....	23.2	9	100.6	15
Early Blackhull	8856	13	6/23	25	5	61.5	31.6	....	20.1	9	97.1	19
Wichita	11952	14	6/23	26	6	61.0	30.8	....	21.0	3	107.6	10
Kharkof	1442	22	7/2	28	31	59.0	30.7	16.9	21.3	10	100.0	17
Tenmarq x Oro	12111	20	6/30	26	35	59.5	30.6	21.4	2	100.5	16
Kan.-H. Fed. x Tenmarq (41-2435)	22	6/30	27	34	59.5	29.3	1	95.4	20

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Standard error of a difference between the mean yields of any two varieties = 2.81 bushels.

Table 1.--(Continued)

Lawton, Oklahoma

(Three, 1/75-acre plots; seeded Oct. 4; emerged Oct. 10)

Variety	C. I. No.	Date		Ht. In.	Leaf rust %	Weight per bushel lbs.	Average yield		Yield		No. years grown	Percent of Kharkof	Rank	
		Head- ed	Ripe				per acre 1931-44	per acre 1943-44	Average rank	Average rank				
Wichita	11952	4/25	5/31	39	65	62	40.2	....	..	36.2	1	4	139.9	1
Fawnee	11669	4/28	6/2	34	35	61	39.2	....	..	34.4	4	5	121.5	4
Comanche	11673	4/28	6/2	38	25	62	38.7	....	..	34.0	5	5	129.7	2
Cheyenne x Tenmarq	11972	5/3	6/3	36	40	60	38.5	....	..	36.1	2	2	127.6	3
Early Blackhull	8856	4/23	5/31	35	50	62	37.9	23.2	4	32.8	6	12	101.8	12
Tenmarq	6936	5/2	6/5	36	39	60	36.4	25.2	1	35.5	3	12	110.5	6
Westar	12110	4/30	6/3	37	5	61	36.0	....	..	....	..	1	115.8	5
Clarkan	8858	5/4	6/6	40	25	62	32.9	....	..	30.2	9	7	102.2	10
Kanred	5146	5/4	6/4	36	40	60	32.6	24.3	2	31.9	7	12	106.6	7
Chiefkan	11754	5/3	6/5	39	25	62	32.4	....	..	30.1	10	6	105.1	8
Blackhull	6251	5/3	6/6	39	25	63	31.9	23.0	..	30.0	11	12	100.9	13
Cheyenne	8885	5/5	6/7	36	50	62	31.6	23.8	3	31.9	8	12	104.4	9
Kharkof	1442	5/6	6/7	37	50	60	31.1	22.8	5	28.3	13	12	100.0	14
Red Chief	12109	5/2	6/5	38	40	62.5	30.6	....	..	28.7	12	3	102.2	11

Standard error of a difference between the mean yields of any two varieties = 1.48 bushels.

Table 1.--(Continued)

Woodward, Oklahoma

(Four, 1/51-acre plots; seeded September 27; emerged October 3, 1943)

Variety	C. I. No.	Date			Weight per bushel	Average		Yield			No. years grown	Percent of Kharkof	Rank
		Head- ed	Ripe	Ht. In.		per acre yield	1931-44	1943-44	Average	Rank				Rank
		May	June	In.	Lbs.	Bu.	Bu.	Bu.	Bu.				
Cheyenne	8885	16	12	39	63	58.9	30.3	2	43.7	3	13	106.7	10
Cheyenne x E. Blackhull	11999	12	12	40	60	57.8	....	..	45.4	1	4	130.3	1
Red Chief	12109	11	12	44	62	56.1	....	..	43.8	2	3	114.9	7
Cheyenne x Tenmarq	11972	13	10	39	58	54.2	....	..	43.3	4	2	115.8	6
Kharkof	1442	18	13	40	59	53.2	28.4	3	37.4	13	13	100.0	13
Westar	12110	12	11	42	59	52.3	....	..	....	..	1	98.3	15
Ceres-18h x Kawvale	12121	8	9	38	63	51.5	....	..	39.0	10	2	104.3	11
Blackhull x Hd. Fed.	12120	10	12	39	62	49.8	....	..	38.0	12	2	101.6	12
Tenmarq	6936	12	10	42	59	49.3	30.7	1	40.3	7	13	108.1	9
Cheyenne x E. Blackhull	12000	8	9	40	64	48.7	....	..	41.8	5	4	124.3	3
Pawnee	11669	10	9	40	63	47.8	....	..	40.6	6	7	129.3	2
Chiefkan	11754	13	12	44	59	47.6	....	..	37.2	14	8	111.4	8
Wichita	11952	7	8	44	62	47.0	....	..	39.4	9	3	118.7	5
Comanche	11673	10	10	42	61	46.8	....	..	40.2	8	7	121.0	4
Blackhull	6251	14	12	42	65	46.3	28.2	4	38.9	11	13	99.3	14
Early Blackhull	8856	7	11	44	62	42.5	27.3	5	35.8	15	13	96.1	16

Standard error of a difference between the mean yields of any two varieties = 3.44 bushels.

Table 1.--(Continued)

Stillwater, Oklahoma
(Four plots)

Variety	C. I. No.	Wt. per bu.	Av. yield Bu.	Yield		No. years grown	Percent of Kharkof	Rank
				Average 1931-44	Rank			
		Lbs.	Bu.	Bu.				
Clarkan	8858	60.9	33.4	....	..	6	108.4	3
Pawnee	11669	61.0	32.3	....	..	3	112.4	1
Comanche	11673	60.6	31.9	....	..	3	110.0	2
Reliant	.....	61.9	31.6	....	..	1	103.9	5
Sibley 81	10084	60.6	31.2	29.6	2	10	102.4	6
Early Blackhull	8856	61.6	31.1	26.1	9	11	88.5	18
Early Triumph	12132	60.8	31.0	....	..	1	102.0	7
Kawvale	8180	59.2	30.7	28.9	7	11	98.0	13
Denton	8265	59.2	30.6	30.1	1	10	104.2	4
Kharkof	1442	59.7	30.4	29.5	4	11	100.0	10
Cheyenne	8885	58.9	29.4	29.4	5	10	101.7	8
Chiefkan	11754	61.5	29.3	....	..	5	101.3	9
Cheyenne x Tenmarq	11972	59.5	29.1	....	..	1	95.7	14
Tenmarq	6936	59.3	28.6	29.4	6	11	99.7	12
Red Chief	12109	61.8	28.5	....	..	1	93.8	16
Early Premium	.....	60.2	28.4	....	..	1	93.4	17
Blackhull	6251	60.8	28.2	29.6	3	10	100.0	11
Turkey (Station Strain)	1558	58.7	25.3	27.4	8	10	94.8	15
Turkey (Hague)	.....	58.6	24.5	....	..	1	80.6	19

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

Goodwell, Oklahoma
(Five plots)

Variety	C. I. No.	Weight per bushel	Average yield Bu.	Yield		No. years grown	Percent of Kharkof	Rank
				Average 1931-44	Rank			
		Lbs.	Bu.	Bu.				
Nebred	10094	59.5	38.1	....	..	4	112.9	8
Wichita	11952	61.0	37.4	....	..	1	147.8	1
Red Chief	12109	59.0	33.4	....	..	1	132.0	2
Pawnee	11669	57.5	33.3	....	..	3	119.4	6
Comanche	11673	57.2	32.9	....	..	3	120.9	5
Chiefkan	11754	57.7	32.7	....	..	3	116.2	7
Westar	12110	57.7	31.8	....	..	1	125.7	3
Cheyenne x Tenmarq	11972	56.1	31.6	....	..	1	124.9	4
Blackhull	6251	58.1	31.2	25.1	1	7	100.8	9
Early Blackhull	8856	60.2	29.3	20.5	5	7	82.3	13
Cheyenne	8885	58.3	28.9	24.8	3	6	94.3	11
Kharkof	1442	53.2	25.3	24.9	2	7	100.0	10
Tenmarq	6936	52.5	23.7	22.5	4	7	90.4	12

Standard error of a difference between the mean yields of any two varieties = 4.20 bushels.

Table 1.--(Continued)

Manhattan, Kansas
(Three, 1/50-acre plots)

Variety	C. I. No.	Date		Lodg- ing	Rust ^{1/}			No. culms: per A.	Wt. per bu.	Av. yield: 1931-44	Yield Average: 1942-43	No. years grown	Percent of Kharkof	Rank	
		Head ed	Ripe		Ht. In.	Leaf	Stem								%
		May	June		%	%	%	000	Lbs.	Bu.	Bu.	Bu.			
Pawnee	11669	24	23	35	5	15	15	2260	60.2	37.6	....	35.1	7	156.6	4
Wichita	11952	22	22	34	30	63	5	1610	60.9	35.1	....	30.7	5	141.0	9
Cheyenne x E. Blackhull	12122	24	23	37	40	63	25	1950	61.2	34.9	....	....	1	180.8	1
E. Blackhull x Tenmarq	12124	23	22	33	30	63	5	1900	61.5	34.4	....	....	1	178.2	2
Cheyenne x Tenmarq	12123	25	24	37	20	15	45	2020	60.0	31.4	....	32.4	3	146.0	5
Early Blackhull	8856	21	22	35	48	63	5	1640	61.3	30.8	31.1	26.8	13	108.0	22
Tenmarq x Blackhull	12126	25	25	38	33	45	25	1910	59.6	30.7	....	....	1	159.1	3
Harvest Queen x Kawvale	12284	27	26	43	13	35	40	1940	57.0	30.4	....	31.0	2	131.9	12
Comanche	11673	25	25	37	15	25	25	1610	58.5	30.1	....	29.2	7	137.6	11
Quivira x Tenmarq	12116	25	23	37	13	23	28	1860	59.2	29.9	....	30.5	2	129.8	13
Kawvale	8180	27	25	42	5	23	30	1850	58.2	29.4	34.8	29.5	13	120.8	15
Red Chief	12109	25	25	40	13	65	45	1990	62.1	29.3	....	25.5	4	118.1	16
Blackhull	6251	27	26	40	33	60	23	1830	60.5	28.9	31.4	26.5	13	109.0	21
Cheyenne x Tenmarq	11972	27	26	38	13	20	45	1970	57.4	28.6	....	31.3	5	141.4	8
Nebred	10094	27	25	37	15	70	33	1990	58.4	27.5	....	27.8	9	115.4	17
Tenmarq selection	12125	26	25	40	8	43	43	1880	58.8	27.4	....	....	1	142.0	7
Kaw. Marquette x Ten.	12330	24	23	36	12	65	50	1990	57.6	27.2	....	....	1	140.9	10
Jobred selection	11997	28	27	43	5	40	50	1770	59.2	26.9	....	....	2	142.6	6
Chiefkan	11754	26	26	40	18	43	25	1640	59.9	25.9	....	26.6	7	125.7	14
Clarkan	8858	27	26	45	16	70	63	1620	57.6	25.8	32.5	27.3	13	112.8	20
Tenmarq	6936	27	25	39	15	45	40	1670	55.9	24.7	32.6	27.3	13	113.2	19
Fulcaster	6471	26	25	45	13	80	63	1710	56.1	23.7	31.1	26.6	13	108.0	22
Cheyenne	8885	28	26	39	5	58	60	2030	55.6	23.7	33.1	28.1	13	114.9	18
Kanred	5146	29	26	38	35	35	40	1900	55.1	21.5	29.3	21.2	13	101.7	24
Turkey	1558	29	26	38	70	63	38	1810	53.9	19.8	29.3	21.1	13	101.7	24
Kharkof	1442	30	27	38	20	55	50	1820	55.1	19.3	28.8	23.5	13	100.0	26
Harvest Queen	6199	27	26	45	21	80	58	1690	53.8	17.4	25.9	19.5	13	89.9	27

Standard error of a difference between the mean yields of any two varieties = 1.03 bushels.

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

Table 1.—(Continued)

Hays, Kansas

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

Variety	C. I. No.	Date			Weight: Average		Yield				No. years: grown:	Percent: of Kharkof:	Rank
		Head- ed	Ripe	Ht. In.	per bushel	per acre yield	Average: 1931-44	Rank	Average: 1943-44	Rank			
		May	June	In.	Lbs.	Bu.	Bu.	Bu.	Bu.				
Pawnee	11669	25	24	34	61.9	35.8	....	..	23.8	1	7	153.7	1
Chey. x E. Blackhull	12122	24	23	33	63.0	35.7	....	..	....	..	1	141.1	3
Early Blackhull	8856	21	22	35	64.4	35.6	24.1	1	23.1	4	13	125.5	12
Wichita	11952	23	22	33	64.0	34.9	....	..	23.4	2	4	139.5	4
E. Blackhull x Tenmarq	12124	25	24	34	64.3	34.3	....	..	....	..	1	135.6	6
Blackhull x Cheyenne	12101	27	24	34	61.9	33.9	....	..	....	..	1	134.0	8
Quivira x Tenmarq	12116	26	22	38	61.5	33.8	....	..	....	..	1	133.6	9
Cheyenne x Tenmarq	12123	27	24	34	63.9	32.4	....	..	....	..	1	128.1	11
Red Chief	12109	26	24	38	66.3	32.4	....	..	22.9	5	4	137.9	5
Comanche	11673	26	24	37	60.5	32.2	....	..	22.2	6	8	132.3	10
Chiefkan	11754	26	24	39	63.4	31.7	....	..	23.2	3	9	135.4	7
Tenmarq x Blackhull	12126	26	24	37	61.9	31.2	....	..	....	..	1	123.3	14
Cheyenne x Tenmarq	11972	27	24	35	60.8	30.6	....	..	21.9	7	4	146.8	2
Blackhull x Tenmarq	12102	26	24	37	62.8	30.6	....	..	....	..	1	120.9	15
Tenmarq	6936	27	24	36	59.3	29.9	23.9	2	20.9	8	13	124.5	13
Blackhull	6251	27	24	37	62.4	29.0	22.1	3	19.3	9	13	115.1	16
Cheyenne	8885	29	25	36	60.5	28.4	21.6	4	18.5	10	13	112.5	17
Turkey	1558	29	25	35	58.4	28.2	19.8	5	17.7	11	13	103.1	19
Kharkof	1442	28	25	36	56.8	25.3	19.2	6	15.7	13	13	100.0	20
Kanred	5146	28	25	34	56.9	25.1	....	..	16.1	12	12	104.2	18

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

Table 1.—(Continued)

Colby, Kansas
(Three, 1/50-acre plots)

Variety	C. I. No.	Date : head : ed	Ht. : in.	Weight : per : bushel	Average : acre : yield	Yield		No. : years : grown	Percent : of : Turkey	Rank
						Average : Rank	Average : Rank			
				Lbs.	Bu.	Bu.	Bu.			
Cheyenne x Tenmarq	12123	5/30	31	61	55.9	.....	.....	1	128.2	2
Cheyenne x Tenmarq	11972	6/2	30	61	55.4	.....	53.6	3	131.9	1
Wichita	11952	5/29	30	61	55.4	.....	53.4	4	121.6	5
Early Blkhl x Tenq.	12124	5/29	31	61	54.7	.....	.....	1	125.5	4
Comanche	11673	5/31	30	61	54.3	.....	52.9	5	118.5	7
Pawnee	11669	6/1	28	61	53.9	.....	51.5	4	125.6	3
Tenmarq sel.	12125	6/2	31	60	52.9	.....	.....	1	121.3	6
Quivira x Tenmarq	12116	5/31	30	61	51.4	.....	.....	1	117.9	8
Nebred	10094	6/3	29	60	51.4	.....	49.3	5	109.1	11
Cheyenne	8885	6/5	31	59	46.0	34.6	47.5	8	107.5	13
Early Blackhull	8856	5/28	30	61	45.9	32.6	48.1	6	101.2	15
Tenmarq	6936	6/2	32	58	45.7	34.7	46.8	7	107.8	12
Blackhull	6251	6/1	30	62	44.7	34.4	44.9	8	106.8	14
Chiefkan	11754	6/1	33	62	44.0	.....	45.9	9	114.1	9
Turkey	1558	6/5	30	57	43.6	32.2	44.4	11	100.0	17
Kanred	5146	6/5	31	58	43.0	32.5	44.3	12	100.9	16
Red Chief	12109	6/1	34	64	42.9	.....	43.8	13	111.7	10

Standard error of a difference between the mean yields of any two varieties = 2.69 bushels.

Table 1.--(Continued)

Akron, Colorado

(Four, 1/41-acre plots; 2 on fallow and 2 on corn land;
seeded Sept. 20; emerged, fallow Oct. 1, corn land Oct. 25)

Variety	C. I. No.	Winter:	Date		Rust		Wt.	Av.	Yield		No.	Percent:					
		sur- vival	Head- ed	Ripe	Ht.	Leaf	Stem	per bu.	acre	Average: 1931-44	Rank	Average: 1943-44	Rank	years: grown	of Kharkof	Rank	
		%	June	July	In.	%	%	Lbs.	Bu.	Bu.		Bu.					
Wichita	11952	90	11	16	32	32	41	58.5	17.1	....	..	18.7	4	4	138.2	1
Chiefkan	11754	92	14	18	32	35	18	59.5	16.6	....	..	18.4	6	6	123.1	6
Early Blackhull	8856	91	9	15	31	36	23	58.0	16.3	16.9	1	20.0	1	13	127.1	3	
Red Chief	12109	89	14	18	32	44	16	60.5	15.7	....	..	16.6	12	3	122.3	7
Blackhull	6251	85	14	18	30	45	28	60.0	15.7	16.5	2	20.0	2	13	124.1	5	
Comanche	11673	88	12	17	30	43	28	56.3	15.4	....	..	17.3	10	6	125.0	4
Kan-H. Fed x Minh-Mint	11970	86	14	17	33	43	20	57.5	14.9	....	..	17.8	8	6	129.5	2
Cheyenne x Tenmarq	11972	85	17	19	29	54	24	58.0	14.6	....	..	18.7	5	2	113.3	11
Tenmarq	6936	82	16	19	29	42	23	56.3	14.2	16.0	3	17.8	9	13	120.3	9	
Cheyenne	8885	86	21	21	28	75	38	58.0	13.9	14.6	4	18.2	7	13	109.8	13	
Alton	1438	97	24	21	28	30	15	58.3	13.9	11.2	8	13.4	16	13	84.2	17	
Nebred	10094	83	17	19	28	50	25	57.8	13.8	....	..	19.1	3	8	118.8	10
Kanred	5146	86	21	21	29	50	29	57.5	13.8	14.6	5	16.7	11	13	109.8	12	
Pawnee	11669	79	13	16	29	33	14	56.3	13.7	....	..	14.2	15	6	121.2	8
Kharkof	1442	86	21	21	27	41	24	57.8	13.2	13.3	7	16.5	13	13	100.0	15	
Kharkof	1583	92	22	21	28	35	18	57.5	12.2	13.9	6	16.2	14	13	104.5	14	
Minturki	6155	90	23	21	29	34	18	57.3	10.4	12.2	9	13.1	17	13	91.7	16	

Standard error of a difference between the mean yields of any two varieties = 1.41 bushels.

