

Schmidt

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

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COMPARISON OF
WINTER WHEAT VARIETIES GROWN IN COOPERATIVE
PLOT AND NURSERY EXPERIMENTS IN THE
HARD RED WINTER WHEAT REGION
IN 1950

Lincoln, Nebraska
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THE UNITED STATES OF AMERICA
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

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IN 1950

By

L. P. Reitz, Agronomist, 1/

Division of Cereal Crops and Diseases

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1/ The writer expresses appreciation to Dorothy M. Wilson, Agent, Virgil A. Johnson, and Marjorie Thomas for their assistance in preparing this report.

EXPERIMENTS IN 1950

This is the twentieth regional report on hard winter wheat improvement. In most areas of man's activities it would be time to reminisce but in wheat breeding such a privilege is scarcely justified since only about two cycles of breeding can be completed in such a span of years. Even so, farmers are growing with profit varieties totally unknown when the program was inaugurated and more new varieties are coming out year by year. In fact several are named in this report. Many "almost-as-good" selections are under observation and perhaps a few superior lines will be pointed out in the pages which follow. If the various plant breeders' ideals come into existence in new varieties, all varieties grown now will quickly become extinct. They are not idle dreams either since in most cases a specific desired characteristic exists somewhere in wheat or a relative but has not been combined with the other desired traits. True progress consists of holding the gains already made and taking a step forward. In wheat breeding, shifting from one incomplete pattern of rust resistance, for example, to another incomplete pattern, may be good dodging and worthwhile but can be scarcely called true progress. It is expected that new varieties after another score of years of breeding will be more rugged and have great permanency of performance.

Workers from 12 states and the U. S. Department of Agriculture met January 23 to 25, 1950, at Stillwater, Oklahoma, for the Sixth Regional Hard Red Winter Wheat Improvement Conference. At this conference past research was reviewed and future plans were discussed. Aspects of the regional program were evaluated, and recommendations were made governing future policies. This conference and the mimeographed report of it should serve as a guide and handy reference to research in progress, goals, and procedure for several years. A few copies of the conference report are still available.

Experiments in 1950 on the uniform variety and nursery tests are reported in the present volume. This report is similar to those which have preceded it since the present style seems to meet with general approval in the region as a whole. Suggestions for improvement are always welcome.

Many workers, testing stations, and agencies cooperate in making this report and all related activities of the regional program possible. Appreciation for this work and the fine spirit with which it is rendered is gratefully acknowledged. Those stations and persons most closely associated with the program in 1950 are given in the following list. The Lawton, Oklahoma, station was closed during the year. In its passing we lost a dependable testing point and the loyal station superintendent, W. M. Osborn (retired). It is with a deep sense of loss that we record here the death in November of L. C. Burnett.

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 Coordinator

Rust and Smut

Milling and Baking

K. S. Quisenberry

S. C. Salmon

L. P. Reitz

C. O. Johnston, H. A.

Rothenhiser

J. A. Shellenberger, Karl
Finney.

TEXAS AGRICULTURAL EXPERIMENT STATION:

Agronomy (Corn and Small Grains)

College Station Agricultural Exp. Station	J. E. Adams
Denton Substation No. 6	E. S. McFadden
Chillicothe Substation No. 12	I. M. Atkins (State leader)
Bushland Amarillo Experiment Station	J. R. Quinby, Don George
	K. B. Porter

OKLAHOMA AGRICULTURAL EXPERIMENT STATION:

Field Crops and Soils

Stillwater A. & M. College	H. F. Murphy
	A. M. Schlehner (State leader), T. H. Johnston
Cherokee Wheatland Conservation Station	A. A. Garrett
*Woodward Southern Great Plains Field Sta.	R. Hunter
Goodwell Panhandle Agr. Exp. Sta.	Raymond Peck

KANSAS AGRICULTURAL EXPERIMENT STATION:

Agronomy

Manhattan Kansas State College	H. E. Myers
	H. H. Leude, E. G. Heyne, and D. E. Weibel
Hays Ft. Hays Branch Exp. Station	A. F. Swanson, A. J. Casady
Colby Colby Branch Station	E. H. Coles, Don Crumbaker
Garden City Garden City Agr. Exp. Station	A. E. Lowe, A. B. Erhart

COLORADO AGRICULTURAL EXPERIMENT STATION:

Agronomy

*Akron U. S. Dry Land Field Station	D. W. Robertson
Fort Collins State Agricultural College	J. F. Brandon, T. E. Haus
Hesperus Fort Lewis Substation	T. E. Haus
	D. W. Koonce

IOWA AGRICULTURAL EXPERIMENT STATION:

Ames Iowa State College	L. C. Burnett, R. E. Atkins
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NEBRASKA AGRICULTURAL EXPERIMENT STATION:

Agronomy

Crops Research	F. D. Keim
Lincoln Agricultural Experiment Sta.	T. A. Kiesselbach
North Platte North Platte Substation	L. P. Reitz, O. J. Webster
Alliance Box Butte Experiment Farm	M. Greenwood
	Harold Chapman, L. P. Reitz

WYOMING AGRICULTURAL EXPERIMENT STATION:

Agronomy

Laramie Agr. Experiment Station	A. F. Vass
*Sheridan U. S. Dry Land Field Station	Dale Bohmont
	C. R. Hills

SOUTH DAKOTA AGRICULTURAL EXPERIMENT STATION:

Agronomy

Brookings Agr. Experiment Station	W. W. Worzelle
	J. E. Grafius

MINNESOTA AGRICULTURAL EXPERIMENT STATION:

Agronomy and Plant Genetics

St. Paul University Farm	H. K. Hayes
Waseca Southeast Experiment Station	E. R. Ausemus
Grand Rapids	R. E. Hodgson
	E. R. Ausemus

NORTH DAKOTA AGRICULTURAL EXPERIMENT STATION:

Agronomy

Dickinson Dickinson Substation

T. E. Stoa
T. J. Conlon

MONTANA AGRICULTURAL EXPERIMENT STATION:

Agronomy

Bozeman Montana Experiment Station
Moccasin Judith Basin Branch Station
Havre North Montana Branch Station

A. H. Post
E. R. Hehn
Ralph Williams
L. O. Baker

CANADIAN DOMINION OF AGRICULTURE:

Lethbridge, Alta. Agr. Experiment Station B. C. Jenkins

2/ Cooperation with Division of Soil Management and Irrigation, Bureau of Plant Industry, Soils, and Agricultural Engineering, as well as with the State experiment stations.

ACCESSION NUMBERS ASSIGNED

Cereal Investigation (C. I.) numbers of the Division of Cereal Crops and Diseases were assigned this season to the strains of wheat listed at the end of this paragraph. After such a number is assigned, state or selection numbers are no longer referred to in these reports. Cooperators are urged to adopt them because of their great convenience in interstate communication.

<u>C. I. No.</u>	<u>Name</u>	<u>State No.</u>
12707	Pawnee selection No. 33	F. J. Faleigh, Clyde, Kans.
12708	Comanche x Cheyenne-Blackhull	Okla. Wd. 43h3-86
12709	Blackhull-Oro x Pawnee	Okla. Wd. 43h1-398
12710	Comanche x Blackhull-Hard Federation	Okla. Wd. 43h2-315
12711	Cheyenne x Turkey	Nebr. N.P. 40672
12712	Hope-Turkey 1069 x Turkey 1069	Nebr. 456446
12713	RedJacket (44-13)	E. G. Clark, Sedgwick, Kans.
12714	NewChief (44-166)	E. G. Clark, Sedgwick, Kans.
12800	Medit. -Hope x Pawnee ²	Kans. 48R779-2
12801	(Comanche x Medit. -Hope) x Chiefkan	Kans. 48R916-2
12802	Robin-Gaza-Robin x Pawnee	Kans. 48R1012-2
12803	T. timopheevi x T. vulgare ³	Kans. 48R2023-2
12804	Medit. -Hope-Pawnee x Oro-Ill.1-Co- manche	Kans. 49454
12805	IVcl-Comanche x Comanche-Pawnee	Kans. 472907
12806	Minturki x T. timopheevi-vulgare ²	Minn. 11-40-102
12807	Minhardi x H44-Minturki ²	Minn. 11-40-113

NEW VARIETIES

Quanah, Kiowa, Red Jacket, and NewChief made their appearance this year as new varieties. Quanah (C. I. 12145) has been increased for two years under control in Texas. In the fall of 1950, 3,900 bushels harvested from 270 acres were released for growing in the Central and Rolling Plains area of Texas. The superior characters of Quanah are greater leaf and stem rust resistance, bunt resistance, and good quality. It appears to lack resistance to drought and cold.

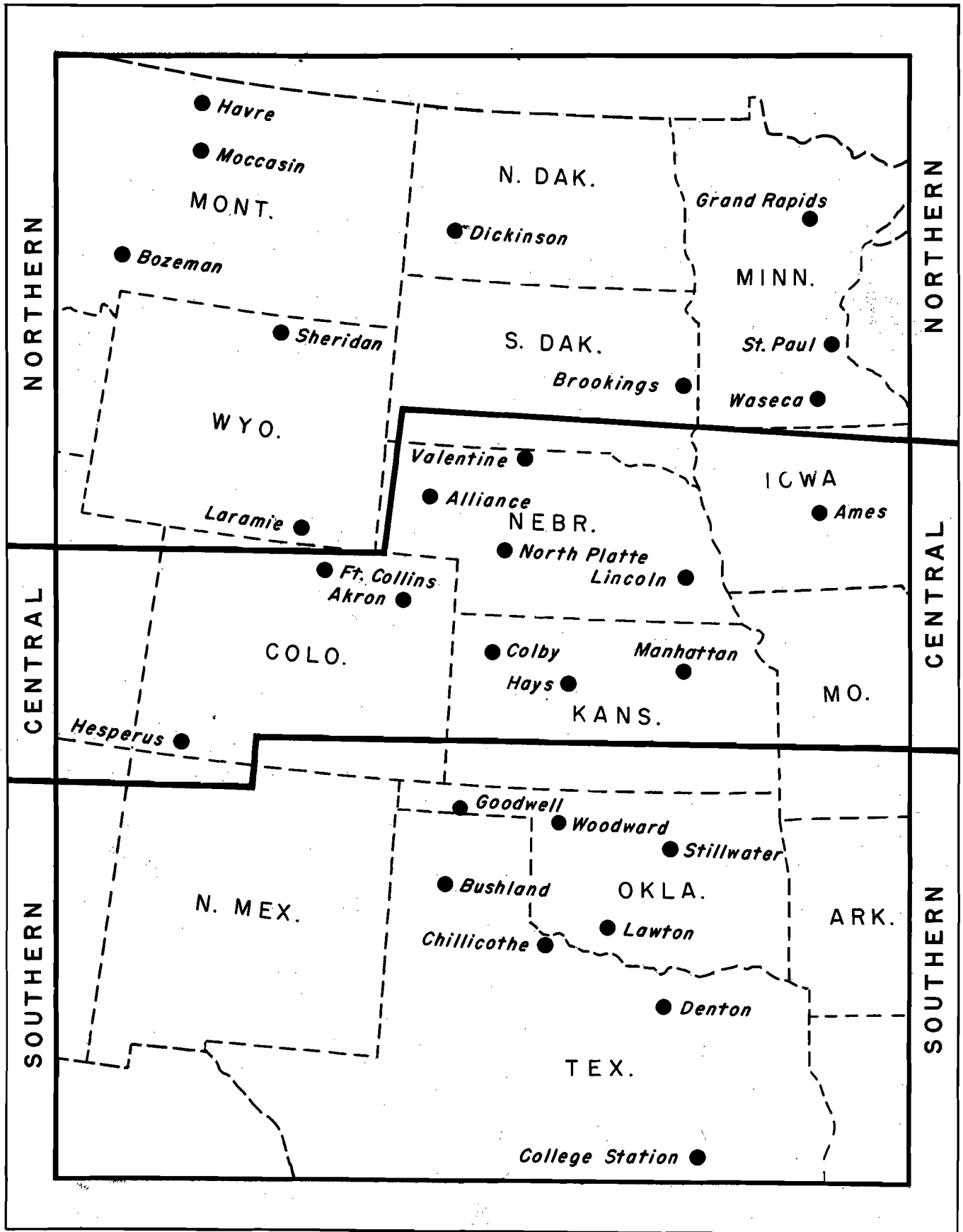
Kiowa has been known in regional testing as Chiefkan x Oro-Tenmarq (C. I. 12133). Bred and released at the Hays, Kansas, station and tested widely in the region since 1945, it appears adapted in the west half of Kansas and adjacent High Plains areas. Its superior characters include high yield, good test weight, good straw strength, bunt resistance, and some resistance to shattering. It is quite susceptible to loose smut and to the rusts. About 1700 bushels were grown in 1950 for release.

Red Jacket and NewChief are releases by E. G. Clark. The former resembles Red Chief but is bearded while the latter is more like Chiefkan. During two years, involving 13 tests in the Kansas intrastate nursery, these varieties yielded less than Pawnee and Kiowa but had better test weight. Both were rated unsatisfactory in bread making since loaf volumes ran 10 to 15% lower than standard varieties. Several hundred bushels of each were available for sale in the fall of 1950 and undoubtedly much of this was sold and planted.

UNIFORM VARIETIES IN FIELD PLOTS OR ADVANCED NURSERIES

Uniform tests are planned by districts--southern, central, and northern as shown by the map which accompanies this report. Sometimes a test covers several districts or a district may be divided. This plan was continued in planning for tests in 1951. Uniform varieties for 1950 and 1951 are as follows:

Variety	C. I. No.	1950				1951			
		S	C	NE	NW	S	C	NE	NW
Kharkof	1442	x	x		x	x	x		x
Tenmarq	6936	x	x			x	x		
Early Blackhull	8856	x				x			
Comanche	11673	x	x			x	x		
Pawnee	11669		x				x		
Red Chief	12109	x	x			x	x		
Wichita	11952		x						
Triumph	12132	x				x			
Kiowa	12133	x	x			x	x		
Chiefkan x Oro-Tenmarq	12518						x		
Kv.-Mgo. x Kv.-Tenmarq	12128	x	x			x	x		
Quanah	12145	x				x			
Minturki	6155			x				x	
Yogo	8033				x				x
Marmin	11502			x					
Minter	12138			x	x			x	x
Marmin x H44-Mint.	12508			x					
H44 x Minturki ²	12532			x				x	
Marmin x H44-Minhardi	12520			x					
Minhardi	12510			x				x	
Ridit x Kharkof	12521				x				x
Martin x Tenmarq	11824				x				
H44-Minh. x Marmin	12704			x				x	
Turkey x Oro	12705				x				x



Several varieties of commercial importance have been dropped, along with several selections of experimental interest only. When strains pass into commercial production, after having been tested many years, there is no longer any justification for continuing them except as check varieties and local option therefore has been adopted as the basis for including certain named strains when not included in the list of uniform varieties. Permanent checks for the southern district are Kharkof, Tenmarq, and Early Blackhull and for the central district are Kharkof, Tenmarq, and Pawnee. In the northeast Minturki and in the northwest section Kharkof have been designated permanent checks. New varieties should be included in the uniform plot series of the district of expected adaptation for a year or more before they are named and released. This provides an abundance of information on which final action relative to a strain can be based.

In this report, all varieties tested by each cooperator in the plot series are listed along with the uniform varieties, thus giving a complete view of those strains in advanced tests at each station.

PLOT DATA

Varietal trials conducted in field plot or advanced nursery tests are reported in table 1 from 24 stations in 9 states. Conditions region-wide varied over great extremes as the yields of grain show. Many different environmental conditions were encountered of which drought, winterkilling and greenbugs were the most common hazards to crop growth. Rainfall in the summer of 1949 was ample over most of the region for preparation of seedbeds and good stands generally were reported. Fall and winter precipitation was extremely light or spotted so that surface soil, and, as the year wore on, subsoil too became dry. Amarillo, Texas, reported that the driest six months in 58 years began October 1. From October 10 to mid-February most of western Kansas, eastern Colorado, and western Nebraska had ineffectual precipitation and almost no snow cover. Low temperatures (as low as -34° at Oshkosh, Nebr., January 4) and the drought killed practically all above-ground portions of the wheat plant. It was feared that much wheat would be abandoned and this was the case in the southwestern states but not in Nebraska and much of Kansas. Drought combined with greenbugs and other adversities brought abandonment to more than 50% of the seeded acreage in Texas and New Mexico, and Oklahoma production was drastically reduced. Drought and a cold winter adversely affected the crop in Montana and North Dakota resulting in considerable abandonment of commercial and experimental plantings. The northeastern district fared better as the data testify.

In contrast to 1949, diseases were of minor importance in most of the winter wheat belt. Stem rust developed too late to do damage to any but a few late fields. Considering what little there was, it is quite alarming that the virulent races 15 and 15B were identified from many collections from Texas to the Canadian border. Leaf rust was common all along the eastern fringe of the region and while it probably did some damage, it was only a minor factor in most of the hard winter wheat belt. Mosaic is rather difficult to diagnose in the field but typical symptoms were observed on wheat in western Oklahoma, western Kansas, Colorado, and Nebraska. Except for a few fields, damage was light or nil.

Greenbugs, the brown wheat mite, and hessian fly were important economic pests in 1950. For the most part the fall was unfavorable for hessian fly infestation but north-central and northwestern Kansas communities and the adjacent territory in Nebraska, and in southeast Nebraska, reported infestations this spring up to 75%. The unusually dry fall, winter, and spring and cold weather in the spring were ideal conditions to favor an outbreak of mites in

March and April and greenbugs in April and May from the Texas Panhandle and southwestern Oklahoma across western Kansas and Nebraska to eastern Colorado and Wyoming. The greenbug was the most widely distributed of the two. Partial control was effected by spray applications of parathion and some other chemicals. Clearly a search for resistance to such pests should be continued and increased.

In spite of everything adverse, a big crop of winter wheat was produced. In rounded millions of bushels by states according to the U. S. Bureau of Agricultural Economics; Office of Agr. cultural Estimates, yields were as follows: Texas 22.7, Oklahoma 43.6, Kansas 178.1, Nebraska 84., Colorado 38.2, Wyoming 5.1, Montana 25.2, South Dakota 3.6, Iowa 5.5, Minnesota 1.2, and the entire U. S. 750.6.

At Denton, Texas, a favorable and mild fall was followed by a dry, cold winter. Rather late spring freezes injured early wheats as did the prolonged drought and aphids also. Later varieties were able to take advantage of the cool and moist fruiting period with the result that fair yields were produced. Leaf rust became abundant on susceptible varieties but stem rust was light. A Sinvaloch hybrid, C. I. 12511, Quannah, and C. I. 12128 yielded the most grain this year. Comanche has the best 7-year average and has the highest relative yield in percent of Kharkof. Quannah, available now in the Denton area, has many of the characteristics of Comanche plus greater rust resistance. In the two-year comparisons it has exceeded Comanche by 0.5 bushels.

The Chillicothe test suffered from drought throughout the winter and early spring. Rains came in time to produce a good crop with late maturing varieties best able to utilize the moisture. C. I. 12702, Blackhull, Kiowa, Kharkof, and Kamrod exceeded 33.0 bushels to the acre, whereas Triumph yielded least or 23.7 bushels to the acre. Leaf rust readings were not related to yields this season but Fronteira and Sinvaloch hybrids exhibited good resistance. C. I. 12702 has the best 2-year average yield, Comanche and Wichita the best 5-year averages, while C. I. 12511, C. I. 12702, and Quannah have the best relative yields in terms of the Kharkof check.

The Bushland test was severely damaged by drought, winterkilling, mites and greenbugs. Only the fall irrigated plots made grain. Three Blackhull derivatives, Comanche and Blackhull ranked highest in yield this year. Two-year averages favor Red Chief, Blue Jacket, and Kiowa while these along with C. I. 12128, Pawnee, and Comanche all have very high relative yields in terms of the Kharkof standard.

At Stillwater, Oklahoma, yields and test weights were somewhat above average. C. I. 12517 was easily the outstanding entry, although Wichita and Westar looked good. Westar has the highest 2-year, 5-year, and relative average yield; Comanche and Pawnee are the best yielding of the older varieties. Drought in early spring made straw short and delayed the rusts.

C. I. 12517 and Wichita were the highest yielding wheats at Cherokee. Drought and greenbugs, and possibly winter injury reduced the crop materially and probably affected varieties differently but the action of each can scarcely be separated when they act simultaneously. Five-year average yields point to the superior adaptation in this area of Triumph and Red Chief.

The Woodward test was subjected to severe drought in winter and early spring and to greenbugs in April. Variable soil and these hazards made the fourth replication too uneven for harvesting. Straw was short, test weights were good, but yields were below average. C. I. 12517 led in yield followed by Cheyenne, Red Chief, and Westar. Two-year averages favor Westar and Pawnee by a slight margin. The 7-year averages are highest for Red Chief, Pawnee, Wichita, Westar, and Cheyenne.

The planting at Goodwell was abandoned because of drought, mites, and greenbugs.

Rather complete data were obtained at Manhattan, Kansas, where good yields and test weights prevailed for all varieties. Wichita, Stafford, Westar, and Pawnee were named varieties yielding over 44 bushels to the acre. Four unnamed selections also exceeded this yield. Leaf rust became abundant late in the season and seemed only slightly related to grain yield. Two-year averages over 40 bushels were made by Wichita, Westar, Ks. 2795, Pawnee, C. I. 12128, and C. I. 12505, whereas 6-year averages this high were made by Westar, Pawnee, and C. I. 12128. Seven entries have exceeded the yield of Kharkof by over 50% for the entire time ranging from 2 to 13 years that each has been compared with the Kharkof standard.

Winter drought and cold thinned all varieties at Garden City, especially C. I. 12128, Early Blackhull, and C. I. 12505. Mites early and greenbugs later in the spring caused some damage. Some mosaic was evident in most of the plots. Yields and test weights were below average. Pawnee and Wichita outyielded other varieties. These with Westar, Kiowa, and Ks. 2795 have the best 2-year average yields. In the 5-year averages it is seen that Kiowa, Comanche, and Pawnee rank high.

