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1963 Small Grain Variety Trials

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1963 SMALL GRAIN VARIETY TRIALS

AGRONOMY DEPARTMENT
AGRICULTURAL EXPERIMENT STATION
SOUTH DAKOTA STATE COLLEGE, BROOKINGS

Standard Variety Trials of Small Grains in South Dakota 1959-1963

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Varieties of small grains being grown by farmers, new varieties not yet widely used, and new experimental strains being considered for release were tested in 1963 at up to eight locations under the supervision of the Crop Performance Testing Activity, Agricultural Experiment Station. Grain yields, test weights, and where available, five-year averages are reported in this circular.

Location of Trials

Because tests only at Brookings would not be a sufficient guide to varietal performance over the State, testing also is done at sub-stations throughout South Dakota at locations listed in Table 1. Seeding and harvesting dates are also shown.

Weather and Climatic Conditions

Field preparation and seeding of small grains in 1963 was only slightly delayed by adverse weather. Rains in the Highmore and Watertown areas in early April delayed planting in those areas until late in April. In other areas planting was accomplished somewhat earlier than in previous years. All spring grains and flax were planted during April. The seeding and harvesting dates are shown in Table 1.

Conditions were favorable for small grain at most locations until the middle of June. Lack of rain at the Southeast Farm caused uneven germination. Higher than normal temperatures in April encouraged rapid germination. Sub-normal temperatures accompanied the below-normal precipitation during May. A hard freeze over the entire state on May 22 was especially detrimental to rye that had begun to head. Some damage occurred to the winter wheat. Flax escaped with little or no injury. It would normally be expected that a sudden drop in

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TABLE 1. THE LOCATION OF TRIALS AND DATES OF SEEDING AND HARVESTING OF OATS, BARLEY, FLAX, WHEAT AND RYE TRIALS, 1963

County	Location and Post Office	Date Planted	Date Harvested
	Oats		
Clay	Southeast Research Farm, Beresford	April 5	July 18
Butte	U. S. Newell Field Station, Newell	April 9	July 30&31
Jackson	Range Field Station, Cottonwood	April 9	July 23
Brookings	Agronomy Farm, Brookings	April 11	July 19
McPherson	North Central Substation, Eureka	April 15	July 24
Hyde	Central Substation, Highmore	April 25	July 22
Codington	Northeast Research Farm, Watertown	April 26	July 25
	Barley		
Clay	Southeast Research Farm, Beresford	April 5	July 12
Butte	U. S. Newell Field Station, Newell	April 9	July 30&31
Jackson	Range Field Station, Cottonwood	April 9	July 23
Brookings	Agronomy Farm, Brookings	April 11	July 19
McPherson	North Central Substation, Eureka	April 15	July 24
Hyde	Central Substation, Highmore	April 25	July 22
Codington	Northeast Research Farm, Watertown	April 26	August 2
	Flax		
Hyde	Central Substation, Highmore	April 25	August 12
Codington	Northeast Research Farm, Watertown	April 26	August 6
Brookings	Agronomy Farm, Brookings	April 30	August 1
	Spring and Durum Wheat		
Clay	Southeast Research Farm, Beresford	April 5	July 18
Butte	U. S. Newell Field Station, Newell	April 9	July 30&31
Jackson	Range Field Station, Cottonwood	April 9	July 23
Brookings	Agronomy Farm, Brookings	April 11	August 5
McPherson	North Central Substation, Eureka	April 15	July 24
Hyde	Central Substation, Highmore	April 25	July 26
Codington	Northeast Research Farm, Watertown	April 26	August 2
	Winter Wheat and Rye		
Brookings	Agronomy Farm, Brookings	Sept. 12	July 16
Lyman	South Central Research Farm, Presho	Sept. 13	July 16
Hyde	Central Substation, Highmore	Sept. 17	July 15
Clay	Southeast Research Farm, Beresford	Sept. 21	July 12

temperatures so late in May would kill flax. It must be noted that for three days prior to the severe freeze, temperatures hovered just above freezing and the activity within the plants had become very low. Had the drop occurred following several days of favorable growing conditions the damage would have been more severe.

Hail occurred at two locations during 1963. The trials at Cottonwood suffered hail damage the last of May. Heading had not begun and the plants made a uniform and satisfactory recovery. During July, hail fell twice at the Highmore station causing some damage, especially a reduction in test weight from heads broken over as they were beginning to fill out.

The Eureka trial performed quite well, considering that only three-fourths of an inch of precipitation was recorded during the crucial time the heads were emerging and filling. Only .76 inch of precipitation occurred from June 9 through July 17.

Abnormally heavy rains occurred during July in the Brookings and Watertown areas. Rainfall exceeded the long time averages up to nine inches. This greatly reduced the quantity and quality of the grain, caused severe lodging and complete loss of some grain. At Brookings the field stood in two to three inches of water until mid-August and only one replication of oats was harvestable.

Lodging was slight at most locations, excepting the Main Station.

Weather data from April through August at all test sites is reported in Table 2.

Planting and Harvesting Procedures

The trials were seeded in randomized block designs of three or four replications at each site. The number of replications depended upon the number of entries and the space available at the test site. The plots were 16 feet long and of four rows one foot apart.

Two center rows, 12 feet long, were harvested for yield determinations. A small National mower, equipped with a catching hopper, was used to cut the grain. Any downed grain was gleaned from the harvested area before the sample was bagged. The samples were returned to the Main Station, air-dried in a pole shed, and threshed with a small Vogel-type nursery thresher. Following threshing the samples were cleaned, weighed for yield determination, and test weighed for bushel weights.

Measurements of Performance

The yield reported for each variety or selection in each test is the average obtained from grain weights of all replications, expressed as bushels per acre. Because of variations in stand, slope or unequal soil fertility, entries of equal potential may have yielded differently. Mathematical determinations have been made to ascertain whether yield differences were caused by variations in environment or were true varietal differences.

