Amarillo

UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF PLANT INDUSTRY

Division of Cereal Crops and Diseases

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COMPARISON OF WINTER-WHEAT VARIETIES GROWN IN COOPERATIVE PLOT AND NURSERY EXPERIMENTS IN THE HARD RED WINTER-WHEAT REGION IN 1935

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COMPARISON OF WINTER-WHEAT VARIETIES GROWN IN COOPERATIVE PLOT AND NURSERY EXPERIMENTS IN THE HARD RED WINTER-WHEAT REGION IN 1935

by

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Contents

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EXPERIMENTS IN 1935

The fifth year of the cooperative winter-wheat improvement program was completed with the crop of 1935. The program was continued along the same general lines as outlined in previous reports. Some changes were made in the lists of uniform varieties grown in both plot and nursery experiments. In addition, changes are constantly being made in the lists of varieties being grown in the plot tests at the various stations.

The cooperating agencies, stations, and personnel concerned in these experiments are as follows:

1/ The writer wishes to express his appreciation to Mr. C. G. Colcord, scientific aid, who calculated all the probable errors.

COOPERATING AGENCIES, STATIONS, AND PERSONNEL

(The asterisk (*) indicates Government field stations)

BUREAU OF PLANT INDUSTRY		
Division of Cereal Crops and Diseases		M. A. McCall
Wheat Investigations		S. C. Salmon
Hard Red Winter Wheat		K. S. Quisenberry
Smut		H. A. Rodenhiser
Leaf Rust		C. O. Johnston
Milling and Baking		C. C. Fifield
TEXAS AGRICULTURAL EXPERIMENT STATION		
Agronomy (Corn and Small Grains)		P. C. Mangelsdorf
Denton	Substation No. 6	I. M. Atkins
Amarillo	Price Memorial College	I. M. Atkins
OKLAHOMA AGRICULTURAL EXPERIMENT STATION		
Field Crops and Soils		H. F. Murphy
*Lawton	U. S. Dry Land Field Station[1/]	W. M. Osborn
Stillwater	A. and M. College	C. B. Cross
Helena		C. B. Cross
*Woodward	Southern Great Plains Field Station[1/]	V. C. Hubbard
Goodwell	Panhandle Agri. Expt. Station	H. A. Daniels
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Agronomy		R. I. Throckmorton
Manhattan	Kansas State College	John H. Parker
		H. H. Laude
Hays	Ft. Hays Branch Experiment Station	A. F. Swanson
Colby	Colby Branch Station	E. H. Coles
COLORADO AGRICULTURAL EXPERIMENT STATION		
Agronomy		Alvin Kezer
*Akron	U. S. Dry Land Field Station[1/]	J. J. Curtis
Fort Collins	State Agricultural College	D. W. Robertson
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Agronomy (Experimental)		T. A. Kiesselbach
Lincoln	Agr. Expt. Station	C. A. Suneson
North Platte	North Platte Substation[1/]	L. L. Zook
Alliance	Box Butte Experiment Farm	C. A. Suneson
Valentine	Valentine Substation	E. M. Brouse
WYOMING AGRICULTURAL EXPERIMENT STATION		
Archer	Cheyenne Experiment Farm[1/]	A. L. Nelson
*Sheridan	U. S. Dry Land Field Station[1/]	R. S. Towle
MINNESOTA AGRICULTURAL EXPERIMENT STATION		
Agronomy and Plant Genetics		H. K. Hayes
		E. R. Ausemus
Waseca	Southeast Experiment Station	R. E. Hodgson
SOUTH DAKOTA AGRICULTURAL EXPERIMENT STATION		
Agronomy		A. N. Hume
*Redfield	United States Field Station[1/]	E. S. McFadden
NORTH DAKOTA AGRICULTURAL EXPERIMENT STATION		
Agronomy		T. E. Stoa
Dickinson	Dickinson Substation	R. W. Smith
MONTANA AGRICULTURAL EXPERIMENT STATION		
Agronomy		Clyde McKee
Bozeman	Montana Experiment Station	L. P. Reitz
Moccasin	Judith Basin Branch Station	J. L. Sutherland
Havre	Northern Montana Branch Station	M. A. Bell

1/ Cooperation with either Division of Dry Land Agriculture or Division of Forage Crops and Diseases, both of the Bureau of Plant Industry, as well as with the State experiment stations.

UNIFORM VARIETIES IN PLOTS

Because of the wide variation in environment encountered in the region from Texas to Montana, it has not seemed advisable to grow the same 10 varieties at all stations. The region has therefore been divided into three districts, as shown by the map on the following page, and different lists of varieties are grown uniformly at the experiment stations in each of these three districts. No changes were made in the uniform varieties grown, thus the lists remain the same as in 1934.

The uniform varieties in each district for 1935 were as follows:

Southern		Central		Northern	
Variety	C.I.No.	Variety	C.I.No.	Variety	C.I.No.
Hard Red:		Hard Red:		Hard Red:	
Kharkof	1442	Kharkof	1442	Kharkof	1442
Turkey sel.	10016	Turkey sel.	10016	Turkey sel.	10016
Nebraska No. 60	6250	Nebraska No. 60	6250	Nebraska No. 60	6250
Tenmarq	6936	Tenmarq	6936	Minturki	6155
Blackhull	6251	Blackhull	6251	Minhardi x Minturki	8034
Quivira	8886	Quivira	8886	Do	8215
Early Blackhull	8856	Minturki	6155	Yogo	8033
Soft Red:		Oro	8220	Minard x Minhardi	8889
Fulcaster	6471	Cheyenne	8885	Karmont	6700
Harvest Queen	6199	Kanred	5146		
Denton	8265				
Kawvale	8180				

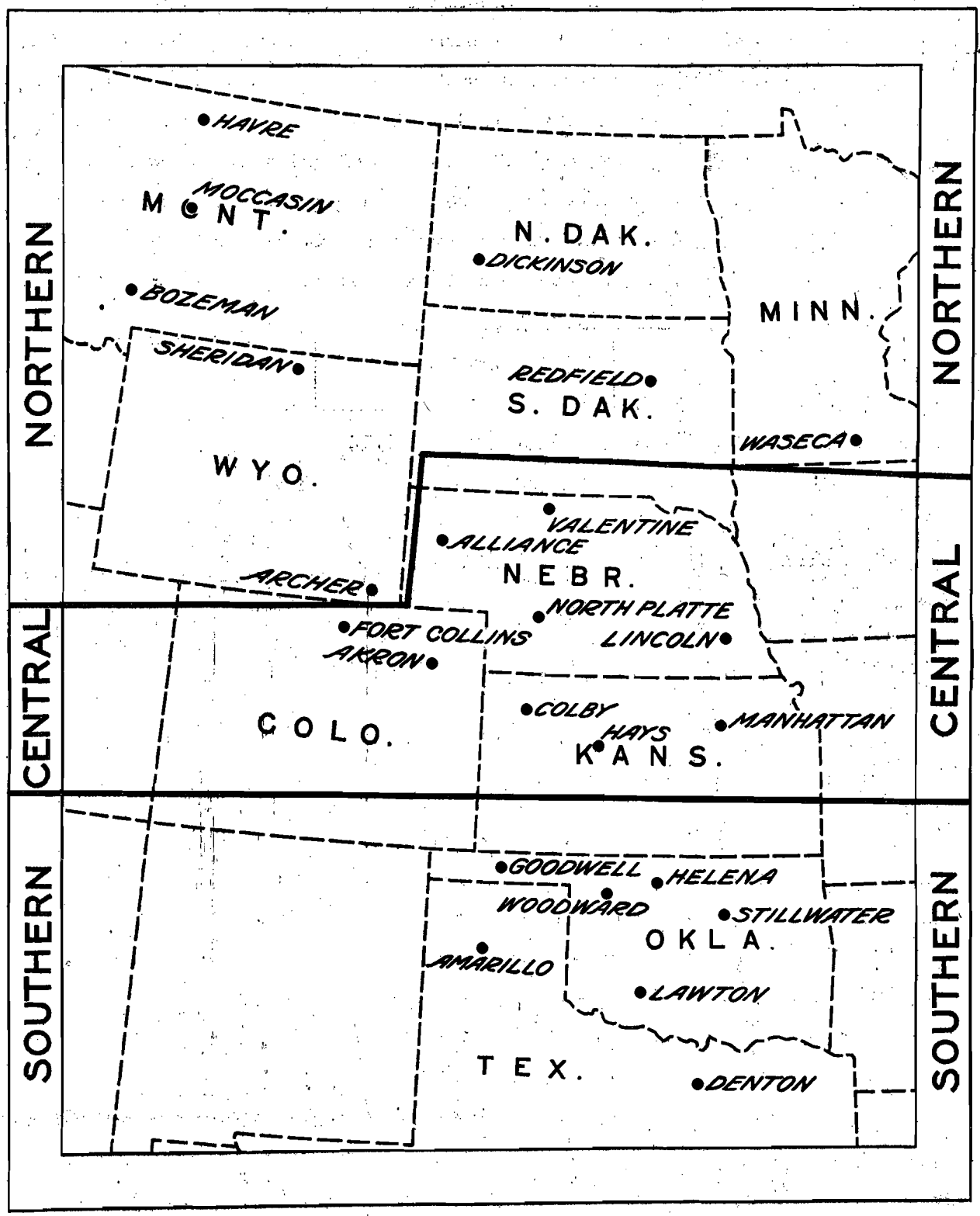
The lists include the most widely grown commercial varieties of the region (considering Kharkof as representing the Turkey type) and some of the more promising new varieties and strains available for plot tests.

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

PLOT DATA

In the fall of 1934, plots were seeded at 21 experiment stations, the cooperative work having been discontinued at Archer, Wyo., and Redfield, S. Dak. Owing chiefly to drought in the fall and early spring, no data were obtained at Amarillo, Texas, Woodward, Okla., Hays and Colby, Kans., Alliance and Valentine, Nebr.

In table 1 agronomic and yield data are given for the varieties reported as grown at each of the 15 stations reporting data.


HAVRE
MOCCASIN
MONT.
N. DAK.
DICKINSON
BOZEMAN
MINN.
SHERIDAN
REDFIELD
S. DAK.
WASECA
WYO.
VALENTINE
ALLIANCE
NEBR.
ARCHER
NORTH PLATTE
FORT COLLINS
LINCOLN
AKRON
COLBY
MANHATTAN
HAYS
COLO.
KANS.
GOODWELL
HELENA
WOODWARD
STILLWATER
OKLA.
AMARILLO
LAWTON
TEX.
DENTON
NORTHERN
NORTHERN
CENTRAL
CENTRAL
SOUTHERN
SOUTHERN

The number of replications and size of plots are shown for each station. In order to keep the tables as brief as possible, data are given only for those characters that showed a contrasting reaction and that may have had an influence on yield. For each station the varieties are listed in order of yield in 1935 and, where possible, average yields are given for the 5-year period. In cases where the varieties have been grown for varying periods, a percentage of Kharkof (C. I. 1442) is shown so that comparisons may be made.

The data as presented need little explanation. The continuation of the drought caused dry seed beds at some stations. There was very little winter-killing for the most part and the spring was dry. At some of the southern stations the crop failed to head or headed so short that harvest was out of the question. Owing to these severe conditions, a very spotted growth was obtained in many of the plots. In the late spring heavy rains occurred and where the crop was not too far gone, the varieties revived and made good growth. At some stations (Woodward and Hays) second growth came up and was later ruined by hot dry winds. Stem rust was very evident at several stations, especially Denton and Lincoln. At the more northern stations dry, hot weather, during the summer stopped growth rather suddenly and undoubtedly influenced yields. Taken as a whole, it was a favorable season in which to study varieties under severe conditions.

At Denton, a sudden drop in temperature following warm weather in late January caused considerable winter-killing. For the most part, the varieties of known winter hardiness had the higher survivals. Abundant spring moisture together with thin stands caused the varieties to mature late, which in turn gave optimum conditions for the development of rust. Early Blackhull escaped the rust but all other varieties were badly infected, causing low yields of light weight wheat. For the 5-year period, Quivira and Tenmarq have the highest average yields.

The freeze of January 20-21, 1935, damaged the wheat at Lawton. The spring was dry but rains in late April allowed the varieties to recover and make fairly good growth. Considerable leaf rust developed on the susceptible varieties, although the resistant varieties were fairly clean. A severe hail storm on May 28 damaged the varieties, causing the yields to be of no value, since the damage was in direct proportion to stage of maturity, the earlier varieties being most severely damaged. It should be noted that Kawvale, Quivira, and some of the early winter x spring hybrids had the highest estimated hail damage. It is felt that the yields should not be used and are omitted from all averages.

At Stillwater, yields ranged from about 20 to 34 bushels per acre. Leaf-rust infection was heavy, some of the susceptible varieties having 100 percent infection and Kawvale, a resistant variety, had an average of 27 percent. For the 5-year period, Penquite selection, Denton, and Tenmarq have the highest average yields.

Yields and test weights are the only data available from Helena. Penquite selection and Tenmarq had the highest yields in 1935. On the basis of two years' results, Penquite selection, Quivira, and Early Blackhull have a slight advantage in average yield.

At Goodwell, three replications were seeded but two were totally or partly ruined by drought, so that the yields reported are from single plots. There was some shattering, Quivira, Kawvale, Denton, and Nebraska No. 28 being most susceptible. Only traces of both leaf and stem rust were present and these data are not recorded. Turkey sel. (C. I. 10094), Kharkof (C. I. 1442), and Turkey sel. (C. I. 10016) had the highest yields. Although grown for two years only, Turkey selection (C. I. 10094) has the highest average yield expressed in percentage of Kharkof. As no data were obtained at Goodwell in 1933, a 4-year average yield is shown. On the basis of the average Kharkof (C. I. 1442), Nebraska No. 60, and Turkey 101 (Goodwell) have the highest averages.

At Manhattan, yields ranged from 15.0 for Kanred x Hard Federation (C. I. 10091) to 33.5 bushels per acre for Minturki. The very early wheats did not yield as well as usual, owing to the fact that when the drought was broken they were so far advanced as to be unable to make use of the additional moisture. The later varieties were benefited by the moisture but those susceptible were injured by both leaf and stem rust. Cheyenne was especially hard hit by stem rust. For the 5-year period at Manhattan, Kawvale, Clarkan, and Cheyenne have the highest average yield.

Very poor stands were obtained on corn land at Akron, while on fallow stands and yields were very good. Some lodging was present and leaf and stem rust were present on all varieties, especially the later ones. Test weights were low owing to rust and lack of sufficient moisture to complete the crop. Akron selection (C. I. 11660), a very stiff-strawed variety, had the highest average yield. On the 5-year average Blackhull and Early Blackhull rank highest.

The crop at Lincoln was somewhat later than usual, and lodging was noted as early as May 24 or before some varieties were headed. This lodging continued to increase until at harvest time some varieties were practically flat. Except on Early Blackhull, Minturki, and certain of the Turkey selections, stem rust was very heavy.

Kawvale, Early Blackhull, and Minturki had the highest yields. Test weights ranged from about 50 pounds per bushel for Nebraska No. 60 to 60.2 pounds per bushel for Early Blackhull. Although Cheyenne had a rather poor record this year, it still ranks first among the varieties reported grown for the 5-year period. A 4-year average is shown for some of the varieties at Lincoln. Based on this figure, Kawvale ranks first and Cheyenne second.

The yields from North Platte are from two plots, one on fallow and one on corn land. It was necessary to plow up the other two replications to make way for the storage lake of the Federal power and irrigation project. Yields were rather high; Turkey selection (C. I. 10016) ranked first, followed by local Turkey and Turkey selection (C. I. 10094). The Beloglina x Hussar strains included in replicated plots for the first time failed to rank very high in yield. These strains are of interest because of their bunt resistance. Local Turkey and Cheyenne have the highest averages for the 4-year period.

At Waseca there was very little winter-killing. Considerable lodging was reported in most varieties and stem- and leaf-rust infections were fairly high. Yields and test weights were fairly good. Turkey selection (C. I. 10016) had the highest average yield in 1935, followed by Minhardi x Marquis (C. I. 11657).

At Dickinson, winter survivals were so poor that only one plot of each variety was allowed to stand for harvest and the yields obtained were very low. Stem-rust was recorded on all varieties.

The season at Sheridan was very dry. Yields ranged from 14.7 to 27.5 bushels per acre. Cheyenne grown for the first time at this station gave the highest average yield. For the 5-year period Kanred and Montana No. 36 rank first and second.

Straw growth was heavy and lodging was bad at Bozeman. Cheyenne had the lowest lodging figure of any of the varieties. In spite of this lodging yields were high, ranging from 58.2 to 81.8 bushels per acre. Yogo, Yogo selection No. 2, and Cheyenne had the highest average yields and Turkey selection (C. I. 10016) had the lowest. For a 4-year period, Yogo and Nebraska No. 60 have the highest average yields.

There was very little winter-killing at Moccasin, but lack of moisture caused the varieties to head very short and yields were low. Newturk and Yogo had the highest yields, while several of the winter hardy hybrids were at the bottom of the list.

Yields at Havre ranged from 15.0 to 18.9 bushels per acre. There was very little winter-killing and straw was short. Newturk, Kanred, and Karmont had the highest yields in 1935. For the 4-year average Yogo and Minturki have the highest average yields.

Table 1. - Agronomic data for winter-wheat varieties grown in replicated plots in cooperative experiments at 15 experiment stations in the winter-wheat area in 1935, and average yields for 1931-35.

Denton, Texas

(Three 1/55th-acre plots; seeded Oct. 4, 1934; emerged Nov. 11.)

Variety	C. I. No.	Winter Survival (P.ct.)	Dates Headed	Dates Ripe	Hgt. (In.)	Rust Leaf (P.ct.)	Rust Stem-rust May 29 (P.ct)	Rust Stem-rust Maturity (P.ct)	Test Weight (Per bu.) (Lbs.)	Acre Yield (Bu.)	Yield Average 1931-35 (Bu.)	Yield Rank	No. years grown	Percentage of Kharkof for same years
				June										
Early Blackhull	8856	42	Apr. 29	3	36	58	3	20	55	14.1	-	-	2	97.5
Quivira	8886	67	May 3	11	36	13	7	65	50	13.1	29.8	1	5	137.3
Kanred	5146	82	May 11	14	37	75	7	60	45	8.8	25.5	4	5	117.5
Kharkof	1442	90	May 13	17	34	85	9	90	44	8.7	21.7	9	5	100.0
Clarkan	8858	68	May 12	17	37	55	55	90	50	8.6	-	-	2	118.5
Mediterranean sel.	10085	63	May 8	14	33	25	57	80	46	8.6	-	-	4	121.6
Do	11526	57	May 8	14	36	13	68	80	43	8.3	-	-	4	123.8
Mediterranean sel. 5933-38		48	May 9	13	38	6	78	90	46	8.0	-	-	4	123.2
Kawvale	8180	50	May 13	17	36	4	20	80	40	7.6	27.1	3	5	124.9
Turkey sel.	10016	78	May 9	11	34	99	8	85	46	6.9	-	-	2	85.4
Blackhull	6251	58	May 12	15	33	70	15	75	48	6.9	21.7	9	5	100.0
Tenmarq	6936	67	May 10	15	36	33	25	75	38	6.7	27.7	2	5	127.6
Nebraska No. 60	6250	83	May 14	17	33	90	32	90	46	5.0	19.1	11	5	88.0
Fulcaster	6471	40	May 12	16	39	45	48	99	42	4.9	22.1	8	5	101.8
Harvest Queen	6199	62	May 12	15	38	99	55	99	47	4.5	17.7	12	5	81.6
Mediterranean sel.	11525	47	May 11	14	41	6	85	99	44	4.5	-	-	4	119.5
Do	11587	52	May 11	14	40	4	99	99	40	3.4	-	-	2	90.8
Sutton	10053	40	May 14	17	38	38	58	99	41	3.4	24.6	6	5	113.4
Denton	8265	32	May 16	17	39	13	40	99	39	2.7	25.4	5	5	117.1
Mediterranean sel.	10086	25	May 16	17	37	48	45	99	40	2.0	22.8	7	5	105.1

Probable error of a difference, 0.5 bu.; probable error of a mean, 0.3 bu., or 4.96 percent.

