

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
CROPS RESEARCH DIVISION

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COMPARISON OF
WINTER WHEAT VARIETIES GROWN IN COOPERATIVE
PLOT AND NURSERY EXPERIMENTS IN THE
HARD RED WINTER WHEAT REGION
IN 1957

Preliminary report not for publication^{1/}

^{1/} This is a progress report of cooperative investigations containing data, the interpretation of which may be modified with additional experimentation. Therefore, publication, display, or distribution of any data or any statements herein should not be made without prior written approval of the Crops Research Division, ARS, USDA, and the cooperating agency or agencies concerned.

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By

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

EXPERIMENTS IN 1957

Few changes from the pattern familiar to the cooperators occur in this report. Data from the uniform varieties in field plots or advanced nurseries and from the uniform yield nursery are presented and summarized as in the past. Certain changes in the method of reporting data from the uniform winterhardness nursery from that of prior years will be noted.

An endeavor has been made to acknowledge those who cooperated in the regional program during the year. A special work of appreciation is due to those who gave a little or a lot of their time. Those individuals listed below contributed in special ways to the planning and execution of the program.

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* Denotes Federal employees, full-time or part-time.

Several personnel changes have occurred in the hard red winter wheat region since 1956. Roscoe Bellingham, formerly plant pathologist at Hays, Kansas, was transferred to Stillwater, Oklahoma. John Miller resigned as Agronomist at Hays to accept a position with the Forage Crops Branch, A.R.S., in Virginia. He is replaced at Hays by J. A. Wilson. Lewis Browder of Stillwater, Oklahoma, is the new Cereal Pathologist at Manhattan, Kansas, replacing M. D. Huffman. Milton Greenwood, Agronomist at North Platte since World War II, passed away in September after several months illness. Milton was an excellent cooperater and he will be missed by his many friends and co-workers in Nebraska. The vacancy at North Platte has not yet been filled. Other personnel changes in Nebraska include the transfer of Robert O'Keefe, formerly Superintendent at the Box Butte Experiment Farm, Alliance, Nebr., to the Horticulture Department at the Agricultural College, Lincoln. The new Superintendent at Alliance is Paul Ehlers. R. P. Pfeifer resigned as Agronomist in charge of small grains investigations at Laramie, Wyoming, to accept a similar position at Pennsylvania State College. His replacement at Laramie is Bernard Kolp. J.R. Brandon was transferred from Akron to Ft. Collins, Colorado. He is succeeded as superintendent of the U. S. Dryland Field Station at Akron by C. E. Johnson.

ACCESSION NUMBERS ASSIGNED

Cereal Investigation, or C. I., numbers were assigned to 16 varieties of hard red winter wheat this year. When a number is assigned, seed of that variety is added to the permanent collection maintained by the Cereal Crops Research Branch at Veltsville, Md., under the direction of D. J. Ward. C. I. numbers take precedence over State and local numbers in this report and it is hoped that they will be used when workers publish reports or correspond. Numbers assigned in 1957 and heretofore unreported numbers are listed below:

C. I. No.	Name	State No.
13189	Kan.-H. Fed.-Tq.-Med.-Hope x Cimarron	Tx. 274-51-A4
13190	Pawnee x Cheyenne	Nebr. 483310
13261	Rex-Rio x Cheyenne ⁴	Idaho
13262	Rex-Rio x Chenenne ³	Idaho
13263	Kharkof 17-7	Montana
13363	Rosetta	Mr. A. Ludeman
13364	Harveyland	Mr. E. Smurr
13395	Avoca	Mr. J. Danne
13426	Cheyenne 57 (Rex-Rio x Cheyenne ⁴)	Idaho
13427	Yogo x Turkey-Oro 66	Montana
13428	Yogo x Turkey-Oro 88	Montana
13429	Yogo x Turkey-Oro 121	Montana
13430	Agrotricum	Calif. 6096
13434	Itana Sel. 1	Idaho
13501	Cheyenne x Kenya-Mentana	Nebr. 57187
13502	McM.-Exch.-Redman ³ x Cheyenne	Nebr. 56156
13503	do	Nebr. 57182
13504	Mediterranean Sel. 40	Tx. 524180
13505	H255-49-5-1-4 x Blackhawk	Minn. III-54-9
13506	do	Minn. III-54-25
13507	Rio Negro x Comanche	Kans. 56738

NEW VARIETIES

Since 1956, three new hard red winter wheat varieties have been released in Montana. Westmont (C. I. 12930), a medium tall, brown-chaffed, smut-resistant variety from a Rio-Rex x Nebred cross made at Moro, Oregon, is being recommended in Montana west of the Continental Divide. Its performance in this area of Montana has been consistently better than other dwarf smut-resistant varieties and selections.

Itana (C. I. 12933), the second dwarf smut-resistant variety released in Montana, also was bred at Moro, Oregon. It is from a cross of Blackhull-Rex x Cheyenne and is a medium tall, brown-chaffed variety. It is recommended in Montana for the dwarf smut areas east of the continental divide and for production under irrigation in the Yellowstone valley.

Third variety released by Montana is C. I. 13181 from the Montana cross of Yogo x Rescue. It has been named Rego and is recommended for production in the western portion of the triangle area. Its outstanding characteristic is a solid stem derived from Rescue and associated resistance to the sawfly. It is somewhat deficient in test weight and winterhardiness and its yield in the regional uniform winterhardiness nursery has been only mediocre.

Several experimental varieties are under preliminary increase for possible release and distribution in 1958 or 1959. The Plains Sub-station in New Mexico has Red Chief x Cheyenne (C. I. 13016) under increase on 10 acres of irrigated land. Naming release is anticipated by the next planting season.

Texas is increasing Kan.-Hd.Fed.-Tq.-Med.-Hope x Cimarron (C. I. 13023). It has outstanding test weight and an excellent yield record in the southern district of the region. C. I. 13023 is moderately early, is resistant to soil-borne mosaic and has moderately short straw.

The 1957 Kansas Wheat Conference voted to increase Early Blackhull-Tq. x Oro-Med.-Hope (C. I. 12871) and Med.-Hope-Pawnee x Oro-Ill. #1-Com. (C. I. 12804) for possible release in Kansas. Both varieties have a number of outstanding characteristics such as earliness, high test weight, long mixing time, and leaf rust and bunt resistance for C. I. 12871, and short stiff straw, resistance to leaf rust, race 56 of stem rust, hessian fly and soil-borne mosaic in the case of C. I. 12804. Both have been somewhat variable in yield in regional tests, although C. I. 12871 has been outstanding during the last two years, particularly in Oklahoma.

The first increase of breeders seed of Pawnee x Nebred (C. I. 13015) is being made in Nebraska for possible release and distribution to growers in eastern Nebraska by the fall of 1959. C. I. 13015 is early maturing, resistant to bunt and soil-borne mosaic, is less susceptible to shattering, and has better quality than Pawnee. Its area of adaptation appears to be restricted to the eastern portion of Nebraska.

WEATHER AND CROP HIGHLIGHTS

Nineteen fifty-seven will be remembered as the year in which the drought was broken in the southern and central plains. For wheat farmers in Oklahoma and Texas especially, it was a year of frustrating extremes. Seldom has a crop been seeded with less soil moisture. Practically the entire hard red winter wheat region experienced fall and winter drought in some degree. Seeding generally was delayed and a considerable acreage was "dusted in." Late emergence, subnormal fall growth, and continued drought during the early winter resulted in high abandonment in some areas. However, a surprising amount of the wheat hung on until the rains started in late winter. From that point until harvest the southern part of the region was as excessively wet as it had been dry earlier. Frequent torrential rains brought

devastating floods to many parts of Texas and Oklahoma. Wheat that had barely survived the winter drought soon was standing in or submerged in water. The wet weather continued in much of the southern and central portions of the region throughout the remainder of the wheat growing season. Rank growth, heavy lodging, wet fields, and delayed ripening plagued the growers during harvest although fair yields were obtained despite these conditions. Record or near-record yields were recorded in Nebraska, Colorado, Wyoming, South Dakota, and Montana. Average acre yields and other winter wheat production data for 11 States in the region are summarized below:

State	Acres planted ^{1/}	Acres harvested ^{2/}	Abandon- ment %	1957 production ^{1/} Bu.	1957 average acre yields ^{2/} Bu.	1946-55 average acre yields ^{2/} Bu.
Texas	3,159	2,322	26.5	33,669	14.5	10.8
Oklahoma	4,276	3,442	19.5	43,025	12.5	12.9
New Mexico	297	105	64.6	1,732	16.5	7.6
Kansas	7,199	5,269	26.8	100,111	19.0	15.8
Nebraska	3,284	2,911	11.4	78,597	27.0	20.4
Colorado	2,007	1,336	33.4	32,732	24.5	16.4
Wyoming	275	248	9.8	5,456	22.0	18.7
Montana	1,885	1,848	2.0	46,200	25.0	20.8
South Dakota	411	368	10.5	10,488	28.5	15.7
Iowa	136	128	5.9	3,456	27.0	21.2
Minnesota	36	33	8.3	742	22.5	19.7
United States	37,535	31,613	15.8	707,201	22.4	18.6

Coincidental with the excessively wet and cool spring throughout the region was the high incidence of certain insects and diseases. Cutworms and armyworms built up to damaging populations at Denton, Texas. Attempts to control them by spraying were frustrated by almost continuous rains and wet weather. Armyworms became heavy at Chillicothe also but were kept under control by aerial spraying of Texaphene. The occurrence of *Septoria tritici* and mildew was widespread in the region. *Septotia nodorum* was identified at both Denton and Chillicothe. Leaf rust reached epidemic proportions in the eastern half of Kansas. Soil-borne mosaic was reported from the eastern portions of Oklahoma, Kansas, and Nebraska. It persisted throughout the wheat-growing season in eastern Kansas. Heavy mildew was reported at Ames, Iowa. Scab was prevalent in Nebraska and South Dakota.

Undoubtedly the most unusual occurrence in 1957 was the far northward movement of *Puccinia glumarum*. The disease reached epidemic proportions in irrigated wheat fields in parts of the Texas panhandle. It was found by the coordinator in trace amounts and locally heavy infection centers in Oklahoma, Kansas, Nebraska, Colorado, Wyoming, South Dakota, and Montana. Prior to 1957 stripe rust had not been reported north of Denton, Texas, in the Plains area.

^{1/} In thousands.

^{2/} Based on harvested acres. Data taken from the 1957 Annual Summary of Crop Production, U. S. Dept. of Agriculture, Agr. Marketing Service, Crop Reporting Board.

UNIFORM VARIETIES IN FIELDS PLOTS OR IN ADVANCED NURSERIES

For uniform variety testing the hard red winter wheat region is divided into districts as follows:

Southern district - Texas, New Mexico, Oklahoma
 Central district - Kansas, Colorado, Nebraska
 Northeast district - Iowa, South Dakota, Minnesota
 Northwest district - Wyoming, Montana

The tabulation below indicates the varieties that were grown uniformly in each district in 1957. The same varieties are designated as uniform varieties for 1958.

Variety	: C. I. :	:	:	:	:
	: No. :	S	C	NE	NW
	:	:	:	:	:
Kharkof	1442	X	X		X
Early Blackhull	8856	X			
Comanche	11673	X	X		
Concho	12517	X	X		
Crockett	12702	X			
Bison	12518		X		
Pawnee	11669		X		
Ea. Blkh.-Tq.x Oro-Med.-Hope	12871	X	X		
Minturki	6155			X	
Minter	12138			X	X
Nebred	10094			X	
Yogo	8033				X

Kharkof and Early Blackhull are permanent check varieties in the southern district; Pawnee and Kharkof in the central district; Minturki and Kharkof are so designated in the northeast and northwest districts, respectively.

Each station grows varieties of local interest in addition to the uniform set. This report includes data on all varieties reported by the various cooperators.

PLOT DATA

Cooperators again were requested to furnish information concerning the weather, soil moisture, diseases, insects, and other factors contributing to the performance of varieties at their stations. The information received is summarized below, together with comments about experimental results as reported in table 1.

The variety test at Denton was abandoned. Satisfactory fall stands were obtained, and condition of the nursery was excellent throughout the winter. Rainfall at Denton was above normal in February and March but became excessive in April and May. April rainfall was 12.18 inches as compared with a 44-year average of 3.71 inches. In May, precipitation was even greater, with 16.75 inches falling. The 44-year average for the month was 4.61 inches. The long period of heavy rain kept the ordinarily well drained nursery soil saturated and caused much of the wheat to drown. The incidence of speckled leaf blotch and glume blotch was heavier than ever previously recorded. Strains in the breeding nursery were defoliated and killed before heading. Leaf and stem rust was light. Cutworms and armyworms in April and May ate most of the leaves still remaining after the Septoria and clipped off the awns of the bearded varieties.

Twenty-three strains were evaluated in the variety test at Chillicothe. Seeding was on November 6 in fair surface moisture. Emergence was somewhat slow and uneven but by January full stands prevailed. A few light freezes and some hail damage occurred in March, but on April 12-15 a killing freeze caused extensive leaf damage and sterility of tip spikelets of early strains in the boot. Heading was about 10 days later than normal. Rain totaling 8.45 inches in April broke a 53-year precipitation record. May rainfall was 8.54 inches. Rain in 30 out of 61 consecutive days caused severe lodging. Yield and test weight were reduced by epidemics of leaf rust and *Septoria tritici*. Loose smut was prevalent. Stem rust and *Septoria nodorum* were present but light. Stripe rust was observed for the first time at Chillicothe. Aerial spraying with Toxaphene was necessary to control the armyworms. Despite all of these hazards, yields were the highest since 1950 although test weights were, for the most part, much below normal. Ponca, Crockett, and C. I. 12871 were in that order the most productive varieties in the test. The latter had the highest test weight and the lowest leaf rust reading in the nursery. Crockett and C. I. 13023 have the best 2-year average yields at Chillicothe.

The variety test at Bushland was grown in both an irrigated and dryland series. The latter was dusted in on December 1 and did not emerge until late February and early March. Spring moisture was adequate but late development coupled with dry, hot weather the last of June and early July prevented normal ripening and maturity. Heading was late and variable with ripening occurring in the first half of July. Notes on heading and ripening were not taken although the nursery was cut for yield. Data are reported in table 1. The irrigated nursery suffered severe hail damage on May 24 which, in addition to variable spring stands, made it unsatisfactory for yield evaluation. Leaf and stem rust as well as stripe rust developed late in the season. The highly abnormal circumstances under which the dryland nursery developed renders the grain yields of questionable value. Some resistance to stripe rust was shown by Kharkof, Crockett, and Early Blackhull in the irrigated series.

Field plots at Clovis were planted on October 25 in soil moist to a depth of 2 feet. No additional moisture was received until February, March, and April when light rains fell. Precipitation was heavy in the latter part of May and early June. Approximately $8\frac{1}{2}$ inches fell between planting and harvest, most of which came in May. A primary infection of stem rust was noted but secondary infection did not develop. Excellent yields and test weights were obtained. There was some tendency for the late maturing varieties to be the most productive, although the early maturing ones had 1-3 pounds test weight advantage. Cheyenne was highest yielding and C. I. 12871 produced the heaviest grain.

The 1957 winter wheat season in Oklahoma was characterized by below-average rainfall from seeding until January, after which it was above normal for the remainder of the growing season and excessive in May and June. Condition of the nurseries at the testing locations was unusually good until May, when the record-breaking high rainfall caused deterioration that continued until harvest. Long periods of continuously waterlogged soil led to root rotting and premature death of the wheat stems before the grain was mature. This situation and the effects of a damaging and widespread freeze on April 11 and 12 led to extensive damage in the form of complete or partial sterility of the heads and various degrees of grain shriveling. The early and heavy occurrence of *Septoria* leaf blotch in the eastern portion of the Oklahoma wheat area actually held down leaf rust development by destruction of the leaves before leaf rust came in. The widespread occurrence of stripe rust in Oklahoma for the first time on record is indicative of the peculiar and abnormal growing season.

Fourteen varieties were tested in field plots at Stillwater. Three varieties in the field plots for the first time in 1957 were the most productive, all yielding over 30 bushels per acre. C. I. 12871, the top ranked variety, lodged heavily but had the highest test weight with 58 pounds. Only four varieties produced grain

weighing more than 56 pounds per bushel. The two Improved Blue Jacket x Comanche Selections (C. I. 13185 and 13186) demonstrated outstanding resistance to lodging. Crockett and C. I. 13187 in that order have slightly the best 2-year average yields at Stillwater.

A very wide range in yields was recorded for 14 varieties grown in rod-rows at Cherokee. Five varieties failed to make as much as 10 bushels per acre. Late-maturing Kharkof yielded only 3.5 bushels and had the extremely low test weight of 43 pounds. In contrast, C. I. 12871 yielded 25.5 bushels and produced grain weighing a respectable 58.5 pounds per bushel. Only four other varieties, Triumph, Crockett, C. I. 13187, and C. I. 13186, had test weights exceeding 50 pounds. C. I. 12871 and the two selections from Improved Blue Jacket x Comanche lodged the least among the varieties in the test. Two-year yield averages show Triumph and Crockett the best at Cherokee, with 22.5 and 20.6 bushels, respectively.

The highest yields of any of the four Oklahoma variety plot locations were reported from Woodward, where 12 out of 15 varieties exceeded 30 bushels and four varieties yielded more than 40 bushels. Eleven varieties test weighed more than 56 pounds per bushel and four exceeded 60 pounds. Despite tall rank growth, lodging was only moderate at Woodward. Leaf rust infection likewise was moderate with C. I. 12871, Crockett, and Ponca showing outstanding field resistance. Early maturing C. I. 12871 yielded 44.1 bushels for first place in the test and had the high test weight of 62.9 pounds. Seldom is a variety as outstanding on a statewide basis as was C. I. 12871 in Oklahoma this year. Its performance in the uniform yield nursery in Oklahoma and in the region in 1956 also was impressive, although its longtime nursery record is only mediocre. C. I. 12871 has the outstanding combination of earliness, long dough mixing requirement, very high test weight, good yield, and leaf rust and bunt resistance. Among its weak features are weak straw and susceptibility to soil-borne mosaic, loose smut, stem rust, and hessian fly.

The variety test at Goodwell was planted in both a dryland and irrigated series. The former was abandoned for lack of stand establishment due to a dry fall and winter. The irrigated nursery emerged to fair stands and produced yields ranging from 19.8 bushels for Kharkof up to 42.9 bushels made by Triumph. Bushel weights were generally well below normal, with only C. I. 12871 weighing as much as 60 pounds. Westar dropped below 50 pounds and four varieties weighed less than 55 pounds. Concho and C. I. 12871 yielded 37.1 bushels per acre, not significantly less than the high yield of 42.9 bushels. Two-year yield averages show Triumph with a 2.3-bushel yield superiority over second-ranked C. I. 13187 and a 2.8-bushel advantage over Concho.