At Hays the winter and spring were very dry but 6 inches of rain in May greatly improved crop prospects. In general, yields and test weights were below average but better than in 1949. Loose smut was abundant in several varieties, but in the new seed of Kiowa especially the incidence of this disease has been greatly reduced by treating with hot water. The average yields for the recent 5-year period show only small differences among most of the varieties; however, Westar and Kiowa are highest. Longer years of testing point to Pawnee, Early Blackhull, Comanche, Red Chief, and others as highly productive varieties for this area.

Good yields and test weights were produced at Colby. Wichita and Kiowa led the field in yield; Red and Blue Jacket, and Red Chief were lowest. For the 2-year period shown, Kiowa has the highest yield and in the 4-year period Kiowa is also highest. Comanche, Pawnee, and Wichita have good long-time averages.

Spring drought and greenbugs kept the crop on the brink of disaster at Akron, Colorado, until mid-June when a period of cool, moist weather commenced. In the end rather good yields and test weights were produced with some of the higher yields being made by moderately late wheats like Cheyenne and Kharkof. C. I. 11970, Kiowa, Red Chief, and Wichita exceeded 22 bushels to the acre also. Over a 12-year period C. I. 11970 has been consistent in producing high yields at this station.

In the irrigated test at Ft. Collins all varieties except Triumph exceeded 40 bushels to the acre. C. I. 11972 was highest followed by Kharkof and Cheyenne. The best relative yields have been made by C. I. 11972, Pawnee, Kiowa, Wichita, and Comanche. Only one strain (C. I. 12128) showed much resistance to leaf rust.

Although rainfall was low at Lincoln, Nebraska, high yields and test weights were produced. Leaf rust came in too late to affect yields much if any. Nebred, Comanche, Cheyenne, Tenmarq, C. I. 12142, Wichita, and Pawnee exceeded Kharkof which yielded 52.6 bushels to the acre. Two-year averages favor C. I. 12523, C. I. 12500, and Pawnee. Among 4-year averages Pawnee and Red Chief excel although the latter variety has been somewhat erratic. Only three varieties tested two or more years have relative averages below Kharkof.

Some winterkilling and extended dry winter and spring weather at North Platte made the outlook for a crop doubtful for a time but a cool, moist fruiting period enabled the wheat to produce near normal yields of good quality grain. Cheyenne, Nebred, and Kharkof were highest among the varieties compared. Two-year averages favor Nebred, Cheyenne, and C. I. 12128 while for all years on a relative basis, Wichita, Pawnee, Red Chief, and Cheyenne are the leaders.

Winterkilling and spring drought depressed yields at Alliance. A hailstorm July 18 just as most varieties were reaching maturity further depressed yields especially in the case of Pawnee. Highest yields were made by Hope x Cheyenne² and C. I. 12711 but Cheyenne, Nebred, and Kharkof were not far behind. Six-year averages show that C. I. 12142 has made the highest yield. In percent of Kharkof, C. I. 12523, 456812, C. I. 12142, C. I. 12128, 422123, and C. I. 12711 are the six entries with the highest percentage rating but have not been tested longer than 6 years.

The nursery at Ames, Iowa contained 12 varieties in addition to the uniform yield nursery list of 27. These 12 along with Kharkof and Pawnee are reported with the plot series. Kawale, Iotürk, and Minter averaged over 40 bushels to the acre. Many of the varieties have been grown at Ames for many years but the present arrangement of testing has been in operation only 2 years so yields for earlier years are not given. Blackhawk showed the most resistance to leaf rust.

Rather complete data were obtained at Waseca, Minnesota. Winterkilling, lodging, and leaf rust affected the appearance of the crop but were only slightly related to yield of grain. Minterki, Minter, Marmin, and Blackhawk gave the highest yields this year and have the best period averages.

A farm test at Worthington is reported to give a wider range of testing experience with the northeastern district wheats. Minn. 2795, 2811, Marmin, and Minter came out best in yield.

At St. Paul all varieties survived the winter with good stands although some killing occurred. Rust did not develop sufficiently for reading. Test weights were low; only four varieties tested over 57 pounds. Iohardi ranked first in yield this year but has the lowest 2-year average. C. I. 12704, C. I. 12532, and Minter have the best 4-year averages.

Winterkilling at Grand Rapids reduced all stands to 73% or below but all varieties retained productive stands, recovered in a gratifying manner, and produced good yields and test weights. Stem rust attacked some varieties, especially Blackhawk and Iohardi. Minn. 2809, Marmin, and C. I. 12520 made the most grain. Minter has the best long-time average.

Loss of stand during the winter at Brookings, South Dakota, affected the yields of some, perhaps all varieties. Pawnee survived poorest and made the lowest yield. C. I. 12704, Minn. 2784, C. I. 12506, and C. I. 12508 made the highest yields. All test weights were good. Leaf rust was 80% on all entries except Iowin but only a trace to 1% of stem rust developed. Records covering 4 to 6 years indicate that C. I. 12506, Minn. 2784, and C. I. 12704 have been the most productive varieties at this station.

At Sheridan, Wyoming, another good crop was produced by all varieties in the test. Yield differences were not quite significant at the 5% point this season. Kunred, Cheyenne, and Nebred have the best 2-year and 6-year averages. Among varieties tested 14 to 20 years Cheyenne and Kanred appear most productive.

1. The first of the references is to the "1964-65" season, which is the season of the 1964-65 season.

2000

[illegible]

Table 1. Yield of grain and other data for winter wheat varieties grown in replicated plots in cooperative experiments at 24 stations in the region in 1950, with average yields for various periods.

Denton, Texas
Ten plots ; rod rows

Variety	C.I. No.	Date		Plant Height Ins.	Top Growth (Fall) %	Rust		Weight per bushel lbs.	Average acre yield			No. Years Grown	Percent of Kharkof	Rank
		Head- ed	Ripe			Leaf	Stem		1950	1948- 50	1943- 50			
		April	May			%	%		Bus.	Bus. 2/	Bus. 2/			
Sinv.-Wich. x Hope-Cheyenne Tx. 208-46-12 ^{1/}		24	6-2	27	110	T	0	59	14.5	-	-	1	-	-
29-34-275 D. Cross	12511	26	31	28	110	8	0	58	13.8	-	-	2	126.9	2
Quanah	12145	19	30	27	110	5	0	58	13.4	17.0	-	3	107.2	8
Kawv.-Mgo. x Kawv.-Tenq.	12128	24	27	29	105	18	0	60	13.4	17.3	-	2	100.6	13
Denton	8265	30	6-2	31	101	16	6	57	13.2	17.3	19.1	18	108.5	7
29-34-275 D. Cross	12504	24	6-1	28	105	5	0	58	13.1	17.0	-	2	98.5	16
(Sinv.-Wich. x Hope-Chey.)x Wich.	12702	21	31	29	105	5	0	60	12.9	-	-	1	-	-
29-34-275 D. Cross	12512	26	6-1	29	110	3	0	58	12.6	-	-	1	-	-
Mediterranean	10086	25	30	29	100	45	T	58	11.6	15.5	19.4	18	105.2	11
Kanred	5146	30	6-2	27	95	68	3	56	11.0	17.9	19.5	18	114.0	5
(Sinv.-Wich. x Hope-Chey.)x Wich.	12703	17	29	28	105	2	0	59	10.8	-	-	1	-	-
Kiowa	12133	26	29	27	100	80	0	-	10.3	18.3	-	2	106.1	9
Wichita	11952	18	27	27	100	85	T	-	10.2	17.3	19.2	7	103.5	12
Sinv. x Wichita	Tx. 201-46-48 ^{1/}	12	26	26	110	T	3	-	10.1	-	-	1	-	-
do	Tx. 201-46-33	12	28	26	120	5	T	-	9.7	-	-	1	-	-
Kharkof	1442	5-2	6-3	26	90	68	8	56	9.7	17.2	18.5	18	100.0	14
(Sinv.-Wich. x Hope-Chey.)x Wich. Tx.														
	237-46-26-2	14	27	25	100	8	0	-	9.5	-	-	1	-	-
Tenmarq	6936	30	6-1	27	100	67	5	56	9.3	16.8	18.3	18	119.4	4
Blackhull	6251	28	6-1	27	105	45	T	58	9.0	17.3	18.3	18	109.2	6
Sinv. - Wich. x Hope-Chey.	12701	13	29	26	100	15	0	-	8.9	-	-	1	-	-
Red Chief	12109	29	6-2	28	90	65	T	-	8.6	16.7	19.6	7	105.8	10
Comanche	11673	23	30	26	100	38	T	-	8.6	16.5	22.4	11	137.7	1
Triumph	12132	13	25	25	100	63	T	-	8.1	16.2	-	4	99.4	15
Early Blackhull	8856	14	24	27	110	70	T	-	7.7	15.6	20.9	16	120.2	3
(Sinv.-Wich. x Ho.-Chey.)x Wich. Tx.														
	237-46-25-1 ^{1/}	10	23	23	110	8	0	-	6.8	-	-	1	-	-

^{1/}Winter survival not 100% but was 85, 90, and 50 respectively. ^{2/}No crop in 1949.
Standard error of a difference = 0.85 bus.

Chillicothe, Texas
Ten plots ; rod rows

Variety	C. I. No.	Date		Plant Height	Top Growth 3-6	Leaf Rust	Weight per bushel	Average acre yield			No. Years Grown	Percent of Kharkof	Rank
		Head- ed	Ripe					1949- 50	1946- 50				
										April			
(Sinv.-Wich. x Hope-Chey.) x Wich.	12702	20	27	32	120	10	64	35.2	36.9	-	2	125.3	2
Blackhull	6251	23	6-1	32	110	5	63	34.3	27.6	28.6	13	108.5	10
Kiowa	12133	19	28	28	110	20	63	33.8	29.8	-	3	106.4	12
Kharkof	1442	27	6-1	31	95	10	62	33.6	29.4	27.2	13	100.0	15
Kanred	5146	25	6-1	34	90	10	62	33.6	30.5	27.7	13	102.3	14
Sinv.-Wich. x Hope-Cheyenne Tx.	208-46-12	22	28	27	130	T	62	33.0	-	-	.1	-	-
Tenmarq	6936	23	6-1	30	90	29	62	32.2	27.1	27.4	13	109.1	9
29-34-275 D. Cross	12512	22	29	28	120	T	63	32.1	-	-	.1	-	-
Quannah	12145	19	27	32	125	0	62	31.9	33.7	-	.4	119.9	3
Kawv.-Mgo. x Kawv.-Tenq.	12128	19	27	32	110	0	62	31.6	34.5	-	.3	113.7	6
Comanche	11673	21	27	32	100	5	62	31.1	28.8	30.7	13	117.2	4
Wichita	11952	16	22	33	105	20	64	30.2	30.3	30.4	9	116.3	5
29-34-275 D. Cross	12511	22	28	33	120	0	62	29.9	32.8	-	.3	132.3	1
Early Blackhull	8856	11	23	32	110	10	62	29.8	29.6	29.5	13	110.2	8
Sinvalocho x Wichita Tx.	201-46-33	11	22	30	125	T	62	29.5	-	-	.1	-	-
29-34-275 D. Cross	12504	22	28	31	125	T	62	28.6	30.9	-	.4	108.4	11
Red Chief	12109	24	6-2	28	90	30	62	27.1	28.8	29.8	9	110.3	7
(Sinv.-Wich. x Hope Chey.) x Wich.	12703	17	26	31	120	T	63	26.9	-	-	.1	-	-
Sinv.-Wich. x Hope-Cheyenne	12701	13	22	27	115	T	62	26.8	-	-	.1	-	-
Triumph	12132	12	21	32	110	10	62	23.7	26.2	28.9	5	106.3	13

Standard error of a difference = 1.99 bus.

Bushland, Texas

Three plots; rod rows; irrigated in fall

Variety	C. I. No.	Survival ^M		Date		Plant Height	Average acre yield			No. Years Grown	Percent of Kharkof	Rank
		Dry	Irrig.	Head-	Ripe		1950	1949-	1942-			
		3-20	4-6	ed			Bus.	Bus.	Bus.			
		%	%	May	June	Ins.						
Red Chief	12109	80	90	26	30	21	15.5	27.6	22.2	7	117.8	5
Kiowa	12133	75	62	23	26	20	14.0	26.4	-	3	128.1	2
Blue Jacket	12502	79	87	24	27	23	13.7	26.9	-	2	131.9	1
Gomanche	11673	83	90	23	26	20	11.3	25.3	22.4	11	116.3	6
Blackhull	6251	87	88	27	28	19	10.9	23.9	22.4	14	108.0	8
Pawnee	11669	55	84	24	26	16	10.5	25.8	22.4	11	117.9	4
Early Blackhull	8856	80	84	19	23	17	9.3	23.7	19.5	13	98.0	14
Tenmerq	5016936	50	86	26	28	17	9.3	23.2	20.8	14	106.7	9
Kawv. - Moq. x Kawv. - Tenq.	12128	63	66	25	27	16	9.1	-	-	2	118.3	3
Wester	12110	80	90	23	26	18	8.8	22.0	21.3	7	113.4	7
Wichita	11952	95	83	20	23	16	7.2	22.1	19.0	7	101.0	10
Kharkof	1442	83	70	6-1	7-1	18	6.6	20.4	18.8	14	100.0	11
Triumph	12132	75	88	20	23	11	6.5	21.8	-	4	99.1	12
Quannah	12145	43	9	-	-	-	2.5	20.1	-	3	98.4	13

1/ From winter and green bug damage. 2/ No crop in 1945 and 1946.

Standard error of a difference = 2.15 bus.

Stillwater, Oklahoma
Four 1/65 acre plots, Perkins Field

Variety	C. #	Date		Plant Height	Weight per bushel	Average acre yield			No. Years Grown	Percent of Kharkof	Rank
		Head- ed	Ripe			1950	1949- 50	1946- 50			
				Ins.	Lbs.	Bus.	Bus.	Bus.			
Comanche x Blackhull - Hd. Fed.	12517	4-29	6-8	28	63.5	31.6	-	-	1	-	-
Wichita	11952	4-25	6-1	29	64.2	27.6	22.3	21.1	6	97.3	15
Westar	12110	5-2	6-8	27	61.8	26.5	25.7	24.8	5	115.7	1
Moking	12556	5-5	6-13	31	63.7	25.2	22.9	-	4	103.5	9
Clarken	8858	5-4	6-12	31	62.9	25.1	23.0	22.3	14	103.7	8
Triumph	12132	4-22	5-31	26	62.3	24.4	23.2	22.2	8	108.0	5
Red Chief	12109	5-2	6-11	30	64.4	24.3	22.8	22.9	8	108.0	5
Cheyenne	8885	5-5	6-12	24	61.8	24.2	22.1	22.9	18	103.3	10
Pawnee	11669	4-30	6-5	27	62.2	23.8	22.7	23.4	10	114.2	2
Kiowa	12133	4-30	6-8	27	63.0	23.5	22.5	-	3	109.0	4
Early Blackhull	8856	4-22	5-31	28	63.5	23.4	23.5	22.1	18	95.4	16
Blue Jacket	12502	5-2	6-10	30	63.9	22.8	23.4	-	4	106.2	7
Comanche	11673	5-1	6-6	27	62.1	22.8	22.5	22.0	10	110.7	3
Kharkof	1442	5-5	6-11	25	61.7	21.7	21.3	21.4	18	100.0	13
Kawv. - Mgo. x Kawv. - Tenq.	12128	4-30	6-5	25	62.6	21.6	23.1	-	3	102.1	12
Tennery	6936	5-2	6-8	26	62.1	21.3	20.8	20.1	18	98.9	14
Austin	12346	5-2	6-11	28	59.1	19.1	18.7	-	4	103.2	11
Quenah	12145	5-1	6-7	25	61.7	16.2	18.5	-	3	89.4	17

Standard error of a difference = 2.12 bus.

Cherokee, Oklahoma
Four plots; rod rows

Variety	C. I. No.	Maturity stage June 6	Plant Weight Ins.	Weight per bushel Lbs.	Average acre yield			No. Years Grown	Percent of Kharkof	Rank
					1950	1949- 50	1946- 50			
		Dough			Bus.	Bus.	Bus.			
Comanche x Blackhull - Hd. Fed.	12517	Stiff	21	64.8	22.5	-	-	1	-	-
Wichita	11952	Ripe	22	64.4	20.9	25.8	27.5	5	119.5	13
Cheyenne	8885	Soft	22	63.0	19.5	26.0	26.9	5	117.0	15
Red Chief	12109	Soft	24	64.5	18.1	26.9	29.0	5	126.0	11
Westar	12110	Soft	22	62.2	18.0	24.1	26.8	5	116.4	16
Blue Jacket	12502	Soft	25	63.9	17.5	25.1	-	4	111.7	19
Comanche	11673	Stiff	21	62.8	17.4	27.5	27.0	5	117.4	14
Termara	6936	Soft	23	62.0	17.1	21.6	23.4	5	101.7	22
Kharkof	1442	Soft	23	62.3	15.6	21.5	23.0	5	100.0	23
Klona	12133	Stiff	21	61.1	15.6	23.6	-	3	110.0	18
Early Blackhull	8856	Ripe	21	63.0	14.8	20.9	26.0	5	112.9	17
Paynee	11669	Stiff	20	62.3	14.5	24.0	26.0	5	113.1	16
Triumph	12132	Ripe	19	63.0	13.3	25.1	28.4	5	123.4	10
Kawv - Moq. x Kawv. - Tenq.	12128	Soft	20	62.5	11.8	22.4	-	3	102.5	21
Quanah	12145	Soft	19	61.0	6.7	16.9	-	3	76.8	24

Standard error of a difference = 1.32 bus.

Woodward, Oklahoma
Three 1/56 acre plots

Variety	C. I. No.	Date		Plant Height Ins.	Weight per bushel Lbs.	Average acre yield			No. Years Grown	Percent of Kharkof	Rank
		Head- ed	Ripe			1950	1949- 50	1944- 50			
			June			Bus.	Bus.	Bus.			
Comanche x Blackhull-Hd. Fed.	12517	4-30	11	21	61.5	16.5	-	-	1	-	1
Cheyenne	8885	5-8	18	22	58.6	15.6	20.7	29.5	19	108.6	8
Red Chief	12109	5-5	19	23	61.1	13.8	20.3	30.0	9	116.8	4
Westar	12110	5-3	14	22	59.6	13.1	21.8	29.4	7	112.0	5
Kiowa	12133	5-2	14	21	60.2	12.5	18.0	-	3	104.5	11
Blue Jacket	12502	5-5	17	24	60.2	11.7	18.4	-	4	105.9	10
Comanche	11673	5-2	12	20	59.8	11.7	17.3	27.2	13	116.8	3
Wichita	11952	4-29	7	21	59.8	11.6	20.6	29.4	9	120.8	2
Tenmarq	6936	5-5	16	21	58.7	11.4	16.6	26.0	19	106.5	9
Kharkof	1442	5-7	19	22	58.2	11.2	17.0	26.2	19	100.0	12
Pawnee	11669	5-2	11	19	59.3	10.9	21.4	29.1	13	125.5	1
Kv.-Mgo. x Kv.-Tenq.	12128	5-3	13	19	60.2	10.7	20.1	-	3	109.6	7
Early Blackhull	8856	4-28	7	21	59.8	9.6	16.7	25.2	19	97.9	13
Triumph	12132	4-27	6	19	59.4	9.5	18.6	-	6	111.5	6
Quarab	12145	5-6	18	17	58.2	7.1	14.3	-	3	90.4	14
Standard error of a difference = 1.16 bus.											

Manhattan, Kansas
Three 1/60 acre plots

Variety	C. I. or Sel. No.	Date		Plant height	Leaf rust	Culms per acre	Culm size 100x10 cm.	Weight per bushel	Average acre yield			No. Yrs. Grown	Percent of Kharkof	Rank
		Head- ed	Ripe						1949- 1950	1945- 50	Bus.			
		May	June	Ins.	%	0000	grams	Lbs.	Bus.	Bus.	Bus.			
Wichita	11952	16	24	30	33	209	11.8	61.7	48.7	41.4	39.0	11	147.1	10
Marquillo-Oro x Pawnee	462668	20	25	26	T	262	9.6	60.5	46.4	-	-	1	-	-
Stafford	12706	21	27	34	18	207	12.1	62.0	46.2	-	-	1	-	-
Chiefkan x Oro-Tenmarq	12518	19	25	29	22	233	10.8	61.2	45.4	37.0	-	2	141.0	15
Westar	12110	20	27	31	T	250	10.2	60.1	45.3	42.3	40.9	6	158.5	3
Marquillo-Oro x Pawnee	462666	20	25	27	T	254	9.7	60.8	44.8	-	-	1	-	-
Marquillo-Oro x Oro-Tenmarq	Ks 2795	20	25	29	T	243	10.9	61.4	44.3	41.1	-	4	166.4	1
Pawnee	11669	18	25	30	13	265	9.5	60.8	44.1	40.2	41.7	13	159.0	2
Kawvale-Marquillo x Kawvale-Tenq	12128	18	25	29	T	260	11.0	61.9	43.8	41.0	40.8	6	158.0	4
Comanche	11673	20	25	30	5	230	10.1	61.2	43.1	36.7	37.3	13	141.2	14
Kiowa	12133	20	25	30	32	217	12.2	61.6	43.0	36.5	-	5	150.8	7
Kawvale-Tenmarq x Comanche	12524	20	25	28	10	249	10.1	60.9	42.5	39.2	-	2	149.3	8
Marquillo-Oro x Pawnee	12505	21	26	28	T	247	10.6	60.9	41.6	40.1	-	2	152.6	6
Turkey	1558	23	27	31	18	243	9.2	60.5	41.1	34.0	29.1	19	105.0	19
Triumph	12132	15	23	28	30	196	10.7	61.7	40.2	38.9	-	5	153.2	5
Marquillo-Oro x Oro-Tenmarq	12406	20	26	30	T	234	10.4	61.1	40.2	38.2	-	2	145.5	12
Red Jacket	12713	21	27	33	27	196	12.4	62.1	40.1	-	-	1	-	-
Tenmarq	6936	21	26	30	15	202	11.5	60.6	39.7	32.7	34.5	19	119.2	17
Kanred	5146	23	27	30	8	241	9.6	60.0	39.3	30.4	28.8	19	104.6	20
Kanqueen	12762	20	27	34	50	147	14.6	63.1	38.2	-	-	1	-	-
Marquillo-Oro x Comanche	K 2796	19	24	28	T	234	11.0	61.1	37.7	39.1	-	2	148.8	9
Kharkof	1442	21	28	32	13	227	9.9	59.4	37.2	26.3	25.8	19	100.0	21
Clarkan	8858	21	28	35	33	147	16.0	61.2	37.1	35.2	33.6	19	117.9	18
Iohardi	12510	22	27	33	18	201	12.3	61.7	37.0	-	-	1	-	-
Moking	12556	21	28	34	50	145	14.5	61.9	36.9	35.3	-	4	143.6	13
Blue Jacket	12502	21	27	34	20	205	13.7	61.8	36.1	35.0	-	4	146.8	11
Red Chief	12109	21	27	33	43	152	14.0	62.8	34.5	34.4	33.7	10	126.0	16

Standard error of a difference = 1.63 bushels

Garden City, Kansas
Three 1/45 acre plots on fallow

Variety	C. I. No.	Survival %	Date		Plant height Ins.	Weight per Bushel Lbs.	Average acre yield			No. Years Grown	Percent of Turkey	Rank
			Head- ed May	Ripe June			1950 Bus.	1949- 50 Bus.	1946- 50 Bus.			
Pawnee	11669	80	21	26	20	55.6	18.8	28.2	28.3	12	133.4	3
Wichita	11952	90	16	22	20	57.7	17.4	26.6	24.9	10	116.7	7
Red Jacket	12713	90	24	28	26	57.1	15.9	-	-	1	-	-
Kiowa	12133	90	20	25	22	55.5	15.9	26.2	30.5	5	128.2	4
Stafford	12706	80	23	27	24	56.3	15.9	-	-	1	-	-
Westar	12110	70	21	26	21	55.0	14.4	26.6	27.6	5	115.9	8
Mgo. - Oro x Oro - Tenmarq Ks.	2795	70	22	27	19	55.1	13.5	26.4	-	2	143.9	1
Comanche	11673	80	22	26	19	55.1	13.0	24.5	29.6	12	134.7	2
Blue Jacket	12502	90	25	28	25	56.8	12.4	23.1	-	4	111.0	12
Tenmarq	6936	70	24	28	21	53.4	11.3	21.3	26.7	12	120.2	6
Turkey	1558	90	28	29	20	52.5	11.3	18.4	23.8	12	100.0	14
Red Chief	12109	90	26	28	25	55.9	10.8	20.3	25.1	9	114.7	9
Triumph	12132	70	17	23	18	56.1	9.4	22.5	24.7	5	103.7	13
Kawv. - Mgo. x Kawv. - Tenq.	12128	60	24	28	17	53.5	8.7	24.1	-	4	122.9	5
Early Blackhull	8856	40	18	24	18	56.3	7.4	21.5	23.1	12	114.0	11
Mgo. - Oro x Pawnee	12505	20	25	29	19	54.0	3.6	20.1	-	3	114.2	10

Standard error of a difference = 1.49 bus.

