UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
FIELD CROPS RESEARCH BRANCH

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COMPARISON OF WINTER WHEAT VARIETIES GROWN IN COOPERATIVE PLOT AND NURSERY EXPERIMENTS IN THE HARD RED WINTER WHEAT REGION IN 1955

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Preliminary report not for publication[1]/

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Nebraska Agricultural Experiment Station
Lincoln, Nebraska
388CC - March 1956

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By

V. A. Johnson1/

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1/ The writer expresses appreciation to Dorothy M. Wilson and Alfred Haunold for their assistance in preparing this report.

EXPERIMENTS IN 1955

Drought and high temperatures again dominated conditions in much of the hard red winter wheat region--particularly the southern and central portions. The eastern edge of the region as far north as Lincoln, Nebraska, which heretofore has produced average or above-average crops was severely affected this year. Late winter freezes in February and again in March caused considerable damage in Oklahoma and Texas. Wheat in northern Kansas and Nebraska made near-spectacular recovery with general rains and cool temperatures during the ripening period in these States Consequently yields varied from near failure at several southern locations to exeeaingly high levels at the more northern stations.

Seeded acreage of winter wheat in the United States in 1955 was 44 393 000 acres. Harvested acres in the country totaled 33,674 000. This is an abandonment of 24 percent as compared with a 16 percent abandonment in 1954. The average yield per harvested acre in 1955 was 20.9 bushels, equaling the record yield of 1952. Above-average yields were harvested in all major wheat states except Kansas, Oklahoma, Texas, and Colorado. The 25 bushel average yield of wheat made in Nebraska is a record for that State. Pertinent data on winter wheat production in 11 states of the hard winter wheat region follow:

State	Acres 1/ planted	Acres 1/ harvested	Abandonment	1955 1/ production	1955 2/ yields/A.	Av. yield Per acre 2/ 1944-53
			%	Bu.	Bu.	Bu.
Texas	4,356	1,496	65.7	13,464	9.0	11.6
Oklahoma	4,923	2,973	39.6	23,784	8.0	13.6
New Mexico	441	200	54.6	1,500	7.5	8.3
Kansas	10,799	8,559	20.7	128,385	15.0	15.7
Nebraska	3,457	3,121	9.7	78,025	25.0	19.6
Colorado	3,184	1,249	60.8	16,237	13.0	17.6
Wyoming	263	214	18.6	4,066	19.0	18.7
Montana	2,122	2,028	4.4	54,756	27.0	20.0
South Dakota	390	330	15.4	5,610	17.0	15.2
Iowa	99	95	4.0	3,040	32.0	19.3
Minnesota	35	33	5.7	858	26.0	19.4

The above data point up the hazardous nature of winter wheat production in the plains area. Seldom is a wheat crop grown that has not been adversely affected by inadequate soil moisture during some portion of the growing season. High summer temperatures frequently associated with low rainfall, wind erosion, low winter temperatures, diseases, and insects annually take their toll of the crop. Wheat varities for the plains area must be able to endure or to excape these conditions and must be able to make productive growth with what nature supplies.

This report follows the pattern that is familiar to the cooperator. Data from the several uniform experiments grown throughout the region are summarized.

1/ In thousands.
2/ Yields based on harvested acres.
Data taken from the 1955 Annual Summary of Crop Production, U.S. Dept. Agr., Agr. Marketing Service, Crop Reporting Board.

An endeavor has been made in this report to acknowledge those who cooperated in the regional program during the year. Such a listing always falls short of being adequate. To the many who gave a little or a lot of their time a special word of appreciation is due. Those who contributed in special ways to the planning and execution of the program are listed below:

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Brookings	Agr. Exp. Station	Victor Dirks
MINNESOTA AGRICULTURAL EXPERIMENT STATION·		
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Waseca	Southeast Exp. Sta.	R. E. Hodgeson
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Bozeman	Montana Exp. Station	E. R. Hehn
Moccasin	Central Mont. Br. Sta.	James Krall, Arthur Dubbs
Havre	North Mont. Branch Sta.	T. Massee, D. Ferguson
Huntley	Huntley Branch Station	D. Baldridge
CANADA DEPARTMENT OF AGRICULTURE:		
Lethbridge, Alta.	Agr. Exp. Station	J. E. Andrews

* Denote federal employees, full-time or part-time.

A number of changes in personnel occurred during the year. In Texas, J. E. Adams was named Dean of the School of Agriculture. He is succeeded as Chairman of the Department of Agronomy by J. B. Page. The death of E. S. McFadden is noted with regret. His contributions to wheat improvement and the fundamental knowledge of wheat were universally recognized. Keith Lahr was added to the staff at Chillicothe and will supervise the small grains work at the Chillicothe station. M. D. Thorne is the new Agronomy Chairman at Oklahome A. & M. College. Byrd Curtis replaced Ben Jackson on the small grains project at that institution. In Kansas M. D. Huffman replaced W. C. Haskett on the wheat rust project. The vacancy caused by the untimely death of E. H. Coles, Superintendent of the Colby Branch Station, has been filled by Evans Banbury. The death on March 7 of F. D. Keim, past Chairman of the Agronomy Department at the University of Nebraska, came as a shock to his coworkers and students at the University and to his many friends in agricultural work throughout the United States. D. G. Hanway is the new Agronomy Department Chairman at the College of Agriculture in Lincoln, Nebraska. He succeeds E. F. Frolik who became Associate Director of the Experiment Station. M. K. Brakke replaced W. C. Burger on virus investigations in the Plant Pathology Department at the University of Nebraska. H. O. Mann was transferred from the Fort Lewis Substation at Hesperus, Colorado, to the Southeastern Colorado Dry Land Branch Station located at Springfield. In Montana James Krall replaced Ralph Williams as Superintendent at the Judith Basin Branch Station. Arthur Dubbs has been assigned the winter wheat work at the Judith Basin Station. David Ferguson and Donald Baldridge are new agronomists at Havre and Huntley, respectively.

ACCESSION NUMBERS ASSIGNED

Cereal Investigation, or C. I. numbers were assigned to nine varieties of hard red winter wheat this year. When a number is assigned, seed of that variety is added to the permanent collection maintained by the Cereal Crops Section, Beltsville, Mad., under the direction of D. J. Ward. C. I. numbers take precedence over State and local numbers in this report and it is hoped that they will be used whenever available when workers publish results or correspond. New numbers assigned this year are as follows:

C. I. No.	Name	State No.
13176	Mqo.-Oro x Wichita	Texas 218-48-44
13177	Nebred x C. I. 12250	Nebr. sel. 522123
13178	Pawnee x C. I. 12250	Nebr. sel. 532044
13179	Pawnee x C. I. 12250	Nebr. sel. 51J-1115
13180	Yogo x Rescue	Mont. 66-22
13181	Yogo x Rescue	Mont. 56-28
13182	Hope-Turkey x Cheyenne	Nebr. sel. 494951
13183	Cheyenne x Hope-Turkey	Nebr. sel. 494738
13184	Hope x Cheyenne^2	Nebr. sel. 451406

NEW VARIETIES

The Seed Policy and Release Committee in Texas has approved C. I. 12702 for release in 1956 under the name Crockett. C. I. 12702 was developed at Denton from the cross (Sinvalocho-Wichita x Hope-Cheyenne) x Wichita. Seventy bushels of seed are being increased under irrigation. The variety will be recommended throughout the main commercial wheat producing areas of Texas. Crockett is intermediate to Comanche and Wichita in maturity and produces high test weight grain of good quality. It possesses excellent resistance to leaf rust and to some races of stem rust. It has been tested in the uniform yield nursery since 1950 and has made consistently high yields in the southern part of the region.

In Kansas decision has been made to name and release C. I. 12518, the sister line of Kiowa. Further increase of seed is being made on the experiment stations for distribution in 1956. C. I. 12518 is agronomically very similar to Kiowa but has better quality, particularly longer mixing time, than the latter.

UNIFORM VARIETIES IN FIELD PLOTS OR IN ADVANCED NURSERIES

The uniform variety tests are organized by districts. Texas, New Mexico, and Oklahoma are included in the southern district; Kansas, Colorado, and Nebraska in the central district; Iowa, South Dakota, and Minnesota are in the northeastern district; and Wyoming and Montana in the northwestern district. Some uniform tests are region wide, while others involve only two or three districts.

The field plot or advanced variety test included varieties as follows in 1955 and 1956:

Variety	C. I. No.	1955				1956			
		S	C	NE	NW	S	C	NE	NW
Kharkof	1442	X	X		X	X	X		X
Tenmarq	6936	X	X						
Early Blackhull	8856	X				X			
Comanche	11673	X	X			X	X		
Concho	12517	X	X			X	X		
Red Chief	12109	X	X			X	X		
Crockett	12702(Bl.)	X				X			
Chiefkan x Oro-Tenmarq	12518		X				X		
Pawnee	11669		X				X		
Minturki	6155			X				X	
Minter	12138			X	X			X	X
Mint. x Timoph.-Vulg.[2]	12806			X				X	
Yogo	8033				X				X

In addition to the uniform set of varieties, each station grows varieties of local interest. Generally, all varieties reported by the various cooperators are included in the station data for plot varieties thus giving a rather complete account of advanced testing in the region.

In 1955, permanent check varieties were Kharkof, Tenmarq, and Early Blackhull in the southern district; Pawnee, Tenmarq, and Kharkof in the central district. Minturki and Kharkof were so designated in the northeast and northwest districts, respectively. At the time of the Seventh Hard Red Winter Wheat Conference the cooperators voted to discontinue Tenmarq as a check variety in the southern and central districts. Thus, the permanent check varieties for 1956 are Kharkof and Early Blackhull in the southern district and Kharkof and Pawnee in the central district. Check varieties in the northern districts remain the same as in 1955.

PLOT DATA

Data for the field plots or advanced nurseries are presented in table 1. The data are tabulated separately for each station and varieties are recorded in declining order of yield for 1955. Appropriate summary data for yield and other agronomic characteristics are given in tables 2 to 12.

Drought overshadowed all else in the southern and central parts of the hard winter wheat region in 1955. In Texas and Oklahoma this was largely a continuation of low-rainfall conditions which have persisted for several years. However, several locations in these States and in Kansas and Nebraska which heretofore had escaped serious drought damage were severely affected. Surface moisture in the autumn of 1954 was generally inadequate for the normal germination of fall-sown wheat in the south except in locally favored areas. Late autumn high temperatures caused rapid growth of the wheat and further depletion of the limited moisture available. Following the mild weather in early winter, a cold wave on February 7 caused temperatures to drop as low as zero in the Texas and Oklahoma panhandle and 16° F. at Denton, Texas. Severe damage to experimental strains that were heading occurred at College Station whereas moderate to heavy leaf damage resulted in the main wheat areas of Texas. In the week ending March 26 one of the most severe and extensive freezes on record again occurred in Texas and Oklahoma. The cold which persisted for several days caused serious damage to the wheat. The condition of winter wheat continued to decline for lack of moisture throughout the spring with most of the dryland wheat in New Mexico and the Texas panhandle being

abandoned by the time of general rains in late April. Wheat was in serious condition throughout Kansas and much of Nebraska during May. General rains and cool temperatures in late May and early June, however, resulted in remarkable recovery of the wheat in northern and western Kansas and in Nebraska where development was not so progressed.

Brown wheat mites caused additional damage to drought-damaged wheat in Texas, Oklahoma, and Kansas. Leaf and stem rust, although present in potentially dangerous amounts in Texas during the winter, was retarded by the late freezes and region-wide spring drought. Nowhere was it a factor in low yields reported. Western streak mosaic, which caused serious wheat losses in Kansas and Nebraska in recent years, failed to develop in heavy amounts in 1955 in these States. Local damage from the disease occurred in the Judith Basin in Montana, however.

Comments about experimental results at each station as reported in table 1 follow:

The adverse conditions which prevailed during much of the growing seaseon at Denton, Texas, are reflected in the dwarfed straw and low yields reported. Only 4 varieties made 12 bushels or more per acre. These included the 2 Texas strains, C. I. 13023 and 218-48-44, and Concho. Bushel weights ranged from a high of 62.0 pounds for Blackhull down to 56.0 for C. I. 13022. Leaf rust reached as much as 60% infection on the more susceptible varieties. Light shattering of grain occurred on border rows left standing of several varieties. Concho has the best average yield among varieties grown in 1954 and 1955 at Denton.

Yields were somewhat higher at Chillicothe than reported at Denton this year. C. I. 12701 x Wichita and Kiowa were most productive making nearly 20 bushels per acre. The straw was very short with Apache, the tallest variety, measuring only 21 inches. Concho although yielding only 16.9 bushels this year has the highest 2-year average yield. Near normal bushel weights for Chillicothe were reported.

Severe drought resulted in the abandonment of the dryland nursery at Bushland. Yields and other agronomic data are reported for the seven southern district uniform plot varieties grown under irrigation. Yields were in the 20- to 30-bushel range but varietal differences were nonsignificant.

Lack of precipitation at Clovis, New Mexico, revealed considerable soil variability in the 1/40-acre wheat plots. Condition of the wheat varied from complete or near failure at one end of the plots to good condition at the other end. Yields reported are based on 1/160-acre plots harvested uniformly from the better portion of the larger plots. Thus they are not entirely indicative of the severe conditions which prevailed at Clovis. Cheyenne, with a 21.3-bushel yield, was the most productive variety.

Wheat at Stillwater, Oklahoma, in 1955 was the poorest in recent years. The extreme drought persisted throughout the winter and spring growing seasons. The short straw of the plot varieties required hand harvest of plot subsamples for yield and test weight determinations. The standard error was high in relation to yield level; thus most of the yield differences are non-significant. Concho and Westar have the highest 2-year averages.

Failure to obtain stands in the fall led to the abandonment of the test at Cherokee.

The later maturing varieties were generally best at Woodward this year. Yields ranged from 26.3 bushels for Cheyenne to only 12.7 bushels for early

maturing Triumph. Heavy leaf injury from the late March freezes was recorded for most varieties with Ponca, Triumph, Tenmarq, and Comanche showing 70% or more loss of leaves. Cheyenne, Comanche, and Pawnee in that order have the best 2-year average yields.

At Goodwell duplicate irrigated and dryland plot tests were grown. The data are reported separately for these tests. Irrigated and dryland yields were not as different as might be expected. They ranged from 27.2 to 10.6 bushels in the dryland test and from 41.5 to 23.0 bushels under irrigation. The relationship of dryland to irrigated yields is not pronounced. Triumph, Wichita, and Apache, all early maturing varieties, responded relatively better to irrigation as compared to dryland production than the other varieties in the tests. Concho and Kanking were high yielders in the dryland test. Similarly Concho has the highest 2-year average yield.

Extreme variability attributable to the drought existed in the plot variety test at Manhattan. Individual rod-row plots showed a wide range in plant height both within and between plots. Corresponding variability in yield resulted in a non-significant standard error for the test. Low field leaf rust readings were obtained for C. I. 12804, Ponca, and Concho while Comanche, C. I. 12518, Concho, and Kiowa showed the best bunt reactions. Concho has the highest 2-year average yield at Manhattan.

No yields were taken at Hays because of the variable stands resulting from inadequate soil moisture in the fall and winter.

At Garden City the highest yields in several years were reported for the entries in the field plots. Bushel weights also were high with only 3 out of 16 varieties failing to make 60 pounds. Concho, Comanche, and Kiowa made virtually the same yield with Concho slightly the higher of the three. Kiowa has the best 2-year yield record.

Excellent plot yields and high bushel weights also were reported from Colby. Only 3 varieties yielded less than 30 bushels per acre and only Kharkof produced grain weighing less than 60 pounds per bushel. Cheyenne and Concho were most productive this year.

Yields which ranged downward from 15.9 bushels were obtained from Akron, Colorado, this year. The performance of Kharkof, which was high yielder, is surprising in view of its late maturity and the droughty conditions during the year at Akron. Comanche, third ranked in 1955, and Kharkof have the best 2-year records. A 59.0 pound test weight for Red Chief was high for the nursery.

Very high yields and bushel weights were reported from Ft. Collins. The 74.9 bushel yield of Cheyenne exceeded second-ranked Concho by 6.4 bushels. Cheyenne also has the highest 2-year average yield. Bushel weights exceeding 63.0 pounds were made by Comanche, Red Chief, and Concho. Lodging was noted in four varieties with highest readings recorded for Kharkof, Sioux, and Tenmarq in that order.

Light rains and accompanying moderate temperatures after flowering of the varieties allowed remarkable recovery of the field plots at Lincoln from their poor early season condition. Only one variety made less than 40 bushels per acre. All varieties except one exceeded 61 pounds in test weight. Since only 7.4 bushels separated the high- and low-yielding varieties in the test, varietal yield differences were for the most part non-significant.

Weather conditions at North Platte were much the same as at Lincoln. Late

rains following the early season drought resulted in high yields of grain and extrememly high test weights. Pawnee x Nebred (C. I. 13021) yielded 50.2 bushels to lead the varieties in the test. A 65-pound test weight was recorded for Red Chief and 64 pounds for Concho and Nebred. Shattering from trace to light amounts was observed in the test with the highest reading recorded for Pawnee x Cheyenne (C. I. 13017) which shattered 15 percent.

Yield differences in the Alliance variety test were not significant in 1955. A deficiency of soil moisture coupled with high temperatures in July forced ripening and resulted in shriveling of the grain and associated low test weights.

Data were obtained for the three northeastern district uniform plot varieties at Ames, Iowa. Minter was highest yielding but lodged 67 percent and had 65 percent leaf rust infection. C. I. 12806 had the highest bushel weight as well as the lowest leaf and stem rust infections.