SEd .174

Table 1. - (Continued)

Lawton, Okla.

(Three 1/50th-acre plots)

Variety	C. I. No.	Dates Headed	Dates Ripe	Height	Leaf Rust May 10	Leaf Rust May 24	Estimated Hail Damage	Test Weight (Per bu.)	Acre Yield 1/	Yield Average 1931-34	Yield Rank	No. years grown	Percentage of Kharkof for same years
		April	June	(In.)	(P.ct.)	(P.ct.)	(P.ct.)	(Lbs.)	(Bu.)	(Bu.)			
Ioturk	11388	29	14	27	32	90	6.7	60	13.5	23.5	12	4	91.8
Kharkof	1442	28	12	27	40	85	11.7	57	12.8	25.6	6	4	100.0
Turkey (Check)	1558	28	12	26	29	81	13.8	57	11.3	25.0	8	4	97.7
Sibley No. 62	11523	24	11	22	20	82	13.3	58	10.8	-	-	1	104.7
Nebraska No. 60	6250	29	12	26	40	87	10.0	58	10.5	23.1	14	4	90.2
Kanred	5146	24	10	22	37	85	15.0	57	10.4	26.3	4	4	102.7
Eagle Chief	8868	24	10	22	35	83	10.0	58	10.1	25.7	5	4	100.4
Blackhull	6251	19	17	22	40	83	11.7	62	10.0	25.0	8	4	97.7
Cheyenne	8885	27	11	21	40	87	5.0	58	9.5	17.7	7	4	98.0
Mediterranean sel.	11587	24	12	22	T	2	13.3	59	9.5	-	-	1	154.1
Turkey sel.	10083	23	11	21	25	73	15.0	58	9.3	-	-	1	85.9
Tenmarq	6936	20	7	20	37	40	30.0	58	9.0	26.7	3	4	104.3
Harvest Queen	6199	23	11	23	40	65	15.0	59	8.5	21.5	15	4	84.0
Kawvale	8180	20	7	21	T	7	50.0	57	8.0	28.4	1	4	110.9
Denton	8265	19	12	21	12	10	16.7	57	8.0	24.9	10	4	97.3
P1066-1 x Burbank	10087	20	7	20	8	78	30.0	59	7.8	-	-	1	135.3
Fulcaster	6471	23	9	20	20	63	25.0	58	7.8	23.8	11	4	93.0
Kanred x Marquis	11589	19	4	19	8	10	50.0	60	7.5	-	-	1	136.5
Kanred x Hard Federation	10092	16	3	17	3	18	30.0	60	7.1	-	-	3	116.4
Quivira	8886	17	5	18	8	15	45.0	60	6.9	27.7	2	4	108.2
P-1066-1 x Prelude	11590	19	4	18	3	10	40.0	60	6.6	-	-	1	149.4
Turkey sel.	10016	22	6	18	40	90	30.0	59	6.2	-	-	1	86.5
Kanred x Hard Federation	11373	16	2	16	5	15	33.3	61	6.2	-	-	3	113.9
Currell	3326	20	5	19	37	87	30.0	59	6.0	20.4	16	4	79.7
Early Blackhull	8856	10	1	17	35	-	41.7	62	5.5	23.3	13	4	91.0
Mediterranean sel.	11525	19	3	19	T	5	50.0	59	5.0	-	-	1	143.5
Kanred x Hard Federation	10091	16	2	16	3	8	50.0	60	3.3	-	-	1	155.3

1/ Owing to hail damage these yields are not used in the averages.

Table 1. - (Continued)

Stillwater, Okla.

(Five 1/131st-acre plots)

Variety	C. I. No.	Rust		Test Weight (Per bu.)	Acre Yield	Yield		No. years grown	Percentage of Kharkof for same years
		Leaf (P.ct.)	Stem (P.ct.)	(Lbs.)	(Bu.)	Average 1931-35 (Bu.)	Rank		
Kawvale	8180	27	T	56.7	34.0	29.2	10	5	99.0
Denton	8265	55	5	56.8	33.6	31.0	2	5	105.1
Clarkan	8858	81	1	57.9	31.2	-	-	1	106.8
Kanred x Hard Federation	10092	75	1	57.4	30.7	-	-	1	105.1
Kanred	5146	90	0	56.9	30.1	28.7	11	5	97.3
Sibley No. 81	10084	56	T	58.4	30.1	29.8	7	5	101.0
Tenmarq	6936	50	T	56.8	29.5	30.8	3	5	104.4
Eagle Chief	8868	85	T+	56.7	29.2	30.6	5	5	103.7
Kharkof	1442	100	T	57.0	29.2	29.5	9	5	100.0
Sibley No. 62	11523	88	T	56.9	29.2	30.7	4	5	104.1
Kanred x Hard Federation	10091	71	1	57.4	28.7	-	-	1	98.3
Fulcaster	6471	100	T+	57.5	27.3	-	-	4	96.0
Penquite sel.	11745	87	T	57.5	27.1	31.6	1	5	107.1
Turkey sel.	10083	71	T	56.7	27.0	-	-	4	104.5
Harvest Queen	6199	100	4	56.4	26.8	26.0	15	5	88.1
Quivira	8886	31	T	57.5	26.6	28.3	13	5	95.9
Cheyenne	8885	100	T	56.7	25.6	30.0	6	5	101.7
Turkey sel.	10016	81	T	56.3	25.5	-	-	2	102.1
Nebraska No. 60	6250	100	T	57.0	24.5	28.6	12	5	96.9
Turkey (Check)	1558	100	T	56.7	24.0	29.6	8	5	100.3
Early Blackhull	8856	74	0	58.2	21.2	27.9	14	5	94.6
Nittany	5962	47	1	55.3	20.0	-	-	4	92.5
"Red Cross"	-	100	T	56.6	19.8	-	-	1	67.8

Probable error of a difference, 1.7 bu.; probable error of a mean, 1.2 bu.; or 4.44 percent.

2.52

Helena, Okla.

(Four 1/131st-acre plots)

Variety	C. I. No.	Test Weight (Per bu.)	Acre Yield	Yield		No. years grown	Percentage of Kharkof for same years
		(Lbs.)	(Bu.)	Average 1934-35 (Bu.)	Rank		
Penquite sel.	11745	59.6	24.9	27.2	1	2	123.6
Tenmarq	6936	58.3	22.4	23.2	5	2	105.5
Nebraska No. 60	6250	59.2	21.8	21.9	12	2	99.5
Early Blackhull	8856	61.2	21.6	26.5	3	2	120.5
Quivira	8886	59.1	21.5	26.7	2	2	121.4
Turkey sel.	10083	58.4	21.0	23.1	6	2	105.0
Eagle Chief	8868	59.0	20.9	23.7	4	2	107.7
Cheyenne	8885	58.8	20.7	22.1	9	2	100.5
Kanred x Hard Federation	10092	59.0	19.8	-	-	1	107.0
Turkey (Checks)	1558	59.0	19.8	21.1	13	2	95.9
Kanred x Hard Federation	10091	59.4	19.4	-	-	1	104.9
Redhull	11534	59.8	18.9	22.0	10	2	100.0
Sibley No. 62	11523	57.7	18.8	18.5	17	2	84.1
Kharkof	1442	59.3	18.5	22.0	10	2	100.0
Kanred	5146	58.8	17.9	20.4	15	2	92.7
Harvest Queen	6199	59.9	17.5	21.0	14	2	95.5
Kawvale	8180	57.5	17.2	20.0	16	2	90.9
Sibley No. 81	10084	59.6	17.0	22.4	8	2	101.8
Denton	8265	58.3	16.7	22.5	7	2	102.3
Fulcaster	6471	58.8	12.2	16.2	18	2	73.6

Probable error of a difference, 1.1 bu.; probable error of a mean, 0.8 bu.; or 3.91 percent.

1.63

Table 1 - (Continued)

Goodwell, Okla.

(Three[1/] 1/50th-acre plots; seeded Oct. 25 and 26, 1934; emerged Nov. 3 and 4.)

Variety	C. I. No.	Dates Headed May	Dates Ripe June	Stand plants per sq. foot	Hgt. (In.)	Shattering kernels per sq. foot	Test Weight (Per bu.) (Lbs.)	Protein (P.ct.)	Acre Yield (Bu.)	Yield Average 1931-32 1933-35 (Bu.)	Yield Rank	No. years grown	Percentage of Kharkof for same years
Turkey sel.	10094	26	21	61.7	30	14.4	58.7	15.1	43.1	-	-	2	106.8
Kharkof	1442	26	16	48.2	34	5.8	56.9	16.1	41.3	29.3	1	4	100.0
Turkey sel.	10016	21	17	73.7	32	14.3	58.5	15.8	37.8	-	-	2	93.2
Turkey 101 (Goodwell)	-	24	16	68.3	31	1.6	56.8	16.1	35.3	28.2	3	4	96.2
Turkey (Matter sel.)	-	28	18	73.7	31	9.2	56.8	16.4	34.5	-	-	2	101.4
Blackhull	6251	21	11	59.4	35	2.0	59.4	14.8	34.5	27.3	5	4	93.2
Oro	8220	28	20	56.3	33	6.5	57.3	16.3	33.3	-	-	2	88.8
Kanred (Checks)	5146	25	15	56.4	33	7.6	56.9	16.0	32.9	27.6	4	4	94.2
Superhard	8054	24	16	70.2	36	8.8	59.4	14.8	32.9	26.6	7	4	90.8
Malakof	5663	24	14	52.0	31	20.4	54.8	16.8	32.3	25.0	12	4	85.3
Ioturk	11388	28	22	50.0	35	3.9	57.1	17.6	32.3	26.5	9	4	90.4
Nebraska No. 60	6250	29	23	65.5	35	4.1	56.7	15.8	31.6	28.6	2	4	97.6
Redhull	11534	28	17	73.4	35	13.0	57.5	15.8	31.2	26.6	7	4	90.8
Quivira	8886	21	10	47.2	34	34.2	58.5	16.6	31.2	22.7	16	4	77.5
Purkof	8381	26	15	55.0	36	9.6	55.8	16.7	31.0	25.1	10	4	85.7
Cheyenne	8885	22	16	44.9	32	3.1	57.8	16.2	30.6	27.2	6	4	92.8
Kanred x Hard Federation	10092	18	7	72.7	28	0	59.1	15.8	29.6	-	-	1	71.7
Ternarq	6936	28	15	43.8	35	20.2	57.1	15.9	29.0	25.1	10	4	85.7
Penquite sel.	11745	24	12	80.5	32	15.8	56.3	17.4	28.8	-	-	1	69.7
Mediterranean	5303	26	16	76.7	37	7.9	56.3	16.0	27.9	21.6	19	4	73.7
Sibley No. 62	11523	28	12	75.0	32	18.3	56.0	16.8	27.1	-	-	1	65.6
Kawvale	8180	18	11	44.4	35	33.2	58.8	16.0	26.1	21.0	20	4	71.7
Minturki	6155	26	18	60.3	33	6.9	54.2	17.1	25.7	24.0	13	4	81.9
Denton	8265	24	20	74.0	34	37.5	55.5	15.7	25.1	21.7	17	4	74.1
Sibley No. 81	10084	21	14	52.0	31	25.9	56.9	16.9	24.9	21.7	17	4	74.1
Fultz	3416	22	15	77.5	33	26.1	55.1	16.1	23.8	18.2	24	4	62.1
Fulcaster	6471	28	16	80.7	34	22.7	56.0	16.4	22.4	20.1	21	4	68.6
Eagle Chief	8868	28	20	55.6	37	9.0	55.6	16.1	21.4	23.4	15	4	79.9
Kanred x Hard Federation	10091	18	7	93.4	28	6.9	58.6	16.3	20.1	-	-	1	48.7
Nebraska No. 28	5147	15	6	87.5	31	34.3	57.0	16.9	19.9	18.3	23	4	62.5
Early Blackhull	8856	15	10	57.1	34	0.8	59.4	15.2	19.7	18.9	22	4	64.5
Turkey 102 (Goodwell)	-	24	15	65.5	32	5.0	56.4	16.7	19.3	23.5	14	4	80.2

1/ Data presented are from one replication only; data from the other replications not complete.

Table 1. - (Continued)

Manhattan, Kans.

(Three 1/30th-acre plots.)

Variety	C. I. No.	Stand per Acre in 1,000		Dates		Hgt.	Breaking Strength per 10 straws	Lodging	Rust		Septoria Coefficient	Test Weight (Per bu.)	Plumpness	Yellowberry	Acre Yield	Yield		No. years grown	Percentage of Kharkof for same years
		Plants in fall	Culms	Headed	Ripe				Stem	Leaf						Av. 1931-35	Rank		
				May		(In.)	(Lbs.)	(P.ct.)	(P.ct.)	(P.ct.)		(Lbs.)	(P.ct.)	(P.ct.)	(Bu.)	(Bu.)			
Minturki	6155	1180	2882	20	July 2	36	6.50	5	25	53	2-	60.8	85	25	33.5	38.4	8	5	106.4
Turkey sel.	10094	1464	3021	19	July 1	31	4.80	2	25	38	2	62.0	87	8	32.7	-	-	1	115.5
Blackhull	6251	1343	2663	18	July 2	32	5.64	7	13	40	2-	61.6	85	13	30.9	39.2	6	5	108.6
Kawvale	8180	1021	2553	12	July 1	33	5.17	0	22	10	2+	58.6	78	22	29.3	42.6	1	5	118.0
Kharkof	1442	1254	2737	20	July 2	33	5.78	8	28	33	2+	59.8	83	8	28.3	36.1	14	5	100.0
Turkey sel.	10016	1269	3902	13	June 30	27	3.98	0	15	22	2+	60.1	82	10	27.4	-	-	2	107.7
Turkey	1558	1274	2822	19	July 2	33	5.06	13	23	42	2	60.0	83	10	27.4	37.6	10	5	104.2
Tenmarq	6936	1120	2459	13	June 30	30	5.33	8	15	6	2	59.6	82	10	27.1	37.4	11	5	103.6
Kanred x Marquis	11589	945	2234	14	June 29	30	5.80	4	8	3	2	61.0	86	6	27.0	-	-	3	103.3
Do	10090	960	2458	18	June 30	31	5.82	7	13	3	2	60.0	82	5	26.9	38.1	9	5	105.5
Nebraska No. 60	6250	1457	3066	21	July 2	35	5.31	17	55	40	2-	58.2	80	13	26.8	37.3	12	5	103.3
Pulcaster	6471	901	2160	16	July 1	36	6.79	17	30	65	2-	59.4	83	62	26.5	40.1	4	5	111.1
Kanred (Av. 12 plots)	5146	979	2622	19	July 1	33	5.31	20	15	23	2.5	59.0	80	6	26.4	35.9	15	5	99.4
Clarkan	8858	916	2006	17	July 1	38	8.01	12	33	37	2	60.8	85	60	25.9	41.4	2	5	114.7
Cheyenne	8885	1095	2533	19	July 1	31	5.78	T	50	37	2	59.1	83	7	25.3	40.6	3	5	112.5
Oro	8220	1180	2771	20	July 2	34	5.55	T	42	47	2	59.2	82	5	25.2	37.0	13	5	102.5
Quivira	8886	1065	2667	11	June 29	29	4.94	13	8	T	3	60.8	82	4	25.1	39.1	7	5	108.3
Prelude x Kanred	11591	995	2463	11	June 29	30	4.98	13	6	T	2.5	61.4	80	8	25.0	-	-	2	108.1
Early Blackhull	8856	1060	3066	7	June 28	26	4.16	5	5	30	3	60.7	82	13	24.3	39.4	5	5	109.1
P1066 x Prelude	11590	1040	2394	11	June 29	28	5.12	13	6	T	3	60.9	83	7	22.9	-	-	2	102.1
Harvest Queen	6199	1075	2056	19	July 1	40	8.32	17	35	67	2	58.3	77	62	22.7	33.9	16	5	93.9
Harvest Queen sel.	11611	1175	1961	19	July 1	38	7.11	25	35	67	2	55.2	70	90	22.5	-	-	1	79.5
Do	11612	1149	2085	19	July 1	38	6.58	25	38	67	2	55.4	70	90	22.4	-	-	1	79.2
Kanred x Hard Federation	10092	1053	3584	11	June 28	23	4.06	0	22	3	4	59.7	83	10	17.9	-	-	4	94.7
Do	10091	1229	3663	8	June 28	22	3.51	0	23	4	3	59.7	85	8	15.0	-	-	4	94.1

Probable error of a difference, 0.8 bu.; probable error of a mean, 0.6 bu.; or 2.40 percent.

1.19

Table I. - (Continued)

Akron, Colo.

(Four 1/50th-acre plots; seeded Sept. 22, 1934; emerged Oct. 2.)