Hays, Kansas
Four 1/50 acre plots; 2 on fallow, 2 after crop 1/

Variety	C. I. No.	Date		Plant height	Loose smut heads	Weight per bushel	Average acre yield			No. Years Grown	Percent of Kharkof	Rank
		Head- ed	Ripe				1949- 1950	1946- 50	1946- 50			
		May	June	Ins.	No.	Lbs.	Bus.	Bus.	Bus.			
Early Blackhull	8856	16	20	23	32	58.3	22.4	16.4	23.1	19	119.6	2
Wichita	11952	17	20	25	7	59.8	21.3	16.7	22.0	10	114.1	7
Tenmarq	6936	22	23	26	2	56.3	19.9	12.8	22.2	19	115.0	6
Apache	12122	20	21	26	109	58.3	19.8	-	-	6	114.0	8
Comanche	11673	20	22	23	7	58.3	19.7	13.5	21.9	14	117.3	3
Pawnee	11669	20	22	24	0	57.0	19.2	14.9	22.0	13	127.3	1
Triumph	12132	17	20	22	0	58.3	18.5	14.8	22.9	5	97.8	19
Blackhull	6251	22	22	28	29	56.0	17.8	11.0	20.4	19	107.6	12
Stafford	12706	21	23	30	16	57.0	17.5	-	-	1	-	-
Chiefkan x Oro-Tenmarq	12518	21	22	25	68	57.0	17.2	12.6	-	2	104.6	13
Blue Jacket	12502	21	24	28	130	57.8	17.1	14.8	-	4	103.4	14
Kiowa	12133	21	22	24	108	57.3	16.7	12.9	23.9	6	111.5	9
Mqo.- Oro x Pawnee Ks. 462666		22	23	24	0	56.8	16.4	13.1	-	2	108.8	10
Westar	12110	21	24	26	0	57.5	16.3	14.2	24.0	5	102.1	15
Mqo. - Oro x Pawnee Ks. 462668		22	23	20	0	55.5	15.9	13.0	-	2	107.9	11
Kawv. - Mqo. x Kawv.- Tenq. 12128		21	22	23	0	56.5	15.7	14.7	23.1	5	98.6	18
Red Chief	12109	23	24	26	26	57.0	15.5	13.6	23.1	10	117.2	4
Red Jacket	12713	22	24	29	5	57.8	15.3	-	-	1	-	-
Kharkof	1442	27	24	28	9	55.3	15.0	12.0	23.5	19	100.0	16
Mqo.-Oro x Oro-Tenq. Ks. 2795		22	23	25	20	57.0	14.9	14.1	-	2	117.1	5
Turkey	1558	25	24	28	11	56.0	13.7	10.4	22.0	19	99.9	17
Quannah	12145	26	24	24	102	55.0	12.3	-	-	1	-	-

5-19-

1/Yield in 1950 based on 3 rod row plots on fallow and 1 field plot after crop.

Standard error of a difference = 2.36 bus.

Colby, Kansas

Three 1/50 acre plots on fallow

Variety	C. I. No.	Date head-ed	Plant height	Loose smut	Weight per bushel	Average acre yield			No. Years Grown	Percent of Turkey	Rank
						1950	1948-1950	1946-50 2/			
		May	Ins.	%	Lbs.	Bus.	Bus.	Bus.			
Wichita	11952	22	32	0	61.0	42.0	35.4	34.7	9	114.9	3
Kiowa	12133	25	33	T-5	62.0	38.6	39.1	40.3	4	121.6	1
Comanche	11673	26	33	T	61.0	37.9	34.8	35.4	10	114.7	4
Westar	12110	27	36	0	61.0	37.8	33.9	34.1	4	103.0	10
Pawnee	11669	25	31	0	59.0	37.2	34.9	34.2	9	119.3	2
Cheyenne	8885	6-1	31	0	63.0	36.9	36.2	36.6	13	109.5	8
Tenmarq	6936	28	34	0	61.0	35.1	35.4	34.2	12	110.7	6
Mqo. - Oro x Oro-Tenq. Ks. 2795		27	32	T	61.5	33.6	-	-	1	-	-
Stafford	12706	29	37	T	62.5	33.3	-	-	1	-	-
Turkey	1558	6-1	30	1	61.0	32.9	36.9	33.1	13	100.0	11
Triumph	12132	20	29	0	59.0	32.2	33.4	36.7	4	111.0	5
Kawv. - Mqo. x Kawv.-Tenq.	12128	26	31	0	60.0	31.7	32.1	36.3	4	109.7	7
Red Jacket	12713	29	38	0	62.5	30.7	-	-	1	-	-
Blue Jacket	12502	29	37	4	61.5	28.7	31.4	-	3	95.1	12
Red chief	12109	29	35	0	63.5	27.5	28.1	32.1	8	106.3	9

1/ Combined record of plots treated and untreated for loose smut.

2/ No crop in 1949 on account of hail.

Standard error of a difference = 2.03 bus.

Akron, Colorado
Four 1/41 acre plots; 2 on fallow, 2 after corn

Variety	C. I. No.	Date		Weight per bushel	Average acre yield			No. Years Grown	Percent of Kharkof	Rank
		Head- ed	Ripe		1950	1949- 50	1947- 50			
		June	June	Lbs.	Bus.	Bus.	Bus.			
Kan.-Hd. Fed. x Minh.- Mint.	11970	5	25	60.8	24.3	18.5	20.0	12	113.6	1
Cheyenne	8885	11	28	61.5	23.1	17.0	19.9	19	108.2	7
Kharkof	1442	12	28	60.5	22.7	16.0	19.4	19	100.0	11
Kiowa	12133	6	27	61.5	22.7	18.2	20.8	4	107.5	8
Red Chief	12109	6	27	62.0	22.5	18.7	21.3	9	108.6	5
Wichita	11952	4	24	61.5	22.0	18.1	18.3	10	107.4	9
Comanche	11673	5	25	62.0	21.8	17.1	18.8	12	110.6	3
Tennaro	6936	7	27	60.0	21.4	16.3	18.0	19	109.6	4
Early Blackhull	8856	3	24	61.5	20.8	17.4	19.1	19	111.5	2
Pawnee	11669	5	25	60.0	20.2	17.7	20.8	12	108.6	5
Minturki	6155	14	29	60.0	20.2	15.6	19.1	19	93.7	12
Kawv. - Mgo. x Kawv.-Teng.	12128	6	28	60.8	19.8	17.7	-	3	100.9	10
Alton	9438	14	30	60.5	18.8	12.3	14.3	19	81.2	13
Triumph	12132	2	24	60.5	17.6	-	-	1	-	-

Standard error of a difference = 1.62 bus.

Ft. Collins, Colorado
Seven plots, rod rows; irrigated 5-20

Variety	C. I. No.	Date		Plant height Ins.	Leaf rust %	Weight per bushel %	Average acre yield			No. Years Grown	Percent of Khar'kov	Rank
		Head- ed	Ripe				1950	1949- 50	1946- 50			
		June	July				Bus.	Bus.	Bus.			
Cheyenne x Tenmarq	11972	19	31	31	60	62.2	56.4	52.3	52.0	7	115.0	1
Khar'kov	1442	22	8-2	35	60	61.6	54.9	43.1	45.5	7	100.0	7
Cheyenne	8885	22	8-2	34	50	62.2	54.8	41.7	48.0	7	103.6	6
E. Blk. - Marmin x Hope - Medit.	-25	17	30	35	40	62.2	53.5	45.9	43.7	5	96.1	10
Wichita	11952	12	26	32	70	63.7	50.6	50.4	46.4	7	109.3	4
E. Blk. - Marmin x Hope - Medit.	-73	18	31	35	40	60.0	48.6	43.2	44.7	5	98.4	9
Kawv. - Moq. - Kawv. - Teng.	12128	16	30	33	3	61.9	48.3	39.7	-	3	92.2	12
E. Blk. - Marmin x Hope - Medit.	-76	19	31	33	30	61.3	46.5	42.3	45.0	5	99.0	8
Kiowa	12133	17	29	33	70	61.5	46.2	47.6	-	4	109.5	3
Comanche	11673	15	28	32	50	60.9	45.9	46.3	45.6	7	105.2	5
Tenmarq	6936	21	8-1	34	60	60.8	44.5	37.3	44.4	7	97.4	11
Pawnee	11669	15	28	31	60	61.9	44.4	44.6	46.8	7	109.6	2
Triumph	12132	11	24	29	80	61.7	36.8	-	-	1	-	-

Standard error of a difference = 3.54 bus.

1/ Kanred used in 1944 and 1945.

Lincoln, Nebraska
Five 1/75 acre plots

Variety	C. I. No.	Date		Plant height	Leaf rust	2,4-D response	Weight per bushel	Average acre yield				No. Years Grown	Percent of Kharkof	Rank
		Head- ed	Ripe					1949- 50	1947- 50					
		May	July	Ins.	%		Lbs.	Bus.	Bus.	Bus.				
Nebred	10094	31	6	40	47	1	60.2	57.3	35.1	38.7	19	106.4	9	
Comanche	11673	29	3	42	19	2	60.9	55.9	33.0	38.3	12	111.8	5	
Cheyenne	8885	6-3	8	40	31	3	60.4	55.6	33.8	38.0	19	111.4	6	
Termarq	6936	31	7	44	36	3	58.1	55.3	33.5	37.2	19	106.4	9	
Cheyenne x Turkey	12142	31	9	39	58	1	57.9	55.2	34.4	34.8	5	105.1	11	
Wichita	11952	27	1	42	55	1	62.1	53.6	31.7	35.1	8	107.8	8	
Pawnee	11669	29	3	38	30	2	61.2	53.3	37.8	40.1	14	127.1	1	
Kharkof	1442	6-3	8	42	24	2	60.0	52.6	31.9	33.8	19	100.0	15	
Kiowa	12133	29	3	41	46	2	61.0	51.6	28.6	-	3	96.3	17	
Neb. 60 x Medit. - Hope	12500	30	3	40	12	1	61.2	51.1	37.9	38.9	4	115.1	4	
Hungarian Sel. x Nebred	12507	6-2	6	41	26	1	59.7	50.8	34.0	39.9	4	118.0	2	
Turk. - Tenq. - Chey. x Turk.	12523	30	6	43	14	1	59.8	50.8	38.3	39.0	4	115.5	3	
Hope - Turkey x Turkey	12712	29	3	39	25	2	62.9	50.0	-	-	1	-	-	
Turkey	12137	6-2	7	42	36	1	60.6	49.6	31.4	33.7	19	98.9	16	
Ichardi	12510	31	8	44	23	1	62.1	49.1	32.2	-	2	100.9	14	
Kaw. - Mo. x Kaw. - Tenq.	12128	30	3	39	4	4	61.2	48.3	33.9	-	3	101.6	13	
North Platte Turkey	12143	6-1	7	42	35	4	60.0	47.1	27.0	-	2	84.6	18	
Blue Jacket	12502	31	6	46	40	1	61.7	46.8	-	-	1	-	-	
Minter	12138	6-4	8	42	15	1	60.3	45.9	32.5	-	2	101.7	12	
Red Chief	12109	31	7	43	22	2	63.1	44.9	29.3	40.0	8	110.5	7	

1/Ends of plots treated in fall; effects rated 7-1 on scale of 1 (light) to 5 (severe); not in area cut for yield.

Standard error of a difference = 1.88 bus.

North Platte, Nebraska
Five 1/50 acre plots on fallow

Variety	C. I. No.	Survival %	Date headed June	Plant height Ins.	Weight per bushel Lbs.	Average acre yield			No. Years Grown	Percent of Kharkof	Rank
						1950	1949- 50	1942- 50 2			
Cheyenne	8885	100	12	25	61.0	38.6	29.1	35.3	18	108.7	4
Nebred	10094	100	12	25	61.0	38.3	29.6	34.5	16	107.2	6
Kharkof	1442	100	13	26	59.5	36.9	27.2	32.0	18	100.0	12
Tenmarq 1	6936	95	11	27	60.0	36.4	27.8	33.5	18	101.4	10
N. Platte Turkey	12143	99	10	27	59.0	36.2	27.4	36.9	18	107.9	5
Comanche	11673	95	3	26	59.5	35.4	27.8	34.9	12	105.1	8
Cheyenne x Turkey	12142	100	13	26	59.0	35.4	28.1	-	3	104.5	7
Kaw.-Mqo. x Kaw. - Tenq.	12128	92	4	26	60.5	33.8	29.7	-	3	103.2	9
Wichita 1	11952	98	1	29	60.0	33.3	26.8	35.7	8	111.7	1
Kiowa	12133	95	3	28	60.0	33.1	26.7	-	4	99.6	13
Turk. - Tenq. - Chey. x Turk.	12523	100	10	26	60.0	32.2	27.7	-	3	100.7	11
Hungarian Sel. x Nebred	12507	100	10	26	59.0	31.9	25.3	-	3	96.1	15
Pawnee 1	11669	100	2	25	60.0	31.5	28.2	37.3	12	110.9	2
Red Chief	12109	100	11	28	61.0	30.3	25.9	35.3	8	110.4	3
Nebr. 60 x Medit. - Hope	12500	98	6	26	58.0	26.2	25.7	-	3	96.7	14

¹/₁ Some shattering noticed. ²/₁ No crop in 1943 (hail).

Standard error of a difference = 1.49 bus.

Alliance, Nebraska
Six plots; rod rows on fallow

Variety	C. I. No.	Survival %	Date		Hail damage 1/	Weight per bushel lbs.	Average acre yield				No. Years grown	Percent of Kharkof	Rank
			Head- ed	Ripe			1950	1949-	1945-				
								50	50				
			June	July	Bus.								
Hope x Cheyenne 2/	45904	99	12	18	1	60.0	21.3	-	-	1	-	-	
Turkey x Cheyenne	12711	100	12	19	1	59.0	19.4	31.8	-	2	112.4	6	
Cherokee x Cheyenne	422123	100	14	19	1	59.1	19.3	31.7	-	4	114.2	5	
Cheyenne	8885	100	16	20	1	59.2	18.8	32.7	35.6	13	109.3	8	
Nebred	10094	100	14	19	1	60.3	17.9	30.1	34.1	11	103.7	13	
Kharkof	1442	98	16	21	2	59.1	17.8	28.3	33.7	13	100.0	16	
Turk. - Tenq. - Chey. x Turk.	12523	100	14	20	2	60.0	17.8	34.7	-	3	122.3	1	
Cheyenne x Turkey	12142	100	15	21	2	58.9	17.7	33.9	38.6	6	114.7	3	
Hope - Turkey x Cheyenne	4541	99	14	19	2	57.5	17.4	29.5	-	2	104.2	10	
Compound Hybrid	12501	100	15	20	3	58.1	17.1	29.9	-	5	110.6	7	
Hope x Cheyenne 2/	45910	100	14	19	2	58.8	16.9	-	-	1	-	-	
Nebred x Hope - Turkey	45612	87	12	19	2	58.4	16.8	33.6	-	2	118.6	2	
Tenq. x Hope	6936	99	14	20	2	59.0	16.8	29.2	30.5	13	93.8	20	
Wichita	11952	97	11	17	3	59.8	16.6	33.4	34.3	8	98.5	17	
Turkey	12137	100	16	20	2	58.9	16.3	27.0	-	3	96.9	18	
Kiowa	12133	99	11	18	3	59.5	16.1	30.3	-	4	104.1	11	
N. Platte Turkey	12143	98	14	20	2	58.6	15.7	29.5	-	2	104.1	11	
Comanche	11673	96	11	18	3	58.9	14.6 2/	29.5	33.3	10	100.8	14	
Red Chief	12109	100	12	20	3	61.9	14.6	27.4	29.6	8	87.2	22	
Kawv. - Moq. x Kawv. - Tenq.	12128	92	13	20	2	58.0	14.3	31.2	-	3	114.7	3	
Hope - Turkey x Turkey	12712	87	12	20	2	60.0	14.0	30.6	-	2	108.1	9	
Pawnee	11669	100	10	17	4	57.9	13.9	30.5	32.8	10	100.5	15	
Hungarian Sel. x Nebred	12507	99	15	20	2	58.9	13.4	31.6	-	5	93.7	21	
Nebr. 60 x Medit. - Hope	12500	100	12	19	2	59.9	11.9 2/	25.5	-	3	94.3	19	

1/ Hail July 18 damaged all varieties; rating of 1 = light, 4 = 5 bus. per acre loss

2/ Five replications harvested; one interpolated

Standard error of a difference = 1.24 bus.

Ames, Iowa
Three plots, rod rows

Variety	C. I. No.	Date		Plant height Ins.	Lodg- ing %	Leaf rust %	Weight per bushel Lbs.	Average acre yield			No. Years grown	Percent of Kharkof	Rank
		Head- ed	Ripe					1950	1949- 50				
		June	July					Bus.	Bus.				
Kawvale	8180	8	12	46	3	20	59.4	49.6	44.7	1/	2	117.8	1
Ioturk	11883	10	14	49	7	35	61.1	41.4	-		1	-	-
Minter	12138	11	13	47	3	10	60.9	40.7	41.4		2	109.2	4
Minturki	6155	9	14	48	2	35	60.0	39.7	-		1	-	-
Pawnee	12218	10	14	49	0	5	61.1	38.3	43.7		2	115.2	2
Blackhawk	12310	8	14	47	0	35	60.8	37.4	40.5		2	106.9	6
Iohardi	10017	9	13	46	20	10	59.8	37.4	40.6		2	107.1	5
Iowin	12532	9	14	47	0	25	61.3	36.9	-		1	-	-
H44 x Minturki 2/	11669	5	10	42	0	15	59.8	39.7	43.5		2	114.6	3
Marmin	11502	10	13	48	7	30	61.3	34.8	37.7		2	99.5	8
Kharkof	1442	10	14	44	7	15	59.5	34.1	37.9		2	100.0	7
H44 - Minhardi x Marmin	12704	10	13	45	0	25	60.4	33.9	-		1	-	-
Marmin x H44 - Minhardi	12508	9	13	45	0	25	60.8	32.0	-		1	-	-
do	12520	10	13	45	0	35	60.8	31.5	-		1	-	-

1/Adjusted mean from lattice analysis

Standard error of a difference = 3.5 bushels

Waseca, Minnesota
Three 1/40 acre plots

Variety	C. I. or Sel. No.	Survival %	Date		Plant height Ins.	Lodg- ing %	Leaf rust %	Weight per bushel Lbs.	Average acre yield				No. Yrs. Grown	Percent of Minturki	Rank
			Head- ed June	Ripe July					1949- 50 Bus.	1946- 50 1/ Bus.					
Minturki	6155	93	18	23	33	7	50	60.2	34.1	29.7	26.6	17	100.0	2	
Minter	12138	80	17	20	30	63	20	60.3	30.7	29.1	25.1	8	107.2	1	
Marmin	11502	91	17	21	32	43	60	59.7	30.6	29.4	24.6	15	99.9	3	
Blackhawk	12218	80	19	23	32	0	T	60.0	30.5	30.0	23.8	7	95.6	4	
Iohardi	12510	80	17	22	33	27	20	61.2	30.5	27.1	-	2	91.2	6	
H44 x Minturki 2	12532	95	18	21	30	57	10	60.3	30.1	27.8	23.6	4	88.5	10	
H44 - Minhardi x Marmin	M. 2811	89	19	20	30	0	T	60.2	29.7	-	-	1	-	-	
H44 x Minturki 4	M. 2809	92	17	20	28	37	20	60.0	28.8	-	-	1	-	-	
H44 x Minturki 3	M. 2784	82	19	23	29	10	30	59.5	28.4	26.0	-	3	90.7	7	
Marmin x H44 - Minhardi	12520	87	19	22	29	0	30	59.8	28.1	26.7	-	3	93.8	5	
H44 x Minturki 2	M. 2813	85	18	22	32	25	T	60.5	27.1	-	-	1	-	-	
H44 x Minturki 2	M. 2812	82	19	25	31	0	T	60.0	26.7	-	-	1	-	-	
Marmin x H44 - Minhardi	12508	87	18	23	32	0	30	57.8	26.6	23.9	23.8	4	89.5	8	
Marmin x H44 - Minturki 2	M. 2794	90	17	18	30	30	10	58.8	26.0	21.2	-	2	71.5	12	
H44 x Minturki 4	M. 2810	92	18	20	29	0	T	59.5	25.6	-	-	1	-	-	
Marmin x H44 - Minturki 2	M. 2795	77	19	21	30	10	10	59.7	25.5	22.7	-	2	76.4	11	
Mint. - Iobred x H44 - Mint.	M. 2814	70	21	24	29	0	T	60.5	25.0	-	-	1	-	-	
H44 - Minhardi x Marmin	12704	70	18	23	30	0	10	57.7	24.2	24.0	-	3	89.8	9	

1/ No crop in 1948.