Ten varieties were evaluated in plots at Brookings. Yields were closely associated with winter survival which ranged from 65 percent for Marmin down to only 12 percent for Pawnee. Both leaf and stem rust were present, although not in heavy amounts.

Minter and Yogo in that order topped the performance of nine plot varieties at Highmore, South Dakota. Minter and Minturki survived the winter 95 and 90 percent, respectively, as compared with Wichita which survived only 65 percent. Stem rust was present in moderate amounts. Test weights were low.

An unnamed selection slightly exceeded Minter in yield at St. Paul. No stem and leaf rust was reported nor was there any winterkilling.

Some loss of stands during the winter occurred at Waseca. The wheat was tall and heavy lodging occurred. The yield of C. I. 12806 was superior to 5 other varieties by more than 10 bushels. Yields ranged from 43.0 to 64.6 bushels. Test weights also were high.

Plot data from four Wyoming stations are included in the report this year. At Laramie where winter survivals ranged from 15 to 66% Yogo was one of the better survivors as well as high yielder in the nursery. Individual plot yields were highly variable making most varietal yield differences statistically non-significant. Moderate infections of both stem and leaf rust occurred.

A dry seed bed in the fall at Sheridan, Wyoming, resulted in poor emergence and highly erratic stands. The winter survival percentages contained in the table of data from Sheridan are for the most part an indication of stand establishment in the fall. Yield differences were for the most part non-significant.

Severe winterkilling occurred among the varieties tested at Gillette, Wyoming. Survivals ranged from 50 down to only one percent. Yogo, the high yielder in the nursery, survived 37 percent as compared with 50 and 45 percent survival for Kharkof and Kharkof M.C. 22. Test weights were low.

Sioux and Turkey x Cheyenne (C. I. 12711) gave superior yield performances in the 10-variety test grown at Albin, Wyoming. Despite the very low test weights recorded (51.5-54.4) yields were excellent, ranging from 32.2 to 49.4 bushels. No winter-killing occurred.

Three experimental winter wheat strains developed at Pullman, Washington, demonstrated superior straw strength in the nursery plot test at Bozeman, Montana. They showed no lodging under conditions that caused 14 out of 24

varieties in the test to lodge 75 percent or more. One of these, 27-15 x Rex-Rio (C. I. 12696), yielded 82.2 bushels which was high for the nursery. Cheyenne ranked third in the nursery with 79.1 bushels but lodged 60 percent. All varieties exceeded 62.0 pounds in test weight. Kharkof test weighed a remarkable 68.0 pounds per bushel.

All varieties survived the winter at Havre, Montana, and made high yields. Yogo and three composites from Yogo were most productive, all making 50 bushels per acre or more. Bushel weights ranged upward from 60 pounds.

Table 1. Yield and other data for varieties of winter wheat grown in replicated plots in cooperative experiments at stations in the region in 1955, with period average yields.

Denton, Texas
Ten plots, rod rows

Variety	C.I. or Sel.No.	Date Headed	Date Ripe	Plant height	Lodging 1/	Shattering 1/	Leaf rust	Bunt	Weight per bushel	Av. Acre yield 1955	Av. Acre yield 1954-1955
		Apr.	May	Ins.	%	%	%	%	Lbs.	Bus.	Bus.
Mqo.-Oro x Wichita	218-48-44	29	23	18	0	0	T	50	60.5	13.0	--
Concho	12517	25	20	20	5	T	50	T	57.0	12.7	25.5
Kan.-Hd. Fed.-Tq.-Med.-Hope x Cim.	13023	24	18	19	T	0	40	90	59.0	12.5	--
Denton 2/	8265	28	22	21	0	10	10	60	58.5	12.0	20.6
Kharkof	1442	27	21	17	T	T	50	T	58.5	11.3	23.0
Kan.-Hd. Fed.-Tq.-Med.-Hope x Cim.	274-51-A4	26	20	20	0	0	50	80	58.5	10.8	--
Blackhull	6251	28	22	19	0	0	30	50	62.0	10.7	24.6
Ponca	12128	26	20	18	T	5	20R	60	56.5	10.1	25.3
12701 x Wichita	12702W.	25	20	20	50	0	20R	70	58.5	10.1	--
Kan.-Hd. Fed.-Tq.-Med.-Hope x Cim.	274-50-1	25	20	21	5	0	50	20	57.5	10.1	--
12701 x Wichita	12702B1.	26	21	20	20	0	20R	60	60.0	9.8	25.2
Kan.-Hd. Fed.-Tq. x Mqo.-Oro	216-49-82	27	21	18	T	0	0	0	58.0	9.5	--
Early Blackhull	8856	22	16	22	5	0	60	80	59.0	9.1	24.2
Comanche	11673	27	21	20	10	T	5-30	5	58.0	9.1	23.8
Cim. Hope-Chey. x Comanche	13024	26	19	21	5	2	5-40	30	58.5	9.0	--
Red Chief	12109	27	21	19	0	0	60	90	61.0	9.0	23.1
Westar x Hope-Turkey	253-48-34	26	21	19	5	T	50	80	54.0	8.7	22.7
Triumph	12132	22	16	20	80	0	60	50	57.0	8.6	24.7
12701 x Wichita	12703	25	19	18	T	0	10R	60	59.0	8.4	20.4
Cimarron x Hope-Cheyenne	13022	24	19	18	10	0	50	60	56.0	7.9	--
Tenmarq	6936	28	22	17	10	5	50	95	58.5	7.6	23.2
Quanah	12145	27	21	19	T	0	0	0	58.5	6.5	20.9

1/ Recorded 6-27-55 on one replication left standing.
2/ Soft wheat
Standard error of a difference = 2.11 bushels.

Chillicothe, Texas
Ten plots, rod rows

Variety	C.I. or Sel.No.	Date Headed	Date Ripe	Plant height	Weight per bushel	Av. Acre yield 1955	Av. Acre yield 1954-1955
				Ins.	Lbs.	Bus.	Bus.
120701 x Wichita	12702B1.	4-29	5-28	17	60	19.9	22.0
Kiowa	12133	5-1	6-6	16	61	19.7	21.5
Kan.-Hd. Fed.-Tq.-Med.-Hope x Cim.	274-51-A4	4-29	5-28	16	61	19.4	--
Apache	12122	5-2	6-5	21	60	18.8	21.4
Westar	12110	5-2	6-8	19	60	18.3	22.4
Kan.-Hd. Fed.-Tq.-Med.-Hope x Cim.	13023	4-29	5-29	15	61	18.2	--
Ponca	12128	5-1	6-3	16	60	17.6	20.0
Ea. Blkhl.-Tq. x Oro-Med.-Hope	12871	4-29	6-4	17	61	17.0	18.7
12701 x Wichita	12702 W.	4-29	5-29	16	59	17.0	21.2
Concho	12517	5-1	6-6	16	60	16.9	23.4
Wichita	11952	4-27	5-31	16	60	16.8	18.0
Comanche	11673	5-1	6-5	16	59	16.5	19.1
Cimarron x Hope-Cheyenne	13022	4-29	6-2	16	58	16.5	--
Early Blackhull	8856	4-26	5-27	19	59	16.3	16.1
Cim.-Hope-Chey. x Comanche	13024	5-1	6-7	15	61	16.1	--
Westar x Hope-Turkey	253-48-34	5-4	6-11	17	58	15.6	20.6
Tenmarq	6936	5-2	6-8	17	59	15.2	20.3
Kan.-Hd. Fed.-Tq. x Mqo.-Oro	216-49-82	5-2	6-8	16	58	15.0	--
Red Chief	12109	5-2	6-8	19	62	14.9	17.3
Mqo.-Oro x Wichita	218-48-44	5-4	6-10	17	61	14.9	--
Kan.-Hd. Fed.-Tq.-Med.-Hope x Cim.	274-50-1	4-29	5-30	16	59	14.7	--
Blackhull	6251	5-2	6-18	16	60	13.0	18.9
Kharkof	1442	5-5	6-18	17	59	11.4	19.8

Standard error of a difference = 1.37 bushels.

Bushland, Texas
Three plots, rod rows, irrigated

Variety	C.I. No.	Date Headed	Date Ripe	Plant height	Weight per bushel	Av. acre yield 1955	Av. acre yield 1954-1955
		May	June	Ins.	Lbs.	Bus.	Bus.
Concho	12517	12	25	25	61.0	31.3	28.8
Kharkof	1442	16	29	27	60.0	31.2	24.2
Comanche	11673	13	26	28	60.0	29.8	24.4
12701 x Wichita	12702B1.	11	26	25	61.5	29.5	25.8
Tenmarq	6936	14	28	27	58.5	28.5	21.9
Early Blackhull	8856	4-29	22	25	60.5	27.2	21.5
Red Chief	12109	15	28	28	58.5	21.4	20.4

Standard error of a difference = not significant.

Clovis, New Mexico
Five 1/160 acre plots

Variety	C.I. No.	Date headed	Plant height	Weight per bushel	Av. acre yield
		May	Ins.	Lbs.	Bus.
Cheyenne	8885	22	22	60.3	21.3
Kharkof	1442	24	23	59.8	19.4
Tenmarq	6936	21	22	59.9	19.0
Apache	12122	15	21	62.3	18.7
Concho	12517	17	20	61.3	18.7
Westar	12110	19	22	60.9	18.6
Wichita	11952	14	21	62.3	17.9
Ponca	12128	19	20	60.4	17.4
Blackhull	6251	19	22	61.9	17.3
Chiefkan	11754	20	24	61.9	16.6
12701 x Wichita	12702B1.	15	21	62.3	16.4
Pawnee	11669	18	19	59.4	15.9
Kiowa	12133	17	21	61.1	15.6
Turkey	1558	23	21	59.8	15.3
Comanche	11673	19	21	60.2	15.1
Triumph	12132	12	22	61.4	14.9
Red Chief	12109	20	22	62.7	14.7
Early Blackhull	8856	11	19	62.5	12.1

Standard error of a difference = 1.82 bushels.

Stillwater, Oklahoma
Four 1/68 acre plots

Variety	C.I. No.	Date Headed	Date Ripe	Plant height	Weight per bushel	Av. acre yield 1955 1/	Av. acre yield 1954-1955
				Ins.	Lbs.	Bus.	Bus.
Westar	12110	4-8	6-4	18	59.6	8.6	14.0
Kanking	12719	5-7	5-26	19	60.1	8.3	--
Early Blackhull	8856	4-29	5-23	20	58.8	6.9	10.3
Red Chief	12109	5-14	6-7	19	61.4	6.6	12.3
Triumph	12132	4-28	5-19	21	54.0	6.6	8.2
Ponca	12128	5-6	5-27	17	56.8	6.6	11.5
Comanche	11673	5-7	5-29	19	57.2	6.5	12.0
Concho	12517	5-7	5-28	17	58.5	6.3	14.6
Pawnee	11669	5-8	5-28	18	55.7	6.2	10.3
Mqo.-Oro x Oro-Tq.	12406	5-12	6-3	17	58.8	5.9	--
12701 x Wichita	12702Bl.	5-5	5-23	19	58.0	5.7	13.0
Wichita	11952	5-2	5-21	20	56.0	5.3	10.5
Tenmarq	6936	5-13	6-9	17	58.9	4.8	11.0
Cheyenne	8885	5-16	6-12	14	59.0	4.6	11.8
Kharkof	1442	5-15	6-11	16	57.6	3.9	10.7
Clarkan	8858	5-15	6-10	17	58.3	3.1	11.8

1/ Yields based on sub-sample of 262.5 sq. ft. per plot.
Standard error of a difference = 1.33 bushels.

Woodward, Oklahoma
Five plots, rod rows

Variety	C.I. No.	Date Headed	Date Ripe	Plant height	Leaf injury 1/	Leaf rust	Weight per bushel	Av. acre yield 1955	Av. acre yield 1954-1955
		May	June	Ins.	%	%	Lbs.	Bus.	Bus.
Cheyenne	8885	17	23	24	52	6.0	59.7	26.3	23.6
Comanche	11673	15	21	24	70	3.5	60.0	24.8	20.9
Pawnee	11669	16	22	22	66	2.5	59.2	24.3	20.6
Kanking	12719	11	18	21	55	27.5	60.7	24.2	--
Westar	12110	15	21	25	68	0.8	59.4	23.8	20.4
Kharkof	1442	17	23	26	48	3.5	59.0	22.6	19.1
Ponca	12128	16	22	24	74	0.5	60.0	21.6	19.8
Tenmarq	6936	17	23	26	71	2.0	60.0	20.7	18.0
Mqo.-Oro x Oro-Tq.	12406	14	22	21	62	1.0	58.9	20.1	--
Apache	12122	9	17	19	41	4.0	58.8	19.3	--
12701 x Wichita	12702Bl.	12	17	19	58	7.5	59.2	19.2	19.1
Red Chief	12109	11	21	21	46	7.5	61.5	18.4	19.3
Concho	12517	11	19	17	43	2.0	60.0	16.9	19.9
Wichita	11952	11	16	17	59	10.0	59.0	16.8	16.2
Early Blackhull	8856	7	11	19	60	10.0	60.0	15.1	15.1
Triumph	12132	10	10	17	73	5.0	58.0	12.9	14.6

1/ Percent of leaves killed by late March freezes.
Standard error of a difference = 2.38 bushels.

Goodwell, Oklahoma
Five plots, rod rows

Variety	C.I. No.	Date Headed	Date Ripe	Plant height	Weight per bushel	Av. acre yield 1955	Av. acre yield 1954-1955
		May	July	Ins.	Lbs.	Bus.	Bus.
Concho	12517	20	5	23	60.0	27.2	25.1
Kanking	12719	21	5	21	61.0	27.2	--
Mqo.-Oro x Oro-Tq.	12406	19	5	25	58.0	24.2	--
Apache	12122	19	5	22	59.0	24.1	24.4
Cheyenne	8885	25	5	27	59.0	23.2	20.0
Pawnee	11669	20	5	23	59.0	22.9	18.4
Red Chief	12109	20	5	27	61.0	22.5	21.0
Wichita	11952	19	5	20	59.0	18.3	16.6
Westar	12110	20	5	25	58.0	18.3	15.2
Triumph	12132	19	5	21	59.0	18.2	17.3
Comanche	11673	22	5	25	58.0	17.5	21.0
Kharkof	1442	26	5	26	58.0	16.9	15.7
Ponca	12128	22	5	23	58.5	15.4	18.4
12701 x Wichita	12702Bl.	19	5	23	59.5	15.1	14.3
Tenmarq	6936	26	5	27	56.0	11.7	12.7
Early Blackhull	8856	20	5	23	59.0	10.6	18.7

Standard error of a difference = 3.04 bushels.

Goodwell, Oklahoma
Five plots, rod rows, irrigated[1/]

Variety	C.I. No.	Date Headed	Date Ripe	Plant height	Weight per bushel	Av. acre yield
		May		Ins.	Lbs.	Bus.
Apache	12122	17	6-28	32	61.0	41.5
Triumph	12132	17	6-27	31	60.0	40.6
Wichita	11952	17	6-27	32	59.0	38.7
Concho	12517	20	7-4	33	59.5	34.3
Westar	12110	19	7-1	36	59.0	32.2
Red Chief	12109	19	7-6	36	62.5	31.0
Cheyenne	8885	24	7-6	36	59.0	29.6
Kanking	12719	18	7-3	33	61.5	29.4
Tenmarq	6936	24	7-3	37	58.0	29.0
Pawnee	11669	18	6-30	33	57.0	27.1
12701 x Wichita	12702Bl.	20	6-28	34	60.0	25.6
Comanche	11673	21	7-5	33	58.0	25.4
Early Blackhull	8856	18	7-8	34	61.0	25.4
Ponca	12128	24	7-8	34	57.5	24.2
Kharkof	1442	25	7-6	35	56.0	24.1
Mqo.-Oro x Oro-Tq.	12406	22	7-8	36	59.0	23.0

1/ Nursery received one pre-planting irrigation and two irrigations in the spring.
Standard error of a difference = 3.73 bushels.

Manhattan, Kansas
Six plots, rod rows[1]

Variety	C.I. No.	Date headed	Plant height	Diseases				Hessian fly[3]	Weight per bushel	Av. acre yield	
				Leaf rust[2]	Stem rust[2]	Loose smut	Bunt[2]			1955	1954-1955
		May	Ins.	%	%	No.[4]	%	%	Lbs.	Bus.	Bus.
Concho	12517	7	24	10	70	1	6	39	60.6	35.6	37.1
Chiefkan x Oro-Tenmarq	12518	7	23	50	60	6	3	100	59.6	35.5	--
Kiowa	12133	6	23	60	60	11	6	--	59.9	34.9	36.0
Kharkof	1442	14	29	40	70	1	80	50	60.5	34.0	32.1
Kanking	12719	5	23	40	70	1	60	15	60.9	33.8	34.8
Ponca	12128	7	23	5	60	0	40	29	59.7	33.3	36.5
Tenmarq	6936	9	25	40	60	2	70	80	60.5	33.3	35.2
Cheyenne	8885	11	25	60	70	1	75	88	60.4	32.7	--
Turkey	1558	12	27	40	60	3	15	100	60.3	32.5	32.6
Red Chief	12109	8	23	50	80	7	90	94	62.0	32.3	32.2
Pawnee	11669	7	23	50	70	0	25	58	59.1	31.6	35.0
Comanche	11673	8	23	20	70	0	0	92	59.9	31.4	35.2
Wichita	11952	5	23	60	50	0	60	100	60.1	31.4	33.1
Med.-Hope-Paw. x Oro-Ill. 1-Com.	12804	7	20	T	70	0	45	0	58.7	30.4	34.4
Triumph	12132	4	22	50	40	0	70	100	59.4	29.9	29.3

[2] Disease nursery data.
[3] Greenhouse infestation.
[4] Average number of smutted heads per 16 feet of row.
Standard error of a difference = not significant.