Seventeen varieties were evaluated in a 6-replication rod-row variety test at Manhattan. Planting was about two weeks later than normal but a good seedbed with adequate soil moisture allowed rapid emergence. Plants were well established by the onset of cold weather and no winter injury was noted. Early spring was cool and dry but the wheat made rapid and rank growth with moderately heavy rains in April and May. The cool spring temperatures caused later-than-normal heading. Soil-borne mosaic which was present throughout the winter wheat nurseries at Manhattan in varying severity persisted through the entire wheat growing season. Normally the disease disappears with warm weather in the spring. Its persistence at Manhattan in 1957 and the far northward movement of stripe rust in the central plains are indicative of the unusually cool and wet weather that prevailed. A heavy leaf rust epidemic developed but stem rust was present in trace amounts only. Lodging was severe. The early maturing varieties were generally most productive in the variety test. C. I. 12804, 12871, and Wichita all made more than 40 bushels, whereas the late-maturing varieties Kharkof, Harveyland, and Juanita yielded less than 30 bushels. Test weights were below normal. Only C. I. 12871 exceeded 60 pounds. Good resistance to the local epidemic of soil-borne mosaic was shown by C. I. 12804, Crockett, Concho, and Comanche. Combined resistance to leaf rust and bunt was exhibited by C. I. 12871. C. I. 12804, Ponca, Crockett, and Harveyland also showed high resistance to leaf rust. Lodging in the test ranged from 81 percent for Concho down to 44 percent by C. I. 12804. Wichita, Pawnee, and C. I. 12804 have slightly the best 2-year average yields at Manhattan.

No variety test data were obtained from Hays this year. Varieties were seeded in 50-foot long drill strips replicated four times and in twice-replicated rodrows. The latter were seeded September 17 on ground that had been sprinkler irrigated. Seeding of the drill strips was delayed until October 28 and followed sprinkler irrigation of the ground. The very late planting of the drill strips with heavy winterkilling ruined the stands. The rod-row series made heavy but uneven growth and lodged heavily. Leaf rust was severe and some stripe rust was present. Both the drill strips and rodrows were destroyed by flood waters on June 17.

Following the driest year in 49 years of recordkeeping at Garden City, the field plots were seeded in dust on October 6. The wheat did not emerge until mid-April following rains in March. Apparently all varieties in the test had vernalized adequately during the winter except Pawnee and C. I. 12804. Only an estimated 10 percent of Pawnee headed and 90 percent of C. I. 12804. All other varieties headed completely. The extremely retarded development of the wheat caused it to be severely damaged by the hot July weather. Bushel weights were very low with no variety weighing more than 47.8 pounds. Yields of grain ranged downward from 12.2 bushels made by C. I. 12871.

Preplanting sprinkler irrigation was resorted to at Colby to get stands of the field plots. Approximately $2\frac{1}{2}$ inches of water was applied in order to simulate a reasonably good summer fallow moisture situation. A similar plot test planted on ordinary fallow ground not irrigated failed completely. Rabbits grazed the field plots heavily. Only limited secondary root development had occurred by December 10. C. I. 12871 was somewhat slower to start spring growth than other varieties, and about 2 percent of its stand was winterkilled in the third replication. Abundant moisture in the spring carried the crop through to maturity with high yields of grain but with subnormal test weight. Leaf rust was prevalent and some stem rust developed in late June and early July. The 28.43 inches of rain received at Colby in 1957 made it the third wettest year on record. C. I. 12804 and Ponca were the high yielding varieties in the test and have as well the best 2-year average yields. The 58.8-pound test weight made by C. I. 12871 was high for the test.

The Akron winter wheat field plots were seeded on September 17 in two replications on summer fallowed ground. Fall emergence was good, although generally dry conditions prevailed until spring rains came. Total precipitation from wheat planting to June 1 was 8.34 inches. An infestation of cutworms developed that was effectively controlled with Endrin. Less than five bushels separated the high- and low-yielding varieties in the test. Only Cheyenne and Sioux made yields larger than 20 bushels per acre. Highest test weights were recorded for late-maturing Kharkof and Cheyenne. Cheyenne and Bison have the highest 2-year average yields.

A nursery type variety test with 7 replications was grown at Ft. Collins. The fall was very dry and the nursery area was irrigated to obtain germination and stand establishment. The 11 inches of rain received during April, May, and June was adequate for high yields and test weights. Stripe rust was observed for the first time and Septoria leaf spot became severe on some varieties. Light stem and leaf rust occurred. The only varieties exceeding 60 bushels per acre were two related Ft. Collins selections, and Concho. Test weights reported from Ft. Collins were the highest in the central district. All entries weighed in excess of 62 pounds per bushel with C. I. 12871 the heaviest with 65.3 pounds. Ft. Collins selection 1262 has the very high 71.3-bushel 2-year average yield, followed by Concho with 61.2 bushels.

A relatively dry fall and winter followed by above-normal precipitation in the spring and early summer was the weather story for variety test locations in Nebraska. However, full stands were obtained without fall irrigation and the wheat at all locations made fair fall growth and survived the winter without damage. In the Lincoln field plots, C. I. 12871 was the high yielder and produced the heaviest grain. It also showed fair resistance to leaf rust and lodging. Ponca and Concho

were the only other plot varieties with low leaf rust readings. Concho and Bison were the second- and third-ranked varieties for yield. They with Pawnee also have the highest 2-year average yields.

High yields of low test weight grain were recorded in the North Platte field plots. As at Lincoln, C. I. 12871 yielded the most and had the highest bushel weight. Its yield was 49.7 bushels as compared with 47.9 bushels for second-ranked Pawnee. Only Pawnee and Nebraska selection 483310 have 2-year average yields at North Platte exceeding 40 bushels.

A nursery type variety test containing 12 entries was grown at Alliance. Near-ideal spring growing conditions made for rank growth with very high yields and satisfactory test weights. Lodging was severe. Bison and Pawnee x Nebred (C. I. 13015) were least lodged with 15 and 17 percent readings, respectively. Yields in excess of 50 bushels were recorded for 8 out of 12 varieties, the high being 62.5 bushels made by Red Chief x Pawnee (521366). The latter also has the highest 2-year average yield at Alliance. As at most other locations in the southern and central districts, C. I. 12871 with 62.6 pounds produced the highest test weight grain.

Ten varieties among which were Minter, Yogo, and Kharkof, the northwestern district uniform varieties, were evaluated at four locations in eastern Wyoming. Yields of grain and test weights only were obtained from three of the locations. Adequate rainfall and otherwise ideal spring and summer growing conditions made for high yields at LaGrange and Albin located in extreme southeastern Wyoming. Somewhat less favorable conditions produced slightly lower yields at Gillette and New Castle in northeastern Wyoming. Cheyenne selection 432 was outstanding. At three of the four Wyoming locations, it was the highest yielding variety although at no location could it be demonstrated to be statistically superior to Cheyenne in yield. W.S. 432 is one of several selections from the parent Cheyenne made by Dr. Pfeifer on the basis of their reaction to the Mannitol test designed to measure germination ability under high moisture tension. W.S. 432 tends to be slightly earlier than Cheyenne and shorter strawed. A composite of Cheyenne selections, identified as W.S. 676, was the most productive at Gillette, probably because it was the only variety in the test with a full stand in all replications at harvest time. Whether stand deficiencies noted at Gillette were associated with fall emergence, winter-killing, or a combination of these is not known.

A remarkably low commercial winter wheat acreage abandonment of only 2 percent in Montana is indicative of the generally excellent spring growing conditions there. High yields of grain were reported from the variety tests at both Huntley and Moccasin. Data were not reported from the Boseman test because of early and total lodging of the nursery.

Soil moisture at Huntley was low at planting time and the nursery did not emerge in the fall. By mid-April all entries in the nursery had full stands and occurrence of above-normal precipitation in April, May, and June was conducive to rapid growth and development. Dry weather from June 21 until harvest was responsible for the low test weights recorded in the nursery. Recently recommended Westmont (C. I. 12930) topped the nursery with a yield of 45.5 bushels per acre. Its 59.6-pound test weight also was high for the nursery. Only Burt, Kharkof M.C. 22, and Bison failed to make 30 bushels or more. Both of the latter were smutty.

All entries in the variety test at Moccasin had good fall stands and survived the winter without injury. A dry period in early July may have caused some reduction in yield although this is not reflected in the test weights, which were mostly 60 pounds or more. Three varieties, Cheyenne, Itana, and Norin 10 x Brevor-17 slightly exceeded 40 bushels per acre. Bison and Kharkof were the only varieties yielding less than 30 bushels. Bison was 40 percent smutted.

The northeastern district uniform plot varieties Minter, Minturki, and Nebred were grown as a part of a combined winter wheat rod-row nursery at Ames, Iowa. Only data on these three varieties are reported in this section. Plentiful fall and spring moisture made for good stands and very tall rank growth at Ames. Lodging began early and occurred repeatedly during May and June. Lodging and maturity notes were not obtained since all nursery entries were flat on the ground. Following severe lodging about mid-May, the nurseries were attacked by one of the heaviest infections of mildew and Septoria on record at Ames which was later followed by heavy leaf rust and some stem rust. Bushel weights were about 10 pounds below normal. Minter was resistant to mildew, while Minturki exhibited some resistance to Septoria.

Winter wheat field plots 1/40 acre in size were grown at four locations in Minnesota. Twelve varieties were evaluated with the three uniform plot varieties at each location. Winterkilling occurred at each location and was extensive at Rushmore where maximum survival was only 45 percent.

Yields of grain and test weights at St. Paul were somewhat below average for that station. Yields ranged downward from the high of 36 bushels made by III-54-58 to 10.8 bushels for Bison. The latter survived only 20 percent. Excellent resistance to leaf rust was shown by the Minnesota experimentals in the test although most of them appear to be less winterhardy than Minter and Minturki.

High yields and average test weights were recorded at Waseca. Light winter-killing occurred and both leaf and stem rust developed. The nine Minnesota experimental varieties were without exception the most productive. All made more than 42 bushels per acre as well as having the highest test weights in the test. All showed outstanding resistance to stem rust and moderate leaf rust resistance.

Six of the Minnesota varieties yielded above 70 bushels at Grand Rapids and exhibited high resistance to stem rust. Winter survival ranged upward from 82 percent. High test weight was 60 pounds and the low 51.7 pounds.

Loss from winterkilling was severe at Rushmore. Only five varieties survived more than 10 percent. The 13 percent survival of III-54-9 as compared with survivals of 7 percent or less for the other Minnesota experimental strains suggests possible superiority of the former in this characteristic.

Field plots grown at 3 stations in South Dakota made high yields in 1957. Differential winterkilling occurred at Brookings and Highmore but at Cottonwood incomplete fall emergence resulted in partial stands of the varieties.

At Brookings, Marmin, Minter and Kharkof M.C. 22 survived best. Minter and Marmin in that order also were the most productive varieties. Leaf rust was very heavy and stem rust occurred in moderate amounts. Minter had the least stem and leaf rust as well as the highest test weight.

Yields of grain ranged from 64.5 bushels made by Wichita down to 45.5 bushels for Nebred in the Highmore test. Pawnee and Wichita winterkilled the most, but despite this were the most productive. The lowest rust readings and highest test weight were made by Wichita.

Wichita also was the highest yielding variety at Cottonwood. It produced the heaviest grain as well. Spring stands ranged from 35 percent for Nebred up to 52 percent for Pawnee.

Table 1. Yields and other data for varieties of Winter Wheat grown in replicated plots in cooperative experiments at stations in the region in 1957, with 2-year average yields.

Chillicothe, Texas
Eight plots, rod rows

5

Variety	C.I. or Sel. No.	Date		Plant height Ins	Lodging %	Diseases		Weight per bushel lbs.	Av. acre yield	
		Headed April	Ripe June			Leaf rust %	Septoria ¹ / tritici		1957 Bus.	1956- 1957 Bus.
Ponca	12128	29	10	40	88	5	M	57.0	35.3	27.1
Crockett	12702	27	7	42	91	10	L	59.0	34.6	28.5
Ea. Blkh.-Tq.xOro-Med.-Hope	12871	25	7	35	78	T	M	61.0	33.8	--
Kan.-H.F.-Tq.-Med.-Hope x Cim.	13023	29	9	38	92	40	M	60.0	33.0	27.6
Cimarron x Hope - Chey.	13022	26	7	37	95	40	H	58.0	31.7	23.8
Bison	12518	29	10	42	81	30	L	56.0	31.2	--
Red Chief	12109	5-3	14	46	40	29	L	62.0	31.1	24.8
Kan.-H.F.-Tq.-Med.-Hope x Cim.	274-51-A4	28	8	40	92	50	M	58.0	30.8	--
Comanche	11673	28	10	40	82	35	T	53.5	30.7	23.1
Cimarron x Hope - Chey.	256-50-3	5-2	9	42	85	25	H	57.0	29.3	24.4
Concho	12517	30	9	40	84	35	M	54.0	28.5	24.2
Triumph	12132	20	5-31	36	82	10	L	58.0	28.2	26.5
Wester	12110	29	10	41	89	60	H	52.0	27.9	24.3
Cim.-Hope-Chey. x Com.	13024	28	8	41	96	50	L	57.0	27.1	23.1
Wichita	11952	24	6	40	86	35	M	58.0	26.8	23.4
Early Blackhull	8856	21	2	40	98	45	M	60.0	26.8	24.6
Tenmarq	6936	5-2	10	43	70	40	H	51.0	25.8	22.4
Kan.-H.F.-Tq. x Med.-Hope	255-48-9	30	9	40	100	50	L	53.0	25.5	--
Wichita x Mqo.-Oro	13176	5-10	15	40	24	5	T	58.0	24.3	21.6
Blackhull	6251	5-7	12	42	64	45	M	55.0	22.2	21.3
Kanred	5146	5-10	12	44	36	40	H	53.0	22.0	19.5
Cim.-Hope-Chey. x Com.	275-51-A46	5-2	9	38	100	25	M	54.0	21.9	19.8
Kharkof	1442	5-9	13	40	36	35	H	51.0	20.2	17.2

¹/ L = light, M = medium, H = heavy.

Standard error of a difference = 2.65 bushels.

Bushland, Texas
Four plots, rod rows

Variety	C. I. or Sel. No	Irrigated Nursery					Dryland Nursery				
		Date		Plant height	Stripe rust		Weight per bushel	Plant height	Weight per bushel	Av. acre yield	
		Headed	Ripe		Prev.	Sev.				1957	1956- 1957
		May	June	Ins.	%	%	lbs.	Ins	lbs.	Bus.	Bus.
Crockett	12702	11	22	40	100	2CMR	61.0	32	49.0	12.2	27.8
Early Blackhull	8856	5	20	39	100	2CMR	61.0	29	49.0	11.6	22.3
Concho	12517	15	25	35	100	25S	61.0	26	48.0	10.6	30.9
Ea. Blk.-Tq. x Oro - Med.-Hope	12871	11	22	36	100	40S	62.5	29	52.5	10.5	--
Comanche	11673	14	25	40	100	T-20S	59.5	29	48.0	9.4	27.6
Kharkof	1442	23	28	46	100	5R	57.0	24	50.5	6.8	23.2

Standard error of a difference = 0.78 bushels.

Clovis, New Mexico
Five 1/40 acre plots

Variety	C. I. or Sel. No.	Date headed	Plant height	Weight per bushel	Average acre yield
		May	Ins.	Lbs.	Bus.
Cheyenne	8885	29	35	60.3	25.6
Blackhull	6251	25	34	62.7	25.0
Red Chief x Cheyenne	N.482831	26	37	62.4	24.9
Westar	12110	25	34	61.7	24.6
Turkey	1558	30	36	61.0	24.4
Tenmarq	6936	24	33	61.9	23.8
Apache	12122	15	28	63.8	23.5
Ponca	12128	23	29	63.0	22.6
Kharkof	1442	30	37	60.0	22.4
Kiowa	12133	24	30	62.2	21.5
Concho	12517	24	30	61.3	21.0
Crockett	12702	16	29	63.9	20.6
Comanche	11673	27	30	61.4	20.5
Red Chief x Cheyenne	13016	26	35	62.3	20.5
Ma., Blkh.-Tq.x Oro-Med.-Hope	12871	18	28	64.6	20.0
Early Balckhull	8856	14	28	63.0	18.7
Wichita	11952	15	28	63.6	17.0

Standard error of a difference = 1.46 bushels

Stillwater, Oklahoma
Four 1/83 acre plots

Variety	C. I. or Sel. No.	Date		Lodging	Weight per bushel	Av. acre yield	
		Headed	Ripe			1957	1956- 1957
		May	June	%	Lbs.	Bus.	Bus.
Ea. Blkh.-Tq. x Oro-Med.-Hope	12871	2	13	78	58.0	32.9	--
Imp. Blue Jacket x Com.	13185	10	18	6	57.5	31.5	--
do	13186	14	18	19	55.7	31.4	--
Crockett	12712	6	13	90	55.1	29.8	23.7
Wichita	11952	1	11	86	55.6	28.3	22.4
Triumph	12132	4-27	10	35	56.2	27.8	21.7
Early Blackhull	8856	4-28	10	96	56.4	27.6	22.1
Comanche	11673	7	14	74	51.6	27.4	21.8
Blackhull-Oro x Paw.	13187	8	15	53	52.2	27.3	22.5
Pawnee	11669	9	15	56	52.1	27.3	21.9
Concho	12517	7	14	89	50.5	25.5	21.2
Ponca	12128	8	15	79	51.9	25.4	20.6
Westar	12110	8	15	70	50.1	23.7	20.7
Kharkof	1442	13	18	88	48.1	20.9	17.5

Standard error of a difference = 1.60 bushels

Woodward, Oklahoma
Five plots, rod rows

Variety	C. I or Sel. No.	Date		Plant height Ins.	Lodging %	Leaf rust %	Weight per bushel Lbs.	Av. acre yield	
		Headed	Ripe					1957	1956- 1957
		May	June					Bus.	Bus.
Ea. Blkh.-Tq. x Oro-Med.-Hope	12871	17	20	44	20	1	62.9	44.1	--
Crockett	12702	19	21	44	23	1	60.6	42.1	29.1
Ponca	12128	20	23	45	22	1	58.9	40.9	28.4
Triumph	12132	14	18	40	1	40	61.4	40.9	27.7
Wichita	11952	16	19	43	14	30	59.9	39.8	27.3
Apache	12122	18	21	42	25	23	59.1	39.0	28.2
Blackhull-Oro x Paw.	13187	19	20	42	19	28	58.8	37.6	28.6
Pawnee	11669	20	22	46	12	20	56.2	36.7	26.6
Early Blackhull	8856	15	18	43	10	28	60.8	35.6	25.9
Comanche	11673	20	23	45	19	10	53.2	34.1	25.3
Westar	12110	20	23	46	22	30	54.8	33.1	24.8
Concho	12517	19	23	44	41	15	52.6	32.3	24.8
Imp. Blue Jacket x Com.	13186	24	25	48	5	30	57.6	29.8	--
Kharkof	1442	25	27	47	19	28	53.9	23.8	19.6
Imp. Blue Jacket x Com.	13185	24	25	47	4	38	56.9	23.2	--

Standard error of a difference = 2.76 bushels.

Cherokee, Oklahoma
Five plots, rod rows

Variety	C. I. or Sel. No.	Plant height Ins.	Lodging %	Weight per bushel Lbs.	Av. acre yield	
					1957 Bus.	1956- 1957 Bus.
Ea. Blkh.-Tq. x Oro-Med.-Hope	12871	41	14	58.5	25.5	--
Triumph	12132	38	68	51.8	22.0	22.5
Crockett	12702	42	37	56.3	19.7	20.6
Blackhull-Oro x Paw.	13187	41	61	50.1	17.3	19.4
Concho	12517	42	71	45.4	14.1	17.8
Early Blackhull	8856	39	93	49.8	13.7	17.9
Wichita	11952	40	92	48.6	12.8	17.2
Imp. Blue Jacket x Com.	13186	45	7	52.6	12.7	--
Ponca	12128	44	86	44.5	10.3	14.8
Pawnee	11669	46	32	45.5	8.8	14.4
Comanche	11673	44	57	44.2	7.9	13.2
Imp. Blue Jacket x Com.	13185	46	15	49.5	6.6	--
Westar	12110	44	61	43.5	5.7	12.8
Kharkof	1442	44	75	43.5	3.5	11.2

Standard error of a difference = 1.47 bushels.