Standard error of a difference = 2.46 bus.

Southwestern Minnesota Field Test
Worthington; three plots, rod rows

Variety	C. I. or Sel. No.	Date ripe	Survival	Plant height	Rust		Weight per bushel	Av. acre yield
					Leaf	Stem		
		July	%	Ins.	%	%	Lbs.	Bus.
Marmin x H44 - Mint. 2	M. 2795	27	91	29	10	1	62.3	31.5
H44 - Minh. x Marmin	M. 2811	26	94	28	18	1	62.3	31.3
Marmin	11502	24	96	29	32	1	62.0	31.0
Minter	12138	26	94	30	10	1	62.3	30.9
Marmin x H44-Minh.	12520	27	91	29	73	1	62.0	30.6
H44 x Minturki 4	M. 2809	26	95	28	37	3	62.7	30.4
H44 - Minhardi x Marmin	12704	25	93	27	40	1	60.7	30.3
H44 x Minturki 2	12532	26	96	30	30	1	62.0	30.2
H44 x Minturki 3	M. 2784	29	95	35	28	3	60.8	29.4
Blackhawk	12218	28	91	30	2	4	62.5	28.9
Marmin x H44 - Minh.	12508	27	92	27	60	1	61.0	28.8
H44 x Minturki 2	M. 2812	27	92	28	6	4	63.0	28.8
do	M. 2813	28	91	31	2	6	62.7	27.9
H44 x Minturki 4	M. 2810	27	95	28	33	1	62.3	27.3
Minturki	6155	26	97	30	37	5	61.8	26.9
Marmin x H44 - Mint. 2	M. 2794	25	93	29	25	1	62.3	25.9
Iohardi	12510	28	82	30	30	6	63.3	25.0
Mint. - Iobred x H44-Mint.	M. 2814	28	93	27	20	1	62.7	24.5

Standard error of a difference = 3.04 bushels

St. Paul, Minnesota
Three 1/40 acre plots

Variety	C. I. or Sel. No.	Survival %	Date		Plant height Ins.	Weight per bushel Lbs.	Average acre yield			No. Yrs. Grown	Percent of Minturki	Rank
			Head- ed	Ripe			1950	1949- 50	1946- 50 ¹ / ₁			
			June	July			Bus.	Bus.	Bus.			
Iohardi	12510	98	16	16	36	58.5	33.5	20.8	-	2	91.0	12
H44 x Minturki 2	M. 2813	99	20	18	39	57.5	30.2	-	-	1	-	-
Marmin x H44-Minhardi	12508	94	19	17	36	54.8	29.3	24.9	34.9	4	106.7	4
H44-Minhardi x Marmin	12704	98	19	19	34	54.7	29.3	25.1	-	3	112.8	1
H44 x Minturki 4	M. 2809	100	19	17	35	55.5	28.4	-	-	1	-	-
H44-Minhardi x Marmin	M. 2811	94	19	17	36	55.2	27.8	-	-	1	-	-
H44 x Minturki 2	M. 2812	96	20	17	34	59.0	27.7	-	-	1	-	-
Marmin x H44-Minturki 2	M. 2794	98	18	16	36	53.2	27.5	24.8	-	2	108.3	3
Blackhawk	12218	88	20	17	38	54.3	27.1	22.0	31.4	5	100.0	8
H44 x Minturki 2	12532	95	20	18	35	55.2	27.0	24.0	35.6	4	108.9	2
H44 x Minturki 4	M. 2810	98	20	16	35	54.7	27.0	-	-	1	-	-
Marmin x H44-Minturki 2	M. 2795	94	18	16	38	55.5	26.6	22.3	-	2	97.4	11
Mint. - Lobred x H44-Mint	M. 2814	97	21	19	36	57.5	26.2	-	-	1	-	-
Minter	12138	94	20	17	37	55.0	25.6	24.6	34.7	6	105.8	5
H44 x Minturki 3	M. 2784	94	20	18	38	52.5	24.9	21.8	-	3	99.0	10
Marmin x H44 - Minhardi	12520	88	21	17	35	54.8	24.7	22.6	-	3	100.7	7
Minturki	6155	96	20	17	37	53.8	24.6	22.9	32.7	11	100.0	8
Marmin	11502	99	18	16	36	53.2	19.7	20.4	32.5	11	101.0	6

¹/ No crop in 1948.

Standard error of a difference = 2.77 bushels.

Grand Rapids, Minnesota
Three 1/40 acre plots

PRODUCT OF 1949-1950 = 100.00

Variety	C. I. or Sel. No.	Survival %	Date		Plant height Ins.	Stem rust %	Weight per bushel Lbs.	Average acre yield			No. Years Grown	Percent of Minturki	Rank
			Head- ing July	Ripe August				1950	1949- 50	1947- 50			
H44 x Minturki 4	M. 2809	58	6	14	39	5	61.6	39.7	-	-	1	-	F
Marmin	11502	52	6	15	40	2	61.5	39.5	39.5	36.2	10	94.4	5
Marmin x H44-Minhardi	12520	48	7	16	40	0	60.8	39.5	40.1	35.3	4	91.7	7
H44 x Minturki 4	M. 2810	62	6	15	39	0	61.5	38.4	-	-	1	-	-
Minturki	6155	67	7	16	40	5	61.0	37.5	40.6	38.4	10	100.0	2
Blackhawk	12218	57	7	16	38	35	60.7	35.9	41.5	37.9	5	95.4	4
H44 x Minturki 2	12532	72	6	15	39	0	62.1	35.7	38.2	34.7	4	90.4	9
Marmin x H44-Minhardi	12508	73	7	16	39	T	61.6	35.4	38.1	35.2	4	91.5	8
Marmin x H44-Minturki 2	M. 2795	45	7	15	40	0	61.0	34.9	-	-	1	-	-
Minter	12138	52	8	15	37	T	60.7	34.4	40.5	42.0	6	109.4	1
H44 - Minhardi x Marmin	M. 2811	58	8	16	36	T	61.1	33.3	-	-	1	-	-
Marmin x H44 - Minturki 2	M. 2794	62	8	15	37	17	60.4	33.0	-	-	1	-	-
H44 x Minturki 3	M. 2784	60	8	16	38	T	60.7	32.9	36.5	35.3	4	91.9	6
H44 x Minturki 2	M. 2812	52	9	15	38	T	61.8	31.6	-	-	1	-	-
Mint. - Iobred x H44- Mint.	M. 2814	53	8	16	38	0	60.8	30.8	-	-	1	-	-
Iohardi	12510	60	6	15	38	40	61.8	29.3	40.4	-	2	99.4	3
H44 minhardi x Marmin	12704	63	7	15	36	0	60.0	29.2	37.3	33.3	4	86.6	10
H44 x Minturki 2	M. 2813	53	8	16	41	8	60.2	25.7	-	-	1	-	-

Standard error of a difference = 3.09 bus.

Brookings, South Dakota
Two 1/50 acre plots

Variety	C. I. or Sel. No.	Survival %	Date headed June	Plant height Ins.	Rust Leaf %	Weight per bushel Lbs.	Average acre yield			No. Years grown	Percent of Minturki	Rank
							1950	1949- 50	1947- 50			
H44 - Minh. x Marmin	12704	75	24	28	80	60	36.5	30.8		3	120.8	3
H44 x Minturki 3	M. 2784	75	26	29	80	60	36.1	31.0		3	121.4	2
Marmin x H44-Minh	12508	80	24	29	80	60	35.0	29.3		3	113.8	6
Hope x Minturki 2	12506	60	26	29	80	61	34.8	32.0		3	123.8	1
H44 x Minh. - Mint.	12509	70	24	27	80	60	33.9	28.7		3	106.8	10
H44 x Minturki 2	12532	75	24	28	80	61	33.4	29.2		3	113.5	7
Marmin x H44 - Minh.	12520	70	26	28	80	60	32.8	28.7		3	114.8	5
H44 x Minturki 3	12519	65	24	29	80	60	32.3	28.5		3	115.3	4
Minter	12138	60	26	28	80	60	31.7	30.7	32.9	6	109.8	9
Marmin	11502	70	24	29	80	60	31.5	29.5	27.9	4	94.8	13
Toherdi	12510	55	23	28	80	61	30.8	26.4		2	112.6	8
Nebred	10094	50	24	24	80	61	29.2	25.3	29.3	6	96.7	12
Lowin	10017	45	25	28	60	60	27.5	26.4	26.2	4	89.2	14
Minturki	6155	60	26	30	80	58	26.6	23.4	29.4	6	100.0	11
Pewnee	11669	30	20	26	80	59	16.0	18.9	13.2	5	64.7	15

1/ Stem rust was trace to 1%.

Standard error of a difference = 0.9 bushels.

Sheridan, Wyoming
Three 1/55 acre plots on fallow

Variety	C. I. No.	Survival %	Date		Plant height Ins.	Weight per bushel Lbs.	Average acre yield			No. Years grown	Percent of Kharkof	Rank
			Head- ed	Ripe			1949- 1950	1949- 50	1945- 50			
			June				Bus.	Bus.	Bus.			
Kanred	5146	95	20	7-30	34	62.0	47.5	48.7	47.1	20	105.9	3
Minter	22138	98	20	8-4	37	62.0	46.5	46.4	41.9	6	96.8	9
Yogo	8033	98	20	8-2	36	62.3	45.7	45.6	43.2	20	100.6	6
Martin x Tenmarq	11824	97	19	8-4	34	60.0	44.6	46.8	-	2	109.6	1
Karmont	6700	95	21	8-2	32	62.0	44.2	44.1	41.9	20	97.8	8
Cheyenne	8885	95	19	8-1	32	60.3	43.7	47.1	46.0	16	107.4	2
Nehred	10094	95	19	8-1	29	59.7	43.4	47.9	44.1	14	102.4	4
Hidit x Kharkof	12521	95	20	8-2	32	62.3	43.2	43.1	-	2	100.8	5
Kharkof	1442	95	21	8-1	32	62.3	43.2	42.7	43.3	20	100.0	7
Marmin	11502	97	20	8-3	36	61.0	41.5	42.3	40.6	15	93.8	10
Turkey x Oro	12705	95	20	8-1	37	60.0	38.7	-	-	1	-	-
Winter rye 2148	-	95	1	7-26	45	55.7	37.0	-	-	-	-	-

Standard error of a difference = 3.51 bus. (F value not significant)

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Bozeman, Montana
Three plots; rod rows

Variety	C. I. or Sel. No.	Stand %	Date Head- ed July	Lodg- ing %	Weight per bushel Lbs.	Average acre yield		No. Yrs. Grown	Percent of Kharkof	Rank
						1950 Bus.	1943- 1950 $\frac{1}{2}$ Bus.			
Ridit x Kharkof	12521	77	3	70	60.8	54.1	-	2	132.2	1
Karmont	6700	87	2	83	61.2	52.6	54.0	13	101.6	4
Huntley 16A	11925	62	4	93	61.8	50.0		1		
Wasatch	11925	87	1	12	61.1	48.3	50.1	5	99.4	7
Turkey x Oro Mont. 208		37	3	85	60.4	47.7		1		
Nebred	10094	60	1	27	60.4	47.2	57.7	10	110.3	2
Turkey x Oro Mont. 201		70	2	8	60.7	45.8		1		
do	12705	40	3	23	60.2	45.7		1		
Yogo	8033	47	5	63	61.3	44.5	54.8	15	107.9	3
Newark	6935	58	4	28	60.6	44.5	51.6	15	99.5	6
Turkey x Oro Mont. 216		63	2	27	59.6	42.1		1		
Huntley 11B		75	3	40	61.2	41.3		1		
Turkey x Oro Mont. 205		63	2	46	60.0	41.2		1		
Minter	12138	50	4	13	61.8	40.7		1	95.2	8
Kharkof	1442	50	4	46	61.8	40.0	50.4	15	100.0	5
Huntley 5B		20	5	0	61.8	28.7		1		

Standard error of a difference = 4.25 bus.

$\frac{1}{2}$ No crop in 1944, 1948 or 1949.

Havre, Montana
Three 1/50 acre plots on fallow

Variety	C. I. No.	Sur- Viv- al %	Weight per bushel Lbs.	Average acre yield			No. Years Grown	Percent of Kharkof	Rank
				1948- 1950	1944- 1950	50 ² / ₅			
Yogo	8033	53	60.4	14.3	14.3	17.2	17	114.1	1
B44 x Minturki	12139	45	58.3	13.0	13.1	15.4	6	103.6	5
Yogo x Oro	Mont. 5	35	60.5	12.8	12.6	-	5	109.1	2
Marmin	11502	47	60.2	11.9	11.9	14.9	12	88.6	10
Minter	12138	45	60.5	11.6	12.2	15.1	6	101.3	6
Mont. 36-Beloglina x Kanred	12108	32	61.7	10.8	12.0	15.5	8	106.3	3
Kharkof	1442	28	60.8	9.3	10.4	14.9	17	100.0	7
Karmont	6700	22	60.6	6.8	10.0	16.0	17	104.2	4
Ridit x Kharkof	12521	8	59.9	5.1	8.3	-	4	94.9	9
Martin x Tenmarq	11804	2	58.1	3.6	7.8	-	5	95.8	8
do	11824	2	59.8	3.6	7.4	-	5	83.3	11
do	11823	1	59.1	2.8	7.3	-	2	70.0	12
Turkey x Oro ¹ / ₅	12705	T	-	0	-	-	1	-	-

¹/This variety planted Sept. 30; all others Sept. 23. ²/No crop in 1949.

Standard error of a difference = 2.26 bus.

STANDARD ERRORS

Standard errors have been calculated on the yield data for the current year. A summary of these is shown in table 2, together with the number of plots and average yields at each station. A footnote indicates where nursery plots were used in place of field plots.

The analysis of variance was used on the data at each station. 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 of each variety to obtain the standard error of the mean. The standard error of a difference between any two variety means was obtained by multiplying the standard error of a mean by the square root of 2. Error expressed as a percentage of the mean is given also. These statistics have considerable practical value to the agronomist even though complete random arrangement of plots was not followed at all stations.

SUMMARY OF PLOT DATA

Summaries of yield data for 1950 and the recent two-year period appear in sections which follow along with an average of other agronomic data for 1950.

Yields by Districts

Yields in the southern district were secured uniformly on 10 varieties at six stations in 1950 and have been assembled in table 3. Kiowa and Wichita averaged 18.3 and 18.0 bushels to the acre while Triumph and Quannah produced 14.3 and 13.0 bushels, respectively. C. I. 12128, high last year, averaged the same as Kharkof in 1950. In table 4, 2-year averages are shown for results in the southern district on the same 10 varieties but involving 12 station years of data. C. I. 12128 ranks first with a yield of 21.7 bushels followed by Red Chief, Wichita, and Kiowa. Kharkof, Tenmarq, and Quannah had the lowest averages.

Table 2. Number of plots, average yield, and standard errors for the variety test at each cooperating station, 1950.

State and Station	No. of plots	No. of Var.	Average yield all varieties Bus.	Standard error of a			
				Single plot Bus.	Difference between means Bus.	Mean in	
						Bushels	Percent
Texas							
Denton *	10	25	10.72	1.89	0.85	0.60	5.58
Chillieotho *	10	20	30.73	4.45	1.99	1.41	4.58
Bushland *	3	14	9.66	2.63	2.14	1.52	15.72
Oklahoma							
Stillwater	4	18	23.60	2.98	2.10	1.49	6.31
Cherokee *	4	15	16.20	1.87	1.32	0.94	5.77
Woodward	3	15	11.79	1.41	1.15	0.82	6.93
Kansas							
Manhattan	3	27	41.27	2.00	1.63	1.15	2.80
Garden City	3	16	12.47	1.82	1.49	1.05	8.45
Heysen	4	22	20.81	3.33	2.36	1.67	8.01
Colby	3	16	34.67	2.49	2.03	1.44	4.15
Colorado							
Akron	4	14	21.27	2.28	1.62	1.14	5.37
Ft. Collins *	7	13	48.58	6.62	3.54	2.50	5.15
Nebraska							
Lincoln *	5	20	51.16	2.98	1.88	1.33	2.60
North Platte	5	15	33.97	2.35	1.49	1.05	3.09
Alliance *	6	24	16.50	2.15	1.24	.88	5.33
Wyoming							
Sheridan	3	11	43.84	4.30 $\frac{1}{2}$	3.51	2.43	5.66

Table 2 contd.

Montana							
Havre	3	12	8.81	2.76	2.26	1.60	18.11
Bozeman *	3	16	44.65	5.21	4.25	3.01	6.74
Iowa							
Ames *	3	14	37.90	4.29	3.50	2.47	6.53
Minnesota							
Waseca	3	18	28.23	3.01	2.46	1.74	6.16
St. Paul	3	18	27.06	3.39	2.77	1.96	7.24
Worthington *	3	18	28.87	3.72	3.04	2.15	7.45
Grand Rapids	3	18	34.26	3.78	3.09	2.19	6.38
South Dakota							
Brookings	2	15	31.21	0.90	0.90	0.64	2.04

* Nursery style plots.

1/ F value not significant.

Table 3. Summary of average yields of winter wheat varieties grown uniformly at 6 stations in the southern district in 1950.

Variety	C. I. No.	Average yield in bushels per acre at						Six station average
		Denton	Chillicothe	Bushland	Stillwater	Cherokee	Woodward	
Kiowa	12133	10.3	33.8	14.0	23.5	15.6	12.5	18.3
Wichita	11952	10.2	30.2	7.2	27.6	20.9	11.6	18.0
Red Chief	12109	8.6	27.1	15.5	24.3	18.1	13.8	17.9
Comanche	11673	8.6	31.1	11.3	22.8	17.4	11.7	17.2
Tenmarq	6936	9.3	32.2	9.3	21.3	17.1	11.4	16.8
Kharkof	1442	9.7	33.6	6.6	21.7	15.6	11.2	16.4
Kawv.-Mgo. x Kawv.-Tenq.	12128	13.4	31.6	9.1	21.6	11.8	10.7	16.4
Early Blackhull	8856	7.7	29.8	9.3	23.4	14.8	9.6	15.8
Triumph	12145	13.4	31.9	2.5	16.2	6.7	7.1	13.0
Quenah	12132	8.1	23.7	6.5	24.4	13.3	9.5	14.3

Table 4. Summary of varietal yields from plot tests at 8 stations in the southern district for one or both of the years 1949 and 1950.

Variety	Average yield in bushels per acre at									Average 12 station- years
	C. I. No.	Dent- on	Chilli- clothe	Bush- land	Law- ton	Still- water	Chero- kee	Wood- ward	Good- well	
No. Years Grown		1	2	1	1	2	2	2	1	
Kawvale - Marquillo x Kawv.-Tenq.	12128	13.4	34.5	9.1	18.9	23.1	22.4	20.1	18.2	21.7
Red Chief	12109	8.6	28.8	15.5	9.1	22.8	26.9	20.3	22.5	21.1
Wichita	11952	10.2	30.3	7.2	12.5	22.3	25.8	20.6	21.2	20.8
Kiowa	12133	10.3	29.8	14.0	12.4	22.5	23.6	18.0	22.5	20.6
Comanche	11673	8.6	28.8	11.3	9.7	22.5	27.5	17.3	22.2	20.3
Early Blackhull	8856	7.7	29.6	9.3	13.6	23.5	20.9	16.7	20.8	19.4
Triumph	12132	8.1	26.2	6.5	10.8	23.2	25.1	18.6	18.8	19.2
Kharkof	1442	9.7	29.4	6.6	11.3	21.3	21.5	17.0	20.4	18.9
Tenmarq	6936	9.3	27.1	9.3	10.6	20.8	21.6	16.6	17.3	18.2
Quannah	12145	13.4	33.7	2.5	17.4	18.5	16.9	14.3	18.0	18.2

In the central district (table 5) eight varieties are compared at 8 stations. On the average Wichita was highest in yield followed by Comanche, Pawnee, and Kiowa. Red Chief yielded least. These same varieties are compared for the 2-year period at 9 stations in table 6. The average again goes to Wichita with Pawnee a close second. Comanche, C. I. 12128, and Kiowa have practically the same average; western Kansas stations and Colorado points tend toward Kiowa, whereas eastern points favor C. I. 12128. Karkof was lowest.

Two stations' results in 1950 in the northwestern district are summarized in table 7 which also shows results for the 2-year period. Among varieties tested in 1950 Yogo and Minter rank highest. These same varieties have the best five-station-years record with Yogo showing slightly greater superiority.

Results with northeastern stations for 1950 appear in table 8. Such slight differences occur among the varieties when yields are averaged that a choice this year would be based largely on factors other than yield. Minter and C. I. 12532 show a small margin over the other varieties. In table 9 are the 2-year average yields for varieties grown in the northeastern district. Again Minter leads in yield but among other varieties, differences are so slight that little confidence can be placed in them.