Hays, Kansas
Six rod-row plots and one 1/50 acre plot

Variety	C.I. No.	Date headed	Plant height	Weight per bushel
		May	Ins.	Lbs.
Kanking	12719	15	24	64.5
Wichita	11952	12	22	63.5
Concho	12517	16	23	63.0
Triumph	12132	10	21	63.0
Red Chief	12109	16	27	63.0
Kiowa	12133	16	25	62.5
Chiefkan x Oro-Tenmarq	12518	16	26	62.0
Pawnee	11669	17	26	62.0
Med.-Hope-Paw. x Oro-Ill.1-Com.	12804	15	26	62.0
Comanche1/	11673	17	29	61.5
Ponca	12128	19	25	61.5
Sioux	12142	21	27	61.5
Cheyenne	8885	21	25	61.5
Tenmarq	6936	18	26	61.0
Turkey	1558	21	26	60.5
Kharkof	1442	22	27	60.0

1/ All data from 1/50 acre plot

Garden City, Kansas
Four 1/45 acre plots

Variety	C.I. No.	Date		Plant height	Weight per bushel	Av. acre yield	
		Headed	Ripe			1955	1954-1955
		May	July	Ins.	Lbs.	Bus.	Bus.
Concho	12517	17	2	24	61.9	35.3	18.6
Comanche	11673	18	3	28	61.0	35.1	19.0
Kiowa	12133	17	2	22	61.6	35.0	20.2
Chiefkan x Oro-Tenmarq	12518	17	2	22	61.5	34.5	--
Red Chief	12109	19	4	29	61.8	33.5	18.9
Med.-Hope-Paw. x Oro-Ill.1-Com.	12804	16	1	22	61.4	32.4	18.0
Triumph	12132	13	6-28	20	60.8	32.1	17.5
Turkey	1558	23	6	34	59.6	31.7	17.7
Kanking	12719	16	1	23	62.7	31.6	18.4
Ea. Blkhl.-Tq. x Oro-Med.-Hope	12871	16	1	25	63.0	30.7	--
Kharkof	1442	23	6	33	59.0	30.2	17.2
Wichita	11952	14	6-29	21	61.4	29.3	16.3
Cheyenne	8885	22	6	26	60.2	27.6	--
Pawnee	11669	18	3	21	61.2	26.9	15.2
Ponca	12128	18	3	24	61.3	26.5	13.8
Tenmarq	6936	20	5	31	59.6	25.9	14.5

Standard error of a difference = 1.70 bushels.

Colby, Kansas
Two 1/50 acre plots

Variety	C.I. No.	Date headed	Plant height	Weight per bushel	Av. acre yield- 1955	Av. acre yield- 1954-1955
		May	Ins.	Lbs.	Bus.	Bus.
Cheyenne	8885	21	25	62.0	34.7	25.0
Concho	12517	18	24	61.8	34.6	24.7
Red Chief	12109	20	27	63.0	33.7	25.6
Turkey	1558	23	25	60.8	33.5	24.1
Chiefkan x Oro-Tenmarq	12518	18	24	60.5	32.4	--
Ponca	12128	18	24	62.8	32.1	23.6
Comanche	11673	19	24	61.3	31.9	22.8
Med.-Hope-Paw. x Oro-Ill.1-Com.	12804	17	22	62.8	31.8	23.2
Sioux	12142	21	23	61.0	31.8	24.7
Kiowa	12133	18	23	60.8	31.6	24.7
Kanking	12719	16	23	62.3	31.6	26.4
Pawnee	11669	17	24	61.5	31.3	25.4
Kharkof	1442	23	26	57.3	30.5	23.0
Wichita	11952	16	22	62.5	29.6	23.8
Tenmarq	6936	20	25	60.5	29.4	20.8
Triumph	12132	14	20	62.3	29.4	20.5

Standard error of a difference = 1.06 bushels.

Akron, Colorado
Three 1/41 acre plots, two on fallow, one after corn

Variety	C.I. No.	Weight per bushel	Av. acre yield 1955	Av. acre yield 1954-1955
		Lbs.	Bus.	Bus.
Kharkof	1442	57.5	15.9	12.9
Tenmarq	6936	55.5	13.6	11.9
Comanche	11673	58.0	13.4	13.3
Kiowa	12133	56.5	13.4	12.6
Red Chief	12109	59.0	13.1	12.4
Pawnee	11669	55.5	12.7	11.9
Concho	12517	56.5	12.6	11.8
Ponca	12128	56.0	12.4	11.4
Cheyenne	8885	57.0	12.1	11.2
Wichita	11952	56.5	11.0	11.8
Alton	1438	56.5	10.7	9.5
Chiefkan x Oro-Tenmarq	12518	56.0	9.9	10.4
Sioux	12142	56.0	9.0	9.4

Standard error of a difference = 1.46 bushels.

Ft. Collins, Colorado
Seven plots, rod rows

Variety	C.I. or Sel. No.	Date Headed	Date Ripe	Plant height	Lodging	Weight per bushel	Av. acre yield 1955	Av. acre yield 1954-1955
		May	July	Ins.	%	Lbs.	Bus.	Bus.
Cheyenne	8885	6-5	20	42	14	62.8	74.9	70.3
Concho	12517	29	17	39	0	63.1	68.5	65.4
Sioux	12142	6-5	19	39	36	62.3	65.3	61.4
Chiefkan x Oro-Tenmarq	12518	29	17	37	0	62.2	64.6	65.6
Pawnee	11669	30	17	38	0	61.8	64.3	60.6
Med.-Hope x Paw.^{2}	12873	31	16	35	0	61.3	63.9	58.8
Comanche	11673	29	18	40	0	63.9	63.4	61.3
Kiowa	12133	29	17	37	0	62.1	61.8	64.3
Mqo.-Oro-Oro-Tq. x Med.-Hope-Paw.	II-46-15-3	27	17	35	0	62.1	61.7	--
Red Chief	12109	6-1	17	45	0	63.4	61.1	58.4
Kharkof	1442	6-5	20	42	45	62.3	58.1	57.7
Tenmarq	6936	6-3	19	40	26	62.2	57.5	60.5
Triumph	12132	26	16	36	0	61.4	54.4	50.5
Ponca	12128	29	17	37	0	62.8	51.8	54.5
Wichita	11952	27	16	39	0	62.4	48.4	50.1

Standard error of a difference = 3.66 bushels.

Lincoln, Nebraska
Five 1/47 acre plots

Variety	C.I. or Sel. No.	Date Headed	Date Ripe	Plant height	Lodging	Weight per bushel	Av. acre yield 1955	Av. acre yield 1954-1955
		May	June	Ins.	%	Lbs.	Bus.	Bus.
Red Chief	12109	13	26	36	0	63.7	47.3	42.4
Nebred	10094	18	27	33	2	61.9	47.2	41.9
Concho	12517	14	26	32	16	62.3	46.6	44.8
Pawnee x Nebred	13006	17	27	31	3	62.1	45.9	--
Pawnee x Cheyenne	12715	17	27	33	0	62.0	45.6	42.8
Chiefkan x Oro-Tenmarq	12518	14	26	33	1	62.2	45.5	43.0
Pawnee x Nebred	13015	13	25	31	12	61.0	45.4	44.4
Pawnee	11669	15	26	31	15	61.3	45.2	42.9
Pawnee x Cheyenne	13017	17	27	32	5	61.8	45.1	41.7
Tenmarq	6936	17	29	34	7	61.6	44.7	38.7
Nebred x Mqo.-Oro	483434	18	27	34	2	61.3	43.5	40.4
Comanche	11673	14	26	31	13	61.6	42.8	40.3
Kharkof	1442	21	30	34	2	61.0	42.7	36.4
Ponca	12128	14	25	32	21	60.9	42.3	42.0
Turkey	12137	19	30	34	6	61.1	42.1	36.4
Pawnee x Cheyenne	13007	15	26	30	0	59.9	41.9	40.7
Pawnee x Cheyenne	12875	15	26	31	0	61.3	39.9	40.2

Standard error of a difference = 2.05 bushels.

North Platte, Nebraska
Five 1/50 acre plots

Variety	C.I. No.	Date Headed	Date Ripe	Plant height	Shattering	Weight per bushel	Av. acre yield
		May	July	Ins.	%	Lbs.	Bus.
Pawnee x Nebred	13021	22	1	21	T	62.5	50.2
Kharkof	1442	25	8	30	T	62.5	48.3
Chey.-Red Chief x Paw.-Mqo.-Oro	13008	23	2	24	T	63.5	47.9
Nebred	10094	23	6	25	T	64.0	45.9
Cheyenne	8885	23	6	25	2	63.5	45.9
Sioux	12142	23	6	25	2	63.0	45.4
Tenmarq	6936	22	7	28	1	63.0	42.1
Pawnee x Nebred	13006	22	1	22	T	63.0	41.8
Concho	12517	21	6-30	22	4	64.0	41.1
Red Chief	12109	23	2	25	T	65.0	40.9
Chiefkan x Oro-Tenmarq	12518	22	1	21	T	63.5	39.2
Comanche	11673	21	1	23	T	63.5	38.4
Pawnee x Nebred	13015	22	1	21	T	62.0	38.3
Pawnee	11669	22	1	20	1	63.0	38.1
Pawnee x Cheyenne	13017	21	1	23	15	63.0	37.8
Pawnee x Cheyenne	12875	22	6-30	20	1	63.0	35.8
Pawnee x Cheyenne	12715	22	1	21	2	63.5	35.5
Pawnee xhCheyenne	13007	24	6-30	16	2	61.5	34.5

Standard error of a difference = 2.04 bushels.

Alliance, Nebraska
Six plots, rod rows

Variety	C.I. or Sel. No.	Weight per bushel	Av. acre yield
		Lbs.	Bus.
Pawnee x Cheyenne	12715	58.4	34.7
Turkey x Cheyenne	12711	58.2	33.4
Cheyenne	8885	57.2	33.4
Pawnee x Nebred	13006	57.7	32.9
Pawnee x Cheyenne	12875	58.3	31.4
Pawnee x Nebred	13015	59.1	31.0
Pawnee x Cheyenne	13007	57.9	30.8
Nebred	10094	58.6	30.6
Pawnee x Cheyenne	13017	56.1	30.5
Red Chief	12109	58.9	30.3
Chey.-Red Chief x Paw.-Mqo.-Oro	13008	58.2	29.6
Concho	12517	56.1	29.4
Pawnee	11669	58.5	28.9
Tenmarq	6936	56.4	28.5
Chey. Sel. x Turkey	461289	58.5	28.2
Chiefkan x Oro-Tenmarq	12518	57.5	28.1
Kharkof	1442	56.5	27.8
Sioux	12142	55.2	27.3
Comanche	11673	56.4	27.1

Ames, Iowa
Three plots, rod rows

Variety	C.I. No.	Date Headed	Date Ripe	Plant height	Lodging	Leaf rust	Weight per bushel	Ave. acre yield 1955	Ave. acre yield 1954-1955
		May	July	Ins.	%	%	Lbs.	Bus.	Bus.
Minter	12138	31	4	43	67	65	58.3	48.3	34.9
Minturki x Timoph.-Vulg.[2]	12806	6-4	10	47	22	35	60.7	42.6	24.4
Minturki	6155	31	5	44	62	90	57.1	38.2	22.5

Standard error of a difference = not significant.

Brookings, South Dakota
Two 1/50 acre plots

Variety	C.I. No.	Date Headed	Date Ripe	Plant height	Winter survival	Rust Stem	Rust Leaf	Weight per bushel	Ave. acre yield
		May	July	Ins.	%	%	%	Lbs.	Bus.
H44 x Mint.-Marm.	--	31	12	34	55	8	35	58.5	25.3
Marmin	11502	28	10	32	65	22	35	58.0	25.1
Minter	12138	31	12	32	52	12	30	58.8	24.8
Hope x Minturki[3]	--	31	12	35	48	10	35	57.2	24.4
Nebred	10094	26	11	26	25	35	50	59.5	22.2
Minturki	6155	30	12	34	48	40	30	58.0	21.9
Mint. x Timoph.-Vulg.[2]	12806	6-8	13	40	35	35	10	59.5	17.0
Sioux	12142	26	11	28	27	20	30	57.3	16.9
Pawnee	11669	24	10	26	12	30	40	59.0	16.1
Wichita	11952	23	10	24	22	10	50	59.7	14.1

Standard error of a difference = 2.55 bushels.

Highmore, South Dakota
Two 1/50 acre plots

Variety	C.I. No.	Date ripe	Plant height	Winter survival	Stem rust	Weight per bushel	Av. acre yield
		July	Ins.	%	%	Lbs.	Bus.
Minter	12138	16	27	95	28	57.6	32.2
Yogo	8033	16	30	80	55	52.6	28.0
Minturki	6155	16	31	90	40	54.1	25.2
Nebred	10094	12	23	75	25	55.6	25.1
Mint. x Timoph.-Vulg.[2]	12806	18	32	70	22	57.4	24.8
Sioux	12142	12	22	70	50	52.7	23.8
Pawnee	11669	12	22	70	40	54.0	22.1
Iohardi	12510	15	28	75	40	53.3	20.4
Wichita	11952	10	20	65	30	55.2	19.6

Standard error of a difference = 1.90 bushels.

St. Paul, Minnesota
Three plots, rod rows

Variety	C.I. or Sel. No.	Date		Plant height	Weight per bushel	Av. acre yield
		Headed	Ripe	Ins.	Lbs.	Bus.
Chey.-Chfk. x H44-Minturki[2]	2863	5-29	7-1	34	57.0	41.7
Minter	12138	5-31	7-1	31	57.7	41.4
Ea. Blkh.-Tq. x H44-Minturki	2865	5-28	6-28	30	59.7	41.2
Iohardi	12510	5-27	6-29	31	59.3	39.3
Minturki	6155	5-31	6-30	31	56.3	38.0
Minturki x Timoph.-Vulg.[2]	12806	6-4	7-1	34	53.7	25.6

Waseca, Minnesota
Three plots, rod rows

Variety	C.I. or Sel. No.	Date		Plant height	Winter survival	Lodging	Leaf rust	Weight per bushel	Av. acre yield
		Headed	Ripe	Ins.	%	%	%	Lbs.	Bus.
		June	July						
Minturki x Timoph.-Vulg.[2]	12806	5	14	51	82	70	40	61.7	64.6
Iohardi	12510	5-29	8	45	77	40	60	61.3	53.9
Minter	12138	1	9	47	83	50	50	61.0	51.8
Minturki	6155	2	10	45	83	60	50	60.0	51.4
Chey.-Chfk. x H44-Minturki[2]	2863	1	8	43	80	60	60	60.0	48.5
Ea. Blkhl.-Tq. x H44-Minturki	2865	1	9	41	68	50	60	62.0	43.0

Laramie, Wyoming
Four plots, rod rows

Variety	C.I. or Sel. No.	Plant height	Winter survival	Rust		Weight per bushel	Av. acre yield
				Leaf	Stem		
		Ins.	%	%	%	Lbs.	Bus.
Yogo	8033	33	61	53	40	58.6	36.9
Minter	12138	32	41	40	37	59.3	31.3
Chey.-Red Chief x Paw.-Mqo.-Oro	13008	27	50	30	63	58.3	31.3
Chey.-Chfk. x H44-Mint.^{2}	13115	24	55	57	23	57.5	31.0
Kharkof M.C.22	6938	37	66	37	53	60.5	30.4
Turkey x Cheyenne	12711	26	58	40	47	59.0	30.2
Mint. x Timoph.-Vulg.^{2}	12806	40	28	17	13	56.5	30.1
Cheyenne	8885	32	28	13	67	58.3	29.5
Minturki	6155	33	24	40	37	58.3	29.4
Kharkof	1442	31	25	33	40	59.0	28.4
Hope x Cheyenne^2	451406	29	51	53	30	56.6	26.1
Chey.-H44 x Chey. Sel.	461529	30	23	50	30	57.5	25.5
Chey. x Hope-Tk.	494738	31	20	47	23	58.5	24.4
Sioux	12142	27	36	53	40	59.0	22.2
Hope-Tk. x Chey.	12716	28	26	43	37	57.0	19.1
Hope-Tk. x Chey.	494951	25	38	43	20	59.3	19.0
Blackhull	6251	30	15	27	50	55.0	19.0
Nebred	10094	30	15	37	60	59.0	15.0
Hope x Cheyenne^2	12717	28	21	33	33	59.0	14.2
Pawnee x Nebred	13015	25	15	37	53	58.5	5.9

Standard error of a difference = 9.20 bushels.

Sheridan, Wyoming
Four plots rod rows

Variety	C.I. or Sel. No.	Date headed	Plant height	Winter survival	Weight per bushel	Av. acre yield
		June	Ins.	%	Lbs.	Bus.
Nebred	10094	25	37	86	59	28.8
Turkey x Cheyenne	12711	25	36	75	60	28.4
Cheyenne	8885	25	37	80	59	27.0
Pawnee x Nebred	13015	23	33	91	60	26.6
Chey. x Hope-Tk.	494738	25	35	93	58	26.0
Sioux	12142	26	37	76	58	25.9
Hope x Cheyenne^2	12717	25	37	75	59	25.3
Hope-Turkey x Chey.	494951	24	34	85	59	25.1
Hope-Turkey x Chey.	12716	25	38	71	59	24.5
Blackhull	6251	24	38	80	58	24.3
Hope x Cheyenne	451406	25	36	85	58	24.0
Chey.-Chfk. x H44-Mint.^{2}	13115	24	40	76	59	23.5
Yogo	8033	27	39	81	58	22.8
Minter	12138	26	40	83	58	22.0
Chey.-H44 x Chey. Sel.	461529	25	35	86	56	21.4
Chey.-Red Chief x Paw.-Mqo.-Oro	13008	24	36	66	59	20.9
Minturki	6155	26	40	73	57	20.8
Kharkof	1442	26	39	62	56	17.3
Mint. x Timoph.-Vulg.^{2}	12806	29	41	96	58	17.3
Kharkof M.C.22	6938	29	40	58	55	16.4

Standard error of a difference = 4.45 bushels.