Goodwell, Oklahoma
Five plots, rod rows, irrigated

Variety	C. I. or Sel. No.	Date headed	Plant height	Weight per bushel	Av. acre yield	
					1957	1956- 1957
		May	Ins.	Lbs.	Bus.	Bus.
Triumph	12132	21	38	58.4	42.9	39.1
Early Blackhull	8856	21	40	57.1	40.9	35.1
Apache	12122	25	39	58.2	38.2	33.7
Concho	12517	26	39	57.0	37.1	36.3
Ea. Blkh.-Tq. x Oro-Med.-Hope	12871	23	39	60.2	37.1	--
Wichita	11952	22	40	55.2	35.0	32.4
Ponca	12128	27	39	55.1	33.1	32.5
Blackhull-Oro x Paw.	13187	26	38	51.9	33.0	36.8
Comanche	11763	27	40	51.7	32.3	32.6
Crockett	12702	24	41	56.8	31.1	28.3
Imp. Blue Jacket x Com.	13186	29	41	59.6	30.4	--
Pawnee	11669	27	39	53.5	29.1	27.9
Imp. Blue Jacket x Com.	13185	29	42	56.2	26.7	--
Westar	12110	27	41	49.0	24.7	26.1
Kharkof	1442	31	41	51.4	19.8	13.7

Standard error of a difference = 2.98 bushels.

Manhattan, Kansas
Six plots, rod rows

Variety	C. I. or Sel. No.	Date headed	Plant height	Lodging	Diseases				Weight per bushel	Av. acre yield	
					Leaf rust	Stem ¹ / rust	Bunt ² / %	Soil-borne Mosaic		1957	1956- 1957
					May	Ins.	%	%	%	%	Lbs.
Med.-Hope-Paw.xOro-Ill.l-Com.	12804	23	38	44	T	50	30	R	58.6	41.6	31.0
Ea.Blkh.-Tq. x Oro -Med.-Hope	12871	22	38	69	T	30	4	S	61.2	41.1	30.7
Wichita	11952	21	40	60	85	90	75	S	59.0	40.8	31.1
Wichita Sel.	-	21	38	69	85	90	90	S	58.6	39.8	30.9
Ponca	12128	24	39	64	T	90	65	S	58.6	38.8	29.8
Kiowa	12133	24	40	46	90	90	2	S	58.7	38.1	29.1
Bison	12518	24	41	49	80	90	1	S	58.3	37.4	30.3
Crockett	12702	22	38	77	4	100	65	R	59.7	37.3	--
Concho	12517	23	40	81	43	100	5	R	57.0	37.2	30.1
Triumph	12132	17	36	59	90	100	95	S	59.0	37.0	29.1
Pawnee	11669	23	39	57	63	90	20	S	57.0	35.3	31.0
Comanche	11673	24	39	73	23	90	1	R	55.7	34.7	27.5
Turkey	1558	28	42	70	50	90	40	S	56.5	32.9	28.0
Cheyenne	8885	29	41	53	80	100	70	S	55.2	31.2	25.5
Harveyland	--	28	41	79	T	100	80	S	57.8	28.4	--
Juanita	--	28	44	66	33	90	65	S	52.7	27.8	--
Kharkof	1442	30	42	62	60	90	65	S	54.5	27.3	26.1

¹/ Readings from the rust nursery by C.O. Johnston.

²/ Bunt data from E.D. Hansing.

Garden City, Kansas
Three 1/45 acre plots

Variety	C. I. or Sel. No.	Date		Plant height Ins.	Weight per bushel Lbs.	Av. acre yield	
		Headed June	Ripe July			1957 Bus.	1956- 1957 Bus.
Ea. Blkh.-Tq. x Oro-Med.-Hope	12871	23	20	30	47.8	12.2	18.8
Crockett	12702	22	18	32	46.5	11.8	--
Concho	12517	22	19	29	43.8	10.6	19.0
Triumph	12132	20	17	28	47.5	9.2	14.2
Ponca	12128	23	20	28	43.0	8.8	15.3
Bison	12518	23	19	28	44.9	8.3	17.2
Med.-Hope-Paw. x Oro-Ill. 1-Com.	12804	26	21	30	43.5	7.9	16.3
Comanche	11673	24	20	27	41.7	7.7	16.0
Triumph Sel.	--	24	19	31	40.6	6.8	--
Kiowa	12133	23	19	28	43.5	6.1	15.9
Paw.-Mgo.-Oro. x Chfk.-Ea. Blkh.-Tq.	52H1036	21	18	28	43.0	5.7	15.1
Wichita	11952	25	20	30	44.4	5.6	16.0
Turkey	1558	26	22	31	42.9	5.2	13.0
Iowin (Yoder)	--	29	23	30	43.4	4.1	--
Cheyenne	8885	29	23	28	42.9	3.5	12.2
Kharkof	1442	28	22	29	41.1	2.9	12.3
Pawnee	11669	26	21	27	39.1	1.4	12.9

Standard error of a difference = 0.53 bushels.

Colby, Kansas
Three 1/50 acre plots, fall irrigated

Variety	C. I. or Sel. No.	Date headed	Plant height	Weight per bushel	Av. acre yield	
					1957	1956- 1957
		June	Ins.	Lbs.	Bus.	Bus.
Med.-Hope-Paw.xOro-Ill.l-Com.	12804	5	37	57.2	39.7	24.0
Ponca	12128	6	37	56.8	39.3	24.0
Wichita	11952	3	37	57.8	37.7	23.5
Pawnee	11669	6	36	56.2	35.3	22.2
Concho	12517	6	36	55.5	33.9	21.2
Iowin	--	9	41	58.2	33.5	--
Ea.Blkh.-Tq.x Oro-Med.-Hope	12871	6	36	58.8	32.4	22.1
Bison	12518	7	36	54.5	31.9	20.7
Comanche	11673	7	37	54.5	31.6	20.1
Kiowa	12133	7	36	55.6	31.3	20.1
Cheyenne	8885	10	39	54.7	30.2	19.2
Nebraska 66 (?)	--	10	38	54.5	28.5	--
Kharkof	1442	10	41	54.2	27.0	17.7
Turkey	1558	10	38	53.5	25.6	16.5

Standard error of a difference = 1.36 bushels.

Akron, Colorado
Two 1/47 acre plots

Variety	C. I. or Sel. No.	Date		Plant height Ins.	Weight per bushel Lbs.	Av. acre yield	
		Headed June	Ripe July			1957 Bus.	1956- 1957 Bus.
Cheyenne	8885	14	12	34	62.0	22.0	18.7
Sioux	12142	13	11	33	59.5	21.8	17.6
Bison	12518	8	12	34	59.5	19.2	18.1
Early Colorado	--	6	10	36	57.0	19.2	17.6
Hyberline	--	7	11	36	58.0	19.2	17.7
Kharkof	1442	18	15	34	62.5	19.0	17.1
Ea. Blkh.-Tq. x Oro-Med.-Hope	12871	5	8	34	60.5	18.4	--
Comanche	11673	8	10	33	60.0	17.8	16.9
Ponca	12128	8	15	33	58.0	17.8	16.5
Kiowa	12133	10	12	34	61.0	17.8	15.9
Wichita	11952	6	10	36	60.0	17.6	17.3
Concho	12517	11	15	34	57.0	17.4	16.7
Alton	1438	17	15	35	61.5	17.4	15.1
Pawnee	11669	8	15	33	57.5	17.2	17.3
Tenmarq	6936	10	12	34	55.0	17.2	15.7

Standard error of a difference = 1.45 bushels

Fort Collins, Colorado
Seven plots, rod rows, fall irrigated

Variety	C. I. or Sel. No.	Date		Plant height	Rust		Weight per bushel	Av. acre yield	
		Headed	Ripe		Leaf	Stem		1957	1956- 1957
		June	July	Ins.	%	%	Lbs.	Bus.	Bus.
Mqo.-Oro-Oro-Tq. x Med.-Hope-Paw.	F.C.1262	9	24	44	T-50	T	62.3	67.7	71.3
Concho	12517	10	24	43	T-10	10	64.1	63.8	61.2
Mqo.-Oro-Oro-Tq. x Med.-Hope-Paw.	F.C.1264	11	24	43	T-75	T	64.8	63.2	58.3
Ea. Blkh.-Tq.x Oro-Med.-Hope	12871	9	23	46	T	2	65.3	59.0	--
Ponca	12128	11	23	46	T-10	10	62.6	57.2	54.3
Bison	12518	11	24	43	10-75	5	63.3	56.4	59.9
Mqo.-Oro-Oro-Tq.x Med.-Hope-Paw.	F.C.1263	12	24	42	T-5	T	63.6	55.4	53.3
Wichita	11952	9	22	46	10-75	5	63.4	54.7	53.3
Mqo.-Oro-Oro-Tq.-Med.-Hope-Paw. x Com.	F.C.1265	9	22	42	T-5	T	63.4	54.4	51.9
Pawnee	11669	9	23	45	T-75	5	62.5	53.4	53.1
Med.-Hope x Paw. ²	12873	10	23	40	T-5	T	62.7	51.8	52.6
Comanche	11673	11	24	45	10-50	5	63.5	51.8	52.5
Kharkof	1442	17	26	48	T-5	10	62.4	47.6	43.8

Standard error of a difference = 5.14 bushels.

North Platte, Nebraska
Four 1/50 acre plots

Variety	C. I. or Sel. No.	Date headed	Plant height	Weight per bushel	Av. acre yield	
					1957	1956- 1957
		June	Ins.	Lbs.	Bus.	Bus.
Ea.Blkh.-Tq. x Oro-Med.-Hope	12871	8	47	57.9	49.7	--
Pawnee	11669	10	48	55.9	47.9	41.1
Red Chief x Pawnee	N.521366	11	45	56.4	45.6	--
Pawnee x Cheyenne	N.483310	11	48	52.4	44.7	40.5
do	13007	10	46	52.5	44.0	38.2
Pawnee x Nebred	13015	11	47	55.4	41.0	36.6
Comanche	11673	11	50	51.6	39.3	36.0
Bison	12518	11	50	51.8	38.7	36.3
Cheyenne	8885	12	52	49.9	37.8	35.7
Nebred	10094	12	49	50.2	37.7	36.3
Concho	12517	10	51	53.6	35.3	33.5
Kharkof	1442	13	54	49.6	30.0	30.3

Standard error of a difference = 0.99 bushels

Lincoln, Nebraska
Five 1/47 acre plots

Variety	C. I. or Sel. No.	Date headed	Plant height	Lodging	Leaf rust	Weight per bushel	Av. acre yield	
							1957	1956- 1957
		May	Ins.	%	%	Lbs.	Bus.	Bus.
Ea. Blkh.-Tq. x Oro-Med.-Hope	12871	28	43	8	12	63.8	40.2	--
Concho	12517	30	45	29	15	60.9	39.4	32.6
Bison	12518	30	45	8	63	61.3	39.3	31.0
Pawnee x Nebred	13015	30	43	13	60	61.0	39.0	30.2
Pawnee	11669	30	43	15	38	59.5	38.9	31.3
Ponca	12128	30	44	21	8	59.9	38.0	28.0
Red Chief x Pawnee	N.521366	29	42	2	48	62.4	38.0	30.5
Pawnee x Cheyenne	13007	30	43	1	75	59.8	37.6	29.9
Wichita x Nebred	N.531538	28	45	20	30	59.2	36.2	--
Comanche	11673	31	46	18	25	58.7	36.1	27.2
Pawnee x Cheyenne	N.483310	6-2	40	12	78	57.2	33.2	28.2
Nebred	10094	6-2	41	4	75	58.2	31.4	25.9
Turkey	12137	6-3	40	8	67	57.4	27.5	24.2
Kharkof	1442	6-4	41	27	63	56.3	27.4	23.2

Standard error of a difference = 2.82 bushels.

Alliance, Nebraska
Three plots, rod rows

Variety	C. I. or Sel. No.	Date headed	Lodging	Weight per bushel	Av. acre yield	
					1957	1956- 1957
		June	%	Lbs.	Bus.	Bus.
Red Chief x Pawnee	N.521366	10	57	61.5	62.5	45.8
Pawnee x Cheyenne	13007	11	33	60.5	59.5	44.3
Concho	12517	10	62	61.1	59.5	44.2
Pawnee	11669	9	37	58.7	58.4	43.2
Ea. Blkh.-Tq. x Oro-Med.-Hope	12871	10	53	62.6	54.0	42.1
Comanche	11673	10	35	59.6	52.1	40.7
Pawnee x Cheyenne	N.483310	11	33	56.4	51.0	38.9
Bison	12518	9	15	60.1	50.9	40.4
Kharkof	1442	18	33	57.5	47.8	36.4
Cheyenne	8885	18	60	57.6	45.5	38.2
Nebred	10094	17	38	57.9	44.2	35.4
Pawnee x Nebred	13015	10	17	61.1	43.7	--

Gillette, Wyoming
Four plots, rod rows

Variety	C. I. or Sel. No.	Date		Plant height	Weight per bushel	Av. acre yield
		Headed	Ripe			
		July	July	Ins.	Lbs.	Bus.
Cheyenne Selection	W.S.676	1	29	32	57.2	28.8
Kharkof	1442	1	29	32	58.0	26.8
Cheyenne	8885	1	29	30	58.7	26.5
Minter	12138	1	29	34	58.0	26.4
Yogo	8033	1	30	34	56.6	26.2
Nebred	10094	6-28	29	31	57.6	25.2
Cheyenne Selection	W.S.432	6-28	30	30	59.4	24.6
Kharkof M.C.22	6938	5	8-3	32	54.6	22.1
Chey.-R.Ch. x Paw.-Mqo.-Oro	13008	6-26	29	32	60.7	20.3
Concho	12517	6-26	29	30	56.3	19.3

Standard error of a difference = 2.43 bushels.

Albin, Wyoming
Four plots, rod rows

Variety	C. I. or Sel. No.	Weight per bushel	Av. acre yield
Cheyenne Selection	W.S.432	58	47.8
Concho	12517	60	46.0
Minter	12138	61	44.0
Nebred	10094	60	43.6
Cheyenne Selection	W.S.676	57	41.8
Cheyenne	8885	58	39.6
Chey.-R.Ch. x Paw.-Mqo.-Oro	13008	61	39.1
Kharkof	1442	59	35.1
Kharkof M.C. 22	6938	51	32.7
Yogo	8033	57	28.0

Standard error of a difference = 5.59 bushels.

La Grange, Wyoming
Four plots, rod rows

Variety	C. I. or Sel. No.	Weight	Av. acre
		per bushel	yield
		Lbs.	Bus.
Cheyenne Selection	W.S.432	59	46.0
Cheyenne	8885	57	44.4
Cheyenne Selection	W.S.676	57	42.3
Chey.-Red Chief x Paw.-Mqo.-Oro	13008	60	40.8
Kharkof	1442	58	39.5
Minter	12138	59	39.1
Nebred	10094	59	38.2
Yogo	8033	58	38.0
Concho	12517	61	35.2
Kharkof M.C. 22	6938	59	33.5

Standard error of a difference = 2.97 bushels.

New Castle, Wyoming
Four plots, rod rows

Variety	C. I. or Sel. No.	Weight	Av. acre
		per bushel	yield
		Lbs.	Bus.
Cheyenne Selection	W.S.432	60.0	27.3
Minter	12138	58.0	23.6
Yogo	8033	59.0	20.0
Nebred	10094	58.5	19.7
Chey-Red Chief x Paw.-Mqo.-Oro	13008	59.0	19.6
Concho	12517	60.0	18.9
Kharkof M.C. 22	6938	57.0	18.2
Cheyenne	8885	58.0	18.1
Cheyenne Selection	W.S.676	58.0	17.1
Kharkof	1442	58.0	17.1

Standard error of a difference = non-significant.

Huntley, Montana
Six plots, rod rows

Variety	C. I. or Sel. No.	Date		Plant height	Weight per bushel	Av. acre yield	
		headed	Ripe			1957	1956- 1957
		June	July			Ins.	Lbs.
Westmont	12930	11	18	39	59.6	45.5	--
Newturk	6935	18	19	45	54.6	39.7	25.1
Brown Awmed Yogo Sel.	--	11	21	36	56.5	39.0	25.4
Cheyenne	8885	13	19	37	58.1	38.7	24.6
Kharkof	1442	19	18	44	55.9	38.2	24.3
Itana	12933	16	20	40	56.0	38.0	24.2
Wasatch	11925	17	20	44	57.3	37.7	23.5
Yogo	8033	19	18	48	54.8	37.3	23.5
Minter	12138	19	19	44	54.5	37.3	23.0
Karmont	6700	19	19	42	57.0	37.0	23.4
Columbia	12928	12	18	38	55.1	36.4	--
Yogo x Turkey-Oro 88	13428	20	20	47	52.2	33.7	--
Yogo Selection	Mont.166	22	20	46	53.5	33.1	21.2
Yogo x Turkey-Oro 121	13429	20	19	46	54.0	32.9	--
Rego	13181	21	24	43	51.0	32.6	21.3
Yogo x Turkey-Oro 66	13427	21	20	45	52.0	31.7	--
Norin 10 x Brevor-17	--	13	18	25	45.8	30.9	--
Burt	12696	21	24	37	48.4	26.8	19.9
Kharkof M.C. 22	6938	21	20	46	51.1	23.2	15.5
Bison	12518	11	22	39	52.0	15.7	12.9

Standard error of a difference = 3.38 bushels.

Moccasin, Montana
Six plots, rod rows

Variety	C. I. or Sel. No.	Date headed	Plant height	Weight per bushel	Av. acre yield	
					1957	1956 1957
		June	Ins.	Lbs.	Bus.	Bus.
Cheyenne	8885	12	39	61.4	41.7	34.3
Itana	12933	12	38	62.2	40.8	33.9
Norin 10 x Brevor-17	--	12	25	57.5	40.5	--
Brown Awned Yogo Sel.	--	7	36	60.7	39.1	31.7
Burt	12696	15	33	60.3	38.4	31.3
Yogo x Turkey-Oro 121	13429	13	41	61.2	38.2	--
Columbia	12928	12	36	62.5	38.1	--
Karmont	6700	14	40	60.9	37.5	34.6
Newturk	6935	12	39	61.2	37.4	32.1
Westmont	12930	10	35	61.9	37.1	--
Yogo	8033	17	40	61.0	36.6	32.2
Rego	13181	13	38	59.3	35.0	27.6
Yogo x Turkey-Oro 88	13428	15	41	60.4	34.7	--
Yogo x Turkey-Oro 66	13427	17	43	60.6	34.3	--
Minter	12138	16	43	60.3	33.2	28.6
Kharkof	1442	15	40	60.8	33.0	30.3
Yogo Selection	Mont.166	17	41	60.4	30.0	29.5
Wasatch	11925	13	41	60.8	30.0	27.8
Bison	12518	7	34	60.4	28.8	23.5
Kharkof M.C. 22	6938	22	43	57.9	28.2	25.9

Standard error of a difference = 2.04 bushels.

Ames, Iowa
Three plots, rod rows

Variety	C. I. or Sel. No.	Date headed	Plant height	Disease ratings			Weight Per Bushel	Av. acre yield	
				Leaf rust	Mildew	Septoria		1957	1956- 1957
		June	Ins.				Lbs.	Bus.	Bus.
Minter	12138	8	40	S+	R+	S-	52.2	21.7	28.0
Minturki	6155	8	43	S++	S	R-	51.4	18.4	24.6
Nebred	10094	5	38	S+	S-	S	49.0	14.4	--

Standard error of a difference = 4.10 bushels.