Summary of Agronomic Data

Data other than yield of grain are summarized for varieties by districts in tables 10 to 13. In all tables the varieties are listed in order of decreasing weight per bushel. The number of stations which reported on the various varietal characteristics is shown at the top of each column of data.

In the southern district (table 10) 10 varieties are characterized under five headings. Wichita and Red Chief had essentially the same average weight per bushel, far exceeding other varieties. All varieties, however, tested above 60 pounds. The varieties ranked about as usual in time of maturity with Triumph earliest and Karkof latest. In plant height Triumph and Quannah were shortest with Red Chief and Tamarq tallest. While only two stations got records on leaf rust it is evident that Quannah and C. I. 12128 were distinctly superior to other varieties in this regard. Comanche held an intermediate position while other varieties appeared fully susceptible.

In the central district (table 11) Red Chief was highest in weight per bushel followed by Wichita. Kiowa ranked third. All other varieties fell below 60 pounds to the bushel. In maturity Wichita was earliest with other varieties falling in about their usual order. Survival was below 100% at three stations and the record indicates that C. I. 12128 winterkilled slightly more than the other varieties. Average plant height followed the usual pattern for these varieties with Pawnee shortest and Red Chief the tallest. C. I. 12128 with only 2% leaf rust rated the most resistant among the varieties compared. Comanche had less rust than Pawnee this year.

The northwestern district agronomic data summary is presented in table 12. Six varieties exceeded 61 pounds to the bushel and only one dropped below 60. In survival, it is clear that Yogo, Minter, and Marmin were the hardiest. Yield of grain and survival were rather closely related in this district in the current period.

Table 5. Summary of average yields of the uniform varieties grown in plot tests at 8 stations in the central district, 1950.

Variety	C. I. No.	Average yield in bushels per acre at:								8 station average
		Man- hattan	Garden City	Hays	Colby	Akron	Lin- coln	North Platte	Alli- ance	
Wichita	11952	48.7	17.4	21.3	42.0	22.0	53.6	33.3	16.6	31.9
Comanche	11673	43.1	13.0	19.7	37.9	21.8	55.9	35.4	14.6	30.2
Pawnee	11669	44.1	18.8	19.2	37.2	20.2	53.3	31.5	13.9	29.8
Kiowa	12133	43.0	15.9	16.7	38.6	22.7	51.6	33.1	16.1	29.7
Tenmarq	6936	39.7	11.3	19.9	35.1	21.4	55.3	36.4	16.8	29.5
Kharkof	1442	37.2	11.3 ^{1/}	15.0	32.9 ^{1/}	22.7	52.6	36.9	17.8	28.3
Kawv.-Mqo. x Kawv.-Tenq.	12128	43.8	8.7	15.7	31.7	19.8	48.3	33.8	14.3	27.0
Red Chief	12109	34.5	10.8	15.5	27.5	22.5	44.9	30.3	14.6	25.1

¹ Turkey

Table 6. Summary of varietal yields from plot tests at 9 stations in the central district for part or all of the period 1949-1950.

Variety	C. I. No.	Average yield in bushels per acre at:									Av.
		Man- hattan	Garden City	Hays	Colby	Akron	Ft. Collins	Lin- coln	North Platte	Alli- ance	
Number of years grown		2	2	2	1	2	1	2	2	2	16
Wichita	11952	41.4	26.6	16.7	42.0	18.1	50.1	31.7	26.8	33.4	30.1
Pawnee	11669	40.2	28.2	14.9	37.2	17.7	44.7	37.8	28.2	30.5	29.8
Comanche	11673	36.7	24.5	13.5	37.9	17.1	46.7	33.0	27.8	29.5	28.1
Kawv.-Mqo. x Kawv.-Tenq.	12128	41.0	24.1	14.7	31.7	17.7	31.0	33.9	29.7	31.2	28.0
Kiowa	12133	36.5	26.2	12.9	38.6	18.2	48.9	28.6	26.7	30.3	27.9
Tenmarq	6936	32.7	21.3	12.8	35.1	16.3	30.1	33.5	27.8	29.2	25.8
Red Chief	12109	34.4	20.3	13.6	27.5	18.7	43.7	29.3	25.9	27.4	25.7
Kharkof	1442	26.3	18.4 ^{1/}	12.0	32.9 ¹	16.0	31.2	31.9	27.2	28.3	24.0

^{1/} Turkey

Table 7. Summary of yields made by varieties grown in uniform plot tests in the northwestern district in 1950 and in 1949-1950.

Variety	C. I. No.	Average yield in bushels per acre:						
		1950			1949-1950			
		Sheridan	Havre	Av.	Sheridan	Moccasin	Havre	Av.
No. years grown		1	1	-	2	1	2 1/2	5
Yogo	8033	45.7	14.3	30.0	45.6	31.0	14.3	30.2
Minter	12138	46.5	11.6	29.1	46.4	25.2	12.2	28.5
Marmin	11502	41.5	11.9	26.7	42.3	25.4	11.9	26.8
Kharkof	1442	43.2	9.3	26.3	42.7	28.1	10.4	26.9
Karmont	6700	44.2	6.8	25.5	44.1	26.3	10.0	26.9
Ridit x Kharkof	12521	43.2	5.1	24.2	43.1	27.2	8.3	26.0
Martin x Tenmarq 3	11824	44.6	3.6	24.1	46.8	25.9	7.4	26.9
Turkey x Oro	12705	38.7	0	19.4	28.4	-	-	-

1/ 1948 and 1950

Table 8. Summary of yields of uniform varieties grown in the northern district at 6 stations in 1950.

Variety	C. I. No.	Average acre yield in bushels at:						6 sta. av.
		Ames	Waseca	Worth- ington	St. Paul	Grand Rapids	Brook- ings	
Minter	12138	40.7	30.7	39.9	25.6	34.4	31.7	32.3
H44 x Minturki 2	12532	36.9	30.1	30.2	27.0	35.7	33.4	32.2
Minturki	6155	39.7	34.1	26.9	24.6	37.5	26.6	31.6
Marmin	11502	34.8	30.6	31.0	19.7	39.5	31.5	31.2
Marmin x H44-Minh.	12508	32.0	26.6	28.8	29.3	35.4	35.0	31.2
do	12520	31.5	28.1	30.6	24.7	39.5	32.8	31.2
Iohardi	12510	37.4	30.5	25.0	33.5	29.3	30.8	31.1
H44-Minh. x Marmin	12704	33.9	24.2	30.3	29.3	29.2	36.5	30.6

Table 9. Summary of yields made by uniform varieties in the northeastern district during part or all of the period 1949-1950.

Variety	C. I. No.	Average acre yield in bushels at:						6 station
		Ames	Waseca	Worth- ington	St. Paul	Grand Rapids	Brook- ings	Average
No. years grown		1	2	1	2	2	2	10
Minter	12138	40.7	29.1	30.9	24.6	40.5	30.7	32.1
H44 x Minturki 2	12532	36.9	27.8	30.2	24.0	38.2	29.2	30.6
Marmin	11502	34.8	29.4	31.0	20.4	39.5	29.5	30.3
Minturki	6155	39.7	29.7	26.9	22.9	40.6	23.4	30.0
H44-Minh. x Marmin	12704	33.9	24.0	30.3	25.1	37.3	30.8	29.9
Marmin x H44-Minh.	12520	31.5	26.7	30.6	22.6	40.1	28.7	29.8
do	12508	32.0	23.9	28.8	24.9	38.1	29.3	29.3
Iohardi	12510	37.4	27.1	25.0	20.8	40.4	26.4	29.2

Data for varieties grown uniformly at northeastern stations appear in table 13. Iohardi was outstanding in weight per bushel with C. I. 12532 the only other entry to average above 60 pounds. Survivals ranged from 75% for Iohardi to 87% for C. I. 12532. Five of the nine entries survived 82% or better. There were no clear differences in time of maturity. C. I. 12704 was consistently the shortest variety entered, averaging 4 inches shorter than Blackhawk. Four entries did not lodge at either of the stations where differential lodging was recorded whereas Minter averaged 33% and C. I. 12532 25%. Except Blackhawk, all varieties were susceptible to leaf rust. H44 and Hope derivatives showed good resistance to stem rust at the three locations where this disease was noted.

Table 10. Summary of agronomic data other than yield for varieties grown in plot tests in the southern district, 1950.

Variety	C. I. No.	Av. date		Av. height	Av. leaf rust	Av. weight per bushel
		Headed	Ripe			
		May	June	Ins.	%	Lbs.
Number of stations		5	5	6	2	4
Wichita	11952	4/29	4	24	53	63.1
Red Chief	12109	5	13	26	48	63.0
Kiowa	12133	2	9	24	50	61.8
Kv.-Mq. x Kv.-Tq.	12128	2	7	24	9	61.8
Early Blackhull	8856	4/27	5/28	24	40	61.7
Triumph	12132	4/25	5/27	22	37	61.7
Comanche	11673	2	8	24	22	61.6
Tenmarq	6936	5	11	26	48	61.2
Kharkof	1442	9	13	24	39	61.1
Quench	12145	2 <u>1/</u>	10 <u>1/</u>	23 <u>1/</u>	3	60.7

1/ One station interpolated

Table 11. Summary of agronomic data other than yield for varieties grown in plot tests in the central district, 1950

Variety	C. I. No.	Av. Date		Av. Surviv- al	Av. height	Av. leaf rust	Av. weight per bushel
		Head- ed	Ripe				
		May	July	%	Ins.	%	Lbs.
Number of stations		9	7	3	7	3	9
Red Chief	12109	6/2 <u>1/</u>	6 <u>1/</u>	97	32 <u>1/</u>	42 <u>1/</u>	61.0 <u>1/</u>
Wichita	11952	28	2	95	30	53	60.8
Kiowa	12133	31	4	95	30	49	60.0
Comanche	11673	31	4	90	29	25	59.8
Kv.-Mq. x Kv.-Tq.	12128	31	5	81	28	2	59.4
Pawnee	11669	30	4	93	28	34	59.3
Tenmarq	6936	6/3	6	88	31	37	58.8
Kharkof	1442	6/6 <u>2/</u>	7 <u>3/</u>	96 <u>3/</u>	30 <u>2/</u>	32	58.8 <u>2/</u>

1/ One station interpolated. 2/ Turkey records at 2 stations.
3/ Turkey records at 1 station.

Table 12. Summary of agronomic data other than yield for varieties grown in the northwestern district plots, 1950.

Variety	C. I. No.	Surviv- al %	Av. weight per bushel lbs.
Number of stations		2	2
Kharkof	1442	62	61.6
Yogo	8033	76	61.4
Minter	12138	72	61.3
Karmont	6700	59	61.3
Ridit x Kharkof	12521	52	61.1
Marmin	11502	72	60.6
Martin x Tenmarq 3	11824	50	59.9
Turkey x Cro	12705	48	-

Table 13. Summary of agronomic data other than yield for varieties grown in northwestern district, 1950.

Variety	C. I. No.	Surviv- al %	Av. date		Av. height Ins.	Av. Lodg- ing %	Rust		Weight per bushel lbs.
			Head- ed June	Ripe July			Leaf	Stem	
Number of stations		5	5	5	6	2	4	3	6
Ichardi	12510	75	20	25	35	14	41	15	61.1
H44 x Minturki 2	12532	87	21	25	35	29	36	T	60.3
Minter	12138	76	22	24	35	33	39	T	59.9
Marmin x H44 - Minh.	12529	77	23	25	34	0	55	T	59.7
Blackhawk 1/	12218	79	22	26	37	0	2	20	59.7
Marmin	11502	82	21	24	36	25	51	1	59.6
Marmin x H44 - Minh.	12508	85	21	25	34	0	49	T	59.3
Minturki	6155	83	22	25	36	5	51	3	59.1
H44-Minh. x Marmin	12704	80	22	25	33	0	39	T	58.9

1/ one fewer stations than shown except for date ripe and lodging.

UNIFORM YIELD NURSERY

Workers at sixteen stations cooperated in growing and collecting data on the uniform yield nursery. This test included 21 relatively new selections and 6 older varieties or checks. Kharkof, Blackhull, and Early Blackhull are the permanent standards in this experiment. At each testing point 3 or more replications of plots 16 square feet in size were planted, generally in randomized order. Four eight-foot rows constituted the most common type of plot from which the two center ones were taken for yield. The entries in 1950 were the following:

No.	Variety or cross	State No.	C. I. No.
1	Kharkof		1442
2	Blackhull		6251
3	Early Blackhull		8856
4	Pawnee		11669
5	Comanche		11673
6	Triumph		12132
7	Quana	Tx. 171-43-29	12145
8	Blue Jacket	E. G. Clark	12502
9	29-34-275 Double Cross	Tx. 172-43-205	12511
10	do.	Tx. 172-43-210	12504
11	do.	Tx. 172-44-104	12512
12	Marquille-Cro x Pawnee	Ks. 45R2023	12505
13	Kiowa	H. C. 43-112	12133
14	Chiefkan x Oro-Tenmarq	H. C. 46-41	12518
15	Meo.-Cro x Oro-Tenmarq	Ks. 431420	12406
16	Comanche x Medit.-Hope	Tx. 157-44-112	12513
17	do.	Tx. 157-44-20	12514
18	Hard Federation Hybrid	Ok. 43h1-399	12515
19	Blackhull-Cro x Pawnee	Ok. 43h1-400	12516
20	Comanche x Blackhull-Hd. Federation	Ok. 43h2-123	12517
21	orienta	Danne 029-5-12	12522
22	Martin-Tenmarq x Chiefkan	Tx. 160-42-333	12146
23	Kawvale-Tenmarq x Comanche	Ks. 451609	12524
24	Quivira x (Kan.-Fd.Fed. x Prelude-Kan.)	Ks. 373963	12525
25	Sinvalacho-Wichita x Hope-Cheyenne	Tx. 208-46-22	12701
26	(Sinv.-Wich. x Hope-Chey.) x Wichita 2	Tx. 237-46-22	12702
27	do.	Tx. 237-46-23-1	12703

Entry numbers 23 to 27 had not been included in this nursery previously. Generally varieties are kept two or three years. Experience has shown that entries failing to make a good regional showing in two seasons scarcely ever do so in a third or fourth. On the other hand a selection may be good one year in the region and not again ever or for several years. Such one-season-wonders are quickly spotted by their erratic interannual behavior. Finally, there are selections which show superior performance regularly. Pawnee, Comanche, Westar, and Wichita did just that in this nursery and have now become highly popular commercial wheats. Entries are discontinued from this nursery when they show outstanding weaknesses or when the area of adaptation appears limited or when they are of sufficient promise to be promoted to the uniform plot series. This of course does not apply to check varieties used as standards for comparison.

DATA OBTAINED

Table 14 shows the data collected at 16 stations. In addition to current results, a summary of previous years' yields are given. Wherever possible a 2-year average yield and a 4- to 6-year average are shown along with a relative yield in terms of the percent of Kharkof for the entire period of years the particular variety was tested. Care should be used in comparing relative ranks of varieties tested in different years. The standard error of a difference reported for each station applies to yield data recorded in 1950.

Conditions prevailing at the various stations where the uniform yield nursery was grown have already been discussed in connection with uniform plots. Therefore, only particular effects of the environment or conditions which were different in the plot and nursery experiments will be mentioned here.

Three stations in Texas obtained results in 1950. At Denton, Quana was the highest yielding variety followed by C. I. 12505 and C. I. 12406. Early maturing varieties were injured severely by drought and cold in early spring. Leaf rust ranged from 2% for a Sinaloa hybrid to more than 70% infection on several entries. Yields were too low on many varieties to make a weight per bushel determination. Long-time averages point out the superiority of Comanche, Pawnee, and Early Blackhull, none of which was good this year. In the Chillicothe test Kharkof was the highest yielding named variety but it was exceeded by four entries. Again early maturity was a disadvantage. Test weights were unusually high with 64 recorded on 5 entries. Two-year average yields favor C. I. 12516 and C. I. 12515 while Kiowa and Pawnee are high in the six-year comparisons. For all comparisons, Kiowa, C. I. 12146, and Pawnee have the best records. The crop at Bushland was all but abandoned because of winter loss, drought, greenbugs, etc. Late recovery of the crop was miraculous. Kiowa and Blue Jacket led in yield followed by Comanche, Blackhull, and Pawnee. Two-year averages point to Kiowa, 4-year averaged to C. I. 12146, Kiowa and Pawnee, and the relative index puts Pawnee, C. I. 12146, Blackhull, and Blue Jacket in top positions.

Among the three Oklahoma tests, yields were highest at Stillwater. C. I. 12701, C. I. 12516, C. I. 12515, C. I. 12146, C. I. 12517, and C. I. 12702 yielded 32 to 34.6 bushels to the acre. High weight per bushel was the rule. Orianta and Kharkof were the highest yielding named varieties. Two-year average yields give C. I. 12517, C. I. 12516, and C. I. 12515 the highest ranks, whereas 6-year averages favor Triumph and Pawnee. In the relative indexes, C. I. 12517 and Pawnee rank highest. At Cherokee, winter injury and greenbugs damaged the wheat. In spite of this, C. I. 12517 exceeded 21 bushels to the acre in yield. Comanche, the highest yielding named variety yielded 18.2. Two-year averages favor C. I. 12517 and Triumph, whereas 4-year averages show that Triumph, Comanche, and Kiowa are highly productive. At Woodward there was great variability among replications partly from soil heterogeneity but also from greenbug attacks and other factors. Significant differences did occur among varieties, however, and good yields were made by many entries. C. I. 12517 was again highest, followed by C. I. 12515, C. I. 12146, and C. I. 12516. It will be remembered that three of these originated at the Woodward station. Blackhull and Orianta were the highest yielding named varieties. Good agreement was noted between the rank in 1949 and in the current season except for C. I. 12505 which was outstanding in 1949 only. Six-year averages favor Triumph but this variety did poorly in 1950.

Three tests were grown in Kansas. Winter loss, record-breaking spring drought and high winds, plus a little hail, threatened at times to overcome the wheat at Manhattan but rain in late May and in June revived all entries so that

yields up to 20.1 bushels to the acre were produced. Blackhull and its descendants occupied the top six places for yield. Leaf rust built up late and did only slight damage. Two-year averages favor Blue Jacket, C. I. 12406, and Blackhull. The 6-year summary favors Pawnee and Kiowa. High plot variability at Hays was associated with the drought factor which varied stands somewhat. It is doubtful if the varieties yielding above 24 bushels to the acre are significantly different. Test weights were low. In the 2-year averages C. I. 12146, C. I. 12517, and Pawnee come off best and in the comparisons for 6 years Kiowa is best. Highest relative yields were made by C. I. 12517, Pawnee, Comanche, and Kiowa. At Colby C. I. 12517 and C. I. 12515 were easily the outstanding entries. All test weights were good. Since hail destroyed the 1949 crop no 2-year averages are shown; however, some varieties have been tested 2 and 3 years. Of these, Kiowa deserves special notice since it ranks first among the 13 compared.

In Colorado, three tests were grown. At Akron, C. I. 12517, Triumph, and C. I. 12146 were high in yield. Two-year averages go to C. I. 12517 and C. I. 12146 and the latter selection is high among 4-year comparisons. The irrigated nursery at Ft. Collins gave moderately high yields with good test weights. Entries yielding above 50 bushels to the acre probably do not differ statistically. Quannah was the highest yielding named variety although Kiowa and Blue Jacket are not much lower. The highest yielding entry was C. I. 12406 which produced 59.8 bushels to the acre. Two-year averages show five entries above 50 with C. I. 12505 and Kiowa at the top in rank. Kiowa has the highest 6-year average and C. I. 12517 the highest relative rank. Hail and failure to apply irrigation water caused low yields at Hesperus and a high error term. Although four hybrids rank above Kharkof in yield, they probably are no better considering the standard error. Bushel weight was very high ranging from 62 to 66 pounds. As expected, the 2-year averages do not agree very well with 1950. C. I. 12406 and C. I. 12516 lead. Among varieties compared five years, Comanche and Pawnee lead. Relative indexes show C. I. 12504 and C. I. 12505 tied for first position followed closely by C. I. 12406.

High yields and complete notes were recorded at Ames, Iowa. C. I. 12517, C. I. 12524, and C. I. 12518 were three of the highest yielding entries. Winter-killing probably contributed to the lower yields of some varieties but leaf rust shows no relationship. Two-year averages go to C. I. 12517 and C. I. 12515. Pawnee leads in yield among seven varieties compared five years.

Three nurseries were grown in Nebraska. Rather complete data at Lincoln show results on seven characteristics. Winterkilling was related to yield in a general way but leaf rust and lodging did not seem to depress yields. Extremely high yields and a low error reveal a high yield potential in many strains. C. I. 12517 and C. I. 12515 were highest. The two-year averages favor these two wheats also. In longer-term comparisons, Pawnee with a 16-year advantage over Kharkof of one-third is a phenomenal demonstration of the progress being made in hard winter wheat improvement. Some winterkilling and a dry spring reduced yields at North Platte. C. I. 12517 and C. I. 12515 made very high yields followed closely by C. I. 12406, C. I. 12524, and C. I. 12146. In general, these were the best in 1949 also. Six-year averages favor Kiowa and Pawnee. Severe winterkilling at Alliance followed by a dry spring completely eliminated productive stands in five entries. Kharkof was the highest yielding variety followed by C. I. 12518. Oriente, Blackhull, and Kiowa. Hail on July 18 damaged all varieties but Pawnee and C. I. 12524 seemed damaged most. The 2-year averages combine results from very dissimilar seasons and may not be very reliable. Three-year and longer comparisons favor C. I. 12406, Kiowa, and Blue Jacket.

Table 14. Yield and other data for varieties grown in the uniform yield nursery in cooperative experiments at 16 stations in the hard red winter wheat region in 1950, and yield summaries for various periods.