Gillette, Wyoming
Three plots, rod rows

Variety	C.I. No.	Winter survival	Weight per bushel	Av. acre yield
		%	Lbs.	Bus.
Yogo	8033	37	53.0	40.3
Kharkof	1442	50	53.5	32.3
Kharfof M.C. 22	6938	45	46.5	25.6
Minter	12138	35	55.0	25.4
Minturki	6155	35	51.5	23.3
Cheyenne	8885	10	56.0	16.1
Nebred	10094	9	56.5	9.2
Blackhull	6251	5	56.0	2.7
Turkey x Cheyenne	12711	4	--	2.5
Sioux	12142	1	--	1.6

Standard error of a difference = 7.55 bushels.

Albin, Wyoming
Four plots, rod rows.

Variety	C.I. No.	Weight per bushel	Av. acre yield
		Lbs.	Bus.
Sioux	12142	52.5	49.4
Turkey x Cheyenne	12711	53.8	48.8
Nebred	10094	53.0	40.8
Kharkof	1442	54.0	38.6
Yogo	8033	54.4	36.7
Blackhull	6251	52.0	36.7
Minter	12138	53.0	35.7
Minturki	6155	51.5	35.4
Cheyenne	8885	52.0	34.6
Kharkof M.C. 22	6938	53.0	32.2

Standard error of a difference = 4.20 bushels.

Bozeman, Montana
Six plots, rod rows

Variety	C.I. or Sel. No.	Date headed	Plant height	Lodging	Weight per bushel	Av. acre yield
			Ins.	%	Lbs.	Bus.
27-15 x Rex-Rio	12696	7-5	42	0	62.4	82.2
Hussar	4843	6-30	52	100	62.8	80.0
Cheyenne	8885	7-5	48	60	64.0	79.1
Yogo x Rescue	56-30	7-4	52	100	63.6	79.0
Yogo (Brown awned)	--	6-28	47	50	64.4	78.7
Yogo x Rescue	56-28	7-4	48	90	62.8	77.1
Kharkof	1442	7-4	49	100	68.0	74.9
Karmont	6700	7-5	50	100	64.0	74.5
Blkhl.-Rex x Chey.	12933	7-5	48	0	62.8	74.2
Blkhl.-Rex x Rio-Rex	12932	7-1	49	70	63.6	73.0
Newturk	6935	7-5	47	90	63.2	71.7
Rex x Rio	M.43096	6-28	44	25	64.4	71.5
Yogo x Rescue	50-7	6-29	47	75	64.0	70.7
Yogo x Rescue	77-11	6-29	45	80	64.0	70.5
Kharkof	17-7	7-4	48	90	63.6	70.0
Minter	12138	7-6	50	95	66.4	68.9
Rio-Rex x Cheyenne	12925	6-29	45	0	62.8	68.0
Wasatch	11925	7-1	51	50	63.6	67.3
Yogo Comp. (Elite)	--	7-5	52	100	63.6	67.0
Yogo x Rescue	56-19	7-3	48	85	63.2	64.1
Yogo	8033	7-5	53	100	64.0	62.8
Yogo x Rescue	66-22	6-29	45	30	63.6	59.0
Mint. x Timoph.-Vulg.[2]	12806	7-11	52	65	64.8	58.1
H44 x Minturki[4]	Minn.2844	7-5	50	80	66.8	57.3

Standard error of a difference = 2.67 bushels.

Havre, Montana
Six plots, rod rows

Variety	C.I. or Sel. No.	Date headed	Plant height	Weight per bushel	Av. acre yield	
					1955	1954-1955
		June	Ins.	Lbs.	Bus.	Bus.
Yogo Comp. (Elite)	--	18	38	61	53.0	39.1
Yogo	8033	15	37	63	52.2	38.9
Yogo (Brown awnless)	--	15	39	61	50.6	--
Yogo (Brown awned)	--	21	37	62	50.0	--
Karmont	6700	15	40	63	49.5	36.9
Kharkof	17-7	15	40	62	48.4	--
Minter	12138	21	37	62	47.8	36.0
Rio-Rex x Cheyenne	12925	15	35	63	45.5	35.0
Yogo x Rescue	56-30	15	37	62	45.1	--
Norin 10 x Brevor-11	--	21	24	60	44.7	--
Yogo x Rescue	50-7	15	38	63	44.1	--
Kharkof	1442	18	39	62	43.8	36.3
Blkhl. -Rex x Chey.	12933	18	35	63	43.4	35.3
Newturk	6935	21	37	63	42.3	36.1
Wasatch	11925	15	38	62	42.3	32.8
Yogo x Rescue	56-19	16	34	61	41.9	--
Yogo x Rescue	77-11	15	38	62	41.3	--
Yogo x Rescue	56-28	15	35	59	40.7	--
Yogo x Rescue	66-22	16	37	63	40.1	--
Rex x Rio	M.43096	21	34	64	37.1	--

Standard error of a difference = 3.89 bushels.

STANDARD ERRORS

Standard errors on the yield data for the current year are given in table 2 together with the number of plots and mean yields at each location. A footnote indicates where nursery plots were used in place of field plots.

The analysis of variance was applied to the data from each reporting station except St. Paul and Waseca, Minnesota. 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 presented also. These statistics have considerable value to the agronomist even though complete random arrangement of plots was not followed at all stations.

SUMMARY OF PLOT DATA

Summary of average yields for 1955 and 2-year average yields for the 1954-55 period as well as averages of other agronomic data for 1955 appear in tables 3 through 12.

Yields by Districts

Seven varieties were grown uniformly at seven stations in the southern district in 1955. The variety Ponca was grown at 6 stations and is also included in table 3. Despite the extreme drought at several of the southern district locations, Concho continued to show outstanding performance. Its 18.6 bushel average yield was high for the district in 1955. Comanche, Kharkof, and C. I. 12702 followed in that order. The 2-year average yield of 22.3 bushels for Concho is nearly 3 bushels better than the yields of second and third ranked Comanche and C. I. 12702

In the central district seven varieties were grown uniformly at eight locations. Ponca was included in tests at six locations. As in the southern district, Concho led all uniform varieties with a 38.0 bushel average yield. Red Chief was second ranked but was followed closely by C. I. 12518. Concho also shows the best 2-year average yield in the central district. Its 8-location yield is 34.1, 0.6 bushels higher than second-ranked C. I. 12518.

Minter was most productive of 3 varieties uniformly tested at 5 locations in the northeastern district. Its 39.7 bushel average yield was 4.8 bushels better than second ranked Minturki.

Yogo, Kharkof, and Minter were tested uniformly in the northwestern district. Yogo had the best performance at 4 out of 6 reporting stations, and had as well the highest district average.

Summary of Agronomic Data

Wherever the same kind of note was recorded on varieties at more than one station in a district, such data were averaged and included in the appropriate table of agronomic data. Tables 9 through 12 include these data for the 4 districts. Varieties in each district are listed in declining order of bushel weight.

In the southern district, average test weights of 7 uniform varieties ranged downward from 61.2 pounds recorded for Red Chief. Leaf rust notes were taken at two stations in the district. Comanche and 12702 in that order showed the lowest average infections.

Only Kharkof failed to make a 60.0 pound average test weight in the central district; an indication of the highly favorable conditions for ripening that prevailed at many of the locations. Red Chief averaged 62.2, Concho 61.0, and Comanche 60.8 pounds. Two locations reported lodging. No lodging was recorded for Red Chief and only 1 percent for C. I. 12518 as compared with Kharkof and Tenmarq with 24 and 17 percent, respectively.

C. I. 12806 had the lowest average survival in the northeast district but showed the lowest lodging and leaf rust readings. The bushel weights of Minter and C. I. 12806 differed by only 0.1 pound.

Minter had the highest average bushel weight in the northwest district while Yogo showed slightly the highest winter survival.

Table 2. Number of plots, average yields and standard errors for the variety tests at the cooperating stations in 1955.

State and Station	No. of plots	No. of var.	Average yield all var.	Standard error of a -----			Coefficient of variability
				Single plot	Difference in means	Mean	
				Bus.	Bus.	Bus.	%
TEXAS							
Denton	10*	22	9.84	2.36	2.11	0.75	23.99
Chillicothe	10*	23	16.50	3.06	1.37	0.97	18.54
Bushland	3*	7	28.43	3.80	N.S.	2.19	13.37
NEW MEXICO							
Clovis	5	18	16.94	2.87	1.82	1.29	16.94
OKLAHOMA							
Stillwater	4	16	5.98	1.88	1.33	0.94	31.36
Woodward	5*	16	20.44	3.77	2.38	1.69	18.45
Goodwell	5*	16	19.59	4.81	3.04	2.15	24.55
KANSAS							
Manhattan	6*	15	32.84	8.31	N.S.	3.39	25.31
Garden City	4	16	31.14	2.40	1.70	1.20	7.72
Colby	2	16	31.87	1.05	1.06	0.74	3.31
COLORADO							
Akron	3	13	12.31	1.78	1.46	1.03	14.50
Ft. Collins	7*	15	61.32	6.85	3.66	2.59	11.16
NEBRASKA							
Lincoln	5	17	44.34	3.23	2.05	1.45	7.29
North Platte	5	18	41.51	3.23	2.04	1.44	7.77
Alliance	6*	19	30.15	4.95	N.S.	2.02	16.43
WYOMING							
Laramie	4*	20	24.95	13.01	9.20	6.51	52.25
Gillette	3*	10	17.90	9.25	7.55	5.34	51.66
Sheridan	4*	20	23.42	6.29	4.45	3.15	26.87
Albin	4*	10	38.89	5.94	4.20	2.97	15.27
SOUTH DAKOTA							
Brookings	2	10	20.79	2.55	2.55	1.80	12.27
Highmore	2	9	24.58	1.90	1.90	1.34	7.73
MONTANA							
Bozeman	6*	24	71.00	4.63	2.67	1.89	6.52
Havre	6*	20	45.19	6.73	3.89	2.75	14.89
IOWA							
Ames	3*	3	42.96	7.21	N.S.	4.16	16.78
MINNESOTA							
St. Paul	3*	6	37.87	--	--	--	--
Waseca	3*	6	52.20	--	--	--	--

* = Nursery plots. N.S. = non-significant at 5% level.

Table 3. Summary of average yields of varieties grown uniformly at 7 stations in the southern district in 1955.

Variety	C.I. No.	Average yield in bushels per acre at---							Seven-station average
		Dent-on	Chilli-cothe	Bush-land	Clovis	Still-water	Wood-ward	Good-well	
Concho	12517	12.7	16.9	31.3	18.7	6.3	16.9	27.2	18.6
Comanche	11673	9.1	16.5	29.8	15.1	6.5	24.8	17.5	17.0
Kharkof	1442	11.3	11.4	31.2	19.4	3.9	22.6	16.9	16.7
12701 x Wichita	12702B1.	9.8	19.9	29.5	16.4	5.7	19.2	15.1	16.5
Tenmarq	6936	7.6	15.2	28.5	19.0	4.8	20.7	11.7	15.4
Red Chief	12109	9.0	14.9	21.4	14.7	6.6	18.4	22.5	15.4
Early Blackhull	8856	9.1	16.3	27.2	12.1	6.9	15.1	10.6	13.9
Ponca	12128	10.1	17.6	--	17.4	6.6	21.6	15.4	14.8 1/

1/ Six-station average. Comparable average for Concho = 16.5 bushels, and for Comanche = 14.9 bushels.

Table 4. Two-year summary of the average yields of varieties grown uniformly in the southern district in 1954 and 1955.

Variety	C.I. No.	Average yield in bushels per acre at---							Two-year average
		Dent-on	Chilli-cothe	Bush-land	Clovis	Still-water	Wood-ward	Good-well	
Years grown.....		2	2	2	1	2	2	2	13
Concho	12517	25.5	23.4	28.8	18.7	14.6	19.9	25.1	22.3
Comanche	11673	23.8	19.1	24.4	15.1	12.0	20.9	21.0	19.5
12701 x Wichita	12702B1.	25.2	22.0	25.8	16.4	13.0	19.1	14.3	19.4
Kharkof	1442	23.0	19.8	24.2	19.4	10.7	19.1	15.7	18.8
Red Chief	12109	23.1	17.3	20.4	14.7	12.3	19.3	21.0	18.3
Tenmarq	6936	23.2	20.3	21.9	19.0	11.0	18.0	12.7	18.0
Early Blackhull	8856	24.2	16.1	21.5	12.1	10.3	15.1	18.7	16.9

Table 5. Summary of average yields of varieties grown uniformly at 8 stations in the central district in 1955.

Variety	C.I. No.	Average yield in bushels per acre at----								Eight-station average
		Manhattan	Garden City	Colby	Akron	Fort Collins	Lincoln	North Platte	Alliance	
Concho	12517	35.6	35.3	34.6	12.6	68.5	46.6	41.1	29.4	38.0
Red Chief	12109	32.3	33.5	33.7	13.1	61.1	47.3	40.9	30.3	36.5
Chiefkan x Oro-Tq.	12518	35.5	34.5	32.4	9.9	64.6	45.5	39.2	28.1	36.2
Kharkof	1442	34.0	30.2	30.5	15.9	58.1	42.7	48.3	27.8	35.9
Comanche	11673	31.4	35.1	31.9	13.4	63.4	42.8	38.4	27.1	35.4
Pawnee	11669	31.6	26.9	31.3	12.7	64.3	45.2	38.1	28.9	34.9
Tenmarq	6936	33.3	25.9	29.4	13.6	57.5	44.7	42.1	28.5	34.4
Ponca	12128	33.3	26.5	32.1	12.4	51.8	42.3	--	--	33.1 1/

1/ Six-station average. Comparable average for Concho = 38.9 bushels, and for Red Chief = 36.8 bushels.

Table 6. Two-year summary of the average yields of varieties grown uniformly in the central district in 1954 and 1955.

Variety	C.I. No.	Average yield in bushels per acre at----								Two year average
		Manhattan	Garden City	Colby	Akron	Fort Collins	Lincoln	North Platte	Alliance	
Years grown.....		2	2	2	2	2	2	1	1	14
Concho	12517	37.1	18.6	24.7	11.8	65.4	44.8	41.1	29.4	34.1
Chiefkan x Oro-Tq 1/	12518	36.3	19.9	25.1	10.4	65.6	43.0	39.2	28.1	33.5
Red Chief	12109	32.2	18.9	25.6	12.4	58.4	42.4	40.9	30.3	32.6
Pawnee	11669	35.0	15.2	25.4	11.9	60.6	42.9	38.1	28.9	32.3
Comanche	11673	35.2	19.0	22.8	13.3	61.3	40.3	38.4	27.1	32.2
Kharkof	1442	32.1	17.2	23.0	12.9	57.7	36.4	48.3	27.8	31.9
Tenmarq	6936	35.2	14.5	20.8	11.9	60.5	38.7	42.1	28.5	31.5

1/ Not grown at Manhattan, Garden City and Colby in 1954; yield for Kiowa substituted.

Table 7. Summary of average yields of the varieties grown uniformly at five stations in the northeastern district in 1955.

Variety	C.I. No.	Average yield in bushels per acre at--- Ames	Brookings	Highmore	St. Paul	Waseca	Five-station average
Minter	12138	48.3	24.8	32.2	41.4	51.8	39.7
Minturki	6155	38.2	21.9	25.2	38.0	51.4	34.9
Mint. x Timoph.-Vulg.[2]	12806	42.6	17.0	24.8	25.6	64.6	34.9

Table 8. Summary of average yields of the varieties grown uniformly at six stations in the northwestern district in 1955.

Variety	C.I. No.	Average yield in bushels per acre at--- Laramie	Gillette	Sheridan	Albin	Bozeman	Havre	Six-staion average
Yogo	8033	36.9	40.3	22.8	36.7	62.8	52.2	42.0
Kharkof	1422	28.4	32.3	17.3	38.6	74.9	43.8	39.2
Minter	12138	31.3	25.4	22.0	35.7	68.9	47.8	38.5

Table 9. Agronomic data other than yield summarized from the variety tests in the southern district, 1955.

Variety	C.I. No.	Average date Headed	Ripe	Average plant height	Average leaf rust	Average weight per bushel
		May	June	Ins.	%	Lbs.
Number of stations.....		7	6	7	2	7
Red Chief	12109	11	15	22	34	61.2
12701 x Wichita	12702B1.	8	10	21	14	60.1
Early Blackhull	8856	3	7	21	35	59.8
Concho	12517	9	12	20	26	59.7
Comanche	11673	11	13	22	9	58.9
Kharkof	1442	14	18	22	27	58.8
Tenmarq	6936	13	16	22	26	58.7

Table 10. Agronomic data other than yield summarized from the variety tests in the central district, 1955.

Variety	C.I. No.	Average date		Average plant height	Average lodging	Average weight per bushel
		Headed	Ripe			
		May	July	Ins.	%	Lbs.
Number of stations.....		7	4	7	2	9
Red Chief	12109	19	5	30	0	62.2
Concho	12517	17	4	27	8	61.0
Comanche	11673	18	5	28	7	60.8
Chiefkan x Oro-Tq.	12518	18	4	27	1	60.6
Pawnee	11669	18	4	26	8	60.4
Tenmarq	6936	20	8	30	17	60.0
Kharkof	1442	23	8	32	24	59.6

Table 11. Average of agronomic data other than yield for the uniform varieties in northeastern district variety tests, 1955.