Table 1.--(Continued)

Fort Collins, Colorado
(Seven plots)

Variety	C. I. No.	Date		Height In.	Rust		Weight per bushel	Average yield Bu.
		Head- ed	Ripe		Leaf	Stem		
		June	July		%	%	Lbs.	
Wichita	11952	16	25	35	100	68	60.0	24.5
Blackhull	6251	21	29	38	100	67	58.4	24.0
Chieftan	11754	20	29	39	94	67	55.3	19.2
Pawnee	11669	17	26	36	81	77	56.3	18.9
Comanche	11673	20	25	37	100	86	52.7	18.6
Nebred	10094	22	28	35	100	71	54.2	18.6
Cheyenne x Tenmarq	11972	22	26	37	97	81	51.7	14.6
Tenmarq	6936	22	26	39	100	86	47.8	13.3
Kanred	5146	24	26	37	93	80	50.0	11.3
Cheyenne	8885	25	26	38	94	91	47.0	10.2

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

Table 1.--(Continued)

Lincoln, Nebraska

(Five, 1/40-acre plots; seeded Sept. 25; emerged Oct. 1)

Variety	G. I. No.	Winter:	Date		No. : culms: per A.:	Ht. :	Leaf : rust :	Wt. : per : bu. :	Av. : acre :	Yield				No. :	Percent: of : Kharkof:	Rank
		sur- vival :	Head- ed :	Ripe						Average:	Average:	years:	of :			
		% :			(00Q):	In. :	% :	Lbs. :	Bu. :	Bu. :	Bu. :	Bu. :				
Pawnee	11669	100	5/29	6/28	2,318	32	16	59.3	29.2	....	41.8	9	132.1	1	
Cheyenne	8885	100	6/1	7/3	1,953	31	39	59.4	26.2	29.5	32.3	14	110.1	8		
Cheyenne x Blackhull	12112	97	5/31	7/4	1,799	32	65	60.5	24.2	....	31.9	3	105.5	10	
Cheyenne x Tenmarq	11972	95	6/1	7/3	1,595	31	29	59.1	24.0	....	35.4	4	113.8	4	
Nebred	10094	96	6/1	7/3	2,427	30	58	59.7	23.4	27.9	30.4	14	104.1	12		
Wichita	11952	96	5/28	6/27	1,406	31	66	59.3	23.0	....	35.4	3	112.4	5	
Tenmarq	6936	95	5/31	7/3	1,749	32	41	58.8	22.8	28.1	31.2	14	104.9	11		
Turkey	12137	100	6/1	7/4	2,069	32	46	58.5	22.6	26.5	30.1	14	98.9	15		
Minturki x Blackhull	11817	93	5/31	7/3	1,650	32	56	58.5	22.3	....	33.7	2	119.1	2	
Blackhull	6251	91	5/31	7/3	1,636	33	42	60.2	21.2	26.5	30.5	14	98.9	16		
Clarkan	8858	99	6/1	7/4	1,598	35	26	59.1	20.9	....	29.8	10	108.2	9	
Kharkof	1442	100	6/2	7/4	1,967	32	47	57.3	20.7	26.8	28.3	14	100.0	14		
Tenmarq x Minturki	11982	93	5/31	7/2	1,524	34	58	58.5	20.6	....	32.5	2	114.8	3	
Comanche	11673	98	5/30	6/30	1,488	31	38	58.5	20.6	....	31.2	7	111.3	6	
Nebraska No. 60	6250	93	6/3	7/5	1,675	33	47	56.6	19.7	25.6	26.0	14	95.5	17		
Chiefkan	11754	94	5/30	7/3	1,517	33	27	59.8	19.6	....	31.7	7	110.9	7	
Red Chief	12109	86	5/30	7/4	1,324	33	68	61.4	18.6	....	30.4	3	101.4	13	

Standard error of a difference between the mean yields of any two varieties = 1.53 bushels.

Table 1.—(Continued)

North Platte, Nebraska

(Four, 1/40-acre plots; seeded Sept. 16)
(Two plots on fallow; two on corn ground)

Variety	C. I. No.	Date			Rust		Weight per bushel	Average yield 1931-44	Yield Bu.	No. years grown	Percent of Kharhof	Rank
		Head ed June	Ripe July	Ht. In.	Leaf %	Stem %						
Wichita	11952	4	10	35	27	29	55.0	33.8	....	2	154.1	5
Minturki x Blackhull	11817	7	11	40	40	17	52.0	31.2	....	1	201.3	1
Cheyenne x Tenmarq	11972	9	12	36	49	41	48.5	27.7	....	1	178.7	2
Chiefkan	11754	6	12	39	62	29	53.5	27.7	....	6	124.3	6
Red Chief	12109	5	11	40	60	32	54.5	27.0	....	2	165.9	4
Tenmarq x Minturki	11982	7	11	38	45	27	49.0	26.7	....	1	172.3	3
Nebred	10094	7	11	36	52	38	51.5	25.7	....	10	111.6	8
Pawnee	11669	6	10	33	43	37	52.0	25.3	....	6	120.5	7
Cemanche	11673	6	11	36	32	38	49.5	23.7	....	6	113.5	9
Turkey (Local)	.....	10	11	38	63	40	45.5	22.8	23.5	2	106.8	11
Tenmarq	6936	8	12	39	37	23	46.0	22.7	22.2	3	100.9	12
Blackhull	6251	10	11	38	53	31	48.5	20.0	22.0	5	100.0	14
Cheyenne	8885	11	12	38	57	43	44.5	17.0	23.8	1	108.2	10
Nebr. No. 60	6250	12	12	39	58	44	44.5	15.7	22.2	3	100.9	12
Kharhof	1442	12	12	38	50	42	47.5	15.5	22.0	5	100.0	15

Standard error of a difference between the mean yields of any two varieties = 2.66 bushels.

Table 1.--(Continued)

Waseca, Minnesota
(Three, 1/40-acre plots)

Variety	Number		Winter:	Date		Rust		Sep-	Wt.	Av.	Yield		No.	% of	Rank	
	Minn.	C. I.	sur- vival	Head- ed	Ripe	Ht. In.	Leaf %	Stem %	toria: l/	per bu.	acre: yield:	Average: 1931-44:	Average: 1943-44:	years: grown:		Min- turki:
			%	June	July				Lbs.	Bu.	Bu.	Bu.				
H44 x Minturki ²	2713	12138	30	22	24	32	T	T	M+	56.5	12.2	....	12.8	3	126.9	1
Minturki	1507	6155	17	23	25	34	43	40	M	50.0	6.0	28.9	8.0	12	100.0	5
H44 x Minturki ²	2714	12139	8	24	24	33	12	T	L+	52.5	5.8	....	7.9	3	110.3	2
Marmin	2614	11502	15	24	24	36	50	40	M	52.5	5.7	28.4	9.7	10	105.6	3
H44 x Minturki ²	2710	.....	10	24	25	31	T	T	M	52.0	4.7	....	5.7	3	104.6	4
Fultz x Minturki	2725	.....	7	23	25	33	T	40	L+	53.0	4.1	....	....	1	68.3	9
Hope x Minturki ²	2719	.....	8	24	26	32	T	T	H	55.5	4.1	....	6.4	2	80.0	8
H44 x Minturki ²	2711	....	13	23	25	34	T	T	H	55.0	3.5	....	5.1	3	97.7	6
Mont. 36-Belog. x Kan.	2715	12108	32	22	18	34	42	90	M+	46.5	3.4	....	4.0	3	86.9	7
Hope x Minturki ¹	II-31-78	.....	20	23	25	31	T	T	M+	56.5	6.2 ^{2/}	....	....	..	.....	..

1/ L = light; M = medium; H = heavy.

2/ Single plot.

Table 1.—(Continued)

Dickinson, North Dakota
(Two, 1/75-acre plots)

Variety	C. I. No.	Winter:	Date		Rust		Av.	Yield		No.	Percent:	Rank	
		sur- vival	Head- ed	Ripe	Ht.	Leaf	Stem	acre:	Average				Rank
		%	June	Aug.	In.	%	%	Bu.	Bu.		of	Rank	
Minturki	6155	59	25	8	35	20	33	15.2	11.8	2	8	118.0	4
Kharkof	1442	52	26	8	35	20	33	15.0	10.0	3	8	100.0	6
Yogo	8033	45	26	8	35	19	28	14.9	12.1	1	8	121.0	3
H. 44 x Minturki ²	12138	69	25	8	34	10	10	14.5	....	..	1	96.7	8
H. 44 x Minturki ²	12139	54	26	8	34	Tr	Tr	14.3	....	..	1	95.3	9
Marmin	11502	46	25	8	34	20	25	12.4	....	..	4	122.6	1
Mont. 36-Belog. x Kanred	12108	62	25	8	33	20	38	11.8	....	..	2	122.3	2
Karmont	6700	62	25	8	34	17	30	11.5	9.7	4	8	97.0	7
Nebred	10094	48	24	8	33	20	28	10.1	....	..	4	116.5	5

Standard error of a difference between the mean yields of any two varieties = 1.46 bushels.

Table 1.--(Continued)

Sheridan, Wyoming

(Three, 1/55-acre plots; seeded Oct. 9, 1943; emerged April 10, 1944)

Variety	C. I. No.	Date			Weight per bushel	Average		Yield		No. years grown	Percent of Kharkof	Rank	
		Head- ed	Ripe	Ht. In.		per acre yield ^{1/}	Average Rank	Average Rank					
					Lbs.	Bu.	Bu.	Bu.					
Karmont	6700	6/30	8/8	42	58	19.6	28.3	4	28.0	6	14	98.3	7
Cheyenne	8885	6/27	8/7	43	59	18.3	....	..	28.9	5	10	108.4	1
Kharkof	1442	6/29	8/7	41	59	18.3	28.8	3	27.8	7	14	100.0	6
Nebred	10094	6/29	8/7	41	59	18.0	....	..	31.0	1	8	102.9	3
Kanred	5146	6/30	8/7	44	58	17.5	29.9	1	27.7	8	14	103.8	2
Yogo	8033	6/30	8/9	43	58	16.2	29.1	2	30.9	2	14	101.0	5
Mont. 36-Belog. x Kanred	12108	6/29	8/7	39	60	15.6	....	..	29.4	4	3	102.1	4
Marmin	11502	6/28	8/7	45	59	13.4	....	..	27.7	9	9	93.6	8
Minturki	6155	7/1	8/8	45	57	12.2	26.7	5	30.0	3	14	92.7	9

^{1/} Hail damage estimated at 90% on July 9.

Standard error of a difference between the mean yields of any two varieties = 2.56 bushels.

Table 1.--(Concluded)

Havre, Montana

(Three, 1/50-acre plots; seeded Sept. 30; emerged April 3)

Variety	C. I. No.	Stand	Date			Wt. per bu.	Av. yield, 1931-34, bu.	Yield		No. years grown	Percent of Kharkof	Rank		
			Head ed	Ripe	Ht. in.			Average, 1913-14, bu.	Average, 1913-14, bu.					
Yogo	8033	82	10	22	32	60.4	23.6	18.3	1	25.6	1	12	113.0	1
Karmont	6700	83	14	24	30	60.3	23.3	16.7	3	20.8	6	12	103.1	4
Relief	10082	79	12	22	32	60.3	22.8	....	..	16.6	9	2	75.1	10
Mont. 36-Belog. x Kanred	12108	82	8	21 ^{1/2}	32	61.0	22.8	....	..	24.8	2	3	107.7	2
Nebred	10094	78	11	22	28	61.2	22.8	....	..	18.1	8	7	86.4	8
Kharkof	1442	78	12	22	30	60.3	22.5	16.2	4	22.1	4	12	100.0	5
Marmin	11502	80	12	23	33	60.2	21.9	....	..	19.6	7	7	83.5	9
Minturki	6155	83	12	22	30	59.4	21.7	16.8	2	22.8	3	12	103.7	3
Wasatch	11925	73	12	24	32	60.5	21.4	....	..	12.7	10	2	57.5	12
H44 x Minturki ²	12139	83	11	23	32	57.3	21.4	....	..	....	..	1	95.1	6
Cache	11559	60	14	25	33	59.8	21.1	....	..	22.1	5	2	69.2	11
H44 x Minturki ²	12138	80	10	22	32	60.7	19.7	....	..	....	..	1	87.6	7

Standard error of a difference between the mean yields of any two varieties = 1.84 bushels.

1/ Began shattering as soon as ripe.

Table 2.--Number of plots, average yield, and standard errors for the variety test at each cooperating station, 1944.

Station	No. of plots	Average yield of varieties	Standard error of a			
			Single plot	Difference between means	Mean in	
					Bu.	Bu.	Bushels	Percent
Texas:						
Denton ^{1/}	8	24.48	3.48	1.74	1.23	5.02
Chillicothe	4	23.18	2.51	1.78	1.26	5.44
Amarillo (Dry) ^{1/}	8	33.84	5.64	2.81	1.99	5.88
Oklahoma:						
Lawton	3	35.00	1.82	1.48	1.05	3.00
Stillwater	4	29.75	3.31	2.35	1.66	5.58
Woodward	4	50.61	4.85	3.44	2.43	4.80
Goodwell ^{1/}	5	31.52	6.64	4.20	2.97	9.42
Kansas:						
Manhattan	3	27.86	1.26	1.03	0.73	2.62
Hays	4	31.53	2.41	1.71	1.21	3.84
Colby	3	49.47	3.29	2.69	1.90	3.84
Colorado:						
Akron	4	14.43	1.99	1.41	1.00	9.77
Ft. Collins ^{1/}	7	17.32	4.59	2.45	1.73	10.00
Nebraska:						
Lincoln	5	22.33	2.42	1.53	1.08	4.84
North Platte	4	24.15	3.75	2.66	1.88	7.78
Minnesota:						
Waseca	3	5.50	....	....	....	....
Wyoming:						
Sheridan	3	16.57	3.13	2.56	1.81	10.92
North Dakota:						
Dickinson	2	13.30	1.45	1.46	1.03	7.74
Montana:						
Havre	3	22.08	2.26	1.84	1.30	5.89

^{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 (1943-44) are also given.

Districts

Summaries of the yield data for the uniform varieties grown in 1944 and the 1943-44 averages where available are presented in tables 3 to 8.

In the Southern District in 1944 yields were reported from 7 stations with 10 varieties being grown uniformly (table 3). The highest yielding variety was Cheyenne x Tenmarq (C. I. 11972), this being the same strain that ranked first in this district in 1943. Wichita and Westar, although not grown in Stillwater, had averages slightly below that of the leading

variety. Pawnee and Comanche ranked fourth and fifth. Red Chief and Chiefkan yielded in the order listed and were higher than either Tenmarq or Blackhull. Kharkof had the lowest average yield. In this district the early varieties had a slight advantage in yield over the later ones.

Table 3.—Summary of average yields of the uniform winter wheat varieties grown in plot tests at 7 stations in the southern district, 1944.

Variety	C. I. No.	Average yield in bushels per acre							
		Denton	Chilli-cothe	Am-rillo	Law-ton	Still-water	Wood-ward	Good-well	Av. 1/
Cheyenne x Tenmarq	11972	24.7	27.7	23.9	38.5	29.1	54.2	31.6	35.1
Wichita	11952	28.1	23.9	30.8	40.2	....	47.0	37.4	34.6
Westar	12110	26.5	23.5	36.6	36.0	....	52.3	31.8	34.5
Pawnee	11669	24.8	22.8	38.6	39.2	32.3	47.8	33.3	34.4
Comanche	11673	25.5	23.4	37.3	38.7	31.9	46.8	32.9	34.1
Red Chief	12109	24.3	20.9	34.8	30.6	28.5	56.1	33.4	33.4
Chiefkan	11754	24.1	22.9	37.8	32.4	29.3	47.6	32.7	32.9
Tenmarq	6936	24.2	22.6	33.5	36.4	28.6	49.3	23.7	31.6
Blackhull	6251	17.4	24.2	34.5	31.9	28.2	46.3	31.2	30.9
Kharkof	1442	16.5	23.2	30.7	31.1	30.4	53.2	25.3	30.0
Cheyenne	8885	....	....	31.6	31.6	29.4	58.9	28.9	....
Kanred	5146	20.2	21.5	34.6	32.6	....	....	....	....

1/ Excluding Stillwater.

The yield data for the 2-year period, 1943-44, are summarized in table 4 with averages being shown for 7 stations or a total of 12 station years. Cheyenne x Tenmarq (C. I. 11972) has had the highest average yield and exceeded Comanche by 1.4 bushels per acre. Pawnee ranked third, followed by Wichita and Tenmarq, and as usual Kharkof had the lowest average yield. Wichita averaged about 2 bushels higher in yield than did Early Blackhull, and Red Chief outyielded Chiefkan by 1.3 bushels per acre.

Table 4.—Summary of average yields of winter wheat varieties grown in plot tests at 7 stations in the southern district for all or part of the period 1943-44.

Variety	C. I. No.	Average yield in bushels per acre							
		Den-ton	Chilli-cothe	Am-rillo	Law-ton	Still-water	Wood-ward	Good-well	Weight-ed av.
No. of yrs. grown		2	2	2	2	1	2	1	
Cheyenne x Tenmarq	11972	29.2	29.5	25.7	36.1	29.1	43.3	31.6	32.4
Comanche	11673	25.9	27.5	26.1	34.0	31.9	40.2	32.9	31.0
Pawnee	11669	24.0	24.8	26.0	34.4	32.3	40.6	33.3	30.4
Wichita	11952	26.8	24.2	21.0	36.2	....	39.4	37.4	30.2
Tenmarq	6936	25.7	25.9	24.1	35.5	28.6	40.3	23.7	29.6
Red Chief	12109	26.1	22.2	25.3	28.7	28.5	43.8	33.4	29.5
Blackhull	6251	23.7	24.1	25.7	30.0	28.2	38.9	31.2	28.7
Chiefkan	11754	25.2	18.8	26.8	30.1	29.3	37.2	32.7	28.2
Early Blackhull	8856	26.5	23.1	20.1	32.8	31.1	36.8	29.3	28.1
Kharkof	1442	22.3	25.0	21.3	28.3	30.4	37.4	24.9	27.0

In the Central District yields were reported from 7 stations and these are presented and summarized in table 5. In this district, Wichita had an average yield of 32.0 bushels per acre compared with 30.6 bushels for Pawnee and 27.9 bushels for Cheyenne x Tenmarq (C. I. 11972). Comanche outyielded Tenmarq by 3 bushels per acre and Red Chief averaged 1.3 bushels higher than Chiefkan. Cheyenne and Kharkof had the lowest average yields. The ability to escape or resist stem rust damage had considerable influence on the final yield of the varieties in this district.