Variety	C. I. No.	Stand	Dates		Hgt.	Lodging	Rust		Test Weight (Per bu.)	Acre Yield	Yield		No. years grown	Percentage of Kharkof for same years
			Headed	Ripe			Stem	Leaf			Average 1931-35	Rank		
		(P.ct.)	June	July	(In.)	(P.ct.)	(P.ct.)	(P.ct.)	(Lbs.)	(Bu.)	(Bu.)			
Akron sel.	11660	68	18	24	42	0	28	18	57.0	24.6	-	-	2	160.9
Turkey sel.	10098	71	16	22	42	1	20	23	54.5	22.7	-	-	2	146.0
Do	10100	65	18	24	42	6	34	35	53.0	20.8	11.3	4	5	124.2
Kanred sel.	10099	60	19	24	44	1	29	28	50.5	20.7	11.4	3	5	125.3
Turkey sel.	10016	64	16	22	42	0	18	18	54.0	20.5	-	-	4	136.3
Oro	8220	59	20	25	43	0	35	48	55.0	20.2	10.6	8	5	116.5
Early Blackhull	8856	48	13	21	40	0	5	10	58.5	19.5	11.8	2	5	129.7
Kanred	5146	60	19	24	44	1	26	25	51.5	19.0	10.7	7	5	117.6
Cheyenne	8885	59	19	25	41	0	38	33	54.0	18.7	10.3	10	5	113.2
Yogo sel.	11678	64	18	24	43	6	30	40	52.5	18.6	10.6	8	5	116.5
Quivira	8886	48	14	22	38	0	14	9	52.5	18.4	10.9	6	5	119.8
Blackhull	6251	48	17	23	41	0	6	14	57.0	18.0	12.1	1	5	133.0
Tenmarq	6936	49	15	22	40	0	18	8	51.0	17.9	11.0	5	5	120.9
Nebraska No. 60	6250	56	21	26	42	1	36	33	53.0	16.5	9.4	11	5	103.3
Kharkof	1583	50	21	26	39	1	36	45	53.0	16.2	9.2	12	5	101.1
Turkey sel.	11375	54	22	27	39	0	25	40	53.0	15.9	-	-	2	103.4
Kharkof	1442	51	21	26	38	0	33	30	54.5	15.3	9.1	13	5	100.0
Yogo	8033	51	25	27	39	0	24	50	54.0	14.9	-	-	2	100.0
Minturki	6155	49	25	27	40	0	21	48	55.0	14.5	7.3	15	5	80.2
Alton	1438	48	22	27	41	1	39	43	54.5	13.5	8.0	14	5	87.9

Probable error of a difference, 1.7 bu.; probable error of a mean, 1.2 bu.; or 6.72 percent.

2.52

Table 1. -(Continued)

Lincoln, Nebr.

(Four 1/40th-acre plots; seeded Sept. 24, 1934; emerged Oct. 2)

Variety	C. I. No.	No. Culms per Acre in 1,000	Date Headed	Hgt.	Lodging			Stem Rust July 5	Test Weight (Per bu.)	Acre Yield	Yield Av. 1931-35	Rank	Yield Av. 1932-35	Rank	No. years grown	Percentage of Kharkof for same years
					May 24	June 3	July 5									
				(In.)	(P.ct.)	(P.ct.)	(P.ct.)	(P.ct.)	(Lbs.)	(Bu.)	(Bu.)		(Bu.)			
Kawvale	8180	3001	June 4	41	0	29	48	30	55.1	32.2	-	-	34.9	1	4	120.3
Early Blackhull	8856	2778	May 25	39	0	5	28	8	60.2	29.8	-	-	30.3	7	4	104.5
Minturki	6155	2938	June 5	43	1	45	66	22	56.2	29.3	31.6	7	29.1	8	5	97.8
Turkey	3689	3397	June 3	39	T	35	69	63	56.1	29.0	-	-	31.2	3	4	107.6
Turkey sel.	10094	3629	June 3	39	0	33	57	48	56.6	28.5	-	-	31.1	4	4	107.2
Tenmarq	6936	3016	June 1	41	0	14	33	90	51.8	28.4	34.7	2	31.1	4	5	107.4
Turkey sel.	10016	3461	May 31	38	T	40	48	17	56.1	26.1	-	-	29.1	8	4	100.3
Blackhull	6251	2777	June 1	40	0	26	54	38	56.6	26.2	33.5	3	30.5	6	5	103.7
Turkey (Seward Co.)	-	3733	June 3	41	1	38	81	58	55.6	25.8	-	-	-	-	3	104.6
Quivira	8886	2815	May 28	41	0	16	22	50	56.3	25.5	30.1	9	26.6	18	5	93.2
Clarkan	8858	2374	June 5	45	0	34	17	98	56.8	25.0	-	-	-	-	1	122.0
Turkey sel.	10015	3621	June 2	39	2	58	82	26	56.7	24.1	-	-	29.0	10	4	100.0
Cheyenne	8885	3024	June 4	40	0	27	36	98	51.8	24.0	36.5	1	33.4	2	5	113.0
Turkey sel.	11576	3289	June 2	40	0	36	59	22	52.5	23.9	-	-	-	-	1	116.0
Turkey sel. (Nebr. No. 312)	-	3349	June 5	40	T	54	82	78	55.1	23.6	-	-	-	-	3	99.3
Turkey sel.	11577	3222	June 2	40	0	39	68	15	53.4	23.5	-	-	-	-	1	114.3
Iowin	10017	2826	June 4	41	3	74	94	85	57.5	23.1	-	-	28.1	15	4	96.9
Nebraska No. 6	6249	3263	June 5	40	1	55	79	90	52.8	21.6	-	-	26.3	19	4	90.7
Oro x Fulhard	11579	3528	June 2	40	0	41	68	83	52.2	21.2	-	-	-	-	1	103.4
Turkey (Nebr. No. 1)	-	3367	June 5	41	1	56	89	73	54.0	20.6	-	-	28.2	14	4	97.2
Kharkof	1442	3610	June 6	40	1	50	76	85	51.4	20.5	32.3	4	29.0	10	5	100.0
Oro	8220	2927	June 5	41	1	50	66	88	51.8	19.8	31.9	6	28.7	12	5	98.8
Kanred	5146	2837	June 5	39	0	47	80	85	51.1	19.2	32.0	5	28.4	13	5	99.1
Crimean	1435	3140	June 4	40	3	56	86	88	49.5	18.4	-	-	26.7	17	4	92.1
Crimean sel. (Nebr. No. 1035)	-	3158	June 4	40	1	75	89	90	51.1	18.2	-	-	-	-	3	97.2
Nebraska No. 60	6250	3158	June 6	42	1	61	87	100	50.3	17.0	30.7	8	27.3	16	5	95.0

Probable error of a difference, 1.2 bu.; probable error of a mean, 0.8 bu.; or 3.42 percent.

1.78

Table 1. - (Continued)

North Platte, Nebr.

(Two 1/40th-acre plots; seeded Sept. 18, 1934.)

Variety	C. I. No.	Dates		Hgt.	Lodging	Acre Yield	Yield		No. years grown	Percentage of Kharkof for same years
		Headed	Ripe				Average 1931-1933-35	Rank		
		June	July	(In.)	(P.ct.)	(Bu.)	(Bu.)			
Turkey sel.	10016	1	8	40	13	48.7	32.2	5	4	100.6
Turkey (local)	-	1	8	43	0	48.0	34.0	1	4	106.3
Turkey sel.	10094	4	8	44	0	46.0	-	-	3	106.0
Tenmarq	6936	6	8	41	40	45.0	32.7	4	4	102.2
Kanred	5146	4	7	43	15	45.0	31.1	11	4	97.2
Cheyenne	8885	3	8	41	0	44.3	33.7	2	4	105.3
Kharkof	1412	5	10	41	0	44.3	32.0	7	4	100.0
Blackhull	6251	5	8	41	38	43.8	32.2	5	4	100.6
Minturki	6155	8	9	44	1	43.3	29.8	12	4	93.1
Beloglina x Hussar	11664	4	9	44	8	43.0	-	-	1	97.1
Do	11582	6	8	42	1	42.3	-	-	1	95.5
Do	11662	4	9	46	5	42.0	-	-	1	94.8
Beloglina sel.	8884	6	9	44	0	42.0	32.8	3	4	102.5
Oro	8220	5	9	48	3	42.0	31.3	10	4	97.8
Nebraska No. 60	6250	6	10	40	0	41.0	32.0	7	4	100.0
Beloglina x Hussar	11583	6	9	40	5	40.7	-	-	1	91.9
Kanred x Minturki	10012	8	9	41	1	39.7	29.0	13	4	90.6
Sherman	4430	7	10	44	0	38.7	31.8	9	4	99.4

Probable error of a difference, 1.1 bu.; probable error of a mean, 0.8 bu.; or 1.76 percent.

1.63

Table 1. - (Continued)

Waseca, Minn.

(Three 1/40th-acre plots.)

Variety	C.I. No.	Winter Survival (Pct.)	Dates Headed June	Dates Ripe July	Hgt. (In.)	Degree Lodged	Percent Lodged	Rust Stem (P.ct.)	Rust Leaf (P.ct.)	Test Weight (Per bu.) (Lbs.)	Acre Yield (Bu.)	Yield Av.1931-'33 & '35 (Bu.)	Yield Rank	No. years grown	Percentage of Kharkof for same years
Turkey sel.	10016	88	12	13	44	12	49	23	23	61.5	45.9	-	-	1	118.6
Minhardi x Marquis	11657	100	14	16	51	13	35	27	27	60.3	43.7	-	-	2	102.9
Yogo	8033	98	15	18	46	70	37	28	53	60.5	42.2	38.1	1	4	102.7
Minard x Minhardi	11656	98	15	17	51	3	45	43	67	61.4	41.2	-	-	1	106.5
Minturki	6155	100	15	17	51	27	50	28	63	60.4	40.6	37.1	2	4	100.0
Minturki x Marquis	11501	98	14	17	53	12	41	28	53	61.3	39.5	-	-	1	102.1
Do	11658	98	15	17	51	30	75	43	60	60.2	39.1	-	-	1	101.0
Kharkof	1442	98	14	16	48	35	32	60	57	59.7	38.7	37.1	2	4	100.0
Minturki x Marquis	11502	97	14	16	49	28	36	25	43	61.6	37.5	-	-	1	96.9
Do	11659	98	14	17	52	18	40	50	63	60.6	37.5	-	-	1	96.9
Karmont	6700	97	15	17	47	52	30	53	47	57.5	34.8	33.9	7	4	91.4
Nebraska No. 60	6250	94	15	17	49	23	41	67	63	56.2	34.6	35.6	4	4	96.0
Newturk	6935	93	14	18	47	3	20	63	60	57.3	34.4	35.0	5	4	94.3
Kanred	5146	97	14	16	45	42	43	50	43	57.9	34.3	34.8	6	4	93.8

Probable error of a difference, 1.2 bu.; probable error of a mean, 0.8 bu.; or 2.14 percent.

1.78

Table 1. - (Continued)

Dickinson, N. Dak.

(Two 1/40th-acre plots; seeded Sept. 20, 1934; emerged Oct. 6.)

Variety	C. I. No.	Winter Survival (P.ct.)	Dates Headed (Aug.)	Dates Ripe (Aug.)	Stem Rust (P.ct.)	Acre Yield 1/ (Bu.)	Yield Av. 1932-33 and 1935 (Bu.)	Yield Rank	No. years grown	Percentage of Kharkof for same years
Turkey sel.	10016	20	June 30	1	35	2.1	-	-	1	233.3
Minturki	6155	16	July 1	1	28	1.9	10.0	5	3	113.6
Beloglina	1543	7	July 3	1	35	1.3	10.5	3	3	119.3
Kanred x Buffum	8030	15	July 3	1	32	1.3	8.6	9	3	97.7
Yogo	8033	11	July 4	1	35	1.3	10.9	1	3	123.9
Nebraska No. 60	6250	30	July 2	1	36	1.3	10.2	4	3	115.9
Kharkof	1442	10	July 4	1	35	0.9	8.8	8	3	100.0
Minhardi x Minturki	8034	12	July 3	1	40	0.9	9.3	6	3	105.7
Turkey	1571	12	July 3	2	30	0.5	10.6	2	3	120.5
Karmont	6700	10	July 4	2	35	0.2	9.0	7	3	102.3

1/ Yield data from one plot of each variety.

Sheridan, Wyo.

(Three 1/50th-acre plots; seeded Sept. 27, 1934; emerged Oct. 5.)

Variety	C. I. No.	Stand (Pct.)	Dates Headed (June)	Dates Ripe (July)	Hgt. (In.)	Test Weight (Per bu.) (Lbs.)	Acre Yield (Bu.)	Yield Av. 1931-1935 (Bu.)	Yield Rank	No. years grown	Percentage of Kharkof for same years
Cheyenne	8885	92	28	20	26	58	27.5	-	-	1	152.8
Kanred	5146	90	28	20	30	57	23.5	26.9	1	5	109.3
Minturki	6155	90	27	22	34	57	23.2	22.8	9	5	92.7
Turkey sel.	10016	92	28	22	33	57	19.9	-	-	1	98.8
Karmont	6700	90	27	22	34	56	19.9	25.3	4	5	102.8
Yogo	8033	93	29	22	34	55	19.6	25.6	3	5	104.1
Minhardi x Minturki	8215	93	28	22	36	55	19.5	22.8	9	5	92.7
Montana No. 36	5549	92	28	21	32	56	18.6	26.6	2	5	108.1
Nebraska No. 60	6250	93	28	21	31	55	18.0	25.2	5	5	102.4
Kharkof	1442	92	28	22	31	59	18.0	24.6	6	5	100.0
Minard x Minhardi	8889	93	28	22	32	55	17.4	23.9	7	5	97.2
Minhardi x Minturki	8034	93	28	22	35	54	14.7	23.4	8	5	95.1

Probable error of a difference, 1.9 bu.; probable error of a mean, 1.3 bu.; or 6.66 percent.

2.82

Table 1. - (Continued)

Bozeman, Mont.

(Three 1/56th-acre plots; seeded Sept. 7, 1934; emerged Sept. 17.)

Variety	C. I. No.	Dates Headed	Dates Ripe	Hgt.	Lodging	Test Weight (Per bu.)	Acre Yield	Yield Av. 1931-1933 and 1935	Yield Rank	No. years grown	Percentage of Kharkof for same years
			Aug.	(In.)	(P.ct.)	(Lbs.)	(Bu.)	(Bu.)			
Yogo	8033	July 3	12	47	73	62.3	81.8	66.0	1	4	103.1
Yogo sel. No. 2	-	July 3	11	48	80	62.7	79.9	-	-	1	103.5
Cheyenne	8885	July 1	11	48	33	62.6	79.6	-	-	2	101.5
Kharkof	1442	July 3	12	47	73	62.3	77.2	64.0	3	4	100.0
Nebraska No. 60	6250	July 1	14	48	75	61.9	75.6	64.8	2	4	101.3
Karmont	6700	July 2	12	46	67	62.0	75.3	63.1	4	4	98.6
Minard x Minhardi	8889	July 2	14	49	70	62.6	73.7	62.1	5	4	96.0
Minturki	6155	July 1	10	50	70	62.0	72.8	58.4	7	4	91.3
Montana No. 36	5549	July 2	11	48	70	62.4	72.2	60.0	6	4	93.8
Minhardi x Minturki	8215	July 2	14	51	50	61.8	69.4	55.9	9	4	87.3
Turkey x Minessa	8887	July 4	13	51	83	61.7	68.1	-	-	3	92.1
Newturk	6935	July 3	9	46	73	62.4	65.9	56.0	8	4	87.5
Oro	8220	July 1	11	49	67	62.4	61.6	-	-	2	83.4
Turkey sel.	10016	June 27	7	46	68	62.2	58.2	-	-	2	74.3

Probable error of a difference, 1.8 bu.; probable error of a mean, 1.3 bu.; or 1.73 percent.

2.67

Moccasin, Mont.

(Four 1/50th-acre plots; seeded Sept. 12, 1934; emerged Oct. 3.)

Variety	C. I. No.	Winter Survival	Dates Headed	Dates Ripe	Hgt.	Test Weight (Per bu.)	Acre Yield	Yield Av. 1931-35	Yield Rank	No. years grown	Percentage of Kharkof for same years
		(P.ct.)			(In.)	(Lbs.)	(Bu.)	(Bu.)			
Newturk	6935	100	June 28	July 31	28	59.0	16.6	14.7	10	5	100.0
Yogo	8033	100	July 3	July 31	27	60.0	15.7	16.6	3	5	112.9
Eureka x Minhardi	8036	100	June 30	July 30	28	61.0	15.0	17.4	1	5	118.4
Turkey x Minessa	8887	100	July 3	Aug. 5	27	57.5	15.0	16.8	2	5	114.3
Kanred x Minessa	8045	99	July 2	Aug. 2	24	59.0	14.8	15.8	5	5	107.5
Nebraska No. 60	6250	100	July 1	Aug. 1	25	60.0	14.7	15.6	7	5	106.1
Turkey	1558	98	July 1	July 31	27	60.5	14.4	14.7	10	5	100.0
Karmont	6700	98	July 2	Aug. 1	26	59.5	14.3	14.7	10	5	100.0
Kanred x Minhardi	8040	99	July 1	July 31	26	57.5	14.2	16.1	4	5	109.5
Minturki	6155	100	July 2	Aug. 2	27	59.0	14.0	14.4	14	5	98.0
Kharkof	1442	100	July 2	July 31	25	61.0	13.8	14.7	10	5	100.0
Cheyenne	8885	99	June 30	July 31	25	61.5	13.2	-	-	2	94.5
Turkey sel.	10016	99	June 24	July 30	26	60.5	13.0	-	-	2	84.0
Minhardi x Minturki	8034	100	July 2	Aug. 2	28	60.0	12.9	15.6	7	5	106.1
Turkey x Minessa	11505	100	July 4	Aug. 5	27	55.5	12.5	-	-	4	83.7
Minard x Minhardi	8889	100	July 2	Aug. 1	26	58.5	12.5	15.2	9	4	103.4
Do	8888	100	July 2	Aug. 1	25	59.0	12.1	-	-	4	101.6
Minhardi x Minturki	8215	100	July 2	Aug. 2	27	58.5	11.2	15.8	5	4	107.5
Minard x Minhardi	8218	100	July 3	Aug. 1	27	60.0	11.1	-	-	4	96.7
Duplicate plots											
Minturki x Bel.-Buff	11661	100	July 2	July 30	27	60.5	15.7				
Turkey x Kanred	11725	100	July 3	July 31	28	59.0	13.2				
Kanred x Minhardi	11726	100	July 3	Aug. 2	25	60.5	12.5				
Minessa x Bel.-Buff B.M. 23-2	-	100	July 3	Aug. 5	26	59.5	11.0				

Probable error of a difference, 0.8 bu ; probable error of a mean, 0.5 bu.; or 3.92 percent.

1.19

Table 1. - (Continued)

Havre, Mont.

(Three 1/50th-acre plots; seeded Oct. 1, 1934; emerged Oct. 10.)

Variety	C. I. No.	Winter Survival (P.ct.)	Dates Headed June	Dates Ripe July	Hgt. (In.)	Test Weight (Per bu.) (Lbs.)	Acre Yield (Bu.)	Yield Av. 1931-1933 and 1935 (Bu.)	Yield Rank	No. years grown	Percentage of Kharkof for same years
Newturk	6935	100	19	22	24	59.1	18.9	8.5	5	4	123.2
Kanred	5146	99	20	21	25	59.3	18.3	8.0	10	4	115.9
Karmont	6700	100	21	22	26	59.1	18.3	8.2	9	4	118.8
Montana No. 36	5549	99	21	21	26	59.5	17.8	8.5	5	4	123.2
Minhardi x Minturki	8034	100	22	22	27	58.7	16.9	8.5	5	4	123.2
Yogo	8033	100	24	24	22	58.2	16.7	10.0	1	4	144.9
Minard x Minhardi	8888	100	23	23	23	58.7	16.1	-	-	2	116.3
Do	8889	100	22	23	24	58.0	16.1	8.3	8	4	120.3
Kharkof	1442	100	21	22	22	58.2	15.8	6.9	11	4	100.0
Turkey sel.	10016	100	18	21	23	58.0	15.8	-	-	1	100.0
Minturki	6155	100	23	23	23	58.2	15.6	9.5	2	4	137.7
Minhardi x Minturki	8215	100	22	23	23	58.4	15.3	8.7	4	4	126.1
Turkey x Minessa	8028	100	23	23	22	58.0	15.0	9.0	3	4	130.4

Probable error of a difference, 0.9 bu.; probable error of a mean, 0.7 bu.; or 3.97 percent.