St. Paul, Minnesota
Three 1/40 acre plots

Variety	C. I. or Sel. No.	Date headed	Winter survival	Plant height	Leaf rust	Weight per bushel	Av. acre yield	
							1957	1956- 1957
		June	%	Ins.	%	Lbs.	Bus.	Bus.
H277-10-3-1-1 x H255-49-5-1-3	III-54-58	12	72	43	2	59.3	36.0	40.5
Wisc. x -287-1	2900	12	75	42	5	58.3	35.4	--
Nebred	10094	11	85	38	32	58.7	33.1	--
Minter	12138	12	82	40	45	60.0	30.2	37.0
H255-49-5-1-4 x Blackhawk	III-54-9	14	73	39	10	59.6	29.2	38.8
do	III-54-10	13	57	40	2	59.0	28.7	37.8
do	III-54-61	15	53	44	T	59.3	28.0	35.4
do	III-54-60	15	62	40	T	60.0	27.8	36.7
do	III-54-12	14	63	38	T	60.0	27.1	--
Minturki	6155	13	82	39	47	59.7	26.4	34.6
Blackhawk	12218	13	73	43	15	59.6	26.3	35.3
H255-49-5-1-4 x Blackhawk	III-54-26	14	73	38	5	59.7	24.9	--
H207-1-6-3-1 x H255-49-5-1-3	III-54-72	15	37	40	5	57.3	24.3	--
H255-49-5-1-4 x Blackhawk	III-54-66	14	57	37	T	58.3	24.0	--
Bison	12518	12	20	39	40	57.7	10.8	--

Standard error of a difference = 3.20 bushels.

Waseca, Minnesota
Three 1/40 acre plots

Variety	C. I. or Sel. No.	Date		Winter Survival %	Plant height Ins.	Rust		Weight per bushel Lbs.	Av. acre yield	
		Headed	Ripe			Leaf	Stem		1957	1956- 1957
		June	July			%	%		Bus.	Bus.
H277-10-3-1-1 x H255-49-5-1-3	III-54-58	11	16	80	35	30	T	60.2	52.5	40.7
H255-49-5-1-4 x Blackhawk	III-54-60	14	18	87	37	20	T	60.0	50.2	40.8
do	III-54-26	12	16	87	38	20	T	60.8	48.4	--
do	III-54-10	12	18	87	35	35	T	60.7	47.9	40.2
do	III-54-12	11	15	90	37	15	T	61.2	47.6	--
do	III-54-61	14	18	80	37	15	T	60.0	47.0	39.4
do	III-54-66	14	20	72	37	10	T	60.0	45.3	--
do	III-54-9	13	19	85	37	20	T	59.8	44.7	39.1
H207-1-6-3-1 x H255-49-5-1-3	III-54-72	13	18	80	36	10	T	60.0	42.4	--
Minter	12138	11	15	87	38	50	20R-SR	60.2	39.8	35.2
Wisc. x-287-1	2900	10	16	72	40	35	40S	57.2	38.5	--
Blackhawk	12218	14	18	92	39	40	50SR-S	58.0	34.1	31.8
Nebred	10094	10	14	87	33	50	30R-SR	56.3	33.5	--
Minturki	6155	14	17	82	40	50	40SR-S	56.5	26.2	25.4
Bison	12518	12	17	58	32	40	30R-SR	--	--	--

Standard error of a difference = 3.65 bushels.

Grand Rapids, Minnesota
Three 1/40 acre plots

Variety	C. I. or Sel. No.	Date		Winter Survival	Plant height	Stem rust	Weight per bushel	Av. acre yield	
		Headed	Ripe					1957	1956- 1957
		June	July	%	Ins.	%	Lbs.	Bus.	Bus.
H255-49-5-1-4 x Blackhawk	III-54-10	20	31	85	40	5	59.0	79.9	49.2
do	III-54-60	20	31	88	43	0	58.3	74.2	46.3
do	III-54-61	21	31	90	42	0	56.3	73.8	46.9
do	III-54-66	22	31	85	42	5	59.3	73.4	--
H227-10-3-1-1 x H255-49-5-1-3	III-54-58	20	8-1	82	40	5	60.0	72.9	47.7
H255-49-5-1-4 x Blackhawk	III-54-9	22	31	83	41	15	60.0	71.5	45.5
H207-1-6-3-1 x H255-49-5-1-3	III-54-72	21	31	82	39	0	59.0	66.8	--
Blackhawk	12218	21	31	83	46	65	58.0	65.7	42.7
Wisc. x-287-1	2900	21	8-1	88	50	90	55.7	62.4	--
H255-49-5-1-4 x Blackhawk	III-54-12	20	30	89	41	0	59.0	61.2	--
Minter	12138	23	31	87	42	28	58.0	53.6	36.9
H255-49-5-1-4 x Blackhawk	III-54-26	20	31	90	36	0	57.7	50.8	--
Nebred	10094	20	30	93	38	40	57.0	47.9	--
Minturki	6155	22	31	89	45	58	54.0	41.2	29.8
Minhardi	5149	23	31	85	45	68	51.7	39.5	28.8

Standard error of a difference = 6.45 bushels.

Rushmore, Minnesota
Three 1/40 acre plots

Variety	C.I. or Sel.No.	Date		Winter survival	Plant height	Rust		Av. acre yield
		Headed	Ripe			Leaf	Stem	
		June	July	%	Ins.	%	%	Bus.
H255-49-5-1-4 X Blackhawk	III-54-9	22	26	13	33	T	T	9.5
Nebred	10094	20	21	20	29	95	90	6.9
Minter	12138	21	24	17	34	50	18	5.4
Minhardi	5149	22	21	45	33	80	73	5.2
Minturki	6155	23	24	22	35	90	68	2.7
Blackhawk	12218	21	25	4	34	T	80	T
H255-49-5-1-4 X Blackhawk	III-54-10	--	--	7	--	--	--	T
H277-10-3-1-1 X H255-49-5-1-3	III-54-58	--	--	5	--	--	--	T
H255-49-5-1-4 X Blackhawk	III-54-60	--	--	5	--	--	--	T
do	III-54-61	--	--	3	--	--	--	T
H207-1-6-3-1 X H255-49-5-1-3	III-54-72	*	*	2	--	--	--	T
H255-49-5-1-4 X Blackhawk	III-54-26	--	--	4	--	--	--	T
do	III-54-66	--	--	3	--	--	--	T
do	III-54-12	--	--	4	--	--	--	T
Wisc. X-287-1	2900	--	--	4	--	--	--	T

Standard error of a difference: 1.15 Bushels.

Brookings, South Dakota
Two 1/50 acre plots

Variety	C.I. No.	Date headed	Winter survival	Plant height	Rust		Weight per bushel	Av. acre yield	
					Leaf	Stem		1957	1956-1957
		June	%	Ins.	%	%	Lbs.	Bus.	Bus.
Minter	12138	16	80	45	60	28	60.1	44.0	25.1
Marmin	11502	13	85	46	70	35	55.6	41.2	24.4
Pawnee	11669	11	65	40	75	40	58.7	41.0	21.7
Nebred	10094	12	70	39	85	35	57.3	40.3	22.0
Wichita	11952	✓	60	37	70	28	56.9	37.6	18.8
Minturki	6155	13	70	49	85	35	56.1	36.9	20.5
Yogo	8033	17	70	49	90	50	56.4	34.4	18.1
Kharkof M.C.22	6938	18	80	50	90	40	54.0	29.9	15.3

Standard error of a difference : 2.45 bushels.

Highmore, South Dakota
Two 1/50 acre plots

Variety	C.I. No.	Date ripe	Winter survival	Plant height	Rust		Weight per bushel	Av. acre yield	
					Leaf	Stem		1957	1956-1957
		July	%	Ins.	%	%	Lbs.	Bus.	Bus.
Wichita	11952	17	75	44	30	5	60.9	64.5	37.9
Pawnee	11669	20	72	42	55	22	59.0	58.6	36.2
Marmin	11502	22	92	45	35	12	58.2	54.5	31.7
Minter	12138	22	95	46	55	15	58.6	53.9	33.0
Minturki	6155	24	92	47	40	20	58.0	51.2	33.7
Yogo	8033	23	98	48	70	✓	58.0	46.1	29.5
Nebred	10094	19	88	42	30	8	58.8	45.5	29.1

Standard error of a difference : 4.00 bushels.

Cottonwood, South Dakota
Two plots, 24 square feet

Variety	C.I. No.	Spring ^{1/} stand %	Weight per bushel lbs.	Av. Acre yield	
				1957 Bus.	1956- 1957 Bus.
Wichita	11952	50	58.0	27.9	19.4
Yogo	8033	45	54.7	26.4	15.5
Pawnee	11669	52	57.5	25.9	18.5
Marmin	11502	42	54.8	24.0	--
Minter	12138	40	56.0	22.3	15.0
Minturki	6155	48	55.5	21.8	13.8
Nebred	10094	35	57.8	21.7	16.3

^{1/} Spring stands reflect partial fall emergence rather than loss due to winter killing.

Standard error of a difference : 2.18 bushels.

STANDARD ERRORS

Standard errors for the 1957 field plot yield data are reported in table 2, together with the number of plots and mean yields at each location. An asterisk indicates where nursery plots were grown in place of field plots.

The analysis of variance was applied to the data from each reporting station. This was done by the cooperators at many of the stations and at Lincoln for the rest. In those cases where only mean yields and an L.S.D. were reported by the cooperator, the errors reported in table 2 were determined from the L.S.D. Where individual plot data were reported, the standard error of the mean was obtained by dividing the standard deviation by the square root of the number of replications. The standard error of a difference between any two variety means was calculated by multiplying the standard error of a mean by the square root of 2. Error expressed as a percentage of the mean is presented also. These statistics have considerable value to the agronomist even though complete random arrangement of the plots was not followed at all stations.

SUMMARY OF PLOT DATA

Summaries of average yields and other agronomic data by districts are reported in tables 3 through 12. Both current-year and 2-year average yields are given for the southern and central districts. Only 1957 data are reported for the two northern districts. Averages of agronomic data other than yield are recorded in tables 9 through 12.

Yields by Districts

Six varieties were grown uniformly at seven reporting stations in the southern district in 1957. This was the first year that C. I. 12871 was so grown. It replaced Red Chief as a uniform variety in both the southern and central districts. C. I. 12871 was highest yielding, it being nearly 2 bushels superior in yield to second-ranked Crockett. Concho for the first time since 1953 dropped from the number 1 yield position in the southern district. Due primarily to its relatively poor performance this year, Concho has been slightly exceeded in yield on a 2-year basis by Crockett.

C. I. 12871 also had the highest average yield among 6 varieties grown uniformly at 8 reporting stations in the central district. Its average yield of 38.4 bushels exceeded that of second-ranked Concho by 1.3 bushels. Concho continues as the most productive variety in two years of testing. Bison and Pawnee in that order have the next highest 2-year average yields.

Cheyenne was highest yielding among 5 varieties grown uniformly at the reporting stations in the northwestern district in 1957. Its 6-station average yield of 34.8 bushels was 0.9 bushel higher than the yield of second place Minter.

Minter had an 8-station average of 33.9 bushels per acre in the northeastern district. This compared with an average yields of 30.4 bushels made by Nebred and 28.1 bushels by Minturki.

Summary of Agronomic Data

Agronomic data other than yield are summarized for the southern district varieties in table 9. C. I. 12871, besides being superior in yield in 1957, was outstanding in several other characteristics. It was the only uniform variety making an average test weight above 60 pounds this year. It produced grain weighing an average of 61.1 pounds as compared with 58.9 for Crockett and 58.3 for Early

Blackhull. C. I. 12871 also demonstrated high resistance to leaf rust at 2 stations; it had slightly the shortest straw, and was the least lodged. It was earlier maturing than all other uniform varieties except Early Blackhull.

C. I. 12871 showed a 3-pound superiority in test weight over the other central district uniform varieties this year. Its average was 59.7 pounds. It had the lowest leaf and stem rust and was the earliest maturing but lodged more than Bison and Pawnee. Bison had the highest leaf rust infection and Concho the most stem rust.

Date headed and ripe, plant height, and test weight were obtained for uniformly grown northwestern district varieties. Cheyenne had slightly the highest test weight, the shortest straw, and was the earliest heading. Kharkof M.C. 22 was the latest maturing and produced the lowest weighing grain.

Only 2 per cent difference in average winter survival separated the 3 uniformly grown varieties in the northeastern district. Minter had slightly the lowest leaf rust readings and carried on the average only half as much stem rust did Nebred and Minturki. It also had a higher average test weight than the other two uniform varieties.

Table 2. Number of plots, average yields and standard errors for the variety tests at the cooperating stations in 1957.

State and Station	No. of plots	No. of varieties	Av. yield all varieties	Standard error of a		Coefficient of variability
				Difference in means	Mean	
			Bu.	Bu.	Bu.	%
TEXAS						
Chillicothe	8*	23	28.2	2.65	1.87	18.8
Bushland	4*	6	10.2	0.78	0.55	10.9
NEW MEXICO						
Clovis	5	17	22.2	1.46	1.03	10.4
OKLAHOMA						
Stillwater	4	14	27.6	1.60	1.13	8.2
Woodward	5*	15	35.6	2.76	1.95	12.3
Cherokee	5*	14	12.9	1.47	1.04	18.0
Goodwell	5*	15	32.8	2.98	2.11	14.4
KANSAS						
Manhattan	6*	17	35.7	--	--	--
Garden City	3	17	6.9	0.53	0.37	9.4
Colby	3	14	32.7	1.36	0.96	5.1
COLORADO						
Akron	2	15	18.6	1.45	1.02	7.8
Ft. Collins	7*	13	56.6	5.14	3.63	17.0
NEBRASKA						
Lincoln	5	14	35.9	0.99	0.70	4.4
North Platte	4	12	41.0	2.82	1.99	9.7
Alliance	3*	12	52.4	--	--	--
WYOMING						
Gillette	4*	10	24.6	2.43	1.72	13.9
Albin	4*	10	39.8	5.59	3.95	19.8
LaGrange	4*	10	39.7	2.97	2.10	10.6
NewCastle	4*	10	20.0	N.S.	2.17	21.7
MONTANA						
Huntley	6*	20	34.3	3.38	2.39	17.1
Moccasin	6*	20	35.6	2.04	1.44	9.9
IOWA						
Ames	3*	22	29.7	4.10	2.90	18.8
MINNESOTA						
St. Paul	3	15	27.5	3.20	2.26	14.3
Waseca	3	15	39.9	3.65	2.58	11.2
Grand Rapids	3	15	62.3	6.45	4.56	12.7
Rushmore	3	15	2.0	1.15	0.81	71.1
SOUTH DAKOTA						
Brookings	2	8	38.2	2.45	1.73	6.4
Higmore	2	7	53.5	4.00	2.83	7.5
Cottonwood	2*	7	24.3	2.18	1.54	9.0

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

Table 3. Summary of average yields of varieties grown uniformly at 7 stations in the southern district in 1957.

Variety	C.I. No.	Average yield in bushels per acre at---							Seven station average
		Chilli-cothe	Bush-land	Clovis	Still-water	Wood-ward	Chero-kee	Good-well	
Ea.Blkh.-Tq.x Oro-Med.-Hope	12871	33.8	10.5	20.0	32.9	44.1	25.5	37.1	29.1
Crockett	12702	34.6	12.2	20.6	29.8	42.2	19.7	31.1	27.2
Early Blackhull	8856	26.8	11.6	18.7	27.6	35.6	13.7	40.9	25.0
Concho	12517	28.5	10.6	21.0	25.5	32.3	14.1	37.1	24.1
Comanche	11673	30.7	9.4	20.5	27.4	34.1	7.9	32.3	23.2
Kharkof	1442	20.2	6.8	22.4	20.9	23.8	3.5	19.8	16.8

Table 4. Two-year summary of average yields of varieties grown uniformly in the southern district in 1956 and 1957.

Variety	C.I. No.	Average yield in bushels per acre at ---						Two year average
		Chilli-cothe	Bush-land	Still-water	Wood-ward	Chero-kee	Good-well	
Crockett	12702	28.5	27.8	23.7	29.1	20.6	28.3	26.3
Concho	12517	24.2	30.9	21.2	24.8	17.8	36.3	25.9
Early Blackhull	8856	24.6	22.3	22.1	25.9	17.9	35.1	24.6
Comanche	11673	23.1	27.6	21.8	25.3	13.2	32.6	23.9
Kharkof	1442	17.2	23.2	17.5	19.6	11.2	13.7	17.1

Table 5. Summary of average yields of varieties grown uniformly at 8 stations in the central district in 1957.

Variety	C.I. No.	Average yield in bushels per acre at ---								Eight station average
		Manhattan	Garden City	Colby	Akron	Ft. Collins	Lincoln	North Platte	Alliance	
Ea.Blkh.-Tq.x Oro.-Med.-Hope	12871	41.1	12.2	32.4	18.4	59.0	40.2	49.7	54.0	38.4
Concho	12517	37.2	10.6	33.9	17.4	63.8	39.4	35.3	59.5	37.1
Pawnee	11669	35.3	1.4	35.3	17.2	53.4	38.9	47.9	58.4	36.0
Bison	12518	37.4	8.3	31.9	19.2	56.4	39.3	38.7	50.9	35.3
Comanche	11673	34.7	7.7	31.6	17.8	51.1	36.1	39.3	52.1	33.8
Kharkof	1442	27.3	2.9	27.0	19.0	47.6	27.4	30.0	47.8	28.6

Table 6. Two-year summary of average yields of varieties grown uniformly in the central district in 1956 and 1957.

Variety	C.I. No.	Average yield in bushels per acre at ----								Two year average
		Manhattan	Garden City	Colby	Akron	Ft. Collins	Lincoln	North Platte	Alliance	
Concho	12517	30.1	19.0	21.2	16.7	61.2	32.6	33.5	44.2	32.3
Bison	12518	30.3	17.2	20.7	18.1	59.9	31.0	36.3	40.4	31.7
Pawnee	11669	31.0	12.9	22.2	17.3	53.1	31.3	41.1	43.2	31.5
Comanche	11673	27.5	16.0	20.1	16.9	52.5	27.2	36.0	40.7	29.6
Kharkof	1442	26.1	12.3	17.7	17.1	43.8	23.2	30.3	36.4	25.9

Table 7. Summary of average yields of varieties grown uniformly at 6 stations in the northwestern district in 1957.

Variety	C. I. No	Average yield in bushels per acre at--						Six station average
		Gill-ette	Albin	La Grange	New Castle	Moccasin	Huntley	
Cheyenne	8885	26.5	39.6	44.4	18.1	41.7	38.7	34.8
Minter	12138	26.4	44.0	39.1	23.6	33.2	37.3	33.9
Kharkof	1442	26.8	35.1	39.5	17.1	33.0	38.2	31.6
Yogo	8033	26.2	28.0	38.0	20.0	36.6	37.3	31.0
Kharkof M.C. 22	6938	22.1	32.7	33.5	18.2	28.2	23.2	26.3

Table 8. Summary of average yields of varieties grown uniformly at 8 stations in the northeastern district in 1957

Variety	C. I. No.	Average yield in bushels per acre at-----								Eight station average
		Ames	St. Paul	Waseca	Grand Rapids	Rushmore	Brookings	Highmore	Cottonwood	
Minter	12138	21.9	30.2	39.8	53.6	5.4	44.0	53.9	22.3	33.9
Nebred	10094	14.4	33.1	33.5	47.9	6.9	40.3	45.5	21.7	30.4
Minturki	6155	18.4	26.4	26.2	41.2	2.7	36.9	51.2	21.8	28.1

Table 9. Agronomic data other than yield summarized from the variety tests in the southern district in 1957.