At the bottom of all yield tables is given the minimum amount in each test by which two entries must differ in yield for the difference to be considered statistically significant at the 5 percent level. If the trials were found to

TABLE 2. TEMPERATURE AND PRECIPITATION DATA FOR THE 1963 SMALL GRAIN GROWING SEASON OF SOUTH DAKOTA

		Temperature			Precipitation		
Location	Month	Mean average	Departure from normal	Ave. departure	Monthly total	Departure from normal	Total departure
		Degrees F.				inches	
Brookings[1/]	April	48.5	3.3		2.55	0.78	
1 E	May	56.5	-1.1		2.50	-0.29	
	June	69.7	2.6		4.40	0.45	
	July	70.9	-2.3		12.10	9.95	
	August	68.8	-2.4	0.1	1.25	-1.72	9.17
Last freeze May 23 - 29°					22.80		
Highmore[1/]	April	47.0	1.1		2.97	1.23	
1 W	May	57.4	0.2		1.85	-0.48	
	June	71.1	4.3		2.54	-1.00	
	July	74.3	-0.2		5.12	3.14	
	August	73.0	0.2	5.6	2.09	0.05	2.94
Last freeze May 22 - 22°					14.57		
Eureka[1/]	April	44.0	0.4		.99	-0.36	
	May	54.6	-1.5		2.69	0.10	
	June	68.3	3.3		2.98	-0.85	
	July	72.2	-0.2		2.55	0.10	
	August	70.4	-0.3	1.7	3.54	1.13	0.12
Last freeze May 22 - 22°					12.75		
Newell[1/]	April	43.6	-0.5		3.36	1.71	
2 NW	May	55.3	-0.1		1.24	-1.25	
	June	65.8	1.4		5.06	1.87	
	July	72.3	-0.9		2.58	0.82	
	August	72.7	1.5	2.4	1.24	-0.04	3.11
Last freeze May 22 - 26°					13.48		
Cottonwood[1/]	April	45.8	-0.5		1.47	-0.18	
2 E	May	55.5	-1.9		5.57	2.86	
	June	70.8	3.7		4.31	1.33	
	July	76.4	0.8		2.28	0.74	
	August	75.5	1.7	3.8	0.29	-1.07	3.68
Last freeze May 23 - 28°					13.92		
Centerville[1/]	April	52.7			2.28		
6 SE	May	60.8			3.09		
	June	73.6			3.53		
	July	76.8			3.79		
	August	72.5			1.91		
Last freeze May 22 - 26°					14.60		
NE Farm	April	43.9	0.7		1.41	-0.65	
15 N	May	52.4	-3.6		3.54	0.67	
Watertown	June	66.1	2.2		3.22	-0.48	
	July	72.7	0.4		5.74	3.07	
	August	67.3	-1.7	-2.0	2.51	-0.27	2.34
Last freeze May 23 - 30°					16.42		

1/ These are based upon reports of Monthly Climatological Data, U. S. Dept. of Commerce, Office of State Climatologist, State College, Brookings, S. Dak.

have statistically significant differences between means an additional test, Duncan's Multiple Range Test, was run on the means.

As an example of Duncan's Test (Table 3) vertical lines on the right side of the trials indicate those variety yields adjacent to the line which are statistically alike. In the instance of this table, under environmental conditions which prevailed during 1963, Andrew, Dupree and all entries in descending order through Nodaway and Clintland 60 were not significantly different in yield from each other. The tables from all trials having significant differences are read the same as the above. It must be remembered that results from only one year do not present as true a picture of yield differences as average results of three or more years at the same location.

The mean yield of all entries in each 1963 test is found at the bottom of the yield column in each table.

Discussion of Results

The results of the 1963 tests and the available five-year averages are presented in tables which follow the text. These 1959-1963 averages present a truer indication of a variety's capabilities under varying temperature and moisture conditions than do one year's results. A brief summary of the results from each crop follows. Preparation of the land, adequate fertility levels and rotation sequence are the same each year in accordance with practices established some time ago.

Oats: The improved varieties of recent release generally do not produce well under conditionsof low fertility. Results reported in this circular are for conditions of adequate fertility and specific varieties might react differently if soil fertility levels are low. Maturity, disease reaction, heat tolerance and kernel types should also be considered in addition to yield. Yields of some varieties are quite high but their lower test weights affect the feeding quality.

The varied climatic conditions over the state in 1963 favored different varieties in the various test areas. Generally, the later varieties were poorer yielding in 1963 than in 1962. For this reason we should consider average yields over several years and discuss the merits of some of them.

Garry and Rodney have performed satisfactorily in the cooler, higher lands of the northeastern portion of the state.

Andrew and Burnett have produced satisfactory yields in the east and central areas of the state for the past years. Mo. 0-205 and Neal, two feed oats, have performed favorably in the southcentral drier areas of the state. Dupree has produced satisfactory yields where diseases are not commonly a hazard. Minhafer has yielded satisfactorily in most areas of the state.

Barley: Liberty, a feed barley, was the highest yielder in most of the 1963 trials. Larker and Trophy, the new malting barley varieties released in 1962, were close behind Liberty in the 1963 trials across the state. Betzes, which showed up well in 1963, is adversely affected by the warmer temperatures more common to our growing seasons than those of 1963. Its lateness and susceptability to diseases are normally disadvantages in South Dakota.

Flax: The newly released varieties, Windom, from Minnesota and, Summit, from South Dakota, have performed favorably during the past several years. Arny and Marine entries have satisfactory performances for the past several years as have B-5128, Bolley and Redwood. Two new races of flax rust have been noted in North Dakota and Canada. All varieties except B-5128, Bolley, Redwood, Windom and Summit are susceptible to at least one of these races.

Spring Wheat: Pembina, one of the more desirable milling wheats and a variety with resistance to present races of stem rust, performed quite satisfactorily in 1963. Both Pembina and Selkirk, as well as the newly released Crim, have performed satisfactorily for the past several years. In the drier western areas of the state, Rushmore and Lee have yielded satisfactorily over the past several years. Spinkcota, though high in yield, is not acceptable to the milling industry.

Durum: Lakota and Wells are recommended as the most desirable durum wheats on the basis of satisfactory performance and disease resistance for the past several years.

Winter Wheat: In the south-central areas of the state, Warrior and Omaha, and in the extreme south, Ottawa, have been satisfactory for the past several years. Where winters are more severe and the need for winter-hardiness becomes of greater importance, Minter has been useful. Nebred has not yielded well because there has been so much rust the past two years. Nebred is otherwise a good variety.

Rye: No great differences in yield have separated the varieties of rye over the past several years. Pierre is perhaps earlier than the others but yields about the same. Yields of Elk were low in 1963 because of poor stands due to low germination of the seed sown in 1962.