Denton, Texas													
Four plots													
C. I. No.	Date		Plant height	Top growth fall	Rust		Weight per bushel	Average acre yield			No. years grown	Percent of Kharkof	Rank
	Head- ed	Ripe			Leaf	Stem		1950	1945- 50 $\frac{1}{2}$				
	April	May	Ins.	%	%	%	Lbs.	Bus.	Bus.				
12145	19	30	27	110	5	0	58.0	14.1			3	100.0	8
12505	22	6-1	27	110	15	0	57.0	13.1			25	95.5	10
12406	22	29	29	110	28	0	58.0	13.0			20	112.4	6
12511	26	31	28	110	8	0	58.0	12.5			14		
12522	29	31	28	100	37	T	58.0	12.4			12		
12512	26	6-1	29	110	3	0	58.0	12.2			1		
12504	24	6-1	28	105	5	0	58.0	12.1			2	92.1	12
12702	21	31	29	105	5	0	60.0	12.1			1		
12516	27	30	27	100	23	0	59.0	11.9			1		
12515	26	31	26	105	35	T	58.0	11.0			1		
12703	17	29	28	105	2	0	59.0	10.9			1		
12524	23	29	28	110	45	0	59.0	10.8			1		
12517	25	29	28	100	30	0	57.0	10.6			1		
12146	25	29	27	115	73	0		10.4			3	114.6	4
12502	30	6-1	28	100	70	3		10.2			2	89.3	13
12701	13	29	26	100	15	0		10.1			1		
6251	28	6-1	27	105	45	T	58.0	10.1	18.6		16	114.3	5
1442	5-2	6-3	26	90	68	8	56.0	9.8	18.8		16	100.0	9
11673	23	30	26	100	38	T	-	9.7	21.0		12	151.6	1
12514	23	31	29	105	30	0		9.7			1		
12513	24	31	28	105	48	0		9.3			1		
12525	10	24	24	110	10	0		9.2			1		
11669	25	31	25	90	60	0		9.1	19.8		13	141.5	2
12133	26	29	27	100	80	0	-	9.1	20.4		5	109.0	7
8856	14	24	27	110	70	T		8.6	20.8		16	141.4	3
12132	13	25	25	100	63	T		8.5	17.4		5	92.9	11
12518	23	30	26	100	73	0	58.0	8.3			1		

Standard error of a difference = 1.31 bus.

$\frac{1}{2}$ No crop in 1949.

Chillicothe, Texas

Four plots

U. I. No.	Date		Plant height Ins.	Top growth 3-6 %	Leaf rust %	Weight per bushel Lbs.	Average acre yield			No. years grown	Percent of Kharkof	Rank
	Head- ed April	Ripe May					1950 Bus.	1949- 50 Bus.	1945- 50 Bus.			
12516	23	29	33	105	0	64	34.0	34.7		2	123.9	4
12515	22	30	31	105	T	64	33.6	33.1		2	118.0	7
12702	20	27	32	120	10	64	32.9			1		
12146	19	25	33	110	T	63	31.3	30.1		4	124.8	2
1442	27	6-1	31	95	10	62	30.8	28.0	23.8	12	100	17
12517	23	29	33	110	0	64	30.5	30.9		2	110.2	11
11673	21	27	32	100	5	62	29.6	26.8	28.0	12	123.9	4
12133	19	28	28	110	20	63	29.3	27.2	30.0	6	125.8	1
6251	23	6-1	32	110	5	63	28.8	24.3	24.0	12	108.8	13
12524	20	21	29	110	5	63	28.6			1		
12511	22	28	33	120	0	62	28.3	30.8		2	110.0	12
12514	18	24	32	135	15	61	28.0	29.7		2	106.1	15
12518	18	25	30	110	10	63	28.0	27.3		2	97.3	20
8856	11	23	32	110	10	62	27.5	28.3	27.7	12	115.8	9
12145	19	27	32	125	0	62	27.4	30.2		4	116.9	8
12502	22	28	34	120	10	64	27.1	28.3		3	96.2	21
12512	22	29	28	120	T	63	27.1	28.8		2	102.9	16
11669	23	6-1	30	80	5	62	27.0	30.8	30.0	12	124.3	3
12406	23	28	29	100	T	62	25.9	29.7		3	111.7	10
12505	20	30	28	115	5	62	25.2	27.8		3	108.8	13
12504	22	28	31	125	T	62	24.9	27.4		3	98.4	18
12522	19	30	30	110	T	62	24.6	27.4		2	97.7	19
12701	13	22	27	115	T	62	23.8			1		
12513	17	24	32	130	15	61	23.7	26.2		2	93.4	22
12132	12	21	32	110	10	62	23.6	26.5	28.8	6	121.1	6
12703	17	26	31	120	T	63	23.2			1		
12525	7	14	25	120	0		19.2			1		

Standard error of a difference = 2.86 bus.

Bushland, Texas
Three plots; fall irrigated

C. I. No.	Survival		Date		Plant height Ins.	Average acre yield			No. years grown	Percent of Kharkof	Rank
	Dry %	Irrig. %	Head- ed May	Ripe June		1950	1949-50	1947-50			
12133	75	62	23	26	20	14.0	26.1	22.4	4	108.9	6
12502	79	87	24	27	23	13.7	25.3		3	112.3	4
11673	83	90	23	26	20	11.3	23.8	21.4	12	110.9	5
6251	87	88	27	28	19	10.9	23.8	21.9	12	113.2	3
11669	55	84	24	26	16	10.5	25.2	22.4	12	118.8	1
12518	79	85	27	28	18	10.2	23.0		2	102.0	11
12146	73	93	22	25	15	9.5	25.9	23.6	4	114.4	2
12703	82	86	20	23	16	9.4			1		
8856	80	84	19	23	17	9.3	23.6	19.3	12	100.0	13
12515	87	89	23	26	16	8.9	23.4		2	103.8	9
12514	65	72	27	29	18	8.8	22.0		2	97.6	15
12522	80	83	25	29	19	8.2	23.5		2	104.4	8
12524	70	90	23	26	15	7.5			1		
12516	78	95	29	29	17	7.3	22.4		2	99.6	14
12702	70	86	21	24	15	7.2			1		
12517	90	88	22	27	17	6.7	24.1		2	107.1	7
1442	83	70	6-1	7-1	18	6.6	22.5	20.6	12	100	12
12132	75	88	20	23	11	6.5	21.9	19.8	4	96	16
12505	70	25	-	-	16	5.9	22.0		3	103.2	10
12513	73	50	-	-	15	5.2	18.9		2	83.8	21
12406	65	85	22	26	18	4.6	20.3		3	91.1	17
12701	65	46	23	24	11	4.2			1		
12512	47	26	-	-	17	3.2	19.2		2	85.1	20
12525	50	86	15	18	11	2.8			1		
12145	43	9	-	-	-	2.5	17.9	17.8	4	86.3	19
12504	47	26	-	-	-	2.3	17.2		3	77.8	22
12511	38	20	-	-	17	1.5	20.3		2	90.2	18

Standard error of a difference = 2.15 bus.

Stillwater, Oklahoma

Four plots

C. I. No.	Date		Plant height Ins.	Weight per bushel Lbs.	Average acre yield			No. years grown	Percent of Kharkof	Rank
	Head- ed Apr.	Ripe June			1950	1949-50	1945-50			
12701	28	7	29	64.0	34.6			1		
12516	30	10	29	64.3	33.8	31.7		2	121.7	3
12515	29	7	27	63.0	32.8	31.3		2	120.4	4
12146	28	7	29	63.0	32.8	29.9		4	111.3	8
12517	28	8	26	63.7	32.3	32.2		2	123.7	1
12702	29	6	29	63.6	32.0			1		
12518	29	8	27	63.2	30.2	28.8		2	110.6	9
12524	28	5	26	62.5	28.6			1		
12522	5/3	12	29	62.0	27.9	26.2		2	100.8	12
12513	30	6	28	61.8	27.8	25.8		2	99.0	15
1442	5/4	11	27	61.6	27.6	26.0	22.4	17	100	13
6251	5/4	12	27	62.3	27.2	26.3	24.5	17	107.6	11
11669	30	6	26	62.5	26.0	25.5	26.8	14	123.1	2
11673	30	6	26	62.1	25.9	26.5	24.7	12	115.2	6
12133	29	8	27	63.1	25.9	26.2	25.1	6	112.0	7
12406	30	8	28	62.2	25.9	25.5		3	96.3	20
12502	30	10	30	63.4	25.7	26.1		3	98.3	17
12525	16	2	24	63.3	25.6			1		
12514	30	4	29	61.3	25.5	25.4		2	97.5	19
12511	30	8	28	61.5	25.5	26.0		2	99.8	14
12703	28	6	27	62.7	25.1			1		
12505	29	7	22	62.1	24.8	24.7		3	97.7	18
8856	24	2	26	63.1	24.7	25.3	26.1	17	108.5	10
12132	25	2	25	62.7	23.8	26.0	27.0	6	120.3	5
12145	29	7	26	61.5	23.5	24.2		4	99.0	16
12512	5/2	11	26	61.2	22.2	23.0		2	88.5	22
12504	5/1	9	25	62.0	21.5	23.7		3	92.0	21

Standard error of difference = 2.11 bus.

Cherokee, Oklahoma

Four plots

C. I. No.	Plant height	Weight per bushel	Average acre yield			No. years grown	Percent of Kharkof	Rank
			1950	1949-50	1947-50			
	Ins.	Lbs.	Bus.	Bus.	Bus.			
12517	21	64.1	21.5	28.9	.	2	137.7	1
12515	22	62.2	19.8	21.5	.	2	102.6	12
12702	22	62.8	18.4	.	.	1	.	.
12146	22	62.6	18.3	24.0	25.9	4	108.9	10
12516	22	62.6	18.2	20.1	.	2	95.7	18
11673	21	62.6	18.2	26.0	28.0	4	117.8	4
12701	21	64.0	18.0	.	.	1	.	.
12513	22	62.1	17.2	18.4	.	2	87.6	20
6251	23	62.4	16.6	18.4	23.9	4	100.5	14
12522	23	62.8	16.0	24.3	.	2	116.0	6
1442	22	61.8	15.0	21.0	23.8	4	100	16
12502	24	63.1	14.8	23.7	.	3	111.3	8
12406	20	62.1	14.6	26.5	.	3	125.6	3
12133	20	62.2	14.5	24.2	27.8	4	116.9	5
12132	20	61.9	13.7	27.7	30.2	4	126.9	2
11669	20	62.1	13.5	24.0	26.7	4	112.2	7
12703	21	62.1	13.5	.	.	1	.	.
12524	19	62.0	13.3	.	.	1	.	.
12518	21	61.3	13.3	22.9	.	2	109.3	9
8856	21	62.6	12.3	20.0	24.0	4	100.6	13
12514	21	59.4	11.8	20.1	.	2	95.7	18
12525	19	63.5	9.3	.	.	1	.	.
12505 1/2	18	61.5	7.3	21.7	.	3	107.2	11
12145 1/2	19	61.1	7.0	18.9	23.9	4	100.4	15
12511 1/2	19	62.3	5.4	20.5	.	2	97.9	17
12504 1/2	20	61.4	5.1	16.1	.	3	81.6	21
12512	Not grown							

1/2 Stand thinned by winter killing.

Standard error of a difference = 1.63 bus.

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Woodward, Oklahoma
Four plots on fallow

C. I. No.	Date		Plant height Ins.	Weight per bushel Lbs.	Average acre yield			No. years grown	Percent of Karkof	Rank
	Head- ed May	Ripe June			1950 Bus.	1949-50 Bus.	1945-50 Bus.			
12517	6	13	23	62.9	24.8	37.6		100.2	144.4	1
12515	6	12	24	61.4	24.2	33.9		100.2	130.4	2
12146	6	12	24	60.5	23.1	34.4		4	124.7	4
12516	9	14	25	62.1	18.2	32.6		2	125.4	3
12518	7	13	23	60.8	17.8	28.6		115.2	109.8	11
12702	5	13	24	62.0	17.7			115.2		
6251	10	19	25	60.6	16.6	27.6	27.4	116.19	104.7	14
12522	11	16	26	60.2	16.2	28.9		116.2	111.2	9
12502	10	17	27	61.0	14.8	25.9		117.3	99.4	18
12406	8	15	22	60.6	14.7	29.6		100.3	110.8	10
12513	7	13	23	59.9	14.2	25.4		110.2	97.5	19
12701	6	12	22	61.0	14.0			100.1		
1142	12	19	23	58.6	13.5	26.0	25.8	119	100	17
11673	8	14	21	60.6	13.1	28.7	28.2	14	117.5	7
12703	6	12	23	60.6	12.6			111.1		
12514	9	13	22	58.0	12.0	24.8		112.2	95.4	20
8856	5	11	21	60.8	11.9	27.7	28.9	119	106.2	13
12524	8	15	19	60.7	11.9			1		
12505	13	19	19	59.4	11.8	31.3		105.3	115.4	8
12133	8	15	21	60.6	11.3	27.6	27.8	116	108.0	12
12511	12	19	22	58.0	10.3	26.7		2	102.7	15
12525	2	9	18	60.5	10.0			1		
12145	12	19	19	57.5	8.8	23.6		4	101.8	16
11669	9	14	19	59.5	8.6	28.8	28.5	16	123.9	5
12132	4	8	19	59.0	7.6	28.5	30.5	6	118.2	6
12504	14	20	20	58.0	5.9	22.4		3	88.3	21
12512	Not grown									

Standard error of a difference = 3.41 bus.

Manhattan, Kansas

Five plots

C. I. No.	Date head- ed	Plant height	Loose smut 1/ No.	Rust		Bunt 2/ %	Weight per bushel Lbs.	Average acre yield			No. years grown	Percent of Kharkov	Rank
				Leaf %	Stem 2/ %			1950 Bus.	1949-50 Bus.	1945-50 Bus.			
	May	Ins.	No.	%	%	%	Lbs.	Bus.	Bus.	Bus.			
6251	25	28	1	20	30	65	56.1	20.1	26.3	31.5	19	112.2	12
12502	26	27	1	23	40	80	57.7	19.1	27.8		3	118.8	5
12146	25	22	1	15	40	60	55.0	18.7	23.0		4	113.8	10
12133	24	21	1	33	30	4	55.7	17.4	25.5	35.8	6	127.2	2
12518	25	21	1	35	30	1	54.3	17.3	23.2		2	113.7	11
12702	23	21	0	T	60	65	55.0	16.5			1		
12522	27	28	T	3	10	50	54.4	16.2	24.4		2	119.6	4
1442	29	27	1	25	10	75	51.7	15.7	20.4	28.1	19	100	15
12515	27	25	0	1	10	0	54.5	15.1	18.8		2	91.9	19
12517	24	22	0	3	20	15	56.6	14.8	24.1		2	117.9	6
12516	26	24	0	6	10	0	55.5	14.8	20.9		2	102.2	14
12406	25	23	1	3	T	3	55.0	14.8	26.6		3	113.9	8
11669	24	22	0	15	30	14	54.4	14.5	23.7	37.3	16	134.5	1
11673	26	22	0	8	40	2	53.0	14.5	24.5	32.9	14	123.4	3
12524	26	20	0	25	30	16	54.0	14.1			1		
12132	21	19	0	23	20	75	55.8	13.2	20.4	32.0	6	113.9	8
8856	22	21	0	18	40	65	56.3	12.9	17.8	29.9	19	114.6	7
12703	26	22	T	1	10	75	55.0	12.9			1		
12505	28	24	1	1	T	35	52.5	11.5	23.4		3	110.9	13
12514	27	23	0	4	T	15	51.2	11.4	18.5		2	90.4	20
12513	3/30	26	T	8	10	30	51.6	11.3	14.7		2	71.8	22
12701	3/26	19	T	10	T	75	53.6	9.9			1		
12512	3/31	27	3	1	T	0	50.5	9.7	19.2		2	94.1	17
12525	20	18	1	1	60	70	57.0	9.2			1		
12511	3/6/1	27	1	1	5	0	50.9	8.6	19.9		2	97.3	16
12504	3/6/1	28	1	2	T	0	50.9	8.1	18.1		3	86.9	21
12145	3/31	25	1	T	T	20	49.2	7.5	16.2		4	92.1	18

1/ 0 = none, 1 = 1 or 2 plants in 8', 2 = 3 or 4 plants, 3 = 5 to 7 smutted plants. 2/ Data from disease nursery.

3/ Some winterkilling noted.

Standard error of a difference = 1.14 bus.

Hays, Kansas
Three plots on fallow

C. I. No.	Date		Plant height	Loose smut per row	Weight per bushel	Average acre yield			No. years grown	Percent of Kharkof	Rank
	Head- ed	Ripe				1950	1949-50	1945-50			
	May	June	Ins.	No.	Lbs.	Bus.	Bus.	Bus.			
12146	21	26	26	3	54.0	30.8	20.1		4	109.7	6
12517	22	25	27	2	56.0	29.3	19.4		2	133.0	1
11669	22	23	30	0	56.0	28.1	18.2	26.8	15	127.1	2
11673	23	24	31	0	57.0	28.1	17.1	27.5	14	120.5	3
12702	20	22	27	0	56.5	28.1			1		
8856	18	22	29	0	56.0	27.3	16.2	27.1	18	111.8	5
12132	16	20	28	0	56.5	27.1	17.4	26.5	6	105.0	10
12524	22	21	21	0	55.5	26.8			1		
6251	23	25	30	4	54.0	26.1	15.5	23.9	18	108.9	7
12133	23	24	27	7	56.5	25.1	15.9	29.8	6	118.4	4
12518	21	23	28	4	56.0	25.0	14.6		2	100.0	13
12515	23	24	27	0	56.0	25.0	15.8		2	108.6	8
12406	23	25	28	0	56.0	24.9	17.6		3	104.1	11
12502	23	24	36	4	56.0	24.2	15.7		3	100.1	12
12516	25	25	29	0	57.0	22.8	15.6		2	106.9	9
1442	27	27	28	1	53.5	22.7	14.6	25.2	18	100	13
12505	25	25	26	1	55.0	20.8	14.1		3	96.2	16
12514	23	23	27	0	54.0	20.6	14.2		2	97.6	15
12511	26	25	32	3	53.5	20.2	13.9		2	95.2	17
12703	22	23	24	1	57.0	19.8			1		
12525	11	19	22	0	58.5	18.6			1		
12145	27	27	31	2	53.0	18.4	11.3		4	91.7	18
12513	24	25	28	0	52.5	18.0	11.2		2	76.6	21
12701	22	21	23	1	56.5	16.0			1		
12522	26	27	30	0	53.0	15.6	12.5		2	85.6	19
12512	27	27	29	4	52.0	15.8	11.7		2	80.4	20
12504	28	26	30	5	52.0	14.1	9.0		3	69.0	22

Standard error of a difference = 3.39 bus.

Colby, Kansas
Four plots on fallow

C. I. No.	Date headed	Plant height	Lodg- ing	Weight per bushel	Average acre yield			No. years grown	Percent of Kharkof	Rank
					1950					
	May	Ins.	%	Lbs.	Bus.	Bus.	Bus.			
12517	23	33	3	62.5	46.0			1		
12515	25	33	2	61.5	42.2			1		
12146	22	31	4	59.5	38.9			2	105.5	2
12518	26	31	3	61.5	37.2			1		
12701	24	33	3	61.0	37.2			1		
12524	22	27	1	60.0	36.4			1		
12702	24	31	3	61.0	36.3			1		
12133	23	30	1	61.0	35.9			2	112.8	1
11673	24	32	3	61.5	34.6			2	99.4	4
12703	23	32	2	61.0	34.0			1		
12516	25	32	4	62.5	32.1			1		
12525	16	29	7	60.5	31.0			1		
12513	25	29	3	59.0	30.9			1		
12505	27	27	1	62.0	30.7			2	96.1	5
6251	26	32	2	61.5	30.7			3	89.4	7
8856	20	29	4	60.0	30.6			3	74.8	13
1442	30	32	3	61.5	30.1			3	100.0	3
11669	22	28	2	59.0	29.8			2	92.5	6
12514	25	31	1	58.0	29.4			1		
12522	27	32	2	62.0	28.0			1		
12502	27	34	1	61.5	27.1			2	86.0	8
12406	23	30	1	60.5	27.1			2	83.2	9
12511	28	32	1	60.5	26.2			1		
12132	20	27	2	59.0	24.8			2	81.8	10
12512	28	30	2	60.0	24.7			1		
12504	29	29	0	61.0	23.6			2	81.7	11
12145	25	28	1	61.5	19.0			2	76.3	12

Standard error of a difference = 2.54 bus.

Akron, Colorado

Five plots

C. I. No.	Date		Plant height	Weight per bushel	Average acre yield			No. years grown	Percent of Kharkof	Rank
	Headed	Ripe			1950	1949- 50	1947- 50			
	June	July	Ins.	Lbs.	Bus.	Bus.	Bus.			
12517	8	12	22	57	21.3	23.5		2	131.4	1
12132	7	9	23	59	21.0	20.8	28.2	6	103.2	13
12146	8	9	25	57	20.1	23.9	29.6	4	107.1	7
12702	8	9	24	59	19.7			1		
12524	9	9	22	58	19.6			1		
12502	10	10	25	62	18.6	18.5		3	87.0	20
12504	11	12	22	59	18.3	17.6		3	85.7	21
8856	7	9	25	61	17.8	22.6	26.3	16	112.6	3
12511	10	11	23	59	17.6	19.1		2	107.0	8
12512	10	12	23	59	17.6	19.4		2	108.4	5
12133	9	12	22	58	17.6	17.2	27.2	6	105.0	10
6251	9	10	23	61	17.6	18.8	27.1	16	108.1	6
12518	9	13	22	60	17.4	18.1		2	101.1	14
12516	10	11	23	59	17.3	22.0		2	123.2	2
12513	9	12	23	56	17.2	17.8		2	99.7	17
12701	7	9	23	62	17.2			1		
12505	11	10	21	57	16.9	21.4		3	104.7	11
12703	7	14	22	57	16.9			1		
12515	9	10	22	56	16.8	17.7		2	99.2	18
12525	5/29	9	22	59	16.5			1		
1442	12	11	21	58	16.0	17.9	27.6	16	100.0	16
11669	9	10	22	57	16.0	21.0	26.3	14	110.6	4
12406	10	13	21	58	15.9	21.0		3	98.8	19
12514	8	10	25	53	15.9	18.7		2	104.5	12
12522	10	13	23	58	15.7	18.1		2	101.1	14
11673	10	11	23	57	15.6	20.1	26.5	13	106.5	9
12145	11	12	21	57	14.4	14.9	22.0	4	79.7	22

Standard error of a difference = 1.82 bus.