Table 5.--Summary of average yields of the uniform winter wheat varieties grown in plot tests at 7 stations in the central district, 1944.

Variety	C. I. No.	Average yield in bushels per acre at:							
		Man-hattan	Hays	Colby	Akron	Ft. Collins	Lincoln	North Platte	Average
Wichita	11952	35.1	34.9	55.4	17.1	24.5	23.0	33.8	32.0
Pawnee	11669	37.6	35.8	53.9	13.7	18.9	29.2	25.3	30.6
Cheyenne x Tenmarq	11972	28.6	30.6	55.4	14.6	14.6	24.0	27.7	27.9
Comanche	11673	30.1	32.2	54.3	15.4	18.6	20.6	23.7	27.8
Red Chief	12109	29.3	32.4	42.9	15.7	....	18.6	27.0	27.7
Nebred	10094	27.5	....	51.4	13.8	18.6	23.4	25.7	26.7
Chiefkan	11754	25.9	31.7	44.0	16.6	19.2	19.6	27.7	26.4
Blackhull	6251	28.9	29.0	44.7	15.7	24.0	21.2	20.0	26.2
Tenmarq	6936	24.7	29.9	45.7	14.2	13.3	22.8	22.7	24.8
Cheyenne	8885	23.7	28.4	46.0	13.9	10.2	26.2	17.0	23.6
Kharkof	1442	19.3	25.3	43.6 ¹	13.2	11.3	20.7	15.5	21.3

^{1/} Yield of Turkey.

For the 2-year period, data are reported from 9 stations in the Central District with a total of 14 station years' results. These data are presented and summarized in table 6. Three varieties, Wichita, Cheyenne x Tenmarq (C. I. 11972), and Pawnee, are at the top of the list with average yields that are nearly identical. Nebred ranks fourth and Comanche fifth. Red Chief and Chiefkan have averages that are about equal, while Blackhull and Kharkof are at the bottom of the list.

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 1943-44.

Variety	C. I. No.	Average yield in bushels per acre at:										Weighted average
		Man-hattan	Hays	Colby	Akron	Ft. Collins	Lincoln	North Platte	Alli-ance	Valen-tine		
No. of yrs. grown		2	2	2	2	1	2	1	1	1	Bu.	
Wichita	11952	30.7	23.4	53.4	18.7	24.5	35.4	33.8	18.0	25.0	30.3	
Chey. x Tenq.	11972	31.3	21.9	53.6	18.7	14.6	35.4	27.7	27.6	29.3	30.1	
Pawnee	11669	35.1	23.8	51.5	14.2	18.9	41.8	25.3	25.8	16.7	30.0	
Nebred	10094	27.8	....	49.3	19.1	18.6	30.4	25.7	29.1	....	29.7
Comanche	11673	29.2	22.2	52.9	17.3	18.6	31.2	23.7	19.2	21.3	27.7	
Tenmarq	6936	27.3	20.9	46.8	17.8	13.3	31.2	22.7	24.3	25.7	26.7	
Cheyenne	8885	28.1	18.5	47.5	18.2	10.2	32.3	17.0	28.9	28.1	26.7	
Red Chief	12109	25.5	22.9	43.8	16.6	....	30.4	27.0	23.7	16.3	26.6
Chiefkan	11754	26.6	23.2	45.9	18.4	19.2	31.7	27.7	17.8	15.3	26.5	
Blackhull	6251	26.5	19.3	44.9	20.0	24.0	30.5	20.0	19.9	14.1	25.7	
Kharkof	1442	23.5	15.7	44.4 ¹	16.5	....	28.3	15.5	24.3	27.6	24.9

^{1/} Yield of Turkey.

For the Northern District, data are not so complete, but an attempt at a summary of the 1944 yields has been made in table 7. When the four stations reporting are considered, the highest average yield was made by H44 x Minturki² (C. I. 12138); Minturki and H44 x Minturki² (C. I. 12139) ranked second. When the yields from 3 stations (Dickinson, Sheridan, and Havre) are averaged, Kharkof, Yogo, and Karmont give the highest yields.

Table 7.--Summary of average yields of varieties of winter wheat grown in plot tests at 4 stations in the northern district in 1944.

Variety	C. I. No.	Average yield in bushels per acre at:				Average	
		Waseca	Dickinson	Sheridan	Havre	4 stations	3 stations ^{1/}
H44 x Minturki ²	12138	12.2	14.5	...	19.7	15.5 ^{2/}	....
Minturki	6155	6.0	15.2	12.2	21.7	13.8	16.4
H44 x Minturki ²	12139	5.8	14.3	...	21.4	13.8 ^{2/}	....
Mont. 36-Bel. x Kan.	12108	3.4	11.8	15.6	22.8	13.4	15.7
Marmin	11502	5.7	12.4	13.4	21.9	13.4	15.9
Kharkof	1442	...	15.0	18.3	22.5	...	18.6
Yogo	8033	...	14.9	16.2	23.6	...	18.2
Karmont	6700	...	11.5	19.6	23.3	...	18.1
Nebred	10094	...	10.1	18.0	22.8	...	17.0

1/ Excluding Waseca.

2/ Short 1 station.

For the 2-year period in the Northern District the data are summarized in table 8. Results are available from 5 stations with a total of 8 station years. For the area in general, Yogo continues to have the highest average yield followed by Minturki and Mont. 36-Beloglina x Kanred (C. I. 12108). Kharkof and Karmont have the lowest averages, although the differences are not great. When the results from Waseca and Dickinson are averaged, H44 x Minturki² (C. I. 12138) shows an average slightly above those for Marmin and Minturki.

Table 8.--Summary of average yields of winter wheat varieties grown in plot tests at 5 stations in the northern district, for all or a part of the period 1943-44.

Variety	C. I. No.	Average yield in bushels per acre at:					Weighted average	
		Waseca	Dickinson	Sheridan	Bozeman	Havre	1/ 2 stations	2/ 3 stations
No. of years grown		2	1	2	1	2	Bu.	Bu.
Yogo	8033	...	14.9	30.9	54.4	25.6	30.4	....
Minturki	6155	5.0	15.2	30.0	51.6	22.8	28.8	10.4
Mont. 36-Bel. x Kanred	12108	4.0	11.8	29.4	47.6	24.8	23.0	6.6
Nebred	10094	...	10.1	31.0	54.4	18.1	27.1	....
Marmin	11502	9.7	12.4	27.7	45.1	19.6	26.9	10.6
Kharkof	1442	...	15.0	27.8	44.8	22.1	26.6	....
Karmont	6700	...	11.5	23.0	37.1	20.8	24.4	....
H44 x Minturki ²	12138	12.8	14.5	...	...	...	...	13.4
H44 x Minturki ²	12139	7.9	14.3	...	...	...	...	10.0

1/ Excluding Waseca.

2/ Waseca and Dickinson only.

States

In several States there were two or more cooperating stations from which data were received in 1944. 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 1944 data were reported from more than one station in Texas, Oklahoma, Kansas, Colorado, and Nebraska and summaries have been made up for these.

In Texas, 13 varieties were grown at 3 stations and the average yields are shown in table 9. For 1944, Kanred-Hard Federation x Tenmarq (C. I. 12115), Westar, and Cheyenne x Tenmarq (C. I. 11972) had the highest averages. Comanche and Pawnee had identical averages and Wichita yielded higher than Early Blackhull. For the 1943-44 average the following varieties ranked in the order listed: Cheyenne x Tenmarq (C. I. 11972), Westar, Comanche, Tenmarq, and Pawnee. From these data it would seem that both Westar and Comanche will probably yield higher in Texas than Tenmarq, and Wichita is slightly better than Early Blackhull.

Table 9.--Average yield in bushels per acre of winter wheat varieties grown in plot tests in Texas in 1944, and weighted average for 1943-44.

Variety	C. I. No.	Average yield in bushels :		Rank
		1944	1943-44	
		:(3 stations):(6 station yrs.):		
Kan.-H.Fed. x Tenmarq	12115	29.4	24.6	7
Westar	12110	28.9	26.9	2
Cheyenne x Tenmarq	11972	28.8	28.1	1
Comanche	11673	28.7	26.5	3
Pawnee	11669	28.7	24.9	5
Chiefkan	11754	28.3	23.6	11
Wichita	11952	27.6	24.0	10
Tenmarq	6936	26.8	25.2	4
Red Chief	12109	26.7	24.5	8
Early Blackhull	8856	26.4	23.2	12
Kanred	5146	25.4	24.7	6
Blackhull	6251	25.4	24.5	8
Kharkof	1442	23.5	22.9	13

Ten varieties were grown uniformly at 4 stations in Oklahoma and these yields are averaged in table 10. For 1944, Cheyenne x Tenmarq (C. I. 11972), Pawnee, Comanche, Cheyenne, and Red Chief yielded in the order named. For the 2-year period (6 station years) the varieties rank in practically the same order as for the 1944 average.

In Kansas, 16 varieties were grown uniformly at 3 stations (table 11). Pawnee and Wichita gave the highest average yields with Early Blackhull x Tenmarq (C. I. 12124) and Cheyenne x Tenmarq (C. I. 12123) ranking third and fourth, respectively. A new strain, Quivira x Tenmarq (C. I. 12116), ranked just below Comanche. The average of Early Blackhull was less than that for Wichita, and Red Chief outyielded Chiefkan by about 1 bushel. The later varieties such as Cheyenne, Turkey, and Kanred had the lower averages. Stem rust probably influenced yields to a considerable extent in the State. For the 2-year period Pawnee, Wichita, and Cheyenne x Tenmarq (C. I. 11972) have had the best yields.

Table 10.--Average yield in bushels per acre of winter wheat varieties grown in plot tests in Oklahoma in 1944, and weighted average for 1943-44.

Variety	C. I. No.	Average yield in bushels		Rank
		1944 (4 stations)	1943-44 (6 station yrs.)	
Cheyenne x Tenmarq	11972	38.4	36.6	1
Pawnee	11669	38.2	35.9	2
Comanche	11673	37.6	35.5	3
Cheyenne	8885	37.2	34.9	4
Red Chief	12109	37.2	34.5	5
Chiefkan	11754	35.5	32.8	9
Early Blackhull	8856	35.2	32.9	7
Kharkof	1442	35.0	31.2	10
Tenmarq	6936	34.5	34.0	6
Blackhull	6251	34.4	32.9	8

Table 11.--Average yield in bushels per acre of winter wheat varieties grown in plot tests in Kansas in 1944, and weighted averages for 1943-44.

Variety	C. I. No.	Average yield in bushels		Rank
		1944 (3 stations)	1943-44 (6 station yrs.)	
Pawnee	11669	42.4	36.8	1
Wichita	11952	41.8	35.8	2
E. Blackhull x Tenmarq	12124	41.1	....	3
Cheyenne x Tenmarq	12123	39.9	....	4
Comanche	11673	38.8	34.7	5
Quivira x Tenmarq	12116	38.3	....	6
Cheyenne x Tenmarq	11972	38.2	35.6	7
Early Blackhull	8856	37.4	32.6	8
Red Chief	12109	34.8	30.7	9
Blackhull	6251	34.2	30.2	10
Chiefkan	11754	33.8	31.9	6
Tenmarq	6936	33.4	31.6	7
Cheyenne	8885	32.7	31.3	8
Turkey	1558	30.5	27.7	12
Kanred	5146	29.8	27.2	13
Kharkof	1442	29.4	27.8	11

Yields were reported for 10 varieties grown at 2 stations in Colorado for 1944 (table 12). Wichita ranked first followed by Blackhull, Chiefkan, Comanche, and Pawnee with Kanred and Cheyenne having the lowest average yields. No 2-year average yields are available for this State.

Data were reported from 2 stations in Nebraska where 15 varieties were grown uniformly (table 13). The highest average yields were produced by Wichita, Pawnee, Minturki x Blackhull (C. I. 11817), and Cheyenne x Tenmarq (C. I. 11972). Tenmarq had an average slightly above that of Comanche and Nebred averaged considerably more than did Cheyenne. Nebraska No. 60 was again at the bottom of the list. For the average of the last 2 years, Pawnee ranks first followed by Cheyenne x Tenmarq (C. I. 11972), Wichita, Nebred, and Red Chief.

Table 12.--Average yield in bushels per acre of varieties of winter wheat grown in plot tests in Colorado in 1944.

Variety	C. I. No.	Av. yield (2 stations)	Bu.
Wichita	11952	20.8	
Blackhull	6251	19.9	
Chiefkan	11754	17.9	
Comanche	11673	17.0	
Pawnee	11669	16.3	
Nebred	10094	16.2	
Cheyenne x Tenmarq	11972	14.6	
Tenmarq	6936	13.8	
Kanred	5146	12.6	
Cheyenne	8885	12.1	

Table 13.--Average yield in bushels per acre of winter wheat varieties grown in plot tests in Nebraska in 1944 and weighted average for 1943-44.

Variety	C. I. No.	Average yield in bushels		Rank
		1944 (2 stations)	1943-44 (4 station yrs.)	
Wichita	11952	28.4	30.7	3
Pawnee	11669	27.3	33.7	1
Minturki x Blackhull	11817	26.8	....	..
Cheyenne x Tenmarq	11972	25.9	31.5	2
Nebred	10094	24.6	28.9	4
Chiefkan	11754	23.7	27.2	8
Tenmarq x Minturki	11982	23.7	....	..
Red Chief	12109	22.8	27.9	5
Tenmarq	6936	22.8	27.4	7
Turkey No. 1	12137	22.7	....	..
Comanche	11673	22.2	26.3	9
Cheyenne	8885	21.6	27.6	6
Blackhull	6251	20.6	25.2	10
Kharkof	1442	18.1	24.1	11
Nebraska No. 60	6250	17.7	23.0	12

SUMMARY OF AGRONOMIC DATA

The agronomic (other than yield) and disease data have been summarized for each district for 1944 in tables 14 to 16. 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.

Eleven varieties were grown uniformly at the southern stations and the data are averaged in table 14. For date of heading Early Blackhull was the earliest with Wichita averaging just 2 days later, while Pawnee was 4 days later than Wichita, and 1 day earlier than Comanche. Cheyenne x Tenmarq (C. I. 11972) headed 1 day later than Tenmarq and at the same time as Blackhull. The dates of ripening show about the same order of maturity except the range is slightly narrower. Early Blackhull and Wichita ripened on the same

day with Pawnee and Comanche being 2 and 3 days later, respectively. No great differences in average height were apparent except that Pawnee was the shortest and Chiefkan the tallest of the varieties in the test. For leaf rust infection, Westar was decidedly the most resistant having an average infection of only 4 percent compared to 30 percent for Pawnee and 35 percent for Comanche and Tenmarq. The highest infections were reported for Kharkof and Wichita. Stem rust readings were reported from 2 stations, and at these Early Blackhull and Wichita had the lowest readings since apparently they escaped infection. Pawnee, Comanche, and Blackhull showed considerable resistance. Test weights per bushel were averaged from 7 stations with Red Chief, Wichita, Early Blackhull, and Blackhull having the highest averages. Comanche averaged considerably heavier than Tenmarq and Pawnee was only slightly lighter in weight than Chiefkan. The lowest test weights were recorded for Kharkof and Tenmarq.

Table 14.--Summary of agronomic data other than yield for winter wheat varieties grown at cooperating stations in the southern district, 1944.

Variety	C. I. No.	Date		Average		Rust Leaf %	Weight per bushel
		Head ed	Ripe	Height In.	Stem %		
Number of stations		5	4	4	2	2	7
Kharkof	1442	5/14	6/14	36	60	16	57.6
Blackhull	6251	5/12	6/12	37	40	10	60.6
Tenmarq	6936	5/11	6/12	36	35	16	57.7
Early Blackhull	8856	5/2	6/7	35	57	3	60.8
Comanche	11673	5/9	6/10	36	35	12	59.3
Pawnee	11669	5/8	6/9	34	30	8	60.0
Chiefkan	11754	5/11	6/12	39	40	18	60.2
Wichita	11952	5/4	6/7	37	58	3	60.8 ^{1/}
Cheyenne x Tenmarq	11972	5/12	6/12	35	52	17	58.8
Red Chief	12109	5/10	6/11	37	53	19	61.0
Westar	12110	5/10	6/11	36	4	19	59.0 ^{1/}

^{1/} Six stations.

Table 15.--Summary of agronomic data other than yield for winter wheat varieties grown at cooperating stations in the central district, 1944.

Variety	C. I. No.	Winter survival %	Date		Average		Rust Leaf %	Weight per bushel
			Head ed	Ripe	Height In.	Stem %		
Number of stations		2	6	5	6	4	3	6
Kharkof	1442	93	...	...	33	..	..	55.3
Blackhull	6251	88	6/7	7/11	34	60	31	58.6
Tenmarq	6936	89	6/7	7/11	35	55	23	54.4
Cheyenne	8885	93	6/10	7/11	34	66	43	54.7
Nebred	10094	90	6/10	7/15	32	65	38	56.6
Pawnee	11669	90	6/5	7/9	32	43	37	57.8
Comanche	11673	93	6/5	7/9	34	53	38	56.4
Chiefkan	11754	93	6/6	7/11	36	55	29	58.9
Wichita	11952	93	6/3	7/8	33	56	29	59.6
Cheyenne x Tenmarq	11972	90	6/8	7/11	33	57	41	56.5
Red Chief	12109	88	...	....	35	..	..	61.3

In the Central District, data were assembled for 11 varieties and these are shown in table 15. Winter survivals were reported from 2 stations with Red Chief, Blackhull, and Tenmarq having the lowest average survivals although the differences were not very great. Date of heading figures again show Wichita to be 2 days earlier than Comanche and Pawnee and 3 days earlier than Chiefkan. For date of ripening, Wichita was the earliest, but only 1 day ahead of Comanche and Pawnee and 3 days ahead of Chiefkan. Average heights varied in a rather narrow range with Nebred and Pawnee being the shortest and Chiefkan the tallest. Leaf rust data from 4 stations showed no variety to be particularly outstanding for resistance, although Pawnee had the lowest average infection. Stem rust infections were reported from 3 stations with Tenmarq, Chiefkan, and Wichita having the lowest averages. Test weights per bushel were averaged from 6 stations with Red Chief being very outstanding with an average of 61.3 pounds per bushel. Other varieties with high test weights were: Wichita, 59.6; Chiefkan, 58.9; and Blackhull, 58.6. The test weights of the other varieties were rather low due to the effects of stem rust at a number of the stations.