TABLE 3. STANDARD VARIETY OAT TRIALS
SOUTHEAST RESEARCH FARM, BERESFORD, 1959-1963[a/]

Variety	1959	1960	1961	1962	1963	1959-63[b/]	1963 test wt. lb./bu	Statistical significance[c/]
	Average yield, bu/acre							
Andrew	7.3	89.7	65.5	43.7	56.8	52.6	35.0	
Dupree				56.8	56.7		33.5	
Osage				53.7	54.4		33.0	
Ajax					53.9		31.0	
Dodge				44.1	53.4		34.5	
CI 7399				54.3	53.2		33.0	
Portage		91.0	54.0	50.9	53.1		33.5	
Mo. 0-205	6.9	96.3	56.5	39.0	52.4	50.2	34.0	
Ortley					51.2		34.0	
Burnett	8.3	89.6	45.5	34.8	50.2	45.7	35.5	
Minhafer	12.4	77.9	56.2	53.9	50.2	51.1	33.5	
Ransom	7.4	70.6	46.8	42.2	50.2	43.4	33.0	
Coachman					50.0		34.5	
Marion	7.0	73.7	60.5	50.6	49.9	48.3	33.5	
Goodfield					49.9		37.0	
Nodaway			45.1	32.8	49.6		36.0	
Clintland 60	4.4	88.2	37.8	44.7	49.0	44.8	36.5	
Waubay	8.5	73.5	40.2	47.1	48.7	43.6	36.5	
Minton					47.1		30.5	
Cherokee					45.6		33.5	
Tonka			38.1	49.5	45.1		38.0	
Garland				37.3	45.1		34.5	
Rodney				38.9	44.7		33.5	
Neal					43.6		33.5	
Newton					43.3		35.0	
AuSable					42.1		35.0	
Nehawka	14.6	84.7	58.1	36.9	41.1	47.1	34.0	
Bonkee					40.7		34.0	
Lodi					38.3		29.5	
Garry	3.5	81.8	55.2	45.1	38.0	44.7	30.5	
			Mean yield		48.3			
LSD .05	4.6	14.3	12.0	12.5	7.9			

a/ 1959 and 1960 data from Menno farm
b/ Five year average
c/ Using Duncan's Multiple Range Test at the 5% level.

TABLE 4. STANDARD VARIETY OAT TRIALS, DRYLAND,
U. S. NEWELL FIELD STATION, NEWELL, 1957-1963[a]

Variety	1957	1959	1960	1962	1963	1957-63[b]	1963 Test wt. lb/bu	Statistical significance[c]
	Average yield, bu/acre							
Coachman					108.9		41.5	
Lodi					98.4		38.0	
Minton					96.8		37.0	
Andrew	51.4	5.4	26.4	78.9	93.5	51.1	38.0	
Dupree	59.0	6.0	28.1	83.3	92.0	53.7	38.5	
Cherokee				75.2	90.9		38.5	
Neal					90.1		39.0	
Burnett				90.7	89.6		40.0	
Dodge				76.8	89.4		40.0	
CI 7399					89.4		38.0	
Clintland 60		6.5	20.6	73.5	88.7		38.5	
Garry				85.2	87.7		39.0	
Portage					87.4		39.5	
Nehawka		5.4	22.1	70.1	86.9		38.0	
Mo. 0-205	56.8	5.9	23.2	88.3	82.4	51.3	38.5	
Bonkee					81.3		40.0	
Minhafer	53.5	3.8	24.6	79.5	81.3	48.5	38.5	
AuSable					77.8		40.0	
Tonka				66.3	77.7		41.5	
Ortley					76.8		41.0	
Marion				82.5	76.8		37.5	
Rodney				89.2	74.0		40.0	
Ransom	59.6	6.7	22.5	84.8	73.3	49.4	39.0	
Garland					65.7		39.0	
Brunker	50.2	2.9	19.8	72.8	61.5	41.4	37.5	
		Mean Yield			84.7			
LSD .05	N.S.	N.S.	N.S.	11.5	22.3			

a/ 1958 hailed out, 1961 failure due to drought
b/ Five year average
c/ Using Duncan's Multiple Range Test at the 5% level

TABLE 5. STANDARD VARIETY BARLEY TRIALS, DRYLAND,
U. S. NEWELL FIELD STATION, NEWELL, 1962-1963

Variety	1962	1963	1962-63[a]	1963 Test wt. lb/bu
	Average yield, bu/acre			
Spartan	47.6	43.3	45.5	52.5
Traill	47.5	41.9	44.7	50.0
Betzes	51.6	40.0	45.8	52.0
Liberty	56.2	39.7	48.0	48.5
Trophy	45.1	36.8	41.0	48.5
Larker	54.2	35.8	45.0	50.0
Feebar	37.8	34.4	36.1	45.0
Parkland	44.3	34.2	39.3	49.5
Custer	41.1	33.7	37.4	47.0
Otis	48.2	32.1	40.2	50.0
Kindred	33.6	30.7	32.2	49.0
Plains	49.4	30.4	39.9	48.5
	Mean yield	36.1		
LSD .05	8.4	N.S.		

a/ Two year average

TABLE 6. STANDARD VARIETY OAT TRIALS, IRRIGATED
U. S. NEWELL FIELD STATION, NEWELL, 1959-1963

Variety	1959	1960	1961	1962	1963	1959-63	1963 Test wt. lb/bu	Statistical significance[a]
	Average yield, bu/acre							
Coachman					94.8		41.0	
Burnett	88.0	79.9	11.8	66.5	93.1	67.9	39.5	
Nodaway				78.3	90.8		38.5	
Lodi					90.8		40.5	
Garry	86.3	97.0	9.3	70.6	89.3	70.5	42.0	
Tonka					89.2		40.5	
Rodney					88.7		40.5	
Ortley					86.8		41.0	
Clintland 60	67.0	83.6	7.0	67.3	86.4	62.3	39.0	
Lodi					85.6		41.5	
Neal					85.0		38.5	
Andrew				79.1	83.7		39.0	
CI 7399					82.4		42.0	
Dodge			10.4	76.1	82.4		40.0	
Portage		86.4	8.2	60.0	81.5		40.0	
Dupreè	75.4	94.1	9.0	60.5	80.7	63.9	39.0	
Mo. 0-205	82.2	87.3	8.2	59.4	79.0	63.2	38.0	
Minton					78.9		37.0	
Marion	74.6	88.3	11.6	74.0	78.7	65.4	37.0	
Ransom	78.2	85.5	10.1	56.8	74.0	60.9	39.0	
Garland					74.0		39.5	
Minhafer	80.2	80.3	8.3	67.6	69.1	61.1	38.5	
Bonkee					66.5		40.0	
Nehawka	72.8	84.5	7.1	64.1	63.6	58.4	38.0	
		Mean yield			82.3			
LSD .05	12.1	6.4	N.S.	N.S.	13.8			

a/ Using Duncan's Multiple Range Test at the 5% level.