PROBABLE ERRORS

For each station the probable error of a difference in bushels and the generalized probable error of a mean in bushels and percent were determined by "Student's" generalized formula, i. e.

$$\text{Probable error of a difference} = \pm 0.6745\sqrt{\frac{2M(\sigma_T^2 - \sigma_V^2 - \sigma_R^2)}{(M-1)\quad(N-1)}}$$

where T = yields of individual plots
V = mean yields of varieties
R = mean yields of replicates
M = number of varieties
N = number of plots of each variety

A generalized probable error of a mean in bushels may be calculated by dividing the probable error of a difference by 2

The probable errors in bushels can be expressed in percent by dividing by the mean yield of all varieties and multiplying by 100. The summary of these probable errors is shown in table 2, together with the number of plots and average yields at each station.

The probable error of an average of averages was determined by the formula

$$\text{P. E.} = \pm\frac{1}{N}\sqrt{a^2 + b^2 + c^2 + \cdots\cdots n^2}$$

where a, b, c, -- n = the separate probable errors and N = the number of separate averages.

Table 2. - Average yield, probable error of a difference and probable error of the mean for the plot tests at each cooperating station, 1935.

Station	No. of plots	Average yield of varieties (Bu.)	Probable error of a difference (Bu.)	Probable error of a mean	
				Bushels	Percent
Texas:					
Denton	3	6.9	0.5	0.3	4.96
Oklahoma:					
Lawton	3	8.4	-	-	-
Stillwater	5	27.2	1.7	1.2	4.44
Helena	4	19.4	1.1	0.8	3.91
Goodwell	1	29.3	-	-	-
Kansas:					
Manhattan	3	24.8	0.8	0.6	2.40
Colorado:					
Akron	4	18.3	1.7	1.2	6.72
Nebraska:					
Lincoln	5	24.0	1.2	0.8	3.42
North Platte	2	43.3	1.1	0.8	1.76
Wyoming:					
Sheridan	3	20.0	1.9	1.3	6.66
Minnesota:					
Waseca	3	38.9	1.2	0.8	2.14
North Dakota:					
Dickinson	1	1.2	-	-	-
Montana:					
Bozeman	3	72.2	1.8	1.3	1.73
Moccasin	4	13.7	0.8	0.5	3.92
Havre	3	16.7	0.9	0.7	3.97

SUMMARY OF YIELDS

The yields of the uniform varieties, as well as other varieties, grown in the cooperative experiments have been summarized for the different districts, States, and for the entire region.

Districts

Summaries of the yield data for the uniform varieties grown in 1934 and the 1931-35 averages where available are presented in tables 3 to 8.

In the southern district useable yields were reported from 4 stations. The yields for 12 varieties uniformly grown at these stations are shown in table 3. Unfortunately, Turkey selection (C. I. 10016) was not included at Helena, Blackhull was not grown at Stillwater and Helena, and Harvest Queen was not included at Goodwell. Of the varieties grown at all stations, Kharkof heads the list, followed by Quivira and Kanred. Fulcaster had the lowest average yield. For the 5-year period (table 4) the weighted averages are given for 10 varieties. The varieties are listed in order of average yield, this order being the same as at the end of the 4-year period. Since these averages include 29 station-years extending over a 5-year period, they should be fairly significant.

Table 3. - Summary of average yields of the uniform winter-wheat varieties grown in plot tests at 4 stations in the southern district, 1935.

Variety	C. I. No.	Average yield in bushels per acre at:				
		Denton	Stillwater	Helena	Goodwell	Average
Kharkof	1442	8.7	29.2	18.5	41.3	24.4
Quivira	8886	13.1	26.6	21.5	31.2	23.1
Kanred	5146	8.8	30.1	17.9	32.9	22.4
Tenmarq	6936	6.7	29.5	22.4	29.0	21.9
Kawvale	8180	7.6	34.0	17.2	26.1	21.2
Nebraska No. 60	6250	5.0	24.5	21.8	31.6	20.7
Denton	8265	2.7	33.6	16.7	25.1	19.5
Early Blackhull	8856	14.1	21.2	21.6	19.7	19.2
Fulcaster	6471	4.9	27.3	12.2	22.4	16.7
Turkey selection	10016	6.9	25.5	-	37.8	-
Blackhull	6251	6.9	-	-	34.5	-
Harvest Queen	6199	4.5	26.8	17.5	-	-
Probable error of a mean (Bushels)		0.3	1.2	0.8	-	-
Probable error of a mean (Percent)		4.96	4.44	3.91	-	-

Table 4. - Summary of average yields of 10 uniform winter-wheat varieties grown in plot tests at 8 stations in the southern district for a part or all the period from 1931 to 1935.

Variety	C. I. No.	Average yield in bushels per acre at:								Weighted average
		Denton	Amarillo	Lawton	Stillwater	Carrier	Helena	Woodward	Goodwell	
No. years grown		5	2	4	5	3	2	4	4	(Bu.)
Tenmarq	6936	27.7	15.5	26.7	30.8	27.8	23.2	30.0	25.1	26.9
Quivira	8886	29.8	13.2	27.7	28.3	22.5	26.7	29.3	22.7	26.1
Blackhull	6251	21.7	14.4	25.0	32.1 1/	26.9	28.9 1/	28.7	27.3	25.9
Kharkof	1442	21.7	13.7	25.6	29.5	27.3	22.0	30.7	29.3	25.9
Kanred	5146	25.5	14.4	26.3	28.7	25.8	20.4	27.9	27.6	25.7
Kawvale	8180	27.1	12.4	28.4	29.2	25.5	20.0	28.3	21.0	25.3
Denton	8265	25.4	12.6	24.9	31.0	25.0	22.5	24.3	21.7	24.5
Nebraska No. 60	6250	19.1	12.0	23.1	28.6	26.4	21.9	29.0	28.6	24.4
Fulcaster	6471	22.1	11.3	23.8	29.0 1/	21.5	16.2	27.3	20.1	22.6
Harvest Queen	6199	17.7	11.2	21.5	26.0	26.7	21.0	23.0	19.8 1/	21.4

1/ Grown one year less than shown at head of column.

Tenmarq has a slight advantage in yield over the other varieties and Quivira ranks second. The soft wheats, Fulcaster and Harvest Queen, are at the bottom of the list.

In the central district for 1935 (table 5) data were obtained from four stations only. Nine varieties were grown at all of these stations and three more of interest were grown at all but one each. Turkey selection (C. I. 10016) and Minturki had the highest average yields, probable due in part to their rust resistance. Nebraska No. 60 ranked last, being severely injured by stem rust. In table 6, the data for nine varieties grown for the 5-year period, 1931-35, at eight stations are summarized. Cheyenne and Blackhull continue to have the highest average yield, and Quivira and Minturki, the lowest.

Table 5. - Summary of average yields of 12 winter-wheat varieties grown in uniform plot tests at 4 stations in the central district in 1935.

Variety	C. I. No.	Average yield in bu. per acre				Average
		Manhattan	Akron	Lincoln	North Platte	(Bu.)
Turkey selection	10016	27.4	20.5	26.1	48.7	30.7
Minturki	6155	33.5	14.5	29.3	43.3	30.2
Blackhull	6251	30.9	18.0	26.2	43.8	29.7
Tenmarq	6936	27.1	17.9	28.4	45.0	29.6
Cheyenne	8885	25.3	18.7	24.0	44.3	28.1
Kanred	5146	26.4	19.0	19.2	45.0	27.4
Kharkof	1442	28.3	15.3	20.5	44.3	27.1
Cro	8220	25.2	20.2	19.8	42.0	26.8
Nebraska No. 60	6250	26.8	16.5	17.0	41.0	25.3
Quivira	8886	25.1	18.4	25.5	-	-
Early Blackhull	8856	24.3	19.5	29.8	-	-
Turkey selection	10094	32.7	-	28.5	46.0	-
Probable error of a mean (bushels)		0.6	1.2	0.8	0.8	0.4
Probable error of a mean (percent)		2.40	6.72	3.42	1.76	2.03

Table 6. - Summary of average yields of 9 uniform winter-wheat varieties grown in plot tests at 8 stations in the central district, 1931-35.

Variety	C. I. No.	Average yields in bushels per acre at: Manhattan	Hays	Colby	Akron	Lincoln	North Platte	Alliance	Valentine	Weighted average
No. years grown		5	4	3	5	5	4	2	1	(Bu.)
Cheyenne	8885	40.6	23.7	32.8	10.3	36.5	33.7	17.8	9.8	27.9
Blackhull	6251	39.2	23.5	32.7	12.1	33.5	32.2	17.8	9.1	27.2
Termarq	6936	37.4	23.0	30.5	11.0	34.7	32.7	17.3	8.4	26.6
Nebraska No. 60	6250	37.3	22.5	38.0 1/	9.4	30.7	32.0	17.1	8.8	25.9
Oro	8220	37.0	21.6	29.7	10.6	31.9	31.3	18.4	7.1	25.6
Kharkof	1442	36.1	19.3	38.8 1/	9.1	32.3	32.0	16.8	9.6	25.5
Kanred	5146	35.9	21.5	28.7	10.7	32.0	31.1	16.5	7.9	25.2
Quivira	8886	39.1	22.7	28.4	10.9	30.1	25.6 1/	18.2	7.6	24.9
Minturki	6155	38.5	18.4	24.4	7.3	31.6	29.8	16.6	8.2	23.9

1/ One year less than figure at top of column.

Yields were reported from six stations in the northern district. Owing to the diversity of conditions of this area, only five varieties were grown at all of these six stations. The data for the five varieties, as well as for several others grown at some of the stations, are presented in table 7. Based on a 5-station average, Yogo ranks first and Minturki second, with Turkey selection (C. I. 10016) last. Since the yields from Bozeman are so high, this station exerts a great influence on the final average.

Table 7. - Summary of average yields of 10 varieties of winter-wheat grown in plot tests at 6 stations in the northern district, 1935.

Variety	C. I. No.	Average yield in bushels per acre at: Waseca	Dickinson	Sheridan	Bozeman	Moccasin	Havre	Av. yield per acre 5 stations 1/ (Bu.)
Yogo	8033	42.2	1.3	19.6	81.8	15.7	16.7	35.2
Minturki	6155	40.6	1.9	23.2	72.8	14.0	15.6	33.2
Kharkof	1442	38.7	.9	18.0	77.2	13.8	15.8	32.7
Karmont	6700	34.8	.2	18.9	75.3	14.3	18.3	32.5
Turkey selection	10016	45.9	2.1	19.9	58.2	13.0	15.8	30.6
Nebraska No. 60	6250	34.6	1.3	18.0	75.6	14.7	-	-
Newturk	6935	34.4	-	-	65.9	16.6	18.9	-
Minhardi x Minturki	8034	-	0.9	-	-	12.9	16.9	-
Do	8215	-	-	19.5	69.4	11.2	15.3	-
Minard x Minhardi	8889	-	-	17.4	73.7	12.5	16.1	-
Probable error of a mean (bushels)		0.8	-	1.3	1.3	0.5	0.7	-
Probable error of a mean (percent)		2.14	-	6.66	1.73	3.92	3.97	-

1/ Excluding Dickinson.

For the 5-year period, 1931-35, the data are presented in table 8. Only four varieties have been uniformly grown during this period. Yogo has the highest average and Minturki, the lowest. In order to get some comparison of varieties not grown at all stations, yields are expressed in percentage of Kharkof. Based on this figure, Yogo and Minhardi x Minturki (C. I. 8034) are highest and Newturk, lowest.

Table 8. - Summary of average yields of 10 uniform winter-wheat varieties grown in plot tests at 9 stations in the northern district during all or a part of the period 1931-35.

Variety	C. I. No.	Average yield in bushels per acre at:									Weighted average 7 sta. 1/	Weighted average all sta.	Percent Kharkof same tests
		Waseca	Red-field	Dick-inson	Archer	Sher-idan	Boze-man	Hunt-ley	Mocca-sin	Havre			
No. years grown		4	2	3	3	4	4	2	5	4			
Yogo	8033	38.1	24.1	10.9	-	25.6	66.0	-	16.6	8.6	27.6	27.6	109.1
Minhardi x Minturki	8034	-	18.6	9.3	11.4	23.4	-	-	15.6	7.1	-	14.3	104.4
Nebraska No. 60	6250	35.6	18.5	10.2	10.4	25.2	64.8	-	15.6	-	-	27.2	101.9
Minard x Minhardi	8889	-	22.1	-	-	23.9	62.1	-	15.2	6.9	-	25.9	101.6
Kharkof	1442	37.1	15.9	8.8	11.1	24.6	64.0	21.3	14.7	6.0	25.3	23.7	100.0
Kanred	5146	34.8	15.6	-	9.8	26.9	-	19.6	-	7.1	-	19.7	99.0
Karmont	6700	33.9	17.6	9.0	11.7	25.3	63.1	17.4	14.7	7.5	25.2	23.4	98.7
Minturki	6155	37.1	16.3	10.0	-	22.8	58.4	-	14.4	7.8	24.6	24.6	97.2
Minhardi x Minturki	8215	-	19.1	-	-	22.8	55.9	-	15.8	7.1	-	24.2	94.9
Newturk	6935	35.0	16.9	-	-	-	56.0	21.0	14.7	7.1	-	25.8	94.2

1/ Excluding Dickinson and Archer.

States

In several of the States, there are two or more cooperating stations. At some of these stations only the uniform varieties are grown, while at others, additional varieties are included.

It has been the practice to summarize the yields by States by averaging the yields reported from all stations within a State. Only one station reported yields from Texas, Kansas, Colorado, Wyoming, and North Dakota in 1935 so no further summaries will be made for these States.

Sixteen varieties were grown at three stations in Oklahoma. In table 9 the yields for these varieties are shown for 1935 as well as the average yield for 1931-35. Kharkof, Tenmarq, and Kanred had the highest average in 1935. Two Kanred x Hard Federation strains were grown at these three stations. Of the two, C. I. No. 10092 had an average about 4 bushels higher than C. I. 10091. Cheyenne did not yield so well in 1935 but for the 5-year average, it has a very good record. Early Blackhull and Fulcaster had the lowest average yields.

Table 9. - Average yield in bushels per acre of winter-wheat varieties grown in plot tests in Oklahoma in 1935 and weighted average for 1931-35.

Variety	C. I. No.	Acre yield in bushels per acre	
		1935 - 3 stations	1931-35 22 station years
Kharkof	1442	29.7	28.0
Tenmarq	6936	27.0	27.8
Kanred	5146	27.0	26.7
Penquite selection	11745	26.9	-
Kanred x Hard Federation	10092	26.7	-
Quivira	8886	26.4	26.4
Nebraska No. 60	6250	26.0	26.8
Kawvale	8180	25.8	26.1
Cheyenne	8885	25.6	27.8
Denton	8265	25.1	25.4
Sibley No. 62	11523	25.0	-
Sibley No. 81	10084	24.0	-
Eagle Chief	8868	23.8	26.7
Kanred x Hard Federation	10091	22.7	-
Early Blackhull	8856	20.8	-
Fulcaster	6471	20.6	-

In Nebraska yields were obtained from two stations in 1935 and these are averaged in table 10. Two Nebraska Turkey selections rank at the top of the list with Cheyenne well down and Oro and Nebraska No. 60 at the bottom. For the 5-year average, based on 12 station-years, Cheyenne has a slight advantage with Tenmarq second. Minturki has the lowest average for the 5-year period.

Table 10. - Average yield in bushels per acre of winter-hweat varieties grown in plot tests in Nebraska in 1935 and weighted average for 1931-35.

Variety	C. I. No.	Average yield in bushels per acre	
		1935 - 2 stations	1931-35 12 station years
Turkey selection	10016	37.4	-
Do	10094	37.3	-
Tenmarq	6936	36.7	29.0
Minturki	6155	36.3	26.5
Blackhull	6251	35.0	28.4
Cheyenne	8885	34.2	30.2
Kharkof	1442	32.4	27.7
Kanred	5146	32.1	27.1
Oro	8220	30.9	27.4
Nebraska No. 60	6250	29.0	27.0
Probable error of a mean (bushels)		0.6	-
Probable error of a mean (percent)		1.92	-

In table 11 the data from three stations in Montana are averaged. As stated before, the yields from Bozeman have a very heavy influence on the averages due to their magnitude in comparison to the other stations. Yogo has the highest average for 1935 and for the 5-year period. Turkey selection (C. I. 10016) has the lowest average yield for the three stations for the second year.

Table 11. - Average yield in bushels per acre of winter-wheat varieties grown in plot tests in Montana in 1935 and weighted average for 1931-35.

Variety	C. I. No.	Average yield in bushels per acre	
		1935 - 3 stations	1931-35 13 station years
Yogo	8033	38.1	29.8
Karmont	6700	36.0	27.6
Kharkof	1442	35.6	27.4
Minard x Minhardi	8889	34.1	27.5
Minturki	6155	34.1	26.7
Newturk	6935	33.8	25.5
Minhardi x Minturki	8215	32.0	26.0
Turkey selection	10016	29.0	-
Probable error of a mean (bushels)		0.5	-
Probable error of a mean (percent)		1.95	-

Region

In table 12 is presented a regional summary of yields for 1931-35 of all varieties reported as being grown in plot tests in 1935. Because the various varieties were grown at different stations andfor a different number of years, the yields are expressed in percentage of Kharkof (C. I. 1442) grown in comparable tests. One exception to this is Colby in 1934 where the yield of Turkey (C. I. 1558) is used as a check since Kharkof was not grown. The data are presented by districts as well as for the entire area. The varieties are listed in alphabetical order. These figures may be open to question since they are based on the behavior of a single variety at all stations. In 1935, 104 varieties were reported from one or more stations, and of these 52 or nearly half had a percentage of Kharkof of 100 percent or more for the entire region.

Some of the outstanding comparisons shown in the table are as follows:

Blackhull has made a better record in the central than in the southern district.

Cheyenne is slightly below Kharkof in the southern district, but above in the central and northern districts.

Clarkan has a good record in both the southern and central districts.

Early Blackhull has a better comparative record in the central than in the southern district.

Kanred and Kharkof are about equal as to yield record.

Minturki does not equal Kharkof in any of the districts.

Oro has a record slightly better than Kharkof in the central district.

Turkey selection (C. I. 10016) has a better record than Kharkof in the central district but is decidedly poorer in both the southern and northern districts.