Very little agronomic data are available for the Northern District, but average dates of heading, ripening, and height are recorded for 9 varieties in table 16.

Table 16.--Summary of agronomic data other than yield for winter wheat varieties grown at co-operating stations in the northern district, 1944.

Variety	C. I. No.	Date		Height In.
		Headed	Ripe	
Number of stations		2	2	2
Kharkof	1442	6/19	7/31	33
Minturki	6155	6/19	7/31	33
Karmont	6700	6/20	8/1	32
Yogo	8033	6/18	7/31	34
Nebred	10094	6/18	7/31	31
Marmint	11502	6/19	7/31	34
Mont. 36-Bellog. x Kanred	12108	6/17	7/30	33
H44 x Minturki ²	12138	6/18	7/31	33
H44 x Minturki ²	12139	6/19	7/31	33

SUMMARY OF PLOT DATA

Southern District:

The winter wheat was very good with little insect or disease damage. Leaf rust was present, but not in excessive amounts and stem rust developed too late to cause damage.

Cheyenne x Tenmarq (C. I. 11972) again ranked first for yield with Wichita second, Westar third, and Pawnee fourth.

Cheyenne x Tenmarq (C. I. 11972), Comanche, and Pawnee have had the highest average yields for the last 2 years.

In Texas, Austin, a soft winter wheat, is being increased for the eastern third of the State. This variety carries considerable resistance to both leaf and stem rust.

Wichita is being increased in Texas, Oklahoma, and Kansas and from the interest shown by farmers, will be a popular early variety.

Central District:

Conditions were spotted with good yields being reported at some stations and poor ones at others. Slow fall growth and a cool spring retarded development, and, as a result, stem rust came in and did considerable damage at a number of the stations.

Stem rust was very heavy at North Platte, Akron, and Fort Collins with very few varieties showing marked resistance.

No serious insect damage was reported in 1944, although Hessian fly were present at some places in the District.

Wichita, Pawnee, and Cheyenne x Tenmarq (C. I. 11972) had the highest average yields in the Central District in 1944.

For the last 2 years, Wichita, Cheyenne x Tenmarq (C. I. 11972), Pawnee, and Nebred have been the highest yielding varieties. Comanche has yielded slightly more than Tenmarq, and Red Chief is about equal to Chiefkan.

The stem rust epidemic in northern Kansas, Nebraska, and eastern Colorado emphasized the need of more work to develop varieties with greater resistance.

Northern District:

Some wheat did not come up until spring, but where it did winterkilling was very severe.

Yogo and Minturki continue to give good yields. Two selections from the crosses Hull x Minturki² showed considerable resistance to rust and a fair yield at some of the stations.

UNIFORM YIELD NURSERY

In the fall of 1943 the uniform yield nursery was seeded at the same 14 stations in the Central and Southern districts as in the previous fall. The nursery included 25 varieties and strains, since this seemed to be all of the available material worthy of regional testing. At each station the nursery was seeded in three- or four-row plots, with from 3 to 5 replications. The varieties making up the 1944 nursery, together with State and C. I. numbers are shown in table 17.

A comparison of the 1944 list with that for 1943 will show a number of changes in the nursery. With the increase and distribution of Comanche, Pawnee, Wichita, and Westar it was possible to discard much material similar to these varieties and thus make room for newer selections. As a result 13 wheats which seemed to be lacking in agronomic, pathologic, or quality characteristics, and which were not needed for ecological studies, were replaced by newer selections. The following 3 new strains were added:

<u>Name</u>	<u>C. I. No.</u>	<u>Remarks</u>
Blackhull x Hd. Federation	12120	Short, stiff straw, good yield at Woodward.
Ceres-38h x Kawvale	12121	Leaf rust resistant and high yield at Wwd.
Cheyenne x Early Blackhull	12122	} Outstanding yield records at Hays.
Tenmarq x Blackhull	12126	
Cheyenne x Tenmarq	12123	Good yield record at Manhattan.
Early Blackhull x Tenmarq	12124	Similar and possibly superior to Wichita.
Tenmarq selection	12125	Possibly superior to Tenmarq in yield.
Tenmarq x Minturki	11982	Some resistance to leaf rust, high yield at Lincoln.

As soon as a strain is shown to be lacking in some important character, it is omitted from the nursery, although it may be continued at individual stations. The strains having the best performance in the nursery are advanced to plot trials. At present there may be too much duplication between plots and nursery, but an attempt is made to keep this at a minimum.

Table 17.--Varieties of hard red winter wheat grown in the uniform yield nursery, 1944.

<u>Variety</u>	<u>State or Hybrid No.</u>	<u>C. I. No.</u>
Kharkof		1442
Blackhull		6251
Early Blackhull		8856
Comanche	Kans. No. 2729	11673
Pawnee	Nebr. No. 1086	11669
Wichita	Kans. No. 2739	11952
Cheyenne x Tenmarq	Kans. No. 2748	11972
Cheyenne x Early Blackhull	Woodward No. 1127	12000
Blackhull x Cheyenne	Hays Cereal No. 40-102	12101
Blackhull x Tenmarq	Hays Cereal No. 40-115	12102
Tenmarq x Oro	Denton sel. No. 70-38-144	12111
Westar	Amarillo sel. No. 25-34-116	12110
Kanred-Hd. Fed. x Tenmarq	Amarillo sel. No. 33-37-90	12115
Quivira x Tenmarq	Kans. No. 2762	12116
Kanred-Hd. Fed. x Minh.-Mint.	Akron No. 186	12117
Kanred-Hd. Fed. x Minh.-Mint.	Akron No. 192	12118
Cheyenne x Early Blackhull	Hays Cereal No. 40-91	12114

New Strains

Blackhull x Hard Federation	Woodward No. 36h769-150	12120
Ceres-38h x Kawvale	Woodward No. 35h1151-19	12121
Cheyenne x Early Blackhull	Hays Cereal No. 40-95	12122
Cheyenne x Tenmarq	Kans. No. 2758	12123
Early Blackhull x Tenmarq	Kans. No. 2769	12124
Tenmarq selection	Kans. No. 2770	12125
Tenmarq x Minturki	Nebr. sel. 23762	11982
Tenmarq x Blackhull	Hays Cereal No. 40-118	12126

DATA OBTAINED

The data from 12 nurseries are presented in table 15. The Alliance nursery was ruined by hail and no report had been received from Stillwater at the time this summary was completed. For each station the varieties are listed in order of the 1944 yields, and only C. I. numbers are given for identification. Average yields and ranges for the 2-year period 1943-44 are shown where possible, and the average yields for the varieties for the period grown are expressed as percentages of Kharkof check for the same period. Data other than yield are included when the characters concerned seemed to be related to yield or when the data showed differences believed to be of interest.

The nursery at Denton behaved in about the same manner as did the varieties in plots. Heading occurred from April 16 to May 6, and ripening from May 23 to June 15. Leaf rust was heavy on all varieties except Westar (C. I. 12110) with C. I. 12121 and C. I. 11669 (Pawnee) having the next lowest readings. Most of the test weights were less than 60 pounds per bushel. The highest yielding varieties were C. I. numbers 11673 (Comanche), 12122, 12115, and 11669 (Pawnee). For the last 2 years C. I. numbers 12115, 12110 (Westar), and 11972 have made the highest average yields. For the years grown the best yield records have been made by C. I. numbers 11673 (Comanche), 11952 (Wichita), 11972, and 11669 (Pawnee).

At Chillicothe heading occurred from May 5 to 19. Test weights were nearly all above 60 pounds per bushel and the yields ranged from 27.9 to 14.7 bushels per acre. C. I. numbers 12101, 11972, 12110 (Westar), and 12111 gave the highest yields, while Early Blackhull (C. I. 3856) and Pawnee (C. I. 11669) gave the lowest. Wichita (C. I. 11952) had a yield nearly twice that of Early Blackhull. In general, the 2-year averages follow the order of the 1944 yields rather closely. For those varieties grown more than 2 years, C. I. numbers 11972, 11673 (Comanche), 12101, and 11669 (Pawnee) have had the highest percentages of Kharkof.

Stem rust was present at Amarillo in sufficient quantities to allow good varietal differentiation. The lowest readings were recorded for C. I. numbers 12114, 11952 (Wichita), 12122, 3856 (Early Blackhull), 12000, and 12124. No doubt the earliness of some of these varieties allowed them to escape heavy infection. Yields were generally high with all but two varieties having averages of 30 or more bushels per acre. The highest yields were recorded for C. I. numbers 11972, 12101, 12114, and 5251 (Blackhull). The 2-year average yields tend to rank the varieties in much the same order as for 1944. The three highest yielding varieties for 1943-44 also rank high in percentage of Kharkof for the years grown. At this station C. I. 11669 (Pawnee) has a better record than C. I. 11673 (Comanche), while C. I. 12110 (Westar) has outyielded both varieties.

The crop at Woodward was very high with nine of the varieties yielding above 40 bushels per acre. No disease or insect damage was reported. C. I. numbers 12101, 11972, 12102, and 11669 (Pawnee) had the highest yields for 1944 and they have had good yield records for all of the years grown, as expressed in percentage of Kharkof. In this nursery Wichita (C. I. 11952) seems to be decidedly superior to Early Blackhull (C. I. 3856), and C. I. 12110 (Westar) ranks among the better strains, although grown for only 3 years.

At Manhattan lodging was noted with such strains as C. I. numbers 12120, 11952 (Wichita), 12124, and 12110 (Westar) having the lowest averages and therefore being the strongest straws. Leaf rust was heavy with C. I. 12110 (Westar) showing marked resistance and C. I. 12115 and Comanche (C. I. 11673) having low averages. Considerable stem rust developed, with a number of the strains showing some resistance or enough earliness to escape injury. Loose smut was present with the highest readings being recorded for C. I. 1442 (Kharkof) and C. I. 6251 (Blackhull). Test weights probably were lowered in some cases by stem rust infection. C. I. numbers 11972, 12122, 12124, and 12120 had the highest average yields. For the 2-year and 5-year periods, C. I. 11952 (Wichita) ranks first for yield. Although grown for only 3 years, Westar (C. I. 12110) has made a very satisfactory yield record at this station.

Heading occurred at Hays during a 9-day period from May 20 to 28, while ripening took place from June 20 to 24. Straw was rather tall and small amounts of shattering were reported for most varieties. Quality of grain as measured by test weight, was good and yields ranged from 39.6 to 23.7 bushels per acre. The highest yields were recorded for C. I. numbers 12122, 12101, 11982, and 12120. Most of the strains giving the highest yields have been grown for only 1 or 2 years at Hays. Of these strains grown for 3 or more years C. I. 11952 (Wichita), C. I. 12114, C. I. 12110 (Westar), and C. I. 12000 have the highest percentage of Kharkof.

At Akron yields and test weights were rather low, due in part to stem rust infection. The spread in yield was rather narrow being from 15.6 to 23.3 bushels per acre. The highest yielding varieties were C. I. numbers 8856 (Early Blackhull), 12115, and 12114. The 1944 yields and the 1943-44 averages do not agree too well indicating some differential behavior between the 2 years. For the period grown, C. I. 11952 (Wichita) has a slight advantage in yield over C. I. 8856 (Early Blackhull) and Pawnee (C. I. 11669) has been slightly above Comanche (C. I. 11673), as indicated by the percentage of Kharkof.

The wheat crop was later than usual at Fort Collins and as a result a very heavy epidemic of leaf rust was recorded and stem rust all but ruined the crop. The lowest leaf rust reading was 72 percent for Westar (C. I. 12110), while at other stations this variety showed considerable resistance. All varieties had very heavy stem rust infections, although some of the earlier types did not suffer such serious damage as did the later ones. Test weights ranged from 60.8 to 49.0 pounds per bushel, and yields from 25.3 to 5.9 bushels per acre. Considering that the yield range at this station is usually from 40 to 60 or more bushels per acre, the real effect of the rust can be appreciated. The highest yields were made by C. I. 8856 (Early Blackhull) followed by C. I. numbers 12120, 12122, and 6251 (Blackhull). For the average of the last 2 years Comanche (C. I. 11673) and Blackhull (C. I. 6251) rank first and second. Due to the very low yield of the Kharkof check in 1944 the yields expressed as a percentage of that variety are very large in a few cases.

A normal crop was harvested at Hesperus, with high test weights per bushel and good yields. No disease damage was reported from this station. C. I. No. 12000 gave a yield of 60.4 bushels per acre while C. I. 11982 yielded 58.0, and C. I. 11972, 57.6 bushels per acre. These varieties are among the medium to late types in the nursery. C. I. numbers 12000, 12114, 11972, and 6251 (Blackhull) have had the highest averages for 1943-44. Of the wheats grown for 3 years or more, C. I. numbers 12114, 11972, and 12000 seem to have the better yield records.

At Ames there was considerable winter injury which seemed to be rather closely correlated with final yield. Grain quality was poor and yields were low with only six varieties averaging higher than 20 bushels per acre. C. I. 12122 had the highest average, followed by C. I. numbers 11942 (Kharkof), 11669 (Pawnee), and 12126. Considering the percentages of Kharkof for those varieties grown for 3 or more years, it will be seen that Pawnee (C. I. 11669), C. I. 12114, and Wichita (C. I. 11952) have exceeded the check. At this station the Kharkof check is among the higher yielding varieties, and most of the newer wheats fail to equal it.

Winterkilling was noted at Lincoln although it was not heavy except in the case of C. I. numbers 12115, 12118, and 12117. Maturity was later than normal and this gave both leaf and stem rust a good chance to develop. To leaf rust C. I. 12110 (Westar) showed the most resistance, with C. I. 12115 and C. I. 11669 (Pawnee) having the next lowest average infections. Stem rust was rather heavy with C. I. numbers 12122, 8856 (Early Blackhull), and 12124 having the lowest readings, indicating either resistance or ability to escape. Most of the varieties had test weights lower than 60 pounds per bushel. One variety, C. I. 12122, yielded 34.5 bushels per acre while all others yielded below 30 bushels. Other varieties yielding high were C. I. numbers 12126, 11669 (Pawnee), and 12120. For the 2-year period 1943-44, Pawnee (C. I. 11669) has had the highest average yield followed by C. I. numbers 12101, 12102, and 12000. For the period of years that it has been included in the nursery, Pawnee (C. I. 11669) ranks first for yield as expressed in percentage of the check, C. I. 12102 second, and C. I. 12101 third.

The crop was later than usual at North Platte, and some emergence did not occur until late winter or early spring. Good growth was produced by all varieties, and both leaf and stem rust were present in rather heavy amounts which reduced grain quality and yields. The early varieties showed a definite advantage and gave the highest test weights and yields. C. I. numbers 12122, 11952 (Wichita), 12000, and 8856 (Early Blackhull) ranked at the top of the list while C. I. numbers 11982 and 12117 were at the bottom. No 2-year averages are shown because the 1943 crop was ruined by hail, and only seven of the varieties have been grown for more than 1 year. Of these C. I. numbers 11972, 11669 (Pawnee), 11673 (Comanche), and 11952 (Wichita) have had the highest percentages of Kharkof.

Table ---Yield and other agronomic data for the uniform winter wheat varieties grown in replicated nursery plots in cooperative experiments at 12 stations in the hard red winter wheat area in 1944, and average yields for 1943-44.

Denton, Texas

(Four plots)

C. I. No.	Date		Ht. in.	Leaf rust %	Sep- toria	Weight per bushel Lbs.	Average acre yield Bu.	Yield Average 1943-44 Bu.	No. Rank	Percent of Kharkof	Rank	
	Head- ed	Ripe										
11673	4/28	5/31	39	37	MS	58.5	31.2	28.3	4	7	184.4	5
12122	4/23	5/27	37	53	S	60.0	30.9	...	..	1	219.1	1
12115	4/26	5/25	41	40	S	59.0	30.2	29.6	1	2	159.6	13
11669	4/29	5/30	37	23	MS	59.5	28.8	27.2	6	8	164.0	12
12123	4/29	6/1	37	55	VS	59.0	28.5	...	..	1	202.1	2
11952	4/21	5/26	37	50	VS	60.0	27.5	27.7	5	5	175.0	8
12120	4/27	5/30	38	42	S	61.0	27.1	...	..	1	192.2	3
12110	4/30	6/2	40	5	S	59.0	27.0	29.0	2	2	158.5	14
8856	4/19	5/25	37	60	VS	60.5	26.9	25.3	9	11	155.1	15
12121	4/18	5/23	34	20	VS	59.0	26.2	...	..	1	185.8	4
11982	4/29	6/1	44	65	VS	58.0	25.5	...	..	1	180.9	6
12000	4/21	5/26	39	52	VS	60.0	25.2	23.4	13	3	146.5	17
12125	4/29	6/5	46	53	S	57.0	25.0	...	..	1	177.3	7
12116	4/28	5/31	40	43	S	59.0	24.9	24.2	11	2	132.2	20
12111	5/1	6/3	41	40	S	58.0	24.7	27.0	7	2	147.5	16
12101	5/2	6/2	40	63	VS	59.0	24.4	25.0	10	3	144.4	18
12118	4/30	5/31	40	65	VS	57.0	24.4	23.5	12	2	128.4	21
12124	4/21	5/26	34	48	VS	60.0	24.2	...	..	1	171.6	9
12114	5/3	6/3	39	63	VS	58.5	24.0	25.7	8	2	140.4	19
11972	5/3	6/2	38	60	VS	58.5	23.8	28.8	3	4	169.2	10
12126	4/30	6/1	40	60	VS	58.0	23.8	...	..	1	168.8	11
12102	5/2	6/3	40	63	VS	60.0	22.4	20.7	15	3	122.9	22
6251	5/3	6/2	41	62	S	58.0	21.2	21.2	14	11	121.4	23
1442	5/6	6/5	41	67	VS	56.0	14.1	18.3	16	11	100.0	24
12117	5/1	6/1	38	73	VS	54.0	13.1	15.8	17	2	86.3	25

1/ Degree of susceptibility.

Standard error of a difference between the mean yield of any two varieties = 2.29 bushels.