TABLE 7. STANDARD VARIETY BARLEY TRIALS, IRRIGATED,
U. S. NEWELL FIELD STATION, NEWELL, 1962-1963

Variety	1962	1963	1962-63[a]	1963 Test wt. lb/bu	Statistical significance[b]
	Average Yield bu/acre				
Spartan	50.2	47.8	49.0	52.5	
Betzes	62.1	46.9	54.5	51.5	
Custer	65.3	46.3	55.8	48.0	
Parkland		45.3		51.5	
Liberty	61.9	45.0	53.5	50.0	
Larker		43.9		51.0	
Trophy	45.7	42.0	43.9	49.5	
Otis	47.3	40.9	44.1	50.0	
Traill	81.5	40.0	60.8	51.5	
Feebar	63.8	35.5	49.7	47.0	
Kindred	53.9	33.4	43.7	51.5	
Plains	64.9	29.4	47.2	49.5	
	Mean yield	41.4			
LSD	N.S.	10.6			

a/ Two year average
b/ Using Duncan's Multiple Range Test at the 5% level.

TABLE 8. STANDARD VARIETY OAT TRIALS,
NORTH CENTRAL SUBSTATION, EUREKA, 1959-1963

Variety	1959	1960	1961	1962	1963	1959-63	1963 test wt. lb/bu	Statistical significance[a]
	Average yield bu/acre							
Sauk					54.2		33.0	
Burnett	47.6	33.6	35.8	56.6	53.6	45.4	35.5	
Coachman					53.0		33.5	
Garland				60.6	51.6		35.5	
Osage					51.4		32.0	
Marion	41.3	34.1	36.1	63.6	49.7	45.0	34.0	
Andrew	35.8	36.4	33.4	57.9	47.8	42.3	32.0	
Dodge			23.7	50.6	47.7		35.5	
Waubay	27.5	30.2	25.8	59.8	46.8	38.0	36.5	
CI 7399		34.6		70.8	46.6		31.0	
Minhafer	31.1	30.4	36.5	72.9	46.5	43.5	32.5	
Ajax				69.6	45.8		32.0	
Minton					45.7		31.0	
Portage					44.9		35.0	
Neal					44.9		31.5	
Ortley					42.7		36.0	
Clintland 60	30.1	28.0	24.0	58.7	41.2	36.4	34.0	
Dupree	38.4	27.8	38.5	47.4	35.4	37.5	31.5	
AuSable					34.3		37.0	
Rodney				54.7	34.1		35.5	
Bonkee					32.6		34.5	
Mo. 0-205	19.1	37.2	33.1	58.5	30.8	35.7	30.0	
Lodi					29.7		32.0	
Ransom	27.4	26.8	28.4	56.2	28.9	33.5	32.0	
Nehawka		32.6	29.1	59.7	27.7		33.5	
Garry	43.6	32.0	29.5	54.2	25.7	37.0	35.5	
		Mean yield			42.1			
LSD .05	N.S.	N.S.	9.5	N.S.	13.9			

[a] Using Duncan's Multiple Range Test at the 5% level.

TABLE 9. STANDARD VARIETY BARLEY TRIALS,
NORTH CENTRAL SUBSTATION, EUREKA, 1959-1963

Variety	1959	1960	1961	1962	1963	1959-63	1963 test wt. lb/bu	Statistical significance[a]
	Average yield bu/acre							
Otis				40.1	55.1		46.5	
Liberty	17.9	22.2	26.5	46.5	52.1	33.0	46.5	
Larker			26.6	57.9	51.6		46.5	
Custer	18.9		24.4	36.1	50.5		46.0	
Parkland	19.1	14.8		35.6	49.1		44.0	
Betzes	26.3	24.6	27.3	34.5	45.0	31.5	44.0	
Traill	15.4	13.6	24.3	33.4	43.8	26.1	41.5	
Spartan		29.3		37.8	43.7		46.5	
Trophy			26.6	33.3	40.9		41.5	
Plains	15.4		17.6	37.1	40.4		45.0	
Feebar	17.2	8.9	17.7	35.3	37.8	23.4	42.0	
Kindred	18.6	12.0	24.7	35.8	29.4	24.1	41.5	
		Mean yield			45.0			
LSD .05	9.1	4.6	6.1	10.3	7.8			

[a] Using Duncan's Multiple Range Test at the 5% level.

TABLE 10. STANDARD VARIETY OAT TRIALS, CENTRAL SUBSTATION, HIGHMORE, 1958-1963[a]

Variety	1958	1960	1961	1962	1963	1958-63[b]	1963 test wt. lb/bu.	Statistical significance[c]
	Average yield bu/acre							
Mo. 0-205	92.7	69.0	41.5	88.7	51.1	68.6	33.5	
Burnett	97.1	72.2	47.1	98.8	50.4	73.1	38.0	
Dupree	80.5	63.4	40.6	87.6	49.5	64.3	33.5	
Andrew	84.0	84.1	39.0	84.2	48.9	68.0	35.5	
Neal					47.8		36.5	
CI 7399		91.1		117.5	47.3		34.0	
Marion	91.0	61.9	37.9	86.7	46.5	64.8	35.0	
Waubay	100.9	73.4	46.7	72.1	45.6	67.7	37.0	
Minton					44.4		30.5	
Osage					43.8		32.5	
Cherokee	87.9	64.6	42.0	93.6	42.5	66.1	34.5	
Portage					41.9		35.0	
Dodge			27.6	96.2	41.9		38.0	
Coachman					41.4		35.0	
Bonkee					40.1		37.5	
Minhafer	93.0	70.4	44.8	112.7	39.2	72.0	35.0	
Lodi					39.2		34.0	
Nehawka	97.6	76.8	42.9	90.7	38.5	69.3	35.0	
Ortley					38.5		36.0	
Garland				110.4	38.4		37.5	
Clintland 60	93.2	42.7	45.6	103.5	36.6	64.3	36.0	
AuSable					36.6		36.0	
Tonka			36.7	74.6	36.5		39.5	
Ransom	84.6	54.8	41.5	77.6	36.3	59.0	34.5	
Rodney				91.2	36.2		37.0	
Garry	88.4	69.7	35.5	86.0	35.6	63.0	38.5	
Nodaway			46.4	88.3	29.0		36.5	
		Mean yield			41.6			
LSD .05	17.6	14.7	6.0	14.9	8.9			

a/ 1959 crop lost to drought
b/ Five year average
c/ Using Duncan's Multiple Range Test at the 5% level.