Variety	C. I. No.	Average date		Average plant height	Average leaf rust	Average lodging	Average bushel weight
		Headed	Ripe				
		May	June	Ins.	%	%	Lbs.
Number of stations-----		6	4	6	2	4	7
Ea.Blkh.-Tq.xOro.-Med.-Hope	12871	11	16	37	1	48	61.1
Crockett	12702	12	16	40	6	60	58.9
Early Blackhull	8856	7	13	38	37	74	58.3
Concho	12517	15	18	38	25	71	54.5
Comanche	11673	15	18	40	23	58	53.6
Kharkof	1442	22	22	42	32	55	52.0

Table 10. Agronomic data other than yield summarized from the variety tests in the central district in 1957.

Variety	C. I. No.	Average date		Average plant height	Average rust		Average lodging	Average bushel weight
		Headed	Ripe		Leaf	Stem		
		June	July	Ins.	%	%	%	Lbs.
Number of stations-----		8	3	7	3	2	3	8
Ea.Blkh.-Tq.xOro.-Med.-Hope	12871	6	17	39	4	16	43	59.7
Bison	12518	8	18	40	62	48	24	56.7
Concho	12517	8	19	40	21	55	57	56.6
Pawnee	11669	7	20	39	46	48	36	55.8
Comanche	11673	8	18	40	26	48	42	55.7
Kharkof	1442	13	21	41	42	50	41	54.8

Table 11. Summary of agronomic data other than yield for varieties grown uniformly in the northwestern district in 1957.

Variety	C. I. No.	Average date		Average plant height	Average bushel weight
		Headed	Ripe		
		June	July	Ins.	Lbs.
Number of stations-----		3	2	3	6
Cheyenne	8885	19	24	35	58.5
Minter	12138	22	24	40	58.4
Kharkof	1442	22	24	39	58.3
Yogo	8033	22	24	41	57.7
Kharkof M.C. 22	6938	26	27	40	55.1

Table 12. Summary of agronomic data other than yield for varieties grown uniformly in the northeastern district in 1957.

Variety	C. I. No.	Average date		Average winter survival	Average plant height	Average Rust		Av. Wt. per bushel
		Headed	Ripe			Leaf	Stem	
		June	July	%	Ins.	%	%	Lbs.
Number of stations-----		6	4	6	7	5	5	7
Minter	12138	15	23	75	41	52	22	57.9
Nebred	10094	13	21	74	37	58	41	56.4
Minturki	6155	16	24	73	43	62	44	55.9

UNIFORM YIELD NURSERY

The uniform yield nursery was grown at 18 stations in the southern and central parts of the region in 1957. The nursery was abandoned at Hays, Kansas, and Akron, Colorado, for failure of emergence and stand establishment in the fall. Yields of grain were reported from 14 locations.

Nineteen experimental strains and varieties composed the nursery this year. Permanent check varieties continue to be Kharkof, Blackhull, and Early Blackhull. Seven entries were new in the nursery. These are identified with an asterisk in the listing below.

Entry: No. :	Variety or cross	: State No.	: C. I. No.
1	Kharkof		1442
2	Blackhull		6251
3	Early Blackhull		8856
4	Pawnee		11669
5	Comanche		11673
6	Concho		12517
7	KanKing		12719
8	Pawnee x Nebred		13015
9	Cimarron x Hope-Cheyenne		13022
10	Kan.-H.Fed.-Tq.-Med.-Hope x Cimarron		13023
11	Cimarron-Hope-Chey. x Comanche		13024
12	Mqo.-Oro x Wichita		13176
13*	Improved Blue Jacket x Comanche	Okla. III-1	13185
14*	Improved Blue Jacket x Comanche	Okla. I-18	13186
15*	Blackhull-Oro x Pawnee	Wd. 43H1-236	13187
16*	Red Chief x Cheyenne		13016
17*	Pawnee x Iowin-T. timo.-Wis. 5	Ia. 55176	13279
18*	Com.-Med.-Hope x Iowin	Ia. 5373	13188
19*	Quivira Hybrid ^{1/}	Kans. 53429	13285

* New entry in 1957.

^{1/} Quivira-Kan.-H.Fed.-Prelude-Kan. x Kv.-Mqo.-Kv.-Tq.

DATA OBTAINED

Data obtained from the reporting stations appear in table 13. Since at most stations the uniform yield nursery was grown in close proximity to the field plots, conditions of weather, insects and diseases affecting the latter also would apply to the uniform yield nursery. Since these were reported in some detail in the field plot section of this report, they will not be discussed here except where they differ from those already reported.

Usable yield information was not obtained from Denton although considerable disease data are reported, some of which were collected at College Station. No variety in the nursery was resistant to stem rust in the field at College Station and only C. I. 13176 showed resistance to leaf rust. At Denton low leaf rust was recorded for several varieties. Several were resistant to mildew but only C. I. 13176 and C. I. 13186 gave low *Septoria tritici* readings. Pawnee, C. I. 13015, and C. I. 13022 were given resistant loose smut ratings.

Yields were high at Chillicothe despite adverse weather conditions but grain weight was below normal for most varieties. Outstanding resistance to lodging was shown by C. I. 13186. C. I. 13279 made the highest yield in the nursery but had a test weight of only 55 pounds. Pawnee and KanKing have slightly the highest 2-year average yields at Chillicothe.

Both an irrigated and dryland nursery were grown at Bushland. Data are reported from each. Yields were not reported from the irrigated nursery because of hail on May 24 and the low dryland yields are of questionable value since emergence did not take place until late February and early March. Dryland bushel weights were between 45 and 55 pounds, whereas normal weights were recorded from the irrigated nursery. Concho has the highest 2-year average yield at Bushland.

The yields reported from Clovis were similar to those in 1956 but well above the average for the last five years. Grain weight was very high with all varieties, exceeding the 60-pound standard. The 18.3-bushel yield made by C. I. 13187 was high for the nursery. Concho had the best 2-year average yield. C. I. 13016 was given the best shattering score while C. I. 13186, C. I. 13015, and C. I. 13176 received the highest straw strength ratings.

The uniform yield nursery at Stillwater was not harvested for yield. Similar to Denton, it was one of the casualties of the torrential rains during the spring and early summer. By May 28, after a very heavy rain with strong winds and some hail, the entire nursery was completely lodged with much broken and twisted straw. Harvest was made only to get test weight information and seed for quality testing purposes.

Probably the best uniform yield nursery in the southern part of the region was grown at Woodward this year. The wheat grew very rank with 2 varieties exceeding 4 feet in height and several approaching 4 feet. Despite the tallness, lodging was only moderate, the worst being 31 percent recorded for C. I. 13187. Yields varied nearly 30 bushels in the test. Kharkof made only 18.7 bushels, whereas C. I. 13285 yielded 47.6 bushels. Test weights were in the 50-60 pound range. C. I. 13285 was the second earliest maturing variety in the nursery; it was the shortest statured and was one of 3 varieties resistant to leaf rust. KanKing has the highest 2-year average yield at Woodward.

C. I. 13285 also was the most productive variety at Cherokee. Its yield of 25.9 bushels was significantly higher than the 17.3 bushels per acre made by second-ranked Early Blackhull. Seven varieties yielded less than 10 bushels, with 2.5 bushels made by Kharkof the lowest. Test weights were extremely low. Only 5 varieties produced grain weighing more than 50 pounds among which were C. I. 13285, KanKing, and C. I. 13186 with 53.5, 53.0, and 52.5 pounds, respectively. The same three varieties were the least lodged in the test.

High yields, below-normal test weight, heavy lodging, and severe leaf rust describes the 1957 Manhattan uniform yield nursery. Although not shown in the table, soil-borne mosaic was unevenly distributed over the nursery and was severe in spots. It persisted through much of the season causing wide variation in plot height and undoubtedly decreased yields in affected varieties. That six out of the 8 high-yielding varieties at Manhattan are resistant to soil-borne mosaic is some indication of this. C. I. 13023 was highest yielding and had as well the highest test weight. C. I. 13285 was the least lodged variety in the test and, together with C. I. 13279 and C. I. 13176, was the most resistant to leaf and stem rust. C. I. 13023 has slightly the highest 2-year average yield.

Sprinkler irrigation was resorted to at Garden City to get emergence of the uniform yield nursery. As much as 4 feet of drifted snow lay on portions of the nursery during the winter which may have been associated with a highly irregular

pattern of winterkilling noted in the nursery. The yields reported are an average of the best 2 out of 4 harvested plots of each variety and therefore are substantially higher than they would have been if all plots had been used for yield purposes. C. I. 13285 was highest yielding and was earlier maturing than all entries except Early Blackhull.

Preplanting irrigation also was necessary for fall emergence at Colby. Plentiful moisture in the spring made for high yields but bushel weights were well below normal. C. I. 13285 headed as early as Early Blackhull; it was the shortest strawed; it was equal to KanKing in test weight; and it was the only variety in the test to yield over 40 bushels per acre. Next most productive varieties at Colby were C. I. 13187, C. I. 13015, and Pawnee, in that order.

High yields and very high bushel weights were reported from Ft. Collins. The nursery was "irrigated up" in the fall. Five varieties, among which were C. I. 13023, C. I. 13188, C. I. 13187, C. I. 13016, and C. I. 13285, yielded in excess of 60 bushels per acre. C. I. 13023 was high with 67.6 bushels and had as well the highest test weight of 64.9 pounds. Seven other varieties weighed more than 64 pounds and only 2 varieties weighed less than 63 pounds, the low being 61.2 made by C. I. 13022.

Record yields of grain were recorded from an irrigated uniform yield nursery grown at Hesperus in southwestern Colorado. Irrigation water was applied ahead of seeding and again in June. Eighty pounds of nitrogen per acre in the form of Urea was applied in April. No diseases were noted with the exception of a trace of bunt in C. I. 13285. Yields of 109.9 and 104 bushels were made by C. I. 13279 and Concho. Both were significantly more productive than all other entries in the nursery. All varieties produced grain weighing 60 pounds or more, the high being 63.3 pounds made by C. I. 13185 and KanKing. C. I. 13185 was the only variety that did not lodge, although C. I. 13016, C. I. 13285, C. I. 13186, and C. I. 13188 had low readings. Plant height in the nursery varied from 33 inches for C. I. 13187 to 42 inches for C. I. 13016. Concho has a 96-bushel 2-year average yield at Hesperus.

Yields ranged from 28.2 up to 52.8 bushels per acre at Lincoln, with C. I. 13279 the most productive and Kharkof the least. Bushel weights were average to above-average with the exception of Kharkof which weighed only 55.2 pounds. Wide differences in lodging were recorded. C. I. 13185 did not lodge at all and C. I. 13285, KanKing, C. I. 13016, and C. I. 13186 lodged less than 10 percent. In contrast, Comanche and Blackhull lodged 93 and 88 percent, respectively. Low leaf rust was recorded on C. I. 13279, C. I. 13285, C. I. 13176, and Concho. In the last 2 years Pawnee has made the best yield record at Lincoln with 40.8 bushels per acre. Next highest 2-year average is 38.9 bushels for Concho.

C. I. 13279 also was the most productive variety at North Platte where yields between 19.8 and 36.1 bushels were made. Test weights were 60 pounds or more for all varieties except Kharkof and C. I. 13185. Similar to Lincoln, Pawnee has the highest 2-year average yield.

Yields made at Alliance in 1957 were considerably higher than in recent years. Test weights, on the other hand, were low with only KanKing and C. I. 13016 weighing more than 60 and several varieties less than 56 pounds. Both Pawnee and Concho exceeded 50 bushels in yield. The same two varieties have the highest 2-year averages.

Complete lodging of all entries in the nursery existed at Ames at harvest time. C. I. 13285 was reported to have resisted lodging the longest during the rainy June weather. This probably is reflected in its high yield and test weight. An abnormally wide spread in yield occurred with Kharkof and Comanche making less than 20 bushels and C. I. 13285 and C. I. 13023 making 50.3 and 42.3, respectively. Combined resistance to leaf rust and mildew was exhibited by the Iowa selections C. I. 13279 and C. I. 13188. All entries in the nursery were classified as susceptible to Septoria. C. I. 13023 and KanKing have the highest 2-year average yields at Ames.

Table 13. Yield and other data for varieties grown in the uniform yield nursery in cooperative experiments at 16 stations in the hard red winter wheat region in 1957, with two-year averages.

Denton, Texas
Four plots

C. I. No.	Date headed	Plant height	Leaf rust at-----		Stem rust at College station		Other diseases at Denton		
			Denton	College Station	Field	Greenhouse	Loose ¹ / ₂ smut rating	Mildew	Septoria tritici
			May	Ins.	%	%	%	Type	%
1442	4	38	10	30	50	4	VH	20	80
6251	5	42	T	60	30	2	VH	20	90
8856	4-23	42	T	40	20	4	VH	0	90
11669	1	43	20	60	60	2	T	10	20
11673	1	41	10	40	20	4	VH	10	50
12517	4-30	44	20	50	40	1	VH	10	40
12719	4-30	44	10	40	40	2	M	5	35
13015	4-30	40	60s	60	30	1-3	L	10	50
13022	4-27	42	10	40	60	4	L	0	75
13023	1	39	10	60	60	4	-	20	20
13024	4-30	44	5R	30	60	0	VH	60	70
13176	6	43	0	5	30	1	VH	20	3
13185	2	45	60s	80	40	2-4	-	40	75
13186	4	46	40	80	40	3	-	30	8
13187	1	41	20s	60	40	2	-	50	90
13016	1	47	T	40	40	0	-	2	50
13279	4-30	42	0	20	60	0	-	0	90
13188	1	44	2	20	20	0	-	0	90
13285	4-22	41	0	40	40	2	-	40	75

¹/₂ / VH=very high, M=medium, L=low, and T=trace

Chillicothe, Texas
Four plots

C. I. No.	Date		Plant height	Lodging	Diseases		Weight per bushel	Av. acre yield	
	Headed	Ripe			Leaf rust	Septoria tritici ¹		1957	1956-1957
	June	June	Ins.	%	%		Lbs.	Bus.	Bus.
13279	5-1	9	40	78	T	M	55	38.2	----
11673	4-28	9	42	79	25	T	57	37.6	25.7
11669	4-30	9	39	86	30	L	56	35.1	27.4
12719	4-29	11	45	30	40	L	62	35.1	27.4
13187	5-1	9	40	85	30	H	56	34.7	----
13015	4-29	9	38	44	65	M	57	34.5	26.2
13016	5-7	12	42	26	10	M	61	32.9	----
13023	4-28	7	39	72	50	M	61	32.6	27.2
13022	4-26	7	38	95	50	M	57	32.1	22.0
13285	4-26	8	34	20	T	H	60	31.9	----
12517	4-29	10	40	86	30	M	56	29.8	23.6
13186	5-6	11	43	10	75	L	59	29.7	----
13188	5-1	9	40	85	45	H	54	29.6	----
13024	4-28	8	35	86	35	L	57	28.6	23.8
8856	4-21	2	39	92	40	H	60	27.0	24.1
13176	5-10	13	41	19	5	L	60	25.0	20.2
6251	5-5	12	44	72	10	L	58	24.0	20.6
1442	5-8	12	42	21	25	H	52	21.8	16.2
13185	5-6	11	42	29	90	L	56	20.6	----

¹/L=light, M=medium, H=heavy.

Standard error of a difference = 3.49 bushels.

Bushland, Texas
Four plots

C. I. No.	Irrigated nursery					Dryland nursery				
	Date		Plant height	Stripe rust		Weight per bushel	Plant height	Weight per bushel	Av. acre yield	
	Headed	Ripe		Prev.	Sev.				1957	1956-1957
	May	June	Ins.	%	%	Lbs.	Ins.	Lbs.	Bus.	Bus.
13285	11	22	38	-	-	62.0	27	52.5	14.0	----
13015	15	24	40	-	-	61.0	27	50.0	12.3	24.4
8856	5	20	39	100	20MR	61.0	29	49.0	11.6	22.3
13187	17	26	39	-	-	59.5	27	51.0	11.4	----
13279	11	24	44	-	-	59.0	29	47.5	11.3	----
13022	11	24	42	100	8R	60.0	27	45.0	11.1	27.8
13016	22	28	42	-	-	61.0	31	54.0	10.9	----
12517	15	25	35	100	25S	61.0	26	48.0	10.6	30.9
6251	19	27	42	-	-	61.0	28	50.5	10.1	27.3
12719	17	25	39	-	-	62.0	23	52.5	9.9	24.8
13024	16	25	37	100	1R	59.5	29	48.5	9.7	25.2
11673	14	25	40	100	T-20S	59.5	29	48.0	9.4	27.6
13023	13	24	39	100	8R	61.0	28	47.5	8.9	30.1
13176	21	28	40	10	20S	60.0	30	48.0	8.8	27.2
13186	17	26	43	-	-	61.5	26	55.0	8.8	----
13188	15	25	40	-	-	57.5	29	47.5	8.6	----
13185	20	26	44	-	-	61.5	26	55.0	8.2	----
1442	23	28	46	100	5R	57.0	24	50.5	6.8	23.2
11669	16	25	37	-	-	60.0	24	46.5	6.5	25.6

Standard error of a difference = 0.87 bushels.

Clovis, New Mexico
Six plots

C. I. No.	Date headed	Plant height	Shattering Score *	Straw strength score *	Weight per bushel	Av. acre yield	
						1957	1956-1957
	May	Ins.			Lbs.	Bus.	Bus.
13187	18	20	2.8	2.3	62.8	18.3	----
13022	17	21	2.0	2.0	62.4	18.0	16.8
13279	23	19	2.7	2.2	61.4	17.6	----
13023	17	18	2.0	2.0	63.1	17.6	16.7
12517	19	20	3.0	2.2	62.4	17.5	17.6
1442	25	26	2.9	3.7	60.8	16.8	16.2
13024	19	21	2.0	2.3	61.6	16.6	16.2
13176	22	19	3.4	1.8	62.2	16.0	15.9
6251	21	21	2.1	2.2	61.7	15.7	16.2
13285	17	17	3.4	2.0	63.8	15.5	----
13016	22	21	1.9	2.3	62.7	15.2	----
8856	15	20	2.0	3.0	62.0	14.9	15.4
13015	18	19	2.1	1.8	61.7	14.9	15.4
11673	20	20	2.5	2.5	61.4	14.7	16.7
12719	19	19	2.2	2.3	63.8	14.4	15.0
11669	20	18	3.9	2.5	61.7	14.2	14.7
13188	22	20	2.6	2.2	61.0	14.0	----
13186	22	21	2.1	1.8	62.1	13.9	----
13185	22	22	2.2	2.0	62.7	13.6	----

* Scores based on 1 to 5 scale, 1 the best.
Standard error of a difference = not significant

Stillwater, Oklahoma
Four plots

C. I. No.	Date headed	Weight per bushel
	May	Lbs.
13023	3	57.3
13186	7	55.2
13285	4-28	54.5
8856	4-26	54.4
13185	7	54.0
12719	3	53.9
13016	8	53.1
13015	5	52.6
13022	1	50.2
13024	3	50.2
12517	2	47.6
11673	5	47.5
13176	10	47.5
13187	4	45.5
1442	12	45.1
6251	11	45.1
11669	7	44.3
13188	4	44.1
13279	3	42.3

Woodward, Oklahoma
Four plots

C. I. No.	Date		Plant height Ins.	Lodging %	Leaf rust %	Weight per bushel Lbs.	Av. acre yield	
	Headed May	Ripe June					1957	1956- 1957
							Bus.	Bus.
13285	17	21	41	6	1	59.9	47.6	----
13279	21	24	46	14	1	56.5	43.7	----
12719	19	23	47	11	30	60.6	39.0	28.0
13188	20	23	47	21	20	55.4	38.8	----
13022	18	20	44	3	38	57.8	37.7	27.0
8856	15	17	43	6	43	60.5	37.7	26.5
13023	19	22	43	9	33	59.2	37.0	26.1
13015	19	25	43	6	50	58.8	34.9	25.1
11669	21	24	45	18	33	55.5	33.4	24.5
13176	25	25	46	16	1	57.8	32.8	23.4
11673	21	23	45	30	28	52.7	32.7	24.2
13024	19	22	45	26	8	53.6	32.7	24.2
13187	21	22	43	31	40	55.9	32.0	----
13186	23	24	49	5	25	57.5	29.6	----
12517	20	22	44	29	33	51.8	28.3	22.4
6251	24	25	47	18	28	57.0	26.7	21.1
13185	23	25	49	8	50	55.9	23.7	----
13016	24	24	48	9	25	54.5	22.7	----
1442	26	26	46	23	30	53.0	18.7	17.5

Standard error of a difference = 1.99 bushels.