Table ---(Continued)

Chillicothe, Texas

(Four plots)

C. I. No.	Date headed	Weight per bushel	Average		Yield Average 1943-44 Bu.	No. years grown	Percent of Rank	Rank
			acre	yield				
		May	Abs.	Bu.	Bu.			
12101	14	61.0	27.9	27.0	5	3	126.0	5
11972	14	61.0	26.3	28.9	2	4	148.8	1
12110	14	62.0	25.9	27.9	3	2	126.2	4
12111	13	62.0	25.9	29.2	1	2	132.1	3
12000	10	62.0	25.9	25.0	6	3	119.8	10
11952	8	62.0	25.8	23.6	11	5	115.6	14
12124	8	62.0	25.4	....	..	1	122.7	6
12120	9	63.0	25.2	....	..	1	121.7	9
6251	14	60.0	24.3	24.2	10	6	119.3	11
12115	10	62.0	24.3	27.1	4	2	122.6	7
12122	11	61.0	24.3	....	..	1	117.4	13
12121	10	61.0	23.6	....	..	1	114.0	16
12125	14	60.0	23.4	....	..	1	113.0	17
12123	11	62.0	23.4	....	..	1	113.0	18
12126	11	60.0	22.9	....	..	1	110.6	20
12114	14	62.0	22.9	24.8	8	2	112.2	19
11673	11	60.0	21.3	25.0	7	6	138.0	2
12118	14	60.0	21.1	23.1	12	2	104.5	22
12102	12	61.0	20.9	22.7	13	3	118.1	12
1142	19	61.0	20.7	22.1	14	6	100.0	23
12116	14	60.0	20.2	24.4	9	2	110.4	21
11982	13	58.0	20.2	....	..	1	97.6	24
12117	18	60.0	18.1	20.1	15	2	92.0	25
8856	8	61.0	15.9	19.3	17	6	114.8	15
11669	12	57.0	14.7	19.5	16	6	122.2	8

Standard error of a difference between the mean yield of any two varieties = 2.59 bushels.

Table ---(Continued)

Amarillo, Texas

Dryland

(Four plots)

C. I. No.	Date		Height In.	Stem rust %	Weight per bushel Lbs.	Average per acre Bu.	Yield Average 1943-44 Bu.	Rank	No. years grown	Percent of Kharkof	Rank
	Head- ed	Ripe									
11972	5/21	6/30	24	28	59.5	39.8	27.6	3	5	131.5	2
12101	5/22	7/2	22	33	59.5	38.9	28.3	2	4	131.3	3
12114	5/20	6/24	23	5	60.0	38.9	28.9	1	3	136.5	1
6251	5/20	7/1	24	20	59.5	37.7	26.1	6	8	118.4	14
12116	5/21	6/30	24	23	61.0	37.0	25.7	7	2	122.4	9
12126	5/15	6/29	24	23	60.5	36.8	....	..	1	122.7	7
12110	5/19	6/28	24	33	59.0	36.7	27.2	4	3	130.7	4
11669	5/18	6/27	24	15	60.0	36.2	24.7	10	8	126.6	6
11952	5/14	6/22	24	5	60.5	36.0	26.2	5	6	127.4	5
12121	5/16	6/22	25	23	58.5	35.8	....	..	1	119.3	12
12120	5/19	7/1	24	20	62.0	35.6	....	..	1	118.7	13
12122	5/15	6/22	22	5	60.0	34.6	....	..	1	115.3	16
12111	5/21	6/30	25	30	60.0	34.0	25.1	8	3	121.4	10
12102	5/22	7/3	24	20	60.0	33.9	23.3	12	4	122.7	8
12123	5/22	7/2	25	30	60.0	33.9	....	..	1	113.0	17
12125	5/21	6/30	26	30	59.0	33.7	....	..	1	112.3	18
8856	5/13	6/22	24	5	61.0	33.6	23.3	13	8	105.7	20
12000	5/14	6/22	23	5	59.0	33.1	24.7	9	4	119.7	11
11673	5/19	6/27	25	18	59.0	32.6	23.8	11	8	117.7	15
12118	5/21	7/1	25	37	58.0	31.2	21.5	15	2	102.4	22
12124	5/14	6/22	23	8	59.5	31.1	....	..	1	103.7	21
12117	5/23	7/2	23	37	57.0	30.7	21.2	16	2	101.0	23
1442	5/22	7/3	23	33	59.5	30.0	21.0	17	8	100.0	24
12115	5/15	6/25	23	23	59.0	29.9	22.6	14	2	107.6	19
11982	5/23	7/4	23	43	57.0	23.9	....	..	1	79.7	25

Standard error of a difference between the mean yield of any two varieties = 3.03 bushels.

Table ---(Continued)

Woodward, Oklahoma

(Four plots; seeded October 4; emerged October 10)

C. I. No.	Date		Height: In.	Weight: Lbs.	Average: Bu.	Yield: Bu.	No. of plants	Percent of plants	Rank	
	Head	Ripe								
12101	14	12	44	62	53.0	40.7	1	4	136.7	1
11972	14	11	44	62	49.3	37.3	2	5	134.3	2
12102	13	12	46	64	46.3	36.0	5	4	125.4	5
11669	11	9	43	60	44.6	35.8	6	10	133.0	3
11673	11	12	44	60	42.6	36.3	4	8	124.3	6
11952	9	8	45	63	42.3	33.6	7	6	127.4	4
12124	8	9	44	64	42.2	...	...	1	104.7	13
6251	14	13	44	61	46.5	31.7	12	13	104.3	14
1442	16	14	41	60	46.3	29.6	17	13	100.0	18
12000	9	10	44	63	39.8	33.2	9	4	111.4	10
12116	10	9	46	63	39.7	33.5	8	2	113.2	9
12114	13	12	45	63	39.6	36.5	3	3	121.8	7
12115	8	9	46	63	38.8	31.9	11	2	107.8	11
12126	12	12	43	63	36.4	...	...	1	95.3	19
12120	11	11	43	64	38.3	...	...	1	95.0	20
12110	12	11	46	62	38.3	33.1	10	3	114.8	8
12118	13	12	46	61	38.2	31.7	13	2	107.0	12
11982	12	11	46	62	37.7	...	...	1	93.5	21
12123	11	12	45	63	37.2	...	...	1	92.8	22
12117	15	11	45	63	36.5	30.6	14	2	103.4	15
8856	6	8	45	62	36.5	29.7	16	3	103.4	16
12111	13	11	46	62	35.9	30.6	15	3	103.3	17
12121	9	10	42	62	35.2	...	...	1	87.3	23
12122	11	11	45	63	34.6	...	...	1	85.9	24
12125	14	11	46	62	34.0	...	...	1	84.4	25

Standard error of a difference between the mean yield of any two varieties = 3.96 bushels.

Table .--(Continued)

Manhattan, Kansas
(Three plots)

C. I. No.	Date		Lodg- ing	Rust		Loose smut	Wt. per bu.	Av. acre yield:	Yield		No. years grown:	% of		
	Head- ed	Ripe		Ht. In.	Leaf				Stem	1943		1944	Rank	Khar- kof	Rank
	May	June	%	%	%	%	Lbs.	Bu.	Bu.					
11972	28	26	38	30	25	25	6	58.0	34.7	32.4	2	5	141.7	5
12122	23	25	36	8	65	20	1	61.0	34.6	....	..	1	134.6	7
12124	23	23	33	1	70	20	3	61.5	33.4	....	..	1	130.0	9
12120	24	26	34	0	30	25	0	62.5	33.1	....	..	1	128.8	11
11952	23	23	33	0	70	15	2	61.5	32.6	34.6	1	5	157.0	1
12116	25	26	39	5	25	25	4	59.5	30.9	31.8	4	2	124.2	14
12000	23	26	37	8	70	25	2	60.7	30.3	30.2	7	4	146.7	4
12110	26	27	39	3	5	35	T	57.7	29.9	31.9	3	3	152.2	2
12114	28	27	37	10	63	25	3	59.3	29.6	30.2	8	3	125.4	13
12102	26	27	38	3	73	20	2	59.3	28.8	30.8	5	4	150.8	3
8856	22	23	36	8	75	25	1	61.0	28.8	29.1	10	12	120.6	15
12111	27	26	39	5	20	25	3	59.5	28.1	28.3	11	3	127.9	12
11669	24	24	36	3	20	20	1	60.3	28.0	30.5	6	9	140.8	6
11982	27	26	35	7	30	30	T	58.0	27.9	....	..	1	108.6	18
12123	25	26	37	5	25	35	0	60.0	27.4	....	..	1	106.6	19
12126	25	26	38	25	65	25	0	59.5	26.8	....	..	1	104.3	20
12121	23	24	33	3	50	75	T	58.7	26.2	....	..	1	101.9	21
1442	29	27	39	20	65	30	8	58.0	25.9	25.6	14	12	100.0	22
6251	27	28	40	15	60	25	7	59.0	25.6	25.4	15	12	112.5	17
12101	27	27	36	5	60	40	T	57.0	25.0	27.8	12	4	129.7	10
11673	25	26	36	10	18	20	2	58.5	24.5	27.3	13	7	134.2	8
12125	27	27	40	7	33	25	2	58.7	24.2	....	..	1	94.2	24
12115	25	26	36	12	10	40	3	58.0	22.6	29.7	9	2	116.0	16
12118	27	26	39	48	70	75	1	53.0	19.2	24.3	16	2	94.9	23
12117	29	26	39	33	68	75	3	51.7	17.5	22.6	17	2	88.3	25

Standard error of a difference between the mean yield of any two varieties = 4.43 bushels.

Table .---(Continued)

Hays, Kansas

(Three plots)

C. I. No.	Date		Ht. In.	Shat- ter- ing %	Weight per bushel Lbs.	Average per acre yield Bu.	Yield Average 1943-44 Bu.	Rank	No. years grown	Percent of Karkof	Rank
	Head- ed	Ripe									
	May	June									
12122	24	21	35	1.0	63	39.6	..	..	1	166.4	3
12101	26	22	38	0.5	62	39.1	30.0	1	4	157.0	9
11982	25	21	40	2.0	59	38.4	..	..	1	161.3	6
12120	23	22	35	1.0	63	36.1	..	..	1	151.7	11
12116	23	22	38	1.0	63	35.9	26.4	3	2	164.0	4
12125	26	21	40	1.0	60	35.9	..	..	1	150.8	13
12123	25	22	35	1.3	61	33.9	..	..	1	142.4	15
12115	23	22	38	0.5	61	33.7	26.2	5	2	162.7	5
12110	26	22	41	1.5	60	33.6	26.4	4	3	159.8	7
12124	23	22	34	2.5	62	33.2	..	..	1	139.5	16
12114	26	22	35	2.0	62	33.0	28.4	2	3	168.9	2
12000	24	22	36	1.0	61	32.5	26.2	6	4	157.5	8
11952	23	22	36	1.5	62	32.1	23.8	8	6	169.4	1
12126	21	22	35	1.0	61	31.6	..	..	1	132.8	17
12121	24	22	34	2.5	61	31.4	..	..	1	131.9	18
8856	20	20	35	0.5	63	31.1	21.1	11	12	114.6	24
11673	25	22	37	0.5	60	31.0	23.7	9	8	131.9	19
11669	24	22	35	1.0	60	30.6	23.5	10	9	145.1	4
12102	25	22	39	1.0	62	30.5	24.2	7	4	151.6	12
6251	26	22	39	1.0	60	30.0	20.4	12	12	117.7	23
12118	25	24	40	0.5	60	29.5	20.3	13	2	126.1	21
12111	26	22	38	1.5	60	27.7	19.7	15	3	130.5	20
12117	26	23	39	2.5	60	24.8	19.5	16	2	121.1	22
1142	28	24	36	1.0	57	23.8	16.1	17	12	100.0	25
11972	26	22	37	0.5	60	23.7	20.1	14	5	155.0	10

Standard error of a difference between the mean yield of any two varieties = 3.92 bushels.

Table .---(Continued)

Akron, Colorado
(Five plots)

C. I. No.	Weight: per bushel:	Average: acre yield:	Yield Average: 1943-44:	No. Rank:	Percent: years: grown:	of Kharkof:	Rank
	Lbs.	Bu.	Bu.				
8856	57.0	23.3	24.4	1	10	123.5	2
12115	56.0	23.0	18.4	11	2	102.2	17
12114	56.5	23.0	22.2	4	3	113.8	10
6251	58.5	22.0	21.6	5	10	116.8	6
11673	54.0	22.0	19.4	9	7	114.1	9
11952	57.0	22.0	21.3	6	5	125.5	1
12101	57.5	22.0	22.5	3	4	114.8	8
12122	57.0	22.0	....	..	1	115.8	7
11972	54.5	21.6	20.8	8	4	121.3	3
12102	58.0	21.1	21.3	7	4	112.2	11
12111	56.5	21.1	16.6	14	3	102.5	16
12000	55.0	20.9	23.5	2	4	121.3	4
11669	54.0	20.3	18.3	12	8	118.0	5
12116	56.5	20.2	18.8	10	2	104.4	14
12120	59.0	20.2	....	..	1	106.3	12
12126	56.0	20.1	....	..	1	105.8	13
12124	58.0	19.8	....	..	1	104.2	15
12121	54.0	19.2	....	..	1	101.1	18
12123	57.0	19.0	....	..	1	100.0	19
1442	56.5	19.0	18.0	13	10	100.0	20
12125	54.5	17.8	....	..	1	93.7	22
12110	54.5	17.4	15.4	15	3	97.5	21
12117	53.0	17.2	15.0	17	2	82.2	25
11982	53.5	16.6	....	..	1	87.4	23
12118	54.5	15.6	15.1	16	2	83.9	24

Standard error of a difference between the mean yields of any two varieties = 1.41 bushels.

Table --- (Continued)

Fort Collins, Colorado

(Five plots)

C. I. No.	Date	Head	Ripe	Ht.	Rust	Weight	Average	Yield	No.	Percent	Rank	
	: June	: July	: In.	: %	: %	: Lbs.	: Bu.	: Bu.	: Years	: of	: Kharkof:	
8856	17	26	36	92	46	60.8	25.3	32.4	8	12	98.2	22
12120	17	26	31	84	46	60.2	25.2	31.5	1	1	331.6	1
12122	20	28	34	100	60	57.4	24.6	31.5	2	1	323.7	2
6251	21	28	36	92	48	60.0	23.8	35.8	2	12	100.0	19
12126	21	28	34	96	46	57.4	23.4	31.5	1	1	307.9	3
12000	19	28	33	96	62	59.3	21.7	34.6	4	4	129.7	8
11952	19	26	36	92	58	59.2	21.4	33.8	5	6	113.3	11
11673	20	25	35	100	68	55.2	20.3	36.3	1	8	111.1	14
11669	19	26	33	86	56	59.0	19.7	33.7	6	10	110.9	15
12102	21	28	37	100	52	58.1	19.6	30.4	10	4	115.7	10
11972	22	26	37	92	70	55.6	18.1	32.7	7	5	111.3	12
12114	22	28	35	100	58	55.8	17.8	35.7	3	3	138.9	6
12115	17	23	34	100	78	57.9	16.2	28.0	11	2	101.1	18
12111	21	26	38	100	78	55.0	15.8	28.1	12	3	109.7	16
12124	21	28	33	90	56	56.0	14.4	31.2	1	1	189.5	4
12116	20	25	35	92	74	50.3	12.9	30.9	9	2	111.2	13
12121	20	22	30	100	90	49.8	11.9	31.1	1	1	156.6	5
12123	21	26	36	100	86	51.5	10.0	31.1	1	1	131.6	7
12101	22	26	35	100	82	52.8	9.7	23.0	17	1	103.9	17
12110	21	26	36	72	86	53.0	9.4	24.9	16	3	99.0	21
12125	23	26	36	96	80	50.0	9.0	31.1	1	1	118.4	9
1442	24	26	37	80	68	54.8	7.6	27.8	13	12	100.0	20
11982	22	26	35	88	66	50.5	6.7	31.1	1	1	88.2	25
12117	24	24	37	100	90	49.0	6.5	25.5	15	2	91.7	24
12118	23	25	36	100	88	51.0	5.9	26.1	14	2	93.9	23

Standard error of a difference between the mean yield of any two varieties = 3.32 bushels.

Table .--(Continued)

Hesperus, Colorado

(Three plots; seeded September 20; emerged September 29;
irrigated June 6)

C. I. No.	Date ripe	Height In.	Weight per bushel	Average per acre Bu.	Yield Average Bu.	Rank	No. years grown	Percent of Kharkof	Rank
	: July:	:	: Lbs. :	: Bu. :	: Bu. :	:	:	:	:
12000	28	38	63.0	60.4	51.9	1	4	126.2	9
11982	29	42	62.5	58.0	....	..	1	141.8	1
11972	29	38	63.0	57.6	46.5	3	5	128.2	7
6251	29	42	62.5	56.0	46.2	4	7	126.2	10
12122	27	38	63.0	55.7	....	..	1	136.2	2
11952	29	38	62.5	55.3	43.3	9	6	101.4	22
12114	27	38	63.0	54.0	48.2	2	3	129.4	4
12121	28	38	63.0	53.6	....	..	1	131.1	3
12125	28	40	62.5	52.8	....	..	1	129.1	5
12120	27	40	63.0	52.7	....	..	1	128.9	6
12126	27	40	62.5	51.7	....	..	1	126.4	8
12116	27	41	62.5	50.4	40.6	10	2	105.2	20
12123	29	38	63.0	49.9	....	..	1	122.0	11
12118	30	41	62.5	49.2	44.7	5	2	115.8	13
12110	28	42	62.5	49.0	44.6	7	3	114.4	16
12117	30	41	62.5	48.5	43.4	8	2	112.4	18
12124	29	37	63.0	47.1	....	..	1	115.2	14
12115	28	41	62.5	46.9	38.6	13	2	100.0	23
8856	27	39	62.0	43.7	35.6	17	7	96.3	25
12101	28	38	62.5	43.2	44.7	6	4	111.9	19
11673	27	37	62.5	42.2	37.4	16	7	121.3	12
1442	28	40	62.0	40.9	38.6	14	7	100.0	24
12111	28	40	62.5	40.5	37.8	15	3	114.8	15
11669	28	37	62.5	38.3	39.7	12	7	102.2	21
12102	29	40	62.5	36.9	40.1	11	4	113.7	17

Standard error of a difference between the mean yield of any
two varieties = 9.94 bushels.