TABLE 11. STANDARD VARIETY BARLEY TRIALS, CENTRAL SUBSTATION, HIGHMORE 1958-1963[a]

Variety	1958	1960	1961	1962	1963	1958-63[b]	1963 test wt. lb/bu.	Statistical significance[c]
	Average yield bu/acre							
Otis				53.0	45.1		44.0	
Trophy			21.7	61.3	45.1		44.0	
Parkland	60.7	16.8	24.4	57.7	44.0	40.7	44.5	
Larker			24.0	52.7	43.1		45.5	
Traill	51.2	16.7	22.2	69.4	41.3	39.2	44.0	
Liberty	54.1	32.7	28.7	54.0	37.5	41.4	45.0	
Betzes		32.3	20.0	43.0	37.4		47.0	
Feebar	39.4	33.9	19.0	42.0	36.9	34.2	40.5	
Custer	57.6		35.7	67.0	36.8		43.5	
Kindred	47.9	14.1	18.0	46.3	35.4	32.3	45.5	
Spartan	37.0	36.7		43.8	33.9		47.0	
Plains	53.6		20.9	50.8	32.4		45.0	
		Mean yield			39.1			
LSD .05	12.0	7.5	6.6	12.6	6.7			

a/ 1959 Crop lost to drought
b/ Five year average
c/ Using Duncan's Multiple Range Test at the 5% level.

TABLE 12. STANDARD VARIETY OAT TRIALS
NORTHEAST RESEARCH FARM, WATERTOWN, 1959-1963

Variety	1959	1960	1961	1962	1963	1959-63	1963 test wt. lb/bu	Statistical Significance[a/]
	Average yield, bu/acre							
Minhafer	23.9	74.8	89.8	93.6	61.9	68.8	32.0	
Garland				91.0	61.3		34.5	
Lodi					59.2		32.0	
Mo. 0-205	14.1	40.0	99.3	73.1	57.5	56.8	32.0	
Burnett	19.4	73.3	92.5	65.9	56.9	61.6	34.5	
CI 7399		66.0		65.9	55.9		32.0	
Nodaway			92.4	72.0	55.5		35.5	
Dupree				76.5	55.4		29.5	
Coachman					55.0		33.0	
Portage			95.5	88.8	54.2		33.0	
Bonkee					53.9		32.0	
Minton					53.8		28.5	
Marion		74.8	88.2	57.7	52.9		32.0	
Clintland 60	11.2	58.0	89.4	88.1	52.6	59.9	34.0	
Neal					52.6		30.0	
Dodge			91.0	88.2	52.3		35.5	
Andrew	16.4	77.9	96.9	61.0	52.2	60.9	30.5	
Waubay		70.6	93.9	56.3	51.6		33.0	
Nehawka			85.4	90.0	49.0		33.5	
Ransom	15.5	61.9	91.5	64.2	48.6	56.3	33.0	
AuSable					46.8		32.5	
Ortley					46.2		34.5	
Garry	19.3	65.9	94.9	60.0	44.2	56.9	33.0	
Goodfield					42.9		34.5	
Rodney	20.7	80.0	88.7	70.0	40.6	60.0	33.0	
		Mean yield			52.5			
L.S.D. .05	7.6	N.S.	8.6	17.2	6.9			

a/ Using Duncan's Multiple Range Test at the 5% level.

TABLE 13. STANDARD VARIETY BARLEY TRIALS
NORTHEAST RESEARCH FARM, WATERTOWN, 1959-1963

Variety	1959	1960	1961	1962	1963	1959-63	1963 test wt. lb/bu	Statistical significance[a/]
	Average yield, bu/acre							
Liberty	16.2	48.3	41.6	38.2	37.9	36.4	42.5	
Plains	13.8			38.1	34.0		42.5	
Betzes	14.9	35.1	40.3	43.7	34.0	33.6	43.0	
Larker			42.7	51.8	31.6		45.0	
Custer	14.3			36.4	31.6		39.0	
Parkland	24.3	27.0	37.4	44.0	30.4	32.6	43.5	
Spartan		26.3		38.9	30.3		43.5	
Feebar	4.5	34.0		41.9	29.7		38.5	
Otis				41.3	28.3		40.0	
Trophy			45.5	47.2	26.8		43.5	
Traill	13.9	37.2	41.8	48.8	25.6	33.5	40.0	
Kindred	16.1	27.0	40.2	31.1	22.5	27.4	40.5	
		Mean yield			30.2			
L.S.D. .05	12.2	10.9	N.S.	7.7	7.5			

a/ Using Duncan's Multiple Range Test at the 5% level.