Cherokee, Oklahoma
Four plots

C. I. No.	Plant height	Lodging	Weight per bushel	Av. acre yield	
				1957	1956-1957
	Ins.	%	Lbs.	Bus.	Bus.
13285	41	9	53.5	25.9	----
8856	41	90	48.5	17.3	19.6
13279	48	19	46.0	16.2	----
13023	41	40	50.0	15.1	17.5
13187	42	68	49.5	14.1	----
13024	44	78	45.5	13.8	15.3
13022	44	78	44.5	13.7	16.3
13186	47	9	52.0	12.0	----
12517	47	93	43.5	11.9	15.3
13015	44	30	48.5	11.4	14.8
11673	46	41	45.0	11.0	14.4
12719	47	14	53.0	10.6	16.2
13176	44	48	46.0	9.2	12.4
13188	47	51	40.0	7.9	----
13016	47	26	50.5	7.3	----
11669	45	19	44.5	7.1	12.6
13185	47	16	48.0	5.8	----
6251	46	53	45.5	5.7	12.1
1442	45	73	41.5	2.5	9.9

Standard error of a difference = 1.57 bushels.

Manhattan, Kansas
Four plots

C. I. No.	Date headed	Lodging	Rust		Bunt ² / ₁	Weight per bushel	Av. acre yield	
			Leaf	Stem ¹ / ₁			1957	1956-1957
	May	%	%	%	%	Lbs.	Bus.	Bus.
13023	22	50	43	100	95	61.0	52.2	34.6
13279	24	45	T	10	70	57.4	50.5	----
13187	24	55	68	50	75	57.6	48.0	----
13188	25	55	37	50	65	56.4	48.0	----
11673	22	58	25	90	2	57.5	47.9	33.9
12517	22	70	50	100	5	58.4	46.9	33.7
13015	24	50	75	90	1	58.8	44.2	31.9
13024	23	55	70	90	30	57.8	44.1	31.5
12719	24	60	78	100	75	60.5	43.8	33.7
13285	21	23	T	10	75	60.2	41.8	----
6251	27	53	50	90	80	60.4	40.6	32.3
13022	22	55	83	50	80	57.2	39.0	28.3
13186	26	30	68	70	30	59.2	38.9	----
11669	24	63	60	90	15	57.1	38.4	28.9
13016	27	48	43	40	80	60.0	36.5	----
1442	28	63	83	90	75	57.0	35.7	27.2
13176	28	75	1	10	30	57.5	34.9	27.3
8856	21	78	75	100	85	57.3	33.7	26.1
13185	27	28	95	70	30	58.8	32.6	----

¹/Stem rust readings from the rust nursery by C.O. Johnston.

²/Bunt readings by E.D. Hansing using local composite of inoculum.

Standard error of a difference = 2.48 bushels.

Garden City, Kansas
Four plots, fall irrigated

C. I. No.	Date		Plant height	Winter survival	Weight per bushel	Av. Acre yield	
	Headed	Ripe				1957 ^{1/}	1956-1957
	June	July	Ins.	%	Lbs.	Bus.	Bus.
13285	5-30	6-30	32	97	59.5	37.0	--
13187	5-30	2	32	91	57.5	33.5	--
12719	5-30	2	35	80	63.0	30.8	14.4
6251	2	3	39	100	61.5	29.0	17.0
12517	5-30	2	34	98	58.5	28.1	16.6
13176	4	7	34	94	58.5	25.5	13.7
13015	1	2	34	98	59.5	25.2	15.9
13279	3	9	35	82	57.5	25.2	--
13186	4	7	35	69	60.0	24.8	--
11669	5-31	1	33	99	58.0	24.0	15.2
13016	3	5	36	74	60.5	24.0	--
13023	1	4	30	98	60.0	22.4	13.2
13188	3	5	37	78	56.0	22.0	--
8856	5-27	6-28	33	94	59.0	21.2	12.5
13022	5-31	1	36	88	59.0	21.1	12.9
1442	5	9	35	94	58.0	21.0	13.9
13185	4	5	37	90	61.0	19.8	--
13024	5-31	2	35	90	57.0	19.6	12.5
11673	1	6	33	90	56.0	17.6	11.9

^{1/} 1957 yields based on best 2 out of 4 harvested plots of each variety.
Standard error of a difference = 4.85 bushels.

Colby, Kansas
Four plots, fall irrigated

C.I. No.	Date headed	Plant height	Leaf rust	Weight per bushel	Av. acre yield
	June	Ins.	%	Lbs.	Bus.
13285	5	34	10	57.0	40.3
13187	6	35	60	53.0	38.5
13015	6	35	50	55.0	37.8
11669	6	37	50	54.5	36.2
13022	7	37	45	53.0	35.4
13176	9	38	8	52.5	35.2
13023	6	35	25	55.5	34.6
13188	8	39	20	51.5	34.0
13279	9	38	T	52.5	33.6
6251	9	39	35	54.5	33.2
12517	7	37	25	51.0	32.8
12719	6	37	28	57.0	32.5
11673	8	36	18	53.0	31.4
8856	5	36	50	55.0	31.3
13024	7	36	30	54.5	29.9
13186	9	38	55	53.5	28.1
1442	11	39	23	49.0	24.5
13016	10	39	25	51.5	24.0
13185	9	40	75	52.0	20.4

Standard error of a difference = 1.93 bushels.

Ft. Collins Colorado
Five plots

C.I. No.	Date		Plant height	Rust		Weight per bushel	Av. acre yield
	Headed	Ripe		Leaf	Stem		
	June	July	Ins.	%	%	Lbs.	Bus.
13023	8	22	46	T-5	2	64.9	67.6
13188	11	25	46	T	5	64.4	67.3
13187	10	23	45	T-5	10	63.2	66.3
13016	13	23	49	T-25	20	64.5	61.7
13285	9	23	43	T	40	64.8	60.8
13186	12	24	48	T-5	5	64.4	58.4
13185	12	26	50	10-75	20	64.6	58.3
13279	12	24	45	T	5	63.3	57.7
11673	10	23	47	5-50	2	63.9	56.2
12719	8	23	49	10-75	10	63.8	55.8
12517	10	25	46	T-10	20	64.0	55.7
11669	10	23	46	10-75	10	64.5	55.2
13176	12	25	47	T	T	63.1	54.9
13015	9	22	45	10-75	10	63.4	54.4
13024	8	22	45	T-50	5	63.7	52.7
13022	9	23	44	T-25	2	61.2	51.0
8856	7	22	48	T-25	T	63.6	50.6
6251	12	25	50	T-10	2	63.2	49.0
1442	18	28	48	T-5	20	62.9	46.7

Standard error of a difference = 4.68 bushels.

Hesperus, Colorado
Five plots, irrigated

C. I. No.	Date headed	Plant height Ins.	Lodging %	Weight per bushel Lbs.	Av. acre yield	
	June				1957 Bus.	1956- 1957 Bus.
13279	28	36	30	61.2	109.9	--
12517	24	37	58	62.3	104.0	96.0
13187	22	33	24	60.1	93.1	--
13285	24	35	8	62.9	89.1	--
13188	26	37	10	62.6	88.7	--
6251	24	39	54	62.3	88.2	81.3
13023	22	36	30	63.2	87.3	82.5
13176	27	37	34	62.7	87.3	90.9
8856	22	36	48	61.5	87.2	81.4
1442	7-2	38	52	61.3	86.8	78.3
11673	24	38	50	61.9	86.8	92.6
13185	28	41	0	63.3	85.9	--
12719	24	38	38	63.3	81.9	76.5
13016	27	42	6	62.4	80.5	--
13186	27	40	10	62.8	79.8	--
13022	24	35	26	60.9	77.5	81.5
13024	25	36	30	60.8	77.0	79.6
11669	23	38	50	60.3	74.7	73.4
13015	23	35	16	61.2	68.8	76.7

Standard error of a difference = 5.38 bushels.

Lincoln, Nebraska
Five plots

C.I. No.	Date headed	Plant height	Leaf Rust	Lodging	Weight per bushel	Av. acre yield	
						1957	1956-1957
	May	Ins.	%	%	Lbs.	Bus.	Bus.
13279	31	43	0	20	61.9	52.8	--
13188	30	43	50	13	60.7	48.6	--
13285	28	38	5	5	62.0	46.8	--
13023	29	41	50	35	62.3	45.8	37.8
13186	31	44	65	8	61.6	43.6	--
12719	29	42	40	5	64.0	42.7	38.0
8856	27	42	75	45	62.0	42.2	36.0
12517	30	42	10	45	61.0	41.9	38.9
13022	29	42	60	23	59.1	41.3	37.3
13016	6-1	44	50	5	62.0	41.3	--
13185	31	43	75	0	62.0	40.8	--
11669	30	42	50	75	58.9	39.9	40.8
13015	30	39	65	48	60.5	39.4	37.0
13024	30	43	60	43	58.9	37.7	33.6
11673	31	44	15	93	57.6	37.6	36.8
6251	31	45	70	88	60.7	35.6	35.8
13187	29	40	65	28	58.7	35.5	--
13176	6-1	40	5	55	58.8	34.2	31.0
1442	6-5	41	60	43	55.2	28.2	30.0

Standard error of a difference = 2.54 bushels.

North Platte, Nebraska
Three plots

C. I. No.	Date headed	Plant height	Weight per bushel	Av. acre yield	
				1957	1956-1957
	June	Ins.	Lbs.	Bus.	Bus.
13279	10	49	60.4	36.1	--
13176	11	44	62.0	35.7	27.5
11669	10	47	61.2	35.6	30.1
13285	9	44	61.8	35.1	--
13188	10	47	60.2	34.9	--
8856	5	47	64.1	32.2	26.0
12517	10	46	60.5	32.1	27.9
13023	10	41	64.0	31.7	26.3
13187	10	47	61.0	31.1	--
12719	9	47	64.5	30.3	28.6
11673	10	48	60.1	29.7	25.7
13022	9	42	62.1	29.2	26.2
13024	10	45	60.3	28.7	25.6
13015	10	44	62.2	27.7	24.1
13186	11	49	60.0	26.9	--
13016	11	49	60.5	26.7	--
1442	12	52	56.3	25.7	23.6
6251	10	50	61.7	23.0	24.0
13185	11	46	59.0	19.8	--

Standard error of a difference = 3.71 bushels.

Alliance, Nebraska
Three plots

C. I. No.	Date headed	Weight per bushel	Av. acre yield	
			1957	1956-1957
	June	Lbs.	Bus.	Bus.
11669	9	56.3	54.2	38.7
12517	10	55.5	51.8	38.9
13023	10	59.1	48.3	35.1
13187	10	55.6	47.2	--
13279	11	55.2	47.1	--
12719	8	61.1	46.6	36.4
13016	12	61.3	46.5	--
13024	10	59.3	46.2	35.5
13285	10	57.9	45.9	--
13186	12	58.9	43.3	--
13188	11	53.8	43.1	--
13176	12	55.7	42.1	30.7
8856	8	57.5	41.9	33.4
13015	11	55.5	37.0	33.2
11673	10	55.9	36.8	31.3
6351	11	55.2	36.6	30.6
13022	10	55.0	34.3	30.1
1442	20	55.0	33.0	27.6
13185	12	53.5	31.0	--

Standard error of a difference = not significant.

Ames, Iowa
Three plots

C. I. No	Date headed	Plant height	Disease ratings			Weight per bushel	Av. acre yield	
			Leaf rust	Mildew	Septoria		1957	1956-1957
	June	Ins.				Lbs.	Bus.	Bus.
13285	5-29	39	R++	S-	S+	59.7	50.3	--
13023	1	38	S+	R	S	58.5	42.3	39.9
13279	1	40	R++	R+	S+	52.6	38.8	--
12719	5-30	41	S	R-	S	58.5	38.5	39.9
11669	1	40	S+	R-	S+	55.6	34.3	34.1
13185	3	44	S++	S	S	57.4	31.7	--
12517	1	42	S	S-	S+	54.7	31.2	38.6
13022	5-30	40	S	S-	S+	52.2	30.8	33.5
8856	5-29	40	S+	S	S-	56.1	30.3	32.6
13015	2	39	S++	S	S	54.8	30.2	33.2
13024	1	43	S	S	S	53.7	29.5	33.6
13188	2	42	R-	R+	S+	48.5	27.3	--
13186	4	43	S++	S	S-	55.8	24.7	--
6251	4	40	S+	S	S-	54.0	24.1	30.6
13016	5	41	S	R-	S	55.0	23.5	--
13176	5	37	S+	S-	S+	49.5	21.1	27.3
13187	5-31	38	S+	S	S++	48.2	20.0	--
11673	4	40	S++	S	S	49.2	19.8	28.8
1442	7	42	S+	S	S-	49.2	15.3	25.8

Standard error of a difference = 4.10 bushels.

STANDARD ERRORS

Standard errors, number of plots, and mean yields at each reporting location are summarized in table 14. Methods of computing the various error terms are described in connection with the plot tests.

SUMMARY OF NURSERY YIELDS

Average regional yields for 19 varieties grown in the uniform yield nursery together with State averages and ranks in 1957 are reported in table 15. Quivira Hybrid (C. I. 13285) ranked relatively high in all States except New Mexico and had the highest 14- and 13-station average yield. As in 1956, Hesperus has been omitted from the 13-station average because of its geographic location and growing conditions that are not representative of the main hard red winter wheat producing region. It will be noted that there are surprisingly few differences in rank of varieties in the two averages. The regional yield performance of C. I. 13279 was quite comparable to that of C. I. 13285 and its 14-station average was only 0.3 bushel less than the latter. C. I. 13023, C. I. 13187, and Concho in that order were next highest yielding on a 14-station basis. In contrast to most years, a very wide spread of 14 bushels per acre separated the high and low yielding varieties at 14 reporting stations. The 13-station spread was even wider, it being 15 bushels.

Despite its somewhat mediocre performance in the southern part of the region this year, Concho has the highest 2-year average yield among 12 varieties tested at 12 locations (table 16). Excluding Hesperus from the average, C. I. 13023 is tied with Concho for high yield and is followed by KanKing and Comanche in that order. Kharkof, the lowest yielding variety, has a 2-year yield average at 12 stations of only 25.8 bushels, 7.5 bushels less than Concho.

SUMMARY OF AGRONOMIC DATA

Only KanKing, C. I. 13023 and C. I. 13285 made average bushel weights of 60 pounds or more (table 17). Eleven out of 19 entries weighed less than 58 pounds, the lowest being Kharkof with an average 54.2-pound weight. C. I. 13285 together with the two selections of Improved Blue Jacket x Comanche showed outstanding resistance to lodging. Best leaf rust resistance was demonstrated by C. I. 13279, C. I. 13176, and C. I. 13285. C. I. 13176 was the only variety with an average stem rust reading of less than 20 percent. C. I. 13023 and C. I. 13285 had on the average the shortest straw, while Early Blackhull and C. I. 13285 in that order were the earliest heading.

Table 14. Number of plots, average yields, and standard errors for the uniform yield nursery at the reporting stations in 1957.

State and Station	No. of plots	Number of Varieties	Av. yield all Varieties	Standard error of a		Coefficient of Variability
				Difference in means	Mean	
			Bus.	Bus.	Bus.	%
TEXAS						
Chillicothe	4	19	30.6	3.49	2.46	16.1
Bushland	4	19	10.0	0.87	0.61	12.3
NEW MEXICO						
Clovis	6	19	15.8	n.s.	1.25	19.4
OKLAHOMA						
Woodward	4	19	33.1	1.99	1.40	8.5
Cherokee	4	19	11.5	1.57	1.11	19.3
KANSAS						
Manhattan	4	19	42.0	2.48	1.75	8.3
Garden City	2	19	24.8	4.85	3.42	19.5
Colby	4	19	32.2	1.93	1.36	8.4
COLORADO						
Fort Collins	5	19	56.8	4.68	3.31	13.0
Hesperus	5	19	86.0	5.38	3.80	9.9
NEBRASKA						
Lincoln	5	19	40.8	2.54	1.80	9.9
North Platte	3	19	30.1	3.71	2.62	15.1
Alliance	3	19	42.8	n.s.	6.34	25.7
IOWA						
Ames	3	22 ^{1/}	29.7	4.10	2.90	18.8

^{1/} Uniform yield nursery grown as a part of a larger nursery.

n.s. = non-significant at the 5% level.

Table 15. Summary of average yields in bushels per acre made by the 19 varieties grown in the uniform yield nursery at 14 stations in 1957, with state averages.

Variety	C.I. No.	Texas				New Mexico		Oklahoma				Iowa	
		Chillicothe	Bushland	Average	Rank	Clovis	Rank	Woodward	Cherokee	Average	Rank	Ames	Rank
Quivira Hybrid	13285	31.9	14.0	23.0	5	15.5	10	47.6	25.9	36.8	1	50.3	1
Pawnee x (Iowin x T. Tim. - Wisc.5)	13279	38.2	11.3	24.8	1	17.6	3	43.7	16.2	30.0	2	38.8	3
Kan. -H. Fed. -Tq.-Med. -Hope x Cim.	13023	32.6	8.9	20.8	9	17.6	3	37.0	15.1	26.1	4	42.3	2
Blackhull - Oro. x Pawnee	13187	34.7	11.4	23.1	4	18.3	1	32.0	14.1	23.1	10	20.0	17
Concho	12517	29.8	10.6	20.2	11	17.5	5	28.3	11.9	20.1	15	31.2	7
Com. - Med. - Hope x Iowin	13188	29.6	8.6	19.1	15	14.0	17	38.8	7.9	23.4	7	27.3	12
Kanking	12719	35.1	9.9	22.5	6	14.4	15	39.0	10.6	24.8	6	38.5	4
Pawnee	11669	35.1	6.5	20.8	9	14.2	16	33.4	7.1	20.3	14	34.3	5
Early Blackhull	8856	27.0	11.6	19.3	12	14.9	12	37.7	17.3	27.5	3	30.3	9
Pawnee x Nebred	13015	34.5	12.3	23.4	3	14.9	12	34.9	11.4	23.2	9	30.2	10
Cim x Hope - Chey.	13022	32.1	11.1	21.6	8	18.0	2	37.7	13.7	25.7	5	30.8	8
Comanche	11673	37.6	9.4	23.5	2	14.7	14	32.7	11.0	21.9	11	19.8	18
Cim. - Hope - Chey. x Com.	13024	28.6	9.7	19.2	14	16.6	7	32.7	13.8	23.3	8	29.5	11
Mqo. - Oro x Wichita	13176	25.0	8.8	16.9	17	16.0	8	32.8	9.2	21.0	12	21.1	16
Imp. Blue Jacket x Com.	13186	29.7	8.8	19.3	12	13.9	18	29.6	12.0	20.8	13	24.7	13
Red Chief x Cheyenne	13016	32.9	10.9	21.9	7	15.2	11	22.7	7.3	15.0	17	23.5	15
Blackhull	6251	24.0	10.1	17.1	16	15.7	9	26.7	5.7	16.2	16	24.1	14
Imp. Blue Jacket x Com.	13185	20.6	8.2	14.4	18	13.6	19	23.7	5.8	14.8	18	31.7	6
Kharkof	1442	21.8	6.8	14.3	19	16.8	6	18.7	2.5	10.6	19	15.3	19

1/ Hesperus, Colorado yields omitted.