A number of new winter x spring strains and Turkey selections have very good records but most of these have not been grown for many station years.

Table 12. - Yields of varieties and strains of winter-wheat expressed in percentage of Kharkof (C. I. 1/12) grown in plot tests at one or more of the cooperating stations in the hard red winter-wheat region for one or more years, 1931-35.

Variety	C. I. No.	Southern District		Central District		Northern District		Entire Region		
		No. station years	P.ct. of Kharkof	No. station years	P.ct. of Kharkof	No. station years	P.ct. of Kharkof	Average yield of variety	Average yield of Kharkof	Percent of Kharkof
Akron sel.	11660	--	----	2	160.9	--	----	14.0	8.7	160.9
Alton	1438	--	----	5	87.9	5	94.7	11.2	12.1	92.6
Beloglina	1543	--	----	2	89.2	6	103.3	15.3	16.0	95.6
Beloglina x Hussar	11582	--	----	1	95.5	--	----	42.3	44.3	95.5
Do	11583	--	----	1	91.9	--	----	40.7	44.3	91.9
Do	11662	--	----	1	94.8	--	----	42.0	44.3	94.8
Do	11664	--	----	1	97.1	--	----	43.0	44.3	97.1
Beloglina sel.	8884	--	----	7	100.3	--	----	32.0	31.9	100.3
Blackhull	6251	27	99.6	29	108.8	--	----	26.6	25.5	104.3
Cheyenne	8885	23	98.9	29	111.6	6	104.0	28.5	27.0	105.6
Clarkan	8858	3	112.0	6	115.5	--	----	32.7	28.5	114.7
Crimean	1435	--	----	4	92.1	--	----	26.7	29.0	92.1
Crimean sel. Nebr. No. 1035	----	--	----	5	96.2	--	----	20.4	21.2	96.2
Denton	8265	29	94.6	--	----	--	----	24.5	25.9	94.6
Eagle Chief	8868	22	95.4	--	----	--	----	26.7	28.0	95.4
Early Blackhull	8856	25	87.0	22	108.5	--	----	25.0	25.9	96.5
Eureka x Minhardi	8036	--	----	--	----	8	104.0	18.3	17.6	104.0
Fulcaster	6471	27	86.6	6	108.3	--	----	25.1	27.5	91.3
Fultz	3416	11	73.2	--	----	--	----	21.8	29.8	73.2
Harvest Queen	6199	28	84.6	6	94.6	--	----	23.3	26.8	86.9
Harvest Queen sel.	11611	--	----	1	79.5	--	----	22.5	28.3	79.5
Do	11612	--	----	1	79.2	--	----	22.4	28.3	79.2
Ioturk	11388	14	94.4	--	----	--	----	27.1	28.7	94.4
Iowin	10017	--	----	4	96.9	--	----	28.1	29.0	96.9
Kanred	5146	29	99.2	29	100.8	28	100.5	23.9	23.8	100.4
Kanred x Buffum	8030	--	----	--	----	5	114.5	7.9	6.9	114.5
Kanred x Hard Federation	10091	4	89.4	7	105.0	--	----	24.6	24.9	98.8
Do	10092	6	101.9	6	101.5	--	----	26.8	26.3	101.9
Kanred x Marquis	10090	4	91.6	5	105.5	--	----	33.7	33.7	100.0
Do	11589	1	136.5	3	103.3	--	----	29.0	26.7	108.6
Kanred x Minessa	8045	--	----	--	----	5	107.5	15.8	14.7	107.5
Kanred x Minhardi	8040	--	----	--	----	5	109.5	16.1	14.7	109.5
Kanred x Minturki	10012	--	----	4	90.6	--	----	29.0	32.0	90.6
Kanred sel.	10099	--	----	5	125.3	--	----	11.4	9.1	125.3
Karmont	6700	--	----	2	85.3	33	99.1	23.3	23.8	97.9
Kawvale	8180	29	97.7	12	114.1	--	----	28.0	27.2	102.9
Kharkof	1442	29	100.0	29	100.0	33	100.0	24.6	24.6	100.0
Do	1583	--	----	5	101.1	--	----	9.2	9.1	101.1
Malakof	5663	6	92.0	--	----	--	----	27.5	29.9	92.0
Mediterranean	5303	11	83.6	--	----	--	----	24.9	29.8	83.6
Mediterranean sel.	10085	4	121.6	--	----	--	----	22.5	18.5	121.6
Do	10086	5	105.1	--	----	--	----	22.8	21.7	105.1
Do	11525	5	123.6	--	----	--	----	22.5	18.2	123.6
Do	11526	4	123.8	--	----	--	----	22.9	18.5	123.8
Do	11587	3	116.1	--	----	--	----	16.6	14.3	116.1
Mediterranean 5933-38	----	4	123.2	--	----	--	----	22.8	18.5	123.2
Minard x Minhardi	8218	--	----	--	----	4	96.7	17.8	18.4	96.7
Do	8888	--	----	--	----	10	100.5	20.6	20.5	100.5
Do	8889	--	----	--	----	25	101.2	24.9	24.6	101.2
Do	11656	--	----	--	----	1	106.5	41.2	38.7	106.5
Minhardi x Marquis	11657	--	----	--	----	2	102.9	39.2	38.1	102.9
Minhardi x Minturki	8034	--	----	3	85.1	28	100.0	17.8	17.9	99.4
Do	8215	--	----	--	----	25	94.7	23.3	24.6	94.7
Minturki	6155	4	81.9	29	95.6	30	96.7	23.5	24.7	95.1
Minturki x Marquis	11501	--	----	--	----	2	105.6	39.5	37.4	105.6
Do	11502	--	----	--	----	2	98.9	37.0	37.4	98.9
Do	11658	--	----	--	----	1	101.0	39.1	38.7	101.0
Do	11659	--	----	--	----	1	96.9	37.5	38.7	96.9
Montana No. 36	5549	--	----	1	100.0	17	101.5	27.6	27.2	101.5
Nebraska No. 6	6249	--	----	8	94.3	--	----	21.5	22.8	94.3

Table 15. - (Continued)

Variety	C. I. No.	Southern District		Central District		Northern District		Entire Region		
		No. station years	P.ct. of Kharkof	No. station years	P.ct. of Kharkof	No. station years	P.ct. of Kharkof	Average yield of variety	Average yield of Kharkof	Percent of Kharkof
Nebraska No. 60	6250	29	94.2	28	101.2	31	101.7	24.8	25.0	99.2
Nebraska No. 28	5147	20	64.6	3	92.5	--	----	20.2	29.4	68.7
Newturk	6935	--	----	6	102.2	27	94.9	23.0	24.1	95.4
Nittany	6962	4	92.5	--	----	--	----	24.6	26.6	92.5
Oro	8220	6	90.1	29	102.4	7	85.3	25.7	26.4	97.3
Oro x Fulhard	11579	--	----	1	103.4	--	----	21.2	20.5	103.4
Penquite sel.	----	10	101.7	--	----	--	----	30.1	29.6	101.7
P-1066-1 x Prelude	11590	1	149.4	2	102.1	--	----	27.8	24.6	113.0
Prelude x Kanred	11591	--	----	2	108.1	--	----	30.8	28.5	108.1
Purkof	8381	13	91.2	--	----	--	----	26.9	29.5	91.2
Quivira	8886	29	100.8	28	102.5	1	83.0	25.8	25.6	100.8
"Red Cross"	----	1	67.8	--	----	--	----	19.8	29.2	78.9
Redhull	11534	19	95.2	--	----	--	----	27.6	29.0	95.2
Sherman	4430	--	----	4	99.4	--	----	31.8	32.0	99.4
Sibley No. 62	11523	11	93.4	--	----	--	----	24.1	25.8	93.4
Sibley No. 81	10084	21	91.2	--	----	--	----	26.0	28.5	91.2
Superhard	8054	14	92.0	4	103.0	--	----	30.0	31.7	94.6
Sutton	10053	6	110.8	--	----	--	----	22.6	20.4	110.8
Tenmarq	6936	29	103.9	29	106.8	--	----	26.8	25.4	105.5
Turkey	1558	14	95.3	12	103.8	7	97.0	25.5	25.4	100.4
Do	1571	--	----	--	----	9	104.7	15.6	14.9	104.7
Turkey 101 (Goodwell)	----	4	96.2	--	----	--	----	28.2	29.3	96.2
Turkey 102 (Goodwell)	----	14	90.4	--	----	--	----	28.1	31.1	90.4
Turkey (Matter sel.)	----	2	84.4	--	----	--	----	24.8	29.4	84.4
Turkey (North Platte)	----	4	106.3	--	----	--	----	34.0	32.0	106.3
Turkey (Seward Co.)	----	--	----	3	104.6	--	----	29.5	28.2	104.6
Turkey x Minessa	8028	--	----	--	----	5	125.0	7.5	6.0	125.0
Do	8887	--	----	--	----	10	98.3	28.4	28.9	98.3
Do	11505	--	----	--	----	4	83.7	15.4	18.4	83.7
Turkey sel.	3689	--	----	4	107.6	--	----	31.2	29.0	107.6
Do	10015	--	----	7	101.3	--	----	23.0	22.7	101.3
Do	10016	9	94.3	19	105.7	11	86.1	22.0	22.8	96.5
Do	10083	9	101.7	--	----	--	----	24.2	23.8	101.7
Do	10094	--	----	9	107.4	--	----	30.5	28.4	107.4
Do	10098	--	----	6	103.6	--	----	23.2	22.4	103.6
Do	10100	--	----	5	124.2	--	----	11.3	9.1	124.2
Do	11375	--	----	2	103.4	--	----	9.0	8.7	103.4
Do	11576	--	----	1	116.6	--	----	23.9	20.5	116.6
Do	11577	--	----	1	114.6	--	----	23.5	20.5	114.6
Turkey sel. Nebr. No. 1	----	--	----	4	97.2	--	----	28.2	29.0	97.2
Turkey sel. Nebr. No. 312	----	--	----	3	99.3	--	----	28.0	28.2	99.3
Yogo	8033	--	----	2	100.0	30	108.4	24.8	23.0	107.8
Yogo sel.	11678	--	----	5	116.5	--	----	10.6	9.1	116.5
Yogo sel. No. 2	----	--	----	--	----	1	206.5	79.9	77.2	103.5

SUMMARY OF AGRONOMIC DATA

The agronomic data other than yield have been summarized for each district in tables 13 to 15. In each case the data are averaged from as many varieties as possible. The number of stations entering the average are shown at the top of each column.

For the varieties grown in the southern district the data are shown in table 13. For date of heading, Early Blackhull was earliest, followed by Quivira. Turkey selection (C. I. 10016) was as early as Blackhull and Kawvale and earlier than Kanred.

Average dates of ripening placed the varieties in about the same order as for heading. Average heights show very little difference between varieties except that Turkey selection (C. I. 10016) is shortest and Kharkof, tallest. Kawvale and Quivira had the lowest leaf rust infection and Nebraska No. 60 and Turkey selection (C. I. 10016), the highest. Test weights are rather low with Early Blackhull having the highest average at five stations. Quivira had the second highest average test weight and Denton, the lowest. Undoubtedly, the presence of rust had considerable influence on test weight.

Table 13. - Summary of agronomic data other than yield for varieties of winter-wheat grown at the cooperating stations in the southern district in 1935.

Variety	C. I. No.	Average				
		Dates		Height (In.)	Leaf rust (Percent)	Test Weight per bu. (Lbs.)
		Headed	Ripe			
Number of stations		3	3	3	3	5
Kharkof	1442	May 12	June 15	32	90	54.8
Kanred	5146	May 10	June 13	31	83	54.9
Nebraska No. 60	6250	May 14	June 17	31	92	55.4
Turkey selection	10016	May 7	June 11	28	90	55.0
Tenmarq	6936	May 9	June 12	30	41	53.6
Blackhull	6251	May 7	June 14	30	-	-
Early Blackhull	8856	Apr. 28	June 5	29	-	59.2
Quivira	8886	May 4	June 9	29	20	57.0
Kawvale	8180	May 7	June 12	31	13	54.0
Fulcaster	6471	May 11	June 14	31	69	54.5
Denton	8265	May 10	June 16	31	26	53.3

In table 14, the data from the central district are summarized. Two stations reported stands which, when averaged, showed that Turkey selection (C. I. 10016) had the largest number of culms per acre. Turkey selection (C. I. 10016) had the earliest date of heading of the varieties averaged being earlier than Tenmarq and Blackhull. Complete data were not available so that Quivira and Early Blackhull have no averages for this character. Turkey selection (C. I. 10016) was the shortest for plant height

and Oro was the tallest. Lodging data were reported from four stations. When averaged, these data showed that Cheyenne had the least lodging and Kanred and Nebraska No. 60 the most. Leaf rust data were reported from two stations. Quivira and Tenmarq had the least average infection and Minturki and Oro the most. Stem rust infection was heavy at three stations. Early Blackhull had the lowest average reading, followed by Turkey selection (C. I. 10016) and Blackhull. All three of these varieties had a lower reading than Minturki. Nebraska No. 60 and Cheyenne had the highest infection. Test weights ranged from 59.8 pounds per bushel for Early Blackhull to 53.8 pounds per bushel for Nebraska No. 60.

Table 14. - Summary of agronomic data other than yield for varieties of winter-wheat grown at the cooperating stations in the central district in 1935.

Variety	C. I. No.	Average							
		No. culms per acre	Dates		Hgt. (In.)	Lodging (Percent)	Percent rust		Test weight per bushel (Lbs.)
			Headed	Ripe			Leaf	Stem	
Number of stations		2	4	3	4	4	2	3	3
Kharkof	1442	3174	June 5	July 13	38	21	32	49	55.1
Kanred	5146	2730	June 4	July 11	40	29	24	42	53.9
Nebraska No. 60	6250	3112	June 6	July 13	40	26	37	64	53.8
Turkey selection	10016	3682	May 31	July 10	37	15	20	17	56.7
Do	10094	3325	-	-	-	-	-	-	-
Minturki	6155	2910	June 7	July 13	41	18	51	23	57.3
Blackhull	6251	2720	June 3	July 11	39	25	27	19	58.4
Early Blackhull	8856	2922	-	-	-	-	20	6	59.8
Tenmarq	6936	2728	June 1	July 10	38	20	7	41	54.1
Quivira	8886	2741	-	-	-	-	5	24	56.5
Cheyenne	8885	2779	June 4	July 11	38	9	35	62	55.0
Oro	8220	2849	June 5	July 12	42	17	48	55	55.3
Kawvale	8180	2777	-	-	-	-	-	-	-

Here again rust, especially stem rust, probably had considerable influence on test weight.

In the northern district (table 15) data could be summarized for five varieties only. There was very little difference in winter survival among the varieties. Turkey selection (C. I. 10016) headed first and was ripe before any of the other varieties and was the shortest in height. Lodging was nearly equal for all of the varieties. Stem rust was present at two stations and showed Minturki and Turkey selection (C. I. 10016) to have the lowest average infection. Test weights were fairly good for all varieties, ranging from an average of 60.0 pounds for Kharkof to 58.8 pounds per bushel for Karmont.

Table 15. - Summary of agronomic data other than yield for varieties of winter-wheat grown at the cooperating stations in the northern district in 1935.

Variety	C. I. No.	Average						
		Winter Survival (Percent)	Dates		Hgt. (In.)	Lodging (Percent)	Stem rust (P.ct.)	Test weight per bushel (Lbs.)
			Headed	Ripe				
Number of stations		4	6	6	5	2	2	5
Kharkof	1442	77	June 26	July 28	35	51	48	60.0
Turkey selection	10016	77	June 23	July 26	34	59	29	59.8
Yogo	8033	77	June 28	July 28	35	55	32	59.2
Minturki	6155	79	June 27	July 28	37	60	28	59.3
Karmont	6700	76	June 27	July 28	36	49	44	58.8

UNIFORM YIELD NURSERY

The uniform yield nursery was seeded in the fall of 1934 at the following stations: Denton, Amarillo, Stillwater, Woodward, Manhattan, Hays, Akron, Ft. Collins, Lincoln, North Platte, and Alliance. The plan of limiting this nursery to 30 varieties and strains was continued and the varieties were seeded in replicated 3-row blocks. The varieties making up the 1935 nursery, together with the State and C. I. numbers, are shown in table 16.

A comparison of the 1935 seeding list with that of 1934 will show some changes in the nursery. Five strains, which seemed to be lacking in agronomic value and which were not needed for ecological studies, were replaced by newer material. Five varieties are grown in both the yield nursery and in the uniform plot tests. This number is larger than was originally intended, but certain varieties were added to the plot tests and they seemed to be of value in the nursery tests, at least until a 5-year period is completed. It is the purpose of the nursery to test new material as rapidly as possible, yet care must be exercised or the turn-over will be so rapid as to defeat any attempts to study correlation from year to year or over a period of years. Since one of the objectives of the nursery is to obtain information on characters influencing yield, it is felt that certain varieties sh uld remain in the nursery for a reasonable length of time.

Table 16. - Varieties of winter-wheat grown as a uniform yield nursery, 1935.

Variety	C. I. No.	State or Hybrid Number
Kharkof	1442	------
Blackhull	6251	------
Nebraska No. 60	6250	------
Early Blackhull	8856	------
Turkey selection	10083	Okla. No. 1
Sibley No. 62	11523	------
Mediterranean selection	11587	Texas No. 3015-105-1
Kanred x Marquis	11589	Kans. No. 2690
P 1066-1 x Burbank	10087	------
Beloglina x Minturki	11588	North Platte 353
Beloglina x Hussar	11513	North Platte 126
P 1066-1 x Prelude	11590	Kans. No. 2695
Fulhard	8257	------
Prelude x Kanred	11591	Kans. No. 2689
Kanred x Hard Federation	11373	Kans. No. 2671
Do	10091	Kans. No. 2672
Do	10092	Kans. No. 2673
Kanred x (Kanred-Marquis)	11592	Kans. sel. No. 303942
Turkey selection	10015	Nebr. No. 1062
Do	10016	Nebr. No. 1069
Do	10094	Nebr. No. 1063
Do	11576	Nebr. sel. No. 31D650
Kanred selection	10099	Colo. No. 0166
Turkey selection	10100	Colo. No. 159
Do	11375	Colo No. 351
Do	11577	Nebr. sel. No. 31D101
Oro x Fulhard	11579	Nebr. sel. No. 23767
(Minhardi x Minturki C. I. 8034) x Temarq	11668	Nebr. sel. No. 23667
Kawvale x Temarq	11669	Nebr. sel. No. 23860
Akron sel.	11660	Akron No. 7

DATA OBTAINED

Table 17 presents data from six of the nurseries. No data were obtained at Denton owing to complete killing, none at Amarillo, Hays, and Alliance, owing to drought, and none at Akron because of ruination of the stands by rabbits during the winter. For each station the varieties are listed in order of yield for 1934. The average yield and rank for the 4-year period, 1932-35, and the 2-year period, 1934-35, are shown where possible. Only those data are given that showed difference or when the character seemed to have an influence on yield.

Stillwater, Okla.