Ft. Collins, Colorado
Five plots; irrigated May 20

C. I. No.	Date		Plant height Ins.	Leaf rust %	Weight per bushel Lbs.	Average acre yield			No. years grown	Percent of Kharkof	Rank
	Head- ed June	Ripe July				1950 Bus.	1949-50 Bus.	1945-50 Bus.			
12406	16	8/3	36	5	62.0	59.8	51.1		3	130.0	8
12517	13	29	33	5	62.2	58.0	51.5		2	148.6	1
12145	16	8/2	34	5	61.5	57.3	49.8		4	132.6	6
12515	14	30	33	5	61.6	56.6	48.4		2	139.5	4
12702	15	30	30	T	62.7	54.9			1		
12516	15	31	34	20	61.6	53.7	48.3		2	139.4	5
12518	14	28	33	70	61.5	52.6	50.8		2	146.5	2
12505	17	8/1	30	5	61.7	51.3	55.2		3	146.2	3
12133	14	30	33	70	61.4	50.0	52.3	51.6	6	123.2	11
12146	12	27	31	50	60.0	48.9	48.1		4	123.3	10
12502	16	30	37	60	63.3	47.2	47.8		3	119.1	12
12524	13	29	27	20	61.7	47.2			1		
12512	19	8/3	33	2	61.7	46.9	43.7		2	126.0	9
12511	19	8/3	34	T	61.7	46.4	40.1		2	115.7	14
12522	18	8/2	37	10	62.1	46.1	45.1		2	130.2	7
12504	19	8/3	34	T	61.7	45.9	41.4		3	116.4	13
12703	13	30	32	3	61.8	45.8			1		
11669	14	29	33	40	61.2	43.4	45.1	42.7	16	107.6	17
12525	10	26	27	70	63.5	42.7			1		
6251	18	8/1	35	60	62.5	41.7	40.7	41.7	18	99.9	20
8856	11	27	31	50	62.8	41.5	40.1	38.5	18	96.1	22
12513	19	8/2	34	30	60.6	40.8	33.4		2	96.4	21
12132	10	25	27	90	61.0	39.9	49.2	45.5	6	108.5	16
11673	15	28	32	40	60.9	39.0	45.2	42.5	14	107.2	18
12514	13	29	33	10	60.4	39.0	38.9		2	112.3	15
1442	24	8/2	36	50	61.0	37.6	34.7	41.9	18	100.	19
12701	15	30	25	10	61.6	29.4					

Standard error of a difference = 5.19 bus.

Hesperus (Ft. Lewis), Colorado

Five plots

C. I. No.	Date		Plant height	Hail loss	Weight per bushel	Average acre yield			No. Yrs. Grown	Percent of Kharkof	Rank
	Headed	Ripe				1950	1949- 50	1946- 50			
	June	July	Ins.	%	Lbs.	Bus.	Bus.	Bus.			
12513	20	23	22	5	63	15.6	45.6		2	121.9	7
12504	20	22	24	10	64	14.0	45.9		3	131.3	1
12518	20	21	26	10	62	13.3	46.5		2	124.2	5
12406	20	23	24	10	64	12.4	47.2		3	131.2	3
1442	20	24	30	10	63	12.4	37.4	38.2	12	100.0	22
12502	20	23	22	5	65	11.2	43.1		3	119.3	9
12702	19	21	21	30	64	10.9			1		
12514	19	22	24	5	62	10.8	40.3		2	107.8	16
12512	19	21	21	10	63	9.6	42.2		2	112.8	13
12133	20	22	24	15	63	9.6	42.2	41.0	5	107.4	18
12505	19	21	21	15	64	9.5	41.9		3	131.3	1
12511 1/19		21	15	15	62	9.5	40.1		2	107.2	19
11673	20	24	20	35	64	8.9	44.5	48.5	12	123.7	6
12522 1/19		24	20	20	64	8.1	41.9		2	111.9	14
12145	19	24	21	10	62	8.0	46.1		4	121.8	8
12701	19	22	26	30	64	7.7			1		
6251	20	23	28	10	62	7.5	38.9	39.3	12	116.9	12
12146	20	22	17	20	63	7.3	43.6		4	118.4	10
11669	20	24	16	35	63	7.0	44.4	47.7	12	111.4	15
8856	19	23	26	10	63	6.9	36.0	44.5	12	104.5	20
12132	20	22	21	30	62	6.9	40.2	39.5	5	103.4	21
12516	20	24	21	15	66	6.6	47.6		2	127.1	4
12703 1/20		22	21	5	62	5.7			1		
12515	20	23	21	30	62	5.5	44.2		2	118.2	11
12517	19	20	15	20	65	4.1	40.2		2	107.5	17
12524	19	20	17	50	65	3.3			1		
12525	20	23	22	40	65	3.0			1		

1/Lodging 20%.

Standard error of a difference = 3.02 bus.

Ames, Iowa
Three plots

C. I. No.	Date		Plant height	Lodg- ing	Loose smut per row	Leaf rust	Weight per bushel	Average acre yield			No. Years grown	Percent of Kharkof	Rank
	Head- ed	Ripe						1950	1949-50	1945-50			
	June	July	Ins.	%	No.	%	Lbs.	Bus.	Bus.	Bus.			
12517	4	10	43	3	0	5	59.9	46.5	47.0		2	123.9	1
12524	4	10	41	2	1	15	59.2	45.5			1		
12518	6	11	42	0	2	10	60.0	45.1	42.2		2	111.3	10
12516	6	12	45	15	0	5	60.8	44.7	43.2		2	113.9	7
12515	6	11	44	17	1	T	58.0	44.2	46.8		2	123.5	2
11673	6	11	43	12	0	10	58.0	44.1	44.7	36.2	10	99.9	17
12406	6	12	43	2	1	5	59.7	43.7	39.9		2	105.3	13
12702	5	10	45	2	0	T	57.2	43.2			1		
12525	1	8	40	0	1	5	60.8	42.2			1		
12132	2	9	42	0	0	20	60.8	40.6	46.0	38.3	5	113.7	8
12511	8	13	44	0	2	T	60.0	40.2	39.9		2	105.1	14
12502	6	14	47	3	5	15	61.4	40.0	44.9		2	118.3	3
12514	6	11	45	7	0	T	59.5	39.8	40.6		2	107.0	12
11669	5	10	42	0	0	15	59.8	39.7	43.5	40.7	10	115.2	4
12133	5	11	43	0	2	10	60.7	39.7	43.8	38.0	5	112.8	9
12146	4	10	44	3	1	10	58.2	39.7	43.5		3	114.9	5
6251	7	11	44	2	1	15	60.0	38.0	40.6	36.2	10	98.6	18
12522	8	13	46	0	0	10	61.3	37.0	43.3		2	114.2	6
12505	6	12	40	0	2	5	58.3	34.8	41.1		2	108.4	11
1442	10	14	44	7	1	15	59.5	34.1	37.9	33.7	10	100	16
8856	2	7	43	10	0	10	56.9	32.6	38.9	36.8	10	100.6	15
12703	4	10	44	2	1	T	59.7	31.8			1		
12512	2/9	14	44	0	8	T	60.1	30.9	34.7		2	91.4	20
12504	2/9	14	43	0	9	T	60.0	30.5	35.7		2	94.1	19
12701	3	11	42	2	0	T	58.6	26.5			1		
12513	5	11	44	0	1	5	58.6	24.3	31.1		2	82.1	22
12145	2/8	15	43	0	3	T	58.4	23.6	30.9		3	89.8	21

1/Adjusted from lattice analysis. 2/Some winterkilling noted.

Standard error of a difference = 3.5 bus.

Lincoln, Nebraska

Five plots

C. I. No.	Date		Survival	Plant height	Lodging		Leaf rust	Freeze- Chamber Surv.	Weight per bushel	Average acre yield			No. years grown	Percent of Kharkof	Rank
	Head- ed	Ripe			Ripe	7-17				1950	1949- 50	1945- 50			
	May	July	%	Ins.	%	%	%	%	Lbs.	Bus.	Bbs.	Bus.			
12517	31	3	100	46	5	80	5	60	60.1	64.3	40.7		2	124.3	3
12515	6/1	3	100	46	35	90	15	50	60.0	61.2	43.1		2	131.7	2
12133	31	3	97	45	20	85	20	53	60.5	59.7	37.1	37.5	6	122.1	5
12701	30	1	96	46	25	80	1	63	59.9	59.3			1		
12702	30	1	97	46	40	85	4	68	59.8	58.4			1		
12524	31	6/30	100	43	0	70	40	63	59.4	57.5			1		
12518	6/1	3	100	45	20	65	45	48	59.8	57.5	33.5		2	102.4	17
12146	30	6/30	100	45	20	55	40	85	59.3	57.4	35.0		4	119.0	7
11673	31	2	100	46	10	75	30	55	58.7	57.3	37.6	37.6	14	114.2	10
11669	31	6/30	100	44	0	65	40	70	59.9	57.0	38.4	39.1	16	133.1	1
12516	6/2	4	100	46	30	70	10	78	60.9	56.9	36.9		2	112.7	11
12406	31	5	100	45	5	30	5	50	58.7	54.9	37.5		3	118.8	8
12525	1/24	6/29	97	39	0	75	20	55	61.6	53.2			1		
12132	27	6/29	97	41	0	60	55	43	61.3	53.1	38.6	37.2	6	121.1	6
1442	6/5	6	100	46	10	35	25	74	58.9	52.3	32.7	30.7	19	100.0	18
8856	27	6/30	97	45	25	80	45	35	61.6	52.0	35.0	36.3	19	123.1	4
12502	6/2	5	97	48	0	20	30	50	60.9	52.0	36.7		3	117.8	9
12703	30	1	96	44	5	50	4	50	60.7	51.4			1		
12505	6/2	5	90	40	0	55	10	38	60.7	50.8	30.1		3	107.6	16
12504	6/4	6	75	44	5	35	2	40	59.9	48.5	28.4		3	99.8	19
12522	6/2	5	98	47	10	35	10	53	60.6	48.4	36.2		2	110.7	12
12512	6/4	6	80	44	5	35	2	28	60.0	48.1	27.0		2	82.4	21
12511	6/3	5	75	44	5	40	4	33	59.8	47.7	29.4		2	89.9	20
6251	6/2	4	99	45	15	55	25	50	60.7	47.2	29.5	30.7	19	108.8	15
12514	30	6/30	97	45	0	80	10	25	57.8	47.2	36.2		2	110.6	13
12145	6/3	5	75	42	5	50	4	33	59.6	46.7	25.6		4	110.3	14
12513	30	1	99	44	10	40	45	35	58.4	43.6	26.7		2	81.5	22

1/Damaged by birds June 19. 2/L. S. D = 22% loss

Standard error of a difference = 2.07 bus.

North Platte, Nebraska

Three plots on fallow

C. I. No.	Survival	Date		Plant height	Weight per bushel	Average acre yield			No. Years grown	Percent of Kharkof	Rank
		Headed	Ripe			1950	1949-50	1945-50			
	%	June	July	Ins.	Lbs.	Bus.	Bus.	Bus.			
12517	97	9	11	30	62.1	39.9	39.7		2	147.0	1
12515	100	7	12	30	61.0	39.0	38.3		2	141.9	2
12406	100	7	10	29	61.0	35.8	34.8		3	124.0	4
12524	100	8	10	26	60.4	34.1			1		
12146	100	9	12	28	60.4	33.7	34.5		4	116.5	6
1442	100	14	15	26	61.1	32.8	27.0	32.7	13	100	14
12133	97	9	11	28	61.2	32.0	29.6	37.1	6	113.2	8
11669	100	10	9	27	61.0	31.8	33.0	36.4	12	125.0	3
11673	100	10	13	27	61.1	31.8	30.2	35.8	10	117.0	5
12702	97	9	9	28	61.7	31.5			1		
12518	100	10	11	29	61.5	31.1	28.6		2	105.9	11
12516	97	10	11	28	61.9	27.5	30.2		2	111.9	9
12522	97	12	11	29	61.3	26.9	26.4		2	97.8	17
12505	50	13	15	25	61.0	26.5	25.9		3	105.9	11
12502	100	10	13	30	61.3	26.0	28.6		3	106.7	10
12701	97	8	10	27	61.4	25.0			1		
6251	93	11	14	27	61.2	24.6	20.6	32.0	13	98.1	16
8856	87	10	13	28	61.1	24.2	22.6	30.1	13	101.2	13
12514	93	9	10	28	59.9	24.1	30.8		2	113.9	7
12132	87	10	12	26	60.7	22.7	27.9	28.9	6	88.2	19
12703	87	10	9	28	60.8	22.0			1		
12513	67	11	12	27	60.6	21.3	25.0		2	92.4	18
12525	87	9	10	27	61.9	19.1			1		
12512	33	15	16	24	59.0	16.3	20.0		2	73.9	21
12504	33	15	16	25	59.5	12.6	19.1		3	80.6	20
12511	27	15	17	24	60.3	11.4	19.1		2	70.6	22
12145	Not grown								3	100.0	14

Standard error of a difference = 3.60 bus.

Alliance, Nebraska
Three plots on fallow

C. I. No.	Survival %	Date		Weight per bushel lbs.	Average acre yield			No. Years grown	Percent of Kharkof	Rank
		Head- ed June	Ripe July		1950 Bus.	1949-50 Bus.	1945-50 Bus.			
1442	97	16	21	59.1	21.2	29.5	30.6	15	100	9
12518	98	12	19	60.4	19.8	34.0		2	115.3	2
12522	97	15	20	60.9	18.4	29.1		2	98.6	10
6251	90	14	20	60.6	17.1	30.5	29.6	15	94.5	13
12133	99	11	18	59.5	16.6	31.2	34.1	6	111.2	4
12516	93	12	18	61.2	16.6	31.2		2	105.8	5
12502	97	14	19	62.0	16.0	29.7		3	103.1	7
11673	97	11	18	58.9	15.9	29.8	30.1	12	97.5	11
12515	97	11	18	60.3	15.7	31.2		2	105.8	5
12517	97	11	18	60.0	15.6	33.0		2	111.9	3
8856	87	11	15	60.8	15.1	30.7	28.9	15	88.3	16
12132	90	10	15	59.9	15.1	29.7	28.6	6	93.5	14
12146	100	11	17	58.9	15.1	29.6		4	92.7	15
12702	90	10	17	60.3	15.1			1		
12703	80	10	17	60.8	14.8			1		
12406	94	11	20	59.6	13.7	32.7		3	116.2	1
11669	100	10	17	57.9	13.4	29.7	29.5	12	100.2	8
12524	100	10	16	60.0	13.4			1		
12701	87	11	17	59.5	9.9			1		
12525	90	7	15	61.6	9.4			1		
12514	75	12	19	56.6	8.5	23.8		2	80.6	17
12511	10				TL	20.8		2	70.6	21
12504	10				TL	20.8		3	75.2	18
12512	13				TL	21.7		2	73.5	19
12505	17				OL	27.1		3	97.0	12
12145	10	-	-	-	OL	22.9		4	72.5	20
12513	Not grown									

Hail damaged all varieties July 18.

1/ Not harvested. Failure.

Standard error of a difference = 1.66 bus.

STANDARD ERRORS

A summary by stations of the number of replications, average yields, and standard errors for the uniform yield nursery appears as table 15. The procedure for calculating errors is the same as that described for the plot series. The standard error of a single plot varied from 1.85 bushels at Denton to 8.21 at Ft. Collins although 9 of the 16 were below 4. All "F" values were significant. The standard error of a difference between means was least at Manhattan (1.14) with most of the stations running below 3. The error term for the mean in percent shows how the general yield level and plot variability are related. It will be seen that the percentage was over 15 only at Bushland, Woodward, and Hesperus. In fact all other stations were below 10% except for Hays which was barely above.

Table 15. No. of plots, average yield, and standard errors for the uniform yield nursery at the various stations in 1950.

State and Station	No. of plots	Av. yield all entries Bus.	Standard error of			
			Single plot Bus.	Difference between means Bus.	Mean in	
					Bushels	Percent
Texas						
Denton	4	10.66	1.85	1.31	0.92	8.66
Chillicothe	4	27.54	4.05	2.86	2.02	7.35
Bushland	3	7.36	2.63	2.15	1.52	20.66
Oklahoma						
Stillwater	4	27.36	2.98	2.11	1.49	5.45
Cherokee	4	14.08	2.30	1.63	1.15	8.18
Woodward	4	14.15	4.82	3.41	2.41	17.04
Kansas						
Manhattan	5	13.69	1.81	1.14	0.81	5.91
Hays	3	22.94	4.15	3.39	2.40	10.45
Colby	4	31.64	3.59	2.54	1.80	5.68
Colorado						
Akron	5	17.46	2.88	1.82	1.29	7.38
Ft. Collins	5	46.80	8.21	5.19	3.67	7.85
Hesperus	5	8.68	4.77	3.02	2.13	24.59
Iowa						
Ames	3	37.89	4.29	3.50	2.47	6.53
Nebraska						
Lincoln	5	53.47	3.27	2.07	1.46	2.73
North Platte	3	26.71	4.41	3.60	2.55	9.54
Alliance	3	12.17	2.03	1.66	1.17	9.63

SUMMARY OF NURSERY YIELDS

Yields of grain made by the varieties in 1950 are brought together in table 16. Here the entries are listed in order of their region-wide averages. This provides a general over-all view of the performance of each entry against the many hazards to plant growth already enumerated for individual testing points. Comanche x Blackhull-Hard Federation (C. I. 12517) was plainly the most productive variety significantly exceeding all other entries on the average except C. I. 12515. It ranked first in Oklahoma, Kansas, Iowa, and Nebraska; it ranked ninth in Texas and third in Colorado. C. I. 12515 did relatively better in Texas than C. I. 12517. Lower yielding entries in order were C. I. 12146, C. I. 12702, C. I. 12518, and C. I. 12516. Kiowa was the highest named variety but it did not surpass Comanche significantly. Pawnee was no better than Kharkof. It made its poorest showings in Oklahoma and Colorado. Quanch was the lowest yielding named variety but ranked fifth in Colorado. Early varieties such as Triumph, Early Blackhull, and C. I. 12525 made a low average in most states in 1950 and in the area as a whole.

In table 17 are the averages on 22 varieties for 1949 and 1950 combined. These were grown uniformly at 14 stations. Since C. I. 12517 ranked first in each of the years it of course leads among the 2-year average comparisons. Following in order is C. I. 12515, C. I. 12146, C. I. 12406, and C. I. 12516. The best named varieties were Pawnee, Comanche, and Kiowa. Low averages were made by Quanch, C. I. 12513, and C. I. 12504. Triumph which ranked second in 1949 ranked 17th in 1950 and eleventh for the 2-year period. With a few irregularities, the varieties rank about alike in the various states. The ranking for Nebraska is in very close agreement with the 14 station ranking.

Nine entries have been in the nursery four years. Kiowa and C. I. 12146 have the highest averages, slightly exceeding 34 bushels to the acre. Pawnee and Comanche rank third and fourth followed by Triumph, Early Blackhull, and Blackhull. Quanch with a yield of 29.9 and Kharkof with 29.8 have the lowest rankings. These data and general observations concur in the conclusion that the first four varieties have good general adaptation in the central and southern districts whereas the latter five varieties do not possess characteristics enabling them to make high yields as consistently over so wide a territory.

Table 16. Summary of the average yields in bushels per acre made by the 27 entries grown in the uniform yield nursery at 16 stations in 1950, with state averages.

Variety	C. I. No.	Texas					Oklahoma					Kansas					Rank
		Dent- on	Chilli- cothe	Bush- land	Av.	Rank	Still- water	Chero- kee	Wood- ward	Av.	Rank	Man- hattan	Hoys	Colby	Av.	Rank	
Com. x Bl. - Hd. Fed.	12517	10.6	30.5	6.7	15.9	9	32.3	21.5	24.8	26.2	1	14.8	29.3	46.0	30.0	1	
Hd. Fed. Hybrid	12515	11.0	33.6	8.9	17.8	1	32.8	19.8	24.2	25.6	2	15.1	25.0	42.2	27.4	3	
Mt.-Tq. x Chiefk.	12146	10.4	31.3	9.5	17.1	5	32.8	18.3	23.1	24.7	3	18.7	30.8	38.9	29.5	2	
Sv.-Wich.-Ho.-Chey x Wich. 2	12702	12.1	32.9	7.2	17.4	4	32.0	18.4	17.7	22.7	5	16.5	28.1	36.3	27.0	4	
Chiefk. x Oro - Tq.	12518	8.3	28.0	10.2	15.5	13	30.2	13.3	17.8	20.4	7	17.3	25.0	37.2	26.5	5	
Bl.-Oro x Pawnee	12516	11.9	34.0	7.3	17.7	2	33.8	18.2	18.2	23.4	4	14.8	22.8	32.1	23.2	13	
Kiowa	12133	9.1	29.3	14.0	17.5	3	25.9	14.5	11.3	17.2	16	17.4	25.1	35.9	26.1	6	
Mgo.-Oro x Oro - Tq.	12406	13.0	25.9	4.6	14.5	19	25.9	14.6	14.7	18.4	13	14.8	24.9	27.1	22.3	15	
Kv.-Tq. x Com.	12524	10.8	28.6	7.5	15.6	12	28.6	13.3	11.9	17.9	15	14.1	26.8	36.4	25.8	7	
Comanche	11673	9.7	29.6	11.3	16.9	7	25.9	18.2	13.1	19.1	11	14.5	28.1	34.6	25.8	7	
Blue Jacket	12502	10.2	27.1	13.7	17.0	6	25.7	14.8	14.8	18.4	13	19.1	24.2	27.1	23.5	12	
Blackhull	6251	10.1	28.8	10.9	16.6	8	27.2	16.6	16.6	20.1	8	20.1	26.1	30.7	25.6	9	
Kharkof	1442	9.8	30.8	6.6	15.7	11	27.6	15.0	13.5	18.7	12	15.7	22.7	30.1	22.8	14	
Pawnee	11669	9.1	27.0	10.5	15.8	10	26.0	13.5	8.6	16.0	20	14.5	28.1	29.8	24.1	10	
Oriente	12522	12.4	24.6	8.2	15.1	15	27.9	16.0	16.2	20.0	9	16.2	15.6	28.0	19.9	22	
Early Blackhull	8856	8.6	27.5	9.3	15.1	15	24.7	12.3	11.9	16.3	19	12.9	27.3	30.6	23.6	11	
Triumph	12132	8.5	23.6	6.5	12.9	24	23.8	13.7	7.6	15.0	21	13.2	27.1	24.8	21.7	17	
Sv.-Wich. x Ho.-Chey.	12701	10.1	23.8	4.2	12.7	25	34.6	18.0	14.0	22.2	6	9.9	16.0	37.2	21.0	18	
Com. x Med.-Hope	12514	9.7	28.0	8.8	15.5	13	25.5	11.8	12.0	16.4	18	11.4	20.6	29.4	20.1	20	
do	12513	9.3	23.7	5.2	12.7	25	27.8	17.2	14.2	19.7	10	11.3	18.0	30.9	20.1	20	
Mgo.-Oro x Pawnee	12505	13.1	25.2	5.9	14.7	17	24.8	7.3	11.8	14.6	23	11.5	20.8	30.7	21.0	18	
29-34-275 D. Cr.	12512	12.2	27.1	3.2	14.2	21	22.2	-	-	-	-	9.7	15.8	24.7	16.7	25	
Quivira Hyb.	12525	9.2	19.2	2.8	10.4	27	25.6	9.3	10.0	15.0	21	9.2	18.6	31.0	19.6	23	
Sv.-Wich.-Ho.-Chey x Wich. 2	12703	10.9	23.2	9.4	14.5	19	25.1	13.5	12.6	17.1	17	12.9	19.8	34.0	22.2	16	
29-34-275 D. Cr.	12511	12.5	28.3	1.5	14.1	22	25.5	5.4	10.3	13.7	24	8.6	20.2	26.2	18.3	24	
Quinnah	12145	14.1	27.4	2.5	14.7	17	23.5	7.0	8.8	13.1	25	7.5	18.4	19.0	15.0	27	
29-34-275 D. Cr.	12504	12.1	24.9	2.3	13.1	23	21.5	5.1	5.9	10.8	26	8.1	14.1	23.6	15.3	26	

Table 16
cont'd.