TABLE 14. STANDARD VARIETY OAT TRIALS
AGRONOMY FARM, BROOKINGS, 1959-1963

Variety	1959	1960	1961	1962	1963	1959-63[a/]	1963 test wt.
	Average yields bu/acre						lb/bu
Portage		121.6	107.4	62.4	61.4		30.0
Dodge			86.5	74.6	56.8		31.0
Minhafer	38.0	113.8	98.2	92.3	55.9	79.6	33.0
Garland				94.7	52.1		28.5
Brunker				70.3	51.3		30.0
Marion	39.5	117.7	78.0	64.8	50.4	70.1	29.0
Sauk				71.4	49.8		23.5
Cherokee	39.5	119.5	90.1	82.0	47.1	75.6	26.0
Clintland 60	31.0	119.1	106.4	64.7	46.4	73.5	25.5
Burnett	39.5	117.7	113.8	72.1	45.5	77.7	26.0
Osage				61.0	43.8		27.5
Nehawka	33.5	129.7	100.7	65.9	43.8	74.7	27.0
Ransom				45.5	43.5		27.5
Ajax				60.1	43.5		24.0
Garry	41.0	118.0	111.7	59.5	43.4	74.7	25.5
Lodi					43.4		21.5
Dupree	44.5	124.1	101.4	69.5	42.6	76.4	24.5
CI 7399				81.8	42.5		25.5
Goodfield	21.0	105.6	96.4	73.8	42.1	67.8	26.5
Andrew	40.5	125.1	89.0	70.3	40.8	73.1	26.5
Rodney	34.5	103.9	103.9	63.4	40.8	69.3	25.0
Tonka			97.1	79.2	39.9		32.0
Mo. 0-205	45.5	126.2	98.6	65.7	37.9	74.8	27.5
Waubay	37.0	120.9	104.2	73.7	37.0	74.6	25.0
Coachman					36.9		23.0
Minton	38.5	116.3	113.4	63.9	36.9	73.8	23.0
Bonkee					35.5		26.5
Neal					35.3		26.0
Nodaway			98.9	69.2	33.6		24.0
Newton				77.6	30.6		26.5
Ortley					29.6		22.5
AuSable					22.8		21.5
	Mean yield				42.6		
LSD .05	5.9	7.8	15.9	16.4	*		

a/ Five year average

* No statistical analysis made, only one replication harvested.

TABLE 15. STANDARD VARIETY BARLEY TRIALS, AGRONOMY FARM, BROOKINGS, 1959-1963

Variety	1959	1960	1961	1962	1963	1959-63	1963 test wt. lb/bu	Statistical significance[a]
	Average yield bu/acre							
Liberty	20.5	58.7	64.0	51.9	63.4	51.7	46.0	
Larker			69.0	53.1	54.8		47.5	
Traill	18.2	48.5	64.2	49.6	53.5	46.8	46.5	
Odessa	11.9	36.8	46.7	38.4	53.5	37.5	45.0	
Otis				46.6	50.3		46.5	
Trophy			69.7	38.9	48.8		44.0	
Husky	12.2	44.6	51.2	45.6	48.6	40.4	44.0	
Custer	21.6	69.6	58.7	46.5	48.4	49.0	44.0	
Swan				41.9	48.3		46.0	
Spartan	16.3	53.4	38.5	40.8	47.8	39.4	48.0	
Plains	22.0	51.6		48.6	46.0		46.5	
Betzes			47.3	32.1	45.5		47.5	
Feebar	13.4	54.9	38.7	50.9	44.6	40.5	44.0	
Parkland	19.7	51.9	63.5	39.0	43.8	43.6	46.5	
Kindred	12.8	35.0	50.2	31.1	42.4	34.3	45.5	
		Mean yield			49.3			
LSD .05	7.4	12.9		7.8	4.7			

[a] Using Duncan's Multiple Range Test at the 5% level.

TABLE 16. STANDARD VARIETY BARLEY TRIALS SOUTHEAST RESEARCH FARM, BERESFORD, 1958-1963[a]

Variety	1958	1959	1961	1962	1963	1958-63[b]	1963 test wt. lb/bu	Statistical significance[c]
	Average yield bu/acre							
Liberty	40.6	15.3	35.5	42.3	34.8	33.7	48.5	
Traill	39.0	5.2		26.3	32.3		46.5	
Larker				31.6	23.9		48.5	
Plains	30.9	10.0	34.7	21.5	21.3	23.7	47.0	
Feebar	34.4	6.5		18.0	20.7		42.5	
Trophy				24.8	20.5		45.5	
Betzes		9.1	22.4	11.8	18.9		45.5	
Spartan	30.4	12.2	24.4	14.4	18.0	19.9	46.5	
Kindred	36.0	2.9		32.1	17.2		45.5	
Parkland				15.4	17.1		47.5	
Otis	39.7	15.6	23.1	17.7	17.0	22.6	44.5	
Custer	43.0	9.3		20.2	11.9		40.5	
		Mean yield			21.1			
LSD	4.2	5.6	N.S.	7.4	5.1			

[a] Data from Menno Station, 1958 and 1959; lost 1960 to windstorm

[b] Five year average

[c] Using Duncan's Multiple Range Test at the 5% level

TABLE 17. STANDARD VARIETY FLAX TRIALS
CENTRAL SUBSTATION, HIGHMORE, 1958-1963[a]

Variety	1958	1960	1961	1962	1963	1958-63[b]	1963 test wt. lb/bu	Statistical significance[c]
	Average yield, bu/acre							
B-5128 (SS)					10.7		51.5	
Summit		23.2	10.8	7.5	10.4		52.5	
Cree					10.0		52.0	
Norland	27.1	12.1	7.2	3.6	9.4	11.9	53.0	
Arny	22.2	17.1	9.5	9.7	9.3	13.6	48.5	
Caldwell					9.2		51.0	
Redwood	23.8	16.9	8.9	6.0	9.1	12.9	52.5	
B-5128	25.9	16.7	10.5	6.1	9.1	13.7	51.5	
Windom		17.2	13.0	5.0	8.1		52.0	
Linda	28.2	19.6	10.7	4.7	8.1	14.26	51.0	
Bison				5.5	7.9		51.5	
Marine	21.5	19.2	10.7	9.8	7.7	13.8	50.5	
Bolley	24.2	22.3	10.0	6.9	7.6	14.2	49.0	
Marine 62					7.2		50.0	
De Oro[d]					5.4		48.5	
		Mean yield			8.6			
LSD	0.8	3.5	2.2	3.5	1.9			

a/ 1959 crop lost to drought
b/ Five year average
c/ Using Duncan's Multiple Range Test at the 5% level
d/ Poor stand because of weevil-damaged seed.