(Four plots)

Table 17. - Agronomic and other data for the uniform winter-wheat varieties grown in replicated nursery plots in cooperative experiments at 6 experiment stations in the winter-wheat area, 1935.

Variety	C. I. No.	Dates		Hgt.	Test Weight (Per bu.)	Acre Yield	Average Yield 1934-35		Average Yield 1932-35	
		Headed	Ripe				Per Acre	Rank	Per Acre	Rank
			June	(In.)	(Lbs.)	(Bu.)	(Bu.)		(Bu.)	
Prelude x Kanred	11591	Apr. 26	10	38	61.5	35.9	37.6	1	-	-
Kawvale x Tenmarq	11669	Apr. 25	10	34	60.1	34.3	-	-	-	-
P 1066 x Prelude	11590	Apr. 26	10	38	59.8	34.3	35.7	2	-	-
Kanred x Hard Federation	10092	Apr. 25	12	35	60.6	34.1	34.3	4	38.3	1
P 1066-1 x Burbank	10087	Apr. 28	14	38	60.2	32.9	32.9	6	34.6	4
Kanred x Hard Federation	10091	Apr. 23	18	34	60.2	31.8	34.2	5	36.1	2
Do	11973	Apr. 25	14	34	61.3	31.3	34.5	3	36.4	3
Mediterranean sel.	11587	May 1	16	38	59.4	30.6	30.8	9	-	-
Kanred sel. 1	10099	May 3	16	38	57.2	30.2	30.5	10	34.1	5
Beloglina x Hussar	11513	May 1	16	38	55.4	30.1	31.4	7	-	-
Kanred x Marquis (Minhardi-Minturki) x Tenmarq	11589	Apr. 27	11	39	60.0	29.5	31.4	7	-	-
	11668	Apr. 26	10	34	60.1	28.8	-	-	-	-
Turkey sel.	10083	May 2	13	36	58.5	28.1	29.3	12	34.0	6
Sibley No. 62	11523	May 1	16	37	57.8	27.0	30.2	11	-	-
Nebraska No. 60	6250	May 6	17	37	58.8	26.0	27.5	14	32.0	9
Early Blackhull	8856	Apr. 20	8	33	61.1	24.4	27.8	13	29.3	15
Kharkof	1442	May 4	15	36	57.7	24.2	25.6	17	31.3	11
Fulhard	8257	Apr. 28	15	37	60.7	23.9	25.2	18	29.6	14
Turkey sel.	10016	Apr. 29	11	34	58.5	23.6	25.2	18	31.4	10
Blackhull	6251	May 1	15	38	60.4	23.0	26.1	16	30.0	13
Turkey sel.	10094	May 4	13	35	57.8	23.0	26.2	15	32.6	8
Do	10100	May 3	15	37	56.5	22.3	25.2	18	32.7	7
Kanred x (Kanred-Marquis)	11592	May 2	13	35	57.0	22.1	24.9	21	-	-
Oro x Fulhard	11579	Apr. 30	13	34	57.0	20.5	-	-	-	-
Turkey sel.	11375	May 3	15	36	56.0	19.8	23.9	22	31.0	12
Do	11576	May 2	15	35	55.0	18.4	21.0	23	-	-
Do	11577	May 1	13	34	55.0	17.4	-	-	-	-
Beloglina x Minturki	11588	May 7	15	34	58.0	17.3	20.0	24	-	-
Turkey sel.	10015	May 2	15	33	59.0	16.9	19.5	25	29.4	16
Akron sel.	11660	Apr. 28	11	34	54.0	14.9	-	-	-	-

Probable error of a difference, 1.4 bu.; probable error of a mean, 1.0 bu.; or 3.81 percent.

Table 17. - (Continued)

Woodward, Okla.

(Four plots; seeded Oct. 12-16, 1934; emerged Oct. 17-21.)

Variety	C. I. No.	Dates Headed	Dates Ripe	Hgt. (In.)	Lodging (P.ct.)	Shattering (P.ct.)	Test Weight (Per bu.) (Lbs.)	Acre Yield (Bu.)	Av. Yield 1934-35 Per Acre (Bu.)	Av. Yield 1934-35 Rank	Av. Yield 1932-35 Per Acre (Bu.)	Av. Yield 1932-35 Rank
Kanred x (Kanred-Marquis)	11592	May 8	June 24	23	20	19	59	21.7	19.8	2	-	-
Blackhull	6251	May 6	June 23	25	6	T	61	20.7	18.7	3	21.6	8
Kawvale x Tenmarq	11669	May 2	June 14	22	9	T	59	18.8	-	-	-	-
Oro x Fulhard	11579	May 7	June 25	23	10	T	60	18.3	-	-	-	-
(Minhardi-Minturki) x Tenmarq	11668	Apr.31	June 14	19	T	T	61	18.2	-	-	-	-
Fulhard	8257	May 5	June 21	24	16	3	61	17.2	18.6	4	21.3	10
Kanred sel.	10099	May 13	June 28	26	39	4	56	16.5	16.6	9	22.0	5
Turkey sel.	10083	May 12	June 28	26	43	3	57	15.9	17.4	7	22.5	2
Kanred x Marquis	11589	May 6	June 23	22	1	5	59	15.6	18.5	5	-	-
Beloglina x Minturki	11588	May 14	June 28	26	23	13	57	15.1	14.0	20	-	-
Akron sel.	11660	May 9	June 27	24	10	1	57	14.7	-	-	-	-
Turkey sel.	11576	May 11	June 28	23	13	3	56	14.6	15.5	16	-	-
Early Blackhull	8856	Apr.25	June 12	19	4	0	63	14.3	16.3	13	19.6	16
Kanred x Hard Federation	10091	Apr.28	June 17	17	T	T	62	14.3	18.2	6	21.5	9
Turkey sel.	11577	May 10	June 28	23	10	3	57	14.0	-	-	-	-
Do	10100	May 9	June 28	24	49	8	56	13.9	16.1	14	22.5	2
Beloglina x Hussar	11513	May 13	June 29	27	16	23	55	13.6	15.4	18	-	-
P 1066-1 x Burbank	10687	May 8	June 25	24	5	5	57	13.5	16.8	8	22.0	5
Kanred xHard Federation	10092	Apr.30	June 15	18	3	T	62	13.3	19.9	1	24.1	1
Kharkof	1442	May 13	June 29	25	31	1	56	13.0	15.3	19	21.9	7
P 1066 x Prelude	11590	May 2	June 23	20	15	0	57	12.5	16.6	9	-	-
Turkey sel.	10016	May 7	June 25	20	18	T	57	12.5	15.5	16	22.1	4
Sibley No. 62	11523	May 13	July 1	26	34	Q	55	12.3	13.5	23	-	-
Nebraska No. 60	6250	May 14	July 1	26	18	0	54	12.2	13.1	24	21.0	12
Turkey sel.	11375	May 12	June 28	23	13	T	57	12.0	13.8	21	20.3	13
Prelude x Kanred	11591	May 2	June 24	21	13	0	1/	11.8	16.5	11	-	-
Turkey sel.	10094	May 10	June 28	21	19	T	58	11.8	15.7	15	21.3	10
Do	10015	May 8	June 28	21	19	T	1/	9.8	13.7	22	20.3	13
Kanred x Hard Federation	11373	Apr.30	June 15	17	4	1	1/	8.8	16.5	11	20.2	15
Mediterranean sel.	11587	May 11	June 30	26	15	0	1/	6.1	9.6	25	-	-

Probable error of a difference, 2.9 bu.; probable error of a mean, 2.1 bu.; or 14.50 percent.

1/ Insufficient seed.

Table 17. - (Continued)

Manhattan, Kans.

(Three plots)

Variety	C. I. No.	Dates Headed	Dates Ripe	Hgt.	Lodging	Leaf Rust	Kernel Color Texture 1/	Kernel Plumpness	Protein	Test Weight (Per bu.)	Acre yield	Average Yield 1934-35 Per Acre	Average Yield 1934-35 Rank	Average Yield 1932-35 Per Acre	Average Yield 1932-35 Rank
		May		(In.)	(P.ct.)	(P.ct.)		(P.ct.)	(P.ct.)	(Lbs.)	(Bu.)	(Bu.)		(Bu.)	
Kawvale x Temmarq	11669	12	June 29	30	3	13	DH	86	15.25	60.6	39.9	-	-	-	-
Turkey sel.	10094	18	June 29	36	23	70	DH	86	15.00	59.1	36.8	36.1	1	39.5	1
Do	10016	13	June 29	36	12	65	DH	87	14.50	59.0	35.4	33.7	4	37.2	3
Prelude x Kanred	11591	11	June 27	33	7	5	DH	85	15.90	59.9	34.0	36.1	1	-	-
Blackhull	6251	18	July 3	36	25	57	SC	84	14.45	58.2	31.8	33.0	5	36.3	5
Turkey sel.	11576	18	July 3	37	38	83	DH	83	16.25	56.8	30.8	30.5	9	-	-
Sibley No. 62	11523	20	July 2	37	43	72	SC	83	-	55.8	30.7	32.5	6	-	-
Turkey sel.	11577	18	July 3	37	47	77	DH	84	16.00	56.8	30.6	-	-	-	-
Kanred x Marquis	11589	18	June 29	35	5	17	DH	86	14.65	58.3	30.1	29.1	17	-	-
Turkey sel.	11375	19	July 4	37	37	63	SC	84	-	57.2	29.3	28.6	18	31.5	15
Do	10083	19	July 2	38	47	80	DH	83	-	55.7	29.0	30.0	12	33.9	10
Oro x Fulhard	11579	15	July 1	35	30	75	DH	84	13.80	57.6	28.5	-	-	-	-
P 1066-1 x Burbank	10087	19	June 30	38	4	10	SC	82	-	56.4	28.4	30.7	8	36.0	6
Kanred x Hard Federation	10092	12	June 28	30	0	7	DH	88	13.70	57.7	28.3	35.7	3	39.0	2
Beloglina x Hussar	11513	22	July 4	38	42	50	SC-	79	-	53.2	28.2	29.9	14	-	-
Fulhard	8257	14	June 30	36	29	68	DH	85	13.70	58.9	28.9	26.8	23	32.6	13
Turkey sel.	10100	19	July 1	38	65	68	DH	82	-	54.6	27.8	29.2	16	33.0	12
Do	10015	15	July 4	35	40	80	DH	89	15.40	59.1	27.8	31.4	7	35.1	9
Kanred x (Kanred x Marquis)	11592	19	July 1	34	32	30	SC	82	14.75	54.8	27.1	30.3	10	-	-
P 1066-1 x Prelude	11590	11	July 1	32	10	8	DH	82	-	57.9	27.1	27.9	20	-	-
Mediterranean sel.	11587	20	July 1	38	18	27	SC-	83	-	56.6	26.8	29.8	15	-	-
Kharkof	1442	21	July 3	36	45	55	SC	80	-	52.9	26.8	24.4	24	28.5	16
Nebraska No. 60	6250	24	July 3	39	33	65	SC	83	-	55.0	26.6	27.5	21	32.1	14
Kanred x Hard Federation	11373	10	June 29	29	0	13	DH	88	-	58.5	25.2	30.3	10	36.7	4
(Minhardi-Minturki) x Temmarq	11668	13	June 29	30	0	40	DH	86	-	58.6	24.8	-	-	-	-
Akron sel.	11660	17	July 1	34	0	78	SS	85	15.05	56.0	24.7	-	-	-	-
Early Blackhull	8856	9	June 27	30	4	25	DH	88	15.25	60.9	24.2	30.0	12	35.7	8
Kanred sel.	10099	20	July 3	36	32	60	SC	76	-	53.9	24.1	27.1	22	33.5	11
Beloglina x Minturki	11588	26	July 3	38	63	72	SC	76	-	52.9	23.3	23.7	25	-	-
Kanred x Hard Federation	10091	9	June 30	26	0	10	SC	83	14.55	56.4	19.5	28.2	19	36.0	6

Probable error of a difference, 2.9 bu.; probable error of a mean, 2.1 bu.; or 7.24 percent.

1/ DH = Dark hard
SC = Subcorneous
SS = Substarchy

Table 17. - (Continued)

Fort Collins, Colo.

(Five plots)

Variety	C. I. No.	Spring Stand	Dates Headed	Dates Ripe	Hgt.	Lodging	Stem Rust	Acre Yield	Average Yield 1934-35 Bu. per Acre	Average Yield 1934-35 Rank
		(P.ct.)		July	(In.)	(P.ct.)	(P.ct.)	(Bu.)		
P 1066-1 x Prelude	11590	83	June 5	19	46	6	T+	60.3	65.2	1
Kanred x Hard Federation	11373	92	June 2	20	46	29	1	53.7	53.4	5
P 1066-1 x Burbank	10087	91	June 10	20	48	5	1	50.7	58.2	2
Beloglina x Hussar	11513	79	June 14	23	49	4	T	50.6	56.3	3
Kanred x Marquis	11589	87	June 8	19	47	0	T	50.3	52.8	6
Kanred x Hard Federation	10091	93	May 31	20	41	0	2	48.9	46.6	17
Prelude x Kanred	11591	89	June 4	18	49	24	T	48.7	56.3	3
Turkey sel.	10100	84	June 12	21	52	76	T	48.4	51.1	8
Kanred x Hard Federation	10092	89	June 3	19	44	15	2	48.3	48.6	11
Early Blackhull	8856	92	May 31	18	47	59	T	46.0	49.6	10
Blackhull	6251	90	June 10	21	51	60	T	44.4	47.7	15
Turkey sel.	11577	82	June 13	22	49	44	T	44.3	-	-
Do	10015	88	June 11	22	48	46	T	44.1	48.0	16
Do	10083	90	June 13	22	52	62	T	43.3	48.4	12
Kanred sel.	10099	89	June 13	22	50	52	T	42.5	52.8	6
Turkey sel.	11576	87	June 12	22	51	66	T	42.4	48.3	13
Do	10094	94	June 12	22	46	20	T	40.3	49.8	9
Sibley No. 62	11523	86	June 12	21	50	64	T	40.3	45.9	19
Kanred x (Kanred-Marquis)	11592	89	June 12	22	47	33	T	39.7	48.3	13
Mediterranean sel.	11587	90	June 13	22	53	26	T	39.3	41.9	24
Akron sel.	11660	89	June 12	21	47	0	T	38.6	-	-
Oro x Fulhard	11579	84	June 13	23	48	2	T	38.1	-	-
Beloglina x Minturki	11588	89	June 16	23	50	20	T	38.1	40.3	25
Turkey sel.	10016	83	June 10	21	47	24	T	38.0	46.3	18
Fulhard	8257	95	June 10	21	50	46	1	37.7	43.6	21
Turkey sel.	11375	88	June 14	23	49	24	T	37.7	42.8	22
Kawvale x Tenmarq	11669	84	June 8	19	43	0	T	35.8	-	-
Nebraska No. 60	6250	91	June 15	23	52	15	T	34.8	42.7	23
Kharkof	1442	86	June 13	22	50	53	T	33.3	43.9	20
Minhardi-Minturki x Tenmarq	11668	76	June 7	20	41	0	T	25.2	-	-

Probable error of a difference, 3.9 bu.; probable error of a mean, 2.8 bu.; or 6.53 percent.

Table 17. - (Continued)

Lincoln, Nebr.

(Three plots; rows 10 inches apart)

Variety	C. I. No.	Winter Survival (P.ct.)	Date Headed	Hgt. (In.)	Lodging (P.ct.)	Rust Leaf (P.ct.)	Rust Stem (P.ct.)	Acre Yield (Bu.)	Av. Yield 1934-35 Per Acre (Bu.)	Av. Yield 1934-35 Rank	Av. Yield 1932-35 Per Acre (Bu.)	Av. Yield 1932-35 Rank
Kawvale x Temmarq	11669	100	May 28	38	2	35	62	47.2	-	-	-	-
Akron sel.	11660	100	June 2	40	0	95	78	37.6	-	-	-	-
Turkey sel.	10016	99	June 1	39	34	98	20	34.7	22.9	3	25.0	5
Blackhull	6251	100	June 2	40	22	88	48	32.0	24.2	2	26.7	3
Turkey sel.	10015	100	June 2	40	60	95	23	32.0	21.0	8	23.0	8
Do	10094	100	June 3	39	38	98	43	31.3	22.8	4	24.9	6
Fulhard	8257	99	May 31	39	2	85	98	29.8	22.7	5	27.7	1
Early Blackhull	8856	98	May 25	37	3	83	30	28.7	25.3	1	27.4	2
(Minhardi-Minturki) x Temmarq	11668	100	May 28	36	0	75	100	25.7	-	-	-	-
Kharkof	1442	100	June 4	41	13	93	80	24.4	17.5	13	19.1	13
Turkey sel.	11577	100	June 3	40	59	88	33	24.4	-	-	-	-
Do	11576	100	June 3	40	47	98	33	24.0	17.5	13	-	-
Oro x Fulhard	11579	100	June 2	40	27	88	80	22.9	-	-	-	-
Prelude x Kanred	11591	92	May 28	39	7	85	90	22.0	21.4	6	-	-
Kanred x Kanred-Marquis	11592	95	June 4	36	5	70	70	22.0	17.0	15	-	-
P 1066-1 x Burbank	10087	98	June 3	40	0	58	95	21.6	19.4	10	25.3	4
Kanred x Hard Federation	10091	93	May 26	33	0	60	100	20.9	18.0	12	21.2	9
P 1066-1 x Prelude	11590	92	May 29	36	7	65	83	20.0	21.4	6	-	-
Kanred x Marquis	11589	98	May 31	38	12	73	90	19.8	16.6	16	-	-
Turkey sel.	11375	100	June 6	40	39	85	50	19.6	15.1	18	23.9	7
Kanred x Hard Federation	10092	95	May 29	35	0	78	100	19.5	19.6	9	19.6	11
Mediterranean sel.	11587	100	June 5	42	47	35	100	18.6	15.6	17	-	-
Kanred sel.	10099	100	June 5	40	64	78	85	18.3	13.0	23	19.5	12
Kanred x Hard Federation	11373	95	May 27	34	0	50	100	17.0	18.6	11	17.5	16
Turkey sel.	10083	98	June 5	39	51	75	83	16.2	14.6	19	18.7	14
Do	10100	100	June 5	40	73	90	93	15.7	14.4	20	20.5	10
Beloglina x Hussar	11513	100	June 10	40	17	83	93	15.6	13.5	22	-	-
Nebraska No. 60	6250	99	June 8	41	17	90	93	15.1	14.0	21	17.9	15
Sibley No. 60	11523	99	June 6	40	67	93	95	14.8	11.6	24	-	-
Beloglina x Minturki	11588	100	June 12	40	13	65	90	8.3	5.7	25	-	-

Probable error of a difference, 1.8 bu.; probable error of a mean, 1.3 bu.; or 5.54 percent.

Table 17. - (Continued)

North Platte, Nebr.