Variety	C.I. No.	Date		Survival	Plant height	Lodging	Rust		Weight per bushel
		Headed	Ripe				Leaf	stem	
			July	%	Ins.	%	%	%	Lbs.
Number of stations.....		4	5	3	5	2	3	2	5
Minter	12138	5-31	8	77	36	59	48	20	58.7
Mint. x Timoph.-Vulg.[2]	12806	6-5	11	62	41	46	28	29	58.6
Minturki	6155	5-31	8	74	37	61	57	40	57.1

Table 12. Average of agronomic data other than yield for the uniform varieties in northwestern district variety tests, 1955.

Variety	C.I. No.	Date headed	Survival	Plant height	Weight per bushel
		June	%	Ins.	Lbs.
Number of stations.....		3	3	4	6
Minter	12138	28	53	40	59.0
Yogo	8033	26	60	41	58.5
Kharkof	1442	26	46	39	58.0

UNIFORM YIELD NURSERY

The uniform yield nursery was sown at 18 locations in a 7-State area in the southern and central plains. Permanent check varieties continue to be Kharkof, Blackhull, and Early Blackhull. Ten new selections were grown in the nursery for the first time in 1955 and six were discontinued from the 1954 nursery. Fall and winter drought at Cherokee, Oklahoma, resulted in poor stands and abandonment of the nursery at that location. Drought also led to the abandonment of the uniform yield nursery at Akron, Colorado. An apparent mix-up of seed at Fort Collins made impossible the identification of a number of strains in the nursery at that location. Since only incomplete data were available from Ft. Collins they were not included in this report. Varieties included in the 1955 tests were as follows:

Entry 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	Concho		12517
7	Ea. Blackhull-Tq. x Oro-Med.-Hope		12871
8	Med.-Hope-Pn. x Oro-Ill. 1-Com.		12804
9	Med.-Hope x Pawnee[2]		12873
10*	Med.-Hope x Pawnee[3]	Ks. 51348	13112
11	12701 x Wichita		12702
12	12701 x Wichita		12702
13	Kanred x Clarkan		13002
14	Kanred x Clarkan		13003
15	Pawnee x Cheyenne		12715
16	Pawnee x Cheyenne		12875
17	Pawnee x Cheyenne		13007
18*	Pawnee x Cheyenne	Nebr. 47NP1642	13017
19*	Pawnee x Nebred	Nebr. 51A823	13021
20*	Pawnee x Nebred	Nebr. 502845	13015
21*	Ponca x Cheyenne	Nebr. 521632	13019
22*	Ponca x Cheyenne	Nebr. 521630	13018
23*	Kanking	E. G. Clark	12719
24*	Cim. x Hope-Cheyenne	Tq. 256-50-7	13022
25*	Kan.-H.Fed.-Tq.-Med.-Hope x Cim.	Tx. 274-51-A7	13023
26*	Cim. x Hope-Cheyenne x Com.	Tx. 275-51-A26	13024

* New entries.

DATA OBTAINED

The uniform yield nursery was grown at most stations in close proximity to the field plots. Thus, the particular conditions which affected the performance of the plot varieties at the various locations apply as well to this nursery. The data obtained from the 15 reporting locations are presented in table 13.

At Denton, Texas, where yields were abnormally low because of the drought, C. I. 13002 was high yielder with 12.8 bushels per acre. Blackhull has the best 2-year average yield. Bushel weights ranged from 62.0 pounds for Blackhull to 54.0 pounds for C. I. 13112. Bunt infections from 0 to 90 percent were obtained. Leaf rust was moderately heavy. The Ponca x Cheyenne selections C. I. 13018 and 13019 showed the

least amount of rust. Shattering and lodging in light amounts occurred.

Yields were only fair at Chillicothe. Three varieties C. I. 13021, Pawnee, and C.I. 13023 made more than 20 bushels per acre as contrasted with 10.4 bushels for Kharkof. Among the strains tested 2 years, Concho shows the best yield average with a 1-bushel advantage over second ranked C. I. 13002.

Only the three replications of the nursery that were given supplemental irrigation water made a crop at Bushland. It is of interest that C. I. 13002 which topped the nursery at Denton where moisture shortage was severe also was the most productive at Bushland under irrigation. Concho which has the highest 2-year yield average at Bushland ranked fourth in the test this year.

Yields at Clovis, New Mexico were very low. Only 7 strains yielded more than 5 bushels per acre. Pawnee x Cheyenne (C. I. 13017) topped the test with 7.1 bushels while Blackhull was the low yielder with 2.3 bushels. Yield differences were mostly non-significant. Moderately heavy shattering occurred in eight varieties.

Good stands were obtained at Stillwater, Oklahoma, but the severe heat and drought in April and early May did irreparable damage to the crop. Considerable tip sterility was observed and many varieties failed to excert more than a small percentage of heads from the boots. The 9.8 bushel yield made by KanKing was high for the nursery. C. I. 13017 yielded only 3.8 bushels.

Stands were somewhat spotty at Woodward although excellent yields were recorded. The two isogenic lines of Kanred x Clarkan were the most productive. Both yielded more than 30 bushels per acre. Blackhull was third high with a 28.3 bushel yield while Early Blackhull was low in the nursery with a yield of 19.9 bushels. Bushel weights ranged from 58.0 to 62.0 pounds. Leaf rust was present in the nursery although in light amounts. Rather severe leaf injury occurred in the late March freezes.

Yields at Manhattan, Kansas, although high, could not be demonstrated as significantly different between varieties because of the extreme variability induced by the drought. The apparent ability of C. I. 13002 and 13003 to withstand drought is suggested by their performance at Manhattan and other locations this year. Both exceeded 45 bushels in yield. Only six varieties were below 60 pounds in test weight. Disease notes taken at Manhattan included loose smut, bunt, and leaf and stem rust. The greenhouse hessian fly reaction of the uniform yield nursery entries was also determined. Excellent combined resistance to fly, the smuts, and leaf rust was shown by C. I. 12871, 12873, and 13112.

Lack of adequate soil moisture in the fall and winter at Hays resulted in failure to establish uniform stands. No yields were taken, although test weights were determined. Only C. I. 13003 weighed less than 60 pounds. KanKing was high for the nursery with 64.5-pound bushel weight.

Yields were the highest in several years at Garden City. The Texas entry C. I. 13022 made 50.4 bushels for high yield in the nursery. C. I. 12715 was low with a 30-bushel yield. All varieties exceeded 60 pounds in test weight. Concho ranked fourth in yield this year but has the best two-year average yield at Garden City.

Only 3 varieties yielded less than 30 bushels per acre at Colby. Eight varieties made more than 40 bushels. C. I. 12873 was high in the nursery, making 44.3 bushels while Early Blakhull was low with a 23.4-bushel yield. Bushel weights

were unusually high ranging from 62 to 65 pounds. C.I. 12873 has the best 2-year yield average at Colby. The identity of C. I. 13112 was questionable at Colby. Thus data for this entry were excluded from the table.

The uniform yield nursery at Hesperus, Colorado, received one irrigation during the growing season. Yields ranged from 32.1 bushels for C. I. 13022 up to 44.1 bushels for C. I. 13003. Concno and C. I. 12702 (Bl.) were second and third, respectively, in the nursery.

Yields were very high at Lincoln, Nebraska. The Texas entries C. I. 13022 and 13023 were outstanding. Both yielded at least five bushels per acre more than other entries in the nursery. Kharkof had a low yield of 41.1 bushels. Rust did not develop but lodging was severe. All varieties showed some lodging with many exceeding 60 percent down straw. C. I. 12804, 13007, and 12715 were the only varieties which lodged less than 40 percent. Bushel weights of 58.3 up to 62.6 pounds were recorded. C. I. 12873 has the high two-year average yield of 52.4 bushels at Lincoln. Other varieties that have two-year averages exceeding 50 bushels include C. I. 12871, 12804, 12702 (Bl.), and Concho.

The North Platte nursery suffered considerable damage from the spring drought but made excellent recovery during the cool weather in June. Yields were moderately high but variable because of the early season lack of moisture. Varietal differences in yield were non-significant. Kharkof produced the most grain this year and has as well the best two-year yield average at North Platte.

Yields at Alliance were comparable to those obtained at North Platte. Varietal differences were non-significant.

High but variable yields, high bushel weights, and heavy lodging and leaf rust were the outstanding characteristics of the test at Ames, Iowa, in 1955. KanKing and C. I. 12811 made yields of more than 60 bushels while Kharkof and C. I. 13017 were the only varieties yielding less than 40 bushels per acre. Fifty percent lodging, recorded for C. I. 12871, was lowest in the test. C. I. 12871 also showed outstanding resistance to leaf rust and the high test weight in the nursery of 63.5 pounds. C. I. 13022 and 13023 were classified as highly resistant and moderately resistant to mildew, respectively. C. I. 12871 has the highest average yield for 1954-55 crop seasons.

Table 13. Yield and other data for varieties grown in the uniform yield nursery in cooperative experiments at 15 stations in the hard winter wheat region in 1955, and period averages.

Denton, Texas
Four plots

C. I. No.	Date Headed	Date Ripe	Plant height	Lodging 1/	Shattering 1/	Leaf rust	Bunt	Weight per bushel	Av. acre yield 1955	Av. acre yield 1954-1955
	April	May	Ins.	%	%	%	%	Lbs.	Bus.	Bus.
13002	27	22	22	T	0	50	90	58.5	12.8	23.2
13112	25	20	19	0	3	20	1	54.0	11.9	--
13023	24	18	19	T	0	40	90	59.0	11.5	--
6251	28	22	19	0	0	30	50	62.0	11.2	25.7
12702W.	25	20	20	50	0	20	70	58.5	11.0	24.5
13021	25	18	19	0	0	40	0	56.0	10.9	--
12517	25	20	20	5	T	50	T	57.0	10.9	22.2
12702B1.	26	21	20	20	0	20	60	60.0	10.3	23.0
12871	25	19	19	T	0	50	20	60.5	10.2	23.0
13018	26	20	18	10	5	5	50	56.0	10.1	--
1442	27	21	17	T	T	50	T	58.5	9.7	20.7
12804	26	21	18	0	T	30	20	56.0	9.4	19.0
13015	26	20	18	T	T	40	0	57.0	9.3	--
12719	25	18	19	T	0	60	90	59.0	9.1	--
11669	26	18	18	T	T	50	10	55.0	9.0	17.6
13003	27	22	22	T	T	50	80	57.5	8.6	23.3
8856	22	16	22	5	0	60	80	59.0	8.5	20.2
13007	25	18	19	T	10	60	30	56.0	8.5	20.2
12873	26	20	17	0	0	20	0	55.5	8.3	18.2
13019	27	21	19	20	T	10	5	56.0	8.3	--
12875	27	21	19	T	5	50	60	60.0	7.9	19.6
13022	24	19	18	10	0	50	60	56.0	7.8	--
13017	28	23	18	T	T	60	10	58.5	7.7	--
11673	27	21	20	10	T	5-30	5	58.0	7.2	21.3
12715	27	21	18	T	T	50	50	59.0	7.1	--
13024	26	19	21	5	2	5-40	30	58.5	6.5	21.5

1/ Recorded on June 27 on a replication left standing.

Standard error of a difference = 1.37 bushels.

Chillicothe, Texas
Four plots

C. I. No.	Date Headed	Date Ripe	Plant height	Weight per bushel	Av. acre yield 1955	Av. acre yield 1954-1955
		June	Ins.	Lbs.	Bus.	Bus.
13021	5-4	13	18	59	21.6	--
11669	5-2	9	19	59	21.5	23.5
13023	4-30	5-31	15	61	20.1	--
13018	4-30	3	16	60	19.8	--
13002	5-6	19	22	58	19.4	25.0
13017	5-5	13	22	59	19.2	--
12702Bl.	4-28	5-28	16	61	19.0	22.8
12719	4-29	5-31	19	60	18.6	--
11673	5-1	8	22	58	18.6	20.2
12804	5-1	5	19	60	18.2	22.7
12871	4-27	5-28	18	61	17.8	19.4
12517	5-1	5	20	60	17.6	26.0
13019	5-2	6	17	59	17.6	--
12875	5-4	12	21	58	17.4	20.2
12873	5-2	6	15	58	17.0	20.6
13003	5-6	19	19	58	16.6	23.3
13007	5-2	6	16	57	16.5	19.6
12702W.	4-28	5-28	15	59	16.2	21.3
13015	5-2	6	18	59	16.0	--
13024	4-30	5	17	58	15.9	--
13112	5-4	13	13	58	15.5	--
12715	5-5	17	18	59	15.0	19.6
8856	4-20	5-27	18	60	14.6	15.4
13022	4-29	5-30	15	58	13.9	--
6251	5-3	18	18	59	13.0	19.8
1442	5-7	14	19	58	10.4	21.2

Standard error of a difference = not significant.

Bushland, Texas
Three plots, irrigated

C. I. No.	Date Headed	Date Ripe	Plant height	Weight per bushel	Av. acre yield 1955	Av. acre yield 1954-1955
	May	June	Ins.	Lbs.	Bus.	Bus.
13002	16	28	27	59.0	35.5	29.5
13007	14	26	25	59.0	33.0	31.6
13015	12	24	26	59.5	31.4	--
12517	12	25	25	61.0	31.3	33.2
1442	16	29	27	60.0	31.2	27.6
6251	12	25	26	61.0	31.1	26.5
11673	13	26	28	60.0	29.8	27.2
13024	12	22	26	60.5	29.7	--
12702B1.	11	26	25	61.5	29.5	29.7
13003	16	28	29	58.0	29.4	27.5
12873	14	26	24	59.5	28.0	30.7
8856	4-29	22	25	60.5	27.2	24.4
12875	13	24	26	60.5	27.2	22.9
12804	12	24	25	60.0	26.8	28.7
12702W.	12	26	25	61.5	26.8	30.2
13017	14	25	29	59.0	26.4	--
13023	14	27	23	61.5	26.2	--
13112	14	26	23	57.0	26.0	--
12871	2	27	23	62.5	24.8	28.7
13022	13	27	26	59.5	23.9	--
12715	14	26	26	58.5	23.8	24.7
13021	13	25	22	58.5	23.7	--
12719	12	25	25	61.0	23.6	--
13018	13	24	25	60.0	21.0	--
13019	14	24	22	58.0	20.0	--
11669	12	24	25	57.5	16.8	24.8

Standard error of a difference = 4.07 bushels.

Clovis, New Mexico
Two plots

C. I. No.	Date headed	Shattering[1/]	Weight per bushel	Av. acre yield
	May		Lbs.	Bus.
13017	24	4	58.1	7.1
13003	23	2	58.3	6.2
1442	28	3	59.0	5.7
12804	16	2	59.0	5.6
12873	23	4	57.4	5.4
13023	19	2	60.5	5.4
12719	20	2	61.1	5.2
11673	22	3	58.0	4.8
13007	25	4	55.8	4.6
12702W.	17	4	58.6	4.6
12517	23	2	58.7	4.5
13022	17	2	59.0	4.4
12715	23	4	58.4	4.1
13002	24	2	57.5	4.1
12875	25	3	59.1	3.9
11669	25	4	56.2	3.8
12871	15	3	60.3	3.8
12702B1.	17	4	59.4	3.8
13019	26	3	56.9	3.6
13021	25	2	56.1	3.5
13112	25	4	54.9	3.4
13018	25	2	57.1	3.0
8856	13	2	60.3	2.9
13024	21	2	59.1	2.8
13015	26	2	57.9	2.6
6251	24	2	60.5	2.3

1/ 1:none; 5:heavy

Standard error of a difference = 2.02 bushels.

Stillwater, Oklahoma
Four plots

C. I. No.	Date Headed	Date Ripe	Plant height Ins.	Weight per bushel Lbs.	Av. acre yield 1955 Bus.	Av. acre yield 1954-1955 Bus.
12719	4-30	5-31	16	60.5	9.8	--
13002	5-3	6-5	17	58.5	9.1	17.5
12702B1.	4-29	5-27	17	59.0	8.9	15.3
13007	5-2	5-31	15	58.0	8.7	12.7
13112	5-1	5-29	15	57.0	8.0	--
12702W.	4-29	5-27	17	57.5	7.9	15.0
13019	5-1	5-31	16	58.0	7.6	--
12873	5-3	5-29	15	57.0	7.5	12.8
13015	5-2	5-31	15	59.0	7.4	--
11669	5-2	5-30	16	58.0	7.2	13.1
13023	4-30	5-26	15	60.5	6.6	--
13003	5-4	6-6	18	56.5	6.4	16.1
8856	4-29	5-26	17	59.0	6.0	11.1
6251	5-3	6-5	15	59.0	5.8	13.4
13022	4-29	5-30	16	57.0	5.7	--
13018	5-3	5-31	15	57.5	5.6	--
12517	5-1	5-31	16	59.0	5.4	15.7
12875	5-2	6-5	16	58.0	5.2	12.1
12804	5-2	5-31	15	56.0	5.1	10.9
12715	5-3	6-5	15	57.5	4.4	10.2
11673	5-1	5-31	15	57.0	4.3	11.1
1442	5-4	6-5	16	58.0	4.3	7.2
13021	5-4	6-2	14	58.0	4.1	--
13024	5-1	5-31	14	57.5	4.1	--
12871	4-30	5-28	15	58.0	4.1	10.6
13017	5-4	6-6	15	57.0	3.8	--

Standard error of a difference = 1.89 bushels.