Table 15. (continued)

C.I. No.	Kansas					Colorado				Nebraska					14	13 Stations ^{1/}	
	Manhattan	Garden City	Colby	Average	Rank	Ft. Collins	Hesperus	Average	Rank	Lincoln	North Platte	Alli-ance	Average	Rank	Station Average	Average	Rank
13285	41.8	37.0	40.3	39.7	2	60.8	89.1	75.0	6	46.8	35.1	45.9	42.6	3	41.6	37.9	1
13279	50.5	25.2	33.6	36.4	3	57.7	109.9	83.8	1	52.8	36.1	47.1	45.3	1	41.3	36.1	2
13023	52.2	22.4	34.6	36.4	3	67.6	87.3	77.5	5	45.8	31.7	48.3	41.9	5	38.8	35.1	3
13187	48.0	33.5	38.5	40.0	1	66.3	93.1	79.7	3	35.5	31.1	47.2	37.9	10	37.4	33.1	4-5
12517	46.9	28.1	32.8	35.9	5	55.7	104.0	79.9	2	41.9	32.1	51.8	41.9	5	37.3	32.2	7
13188	48.0	22.0	34.0	34.7	8	67.3	88.7	78.0	4	48.6	34.9	43.1	42.2	4	36.6	32.6	6
12719	43.8	30.8	32.5	35.7	6	55.8	81.9	68.9	12	42.7	30.3	46.6	39.9	7	36.6	33.1	4-5
11669	38.4	24.0	36.2	32.9	10	55.2	74.7	65.0	16	39.9	35.6	54.2	43.2	2	34.9	31.9	8
8856	33.7	21.2	31.3	28.7	16	50.6	87.2	68.9	12	42.2	32.2	41.9	38.8	8	34.2	30.1	11
13015	44.2	25.2	37.8	35.7	6	54.4	68.8	61.6	19	39.4	27.7	37.0	34.7	15	33.8	31.1	9
13022	39.0	21.1	35.4	31.8	13	51.0	77.5	64.3	18	41.3	29.2	34.3	34.9	14	33.7	30.4	10
11673	47.9	17.6	31.4	32.3	11	56.2	86.8	71.5	8	37.6	29.7	36.8	34.7	15	33.5	29.4	13
13024	44.1	19.6	29.9	31.2	14	52.7	77.0	64.9	17	37.7	28.7	46.2	37.5	12	33.3	30.0	12
13176	34.9	25.5	35.2	31.9	12	54.9	87.3	71.1	9	34.2	35.7	42.1	37.3	13	33.0	28.9	15
13186	38.9	24.8	28.1	30.6	15	58.4	79.8	69.1	11	43.6	26.9	43.3	37.9	10	33.0	29.4	13
13016	36.5	24.0	24.0	28.2	17	61.7	80.5	71.1	9	41.3	26.7	46.5	38.2	9	32.4	28.7	16
6251	40.6	29.0	33.2	34.3	9	49.0	88.2	68.6	14	35.6	23.0	36.6	31.7	17	31.5	27.2	17
13185	32.6	19.8	20.4	24.3	19	58.3	85.9	72.1	7	40.8	19.8	31.0	30.5	18	29.4	25.1	18
1442	35.7	21.0	24.5	27.1	18	46.7	86.8	66.8	15	28.2	25.7	33.0	29.0	19	27.4	22.8	19

Table 16. Summary of two-year average yields in bushels per acre for 12 varieties grown in the uniform yield nursery at 12 stations in 1956 and 1957, with state averages.

Variety	C.I. No.	Texas				New Mexico		Oklahoma			
		Chilli-cothe	Bush-land	Aver-age	Rank	Clovis	Rank	Chevo-kee	Wood-ward	Aver-age	Rank
Concho	12517	23.6	30.9	27.3	2	17.6	1	15.3	22.4	18.9	8
Kan.-H.Fed.-Tq.-Med.-Hope x Cim.	13023	27.2	30.1	28.7	1	16.7	3	17.5	26.1	21.8	3
Kan King	12719	27.4	24.8	26.1	5	15.0	11	16.2	28.0	22.1	2
Comanche	11673	25.9	27.6	26.8	3	16.7	3	14.4	24.2	19.3	7
Pawnee	11669	27.4	25.6	26.5	4	14.7	12	12.6	24.5	18.6	9
Cim. x Hope - Chey.	13022	22.0	27.8	24.9	7	16.8	2	16.3	27.0	21.7	4
Pawnee x Nebred	13015	26.2	24.4	25.3	6	15.4	9	14.8	25.1	20.0	5
Cim. - Hope - Chey. x Com.	13024	23.8	25.2	24.5	8	16.2	5	15.3	24.2	19.8	6
Early Blackhull	8856	24.1	22.3	23.2	11	15.4	9	19.6	26.5	23.1	1
Blackhull	6251	20.6	27.3	24.0	9	16.2	5	12.1	21.1	16.6	11
Mgo. - Oro x Wichita	13176	20.2	27.2	23.7	10	15.9	8	12.4	23.4	17.9	10
Kharkof	1442	16.2	23.2	19.7	12	16.2	5	9.9	17.5	13.7	12

1/ Hesperus, Colorado yields omitted.

Table 16. (continued)

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C.I. No	Kansas				Colorado		Iowa		Nebraska					12	11 Station	
	Man-hattan	Garden City	Aver-age	Rank	Hesper-us	Rank	Ames	Rank	Lincoln	North Platte	Alli-ance	Aver-age	Rank	Station Average	Aver-age	Rank
12517	33.7	16.6	25.2	1	96.0	1	38.6	3	38.9	27.9	38.9	35.2	2	33.4	27.7	1
13023	34.6	13.2	23.9	4	82.5	4	39.9	1	37.8	26.3	35.1	33.1	4	32.2	27.7	1
12719	33.7	14.4	24.1	3	76.5	11	39.9	1	38.0	28.6	36.4	34.3	3	31.6	27.5	3
11673	33.9	11.9	22.9	6	92.6	2	28.8	10	36.8	25.7	31.3	31.3	8	30.8	25.2	7
11669	28.9	15.2	22.1	7	73.4	12	34.1	4	40.8	30.1	38.7	36.5	1	30.5	26.6	4
13022	28.3	12.9	20.6	9	81.5	5	33.5	6	37.3	26.2	30.1	31.2	9	30.0	25.3	6
13015	31.9	15.9	23.9	4	76.7	10	33.2	7	37.0	24.1	33.2	31.4	7	29.8	25.6	5
13024	31.5	12.5	22.0	8	79.6	8	33.6	5	33.6	25.6	35.5	31.6	6	29.7	25.2	7
8856	26.1	12.5	19.3	12	81.4	6	32.6	8	36.0	26.0	33.4	31.8	5	29.7	25.0	9
6251	32.3	17.0	24.7	2	81.3	7	30.6	9	35.8	24.0	30.6	30.1	10	29.1	24.3	10
13176	27.3	13.7	20.5	11	90.9	3	27.3	11	31.0	27.5	30.7	29.7	11	29.0	23.3	11
1442	27.2	13.9	20.6	9	78.3	9	25.8	12	30.0	23.6	27.6	27.1	12	25.8	21.0	12

Table 17. Summary of agronomic data other than yield for varieties grown in the uniform yield nursery in 1957.

Variety	C. I No.	Date		Plant height	Rust		Lodging	Weight per bushel
		Headed	Ripe		Leaf	stem		
		May	June	Ins.	%	%	%	Lbs.
Number of stations - - -		15	5	13	7	3	6	15
KanKing	12719	25	29	41	39	50	26	60.7
Kan.-H.Fed.-Tq.-Med.-Hope x Cim.	13023	25	28	37	34	54	39	60.0
Quivira Hybrid	13285	23	27	37	7	30	12	60.0
Imp. Blue Jacket x Com.	13186	29	30	42	51	38	12	58.9
Early Blackhull	8856	21	24	39	42	40	60	58.8
Red Chief x Cheyenne	13016	29	30	42	26	33	20	58.7
Pawnee x Nebred	13015	26	28	38	59	43	32	58.0
Imp. Blue Jacket x Com.	13185	29	7-1	42	71	43	13	58.0
Blackhull	6251	29	30	42	32	41	56	57.4
Cim.-Hope-Chey. x Com.	13024	26	28	39	33	52	53	56.9
Mgo.-Oro x Wichita	13176	30	7-2	39	3	13	41	56.9
Cim. x Hope - Chey.	13022	24	27	39	42	37	47	56.8
Pawnee	11669	26	28	39	43	53	52	56.6
Concho	12517	26	29	40	28	53	63	56.5
Blackhull - Oro. x Pawnee	13187	26	28	38	43	33	48	56.3
Pawnee x (Iowin x T.Tim-Wisc.5)	13279	27	30	40	3	25	34	56.1
Comanche	11673	26	29	40	24	37	58	55.9
Com.-Med.-Hope x Iowin	13188	27	29	41	24	25	39	55.1
Kharkof	1442	6-1	7-3	41	33	53	46	54.2

UNIFORM WINTERHARDINESS NURSERY

DATA OBTAINED

The uniform winterhardiness nursery, the northern area counterpart of the uniform yield nursery, is grown annually at 11 stations including Lethbridge, Alberta. Twenty-three varieties were evaluated this year. Replicated row plots were grown at all stations except St. Paul and Waseca where observation rows only were grown. Data are reported from all stations this year except Havre and Dickinson. At Havre, dry seedbed conditions at planting time resulted in only partial fall germination and stands. The nursery was not harvested for yield. A severe hailstorm in July destroyed the nursery at Dickinson. Data from the reporting stations appear in table 18.

No winterkilling occurred at Alliance. Favorable moisture conditions in the spring made for generally high yields. The spread in both yield and bushel weights was unusually wide this year. More than 30 bushels per acre separated the high and low yielding varieties and bushel weights ranged from 61.5 down to 49.9 pounds. C. I. 13279 made the high yield of 49.1 bushels but had very low test weight. Minnesota selection III-54-58 was second high in both yield and test weight. Among the varieties grown two years in the nursery, Pawnee x Nebred (C. I. 13015) has the highest average yield.

Excessive lodging and high incidence of disease associated with an unusually wet spring led to the abandonment of the nursery for yield purposes at Ames. Only date of heading and plant height notes were taken.

Near perfect fall stands were established in an irrigated nursery at Laramie. Snow cover during periods of excessively low temperatures allowed complete winter survival of the nursery. Very high yields and above-normal test weights were made. Rego and W.S. 432 both yielded more than 90 bushels per acre. Early maturing Pawnee x Nebred (C. I. 13015) was least productive with a 62.7-bushel yield. Its test weight of 58 pounds also was low for the nursery. Lodging ranged from none for several varieties to as much as 58 percent for tall-growing Minter. Lowest stem rust infections were recorded for the Minnesota selections and two of the South Dakota selections. Five varieties have 2-year average yields that exceed 60 bushels per acre.

Nebraska selection 483310 and W.S. 432 were most productive in the Archer nursery with yields of 31.6 and 31.4 bushels, respectively. All yields in the nursery exceeded 20 bushels per acre and only three varieties test weighed less than 60 pounds per bushel, they being C. I. 13015, Rego, and Kharkof M.C. 22. Turkey x Cheyenne has the highest 2-year average yield at both Laramie and Archie.

Yields ranged from 21.6 to 38 bushels per acre at Sheridan in northeastern Wyoming. Thirteen varieties made more than 30 bushels with C. I. 13279, 53-498, and C. I. 12711, in that order, high for the nursery. Lack of moisture during ripening resulted in shriveled grain. All varieties weighed less than 60 pounds and 12 were below 55 pounds per bushel.

The uniform winterhardiness nursery at Brookings was seeded on September 20 in good soil moisture. Emergence was prompt and a dry fall was followed by a relatively open winter. Good differential winterkilling occurred. Heavy May and June rainfall favored tall growth and abundant tillering. Leaf rust became heavy and stem rust also was present in light to moderate amounts. Aphids were severe. Three Minnesota selections and C. I. 13279 yielded above 50 bushels per acre. Rego and Kharkof M.C. 22

were the only varieties yielding less than 30 bushels and they were as well the lightest in test weight. No varieties in the test were resistant to leaf rust although moderately low readings were obtained for some of the South Dakota and Minnesota selections. These were also the most resistant to stem rust. Highest winter survivals were recorded for Yogo, Kharkof M.C. 22, Minturki, and 3 South Dakota selections. All survived 90 percent or more.

Differential winter survival occurred at both St. Paul and Waseca. Killing was most severe at Waseca where only 6 varieties had more than 60 percent survival, among which were 2 South Dakota selections, Kharkof M.C. 22, Minturki, Minter, and Rego. The position of Rego was completely reversed at St. Paul where it survived only 11 percent, while 12 other varieties survived more than 80 percent. Resistance to stem rust at St. Paul was shown by the Minnesota and South Dakota selections. C. I. 13279 had the lowest leaf rust reading.

Slight loss of stands during the winter occurred in only 6 varieties at Lethbridge. Lowest survival was 80 percent recorded for Rego. Yields of grain were somewhat lower than those recorded in 1956. Only 5 bushels in yield separated the top-ranked Cheyenne from Kharkof M.C. 22, the nineteenth-ranked variety. Bushel weights were high. Yogo has slightly the highest 2-year average yield.

Table 18. Yield and other data for varieties grown in the uniform winterhardness nursery at 9 stations in the hard red winter wheat region in 1957 with 2-year averages.

Alliance, Nebraska
Three plots

Variety	C. I. or Sel. No.	Date headed	Weight per bushel	Av. acre yield	
				1957	1956- 1957
		June	Lbs.	Bus.	Bus.
Paw. x Iowin-T. timo.-Wisc. 5	13279	12	53.0	49.1	----
227-10-3-3-1 x 255-49-5-1-3	III-54-58	21	60.3	44.6	----
Chey.-Chfk. x H44-Mint. ²	13115	21	58.8	42.5	33.0
H255-49-5-1-4 x Blackhawk	III-54-66	21	59.3	40.9	----
Pawnee x Nebred	13015	11	56.9	39.8	34.6
So. Dakota Selection	53-520	22	58.3	39.3	----
Cheyenne	8885	22	57.3	38.4	----
So. Dakota Selection	53-411	22	58.4	37.3	----
Do	53-498	18	56.4	37.0	----
Do	53-594	22	56.9	36.5	----
Pawnee x Cheyenne	N.483310	16	50.6	36.1	----
Nebred	10094	18	56.9	36.1	29.1
H255-49-5-1-4 x Blackhawk	III-54-60	22	60.2	36.1	----
Cheyenne Selection	W.S.432	22	57.2	35.8	----
Kharkof	1442	22	55.1	34.1	28.2
Turkey x Cheyenne	12711	12	52.6	33.3	29.9
So. Dakota Selection	53-429	22	57.9	33.2	----
Minturki	6155	22	56.3	31.5	27.0
H255-49-5-1-4 x Blackhawk	III-54-12	21	61.5	31.0	----
Minter	12138	22	57.0	28.3	25.1
Rego	13181	22	49.9	25.5	22.9
Yogo	8033	22	53.0	17.5	19.3
Kharkof M.C. 22	6938	24	56.0	17.4	18.1

Standard error of a difference = 5.66 bushels.
Coefficient of variation = 19.9 percent.

Ames, Iowa
Three plots

Variety	C. I. or Sel. No.	Date headed	Plant height
		June	Ins.
Kharkof	1442	8	41
Kharkof M.C.22	6938	11	40
Nebred	10094	4	41
Minturki	6155	9	41
Minter	12138	9	42
Yogo	8033	7	41
Pawnee x Nebred	13015	1	39
Turkey x Cheyenne	12711	1	41
Pawnee x Cheyenne	N.483310	4	39
Rego	13181	8	40
Paw. x Iowin-T timo.-Wisc. 5	13279	3	43
Cheyenne Selection	W.S. 432	6	38
Cheyenne	8885	6	39
So. Dakota Selection	53-594	10	42
do.	53-498	5	44
do.	53-520	7	42
do.	53-411	8	44
do.	53-429	8	42
Chey.-Chfk. x H44-Mint. ²	13115	8	44
H227-10-3-1-1 x H255-49-5-1-3	III-54-58	6	42
H255-49-5-1-4 x Blackhawk	III-54-60	7	43
do.	III-54-12	5	40
do.	III-54-66	8	39

Laramie, Wyoming
Four plots, irrigated

Variety	C. I. or Sel. No.	Plant height	Lodging	Stem rust	Weight per bushel	Av. acre yield	
						1957	1956- 1957
		Ins.	%	%	Lbs.	Bus.	Bus.
Rego	13181	44	22	5	60	92.4	63.7
Cheyenne Selection	W.S. 432	40	2	10	62	92.2	----
Pawnee x Cheyenne	N.483310	40	2	10	60	88.6	----
Turkey x Cheyenne	12711	42	0	25	61	87.9	65.3
Cheyenne	8885	43	5	5	60	86.9	----
Paw. x Iowin-T. Timo.-Wisc. 5	13279	39	0	5	61	81.8	----
H227-10-3-1-1 x H255-49-5-1-3	III-54-58	41	0	2	62	78.2	----
Minter	12138	46	58	10	59	77.1	60.8
South Dakota Selection	53-594	44	47	10	61	75.3	----
Yogo	8033	46	31	10	59	74.2	59.9
Nebred	10094	40	2	10	62	74.0	63.3
South Dakota Selection	53-411	44	38	5	60	73.8	----
Kharkof	1442	44	24	5	60	71.8	60.6
South Dakota Selection	53-520	46	34	2	62	71.4	----
do	53-498	42	0	15	60	71.2	----
Minturki	6155	44	26	15	58	70.7	54.9
H255-49-5-1-4 x Blackhawk	III-54-66	42	12	2	61	70.0	----
Kharkof M.C. 22	6938	46	14	10	60	68.1	53.8
Chey.-Chfk. x H44-Mint. ²	13115	45	20	15	62	67.4	51.4
South Dakota Selection	53-429	44	35	2	61	66.6	----
H255-49-5-1-4 x Blackhawk	III-54-12	40	2	2	60	65.6	----
do	III-54-60	41	2	2	60	65.4	----
Pawnee x Nebred	13015	34	0	10	58	62.7	44.8

Standard error of a difference = 3.81 bushels.
Coefficient of variation = 7.1 percent.