(Three plots)

Variety	C. I. No.	Winter Survival (P. ct.)	Dates Headed	Dates Ripe July	Hgt. (In.)	Lodging (P.ct.)	Stem Rust (P.ct.)	Acre Yield (Bu.)
Kawvale x Tenmarq	11669	100	May 30	7	41	5	13	43.2
Kanred x Marquis	11589	95	June 2	8	45	7	37	40.2
Prelude x Kanred	11591	100	May 29	6	46	23	22	39.8
Akron sel.	11660	100	June 2	9	45	0	40	39.6
Minhardi-Minturki x Tenmarq	11668	100	May 29	6	40	2	58	39.3
Turkey sel.	11577	100	June 6	8	44	50	13	38.6
P 1066-1 x Burbank	10087	98	June 3	7	45	3	60	38.5
Turkey sel.	10016	100	June 3	7	43	25	6	38.2
Fulhard	8257	100	June 1	6	45	23	62	37.7
Turkey sel.	11375	100	June 6	8	43	25	20	37.5
Kanred x Hard Federation	11373	97	May 27	6	41	3	57	37.1
Turkey sel.	10083	100	June 3	7	44	68	10	36.9
Kharkof	1442	99	June 9	9	46	8	20	36.7
Oro x Fulhard	11579	100	June 3	7	44	25	35	36.6
Kanred x Kanred-Marquis	11592	100	June 2	5	43	27	18	36.3
Turkey sel.	10015	100	June 5	7	44	37	13	36.3
Do	10100	100	June 5	7	44	53	33	35.9
Kanred x Hard Federation	10091	99	May 26	5	38	2	62	35.7
Sibley No. 62	11523	100	June 8	7	45	58	28	35.5
P 1066-1 x Prelude	11590	97	May 29	6	44	33	25	35.4
Beloglina x Hussar	11513	100	June 7	7	47	23	37	35.3
Kanred x Hard Federation	10092	99	May 30	5	39	7	72	34.6
Kanred sel.	10099	100	June 6	7	44	55	17	34.0
Early Blackhull	8856	97	May 29	6	43	52	10	32.8
Turkey sel.	11576	100	June 7	6	44	57	11	32.8
Blackhull	6251	97	June 5	7	44	27	7	32.7
Turkey sel.	10094	100	June 6	7	43	28	20	30.6
Beloglina x Minturki	11588	99	June 9	8	45	17	67	30.0
Nebraska No. 60	6250	100	June 9	9	47	8	20	29.8
Mediterranean sel.	11587	94	June 8	8	46	5	68	27.7

Probable error of a difference, 2.4 bu.; probable error of a mean, 1.7 bu.; or 4.64 percent.

The data for the most part are self-explanatory. In studying them it must be kept in mind that the winter was mostly mild and dry; late in the spring rather heavy rains were general, causing second growth and delaying maturity. At certain stations rust had a splendid opportunity to develop.

At Stillwater, 7 winter x spring combinations had the highest yields, while the later Turkey type wheats were the lowest yielders. For the most part, the yields were in line with the 2- and 4-year averages. The data from Woodward are variable, owing to a spotted condition of the nursery. Straw was short and lodging and shattering were noted. The yield data are not entirely in line with the record of previous years. From Manhattan rather complete data were reported. There seemed to be no close correlation between yield and earliness. Lodging was quite common in most varieties, although a number of stiff-strawed strains such as Kanred x Hard Federation and Akron selection showed no lodging. Differences were present with regard to leaf rust infection. No variety was clean, however, the lowest infection being on Prelude x Kanred (C. I. 11591) which had 5 percent, and the highest, on Turkey selection (C. I. 11576) with 83 percent. For the most part, the yields in 1935 were in line with the 2- and 4-year average yields.

At Fort Collins, spring stands were a bit variable. There seemed to be little relation between the data of heading and yield. Straw was tall and considerable lodging occurred; only a few of the stronger-strawed varieties remained erect. For the most part, yields were in line with the previous year.

Slight winter-killing was reported at Lincoln. Lodging was heavy for the weaker-strawed varieties, one of the weakest being Turkey selection (C. I. 10100), which is known to have been weak in previous years. Nearly all varieties were heavily infected with leaf and stem rust. Some of the strains most resistant to stem rust were the Turkey selections from Nebraska. Yields ranged from 8.3 to 47.2 bushels per acre.

Yields at North Platte ranged from 27.7 to 43.2 bushels per acre. Winter-killing was light and most of the varieties survived 100 percent. Lodging was recorded on all varieties except Akron selection. Stem rust was present on all varieties, there being a nice spread between the resistant and susceptible types. No long-time average is given for North Platte, because nursery data have been obtained there only in 1933 previous to this year.

PROBABLE ERRORS

Probable errors were calculated by "Students" generalized formula as outlined on page 21 of this summary. In table 18 the number of plots, average yields, and probable errors for each station are given. For the most part, the errors are not unusually high, except the probable error of a mean in percentage at Woodward. This was due to a combination of spotted soil, causing considerable variability and low yields.

Table 18. - Average yield, probable error of a difference, and generalized probable error of a mean for the uniform yield nursery at each cooperating station, 1935.

Station	No. of plots	Average acre yield of varieties	Probable error of a difference	Probable error of a mean	
				Bushels	Percent
Oklahoma:					
Stillwater	4	25.9	1.4	1.0	3.81
Woodward	4	14.2	2.9	2.1	14.50
Kansas:					
Manhattan	3	28.5	2.9	2.1	7.24
Colorado:					
Ft. Collins	5	42.8	3.9	2.8	6.53
Nebraska:					
Lincoln	3	23.3	1.8	1.3	5.54
North Platte	3	35.8	2.4	1.7	4.64

SUMMARY OF NURSERY YIELDS

The yields from the 30 varieties grown at 6 stations are summarized in table 19. The varieties are listed in the order of the 6-station average. These averages are of interest only insofar as they show the general adaptation of a variety. A more detailed study is made possible since the varieties have been averaged and ranked by States. Kawvale x Tenmarq (C. I. 11669) ranked first in Oklahoma and Nebraska, and at Manhattan and the 6-station average, but was 27th at Fort Collins. Prelude x Kanred (C. I. 11591), which ranked first in 1934, ranks second for the 6-station average in 1935. This strain made a very good record at most stations. Five strains had averages above Blackhull. All but three of the strains were above Kharkof and all but one, higher than Nebraska No. 60. Of the three Kanred x Hard Federation strains in the nursery, C. I. 10092 had the highest average yield and C. I. 10091, the lowest. Of the various Turkey selections included, C. I. 10016 had the highest average, followed by C. I. 10094. These two wheats were rather poor in Oklahoma, good in Kansas and Nebraska, and rather poor at Ft. Collins.

At the lower end of the table will be found Kharkof and Nebraska No. 60 as mentioned before, Turkey selection (C. I. 11375), Mediterranean selection (C. I. 11587), and Beloglina x Minturki (C. I. 11588). The Mediterranean selection ranks low because it is a soft wheat and unadapted at most of the stations reporting yields. The Beloglina x Minturki strain is too late for this area, its desirable character being bunt resistance.

In table 20 is presented a summary of yield data for 25 varieties that have been grown at 6 stations for two years, 1934-35. The varieties are listed in order of the average yields at the 6 stations. At the top of the list are 5 winter x spring hybrid strains. Prelude x Kanred (C. I. 11591) seems to have considerable yielding ability as it ranked first in yield at all stations last year. Six strains have average yields higher than Blackhull. On the basis of this 2-year average, Kanred x Hard Federation (C. I. 10092) seems better in yielding ability than C. I. 10091. Turkey selection (C. I. 10094) has a better 2-year record than Turkey selection (C. I. 10016). At the bottom of the list are such varieties as Kharkof, Nebraska No. 60, Turkey selection (C. I. 11375), and Beloglina x Minturki (C. I. 11588).

Sixteen varieties have been grown in the nursery for the 4-year period, 1932-35. In table 21 the yields for these varieties for all years grown are shown and a weighted average for 32 station years obtained. The varieties are listed in order of the average for all stations and for the most part, the order is the same as at the end of the 3-year period. P-1066-1 x Burbank (C. I. 10087) and three Kanred x Hard Federation strains head the list and have average yields above that of Blackhull. Turkey selections (C. I. 10015) and (C. I. 11375) are at the bottom of the list, together with Nebraska No. 60. For more detailed study, an average and rank by States is given. It would seem that the rankings agree fairly well with the exception that in Nebraska the slightly later wheats seem to do best. Several of the varieties that have made good showings in this nursery are now being grown in plot tests at several of the stations.

Table 19. - Summary of average yields of the 30 winter-wheat varieties grown as uniform yield nurseries at 6 stations in the hard red winter-wheat region, 1935.

Variety	C. I. No.	Oklahoma Bushels per Acre				Kansas Bu. per Acre		Nebraska Bushels per Acre				Colorado Bu. per Acre		Average bushel per acre
		Still-water	Woodward	Av.	Rank	Man-hattan	Rank	Lincoln	North Platte	Av.	Rank	Ft. Collins	Rank	6 stations
Kawvale x Temmarq	11669	34.3	18.8	26.6	1	39.9	1	47.2	43.2	45.2	1	35.8	27	36.5
Prelude x Kanred	11591	35.9	11.8	23.9	2	34.0	4	22.0	39.8	30.9	10	48.7	7	32.0
P 1066-1 x Prelude	11590	34.3	12.5	23.4	5	27.1	19	20.0	35.4	27.7	20	60.3	1	31.6
Kanred x Marquis	11589	29.5	15.6	22.6	9	30.1	9	19.8	40.2	30.0	14	50.3	5	30.9
P 1066-1 x Burbank	10087	32.9	13.5	23.2	7	28.4	13	21.6	38.5	30.1	13	50.7	3	30.9
Blackhull	6251	23.0	20.7	21.9	11	31.8	5	32.0	32.7	32.4	7	44.4	11	30.8
Turkey sel.	10016	23.6	12.5	18.1	22	35.4	3	34.7	38.2	36.5	3	38.0	24	30.4
Kanred x Hard Federation	10092	34.1	13.3	23.7	3	28.3	14	19.5	34.6	27.1	21	48.3	9	29.7
Fulhard	8257	23.9	17.2	20.6	14	27.9	16	29.8	37.7	33.8	5	37.7	25	29.0
Turkey sel.	10094	23.0	11.8	17.4	24	36.8	2	31.3	30.6	31.0	9	40.3	17	29.0
Kanred x Hard Federation	11373	31.3	8.8	20.1	15	26.2	24	17.0	37.1	27.1	21	53.7	2	28.9
Beloglina x Hussar	11513	30.1	13.6	21.9	11	28.2	15	15.6	35.3	25.5	26	50.6	4	28.9
Kanred x Hard Federation	10091	31.8	14.3	23.1	8	19.5	30	20.9	35.7	28.3	19	48.9	6	28.5
Early Blackhull	8856	24.4	14.3	19.4	17	24.2	27	28.7	32.8	30.8	11	46.0	10	28.4
Akron sel.	11660	14.9	14.7	14.8	29	24.7	26	37.6	39.6	38.6	2	38.6	21	28.4
Turkey sel.	10083	28.1	15.9	22.0	10	29.0	11	16.2	36.9	26.6	23	43.3	14	28.2
Do	11577	17.4	14.0	15.7	28	30.6	8	24.4	38.6	31.5	8	44.3	12	28.2
Kanred x (Kanred-Marquis)	11592	22.1	21.7	21.9	11	27.1	19	22.0	36.3	29.2	16	39.7	19	28.2
Turkey sel.	10015	16.9	9.8	13.4	30	27.8	17	32.0	36.3	34.2	4	44.1	13	27.8
Kanred sel.	10099	30.2	16.5	23.4	5	24.1	28	18.3	34.0	26.2	24	42.5	15	27.6
Oro x Fulhard	11579	20.5	18.3	19.4	17	28.5	12	22.9	36.6	29.8	15	38.1	22	27.5
Turkey sel.	10100	22.3	13.9	18.1	22	27.8	17	15.7	35.9	25.8	25	48.4	8	27.3
Do	11576	18.4	14.6	16.5	25	30.8	6	24.0	32.8	28.4	18	42.4	16	27.2
(Minhardi-Minturki) x Temmarq	11668	28.8	18.2	23.5	4	24.8	25	25.7	39.3	32.5	6	25.2	30	27.0
Sibley No. 62	11523	27.0	12.3	19.7	16	30.7	7	14.8	35.5	25.2	27	40.3	17	26.8
Kharkof	1442	24.2	13.0	18.6	20	26.8	21	24.4	36.7	30.6	12	33.3	29	26.4
Turkey sel.	11575	19.8	12.0	15.9	27	29.3	10	19.6	37.5	28.6	17	37.7	25	26.0
Mediterranean sel.	11587	30.6	6.1	18.4	21	26.8	21	18.6	27.7	23.2	28	39.3	20	24.9
Nebraska No. 60	6250	26.0	12.2	19.1	19	26.6	23	15.1	29.8	22.5	29	34.8	28	24.1
Beloglina x Minturki	11588	17.3	15.1	16.2	26	25.3	29	8.3	30.0	19.2	30	38.1	22	22.0
Probable error of a mean (bushels)		1.0	2.1	1.2	-	2.1	-	1.3	1.7	1.1	-	2.8	-	0.8
Probable error of a mean (percent)		3.81	14.50	7.50	-	7.24	-	5.54	4.64	3.61	-	6.53	-	3.30

Table 20. - Summary of average yields of 25 winter-wheat varieties grown in uniform yield nurseries at 6 stations in the hard red winter-wheat region, 1934-35.

Variety	C. I. No.	Oklahoma				Kansas		Colorado		Nebraska		Average bu. per acre 5 stations
		Bushels per Acre										
		Still-water	Woodward	Average	Rank	Man-hattan (Bu. per Acre)	Rank	Ft. Collins (Bu. per Acre)	Rank	Lincoln (Bu. per Acre)	Rank	
Prelude x Kanred	11591	37.6	16.5	27.1	1	36.1	1	56.3	3	21.4	6	33.6
P 1066-1 x Prelude	11590	35.7	16.6	26.2	3	27.9	20	65.2	1	21.4	6	33.4
P 1066-1 x Burbank	10087	32.9	16.8	24.9	7	30.7	8	58.2	2	19.4	10	31.6
Kanred x Hard Federation	10092	34.3	19.9	27.1	1	35.7	3	48.6	11	19.6	9	31.6
Do	11373	34.5	16.5	25.5	5	30.3	10	53.4	5	18.6	11	30.7
Turkey sel.	10094	26.2	15.7	21.0	16	36.1	1	49.8	9	22.8	4	30.1
Blackhull	6251	26.1	18.7	22.4	11	33.0	5	47.7	15	24.2	2	29.9
Early Blackhull	8856	27.8	16.3	22.1	13	30.0	12	49.6	10	25.3	1	29.8
Kanred x Marquis	11589	31.4	18.5	25.0	6	29.1	17	52.8	6	16.6	16	29.7
Beloglina x Hussar	11513	31.4	15.4	23.4	9	29.9	14	56.3	3	13.5	22	29.3
Kanred x Hard Federation	10091	34.2	18.2	26.2	3	28.2	19	46.6	17	18.0	12	29.0
Turkey sel.	10016	25.2	15.5	20.4	19	33.7	4	46.3	18	22.9	3	28.7
Kanred x (Kanred-Marquis)	11592	24.9	19.8	22.4	11	30.3	10	48.3	13	17.0	15	28.1
Kanred sel.	10099	30.5	16.6	23.6	8	27.1	22	52.8	6	13.0	23	28.0
Turkey sel.	10083	29.3	17.4	23.4	9	30.0	12	48.4	12	14.6	19	27.9
Fulhard	8257	25.2	18.6	21.9	14	26.8	23	43.6	21	22.7	5	27.4
Turkey sel.	10100	25.2	16.1	20.7	17	29.2	16	51.1	8	14.4	20	27.2
Sibley No. 62	11523	30.2	13.5	21.9	14	32.5	6	45.9	19	11.6	24	26.7
Turkey sel.	11576	21.0	15.5	18.3	23	30.5	9	48.3	13	17.5	13	26.6
Do	10015	19.5	13.7	16.6	25	31.4	7	47.0	16	21.0	8	26.5
Mediterranean sel.	11587	30.8	9.6	20.2	21	29.8	15	41.9	24	15.6	17	25.5
Kharkof	1442	25.6	15.3	20.5	18	24.4	24	43.9	20	17.5	13	25.3
Nebraska No. 60	6250	27.5	13.1	20.3	20	27.5	21	42.7	23	14.0	21	25.0
Turkey sel.	11375	23.9	13.8	18.9	22	28.6	18	42.8	22	15.1	18	24.8
Beloglina x Minturki	11588	20.0	14.0	17.0	24	23.7	25	40.3	25	5.7	25	20.7

Table 21. - Summary of average yields of 16 winter-wheat varieties grown in uniform yield nurseries at 10 stations in the hard red winter-wheat region for all or a part of the 4-year period, 1932-35.

Variety	C. I. No.	Texas		Oklahoma				Kansas					Colorado				Nebraska					Yield at all stations (Weighted average)
		Denton		Bushels per acre				Bushels per acre					Bushels per acre				Bushels per acre					
		(Bu. per acre	Rank	Stillwater	Woodward	Av.	Rank	Manhattan	Hays	Colby	Av.	Rank	Akron	Ft. Collins	Av.	Rank	Lincoln	North Platte	Alliance	Av.	Rank	
Number of years grown		3		4	4			4	3	1			2	2			4	2	3			
P 1066-1 x Burbank	10087	30.7	1	34.6	22.0	28.6	3	36.0	29.3	33.6	33.2	2	7.8	58.2	33.0	1	25.3	35.9	15.5	24.4	2	29.2
Kanred x Hard Federation	10092	30.5	2	38.3	24.1	31.2	1	39.0	26.3	36.8	34.0	1	8.6	48.6	28.6	8	19.6	33.4	15.0	21.1	13	28.7
Do	10091	31.2	3	36.1	21.5	28.8	2	36.0	27.8	30.4	32.2	5	8.2	46.6	27.4	10	21.2	34.4	14.7	22.0	10	27.8
Do	11373	28.4	5	36.4	20.2	28.3	4	36.7	25.6	27.6	31.4	6	8.3	53.4	30.9	4	17.5	33.0	15.4	20.2	15	27.1
Blackhull	6251	20.7	9	30.0	21.6	25.8	12	36.3	26.8	33.5	32.4	4	11.6	47.7	29.7	6	26.7	31.2	13.6	23.3	5	26.8
Turkey sel.	10094	15.7	14	32.6	21.3	27.0	8	39.5	23.4	36.7	33.1	3	10.6	49.8	30.2	5	24.9	29.9	16.4	23.2	6	26.8
Kanred sel.	10099	23.8	7	34.1	22.0	28.1	6	33.5	22.9	40.2	30.4	11	10.0	52.8	31.4	3	19.5	32.7	17.1	21.6	12	26.8
Turkey sel.	10100	19.6	10	32.7	22.5	27.6	7	33.0	22.9	44.5	30.7	9	13.0	51.1	32.1	2	20.5	35.5	16.8	22.6	9	26.8
Early Blackhull	8856	28.8	4	29.3	19.6	24.5	16	35.7	27.5	20.3	30.7	9	8.2	49.6	28.9	7	27.4	28.5	13.8	23.1	7	26.6
Turkey sel.	10083	25.0	6	34.0	22.5	28.3	4	33.9	24.7	38.8	31.1	7	5.0	48.4	26.7	11	18.7	32.5	15.3	20.6	14	26.3
Fulhard	8257	21.5	8	29.6	21.3	25.5	14	32.6	27.5	27.0	30.0	12	8.7	43.6	26.2	13	27.7	35.4	15.3	25.3	1	26.3
Turkey sel.	10016	16.9	13	31.4	22.1	26.8	9	37.2	22.3	32.6	31.0	8	8.8	46.3	27.6	9	25.0	33.0	15.7	23.7	4	26.1
Do	11375	15.2	15	31.0	20.3	25.7	13	31.5	23.0	35.1	28.8	14	9.0	42.8	25.9	14	23.9	35.4	17.8	24.4	2	25.1
Kharkof	1442	18.8	11	31.3	21.9	26.6	10	28.5	20.7	40.2	27.0	16	7.6	43.9	25.8	16	19.1	35.6	15.9	21.7	11	24.5
Turkey sel.	10015	12.2	16	29.4	20.3	24.9	15	35.1	18.4	38.1	29.2	13	6.2	47.0	26.6	12	23.0	33.2	16.3	23.0	8	24.5
Nebraska No. 60	6250	17.9	12	32.0	21.0	26.5	11	32.1	20.6	34.9	28.1	15	7.7	42.7	25.2	14	17.9	32.6	12.8	19.5	16	24.0

SUMMARY OF AGRONOMIC DATA

In table 22 are shown the averages for data on characters other than yield. The number of stations entering the averages for a given character also is shown.