Table .--(Continued)

Ames, Iowa

(Four plots)

C. I. No.	Winter:	Date:	Weight:	Average:	Yield:	No.:	Percent:	Rank:	
	sur- vival:	ripe:	per bushel:	acre yield:	Average 1943-44:		years grown:		of Rankof:
	%	July:	In.	Lbs.	Bu.	Bu.			
12122	80	4	31	55.5	22.5	...	1	106.6	2
1442	90	8	31	54.0	21.1	17.3	5	100.0	5
11669	80	4	30	53.6	21.1	19.1	2	108.6	1
12126	90	6	32	52.9	20.5	...	1	97.2	6
11952	85	4	32	52.8	20.4	16.3	7	103.1	4
12000	75	4	32	55.0	20.3	21.8	1	95.9	9
12101	60	4	31	51.4	18.6	15.5	8	97.1	7
11972	85	4	31	51.5	18.4	14.7	10	96.9	8
8856	50	4	32	54.5	18.4	17.3	6	90.7	12
12114	75	7	29	52.1	18.2	18.6	3	105.4	3
12102	75	5	31	54.3	17.4	18.2	4	91.3	11
11673	70	4	31	51.2	16.7	15.5	9	91.4	10
6251	80	6	30	55.0	16.4	13.1	11	88.3	14
12124	70	4	27	54.2	16.3	...	1	77.3	16
12111	85	6	29	52.1	15.9	13.0	12	89.6	13
12125	70	15	31	51.8	15.1	...	1	71.6	17
12123	70	8	29	53.0	15.1	...	1	71.6	18
12110	50	12	28	51.0	14.3	10.1	13	87.1	15
12116	50	8	27	51.7	12.3	8.6	14	49.7	21
11982	40	15	31	50.6	11.7	...	1	55.5	19
12120	70	8	26	53.4	11.0	...	1	52.1	20
12117	75	6	30	49.4	9.6	8.6	15	49.7	22
12118	50	6	29	47.0	8.8	7.8	16	45.1	23
12121	50	6	24	51.0	8.6	...	1	40.8	24
12115	40	6	26	51.0	8.4	6.8	17	39.3	25

Standard error of a difference between the mean yield of any two varieties = 4.54 bushels.

Table .--(Continued)

Lincoln, Nebraska

(Five plots; seeded September 25; emerged October 1, 1943)

C. I. No.	Winter:	Date		Rust			Wt.:	Av.:	Yield		No.:	Percent:	Rank
	sur- vival	Head- ed	Ripe	Ht.:	Leaf	Stem	per:acre	per:acre	Average:	Rank	years:	of	
	%		In.:	%	%	Lbs.:	Bu.:	Bu.:	Bu.:			Kharkof:	
12122	100	5/29	6/27	37	75	10	60.4	34.5	....	..	1	215.6	1
12126	100	5/29	6/29	37	75	25	59.5	29.7	....	..	1	185.6	2
11669	99	5/29	6/27	34	33	28	58.3	28.5	30.7	1	10	137.8	6
12120	100	5/29	6/30	34	37	20	63.3	27.9	....	..	1	174.4	3
12102	100	5/30	6/30	36	85	65	61.9	26.2	24.5	3	4	129.8	8
12101	95	5/31	6/30	34	83	63	58.4	26.2	25.4	2	4	128.9	9
12124	100	5/29	6/26	35	85	18	59.1	25.0	....	..	1	156.3	4
8856	96	5/28	6/26	35	78	13	59.4	23.4	22.3	6	13	126.5	10
12000	96	5/29	6/27	35	90	25	58.5	23.1	24.5	4	4	119.1	13
12125	95	5/31	7/1	35	65	73	57.1	23.0	....	..	1	143.8	5
11952	93	5/29	6/26	34	90	18	58.4	21.8	22.9	5	6	122.4	12
12123	90	5/30	7/1	35	68	50	59.3	20.7	....	..	1	129.4	7
6251	96	6/1	7/2	36	83	43	58.0	20.6	22.0	7	13	114.6	14
11982	90	5/31	6/30	35	80	50	56.0	19.6	....	..	1	122.5	11
12121	88	5/30	6/29	33	75	33	57.5	18.0	....	..	1	112.5	15
12114	93	6/1	7/3	33	85	45	58.0	17.5	18.7	9	3	110.9	16
12116	89	5/30	6/29	32	73	58	57.0	17.4	15.8	12	2	87.8	23
11972	86	6/1	7/2	33	70	65	56.2	17.3	19.8	8	5	109.6	17
1442	90	6/2	7/2	35	83	62	56.2	16.0	18.0	10	13	100.0	19
11673	84	5/31	7/1	32	60	33	56.0	15.1	14.5	15	8	105.9	18
12111	92	6/1	7/2	33	63	53	56.0	14.7	14.4	17	3	89.1	22
12110	82	6/1	7/2	34	18	68	55.5	13.8	15.1	13	3	97.0	20
12115	69	5/30	6/30	33	25	65	56.5	11.1	17.2	11	2	95.6	21
12118	71	6/1	7/1	35	78	70	51.8	9.3	14.9	14	2	82.8	24
12117	67	6/3	7/1	35	93	70	52.0	7.2	14.5	16	2	80.6	25

Standard error of a difference between the mean yield of any two varieties = 2.56 bushels.

Table --- (Concluded)

North Platte, Nebraska

(Three plots; seeded September 16)

C. I. No.	Date		Ht.	Plant		Weight per bushel Lbs.	Average yield Bu.	No. years grown	Percent of Kharkof	Rank
	Head- ed	Ripe		Leaf	Stem					
12122	3	8	36	M	M	58.0	29.4	1	247.1	1
11952	2	8	35	M	M	59.2	27.2	1	134.8	16
12000	3	9	36	M	M	58.9	26.8	1	225.2	2
8856	1	9	35	M	M	59.6	26.7	7	141.3	17
12126	5	9	37	M	L	55.9	24.8	1	208.4	3
12124	3	9	36	M	H	59.0	24.1	1	202.5	4
11669	4	10	34	M	M	55.0	23.7	6	144.6	12
11673	3	10	38	M	M	52.5	21.8	4	136.0	15
12120	4	11	33	M	M	58.5	21.7	1	182.4	5
11972	5	10	37	M	M	52.0	21.5	2	145.5	11
12101	5	9	39	M	M	54.0	20.5	1	172.3	6
12115	3	9	36	H	H	52.7	20.3	1	170.6	7
12123	5	9	38	M	M	56.0	20.1	1	168.9	8
12102	5	11	40	M	M	49.0	17.5	1	147.1	9
12114	7	11	38	M	M	53.0	17.4	1	146.2	10
12121	5	8	36	M	M	51.0	16.7	1	140.3	13
12111	8	10	39	M	M	50.0	16.6	1	139.5	14
6251	7	11	40	M	M	50.5	15.4	7	93.0	22
12110	5	10	40	M	M	56.5	14.1	1	113.5	18
12116	4	11	37	M	M	51.0	12.9	1	108.4	19
12125	7	12	39	M	M	48.5	12.3	1	105.4	20
11442	9	11	39	M	M	43.7	11.9	7	100.0	21
12118	7	9	39	H	H	46.5	10.7	1	89.9	23
11982	7	12	38	M	M	46.0	9.8	1	82.4	24
12117	9	7	40	H	H	42.0	8.8	1	73.9	25

1/ Degree of susceptibility.

Standard error of a difference between the mean yield of any two varieties = 3.22 bushels.

STANDARD ERRORS

Standard errors were calculated for each station as outlined on page 13 of this report. In table 19 will be found the number of plots, average yields, and standard errors for the uniform yield nursery grown at each of the 12 stations.

Table 19.--Number of plots, average yield, and standard errors for the uniform yield nursery at several cooperating stations in 1944.

Station	No. of plots	Average yield of varieties	Standard error of a			
			Single plot	Difference between means	Mean in	
		Bu.	Bu.	Bu.	Bushels	Percent
Texas:						
Denton	4	25.00	3.23	2.29	1.62	6.48
Chillicothe	4	22.80	3.65	2.59	1.83	8.03
Amarillo (Dry)	4	34.21	4.27	3.03	2.14	6.26
Oklahoma:						
Woodward	4	39.98	5.59	3.96	2.80	7.00
Kansas:						
Manhattan	3	27.83	5.43	4.43	3.13	11.25
Hays	3	32.10	4.79	3.92	2.77	8.63
Colorado:						
Akron	5	20.25	2.33	1.47	1.04	5.14
Ft. Collins	5	15.88	5.26	3.32	2.35	14.80
Hesperus	3	49.37	12.18	9.94	7.03	14.24
Iowa:						
Ames	4	15.931.73	6.42	4.54	3.21	10.12
Nebraska:						
Lincoln	5	20.30	4.05	2.56	1.81	8.92
North Platte	3	18.91	3.95	3.22	2.28	12.06

SUMMARY OF NURSERY YIELDS

The yields of the 25 varieties of winter wheat grown at 12 stations are summarized in table 20 where the varieties are listed in order of their 12-nursery average yield. 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.

Cheyenne x Early Blackhull (C. I. 12122), with an average yield of 32.3 bushels per acre, ranked first in the nursery exceeding the second variety, Wichita, by 1.9 bushels. The performance of this strain was fairly consistent since it ranked first in Kansas, Iowa, and Nebraska, second in Colorado, and third in Texas. It made its poorest record at Woodward, Oklahoma, where it ranked twenty-fourth. This strain appears in the 1944 nursery for the first time. The performance of Wichita was fairly consistent since it ranked fourth in Colorado, fifth in Texas and Iowa, sixth in Oklahoma and Kansas, and eighth in Nebraska. A second selection of Cheyenne x Early Blackhull (C. I. 12000) ranked third with an average just 0.4 bushel less than Wichita, thus the three highest yielding varieties are selections from hybrids having Early Blackhull as one parent. Blackhull x Hard Federation (C. I. 12120) ranked fourth and closely following

this variety were Cheyenne x Tenmarq (C. I. 11972) and Tenmarq x Blackhull (C. I. 12126). Pawnee ranked tenth followed by Early Blackhull and Blackhull with Comanche in fourteenth and Westar in seventeenth place. Westar yielded fairly well in Texas, but farther north its yield was reduced by winterkilling and by stem rust infection. All but two of the varieties in the nursery outyielded the Kharkof check. A new Tenmarq selection (C. I. 12125) was included in the nursery, but this strain failed to perform as well as did either Comanche and Pawnee.

Seventeen varieties have been grown in the nursery for the 2-year period 1943-44 at 11 stations. These data are presented in table 21 where the yields are again averaged by States and the varieties are listed in the order of average yield at all stations. The number of varieties appearing in this table is somewhat lower than usual since there was a heavy turnover in the 1944 nursery. When the yields over the area are averaged, some of the differences are rather small and the range between the highest and lowest yielding varieties is only 7.5 bushels per acre. Two strains of Cheyenne x Early Blackhull (C. I. numbers 12000 and 12114) had the highest average yields, in fact the averages were nearly identical. The performance of these strains was fairly uniform, although each seemed to do slightly better at the more northern stations than at the stations in Texas. Blackhull x Cheyenne (C. I. 12101) ranked third and Cheyenne x Tenmarq (C. I. 11972) fourth. Some of the named varieties ranked as follows: Wichita fifth, Pawnee sixth, Blackhull eighth, Comanche ninth, Early Blackhull twelfth, and Kharkof sixteenth. From the plant breeding standpoint, it is encouraging to have some new strains that appear to have yielding ability above that of some of the recently named varieties.

Table 20.—Summary of the average yield of the 25 varieties grown as uniform yield nurseries at 12 stations in the hard red winter wheat region, 1944.

Variety	C. I. No.	Bushels per acre										
		Texas			Oklahoma			Kansas				
		Denton	Chilli- cothe	Ama- rillo	Av.	Rank	Wood- ward	Rank	Man- hattan	Hays	Av.	Rank
Cheyenne x E. Blackhull	12122	30.9	24.3	34.6	29.9	3	34.6	24	34.6	39.6	37.1	1
Wichita	11952	27.5	25.8	36.0	29.8	5	42.3	6	32.6	32.1	32.4	6
Cheyenne x E. Blackhull	12000	25.2	25.9	33.1	28.1	13	39.8	10	30.3	32.5	31.4	9
Blackhull x Hd. Fed.	12120	27.1	25.2	35.6	29.3	6	38.3	15	33.1	36.1	34.6	2
Cheyenne x Tenmarq	11972	23.8	26.3	39.8	30.0	2	49.3	2	34.7	23.7	29.2	16
Tenmarq x Blackhull	12126	23.8	22.9	36.8	27.8	14	38.4	14	26.8	31.6	29.2	17
Blackhull x Cheyenne	12101	24.4	27.9	38.9	30.4	1	53.0	1	25.0	39.1	32.1	7
E. Blackhull x Tenmarq	12124	24.2	25.4	31.1	26.9	18	42.2	7	33.4	33.2	33.3	4
Cheyenne x E. Blackhull	12114	24.0	22.9	38.9	28.6	8	39.6	12	29.6	33.0	31.3	10
Pawnee	11669	28.8	14.7	36.2	26.6	19	44.6	4	28.0	30.6	29.3	15
Early Blackhull	8856	26.9	15.9	33.6	25.5	22	36.5	21	28.8	31.1	30.0	13
Blackhull	6251	21.2	24.3	37.7	27.7	15	40.5	8	25.6	30.0	27.8	22
Blackhull x Tenmarq	12102	22.4	20.9	33.9	25.7	20	46.3	3	28.8	30.5	29.7	14
Comanche	11673	31.2	21.3	32.6	28.4	10	42.6	5	24.5	31.0	27.8	21
Cheyenne x Tenmarq	12123	28.5	23.4	33.9	28.6	7	37.2	19	27.4	33.9	30.7	11
Quivira x Tenmarq	12116	24.9	20.2	37.0	27.4	17	39.7	11	30.9	35.9	33.4	3
Westar	12110	27.0	25.9	36.7	29.9	4	38.3	16	29.9	33.6	31.8	8
Kan.-Hd. Fed. x Tenmarq	12115	30.2	24.3	29.9	28.1	12	38.8	13	22.6	33.7	28.2	19
Ceres-38h x Kawvale	12121	26.2	23.6	35.8	28.5	9	35.2	23	26.2	31.4	28.8	18
Tenmarq selection	12125	25.0	23.4	33.7	27.4	16	34.0	25	24.2	35.9	30.1	12
Tenmarq x Oro	12111	24.7	25.9	34.0	28.2	11	35.9	22	28.1	27.7	27.9	20
Tenmarq x Minturki	11982	25.5	20.2	23.9	23.2	23	37.7	18	27.9	38.4	33.2	5
Kharkof	1442	14.1	20.7	30.0	21.6	24	40.3	9	25.9	23.8	24.9	23
Kan.-Hd. Fed. x Minh.-Mint.	12118	24.4	21.1	31.2	25.6	21	38.2	17	19.2	29.5	24.4	24
Kan.-Hd. Fed. x Minh.-Mint.	12117	13.1	18.1	30.7	20.6	25	36.5	20	17.5	24.8	21.2	25

Table 20.--(Concluded).

Variety	C. I. No.	Bushels per acre											Average of 12 stations
		Colorado				Iowa		Nebraska		Average	Rank		
		Akron	Fort Collins	Hes- perus	Av.	Rank	Ames	Rank	Lin- coln			North Platte		Av.	Rank
Cheyenne x E. Blackhull	12122	22.0	24.6	55.7	34.1	2	22.5	1	34.5	29.4	32.0	1	32.3
Wichita	11952	22.0	21.4	55.3	32.9	4	20.4	5	21.8	27.2	24.5	8	30.4
Cheyenne x F. Blackhull	12000	20.9	21.7	60.4	34.3	1	20.3	6	23.1	26.8	25.0	5	30.0
Blackhull x Hd. Fed.	12120	20.2	25.2	52.7	32.7	5	11.0	21	27.9	21.7	24.8	6	29.5
Cheyenne x Tenmarq	11972	21.6	18.1	57.6	32.4	6	18.4	8	17.3	21.5	19.4	12	29.3
Tenmarq x Blackhull	12126	20.1	23.4	51.7	31.7	7	20.5	4	29.7	24.8	27.3	2	29.2
Blackhull x Cheyenne	12101	22.0	9.7	43.2	25.0	22	18.6	7	26.2	20.5	23.4	9	29.0
E. Blackhull x Tenmarq	12124	19.8	14.4	47.1	27.1	15	16.3	14	25.0	24.1	24.6	7	28.0
Cheyenne x E. Blackhull	12114	23.0	17.8	54.0	31.6	8	18.1	10	17.5	17.4	17.5	16	28.0
Pawnee	11669	20.3	19.7	38.3	26.1	18	21.1	3	28.5	23.7	26.1	3	27.9
Early Blackhull	8856	23.3	25.3	43.7	30.8	9	18.4	9	23.4	26.7	25.1	4	27.8
Blackhull	6251	22.0	23.8	56.0	33.9	3	16.4	13	20.6	15.4	18.0	14	27.8
Blackhull x Tenmarq	12102	21.1	19.6	36.9	25.9	19	17.4	11	26.2	17.5	21.9	10	26.8
Comanche	11673	22.0	20.3	42.2	28.2	11	16.7	12	15.1	21.8	18.5	13	26.8
Cheyenne x Tenmarq	12123	19.0	10.0	49.9	26.3	17	15.1	17	20.7	20.1	20.4	11	26.6
Quivira x Tenmarq	12116	20.2	12.9	50.4	27.8	13	12.3	19	17.4	12.9	15.2	20	26.2
Westar	12110	17.4	9.4	49.0	25.3	21	14.3	18	13.8	14.1	14.0	22	25.8
Kan-Hd. Fed. x Tenmarq	12115	23.0	16.2	46.9	28.7	10	8.4	25	11.1	20.3	15.7	18	25.5
Ceres-38h x Kawvale	12121	19.2	11.9	53.6	28.2	12	8.6	24	18.0	16.7	17.4	17	25.5
Tenmarq selection	12125	17.8	9.0	52.8	26.5	16	15.1	16	23.0	12.3	17.7	15	25.5
Tenmarq x Oro	12111	21.1	15.8	40.5	25.8	20	15.9	15	14.7	16.6	15.7	19	25.1
Tenmarq x Minturki	11982	16.6	6.7	58.0	27.1	14	11.7	20	19.6	9.8	14.7	21	24.7
Kharkof	1142	19.0	7.6	40.9	22.5	25	21.1	2	16.0	11.9	14.0	23	22.6
Kan-Hd. Fed. x Minh-Mint.	12118	15.6	5.9	49.2	23.6	24	18.8	23	9.3	10.7	10.0	24	21.9
Kan-Hd. Fed. x Minh-Mint.	12117	17.2	6.5	48.5	24.1	23	9.6	22	7.2	8.8	8.0	25	19.9

Table 21.—Summary of average yields of 17 winter wheat varieties grown in uniform yield nurseries at 11 stations in the hard red winter wheat region, 1943 and 1944.