Woodward, Oklahoma
Four plots

C. I. No.	Date Headed	Date Ripe	Plant height	Leaf injury 1/	Leaf rust 2/	Weight per bushel	Av. acre yield 1955	Av. acre yield 1954-1955
	May	June	Ins.	%	%	Lbs.	Bus.	Bus.
13003	15	22	27	43	5	60.0	32.1	25.4
13002	16	23	26	35	9	59.7	31.0	26.2
6251	15	22	28	51	5	61.0	28.3	23.3
12715	17	23	24	75	8	61.0	27.4	19.8
13021	16	22	20	31	15	59.0	26.6	--
13007	18	23	22	60	13	59.0	26.5	19.8
12517	13	20	20	55	33	61.0	26.2	22.8
11669	17	22	23	73	8	60.0	25.6	19.9
13022	18	23	25	85	6	60.0	25.4	--
12804	16	22	21	65	T	60.0	25.4	19.7
13112	15	22	19	48	2	58.0	25.3	--
12875	18	23	27	79	15	61.0	25.3	20.3
12702Bl.	14	20	22	64	6	61.0	25.0	21.0
12873	17	23	22	76	1	60.0	24.9	19.2
13015	14	21	20	35	18	59.0	24.9	--
1442	18	23	27	48	5	58.0	24.8	18.6
11673	17	22	24	73	4	60.0	24.7	19.7
13024	16	23	24	60	6	59.0	24.4	--
13017	17	23	23	53	13	59.0	24.3	--
13018	19	23	25	81	T	60.0	23.9	--
12719	13	21	21	44	11	60.0	23.9	--
12702W.	13	20	22	65	6	60.0	23.6	20.1
12871	14	21	22	58	2	62.0	23.5	20.0
13023	16	22	16	66	9	60.0	23.1	--
13019	21	23	25	88	T	60.0	20.0	--
8856	9	14	21	60	14	60.0	19.9	16.5

1/ Percent of leaves killed by late March freezes.

2/ Average of 2 replications.

Standard error of a difference = 2.36 bushels.

Manhattan, Kansas
Two plots

C. I. No.	Date headed	Plant height	Diseases				Hessian fly 3/	Weight per bushel	Av. acre yield	
			Loose smut 1/	Bunt 2/	Leaf rust 2/	Stem rust 2/			1955	1954-1955
	May	Ins.	No.	%	%	%	%	Lbs.	Bus.	Bus.
13002	11	29	2	40	10	60	77	61.5	46.1	45.0
13003	11	31	3	70	T	60	100	60.5	45.3	41.7
12715	8	26	0	40	10	70	40	60.4	39.3	41.2
12517	8	23	0	5	T	50	52	62.0	37.9	43.9
12719	6	26	0	60	40	60	38	62.7	37.5	--
13021	9	23	0	T	10	50	32	61.0	37.3	--
8856	4	26	1	45	30	40	34	60.2	36.8	37.8
1442	13	30	2	55	10	60	100	60.6	36.8	37.8
13024	8	25	0	10	20	40	100	61.7	36.7	--
12702W.	7	25	1	50	T	40	24	61.5	36.5	44.1
11673	8	24	3	0	20	40	100	61.0	35.7	41.6
13018	9	25	0	50	T	60	0	61.1	35.7	--
12871	6	24	1	1	T	30	4	61.9	35.4	42.1
13017	10	26	0	30	30	50	56	61.0	35.0	--
12804	8	22	0	35	T-5	40	3	60.0	33.8	39.9
13022	7	24	0	60	20	50	100	60.6	33.6	--
6251	10	29	0	45	T-5	50	7	61.2	33.5	38.0
13112	8	20	0	2	T	30	6	59.5	32.9	--
12875	7	22	4	50	20	70	0	61.5	32.6	36.9
11669	8	23	0	10	20	40	3	59.5	32.3	39.9
13023	8	22	0	60	20	50	100	63.8	31.9	--
13019	9	24	0	30	T-5	50	0	61.3	30.2	--
13015	8	22	1	0	20	60	52	59.8	28.7	--
12702B1.	6	22	0	50	T	40	--	59.8	28.0	39.8
13007	7	20	0	50	30	60	57	58.6	27.4	36.7
12873	8	20	0	1	T	30	16	59.0	23.7	36.6

1/ Number of smutted heads in 16 feet of row.

2/ Single readings in disease nursery.

3/ Greenhouse response.

Standard error of a difference = not significant.

Hays, Kansas
Four plots

C. I. No.	Date headed	Plant height	Weight per bushel
	May	Ins.	Lbs.
12719	15	23	64.5
13023	16	23	64.0
12871	14	21	63.5
12702B1.	15	23	63.0
6251	18	25	62.5
8856	12	23	62.5
12702W.	15	24	62.5
12517	16	20	62.0
12804	16	24	62.0
12875	18	24	62.0
13019	19	24	62.0
13022	16	24	62.0
11673	16	24	61.5
12873	18	24	61.5
13112	17	24	61.5
12715	19	27	61.5
13021	18	21	61.5
13015	16	21	61.5
13018	19	24	61.5
13024	17	21	61.5
11669	18	24	61.0
13002	19	27	61.0
13007	17	25	61.0
13017	19	26	61.0
1442	22	25	60.5
13003	20	26	59.5

Garden City, Kansas
Four plots

C. I. No.	Date Headed	Date Ripe	Plant height	Weight per bushel	Av. acre yield 1955	Av. acre yield 1954-1955
	May		Ins.	Lbs.	Bus.	Bus.
13022	15	6-30	28	62.1	50.4	--
13021	18	7-3	30	61.5	49.7	--
13003	20	7-4	35	60.8	48.7	29.9
12517	16	6-30	28	62.9	45.9	30.0
13002	20	7-4	34	61.2	45.0	27.6
13023	16	7-1	26	64.0	43.9	--
13112	16	7-1	27	60.8	42.5	--
11673	17	7-2	32	61.4	42.2	27.7
13024	18	7-3	32	62.0	42.2	--
13007	16	7-1	28	61.4	42.1	27.9
12702W.	16	7-1	28	63.1	42.0	25.2
8856	11	6-26	26	62.4	41.8	24.6
12804	15	6-30	28	62.2	40.9	26.5
12873	16	7-1	25	61.2	40.7	27.6
12719	14	6-29	28	63.6	40.1	--
12702Bl.	14	6-29	29	62.8	39.8	25.5
13017	17	7-2	34	62.0	39.6	--
12875	17	7-2	30	61.9	39.3	26.4
12871	14	6-29	27	63.6	39.0	24.7
13015	15	6-30	27	61.5	38.5	--
1442	21	7-5	35	60.6	38.5	25.8
6251	18	7-3	34	62.0	38.4	23.4
13019	18	7-3	32	61.6	38.0	--
11669	17	7-2	30	61.8	36.6	24.0
13018	19	7-4	32	61.6	34.8	--
12715	17	7-2	30	61.4	30.0	20.8

Standard error of a difference = 3.53 bushels.

Colby, Kansas
Four plots

C. I. No.	Date headed	Plant height	Weight per bushel	Av. acre yield	
				1955	1954-1955
	May	Ins.	Lbs.	Bus.	Bus.
12873	16	22	62.0	44.3	30.3
13021	20	24	62.5	43.1	--
12702W.	15	24	64.0	43.1	25.8
13002	20	28	62.5	41.1	27.5
13017	19	26	63.0	41.1	--
13023	15	21	65.0	40.7	--
13003	20	28	62.5	40.3	26.2
12517	17	24	63.5	40.2	23.7
13022	14	23	63.5	38.3	--
12702B1.	15	23	64.5	38.1	23.4
1442	21	27	62.0	37.5	25.6
6251	19	29	63.5	37.5	25.8
11669	16	23	63.0	37.1	26.7
13019	18	25	62.0	35.7	--
12871	15	24	64.5	35.7	21.7
12715	17	24	62.5	35.4	23.8
13024	16	24	63.5	34.3	--
12804	15	24	62.5	33.6	23.6
13018	18	24	62.5	33.2	--
13007	18	21	62.5	33.1	24.1
11673	19	24	62.5	33.1	21.4
12875	17	24	62.5	32.0	23.4
13015	18	22	63.5	29.1	--
12719	15	22	64.5	25.9	--
8856	13	20	63.0	23.4	16.7

Uniform yield nursery entry C. I. 13112 missing from table.

Standard error of a difference = 4.02 bushels.

Hesperus, Colorado
Four plots, irrigated once

C. I. No.	Date Headed	Date Ripe	Plant height	Weight per bushel	Av. acre yield
	June		Ins.	Lbs.	Bus.
13003	23	8-6	33	59.2	44.1
12517	17	7-30	32	58.7	42.6
12702Bl.	17	7-29	31	62.0	41.3
12702W.	18	7-31	32	61.2	41.0
11673	18	7-31	32	61.0	40.4
13018	19	8-1	31	60.2	40.0
12715	19	7-31	30	61.0	39.9
8856	16	7-31	33	61.3	39.4
13002	22	8-4	30	60.1	39.4
1442	23	8-2	32	61.3	39.3
13112	19	8-1	29	61.5	38.8
12804	17	7-30	30	60.7	38.7
12871	19	7-31	30	61.8	38.4
11669	17	7-30	31	59.9	37.3
6251	20	8-2	31	60.2	37.1
12875	19	8-1	30	60.8	37.1
13019	19	7-31	31	61.4	36.7
13023	17	7-29	31	61.6	36.0
13024	18	8-1	33	59.5	36.0
12719	17	7-30	32	62.1	35.9
13007	20	7-31	29	58.3	35.6
13021	20	7-29	27	59.3	34.8
13017	21	8-2	32	59.9	34.3
13015	17	7-30	29	59.4	34.2
12873	20	7-30	29	59.3	33.9
13022	17	7-30	29	60.8	32.1

Standard error of a difference = 2.70 bushels.

Lincoln, Nebraska
Five plots

C. I. No.	Date Headed	Date Ripe	Plant height	Lodging	Weight per bushel	Av. acre yield 1955	Av. acre yield 1954-1955
	May	June	Ins.	%	Lbs.	Bus.	Bus.
13022	12	24	38	50	59.4	64.1	--
13023	12	25	35	42	59.9	61.2	--
12871	11	23	37	67	62.6	55.4	50.9
12804	14	25	37	30	60.1	53.6	50.2
13015	14	24	36	62	58.8	53.3	--
12517	15	25	38	60	60.9	53.2	50.6
12873	15	25	36	63	58.9	53.0	52.4
11673	15	25	40	67	60.1	52.8	46.3
8856	8	23	38	65	60.7	52.8	48.5
12702W.	11	25	40	82	58.5	52.7	49.0
13007	13	25	37	33	58.7	52.7	48.7
13002	19	30	44	66	59.9	52.3	42.7
13019	14	25	39	50	60.3	52.0	--
13112	16	25	35	59	58.2	51.8	--
13018	15	25	38	53	60.9	51.4	--
12702B1.	12	24	40	82	58.4	51.1	50.7
11669	15	25	37	50	59.3	50.8	47.4
12719	12	25	40	40	62.3	50.0	--
13024	15	26	41	63	62.4	49.9	--
12875	14	25	41	44	59.5	49.7	46.0
13003	20	30	43	72	58.9	48.5	40.6
6251	16	27	40	68	60.1	48.2	43.5
13021	17	25	38	63	56.9	47.3	--
13017	16	26	41	49	59.7	47.3	--
12715	16	26	39	35	59.6	47.2	44.6
1442	21	30	41	76	58.3	41.1	34.4

Standard error of a difference = 3.26 bushels.

North Platte, Nebraska
Three plots

C. I. No.	Date Headed	Date Ripe	Plant height	Weight per bushel	Av. acre yield 1955	Av. acre yield 1954-1955
	May	July	Ins.	Lbs.	Bus.	Bus.
1442	26	8	29	60.2	43.5	33.3
13024	21	1	25	61.4	39.5	--
12873	23	1	18	61.6	37.5	32.4
13003	26	10	26	59.3	36.6	24.8
12517	22	1	23	61.0	34.3	28.6
11673	23	1	21	59.2	33.2	27.2
13017	22	1	25	61.2	33.1	--
13002	27	10	26	59.8	32.7	24.9
6251	23	2	27	60.7	31.3	23.6
13021	25	4	22	59.3	30.6	--
13112	23	1	21	60.5	30.5	--
13023	20	6-30	17	60.5	29.6	--
12804	22	1	20	61.3	28.9	24.9
13022	21	1	18	60.0	28.3	--
11669	22	6-30	20	60.0	28.1	27.6
8856	19	6-30	18	61.0	27.0	22.4
12871	22	1	19	61.5	26.7	25.1
12702W.	22	1	21	60.0	24.8	22.0
12702B1.	22	1	19	59.5	24.8	22.6
12715	23	2	18	59.5	24.3	24.8
12875	23	2	19	61.0	24.2	23.0
13007	23	1	17	59.0	24.0	23.7
13015	24	2	19	60.0	22.8	--
13018	22	2	18	59.5	21.8	--
12719	23	2	18	60.5	21.8	--
13019	22	2	19	59.5	21.6	--

Standard error of a difference = not significant.

Alliance, Nebraska
Three plots

C. I. No.	Weight per bushel	Av. acre yield
	Lbs.	Bus.
13112	58.4	35.5
12715	58.4	31.2
12804	58.5	31.1
12873	59.5	30.2
12702B1.	60.0	29.1
12517	56.1	28.5
13002	58.0	28.5
13017	56.1	28.4
13007	57.9	27.8
13022	59.0	27.1
12719	61.5	27.1
13015	59.1	27.0
13003	55.5	26.1
13021	57.5	26.0
13019	58.5	25.5
6251	59.0	25.3
13024	57.5	25.2
13018	58.0	24.7
12871	61.5	24.4
11669	58.5	24.3
12875	58.3	24.3
1442	56.5	24.2
12702W.	59.0	24.2
13023	58.5	23.5
8856	60.0	23.2
11673	56.4	22.3

Standard error of a difference = not significant.

Ames, Iowa
Three plots

C. I. No.	Date Headed	Date Ripe	Plant height	Lodging	Mildew	Leaf rust	Weight per bushel	Av. acre yield 1955	Av. acre yield 1954-1955
	May		Ins.	%		%	Lbs.	Bus.	Bus.
12719	21	7-1	45	65	S	80	63.2	64.3	--
12871	21	6-30	46	50	MS	5	63.5	61.1	41.8
13019	22	7-2	42	58	MS	5	61.5	58.8	--
13023	22	6-30	42	73	MR	20	62.8	56.9	--
12873	22	6-30	43	70	MS	5	60.1	56.1	38.8
13018	22	7-1	44	58	MS	5	61.0	55.8	--
13007	24	6-30	41	67	S	75	61.2	55.1	36.1
12804	22	7-1	42	73	MS	5	61.5	54.5	39.6
13112	23	7-1	42	63	S	50	61.2	52.9	--
8856	19	6-30	46	58	S	80	62.9	52.4	36.7
12517	22	6-30	43	77	MS	15	61.4	52.1	40.1
13024	23	6-29	44	55	HS	55	61.7	51.5	---
13022	21	6-30	43	85	HR	20	60.6	49.5	--
11669	23	7-1	43	58	S	65	60.5	49.2	32.3
13015	22	6-30	43	75	MS	75	60.1	48.7	--
12875	22	7-1	42	72	S	90	59.6	47.5	34.6
12702W.	21	6-29	44	73	MS	5	61.6	47.2	34.8
6251	24	7-3	42	75	HS	75	61.2	46.5	29.3
12715	25	7-2	41	67	S	85	58.9	45.5	28.0
12702B1.	21	6-30	44	65	S	5	61.7	45.3	36.4
13002	30	7-4	40	67	S	30	57.8	44.4	28.4
13021	25	6-30	40	80	S	70	57.2	41.3	--
13003	30	7-5	42	65	MS	40	55.5	41.3	25.2
11673	22	7-1	42	58	S	65	58.0	40.9	28.7
13017	24	7-1	42	74	S	75	59.2	38.8	--
1442	29	7-4	41	88	S	70	55.1	35.7	22.1

Standard error of a difference = 6.07 bushels.

STANDARD ERRORS

A summary of standard errors together with the number of plots and number of varieties grown at each station is presented in table 14. Methods of computing the various error terms are described in connection with the plot tests.

SUMMARY OF NURSERY YIELDS

Yields of grain for strains in the Uniform Yield Nursery at the 14 reporting stations have been assembled in table 15. Varieties are listed in decreasing order of their 14-station averages. Varieties also have been ranked according to their state averages. The overall performance of a variety throughout the region quickly becomes evident. The awned isogenic line of Kanred x Clarkan (C. I. 13002) ranked first in the region this year while the beardless line, C. I. 13003 ranked third. Concho was in second place. The performance of C. I. 13002 was outstanding in Texas, Oklahoma, and Kansas where it ranked no poorer than second. C. I. 13003 was equally outstanding in New Mexico, Oklahoma, Kansas, and Colorado. The superior regional yield records of these strains can be attributed to their performance in these states where drought was the major factor limiting yields. Concho, on the other hand, demonstrated its wide adaptation by a somewhat more consistent performance throughout the region. It ranked fourth or higher in Texas, Kansas, Colorado, and Nebraska, and not lower than twelfth in any state. No association of maturity and yield is evident in the performance of varieties this year. Represented among the top four varieties in the region this year are late maturing C. I. 13002 and 13003, Concho which is moderately early, and C. I. 13023, an early maturing strain.

Two-year average yields are summarized in table 16. Since 1954 Concho has had the best performance in the uniform yield nursery. Its rank based on the 1954-55 crop years is first, third, third, second, and second in Texas, Oklahoma, Kansas, Nebraska, and Iowa, respectively. The excellent performance of C. I. 12873 in Kansas, Nebraska, and Iowa since 1954 puts it in second place on a regional basis.