Very little winter-killing occurred and only two stations reported data. A few of the winter x spring strains showed a survival below 100.

Average heading dates from 6 stations ranged from May 13 for Early Blackhull to May 30 for Beloglina x Minturki (C. I. 11588). A number of winter x spring strains are nearly as early as Early Blackhull. Dates of ripening agree very well with heading dates, although the spread in ripening is less than in heading.

Lodging data were reported from 5 stations, and the averages indicate that Kanred x Hard Federation (C. I. 10091), Minhardi-Minturki x Ternarq (C. I. 11668), Akron selection (C. I. 11660), and P 1066-1 x Burbank (C. I. 10087) have the strongest straw. The most lodging was present in Turkey selection (C. I. 10100).

Table 22. - Summary of agronomic data other than yield for 30 varieties of winter-wheat grown as uniform yield nurseries at 6 stations in the hard red winter-wheat region, 1935.

Variety	C. I. No.	Average							
		Winter Survival	Date Headed	Date Ripe	Hgt.	Lodging	Leaf Rust	Stem Rust	Test Weight (Per bu.)
Number of stations		2	6	5	6	5	2	2	3
		(P.ct.)	May		(In.)	(P.ct.)	(P.ct.)	(P.ct.)	(Lbs.)
Kharkof	1442	100	26	July 4	39	30	74	50	55.5
Blackhull	6251	99	23	July 2	39	28	73	28	59.9
Nebraska No. 60	6250	100	28	July 5	40	18	78	57	55.9
Early Blackhull	8856	98	13	June 26	35	24	54	20	61.7
Turkey sel.	10083	99	25	July 2	39	54	78	47	57.1
Sibley No. 62	11523	100	26	July 3	39	53	83	62	56.2
Mediterranean sel.	11587	97	25	July 3	41	22	31	84	58.0
Kanred x Marquis	11589	97	21	June 30	38	5	45	64	59.1
P 1066-1 x Burbank	10087	98	22	July 1	39	3	34	78	57.9
Beloglina x Minturki	11588	100	30	July 3	39	27	69	79	56.0
Beloglina x Hussar	11513	100	27	July 4	40	4	67	65	54.5
P 1066-1 x Prelude	11590	95	17	June 30	36	14	37	54	58.2
Fulhard	8257	100	20	July 1	39	23	77	80	60.2
Prelude x Kanred	11591	96	17	June 29	38	15	45	56	60.7
Kanred x Hard Federation	11373	91	15	June 29	34	7	32	79	59.9
Do	10091	96	14	June 30	32	T	35	81	59.5
Do	10092	97	17	June 28	34	5	43	86	60.1
Kanred x (Kanred-Marquis)	11592	98	23	July 1	36	23	50	44	56.9
Turkey sel.	10015	100	23	July 3	37	40	88	18	59.1
Do	10016	100	21	July 1	37	23	82	13	58.2
Do	10094	100	24	July 2	37	26	84	32	58.3
Do	11576	100	24	July 3	38	44	91	22	55.9
Kanred sel.	10099	100	26	July 3	39	48	69	51	55.7
Turkey sel.	10100	100	24	July 2	39	63	79	63	55.7
Do	11375	100	26	July 4	38	28	74	35	56.7
Do	11577	100	24	July 3	38	42	83	23	56.3
Oro x Fulhard	11579	100	22	July 2	37	19	82	58	58.2
Minhardi-Minturki x Ternarq	11668	100	18	June 28	33	T	58	79	59.9
Kawvale x Ternarq	11669	100	18	June 28	35	4	24	38	59.9
Akron sel.	11660	100	22	July 2	37	2	87	59	55.7

Leaf- and stem-rust data were reported from two stations. Stem-rust infections were heavy, the lowest average being 24 percent on Kawvale x Tenmarq (C. I. 11669) and the highest, 88 percent on Turkey selection (C. I. 10015). No variety was really resistant to stem-rust, although several of the Turkey selections had low average infections. The susceptible varieties had rather high average infections.

Test weights were reported from 3 stations and when these were averaged there was considerable range. Early Blackhull had the highest average of 61.7 pounds per bushel and Beloglina x Hussar (C. I. 11513) had the lowest, which was 54.5 pounds per bushel. Only four strains had averages of 60 pounds per bushel or better.

DATA FROM THE DISEASE NURSERIES

BUNT NURSERY

For convenience, a copy of the data from the uniform winter-wheat bunt nursery is included in this report. The data are presented in table 23.

UNITED STATES DEPARTMENT OF AGRICULTURE

Bureau of Plant Industry

SUMMARY OF UNIFORM WINTER-WHEAT BUNT NURSERY, GREAT PLAINS AREA 1934-35

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The uniform winter-wheat bunt nursery in the Great Plains area was continued in 1934-35, in the same manner as in previous years. This report gives a summary of the data obtained in 1934, together with averages for the 4-year period, 1932-1935.

In the fall of 1934, 50 varieties and strains of winter wheat were seeded in duplicate 8-foot rows at 12 stations in the Great Plains and at Kearneysville, W. Va. The nursery included strains that had shown resistance in previous years and new strains of interest at the various stations.

Before inoculation the seed was treated with formaldehyde and thoroughly washed in water. When dry, the seed for each station was smutted with inoculum from the particular station to which the seed was to be sent. Inoculum for each station was obtained from the previous year's nursery at that station by selecting bunted heads from all infected varieties. For the Kearneysville nursery, the seed was inoculated with a composite made up of inoculum from all the other nurseries. The smut used in all these tests was Tilletia levis, the smooth-spored species.

The data obtained from 9 nurseries are recorded in table 23. No counts were obtained at Amarillo, Texas, Alliance, Nebr., Akron, Colo., or St. Paul, Minn., because of very poor stands caused by drought or winter-killing.

The varieties are listed in the accompanying table in the order of average infection at the 9 stations. It will be seen that no strain was clean at all stations, the average infections ranging from 0.2 to 66.5 percent. A total of 38 strains had an average infection of less than 10 percent. The low infection on several of the Oro x Tenmarq strains is of interest, the strains apparently being more resistant than Oro. The low infection on Cheyenne sel. is also rather encouraging. It will also be noticed that Minturki for the first time showed an unusually high infection at all stations.

Owing to a rather rapid turn-over in the nursery only 11 varieties have been included for the 4-year period. Of these, Hussar has the best record with an average infection of 0.4 percent. Twenty-six varieties have been tested for two years. Of these, Martin-Blackhull x Blackhull (C. I. 11572) Hussar and Beloglina x Hussar (C. I. 11583) have the best records. Three susceptible varieties, Cheyenne, Kharkof, and Quivira are continued as checks.

October 21, 1935.

Table 22.—Summary of bunt infection on 50 varieties and strains of wheat grown in the uniform winter-wheat bunt nursery at 9 stations in the Great Plains area, 1934-35, and average bunt infection for 1932 to 1935.

Variety	C.I.No.	Average percentage of bunt at —									Average		
		Denton, Texas	Stillwater, Okla.	Woodward, Okla.	Manhattan, Kans.	Lincoln, Nebr.	Fort Collins, Colo.	Moccasin, Mont.	Bozeman, Mont.	Kearneysville, W. Va.	9 Stations 1935	1934 & 1935 (Weighted	1932-1935 (Weighted
Martin-Blackhull x Blackhull	11572	0.0	0.0	0.0	0.0	0.0	0.9	0.5	0.0	0.0	0.2	0.2	—
Hussar	4843	0	0	0	0	0	1.1	0	.5	.9	0.3	0.3	0.4
Oro x Tenmarq	11677	0	0	0	0	0	0	2.4	.3	0	0.3	—	—
Do.	11674	0	0	.5	0	0	.2	1.2	.7	.5	0.3	—	—
Do.	11675	0	0	.2	0	.4	0	2.3	.2	0	0.3	—	—
Beloglina x Hussar	11583	2.8	0	0	.2	0	.9	0	1.0	0	0.5	0.3	—
Ridit x Nebr. No. 6	11670	0	0	.6	.1	0	.2	.3	.7	2.7	0.5	—	—
Turkey sel.	11576	0	.3	1.2	0	.3	1.7	1.1	1.0	2.2	0.9	0.8	—
Beloglina x Hussar	11513	2.0	1.9	0	1.2	0	.5	.7	2.3	.9	1.1	0.6	—
Oro x Tennmarq	11673	.6	0	1.8	0	0	1.3	1.8	1.5	3.0	1.1	—	—
Cheyenne sel.	11666	0	1.0	.5	0	0	.4	2.6	.7	6.1	1.3	—	—
Oro x Tenmarq	11676	0	.4	.2	.3	0	1.0	8.2	.3	1.0	1.3	—	—
Minturki x Blackhull	11671	0	1.5	1.1	.3	0	2.9	.4	1.5	4.8	1.4	—	—
Turkey sel.	10016	1.0	.6	.4	.7	.5	1.8	2.6	2.4	3.9	1.5	1.2	1.0
Wheat x Rye (Meister)	11403	0	3.0	2.6	1.5	1.1	1.4	0	.9	5.4	1.8	—	—
Minturki x Marquis	11658	.9	.9	2.0	1.4	0	4.0	1.3	1.0	5.6	1.9	—	—
Yogo	8033	.4	1.7	2.7	0	.3	2.8	1.8	1.2	9.8	2.3	1.7	1.6
Ioturk	11388	1.6	2.9	.5	.5	0	3.7	2.2	2.4	8.9	2.5	2.3	—
Oro x Tenmarq	11672	0	0	.4	.7	0	2.8	10.5	1.2	6.7	2.5	—	—
Turkey	11376	2.8	1.6	2.0	.9	0	3.2	3.7	2.2	6.7	2.6	2.0	—
Martin-Blackhull x Blackhull	11571	0	.5	1.1	1.5	.4	5.4	10.5	.5	3.8	2.6	1.6	—
Beloglina x Hussar	11582	2.4	.7	.5	0	0	.5	0	16.5	3.2	2.6	1.6	—
Turkey sel.	10094	1.1	1.3	2.9	1.5	0	4.5	6.7	4.4	4.0	2.9	2.2	1.8
Minturki x Beloglina-Buffum	11661	2.1	.4	2.0	2.7	0	5.4	3.2	1.3	9.3	2.9	—	—
Oro	8220	3.4	1.3	2.5	1.7	2.0	1.5	6.2	4.5	3.9	3.0	4.1	4.5
Turkey sel.	11667	13.3	1.1	.3	.2	.2	2.2	2.0	.5	8.6	3.2	—	—
Tenmarq x Minturki	11580	1.2	1.2	3.5	.2	.6	6.4	2.6	4.9	12.1	3.6	2.8	—
Turkey x Minturki	11662	5.6	3.9	4.4	0	.7	8.4	1.2	1.2	8.6	3.8	—	—
Oro x Fulhard	11579	2.1	1.5	5.0	2.1	0	5.4	5.1	9.0	8.1	4.3	3.8	—
Turkey sel.	10015	5.8	2.7	4.2	1.0	.3	8.3	8.1	3.2	12.4	5.1	4.3	3.8
Minturki x Marquis	11502	3.8	3.0	3.3	.6	.9	13.5	5.5	6.4	20.7	6.4	4.5	—
Beloglina x Hussar	11664	17.0	4.1	1.1	2.4	.7	.5	0	31.0	1.5	6.5	—	—
Ridit	6703	1.3	2.4	7.4	2.6	1.6	7.9	4.7	13.2	18.2	6.6	6.4	4.2
Minturki x Marquis	11501	6.4	5.8	10.2	1.0	4.1	8.2	7.2	2.2	15.8	6.8	5.0	—
Beloglina x Hussar	11663	22.1	6.4	.7	.6	1.5	0	0	34.9	3.9	7.8	—	—
Minturki x Marquis	11659	13.2	6.1	8.2	1.7	1.5	11.1	8.7	6.7	14.3	7.9	—	—
Beloglina x Minturki	11515	9.7	2.1	2.4	2.9	15.0	7.8	6.5	15.0	20.4	9.1	6.4	—
Yogo sel.	11678	16.4	5.6	2.0	4.9	.9	.8	7.1	41.6	7.1	9.6	—	—
Minturki x Turkey	11500	10.2	7.1	10.0	2.7	4.2	27.7	9.0	15.9	26.1	12.5	9.6	—
Beloglina x Minturki	11588	16.2	8.6	4.2	2.6	6.3	16.9	2.6	28.4	27.7	12.6	7.7	—
Minturki	6155	26.0	21.3	14.2	6.4	5.6	20.1	14.1	14.3	21.8	16.0	9.6	7.1
Minard x Minhardi	11656	26.2	10.5	14.8	3.3	3.1	19.6	16.2	15.2	37.7	16.3	—	—
Kawvale x Tenmarq	11669	3.7	11.9	24.2	6.5	9.9	2.3	29.9	33.5	49.7	19.1	—	—
Minturki x Marquis	11657	35.6	31.5	27.6	11.5	6.9	27.7	40.7	28.2	58.0	29.7	—	—
Mediterranean x Hope	11665	58.4	34.8	35.8	18.7	2.9	57.8	37.0	52.8	71.7	41.1	—	—
Minhardi - Minturki x Tenmarq	11668	20.8	51.7	64.7	30.0	19.8	61.6	27.8	52.0	92.9	46.8	—	—
Cheyenne	8885	50.9	52.2	61.7	18.0	23.7	44.7	67.1	61.8	92.5	52.5	44.2	42.1
Kharkof	1442	47.4	57.0	66.4	32.6	18.6	67.9	41.3	53.9	91.3	52.9	52.6	47.3
Quivira	8886	75.5	64.5	76.0	32.4	35.7	62.0	53.8	59.0	89.4	60.9	46.4	39.5
Turkey (Keliehor's)	11679	81.4	55.8	80.7	52.8	45.4	62.0	72.9	50.5	97.0	66.5	—	—
Average infection	-	11.8	9.5	11.2	5.1	4.3	12.0	10.8	13.7	20.0	—	—	—

DISEASE GARDEN

In table 24 a summary is given of the data obtained in the disease garden at Manhattan, Kans. This garden is conducted by C. O. Johnston and the data are presented through his kind cooperation. Data were obtained for infections on bunt, leaf rust, stem rust, and mildew. The data on rust are probable the best obtained since the coordinated program was started. Since only a trace of loose smut was obtained on a few varieties these data are not presented.

Table 24. - Reaction of 50 winter-wheat varieties grown in the wheat-disease garden to bunt, leaf rust, stem rust, and mildew, Manhattan, Kans., 1935.

Variety	C. I. No.	Percentage of infection			Mildew coefficient
		Bunt	Leaf rust	Stem rust	
Kharkof	1442	57.7	65	25	3
Kanred	5146	73.8	65	5	4
Tenmarq	6936	64.9	45	10	3
Quivira	8886	57.9	10	5	2
Kanred x Hard Federation	10091	71.4	15	80	4+
Do	10092	83.8	10	60	4+
Blackhull	6251	69.9	70	10	4
Cheyenne	8885	72.0	70	25	4
Minturki	6155	11.8	75	25	4
Nebraska No. 60	6250	46.7	75	30	3
Turkey sel.	10016	1.1	80	10	3
Do	10094	2.9	80	10	3
Do	11576	0.0	80	10	2+
Do	11577	0.5	70	10	3
Early Blackhull	8856	86.9	70	15	4
Mediterranean sel.	11587	84.2	10	70	4
White Mediterranean	10023	64.6	45	50	4+
Beloglina x Hussar	11513	1.4	65	40	2
Kanred x Marquis	11589	70.8	25	15	4+
Beloglina x Minturki	11588	10.4	75	30	3
P 1066-1 x Prelude	11590	53.4	10	5	2
Prelude x Kanred	11591	60.9	15	10	2+
Kanred x (Kanred x Marquis)	11592	81.1	65	15	4+
Oro x Fulhard	11579	1.8	70	15	3
C. I. 8034 x Tenmarq	11668	58.5	60	70	4
Kawvale x Tenmarq	11669	25.8	15	25	3
Akron sel.	11660	68.5	70	20	2+
Cheyenne sel.	11666	0.6	75	10	2+
Turkey sel.	11667	3.7	80	10	4
Ridit x Nebraska No. 6	11670	1.4	60	5	2
Minturki x Blackhull	11671	1.4	80	5	4
Oro x Tenmarq	11672	0.0	10	5	2+
Do	11673	0.9	25	5	3
Do	11674	0.2	25	15	3
Do	11675	0.0	70	10	4
(Martin x Blackhull) x Blackhull	11571	34.0	80	5	4
Do	11572	0.5	70	25	3
Oro x Tenmarq	11676	2.2	65	10	2
Do	11677	0.0	65	10	2
Mediterranean Texas 3015-63 x Hope	11665	23.7	15	T	2
Beloglina x Hussar	11663	1.6	65	50	3
Do	11664	4.2	60	60	3
Do	11582	0.2	80	75	4
Do	11583	0.7	80	70	3
Wheat x Rye (Meister)	11403	4.1	65	3	1
Minard x Minhardi	11656	5.9	70	8	2
Minhardi x Marquis	11657	23.1	65	5	4
Minturki x Marquis	11658	97.9	70	40	4
Do	11659	4.0	70	40	3
Turkey x Minturki	11662	0.6	80	5	4