Variety	C. I. No.	Bushels per acre										
		Texas					Oklahoma		Kansas			
		Denton	Chilli-cothe	Ama-rillo	Av.	Rank	Wood-ward	Rank	Man-hattan	Hays	Av.	Rank
Cheyenne x E. Blackhull	12000	23.4	25.0	24.7	24.4	10	33.2	9	30.2	26.2	28.2	6
Cheyenne x E. Blackhull	12114	25.7	24.8	28.9	26.5	5	36.5	3	30.2	28.4	29.3	1
Blackhull x Cheyenne	12101	25.0	27.0	28.3	26.8	4	40.7	1	27.8	30.0	28.9	5
Cheyenne x Tenmarq	11972	28.8	28.9	27.6	28.4	1	37.3	2	32.4	20.1	26.3	10
Wichita	11952	27.7	23.6	26.2	25.8	7	33.6	7	34.6	23.8	29.2	2
Pawnee	11669	27.2	19.5	24.7	23.8	12	35.8	6	30.5	23.5	27.0	9
Blackhull x Tenmarq	12102	20.7	22.7	23.3	22.2	15	36.0	5	30.8	24.2	27.5	8
Blackhull	6251	21.2	24.2	26.1	23.8	11	31.7	12	25.4	20.4	22.9	14
Comanche	11673	28.3	25.0	23.8	25.7	8	36.3	4	27.3	23.7	25.5	11
Kan.-Hd.Fed. x Tenmarq	12110	29.0	27.9	27.2	28.0	2	33.1	10	31.9	26.4	29.2	3
Quivira x Tenmarq	12116	24.2	24.4	25.7	24.8	9	33.5	8	31.8	26.4	29.1	4
Early Blackhull	8856	25.3	19.3	23.3	22.6	14	29.7	16	29.1	21.1	25.1	12
Kan.-Hd.Fed. x Tenmarq	12115	29.6	27.1	22.6	26.4	6	31.9	11	29.7	26.2	28.0	7
Tenmarq x Oro	12111	27.0	29.2	25.1	27.1	3	30.6	15	28.3	19.7	24.0	13
Kan.-Hd.Fed. x Minh.-Mint.	12118	23.5	23.1	21.5	22.7	13	31.7	13	24.3	20.3	22.3	15
Kharkof	1442	18.3	22.1	21.0	20.5	16	29.6	17	25.6	16.1	20.9	17
Kan.-Hd.Fed. x Minh.-Mint.	12117	15.8	20.1	21.2	19.0	17	30.6	14	22.6	19.5	21.1	16

Table 21.--(Concluded).

Variety	C. I. No.	Colorado			Iowa			Nebraska			Average of 11 Rank stations
		Akron	Fort Collins	Hess	Rank	Ames	Rank	Lincoln	Rank		
Cheyenne x E. Blackhull	12000	23.5	34.6	51.9	36.7	1	21.8	1	24.5	4	29.0
Cheyenne x E. Blackhull	12104	22.2	35.7	48.2	35.4	2	18.6	3	18.7	9	28.9
Blackhull x Cheyenne	12101	22.5	23.0	44.7	30.1	11	15.5	8	25.4	2	28.2
Cheyenne x Tenmarq	11972	20.8	32.7	46.5	31.3	4	14.7	10	19.8	8	28.1
Wichita	11952	21.3	33.8	43.3	32.8	5	16.3	7	22.9	5	27.9
Pawnee	11669	16.3	33.7	39.7	30.6	8	19.1	2	30.7	1	27.5
Blackhull x Denmark	12102	21.3	30.4	40.1	30.6	9	18.2	4	24.5	3	26.6
Blackhull	6250	21.6	35.8	46.2	34.5	3	13.1	11	22.0	7	26.2
Comanche	11673	19.4	36.3	37.4	31.0	6	15.5	9	14.5	15	26.1
Kan. Hd. Fed. x Tenmarq	12110	15.4	24.9	41.6	28.3	14	10.1	13	15.1	13	26.0
Quivira x Tenmarq	12116	18.8	30.9	40.6	30.1	10	8.6	14	15.8	12	25.5
Early Blackhull	8356	24.4	32.4	35.6	30.8	7	17.3	6	22.3	6	25.4
Kan. Hd. Fed. x Tenmarq	12115	18.4	28.1	38.6	28.4	13	6.8	17	17.2	11	25.1
Tenmarq x Oro	12111	16.6	28.1	37.8	27.5	17	13.0	12	14.4	17	24.5
Kan. Hd. Fed. x Minn. - Mint.	12118	15.1	26.1	36.1	28.6	12	7.8	16	14.9	14	23.0
Markof	1142	18.0	27.8	38.6	28.1	15	17.3	5	18.0	10	22.9
Kan. Hd. Fed. x Minn. - Mint.	12117	15.0	25.5	35.1	28.0	16	8.6	15	14.5	16	21.5

Table 22.--Summary of agronomic data other than yield for varieties of winter wheat grown as uniform yield nurseries at 12 stations in the hard red winter wheat region, 1944.

Variety or cross	C. I. No.	Winter:	Date		Height:	Rust		Weight per bushel : Lbs.
		sur- vival %	Head- ed May	Ripe		In.	Leaf %		Stem %
Number of stations		2	9	10	10	4	4	12
Kharkof	1442	90	28	7/3	36	74	56	57.0
Blackhull	6251	88	25	7/2	37	74	45	58.5
Early Blackhull	8856	73	18	6/28	35	76	36	59.9
Comanche	11673	77	23	6/30	35	54	43	57.3
Pawnee	11669	90	22	6/30	34	41	41	58.3
Wichita	11952	89	20	6/28	35	76	35	59.8
Cheyenne x Tenmarq	11972	86	25	7/2	36	62	55	57.7
Cheyenne x Early Blackhull	12000	86	20	6/29	35	77	39	59.6
Blackhull x Cheyenne	12101	78	25	7/1	36	77	59	58.1
Blackhull x Tenmarq	12102	88	24	7/2	37	80	51	59.2
Tenmarq x Oro	12111	88	25	7/2	37	56	52	57.8
Westar	12110	66	24	7/2	37	25	59	57.7
Kanred-Hd. Fed. x Tenmarq	12115	55	21	6/29	35	44	57	58.2
Quivira x Tenmarq	12116	70	23	7/1	36	63	42	58.0
Kanred-Hd. Fed. x Minn.-Mint.	12117	71	27	7/1	37	84	71	54.5
Kanred-Hd. Fed. x Minn.-Mint.	12118	61	25	7/2	37	78	71	55.2
Blackhull x Hd. Federation	12120	85	22	7/1	34	48	41	61.1
Ceres-38h x Kawvale	12121	69	21	6/28	33	61	58	57.2
Cheyenne x Early Blackhull	12114	84	25	7/2	35	78	44	58.6
Cheyenne x Early Blackhull	12122	90	21	6/29	35	73	34	59.9
Cheyenne x Tenmarq	12123	80	23	7/2	36	62	54	58.7
E. Blackhull x Tenmarq	12124	85	20	6/30	34	73	37	59.9
Tenmarq selection	12125	83	25	7/3	38	62	57	56.8
Tenmarq x Minturki	11982	65	25	7/3	37	66	56	55.9
Tenmarq x Blackhull	12126	95	22	7/1	36	74	43	58.9

SUMMARY OF AGRONOMIC DATA

Data for characters other than yield are averaged and presented in table 22. Since all stations did not report the same data, the number of stations entering the averages is shown at the top of each column.

Due to a generally mild winter throughout the area covered by the nurseries, winterkilling was reported from two stations only and average survivals ranged from 90 to 55 percent. Such varieties as Tenmarq x Blackhull (C. I. 12126), Kharkof, Pawnee, and Cheyenne x Early Blackhull (C. I. 12122) had the highest average survivals while Kanred-Hard Federation x Minhardi-Minturki (C. I. 12112) and Tenmarq x Minturki (C. I. 11952) had the lowest. Dates of heading were reported from 9 stations and as usual Early Blackhull averaged the earliest, Wichita headed 2 days later than Early Blackhull as did Cheyenne x Early Blackhull (C. I. 12000), and Early Blackhull x Tenmarq (C. I. 12124). Pawnee was 2 days later in heading than Early Blackhull and Comanche 3 days later. Kharkof had the latest date of heading, being 8 days later than Early Blackhull. Dates of ripening were reported from 10 stations and the range was from June 28 to July 3 which was considerably narrower than for date of heading. Varieties matured in about the same order as indicated by the heading dates.

Plant heights from 10 stations were averaged but showed no great differences. The shortest varieties in the nursery, Pawnee and Early Blackhull x Tenmarq (C. I. 12124) averaged 34 inches while Tenmarq selection (C. I. 12125) averaged 38 inches in height.

Leaf rust readings were reported from 4 stations and in general the averages were rather high. Westar with an average infection of 25 percent showed the most resistance while the next lowest averages were for Pawnee and Kanred-Hard Federation x Tenmarq (C. I. 12115). Some of the more susceptible varieties had averages as high as 78 percent.

Stem rust readings were obtained at 4 stations and at these, Cheyenne x Early Blackhull (C. I. 12122), Wichita, and Early Blackhull had the lowest averages. It is probable that these varieties escaped infection rather than resisted it because they are among the earlier strains in the nursery. Pawnee and Comanche had average infections of 41 and 43 percent, respectively.

Average test weights per bushel for 12 stations ranged from 54.5 to 61.1 pounds per bushel. The highest average was recorded for Blackhull x Hard Federation (C. I. 12120) with Cheyenne x Early Blackhull (C. I. 12122), Early Blackhull, and Early Blackhull x Tenmarq (C. I. 12124) ranking next. The lowest weights were recorded for 2 strains of Kanred-Hd. Federation x Minhardi-Minturki (C. I. numbers 12117 and 12118). These strains were injured rather badly by stem rust at a number of the stations. As in previous years, strains having Blackhull and Early Blackhull germ plasma again gave the highest weights per bushel. Pawnee had an average test weight 1 pound heavier than did Comanche.

DATA FROM THE DISEASE NURSERIES

BUNT NURSERY

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

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, 1944

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The uniform winter wheat bunt nursery for the Great Plains area was continued in 1944 in the same manner as outlined for 1943. In 1944, 10 stations reported data. This report presents a summary of these data, together with the averages for the varieties grown during different periods from 1932-1944.

In the fall of 1943, 50 varieties and strains of winter wheat were sown in duplicate 8-foot rows at each of the stations shown in the table. It will be noticed that most of these stations are located in the Great Plains although there were seedings at Bozeman, Mont., Beltsville, Md., Kearneysville, W. Va., and Logan, Utah. The stations selected for growing these nurseries were so located that each represented a State or a distinct region that might include part of several States. Usable data were obtained from all of the nurseries and the results are summarized in Table 1. The 1944 average is based on the results of 9 stations. The dwarf bunt data obtained at Logan are not included in these averages.

The inoculum used at each station was made up of a mixture of races known to be prevalent in the area represented by that station with the following exceptions: For Beltsville and Kearneysville the inoculum consisted of a composite of all the races of Tilletia foetida and T. caries used in the other nurseries. At Logan the seed was not inoculated but was planted in soil known to be infested with the dwarf bunt organism. The inoculum for the different stations included the following races:

<u>Station</u>	<u>Races</u>
Denton	L-2, L-3, L-4, L-5, L-10
Woodward	L-3, L-4, L-10
Manhattan	L-3, L-5, L-7
Lincoln	L-2, L-3, L-7
North Platte	L-2, L-3, L-7
Fort Collins	L-3, L-8, L-10
Bozeman	L-2, L-3, L-4, L-8, T-3, T-6, T-8, T-11
Beltsville	Composite of above
Kearneysville	Composite of above
Logan	Soil-borne dwarf bunt

In addition to the regular nursery, a so-called Supplementary Nursery, made up of seven tester varieties, was included. The inoculum used for this group of wheats was a group of bulk collections made in the State or in the immediate vicinity of the station in question. Any new collections made during the year were added to this bulk and put on the seven testers in order to detect any new or unusual races present in the area involved.

The varieties grown in the regular nursery are listed in Table 1 in order of the average infection at 9 stations. The averages range from 0.8 to 70.0 percent. Sibley 81 x Yogo (Nebr. sel. 92678) developed the least infection at all of the stations. Oro x Marquillo-Tenmarq (Kans. sel. 402427) ranked second with an average infection of 1.7 percent. Both of these wheats had slightly less infection than Relief which averaged 2.0 percent. The average percent infection of some of the other standard varieties included were as follows: Redit, 3.9; Hussar, 4.0; Nebred, 4.4; Comanche, 7.7; Oro, 9.0; Minturki, 11.0; and Pawnee, 17.1. Of the susceptible varieties grown as checks Kharkof had an average infection of 39.7; Wichita, 37.0; Cheyenne, 46.0; and Red Chief, 70.0 percent. From the table it will be noted that the average for Comanche was 7.0, while its two parents had the following average infections: Oro, 9.0; Tenmarq, 36.0. A more definite indication of transgressive segregation is apparent for Pawnee which had an average of 17.1 while its two parents, Tenmarq and Kawale, had infections of 36.0 and 44.7 percent, respectively. In this case two susceptible varieties seem to have produced a wheat that has some resistance.

At the bottom of Table 1 are shown the average infections by stations for the uniform nursery. The highest averages were obtained at Fort Collins, Colo., and Kearneysville, W. Va., and the lowest at North Platte, Nebr. Those at Bozeman, Mont., were likewise high. A study of the data clearly indicates differential reaction of certain wheats to races at the different stations. This seems to be brought out more clearly since known races are being used. The higher infection at Fort Collins of some of the varieties resistant at other stations is probably caused by the presence of race 8. It is noteworthy also that strains having Martin as one of the parents had higher percentages of infection at Bozeman than at Fort Collins due to the presence of the so-called Martin races in the composite inoculum.

Average infection percentages are given for those varieties grown for a number of years. For the period 1932-1941 seven strains are included and of these Hussar, Nebred, and Redit have had the lowest averages. For the period 1942-1944 Relief has had an average infection slightly lower than Redit, Nebred, or Hussar. For the last 2 years, namely 1943 and 1944, Oro x Marquillo-Tenmarq (Kans. sel. 402427) has had the lowest average and Relief the next lowest. For this same period Comanche has averaged 6.5; Pawnee, 14.7; and Kharkof, 37.6 percent. Several varieties that have been highly resistant in these tests and are otherwise agronomically desirable are being tested with individual races found in all the wheat-growing areas.

The varieties grown in the Supplementary Nursery are shown in Table 2 and are ranked in the order of the average infection at nine stations. It will be noted that Oro x Turkey-Florence showed infection at only two stations and were also free from bunt at Logan. Hussar had an average infection slightly lower than that of either Oro or Redit, while again Chiefkan was extremely susceptible. The data do not indicate the occurrence of any new or unusual races in areas for which the tests were made.

Table 1.--Summary of bunt infection of 50 varieties and strains of winter wheat grown in the Great Plains uniform winter wheat bunt nursery at 10 stations in 1944, and average bunt infections for 1932-1944.

Variety or cross	C. I. or selection No.	Average percentage of bunt at:										Weighted av.			
		Den- ton	Wd.- ward	Man- hattan	Lin- coln	North Platte	Fort Collins	Boze- man	Belts- ville	Kear- ney	Logan ville	Av. for	1943 and	1942 to	1932 to
		Tex.	Okla.	Kans.	Nebr.	Nebr.	Colo.	Mont.	Md.	W.Va.	Utah	1944	1944	1944	1944
Sibley 81 x Yogo	Nebr. sel. 392678	0	0	0	0	0	0	0	4	2	1	25	0.8	...	...
Oro x Marq.-Tenmarq	Kans. sel. 402427	T	1	0	1	0	0	4	6	1	2	20	1.7	1.5	...
Relief	10082	3	0	3	0	0	0	0	6	0	6	1	2.0	1.7	1.3
Turkey x Turk.-Chey	Nebr. sel. 383130	1	1	1	0	0	0	19	10	0	1	48	3.7	...	...
Ridit	6703	2	5	3	1	0	0	4	13	2	5	5	3.9	4.1	3.0
Hussar	4843	1	0	11	0	1	0	0	9	2	12	1	4.0	3.3	2.3
Nebred	10094	4	1	2	2	0	0	16	9	4	2	20	4.4	3.7	3.7
Chiefkan x Oro-Tenq	Kans. sel. 43BN446	0	0	0	0	0	0	18	13	1	10	15	4.7	...	...
Chey. x Turkey 1081	Nebr. sel. 422061	7	2	1	3	0	0	15	10	2	5	45	5.0	...	...
Marq-Oro x Oro-Tenq	Kans. sel. 415029	7	5	2	3	0	0	16	7	3	2	15	5.0	...	...
Hope x Turkey	Nebr. sel. 402113	5	1	2	0	0	0	24	10	4	1	..	5.2	...	...
C. I. 10016 x Chey.	Wd. 39h2013-22-17	1	1	0	0	1	0	17	25	1	1	40	5.2	...	...
Turkey x Blackhull	Wd. 39h3283-30-3	0	0	T	0	0	0	27	20	0	1	45	5.3	...	...
H44 x Minturki ²	Minn. 2710	3	1	1	0	0	0	24	18	0	3	18	5.6	4.9	...
Fire	Wd. 38B1-8	T	T	0	0	0	0	35	18	0	1	40	6.0	...	...
Marquillo x Oro	Kans. 3464	6	6	T	4	2	0	20	6	5	5	23	6.0	...	...
C. I. 10016 x Chey.	Wd. 39h2013-22-14	1	2	T	0	0	0	14	35	1	1	30	6.0	...	...
Mont. 36-Bel x Kanred	12108	T	2	12	1	0	0	14	18	1	10	8	6.4	6.6	4.6
H44 x Minturki ²	Minn. 2711	4	1	2	0	0	0	27	23	1	2	20	6.7	5.3	...
Chiefkan x Oro-Tenq	Kans. sel. 43BN433	T	0	0	0	0	0	43	17	1	2	20	7.0	...	...
K. S. Q. bulk sel.	Wd. 35B-1-1	1	1	0	1	1	1	36	20	2	1	19	7.0	...	...
Turkey 1005 sel.	Nebr. sel. 4CS-6	9	0	1	1	1	1	27	18	2	5	40	7.1	...	...
Fire	Wd. 38B1-7	2	T	2	0	0	0	37	23	0	2	45	7.3	...	...
Comanche	11673	3	5	3	3	3	3	33	5	5	9	10	7.7	6.5	8.0
Chey. x Turkey 1062	N.P. 40410	1	4	1	1	1	2	23	20	4	15	30	7.9	...	...
Turkey selection	11530	2	5	18	2	0	0	0	23	15	15	2	8.9	7.0	4.7
Oro	8220	6	3	6	1	3	0	24	28	2	8	7	9.0	8.6	11.1
H44 x Minturki ²	Minn. II-36-18	8	3	5	0	0	0	25	45	2	3	25	10.1	...	...
Chiefkan x Oro-Tenq	H.C. 42-4047	0	0	0	3	1	0	41	30	3	15	15	10.3	...	...
Minturki	6155	19	8	14	0	0	0	17	18	5	18	20	11.0	10.1	9.0
Turkey x E. Blackhull	Wd. 37B-16-1	12	1	1	1	0	0	53	28	0	3	40	11.0	10.0	...
Turkey x E. Blackhull	Wd. 37B-16-3	10	2	5	1	1	0	37	38	2	20	8	12.9	11.1	...
Fire	Wd. 38B-1-11	16	9	5	9	2	0	28	40	5	14	43	14.2	...	...