TABLE 18. STANDARD VARIETY FLAX TRIALS, NORTHEAST RESEARCH FARM, WATERTOWN, 1959-1963[a]

Variety	1959	1960	1961	1962	1963	1959-63	Test wt. lb/bu	Statistical significance[b]
	Average yields, bu/acre							
Marine	11.6	14.5	15.7	a/	18.3	15.0	54.5	
Marine 62					17.0		55.0	
Arny	9.7	15.5	16.5		16.7	14.6	54.0	
Summit	11.6	18.2	21.3		16.4	16.9	52.5	
Windom	10.0	21.7	19.2		15.8	16.7	54.5	
Bolley	9.0	19.0	13.5		15.5	14.3	53.5	
Bison					14.4		53.5	
Cree					13.9		52.0	
Caldwell					13.0		53.0	
Redwood	11.2	13.1	18.3		13.0	13.9	54.0	
B-5128 (SS)					12.9		53.0	
Linda	11.0	15.7	15.8		12.6	13.8	51.0	
Norland	12.1	13.0	18.7		12.6	14.1	52.0	
B-5128	9.7	15.9	18.5		11.6	13.9	52.0	
DeOro[c]					6.1		45.5	
		Mean yield			13.9			
LSD .05	N.S.	1.8	2.7		2.0			

a/ Four-year average; 1962 lodged too severely to harvest
b/ Using Duncan's Multiple Range Test at the 5% level
c/ Poor stand because of weevil-damaged seed.

TABLE 19. STANDARD VARIETY FLAX TRIALS, AGRONOMY FARM, BROOKINGS, 1959-1963.

Variety	1959	1960	1961	1962	1963	1959-63	1963 test wt. lb/bu	Statistical significance[a]
	Average yield bu/acre							
Arny	13.0	20.0	25.3	11.5	22.0	18.4	52.5	
Marine	13.9	20.7	26.9	7.9	19.9	17.9	54.0	
Windom	13.9	23.4	29.6	9.1	19.2	19.0	53.0	
Marine 62					18.7		54.0	
Summit	15.3	21.3	27.5	10.1	18.6	18.6	54.5	
Cree					18.5		53.0	
Caldwell					18.4		51.5	
Bolley	13.6	22.7	23.1	7.0	17.0	16.7	52.0	
Bison				7.8	16.2		53.0	
Linda				7.1	16.0		50.0	
B-5128 (SS)					15.3		49.5	
Redwood	12.4	21.5	29.2	5.8	14.9	16.8	53.0	
B-5128	11.4	17.0	28.0	4.6	13.2	14.8	51.0	
Norland	12.0	14.8	27.3	4.0	12.7	14.2	53.0	
DeOro[b]					9.7		51.0	
		Mean yield			16.7			
LSD .05	1.6	4.6	1.9	2.3	3.3			

a/ Using Duncan's Multiple Range Test at the 5% level
b/ Poor stand because of weevil-damaged seed

TABLE 20. STANDARD VARIETY SPRING WHEAT AND DURUM TRIALS SOUTHEAST RESEARCH FARM, BERESFORD 1958-1963[a]

Variety	1958	1960	1962	1963	1958-63[b]	1963 test wt. lb/bu	Statistical significance[c]
	Average yield bu/acre						
Lakota	25.4	35.9	7.8	19.6	22.2	54.5	
CI 13654				19.1		58.0	
Wells	20.8	39.4	8.3	17.3	21.5	57.0	
CI 13751				16.8		57.5	
CI 13586				16.8		56.0	
Spinkcota	20.6	25.5	10.1	13.9	17.5	57.0	
Langdon	23.9	39.5	4.9	12.9	**20.3**	54.0	
Crim			8.5	12.0		55.0	
Rushmore	20.7	28.2	8.1	11.8	17.2	54.0	
Pembina		35.1	7.3	11.4		51.5	
Selkirk	21.4	28.8	5.7	10.5	16.6	49.0	
Canthatch	21.7	25.1	6.5	10.4	15.9	51.0	
Thatcher	22.3	25.0	6.5	10.3	16.0	51.5	
Lee	19.7	22.9	6.9	8.7	14.6	53.0	
Justin			4.5	8.7		51.5	
Ceres	22.7		5.9	4.0		43.5	
	Mean yield			12.8			
LSD .05	2.8	6.9	3.0	2.7			

a/ 1959 data not available
b/ 4 year average
c/ Using Duncan's Multiple Range Test at the 5% level

TABLE 21. STANDARD VARIETY SPRING WHEAT AND DURUM TRIALS, DRYLAND U.S. NEWELL FIELD STATION, NEWELL, 1957-63[a]

Variety	1957	1959	1960	1962	1963	1957-63[b]	1963 test wt.
	Average yield bu/acre						lb/bu
CI 13654					32.2		62.0
Wells				38.5	30.4		62.5
Pembina			12.4	27.7	29.9		60.0
CI 13586					27.8		62.5
Spinkcota	17.0			29.1	26.6		62.5
Selkirk	19.7	0.4	12.9	33.5	26.2	18.5	60.0
Crim			12.2	32.0	25.2		60.5
CI 13751					24.6		62.0
Mida	16.0	0.6	12.2	36.8	24.1	17.9	63.0
Lee	18.5	0.2	11.8	30.5	23.1	16.8	60.5
Justin				31.8	23.0		60.0
Rushmore	15.3		13.3	25.2	22.6		60.0
Lakota				37.3	21.0		61.5
Thatcher	19.4	0.9	12.6	23.7	19.5	15.2	59.5
Marquis		0.9	11.3	7.4	18.8		58.5
Canthatch			10.9	23.5	18.7		61.0
	Mean yield				24.6		
LSD .05	N.S.		N.S.	6.1	N.S.		

[a] 1958 hailed out; 1961 - drought, no crop

[b] Five year average

TABLE 22. STANDARD VARIETY SPRING WHEAT TRIALS, IRRIGATED U. S. NEWELL FIELD STATION, NEWELL, 1959-63

Variety	1959	1960	1961	1962	1963	1959-63	1963 test wt.
	Average yield bu/acre						lb/bu
Selkirk	36.4	41.4	5.1	40.7	37.3	32.2	58.5
CI 13586					35.6		62.5
Canthatch	36.2	41.6	6.5	36.3	35.5	31.2	60.0
Pembina	31.8	40.1	4.9	39.5	34.9	30.2	59.5
Thatcher					34.7		59.5
Crim		43.0	6.3	34.1	32.5		60.0
CI 13654					32.3		63.0
CI 13751					32.1		61.0
Spinkcota					31.2		62.0
Lee	25.5	41.2	5.2	37.8	30.5	28.0	59.5
Justin			6.2	36.3	29.7		60.5
Rushmore	30.7	40.2	5.5	35.7	29.3	28.3	60.0
	Mean yield				33.0		
LSD .05	6.2	N.S.		N.S.	N.S.		