SUMMARY OF AGRONOMIC DATA

Agronomic data other than yield are summarized in table 17. Varieties are ranked in declining order of test weight. Eleven varieties averaged 60 or more pounds per bushel this year and three varieties C. I. 12871, KanKing, and C. I. 13023 averaged 61.5 pounds or higher. Early Blackhull was the earliest maturing variety followed by C. I. 12871 and the black and white composites of C. I. 12702. C. I. 13023 was the shortest growing variety on the average and C. I. 13002 and 13003 the tallest. Lodging occurred at three stations. C. I. 13007 averaged 33 percent for slightly the lowest reading and 12702(W) was high with a 68 percent average. Good combined leaf rust and bunt resistance was shown by Concho, C. I. 12871, and C. I. 12873.

Table 14. Number of plots, average yields, and standard errors for the uniform yield nursery at the various stations in 1955.

State and Station	No. of plots	No. of varieties	Average yield all var.	Standard error of a----			Coefficient of variability
				Single plot	Difference between means	Mean	
			Bus.	Bus.	Bus.	Bus.	%
Texas							
Denton	4	26	9.36	1.94	1.37	0.97	20.71
Chillicothe	4	26	17.19	4.16	N.S.	2.08	24.19
Bushland	3	26	27.08	4.98	4.07	2.88	18.41
New Mexico							
Clovis	2	26	4.27	2.02	2.02	1.43	47.31
Oklahoma							
Stillwater	4	26	6.26	2.67	1.89	1.34	42.71
Woodward	4	26	25.21	3.34	2.36	1.67	13.23
Kansas							
Manhattan	2	26	34.61	5.24	N.S.	3.71	15.15
Garden City	4	26	35.68	5.00	3.53	2.50	14.01
Colby	4	25	36.24	5.69	4.02	2.84	15.69
Colorado							
Hesperus	4	26	37.86	3.82	2.70	1.91	10.09
Nebraska							
Lincoln	5	26	51.67	5.16	3.26	2.31	9.98
North Platte	3	26	29.29	9.61	N.S.	5.55	32.81
Alliance	3	26	26.72	4.83	N.S.	2.79	18.06
Iowa							
Ames	3	26	62.10	7.43	6.07	4.29	11.96

Table 15. Summary of the average yields in bushels per acre made by the 26 entries grown in the uniform yield nursery at 14 stations in 1955, with state averages.

Variety	C. I. No.	Texas					New Mexico		Oklahoma				Kansas					Colorado		Nebraska					Iowa		14 Station average
		Denton	Chillicothe	Bushland	Average	Rank	Clovis	Rank	Stillwater	Woodward	Average	Rank	Manhattan	Garden City	Colby	Average	Rank	Hesperus	Rank	Lincoln	North Platte	Alliance	Average	Rank	Ames	Rank	
Kanred x Clarkan	13002	12.8	19.4	35.5	22.6	1	4.1	14	9.1	31.0	20.1	1	46.1	45.0	41.1	44.1	2	39.4	9	52.3	32.7	28.5	37.8	8	44.4	21	31.5
Concho	12517	10.9	17.6	31.3	19.9	2	4.5	11	5.4	26.2	15.8	12	37.9	45.9	40.2	41.3	4	42.6	2	53.2	34.3	28.5	38.7	4	52.1	11	30.8
Kanred x Clarkan	13003	8.6	16.6	29.4	18.2	10	6.2	2	6.4	32.1	19.3	2	45.3	48.7	40.3	44.8	1	44.1	1	48.5	36.6	26.1	37.1	9	41.3	23	30.7
Kan.-H.P.-Tq.-Med.-Hope x Cim.	13023	11.5	20.1	26.2	19.3	4	5.4	6	6.6	23.1	14.9	20	31.9	43.9	40.7	38.8	7	36.0	18	61.2	29.6	23.5	38.1	6	56.9	4	29.8
Med.-Hope x Paw.[2]	12873	8.3	17.0	28.0	17.8	14	5.4	5	7.5	24.9	16.2	9	23.7	40.7	44.3	36.2	15	33.9	25	53.0	37.5	30.2	40.2	1	56.1	5	29.3
Med.-Hope-Paw. x Oro-Ill. 1-Com.	12804	9.4	18.2	26.8	18.1	11	5.6	4	5.1	25.4	15.3	16	33.8	40.9	33.6	36.1	16	38.7	12	53.6	28.9	31.1	37.9	7	54.5	8	29.0
Cimarron x Hope-Chey.	13022	7.8	13.9	23.9	15.2	26	4.4	12	5.7	25.4	15.6	14	33.6	50.4	38.3	40.8	5	32.1	26	64.1	28.3	27.1	39.8	2	49.5	13	28.9
12701 x Wichita	12702W.	11.0	16.2	26.8	18.0	12	4.6	10	7.9	23.6	15.8	13	36.5	42.0	43.1	40.5	6	41.0	4	52.7	24.8	24.2	33.9	22	47.2	17	28.7
Pawnee x Nebred	13021	10.9	21.6	23.7	18.7	7	3.5	20	4.1	26.6	15.4	15	37.3	49.7	43.1	43.4	3	34.8	22	47.3	30.6	26.0	34.6	17	41.3	22	28.6
Ea. Blkh.-Tq. x Oro-Med.-Hope	12871	10.2	17.8	24.8	17.6	16	3.8	17	4.1	23.5	13.8	25	35.4	39.0	35.7	36.7	13	38.4	13	55.4	26.7	24.4	35.5	13	61.1	2	28.6
Cim.-Hope-Chey. x Com.	13024	6.5	15.9	29.7	17.4	18	2.8	24	4.1	24.4	14.3	22	36.7	42.2	34.3	37.7	9	36.0	19	49.9	39.5	25.2	38.2	5	51.5	12	28.5
Pawnee x Cheyenne	13007	8.5	16.5	33.0	19.3	5	4.6	9	8.7	26.5	17.6	3	27.4	42.1	33.1	34.2	24	35.6	21	52.7	24.0	27.8	34.8	16	55.1	7	28.3
12701 x Wichita	12702Bl.	10.3	19.0	29.5	19.6	3	3.8	18	8.9	25.0	17.0	5	28.0	39.8	38.1	35.3	18	41.3	3	51.1	24.8	29.1	35.0	14	45.3	20	28.1
Kanking	12719	9.1	18.6	23.6	17.1	20	5.2	7	9.8	23.9	16.9	6	37.5	40.1	25.9	34.5	23	35.9	20	50.0	21.8	27.1	33.0	24	64.3	1	28.1
Comanche	11673	7.2	18.6	29.8	18.5	8	4.8	8	4.3	24.7	14.5	21	35.7	42.2	33.1	37.0	12	40.4	5	52.8	33.2	22.3	36.1	12	40.9	24	27.9
Blackhull	6251	11.2	13.0	31.1	18.4	9	2.3	26	5.8	28.3	17.1	4	33.5	38.4	37.5	36.5	14	37.1	15	48.2	31.3	25.3	34.9	15	46.5	18	27.8
Pawnee x Cheyenne	13017	7.7	19.2	26.4	17.8	15	7.1	1	3.8	24.3	14.1	23	35.0	39.6	41.1	38.6	8	34.3	23	47.3	33.1	28.4	36.3	10	38.8	25	27.6
Kharkof	1442	9.7	10.4	31.2	17.1	19	5.7	3	4.3	24.8	14.6	19	36.8	38.5	37.5	37.6	11	39.3	10	41.1	43.5	24.2	36.3	11	35.7	26	27.3
Ponca x Cheyenne	13018	10.1	19.8	21.0	17.0	21	3.0	22	5.6	23.9	14.8	18	35.7	34.8	33.2	34.6	22	40.0	6	51.4	21.8	24.7	32.6	26	55.8	6	27.2
Pawnee	11669	9.0	21.5	16.8	15.8	23	3.8	16	7.2	25.6	16.4	8	32.3	36.6	37.1	35.3	17	37.3	14	50.8	28.1	24.3	34.4	19	49.2	14	27.1
Early Blackhull	8856	8.5	14.6	27.2	16.8	22	2.9	23	6.0	19.9	13.0	26	36.8	41.8	23.4	34.0	25	39.4	8	52.8	27.0	23.2	34.3	20	52.4	10	26.9
Ponca x Cheyenne	13019	8.3	17.6	20.0	15.3	24	3.6	19	7.6	20.0	13.8	24	30.2	38.0	35.7	34.6	21	36.7	17	52.0	21.6	25.5	33.0	23	58.8	3	26.8
Med.-Hope x Paw.[3]	13112	11.9	15.5	26.0	17.8	13	3.4	21	8.0	25.3	16.7	7	32.9	42.5	--	37.7	10	38.8	11	51.8	30.5	35.5	39.3	3	52.9	9	26.8
Pawnee x Cheyenne	12715	7.1	15.0	23.8	15.3	25	4.1	13	4.4	27.4	15.9	11	39.3	30.0	35.4	34.9	19	39.9	7	47.2	24.3	31.2	34.2	21	45.5	19	26.8
Pawnee x Nebred	13015	9.3	16.0	31.4	18.9	6	2.6	25	7.4	24.9	16.2	10	28.7	38.5	29.1	32.1	26	34.2	24	53.3	22.8	27.0	34.4	18	48.7	15	26.7
Pawnee x Cheyenne	12875	7.9	17.4	27.2	17.5	17	3.9	15	5.2	25.3	15.3	17	32.6	39.3	32.0	34.6	20	37.1	16	49.7	24.2	24.3	32.7	25	47.5	16	26.7

Table 16. Summary of two-year average yields in bushels per acre for 16 varieties grown in the uniform yield nursery at 11 stations in 1954 and 1955.

Variety	C. I. No.	Texas					Oklahoma				Kansas					Nebraska				Iowa		11 Station average
		Denton	Chillicothe	Bushland	Average	Rank	Stillwater	Woodward	Average	Rank	Manhattan	Garden City	Colby	Average	Rank	Lincoln	North Platte	Average	Rank	Ames	Rank	
Concho	12517	22.2	26.0	33.2	27.1	1	15.7	22.8	19.3	3	43.9	30.0	23.7	32.5	3	50.6	28.6	39.6	2	40.1	2	30.6
Med.-Hope x Paw.[2]	12873	18.2	20.6	30.7	23.2	11	12.8	19.2	16.0	10	36.6	27.6	30.3	31.5	5	52.4	32.4	42.4	1	38.8	4	29.1
Kanred x Clarkan	13002	23.2	25.0	29.5	25.9	2	17.5	26.2	21.9	1	45.0	27.6	27.5	33.4	1	42.7	24.9	33.8	14	28.4	13	28.9
12701 x Wichita	12702W.	24.5	21.3	30.2	25.3	3	15.0	20.1	17.6	6	44.1	25.2	25.8	31.7	4	49.0	22.0	35.5	10	34.8	8	28.4
12701 x Wichita	12702Bl.	23.0	22.8	29.7	25.1	4	15.3	21.0	18.2	5	39.8	25.5	23.4	29.6	11	50.7	22.6	36.7	7	36.4	6	28.2
Ea. Blkh.-Tq. x Oro-Med.-Hope	12871	23.0	19.4	28.7	23.7	8	10.6	20.0	15.3	13	42.1	24.7	21.7	29.5	12	50.9	25.1	38.0	3	41.8	1	28.0
Med.-Hope-Paw. x Oro-Ill. 1-Com.	12804	19.0	22.7	28.7	23.5	9	10.9	19.7	15.3	12	39.9	26.5	23.6	30.0	8	50.2	24.9	37.6	4	39.6	3	27.8
Kanred x Clarkan	13003	23.3	23.3	27.5	24.7	5	16.1	25.4	20.8	2	41.7	29.9	26.2	32.6	2	40.6	24.8	32.7	16	25.2	15	27.6
Pawnee x Cheyenne	13007	20.2	19.6	31.6	23.8	7	12.7	19.8	16.3	8	36.7	27.9	24.1	29.6	10	48.7	23.7	36.2	8	36.1	7	27.4
Pawnee	11669	17.6	22.5	24.8	22.0	13	13.1	19.9	16.5	7	39.9	24.0	26.7	30.2	7	47.4	27.6	37.5	5	32.3	10	27.0
Comanche	11673	21.3	20.2	27.2	22.9	12	11.1	19.7	15.4	11	41.6	27.7	21.4	30.2	6	46.3	27.2	36.8	6	28.7	12	26.6
Blackhull	6251	25.7	19.8	26.5	24.0	6	13.4	23.3	18.4	4	38.0	23.4	25.8	29.1	13	43.5	23.6	33.6	15	29.3	11	26.6
Pawnee x Cheyenne	12875	19.6	20.2	22.9	20.9	15	12.1	20.3	16.2	9	36.9	26.4	23.4	28.9	14	46.0	23.0	34.5	12	34.6	9	26.0
Pawnee x Cheyenne	12715	21.5	19.6	24.7	21.9	14	10.2	19.8	15.0	14	41.2	20.8	23.8	28.6	15	44.6	24.8	34.7	11	28.0	14	25.4
Early Blackhull	8856	20.2	15.4	24.4	20.0	16	11.1	16.5	13.8	15	37.8	24.6	16.7	26.4	16	48.5	22.4	35.5	9	36.7	5	24.9
Kharkof	1442	20.7	21.2	27.6	23.2	10	7.2	18.6	12.9	16	37.8	25.8	25.6	29.7	9	34.4	33.3	33.9	13	22.1	16	24.9

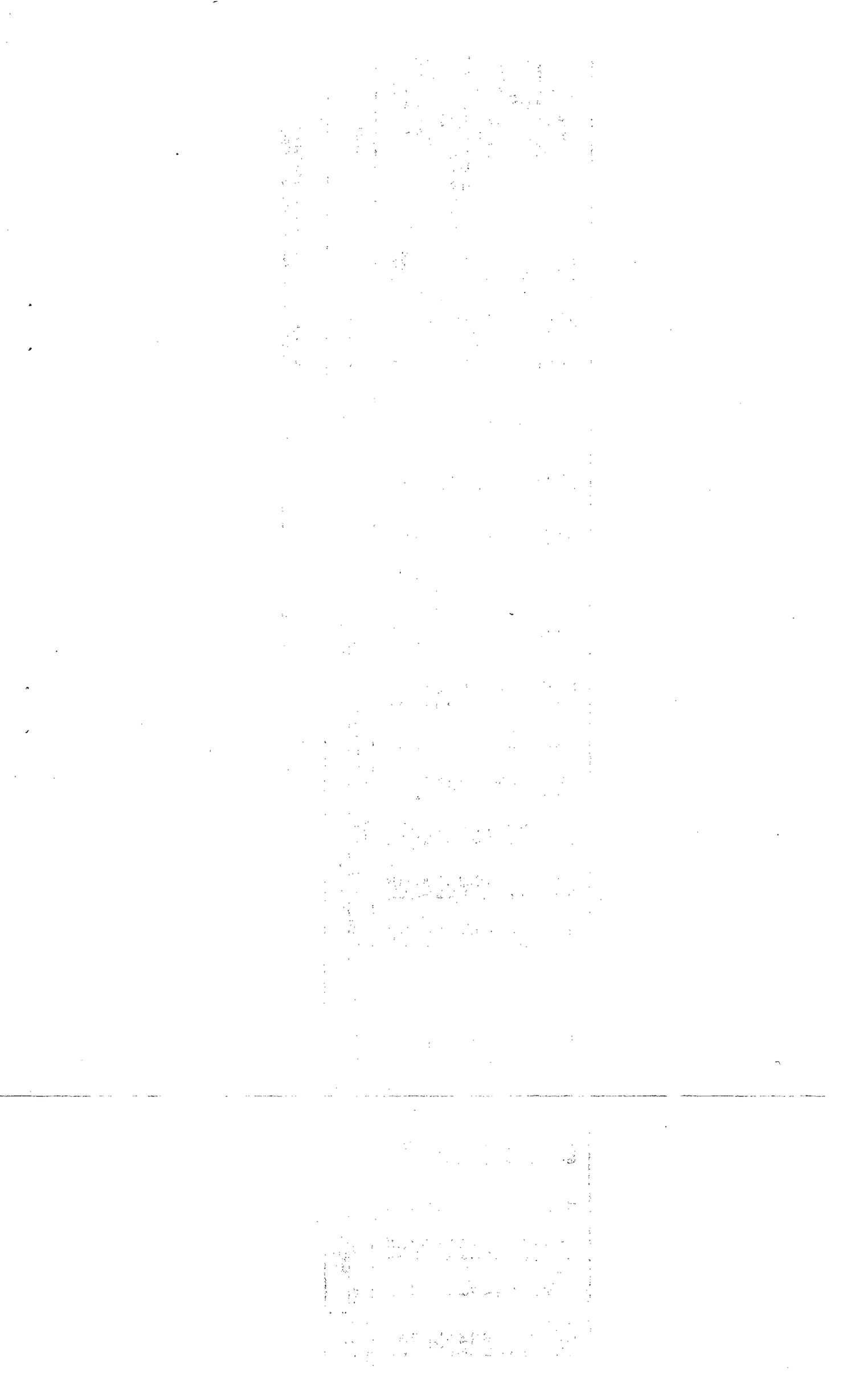

Table 17. Summary of agronomic data other than yield for varieties grown in the uniform yield nursery in 1955.