Table 1. (Concluded).

Variety or cross	C. I. or selection No.	Average percentage of bunt at:											Weighted av.			
		Den-	Wd.-	Man-	Lin-	North	Fort	Boze-	Belts-	Kear-	Av.	Av.	Av.	Av.		
		ton	ward	hattan	coln	Platte	Collins	man	ville	neys-	Logan	for	and	to	to	
	Tex.	Okla.	Kans.	Nebr.	Nebr.	Colo.	Mont.	Md.	W.Va.	Utah	1944	1944	1944	1944		
Pawnee	11669	4	18	10	5	1	21	45	5	45	8	17.1	14.7	14.4	...	
(Qv x M-T) x H-Medit. Am.	42-2468	17	16	26	2	0	0	13	40	40	..	17.1	...	...	...
Hope x Minturki ²	Minn. 11-31-129	10	7	16	4	0	48	33	9	35	15	18.0	...	...	...
Minturki x Kawvale	Nebr. sel. 391498	17	10	17	2	0	35	17	25	50	37	19.2	...	...	...
Martin-Tenq x Kharkf	Am. 41-2510	10	13	41	9	1	0	10	50	50	1	20.4	...	...	...
Hope x Turkey	N.P. 112	23	16	13	1	0	46	28	5	65	43	21.9	...	...	...
Turkey x E. Blackhull	Wd. 37B-16-6	19	28	16	2	1	51	28	40	33	48	24.2	...	...	...
(Qv x M-T) x H-Medit. Am.	41-2469	21	20	44	2	1	1	25	40	70	1	24.9	...	...	...
Chieffkan x Mart-Ten	Am. 42-2500	16	31	42	3	0	0	23	40	75	1	25.6	...	...	...
Chieffkan x Mart-Ten	Am. 42-2511	37	37	51	13	0	0	15	70	70	T	32.6	...	...	...
Tenmarq	6936	27	42	44	17	8	44	17	65	60	23	36.0	...	...	...
Wichita	11952	23	50	46	13	4	47	40	50	60	..	37.0	35.7	39.0	...	
Khankof	1142	51	41	49	8	7	46	45	30	80	30	39.7	37.6	38.7	41.4	
Turkey 1069 x Kvale	Nebr. sel. 394709	47	67	47	6	2	46	60	6	85	38	40.7	...	...	...
Kawvale	8180	48	42	51	12	0	64	55	50	80	33	44.7	...	...	...
Cheyenne	8885	40	68	63	30	4	31	43	60	75	5	46.0	45.6	44.3	43.9	
Red Chief	12109	82	91	92	38	27	90	35	90	85	44	70.0	71.0	78.0	...	
Average		12.5	13.3	15.4	4.1	1.5	25.8	22.9	15.1	25.2	21.4	...	...	...	...

Table 2. Bunt infection on 7 varieties and strains of winter wheat grown in the Great Plains Supplement-ary Bunt Nursery at 10 stations in 1944.

Variety or cross	C. I. No.	Average percentage of bunt at:											Av. 1944
		Den-	Wood-	Man-	Lin-	North	Fort	Boze-	Belts-	Kear-	Av.		
		ton	ward	hattan	coln	Platte	Collins	man	ville	neys-	Logan	for	
	Tex.	Okla.	Kans.	Nebr.	Nebr.	Colo.	Mont.	Md.	W.Va.	Utah	1944		
Oro x Turkey-Florence (Comp. 2)		0	T	0	0	0	0	0	1	0	0	0	0.1
Hussar	4813	0	1	8	0	0	0	0	1	1	10	0	2.3
Oro	8220	1	3	4	0	0	0	14	13	1	1	5	4.1
Ridit	6703	1	7	3	2	0	0	7	4	2	12	1	4.2
Berkley Rock sel. (T-47-55)		0	17	33	0	0	0	39	6	15	..	..	13.8
White Odessa	4655	0	26	60	0	0	0	36	1	25	60	0	23.1
Chieffkan	11754	58	89	89	47	24	50	45	85	60	33	61.9	
Average		10.0	20.4	28.1	7.0	3.4	20.9	10.1	18.4	20.4	5.6	...	...

UNIFORM WINTER WHEAT RUST NURSERIES

In tables 23 and 24 are presented the data on severity of leaf rust and stem rust infection on the 33 varieties of winter wheat grown in uniform rust observation nurseries throughout the country in 1944. These nurseries are maintained as a part of a rust research program carried on in cooperation with agronomists and plant pathologists employed in the several States concerned. These preliminary data are included in this report through the kindness of Dr. H. A. Rodenhiser. Later a complete report will be issued and the rust percentages may not agree entirely with those presented here, since the data shown in this less detailed report include only figures for the severity and not the coefficient of infection.

Differential data for leaf rust infection were obtained for the varieties at 19 stations (table 23). At St. Paul, Minn., the data are rather incomplete due to winterkilling. Among the varieties classed as semihard Hope x Hussar (C. I. 11682) had the lowest average infection, being considerably lower than Kawvale and Harvest Queen x Kawvale (C. I. 12284). Among the varieties classed as hard red winter the best record was made by Comanche x Medit.-Hope (C. I. 12329). At all but 2 stations this variety had either a zero or trace of rust and averaged 0.3 percent. Mediterranean-Hope x Pawnee (C. I. 12287) ranked second with an average infection of 1.3 percent. Other varieties having low averages were Kawvale-Marquillo x Kawvale-Tenmarq (C. I. 12331), Kawvale-Marquillo x Tenmarq (C. I. 12330), H44 x Minturki² (C. I. numbers 12139 and 12138). Comanche and Pawnee had averages that were nearly identical and were considerably lower than such varieties as Kharkof, Tenmarq, and Kanred but somewhat higher than the more resistant strains.

Stem rust readings showing differential reaction were reported from 15 stations (table 24). Of the semihard red wheats Hope x Hussar (C. I. 11682) had the lowest average infection, followed by Minturki and Harvest Queen x Kawvale (C. I. 12284). Of the hard wheats H44 x Minturki² (C. I. 12139) averaged 1.5 percent and Comanche x Mediterranean-Hope (C. I. 12329) averaged 2.3 percent. Other varieties averaging less than 10 percent were Marmin x H44-Minhardi (C. I. 12328), Mediterranean-Hope x Pawnee (C. I. 12287), and H44 x Minturki² (C. I. 12138). Again Pawnee and Comanche had averages that were nearly identical and these varieties had less infection than did Kharkof, Tenmarq, and Kanred. The highest reading was for Kawvale-Marquillo x Tenmarq (C. I. 12330).

When both rusts are considered, Comanche x Mediterranean-Hope (C. I. 12329) has the best performance although Mediterranean-Hope x Pawnee (C. I. 12287) is nearly as good. These two wheats seem to combine considerable superior germ plasm for resistance to both rusts. Kawvale-Marquillo x Tenmarq (C. I. 12330) and Kawvale-Marquillo x Kawvale-Tenmarq (C. I. 12331) showed considerable resistance to leaf rust but were rather susceptible to stem rust.

Table 23.--Severity of leaf rust infection on winter wheat varieties grown in Uniform Rust Nurseries, 1944.

Class, variety, or cross	Percent severity of leaf rust infection at:										
	C. I. No.	College: Station: Tex.	Denton: Tex.	Fayetteville: Ark.	Stillwater: Okla.	Manhattan: Kans.	Lexington: Ky.	Wooster: Ohio	Lafayette: Ind.	Urbana: Ill.	Ames: Iowa
Soft Red											
Fultz sel. x Hung. sel.	12017	1	T	T	5	T	T	3	T	1	T
Fultz x Minturki	12218	1	T	T	1	T	T	5	5	10	0
Austin	12288	0	51	0	1	T	T	.	T	1	0
Trumbull x Fultz sel.	12220	10	T	T	10	T	T	5	10	5	10
Trumbull x Fultz sel.	12217	5	T	T	10	T	T	5	10	5	10
Wabash	11384	5	T	25	10	T	T	7	5	10	5
Denton	8265	15	25	50	10	25	0.5	5	1	5	20
Mediterranean	3332	20	35	90	25	20	5	10	85	45	50
Fulcaster	6471	35	60	30	50	60	8	40	85	50	40
Michigan Amber	5620	50	50	50	50	60	5	35	75	65	60
Trumbull	5657	40	50	75	50	60	10	35	85	40	70
Minhardi	5149	60	65	90	75	70	15	40	90	60	80
Semi-hard Red											
Hope x Hussar	11682	T	T	T	5	T	T	T	T	5	5
Kawvale	8180	1	10	25	10	10	1	3	25	5	20
Harvest Queen x Kawvale	12284	T	5	25	3	15	5	3	90	5	5
Hussar	4843	40	40	25	25	10	8	10	65	50	30
Minturki	6155	30	60	25	25	60	20	20	75	70	50
Hard Red											
Comanche x Medit.-Hope	12329	T	0	0	1	T	0	0	T	0	0
Medit.-Hope x Pawnee	12287	T	0	0	1	T	0	0	T	T	0
Kawvale-Marq. x Kaw.-Ten.	12331	5	T	0	1	T	0	1	5	1	0
Kawvale-Marq. x Tenmarq	12330	5	2	0	1	T	0	T	T	5	10
H44 x Minturki ²	12139	5	5	T	20	T	T	5	2	10	5
H44 x Minturki ²	12138	5	5	T	5	5	1	0	2	2	10
Kanred-Hd. Red. x Tenmarq	12110	5	T	0	1	T	T	20	15	15	10
Marmin x H44 Minhardi	12328	5	10	0	25	5	0.5	5	5	5	10
Comanche	11673	5	30	0	25	15	3	5	20	25	20
Pawnee	11669	5	5	0	25	25	20	25	15	5	20
Cheyenne x Tenmarq	11972	20	40	0	10	10	5	5	25	40	30
Kanred	5146	10	60	50	25	25	4	5	25	10	40
Tenmarq	6936	10	35	0	5	40	5	5	25	25	30
Malakof	4898	20	45	10	10	50	10	25	30	35	30
Wichita	11952	30	65	0	30	45	20	0	20	30	30
Kharkof	1442	20	65	5	25	60	20	15	65	45	60

1/ Seg. 0-10.

Table 23.--(Concluded).

Class, variety, or cross	Percent severity of leaf rust infection at:										Average all stations
	C. I. No.	Kana- Iowa	Co- Mo.	Lin- Nebr.	St. Minn.	Madison Wis.	Cha- Mich.	Belts- Md.	West- S. C.	Experi- ment Ga.	
<u>Soft Red</u>											
Fultz sel. x Hung. sel.	12017	0	5	T	..	1	10	1	2	0	1.7
Fultz x Minturki	12218	0	3	T	..	T	15	T	5	0	2.6
Austin	12288	0	30 ^{2/}	5	..	T	T	2	2	0	2.8
Trumbull x Fultz sel.	12220	5	10	5	..	2	5	3	5	0	4.8
Trumbull x Fultz sel.	12217	5	10	5	..	1	15	1	10	0	5.2
Wabash	11384	0	15	5	..	1	T	3	5	0	5.4
Denton	8265	15	25	20	..	30	40	10	..	5	17.7
Mediterranean	3332	20	100	25	..	10	40	50	40	5	37.5
Fulcaster	6471	40	100	80	..	20	30	50	65	5	47.1
Michigan Amber	5620	40	100	45	..	30	45	75	25	5	48.1
Trumbull	5657	..	100	85	..	20	40	75	40	5	51.8
Minhardi	5149	60	90	85	20	20	30	20	100	10	56.8
<u>Semi-hard Red</u>											
Hope x Hussar	11682	0	30 ^{3/}	10	..	T	1	T	1	0	3.2
Kawvale	8180	10	50	15	3	3	15	5	40	5	13.5
Harvest Queen x Kawvale	12284	5	60	15	10	10	50	5	25	5	18.0
Hussar	4843	20	80	70	..	1	20	10	5	5	27.4
Minturki	6155	30	100	85	10	10	40	35	25	5	40.8
<u>Hard Red</u>											
Comanche x Medit.-Hope	12329	0	0	T	0	T	3	T	..	0	0.3
Medit.-Hope x Pawnee	12287	0	0	T	..	T	20	T	1	0	1.3
Kawvale-Marq. x Kaw.-Ten.	12331	0	T	T	..	1	15	1	1	0	1.8
Kawvale-Marq. x Tenmarq	12330	T	5	5	..	2	15	T	2	0	2.9
H44 x Minturki ²	12139	T	5	15	0	T	4	T	0	0	4.1
H44 x Minturki ²	12138	T	25 ^{4/}	15	..	1	2	T	1	0	4.4
Kanred-Hd. Fed. x Tenmarq	12110	T	10	30	3	1	10	1	1	0	6.5
Marmin x H44-Minhardi	12328	T	20	25	..	T	60	T	0	0	9.5
Comanche	11673	10	20	30	..	2	35	T	1	0	14.4
Pawnee	11669	15	60	35	5	2	10	5	2	0	14.7
Cheyenne x Tenmarq	11972	15	60	60	5	10	60	3	1	0	22.1
Kanred	5146	30	80	60	2	5	20	5	25	5	25.9
Tenmarq	6936	30	80	65	..	10	15	8	25	5	27.1
Malakof	4898	40	80	60	3	3	35	5	1	5	28.3
Wichita	11952	20	40	80	5	10	20	5	..	0	31.1
Kharkof	1442	30	80	80	15	10	60	20	2	5	35.9

2/ Seg. T-60

3/ Seg. 3-60

4/ Seg. 5-50

Table 24.—Severity of stem rust infection on winter wheat varieties grown in Uniform Rust Nurseries, 1944.

C. I. No.	Percent severity of stem rust infection at:															Average all stations
	Col. Sta.: Tex.	Payetteville: Ark.	Stillwater: Okla.	Davis: Cal.	Manhattan: Kans.	Bexington: Ky.	Lafayette: Ind.	Urbana: Ill.	Ames: Iowa	Kanawha: Iowa	Clinton: Mo.	Lincoln: Nebr.	St. Paul: Minn.	Madi-son: Wis.	Chatham: Mich.	
Soft Red																
12288	65	0	1	0	T	T	0	2	0	0	0	T	..	T	5	5.3
12218	80	0	1	3	50	T	5	2	5	T	T	15	..	2	60	16.0
8265	80	10	1	50	60	T	35	50	15	5	T	30	..	20	40	28.3
3332	80	10	5	50	60	1	25	40	30	10	T	30	..	20	45	29.0
12220	80	T	20	65	60	20	5	25	25	5	10	30	..	25	40	29.3
12217	80	T	20	65	70	5	10	15	25	5	T	40	..	20	60	29.7
6471	80	25	1	50	70	T	15	35	15	5	T	50	..	30	60	31.2
5149	80	T	5	60	60	5	35	25	45	10	T	55	15	30	55	32.0
11384	80	T	20	55	60	5	10	40	20	5	T	60	..	25	70	32.1
5620	80	25	1	60	60	1	20	20	25	5	10	60	..	30	45	32.2
5657	80	25	1	60	70	3	20	5	15	..	T	50	..	25	75	33.0
12017	80	5	30	70	50	5	25	30	30	10	15	65	..	30	60	36.1
Semi-hard Red																
11682	50	0	..	0	5	T	0	T	10	0	T	T	..	T	3	5.3
6155	70	0	..	3	25	2	2	5	10	10	T	10	10	2	30	12.8
12284	80	0	1	3	50	T	T	5	5	0	T	15	2	5	40	13.7
8180	80	0	1	25	50	1	2	T	10	T	T	15	5	5	40	16.8
4843	90	T	1	60	60	T	25	10	25	5	T	50	..	20	70	29.7
Hard Red																
12139	15	0	0.5	0	T	T	0	0	5	0	0	T	0	0	1	1.5
12329	15	0	..	2	T	0	0	0	5	0	0	T	5	0	5	2.3
12328	25	0	..	0	2	0	0	0	0	0	0	10	0	1	3	3.0
12287	50	0	0.5	0	T	0	0	0	0	0	0	T	..	T	5	4.0
12138	50	0	0.5	5	T	0	0	0	10	0	0	T	..	1	8	5.1
11952	70	0	0.5	2	10	T	T	0	10	0	0	T	10	20	20	10.9
11673	55	0	1	15	45	T	2	T	5	0	T	10	..	20	25	12.8
11669	90	0	0.5	1	30	T	T	10	5	5	T	10	2	15	30	12.9
11972	60	0	0.5	10	45	T	10	3	15	T	T	25	5	20	35	15.3
5146	60	T	1	55	25	T	5	0	10	T	T	10	15	15	35	15.5
4898	90	0	1	15	50	T	2	5	15	5	T	25	5	20	40	18.2
12331	80	0	5	3	40	0	2	2	10	T	T	40	..	15	50	18.3
6936	60	0	1	50	45	1	2	2	15	T	T	25	..	25	60	20.5
1442	75	0	0.5	25	45	2	10	2	20	5	T	25	25	20	60	20.9
12110	40	0	5	40	40	0.5	T	3	10	T	T	35	35	50	60	21.3
12330	80	T	25	45	50	0.5	T	2	10	10	10	60	..	60	55	29.3