Archer, Wyoming
Four plots

Variety	C.I. or Sel. No.	Plant height	Weight per bushel	Av. acre yield	
				1957	1956- 1957
		Ins.	Lbs.	Bus.	Bus.
Pawnee x Cheyenne	N.483310	29	60	31.6	--
Cheyenne Selection	W.S.432	28	63	31.4	--
Turkey x Cheyenne	12711	30	62	29.8	27.3
Cheyenne	8885	29	62	29.5	--
Yogo	8033	30	61	29.4	26.2
Kharkof	1442	31	62	29.2	26.5
H255-49-5-1-4 x Blackhawk	III-54-60	29	61	28.2	--
do	III-54-12	29	61	27.5	--
Minter	12138	31	60	27.0	24.3
Nebred	10094	28	61	26.6	25.0
Chey.- Chfk. x H44-Mint. ²	13115	34	61	26.5	24.1
So. Dakota Selection	53-429	30	60	26.3	--
H227-10-3-1-1 x H225-49-5-1-3	III-54-58	30	60	26.0	--
So. Dakota Selection	53-498	29	60	25.5	--
do.	53-594	29	62	25.1	--
Minturki	6155	30	63	24.8	22.3
Pawnee x Nebred	13015	29	59	24.7	24.3
Paw. x Iowin-T.timo.-Wisc. ⁵	13279	29	61	24.5	--
H.255-49-5-1-4 x Blackhawk	III-54-66	29	60	24.3	--
So. Dakota Selection	53-520	30	61	23.8	--
Rego	13181	28	59	23.1	23.2
So. Dakota Selection	53-411	29	60	21.3	--
Kharkof M.C.22	6938	31	59	21.0	19.9

Standard error of a difference = 3.31 bushels.

Coefficient of variation = 17.8 percent.

Sheridan, Wyoming
Four plots

Variety	C.I. or Sel. No.	Date headed	Weight per bushel	Av. acre yield
		June	Lbs.	Bus.
Paw. x Iowin-T.timo.-Wis.5	13279	16	58	38.0
South Dakota Selection	53-498	20	58	37.0
Turkey x Cheyenne	12711	16	59	34.3
Chey.-Chfk. x H44-Mint. ²	13115	16	56	33.4
H255-49-5-1-4 x Blackhawk	III-54-12	16	59	33.3
Rego	13181	16	52	32.9
Minturki	6155	16	57	32.6
Cheyenne Selection	W.S.432	16	56	32.4
Pawnee x Cheyenne	N.483310	16	55	32.2
Cheyenne	8885	16	56	32.1
South Dakota Selection	53-594	16	55	31.2
Nebred	10094	16	54	30.4
South Dakota Selection	53-429	16	53	30.1
H255-49-5-1-4 x Blackhawk	III-54-60	24	51	29.4
South Dakota Selection	53-411	20	54	29.1
Minter	12138	16	53	27.0
H255-49-5-1-4 x Blackhawk	III-54-66	26	50	26.8
H227-10-3-1-1xH255-49-5-1-3	III-54-58	16	52	26.6
Yogo	8033	16	52	25.5
Kharkof M.C. 22	6938	28	51	24.5
South Dakota Selection	53-520	16	55	24.4
Pawnee x Nebred	13015	16	51	24.1
Kharkof	1442	16	51	21.6

Standard error of a difference = 3.71 bushels.
Coefficient of variation = 17.5 percent.

Brookings, South Dakota
Three plots

Variety	C. I. or Sel. No.	Date		Winter Survival	Plant height	Rust		Weight per bushel	Av. acre yield	
		Headed	Ripe			Stem	Leaf		1957	1956- 1957
		June	July			%	%		Bus.	Bus.
H255-49-5-1-4 x Blackhawk	III-54-60	19	23	72	46	12	40	60.0	53.0	----
do.	III-54-12	14	20	78	42	5	30	61.7	52.6	----
do.	III-54-66	20	24	60	48	40	47	58.7	51.0	----
Paw. x Iowin-T. timo.-Wisc. 5	13279	12	21	50	41	53	40	57.9	50.9	----
So. Dakota Selection	53-520	16	22	93	44	9	33	59.3	48.2	----
do.	53-429	16	22	90	46	5	30	59.3	47.7	----
H227-10-3-1-1 x H255-49-5-1-3	III-54-58	13	20	50	44	28	43	60.1	47.2	----
Hey.-Chfk. x H44-Mint. ²	13115	17	21	68	49	12	43	60.3	45.6	38.6
So. Dakota Selection	53-411	14	22	92	46	9	37	58.9	44.7	----
Nebred	10094	13	20	68	40	37	80	56.3	44.2	35.1
So. Dakota Selection	53-498	13	22	83	45	14	70	58.4	43.4	----
do.	53-594	16	21	80	46	12	50	57.9	43.1	----
Minter	12138	17	23	88	44	27	57	58.7	41.6	33.5
Pawnee x Nebred	13015	9	18	67	37	15	70	58.1	40.5	29.9
Turkey x Cheyenne	12711	12	20	60	41	40	67	56.0	40.4	32.1
Pawnee x Cheyenne	N483310	12	19	77	39	18	67	54.3	37.7	----
Kharkof	1442	15	21	67	45	30	80	54.2	37.1	28.4
Cheyenne	8885	17	22	65	47	37	80	55.5	37.1	----
Minturki	6155	17	24	90	48	33	77	55.7	36.6	30.6
Cheyenne Selection	W.S.432	13	20	68	43	37	60	52.8	35.6	----
Yogo	8033	17	24	90	47	40	80	57.0	34.5	28.1
Rego	13181	19	25	38	46	57	80	52.1	29.1	17.9
Kharkof M.C. 22	6938	19	23	95	48	33	80	52.2	28.3	20.3

Standard error of a difference = 7.0 bushels.
Coefficient of variation = 20.6 percent.

St. Paul and Waseca, Minnesota
Observation rows

Variety	C. I. or Sel. No.	St. Paul				Waseca Winter survival
		Date headed	Winter survival	Rust		
				Stem	Leaf	
		June	%	%	%	%
Kharkof	1442	15	68	60S	40	41
Kharkof M.C. 22	6938	17	86	50S	65	70
Nebred	10094	11	96	60R-S	65	33
Minturki	6155	14	88	50R-S	55	68
Minter	12138	14	96	15R-S	50	60
Yogo	8033	13	96	50R-S	60	55
Pawnee x Nebred	13015	9	66	50R-S	75	17
Turkey x Cheyenne	12711	11	66	50S	70	43
Pawnee x Cheyenne	N.483310	11	81	60S	75	33
Rego	13181	15	11	60S	70	68
Paw. x Iowin-T. timo.-Wisc. 5	13279	13	42	50S	10	32
Cheyenne Selection	W.S.432	17	63	80S	40	33
Cheyenne	8885	14	56	30S	50	43
So. Dakota Selection	53-594	14	96	20R-S	45	60
do.	53-498	11	96	15R-S	43	42
do.	53-520	14	96	10R-HR	45	43
do.	53-411	14	92	20R-S	48	53
do.	53-429	15	90	30R-HR	55	66
Chey.-Chfk. x H44-Mint. ²	13115	18	93	20R-S	53	56
H255-49-5-1-4 x Blackhawk	III-54-12	14	36	10R-S	37	48
H227-10-3-1-1 x H255-49-5-1-3	III-54-58	13	62	T	45	42
H255-49-5-1-4 x Blackhawk	III-54-60	14	40	T	23	56
do.	III-54-66	16	40	T-40R-S	20	57

Lethbridge, Alberta
Four plots

Variety	C. I. or Sel. No.	Date		Plant height	Winter survival	Weight per bushel ^{1/}	Av. acre yield	
		Headed	Ripe				1957	1956- 1957
		June	July	Ins.	%	Lbs.	Bus.	Bus.
Cheyenne	8885	10	24	32	95	68.0	33.2	----
So. Dakota Selection	53-594	13	25	33	100	66.5	31.6	----
Minter	12138	13	24	34	100	67.0	31.2	41.9
Cheyenne Selection	W.S.432	11	23	30	100	68.0	30.8	----
So. Dakota Selection	53-520	12	23	34	100	66.0	30.5	----
Kharkof	1442	12	24	34	95	67.0	30.3	33.9
Paw. x Iowin-T. timo.-Wisc. 5	13279	5	21	31	100	68.0	30.3	----
Turkey x Cheyenne	12711	5	23	29	100	67.0	30.3	30.9
So. Dakota Selection	53-411	13	23	34	100	68.0	30.1	----
H277-10-3-3-1 x H255-49-5-1-3	III-54-58	11	24	32	100	66.0	30.1	----
Yogo	8033	16	24	36	100	67.0	30.1	42.3
H255-49-5-1-4 x Blackhawk	III-54-12	12	23	31	100	66.0	29.8	----
Pawnee x Cheyenne	N.483310	6	23	28	95	68.0	29.7	----
So. Dakota Selection	53-429	13	23	35	100	66.0	29.2	----
Rego	13181	12	25	35	80	64.0	29.2	34.4
Nebred	10094	10	25	30	95	68.0	28.7	34.9
H255-49-5-1-4 x Blackhawk	III-54-66	17	24	35	82	64.0	28.4	----
do.	III-54-60	14	26	33	95	66.0	28.3	----
Kharkof M.C. 22	6938	14	26	37	100	65.0	28.2	41.8
Chey.-Chfk. x H44-Mint ²	13115	13	25	37	100	64.0	27.9	38.1
So. Dakota Selection	53-498	10	23	31	100	65.0	26.8	----
Minturki	6155	14	24	36	100	67.0	25.6	41.5
Pawnee x Nebred	13015	4	20	28	100	65.0	20.1	25.0

^{1/} Imperial bushel weights.

Standard error of a difference = 1.71 bushels.

Coefficient of variation = 8.2 percent.

SUMMARY OF YIELDS AND AGRONOMIC DATA

Yields of grain are summarized for the uniform winterhardness nursery in this report in the same manner as the uniform plots. A summary of average yields for 1957 is given in table 19 and the 2-year average yields are summarized in table 20. C. I. 13279, the highest yielding variety at Sheridan and Alliance, also had the highest 6-station average yield in 1957. Its yield of 45.7 bushels was 2.7 bushels higher than W.S. 432, the second-ranked variety. The latter averaged just 0.2 bushel higher than Cheyenne, the variety from which it was selected. C. I. 12711 and 483310 were equally productive on the average, ranking fourth among 23 varieties.

Nebred has the highest average yield among 10 varieties tested in both 1956 and 1957. Its 2-year yield of 37.5 bushels slightly exceeds that made by Minter, C. I. 12711, and C. I. 13115. Kharkof M.C. 22, C. I. 13015, and Rego have been least productive on a 2-year basis.

Comparison of the agronomic data presented in table 21 with average yields made by the varieties is of interest. It is readily apparent that the least winter-hardy varieties were generally the most productive in the absence of heavy winter-killing. C. I. 13279, W.S. 432, Cheyenne, C. I. 12711, and Sel. 483310 in that order were the highest yielding this year, whereas their average winter survival at 4 stations where killing occurred was among the lowest for the 23 varieties in the nursery. Conversely, the varieties Kharkof M.C. 22, Yogo, Minturki, and Minter had low average yields but high average winter survivals. Rego and C. I. 13015 were exceptions in that both were low yielding on the average and were among the least winterhardy varieties. No apparent association between maturity and yield existed this year. On the average, C. I. 13015, C. I. 12711, C. I. 13279, and 483310 were the earliest maturing. Among these, C. I. 13015 had a low average yield and the others were high in yield. C. I. 13015 and 483310 had the shortest straw; C. I. 13279 the lowest leaf rust reading; and III-54-60, III-54-12, and 53-520 the lowest average stem rust readings. The highest average test weight was 61.5 pounds recorded for III-54-12. Three other experimental varieties averaged 60 pounds or more.

Table 19. Summary of average yields made by 23 varieties grown in the uniform winter hardiness nursery at 6 stations in 1957.

Variety	C.I. or Sel. No.	Yield in bushels per acre at - - - -						Six- station average
		Lar- amie	Sher- idan	Archer	Brook- ings	Leth- bridge	Alli- ance	
Paw. x (Iow. x T.tim - Wis. 5)	13279	81.8	38.0	24.5	50.9	30.3	49.1	45.7
Cheyenne Selection	W.S.432	92.2	32.4	31.4	35.6	30.8	35.8	43.0
Cheyenne	8885	86.9	32.1	29.5	37.1	33.2	38.4	42.8
Turkey x Cheyenne	12711	87.9	34.3	29.8	40.4	30.3	33.3	42.6
Pawnee x Cheyenne	N.483310	88.6	32.2	31.6	37.7	29.7	36.1	42.6
H227-10-3-1-1xH255-49-5-1-3	III-54-58	78.2	26.6	26.0	47.2	30.1	44.6	42.1
Chey. - Chfk. x H44 - Mint ²	13115	67.4	33.4	26.5	45.6	27.9	42.5	40.5
South Dakota Selection	53-594	75.3	31.2	25.1	43.1	31.6	36.5	40.5
H255-49-5-1-4 x Blackhawk	III-54-66	70.0	26.8	24.3	51.0	28.4	40.9	40.2
do.	III-54-60	65.4	29.4	28.2	53.0	28.3	36.1	40.1
South Dakota Selection	53-498	71.2	37.0	25.5	43.4	26.8	37.0	40.1
Nebred	10094	74.0	30.4	26.6	44.2	28.7	36.1	40.0
H255-49-5-1-4 x Blackhawk	III-54-12	65.6	33.3	27.5	52.6	29.8	31.0	40.0
South Dakota Selection	53-520	71.4	24.4	23.8	48.2	30.5	39.3	39.6
do.	53-411	73.8	29.1	21.3	44.7	30.1	37.3	39.4
do.	53-429	66.6	30.1	26.3	47.7	29.2	33.2	38.8
Rego	13181	92.4	32.9	23.1	29.1	29.2	25.5	38.7
Minter	12138	77.1	27.0	27.0	41.6	31.2	28.3	38.7
Kharkof	1442	71.8	21.6	29.2	37.1	30.3	34.1	37.3
Minturki	6155	70.7	32.6	24.8	36.6	25.6	31.5	37.0
Pawnee x Nebred	13015	62.7	24.1	24.7	40.5	20.1	39.8	35.3
Yogo	8033	74.2	25.5	29.4	34.5	30.1	17.5	35.2
Kharkof M.C.22	6938	68.1	24.5	21.0	28.3	28.2	17.4	31.2

SUPPLEMENTARY WINTERHARDINESS NURSERY

This is an observation type nursery seeded annually at 6 locations in the northern part of the region. In it, breeding materials from the southern and central parts of the region, where winterkilling seldom occurs, can be evaluated for their resistance to cold and associated winter hazards. The nursery is seeded in duplicated single rows at each location. No harvest is made. This year it contained a total of 195 entries from 7 States. No winterkilling occurred at Alliance, Ames, and Moccasin. Excellent differential survival occurred at the other stations. The data were summarized and distributed to cooperators before harvest and, therefore, are not included in this report.

DISEASE NURSERIES

A uniform bunt nursery containing 48 entries was grown at 8 locations in 1957. Data were obtained from 5 locations and have been compiled as a separate report for distribution to the cooperators.

The uniform and international winter wheat rust nurseries again were grown at several locations in the region. Rust data from each location are reported to Dr. W. Q. Loegering who summarizes them and prepares periodic reports for distribution to the wheat breeders.

Hard red winter wheat strains totaling 127 were evaluated in a soil-borne mosaic nursery at Urbana, Illinois. This was the third year that the nursery has been grown at Urbana. The persistent and reoccurring nature of this virus disease in the eastern portions of Oklahoma, Kansas, and Nebraska is now well recognized. Evaluation of materials for resistance to the disease in these States has been difficult due to the erratic occurrence of the disease at any one location. Therefore, the information received from Urbana since 1955 has been extremely valuable to those breeding for soil-borne mosaic resistance in wheat. Prior to harvest, a separate report on the results of the Urbana test was distributed.

In accordance with the recommendation of the committee on virus diseases at the Hard Red Winter Wheat Conference held at Manhattan, Kansas, in 1955, a regional streak mosaic nursery was established in the fall of 1956. A uniform set of 15 tolerant and susceptible varieties was planted in duplicated observation rows 5 feet long at Stillwater, Manhattan, Hays, Garden City, Colby, Lincoln, Imperial (Nebr.), Akron, Ft. Collins, and Moccasin. One-half of each row was artificially inoculated with a local source of inoculum at each station except Moccasin where no inoculation was performed. Sufficient infection was obtained at the Kansas stations, Imperial, and Ft. Collins for the ratings to be made. Since local inoculum was used wherever possible, the nursery should give information on the extent to which strains of the virus and the environment of the various testing locations condition varietal response. The nursery, if continued, also would allow future uniform screening of resistant and tolerant materials derived from breeding work now in progress.

Lack of a uniform system of evaluation at the various locations lessens the value of the data collected in 1957 which are compiled in table 22. Wheat-rye-Ivcl-Com. Sel. M. 438 was the only strain consistently rated resistant at all locations. Wheat x rye (M. 428) was rated down at Garden City, as was Blue Jacket. At other locations, these were given resistant or good ratings.

DATA FROM THE QUALITY LABORATORY

Fire in late August destroyed much of East Waters Hall at Kansas State College. The pilot mill and adjacent offices and laboratories were totally destroyed. Office equipment and records of the federal quality laboratory were lost but fortunately very little of the laboratory equipment. Consequently, it was possible to set up the quality laboratory in temporary quarters and it has resumed operations on a somewhat limited basis. Grain harvested from the uniform plots, uniform yield nursery, and uniform winterhardiness nursery has been submitted as usual, although cooperators were requested not to submit special samples for evaluation this year. The report of results of quality evaluation of the 1957 samples will be prepared and distributed by the Quality Laboratory.

Table 22. Ratings obtained from the cooperative regional streak mosaic nursery in 1957.

Variety	C.I. or Sel. No.	Manhattan	Hays	Garden City	Imperial	Ft. Collins	
						Rating	Stunting
Stafford	12706	R	6.0	5.0	2	3.0	Severe
Pawnee	11669	S	7.0	7.0	5	2.0	Severe
Blue Jacket	12502	R	3.0	5.0	1	1.5	Moderate
Bison	12518	-	6.0	5.0	2	1.5	Moderate
Concho	12517	S	7.0	7.0	2	2.5	None
Triumph	12132	Int.	5.0	7.0	2	2.0	Moderate
Comanche	11673	S	7.0	7.0	4	2.0	Moderate
Apache x C. O. T.	--	-	6.0	6.0	3	1.0	Moderate
Wheat-Rye x IVcl-Com.Sel.	M.438	R	3.0	3.0	1	R	Slight
Wheat x Rye	M.428	R	2.0	6.0	1	R	None
F. P. I.	181457	R	7.0	6.5	3	1.5	Severe
F. P. I.	192578	S	7.0	6.5	3	1.0	Slight
Mgo-Oro-Triunfo x Paw.	x52A1	-	7.0	6.0	4	2.5	None
Mgo-Oro x Triunfo	12856	S	4.5	6.0	3	2.0	Moderate
Cent. x Med.-Hope-Paw.	--	S	5.0	6.5	4	1.5	Slight

Manhattan	Hays and Garden City	Imperial	Fort Collins
R = resistant	1 = good (no symptoms)	1 = slight	R = resistant
Int = intermediate	2 = good to good -	2 = mild	1 = mild
S = susceptible	3 = good -	3 = moderate	2 = medium
	4 = intermediate to good-	4 = heavy	3 = severe
	5 = intermediate †	5 = severe	
	6 = intermediate to intermediate †		
	7 = intermediate or poorer		

Note: Hays ratings were based on general appearance on May 27, weighted toward stunting reaction. The Garden City ratings were made at harvest time and are based entirely on stunting. At Imperial, ratings also were made at harvest and are based on stunting. The Ft. Collins ratings were based on both yellowing and stunting.