Variety	C. I. No.	Date		Plant height	Lodging	Diseases		Weight per bushel
		Headed	Ripe			Leaf rust	Bunt	
		May	June	Ins.	%	%	%	Lbs.
Number of stations		14	10	13	3	4	2	15
Ea. Blkh.-Tq. x Oro-Med.-Hope	12871	12	20	25	39	14	11	61.9
Kanking	12719	14	21	26	35	48	75	61.8
Kan.-H. F.-Tq.-Med.-Hope x Cim.	13023	14	21	23	38	22	75	61.5
Blackhull	6251	17	25	28	48	28	48	60.9
12701 x Wichita	12702Bl.	13	20	25	56	8	55	60.9
Early Blackhull	8856	9	18	26	43	46	63	60.9
12701 x Wichita	12702W.	13	21	26	68	8	60	60.4
Concho	12517	15	22	26	47	17	3	60.3
Cim.-Hope-Chey. x Com.	13024	15	22	27	41	25	20	60.3
Pawnee x Cheyenne	12875	16	23	26	39	44	55	60.2
Med.-Hope-Paw. x Oro-Ill. 1-Com.	12804	14	22	25	34	9	28	60.0
Ponca x Cheyenne	13018	16	22	26	40	3	50	59.8
Cimarron x Hope-Chey.	13022	14	21	25	48	24	60	59.8
Pawnee x Cheyenne	12715	17	24	26	34	38	45	59.8
Pawnee x Nebred	13015	15	22	24	46	38	0	59.7
Ponca x Cheyenne	13019	17	23	26	43	4	18	59.7
Pawnee x Cheyenne	13017	17	24	28	41	45	20	59.6
Kanred x Clarkan	13002	19	27	29	44	25	65	59.5
Comanche	11673	16	23	27	45	26	3	59.5
Med.-Hope x Paw.^{2}	12873	16	22	24	44	7	1	59.4
Pawnee	11669	16	22	26	36	36	10	59.3
Kharkof	1442	20	27	28	55	34	28	59.1
Pawnee x Nebred	13021	17	23	24	48	34	T	58.9
Pawnee x Cheyenne	13007	16	22	24	33	45	40	58.9
Kanred x Clarkan	13003	19	27	29	46	24	75	58.7
Med.-Hope x Paw.^{3}	13112	15	23	24	41	18	2	58.6

UNIFORM WINTERHARDINESS NURSERY

Two uniform hardiness nurseries are grown in the region. The supplementary unit contains new selections submitted from all parts of the region. In 1955 this nursery was planted in a duplicate series of single rows and contained 171 entries. It was grown at Alliance, Akron, Brookings, St. Paul, Moccasin, and Dickinson. Differential survival was observed at Brookings, Moccasin, and St. Paul. No killing occurred at Akron and Alliance, while at Dickinson none of the entries survived the winter. Data from the three stations at which differential survival occurred were summarized and distributed before harvest to breeders who had submitted strains for testing.

The "uniform" replicated nursery was grown at Alliance, Ames, Brookings, Waseca, St. Paul, Laramie, Sheridan, Dickinson, Havre, and Lethbridge, Alberta. This was a rod-row yield nursery at all except the Minnesota stations where only observation rows were grown. Differential survival occurred at five stations. These are summarized in table 18. Varieties are listed in decreasing order of average survival. Correlation of survival between stations does not appear very high. Yogo, M. C. Kharkof, and Minter have the best 5-station averages.

Yields of entries in the uniform winterhardiness nursery from seven reporting stations are assembled in table 19. Cheyenne x Hope-Turkey (N. 494738), for which the lowest average survival was recorded, had the highest 7-station average yield. However, this was influenced greatly by its unusually high yield at Ames, Iowa, where no winterkilling occurred. Yogo and C. I. 12711 ranked second and third in yield, respectively. Bushel weights for entries in the uniform winterhardiness nursery are summarized in table 20. Weights generally below 60 pounds were recorded at Alliance, Laramie, and Sheridan. Havre and Lethbridge recorded high test weights--particularly at the latter station where 2 varieties weighed 67 pounds and none were lower than 61.5 pounds. On the average at 7 locations an equal number of varieties fell above and below the 60-pound standard.

In table 21 dates of heading and ripening are summarized. Comparison of these data with survival and yield data presented in tables 18 and 19 indicate rather clearly that the later maturing varieties generally survived better and were more productive than the early maturing strains in the nursery. C. I. 12711 seems to be an exception since it survived well, is early maturing, and was third high in yield.

Plant height and rust data are given in table 22. Later maturing varieties were generally tallest. The 3-station leaf rust average shows C. I. 12806 with a low 21 percent infection. C. I. 13115, N. 494738, N. 494951, and C. I. 12806 had the lowest average stem rust readings based on Brookings and Laramie data.

Table 18. Winter survivals recorded for entries in the uniform winter hardiness nursery in 1955.

Variety	C.I. or Sel.No.	Winter survival at ----					Five-Station Ave.Survival
		Brookings	Waseca	Laramie	Sheridan	Lethbridge	
		%	%	%	%	%	%
Yogo	8033	43	73	61	81	100	72
M.C.Kharkof	6938	62	70	66	58	100	71
Minter	12138	43	83	41	83	98	70
Chey.-Chfk.xH44-Mint.^{2}	13115	56	68	55	76	95	70
Minturki	6155	77	75	24	73	98	69
Hope x Cheyenne^2	451406	11	83	51	85	98	66
Turkey x Cheyenne	12711	18	78	58	75	98	65
Mint. x Timoph.-Vulg.^{2}	12806	41	67	28	96	95	65
Chey.-Red Chief x Paw.-Mqo.-Oro	13008	41	78	50	66	80	63
Hope-Turkey x Chey.	494951	20	73	38	85	95	62
Nebred	10094	30	78	15	86	98	61
Sioux	12142	18	73	36	76	100	61
Pawnee x Nebred	13015	40	73	15	91	80	60
Hope x Cheyenne^2	12717	21	80	21	75	95	58
Kharkof	1442	35	68	25	62	95	57
Hope-Turkey x Chey.	12716	20	70	26	71	95	56
Chey.-H44 x Chey.Sel.	461529	14	78	23	86	80	56
Chey. x Hope-Turkey	494738	17	73	20	93	70	55

Table 19. Yields of grain recorded for entries in the uniform winterhardiness nursery at 7 locations in 1955.

Variety	C.I. or Sel.No.	Yield in bushels per acre at ----							Seven-station average
		Alliance	Ames	Brookings	Laramie	Sheridan	Havre	Lethbridge	
Chey. x Hope-Turkey	494738	27.9	80.9	9.8	24.4	26.0	44.6	20.5	33.4
Yogo	8033	23.6	46.2	19.5	36.9	22.8	46.9	30.6	32.4
Turkey x Cheyenne	12711	30.5	48.8	8.9	30.2	28.4	43.7	27.2	31.1
Minturki	6155	22.8	46.2	23.9	29.4	20.8	46.5	27.1	31.0
Chey.R.Ch. x Paw.-Mqo.-Oro.	13008	28.1	59.2	14.7	31.3	20.9	38.0	25.1	31.0
Minter	12138	25.6	49.8	20.9	31.3	22.0	41.2	25.7	30.9
Hope x Cheyenne^2	12717	31.8	66.7	11.4	14.2	25.3	37.0	25.5	30.3
Chey-Chfk. x H44-Mint.^{2}	13115	24.4	49.9	18.0	31.0	23.5	38.3	27.3	30.3
Hope x Cheyenne^2	451406	25.3	51.9	8.9	26.1	24.0	43.9	24.6	29.2
Kharkof	1442	24.2	45.0	17.1	28.4	17.3	41.3	29.5	29.0
Hope-Tk. x Chey.	12716	29.6	54.5	9.6	19.1	24.5	43.5	22.3	29.0
Sioux	12142	24.2	41.7	7.8	22.2	25.9	49.6	27.9	28.5
Nebred	10094	29.2	41.3	15.0	15.0	28.8	40.5	28.4	28.3
Hope-Tk. x Chey.	494951	25.1	57.4	9.9	19.0	25.1	39.4	22.2	28.3
M.C. Kharkof	6938	23.4	32.9	20.5	30.4	16.4	32.9	29.6	26.6
Pawnee x Nebred	13015	27.0	47.0	13.1	5.9	26.6	40.8	22.1	26.1
Mint. x Timoph.-Vulg.^{2}	12806	14.5	37.7	10.9	30.1	17.3	40.5	25.6	25.2
Chey.-H44-x Chey.Sel.	461529	21.0	38.2	8.6	25.5	21.4	34.7	21.8	24.5
L. S. D. (.05)	--	7.6	20.5	8.3	18.4	8.9	8.4	4.9	--

Table 20. Bushel weights for entries in the uniform winterhardiness nursery at 7 locations in 1955.

Variety	C.I. or Sel.No.	Weight per bushel in pounds at ----							Seven-station average
		Alliance	Ames	Brookings	Laramie	Sheridan	Havre	Lethbridge *	
Hope-Tk. x Chey.	494951	59.5	61.1	60.7	59.3	59	62	66.0	61.1
Turkey x Chey.	12711	58.2	61.4	59.2	59.0	60	62	67.0	61.0
Hope x Chey.^{2}	12717	57.6	61.1	61.1	59.0	59	62	66.0	60.8
Chey.-R.Ch. x Paw.-Mqo.-Oro	13008	58.2	61.0	60.5	58.3	59	63	65.5	60.8
Minter	12138	57.0	61.4	60.0	59.3	58	62	66.5	60.6
Pawnee x Nebred	13015	59.1	59.3	61.0	58.5	60	61	64.0	60.4
Chey. x Hope - Tk.	494738	57.0	61.6	60.0	58.5	58	62	65.0	60.3
Hope-Tk. x Chey.	12716	58.5	62.2	59.5	57.0	59	61	63.5	60.1
Nebred	10094	58.6	59.0	60.7	59.0	59	62	61.5	60.0
Mint. x Timoph. - Vulg.^{2}	12806	59.5	59.8	57.9	56.5	58	62	66.0	60.0
Kharkof	1442	56.5	57.0	58.4	59.0	56	63	67.0	59.6
Chey.-Chfk. x H44 - Mint.^{2}	13115	58.5	59.3	58.0	57.5	59	61	64.0	59.6
Yogo	8033	56.0	57.6	59.0	58.6	58	61	66.5	59.5
Sioux	12142	55.2	58.9	58.5	59.0	58	60	65.0	59.2
Minturki	6155	55.5	58.0	59.0	58.3	57	61	65.0	59.1
Chey. - H44 x Chey. Sel.	461529	57.0	57.0	60.0	57.5	56	61	64.5	59.0
Hope x Chey.^{2}	451406	56.0	58.0	58.7	56.6	58	60	65.0	58.9
M.C. Kharkof	6938	55.0	57.0	56.8	60.5	55	60	64.0	58.3

*Imperial bushel weights

Table 21. Date headed and date ripe for the entries in the uniform winterhardiness nursery at the various reporting stations in 1955.

Variety	C.I or Sel.No.	Date headed						Date ripe		
		Brookings	St. Paul	Sheridan	Havre	Lethbridge	5-station average	Brookings	Lethbridge	5-station average
		May	May	June	June	June	June	July	Aug.	July
Pawnee x Nebred	13015	22	24	23	14	21	8	9	3	22
Turkey x Cheyenne	12711	27	24	25	14	22	10	14	3	24
Hope x Cheyenne^2	12717	26	26	25	14	22	10	13	4	24
Hope-Turkey x Chey.	494951	27	25	24	14	22	10	13	3	24
Nebred	10094	27	28	25	15	23	11	11	5	24
Sioux	12142	29	27	26	14	23	11	13	5	25
Hope-Tk. x Chey.	12716	26	27	25	14	23	11	12	5	24
Chey.-R.Ch. x Paw.-Mqo.-Oro.	13008	28	27	24	15	22	11	12	7	25
Chey. x Hope-Turkey	494738	29	25	25	14	22	11	14	6	26
Hope x Cheyenne^2	451406	28	28	25	14	24	11	15	6	26
Chey.-Chfk. x H44 - Mint.^{2}	13115	23	30	24	15	25	11	11	5	24
Chey.-H44 x Chey. Sel.	461529	29	30	25	14	25	12	15	6	26
Kharkof	1442	30	30	26	15	25	13	12	7	25
Minturki	6155	6-1	31	26	21	26	15	12	7	25
Minter	12138	6-1	31	26	21	25	15	14	6	26
Yogo	8033	6-3	31	27	21	25	15	14	5	25
M.C. Kharkof	6938	31	6-3	29	22	27	16	13	7	26
Mint. x Timoph. - Vulg.^{2}	12806	6-3	6-6	29	23	7-2	19	16	11	29

Table 22. Plant height and rust data for the entries in the uniform winterhardiness nursery in 1955.

Variety	C.I. or Sel.No.	Plant height at ---					Leaf rust at ---				Stem rust at ---		
		Brookings	Laramie	Sheridan	Havre	4-sta. ave.	Ames	Brookings.	Laramie	3-sta. ave.	Brookings	Laramie	2-sta. ave.
		Ins.	Ins.	Ins.	Ins.	Ins.	%	%	%	%	%	%	%
Mint. x Timoph. - Vulg.^{2}	12806	42	40	41	37	40	35	10	17	21	25	13	19
M.C. Kharkof	6938	38	37	40	38	38	80	50	37	56	35	53	44
Yogo	8033	39	33	39	40	38	70	50	53	58	30	40	35
Minturki	6155	36	33	40	37	37	85	35	40	53	18	37	28
Kharkof	1442	36	31	39	36	36	70	40	33	48	30	40	35
Minter	12138	37	32	40	36	36	80	30	40	50	20	37	29
Chey.-Chfk. x H44 - Mint.^{2}	13115	39	24	40	41	36	85	10	57	51	6	23	15
Hope - Tk. x Chey.	12716	32	28	38	36	34	60	30	43	44	20	37	29
Hope x Chey.^{2}	12717	34	28	37	37	34	45	30	33	36	20	33	27
Nebred	10094	28	30	37	36	33	85	40	37	54	25	60	43
Chey. x Hope - Tk.	494738	30	31	35	37	33	80	5	47	44	12	23	18
Chey. - H44 x Chey. Sel	461529	32	30	35	36	33	75	15	50	47	25	30	28
Hope x Chey.^{2}	451406	31	29	36	36	33	75	10	53	46	15	30	23
Sioux	12142	29	27	37	36	32	85	40	53	59	40	40	40
Turkey x Chey.	12711	32	26	36	35	32	80	50	40	57	50	47	49
Chey. - R.Ch. x Paw.-Mqo.-Oro	13008	29	27	36	36	32	60	25	30	38	30	63	47
Hope - Tk. x Chey.	494951	28	25	34	38	31	70	30	43	48	15	20	18
Pawnee x Nebred	13015	27	25	33	35	30	75	10	37	41	12	53	33

UNIFORM PROTEIN NURSERY

This year was the third in which the variety-protein was conducted in the region. As in 1953 and 1954 eight varieties were grown at four locations in the southern district and at Pullman, Washington. The objective of the test has been to determine the degree to which varieties lay down differing amounts of protein in the grain. Three of the varieties, namely, Atlas 50, Atlas 66, and Taylor, are soft red winter wheats which have shown high protein content in that region. The other five entries are plains varieties.

Yield data from the 5 test locations as well as protein content of the grain grown at Pullman, Washington, are presented in table 23. It will be noted that yields of grain were abnormally low at all of the southern district locations due primarily to the drought. At Pullman, moderately high yields together with low protein content of the grain were the main characteristics of this year's data. Although the protein content of Atlas 66 and Atlas 50 was nearly one percent higher than Wichita and Comanche, the yields of these varieties were likewise somewhat lower than the yields of the latter.

Protein determinations of the grain from the southern district locations have not as yet been completed. At such time as they are the accumulated yield and protein data from the three years will be analyzed and made available to the cooperators in the region. The nursery has been discontinued for 1956.

Table 23. Yield of grain and protein content for varieties grown in the uniform protein nursery at 5 stations in 1955.[1]

Variety	C.I. or Sel. No.	Stillwater Oklahoma	Denton Texas	Chillicothe Texas	McGregor Texas	Pullman, Washington	
						Yield	Protein
		Bus.	Bus.	Bus.	Bus.	Bus.	%
Comanche	11673	7.4	12.1	11.3	13.1	46.7	8.0
Wichita	11952	7.4	10.8	11.6	7.1	41.1	8.0
Quanah	12145	4.4	11.8	8.1	17.1	45.8	8.3
Frisco	13106	5.7	15.8	7.8	14.4	30.9	10.5
29-34-275 D. Cr.	12511	7.0	10.6	9.6	17.2	40.0	8.6
Atlas 66	12561	5.2	7.8	7.3	10.2	38.9	8.9
Atlas 50	12534	4.7	8.2	8.1	11.1	36.0	9.0
Taylor	12461	7.5	12.2	6.8	14.4	37.6	8.3
Concho	12517	5.8	--	--	--	--	--
Triumph	12132	7.0	--	--	--	--	--
Alba	--	--	--	--	--	52.2	7.9
Ministre	--	--	--	--	--	57.3	8.1

Protein analyses not completed on samples from Stillwater, Okla. and the three Texas stations.

DATE FROM THE DISEASE NURSERIES

A uniform bunt nursery containing 33 strains was grown at eight locations in the region in 1955. A separate report on this test has been compiled and distributed to the cooperators and other interested persons. Excellent levels of bunt infection were obtained at all locations except Spring Hill, Montana, where seeding of clean seed was made in soil containing dwarf bunt inoculum. Several of the selections tested in recent years, particularly derivatives of C. I. 12250, have shown excellent combined resistance to the races of common bunt as well as dwarf bunt.

The uniform rust nursery data also will appear as a separate report.

DATA FROM THE QUALITY LABORATORY

Grain harvested from the uniform plots, uniform yield nursery, uniform winterhardiness nursery, and the uniform protein nursery was submitted by cooperators to the Federal Hard Winter Wheat Quality Laboratory for milling and baking evaluation. In addition, promising new strains of local interest were submitted for similar evaluation. Results of quality evaluation of the 1955 samples will be prepared and distributed by the Quality Laboratory.