C. I. No.	Colorado					Iowa		Nebraska				Rank	16 state av. *
	Akron	Ft. Collins	Hes- perus	Av.	Rank	Ames	Rank	Lin- coln	North Platte	Alli- ance	Av.		
12517	21.3	58.0	4.1	27.8	3	46.5	1	64.3	39.9	15.6	39.9	1	29.1
12515	16.8	56.6	5.5	26.3	6	44.2	5	61.	39.0	15.7	38.6	2	28.2
12146	20.1	48.9	7.3	25.4	12	39.7	14	57.4	33.7	15.1	35.4	5	27.3
12702	19.7	54.9	10.9	28.5	2	43.2	8	58.4	31.5	15.1	35.0	7	27.2
12518	17.4	52.6	13.3	27.8	3	45.1	3	57.5	31.1	19.8	36.1	3	26.5
12516	17.3	53.7	6.6	25.9	8	44.7	4	56.9	27.5	16.6	33.7	12	26.0
12133	17.6	50.0	9.6	25.7	10	39.7	14	59.7	32.0	16.6	36.1	3	25.5
12406	15.9	59.8	12.4	29.4	1	43.7	7	54.9	35.8	13.7	34.8	10	25.1
12524	19.6	47.2	3.3	23.4	16	45.5	2	57.5	34.1	13.4	35.0	7	24.9
11673	15.6	39.0	8.9	21.2	25	44.1	6	57.3	31.8	15.9	35.0	7	24.9
12502	18.6	47.2	11.2	25.7	10	40.0	12	52.0	26.0	16.0	31.3	14	24.2
6251	17.6	41.7	7.5	22.3	20	38.0	17	47.2	24.6	17.1	29.6	18	23.8
1442	16.0	37.6	12.4	22.0	23	34.1	20	52.3	32.8	21.2	35.4	5	23.6
11669	16.0	43.4	7.0	22.1	21	39.7	14	57.0	31.8	13.4	34.1	11	23.5
12522	15.7	46.1	8.1	23.3	17	37.0	18	48.4	26.9	18.4	31.2	15	22.9
8856	17.8	41.5	6.9	22.1	21	32.6	21	52.0	24.2	15.1	30.4	16	22.2
12132	21.0	39.9	6.9	22.6	19	40.6	10	53.1	22.7	15.1	30.3	17	21.8
12701	17.2	29.4	7.7	18.1	27	26.5	25	59.3	25.0	9.9	31.4	13	21.4
12514	15.9	39.0	10.8	21.9	24	39.8	13	47.2	24.1	8.5	26.6	20	21.4
12513	17.2	40.8	15.6	24.5	14	24.3	26	43.6	21.3	-	-	-	21.4 ^{1/}
12505	16.9	51.3	9.5	25.9	8	34.8	19	50.8	26.5	0	25.8	22	21.3
12512	17.6	46.9	9.6	24.7	13	30.9	23	48.1	16.3	T	21.5	23	20.3 ^{2/}
12525	16.5	42.7	3.0	20.7	26	42.2	9	53.2	19.1	9.4	27.2	21	20.1
12703	16.9	45.8	5.7	22.8	18	31.8	22	51.4	22.0	14.8	29.4	19	19.9
12511	17.6	46.4	9.5	24.5	14	40.2	11	47.7	11.4	T	19.8	25	19.5
12145	14.4	57.3	8.0	26.6	5	23.6	27	46.7	-	0	-	-	18.6 ^{1/}
12504	18.3	45.9	14.0	26.1	7	30.5	24	48.5	12.6	T	20.4	24	18.0

* Standard error of a difference = 0.7 bushels.

^{1/}15 stations.

^{2/}14 stations.

Table 17. Summary of 2-year averages in bushels per acre for 22 varieties grown in the uniform yield nursery at 14 stations in 1949 and 1950.

Variety	C. I. No.	Texas				Oklahoma					Kansas			
		Chilli- cothe	Bush land	Av.	Rank	Still- water	Chero- kee	Wood- ward	Av.	Rank	Man- hattan	Days	Av.	Rank
Com. x Bl. - Hd. Fed.	12517	30.9	24.1	27.5	5	32.2	28.9	37.6	32.9	1	24.1	19.4	21.8	2
Hard Fed. Hybrid	12515	33.1	23.4	28.3	2	31.3	21.5	33.9	28.9	3	18.8	15.8	17.3	15
Mt.-Tenq. x Chiefk.	12146	30.1	25.9	28.0	3	29.9	24.0	34.4	29.4	2	23.0	20.1	21.6	4
Mqo.-Oro x Oro-Tq.	12406	29.7	20.3	25.0	15	25.5	26.5	29.6	27.2	6	26.6	17.6	22.1	1
Bl.-Oro x Pawnee	12516	34.7	22.4	28.6	1	31.7	20.1	32.6	28.1	4	20.9	15.6	18.3	13
Pawnee	11669	30.8	25.2	28.0	3	25.5	24.0	28.8	26.1	10	23.7	18.2	21.0	5
Comanche	11673	26.8	23.8	25.3	12	26.5	26.0	28.7	27.1	7	24.5	17.1	20.8	7
Kiowa	12133	27.2	26.1	26.7	7	26.2	24.2	27.6	26.0	11	25.5	15.9	20.7	8
Blue Jacket	12502	28.3	25.3	26.8	6	26.1	23.7	25.9	25.2	13	27.8	15.7	21.8	2
Chiefk. x Oro-Tenq.	12518	27.3	23.0	25.2	14	28.8	22.9	28.6	26.8	8	23.2	14.6	18.9	9
Triumph	12132	26.5	21.9	24.2	17	26.0	27.7	28.5	27.4	5	20.4	17.4	18.9	9
Mqo.-Oro x Pawnee	12505	27.8	22.0	24.9	16	24.7	21.7	31.3	25.9	12	23.4	14.1	18.8	11
Oriente	12522	27.4	23.5	25.5	11	26.2	24.3	28.9	26.5	9	24.4	12.5	18.5	12
Early Blackhull	8856	28.3	23.6	26.0	8	25.3	20.0	27.7	24.3	15	17.8	16.2	17.0	16
Com. x Med.-Hope	12514	29.7	22.0	25.9	9	25.4	20.1	24.8	23.4	18	18.5	14.2	16.4	18
Blackhull	6251	24.3	23.8	24.1	18	26.3	18.4	27.6	24.1	17	26.3	15.5	20.9	6
Khar'kof	1442	28.0	22.5	25.3	12	26.0	21.0	26.0	24.3	15	20.4	14.6	17.5	14
29-34-275 D. Cr.	12511	30.8	20.3	25.6	10	26.0	20.5	26.7	24.4	14	19.9	13.9	16.9	17
do	12512	28.8	19.2	24.0	20	23.0	-	-	-	-	19.2	11.7	15.5	19
Quannah	12145	30.2	17.9	24.1	18	24.2	18.9	23.6	22.2	20	16.2	11.3	13.8	20
Com. x Med.-Hope	12513	26.2	18.9	22.6	21	25.8	18.4	25.4	23.2	19	14.7	11.2	13.0	22
29-34-275 D. Cr.	12504	27.4	17.2	22.3	22	23.7	16.1	22.4	20.7	21	18.1	9.0	13.6	21

Table 17
cont'd

C. I. No.	Colorado					Iowa		Nebraska					14 station average
	Akron	Ft. Collins	Hes- perus	Av.	Rank	Ames	Rank	Lin- coln	North Platte	Alli- ance	Av.	Rank	
12517	23.5	51.5	40.2	38.4	6	47.0	1	40.7	39.7	33.0	37.5	1	33.8
12515	17.7	48.4	44.2	36.8	8	46.8	2	43.1	38.3	31.2	37.5	1	32.0
12146	23.9	48.1	43.6	38.5	4	43.5	7	35.0	34.5	29.6	33.0	5	31.8
12406	21.0	51.1	47.2	39.8	1	39.9	15	37.5	34.8	32.7	35.0	3	31.4
12516	22.0	48.3	47.6	39.3	3	43.2	10	36.9	30.2	31.2	32.8	6	31.2
11669	21.0	45.1	44.4	36.8	8	43.5	7	38.4	33.0	29.7	33.7	4	30.8
11673	20.1	45.2	44.5	36.6	11	44.7	5	37.6	30.2	29.8	32.5	8	30.4
12133	17.2	52.3	42.2	37.2	7	43.8	6	37.1	29.6	31.2	32.6	7	30.4
12502	18.5	47.8	43.1	36.5	13	44.9	4	36.7	28.6	29.7	31.7	11	30.2
12518	18.1	50.8	46.5	38.5	4	42.2	11	33.5	28.6	34.0	32.0	10	30.2
12132	20.8	49.2	40.2	36.7	10	46.0	3	38.6	27.9	29.7	32.1	9	30.1
12505	21.4	55.2	41.9	39.5	2	41.1	12	30.1	25.9	27.1	27.3	16	29.1
12522	18.1	45.1	41.9	35.0	15	43.3	9	36.2	26.4	29.1	30.6	12	29.1
8856	22.6	40.1	36.0	32.9	18	38.9	17	35.0	22.6	30.7	29.4	15	27.5
12514	18.7	38.9	40.3	32.6	20	40.6	13	36.2	30.8	23.8	30.3	13	27.4
6251	18.8	40.7	38.9	32.8	19	40.6	13	29.5	20.6	30.5	26.9	17	27.3
1442	17.9	34.7	37.4	30.0	22	37.9	18	32.7	27.0	29.5	29.7	14	26.8
12511	19.1	40.1	40.1	33.1	17	39.9	15	29.4	19.1	20.8	23.1	18	26.2
12512	19.4	43.7	42.2	35.1	14	34.7	20	27.0	20.0	21.7	22.9	19	25.9 ^{1/}
12145	14.9	49.8	46.1	36.6	11	30.9	22	25.6	-	22.9	-	-	25.6 ^{2/}
12513	17.8	33.4	45.6	32.3	21	31.1	21	26.7	25.0	-	-	-	24.6 ^{2/}
12504	17.6	41.4	45.9	34.4	16	35.7	19	28.4	19.1	20.8	22.8	20	24.5

^{1/} 12 stations. ^{2/} 13 stations.

SUMMARY OF AGRONOMIC DATA

Many observations other than yield per acre were recorded by cooperators on the entries in the uniform yield nursery. When two or more stations show data on the same character, an average has been calculated and placed in summary table 18. Single-station observations were made on a number of other traits. In table 18 the 27 entries are listed in order of average weight per bushel. Blue Jacket at 61.6 pounds averaged heaviest. Other entries over 61 were C. I. 12516, C. I. 12525, C. I. 12517, and C. I. 12518. Sixteen of the varieties surpassed the 60-pound minimum required for grade No. 1 wheat. All but three tested 59 or heavier.

Winterkilling was a factor at four stations and it affected yields of grain materially. C. I. 12505, C. I. 12504, C. I. 12511, C. I. 12512, and Quench were injured the most. Eleven entries averaged below 90% survival.

Date of heading and ripening was recorded at the majority of locations where a test was grown. C. I. 12525 was earliest followed by Triumph and Early Blackhull. Kharkof was latest to head and among the three last varieties to ripen.

Plant height taken at 14 stations shows that C. I. 12525, C. I. 12524, and C. I. 12505 are the shortest. They averaged six or seven inches shorter than Blue Jacket, the tallest variety.

Lodging at three stations indicates C. I. 12505 had the ~~shortest~~ ^{best} straw although Blue Jacket, Triumph, C. I. 12524, Pawnee, and perhaps others were about as good.

Leaf rust was noted at six stations. It is clear that Quench and the Sinvalocho hybrids had the least rust. The Marquillo hybrids and C. I. 12517 had rather low readings also. C. I. 12518 and Triumph averaged more than 40% infection. Stem rust was too light at most stations to justify readings.

Table 18. Summary of agronomic data other than yield for the varieties grown in the uniform yield nursery in 1950

Variety	C. I. No.	Survival %	Date		Plant height Ins.	Lodging %	Leaf rust %	Weight per bu. Lbs.
			Head	Ripe				
Number of stations.....		4	12	11	14	3	6	13
Blue Jacket	12502	94	23	29	32	1	35	61.6
BL.-Oro x Pawnee	12516	94	23	29	30	16	11	61.4
Quivira Hybrid	12525	86	13	24	25	2	18	61.3
Com. x BL.-Hd.Fed.	12517	96	21	28	29	4	8	61.2
Chiefk. x Oro - Tong.	12518	95	21	28	29	8	41	61.1
Sv.-Wich. x Ho.-Chey.	12701	84	19	27	28	10	6	60.7
(Sv.-W. x Ho.-Ch.) x Wich. ²	12702	91	20	27	29	15	3	60.7
Blackhull	6251	93	23	30	31	6	28	60.6
Early Blackhull	8856	88	18	25	29	13	34	60.6
Kiowa	12133	91	21	28	28	7	39	60.5
Oriente	12522	94	24	30	31	4	12	60.3
(Sv.-W. x Ho.-Ch.) x Wich. ²	12703	87	20	27	28	3	2	60.3
Triumph	12132	89	17	25	27	1	44	60.1
Mqo.-Oro x Oro - Tq.	12406	92	22	29	29	3	8	60.1
Hd. Fed. Hybrid	12515	96	22	28	29	18	9	60.1
Kv. - Tong. x Com.	12524	95	21	26	26	1	25	60.1
Comanche	11673	96	22	28	29	8	22	59.9
Pawnee	11669	93	22	28	27	1	29	59.8
Mqo.-Oro x Pawnee	12505	51	23	30	26	1-	7	59.8
Mt.-Tq. x Chiefk.	12146	96	20	27	29	9	31	59.7
Kharkof	1442	94	27	7/1	30	7	32	59.4
29-34-275 D. Cr.	12504	39	25	7/1	29	2	2	59.3
do	12511	35	25	30	29	2	2	59.3
do	12512	41	26 ^{1/}	7/2 ^{1/}	30 ^{2/}	2	1	59.0 ^{2/}
Com. x Med.-Hope	12513	76 ^{1/}	22	28	29	4	25	58.9
Quanah	12145	37 ^{1/}	21 ^{1/}	29 ^{1/}	28 ^{1/}	2	2	58.7 ^{1/}
Com. x Med.-Hope	12514	84	21	28	30	3	12	58.1

^{1/}One fewer stations than indicated; ^{2/}two fewer.

UNIFORM WINTERHARDINESS NURSERY

The uniform winterhardiness nursery was planted at 8 stations in the northern region for the purpose of determining rather carefully the ability of numerous new selections to survive and to determine their productiveness. Data were obtained on survival at 6 stations as shown in table 19. Plantings at Dickinson, N. Dak., and Havre, Mont., failed completely more as a consequence of drought than cold. In the table the entries are listed in declining order of percent survival. Minhardi was best able to survive in 1949-50 followed closely by three Minnesota hybrids and Yogo. Ichardi and Minter were slightly but probably not significantly better than Minturki. Kharkof and Nebred averaged 64.5 and 61.5, respectively. These varieties have been sufficiently hardy in Nebraska in most winters but the Minturki-Yogo-Minhardi levels should be attained for satisfactory hardiness north of this. There is a desire on the part of breeders to find new genes for hardiness that would push the level above what is available now. However, nothing specific is in sight.

All entries were harvested at Alliance and those surviving 20% or better were cut at Brookings. Yields and test weights appear in the table. Four entries averaged over 59 pounds per bushel while Kharkof was down to 56.1. The highest yields at Alliance were made by 45904, 422123, Kharkof and 12711; at Brookings the best yields were made by C. I. 12520, M. 2784, and Minter. In the 2-station averages, M. 2784, Minter, and C. I. 12704 were highest although several other entries are not significantly lower. Leaf rust notes at Brookings showed all entries to be susceptible except N. 47511.

A supplementary winterhardiness nursery consisting of 96 entries was sown in duplicate 8-foot rows at six stations. Usable data on survival were collected from three stations, summarized and sent as a separate report to breeders who had material among the 96 entries for trial. No data are presented here.

DATA FROM THE DISEASE NURSERIES

Summaries of the results obtained in the uniform bunt nursery which was sown at 8 stations and the uniform rust nursery grown at several locations in this region will appear in separate reports.

DATA FROM THE QUALITY LABORATORY

Grain harvested from the uniform plots and yield nursery along with that from promising new strains of local station interest was sent by cooperators to the Federal Hard Wheat Quality Laboratory for milling and baking tests. Results on these samples will appear in a separate report prepared by the workers at the laboratory.

Table 19. Survivals and other data recorded on strains of winter wheat tested in the uniform winterhardness nursery at 6 stations in the northern region in 1950. ^{1/}

Variety	C. I. or Sel. No.	Spring Survival							Weight per bushel			Average acre yield ^{2/}		
		Alli- ance	Lar- amie	Was- eca	St. Paul	Brook- ings	Leth- bridge	6 sta. average	Alli- ance	Brook- ings	Average	Alli- ance	Brook- ings	Average
		%	%	%	%	%	%	%	Lbs.	Lbs.	Lbs.	Bus.	Bus.	Bus.
Minhardi	5149	100	86	80	98	80	91	89.2	58.0	50	54.0	15.8	27.3	21.6
H44 x Minturki 3	M.2784	100	88	90	87	67	93	87.5	60.1	58	59.1	16.3	32.5	24.4
H44 x Minturki 2	12532	100	85	93	92	57	94	86.8	59.3	57	58.2	13.7	28.3	21.0
Yogo	8033	100	89	77	100	50	91	84.5	60.2	56	58.1	17.5	28.6	23.1
Marm. x H44-Minh.	12520	100	86	78	83	63	93	83.8	58.6	58	58.3	17.1	30.7	23.9
do	12508	100	86	80	80	57	88	81.8	59.0	56	57.5	16.3	28.1	22.2
Iohardi	12510	100	86	92	78	40	84	80.0	61.1	58	59.6	17.4	22.7	20.1
Minter	12138	100	81	58	73	63	89	77.3	59.0	60	59.5	16.9	31.1	24.0
H44-Minh. x Marm.	12704	100	85	58	83	57	79	77.0	59.2	58	58.6	19.6	29.4	24.5
Minturki	6155	100	91	70	65	47	87	76.7	58.7	55	56.9	18.0	27.3	22.7
Chiefk. x Cheyenne	N422123	100	91	70	62	33	85	73.5	59.1	55	57.1	21.7	23.0	22.4
Cheyenne x Turkey	12142	100	95	63	92	13	76	73.2	58.9	-	-	19.4	-	-
Hope-Turkey x Chey.	44541	99	96	60	72	27	68	70.3	57.5	58	57.8	18.6	21.5	20.1
Hope x Cheyenne 2	45904	98	85	58	73	13	78	67.5	60.0	-	-	23.6	-	-
Oro x Mgo. - Oro	N47511	100	93	87	27	47	46	66.7	60.4	59	59.7	17.5	29.1	23.3
Hope-Turkey x Chey.	44552	95	91	38	88	10	77	66.5	59.2	-	-	18.7	-	-
Hope x Cheyenne 2	N451558	98	95	63	40	23	76	65.8	59.2	58	58.6	17.1	21.6	19.4
Kharkof	1442	97	86	47	50	22	85	64.5	59.1	53	56.1	21.2	14.4	17.8
Nebred x Hope-Turkey	N456812	85	86	50	83	7	70	63.5	58.4	-	-	17.8	-	-
Turkey x Cheyenne	12711	100	90	27	72	10	72	61.8	59.0	-	-	21.1	-	-
Nebred	10094	100	90	30	48	20	86	61.5	60.3	57	58.7	18.8	21.5	20.2
Turkey x Oro	12705	99	88	50	50	25	51	60.5	59.9	54	57.0	16.5	15.1	15.8
do	Mont. 208	100	85	30	50	13	64	57.0	58.9	-	-	16.5	-	-
Martin x Tenmarq 3	11824	93	84	37	37	18	72	56.8	58.9	-	-	17.5	-	-
Hope-Turkey x Turkey	N456446	87	85	43	20	15	62	52.0	60.0	-	-	14.7	-	-
Turkey x Oro	Mont. 216	100	89	14	17	8	69	49.5	60.0	-	-	14.5	-	-
Ridit x Kharkof	12521	95	78	25	15	5	78	49.3	58.5	-	-	17.8	-	-

^{1/}Three replications except 5 at Lethbridge.

^{2/}Standard error of a difference at Alliance = 1.7 and at Brookings = 4.3 bushels.

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