TABLE 23. STANDARD VARIETY SPRING WHEAT AND DURUM TRIALS
AGRONOMY FARM, BROOKINGS, 1958-1963[a]

Variety	1958	1960	1961	1962	1963	1958-63[b]	1963 test wt. lb/bu	Statistical significance[c]
	Average yield bu/acre							
CI 13751					23.4		55.0	
Lakota	29.3	40.7	26.2	25.8	22.0	28.8	47.5	
CI 13654					21.1		55.5	
Wells	29.5	38.9	25.0	24.5	20.9	27.8	50.5	
Sentry	25.5		21.2	21.5	18.8		52.0	
CI 13586					18.3		53.0	
Spinkcota	29.9	32.7	29.8	21.3	17.0	26.1	53.5	
Crim			26.2	12.4	14.5		49.5	
Langdon	28.6	40.6	24.6	32.2	14.2	28.0	46.5	
Pembina		40.1	27.4	22.0	13.5		48.5	
Rushmore	26.8	37.9	20.9	17.5	12.7	23.2	49.0	
Mida	27.6	34.9	27.9	21.1	11.9	24.7	51.0	
Selkirk	29.0	39.1	30.7	22.3	11.9	26.6	46.5	
Canthatch	28.5	31.3	22.2	16.4	10.4	21.8	48.5	
Thatcher	29.5	29.2	17.5	15.0	10.3	20.3	46.0	
Ramsey	30.8	33.2	28.2	16.9	10.0	23.8	48.0	
Lee	23.3	37.3	23.1	21.5	10.0	23.0	45.0	
Justin			22.4	17.6	8.3		44.0	
Marquis	25.8	13.0	6.1	7.3	1.2	10.7	33.5	
Ceres	28.2	20.4	15.1	11.0	0.9	15.1	----[d]	
		Mean yield			13.7			
LSD .05	3.8	3.3		4.5	3.4			

a/ 1959 data not available
b/ 5 year average
c/ Using Duncan's Multiple Range Test at the 5% level
d/ Yield too small for proper measure of test weight

TABLE 24. STANDARD VARIETY SPRING WHEAT AND DURUM TRIALS
NORTH CENTRAL SUBSTATION, EUREKA 1958-1963[a]

Variety	1958	1960	1961	1962	1963	1958-63[b]	1963 test wt. lb/bu
	Average yield bu/acre						
Ramsey	43.5	13.8	9.8	25.4	20.7	22.6	62.0
CI 13654					18.9		59.5
Spinkcota	40.5	14.0	31.4	29.5	18.1	26.7	60.5
CI 13586					17.9		58.5
CI 13751					17.8		58.5
Wells	49.2	12.4	6.8	27.2	17.4	22.6	57.5
Langdon	47.2	14.3	7.1	34.2	16.8	23.9	58.5
Pembina			25.2	30.9	16.6		55.0
Canthatch	32.6	15.2	32.1	21.8	16.5	23.6	56.0
Rushmore	33.0	15.0	23.5	24.5	16.4	22.5	56.0
Thatcher	29.7	14.3	28.1	25.7	15.7	22.7	55.5
Lakota	46.9	16.8	11.5	30.6	15.6	24.3	55.0
Justin			28.1	24.3	14.7		56.5
Selkirk	38.4	13.5	19.3	29.0	13.8	22.8	52.0
Lee	45.4	14.2	26.0	26.6	13.7	25.2	55.5
Crim			23.5	23.4	12.3		55.0
		Mean yield			16.4		
LSD .05	5.2	N.S.		7.5	N.S.		

a/ 1959 data not available
b/ Five year average

TABLE 25. STANDARD VARIETY SPRING WHEAT AND DURUM TRIALS CENTRAL SUBSTATION, HIGHMORE 1958-1963[a/]

Variety	1958	1960	1961	1962	1963	1958-63[b/]	1963 test wt. lb/bu	Statistical significance[c/]
	Average yield bu/acre							
Wells	48.8	21.5	14.5	52.4	22.8	32.0	61.5	
Lakota	42.9	21.9	14.2	47.1	21.3	29.5	59.0	
CI 13751					19.2		59.5	
CI 13654					17.6		59.0	
Lee	34.6	24.6	16.4	37.2	16.7	25.9	57.5	
CI 13586					16.7		57.0	
Spinkcota	34.6	24.8	18.7	32.4	16.3	25.4	59.5	
Pembina		24.5	17.6	39.6	15.0		52.0	
Rushmore	30.1	23.4	17.8	30.9	14.7	23.4	55.0	
Canthatch	28.4	22.6	18.1	26.1	14.6	22.0	57.0	
Crim			18.2	33.8	14.2		54.5	
Justin			16.2	37.4	13.4		56.0	
Thatcher	28.3	20.5	17.1	27.0	12.6	21.1	56.0	
Selkirk	33.4	23.1	18.5	37.6	11.5	24.8	51.5	
Ceres	29.0	19.3	14.1	22.6	9.6	18.9	54.0	
Marquis	23.3	19.1	11.0	10.6	4.4	13.7	49.5	
		Mean yield			15.0			
LSD .05	4.7	3.0		8.7	2.7			

a/ 1959 data not available
b/ 5 year average
c/ Using Duncan's Multiple Range Test at the 5% level.

TABLE 26. STANDARD VARIETY SPRING WHEAT AND DURUM TRIALS NORTHEAST RESEARCH FARM, WATERTOWN, 1958-1963[a/]

Variety	1958	1960	1961	1962	1963	1958-63[b/]	1963 test wt. lb/bu	Statistical significance[c/]
	Average yield, bu/acre							
CI 13654					18.6		54.5	
CI 13751					17.0		50.5	
Pembina			26.4	21.4	13.7		47.5	
CI 13586					11.4		47.5	
Lakota	27.8	27.3	30.5	41.2	9.9	27.3	41.0	
Spinkcota	29.8	26.8	27.7	23.4	9.6	23.5	48.5	
Rushmore	17.1	22.4	22.0	20.7	9.5	18.3	43.5	
Selkirk	23.5	25.7	25.8	22.4	8.6	21.2	39.0	
Wells	31.7	30.0	32.5	38.3	7.6	28.0	40.5	
Thatcher	13.1	13.1	17.2	14.1	7.0	12.9	39.0	
Canthatch	17.5	21.4	17.5	16.4	6.9	15.9	40.5	
Crim			25.4	18.0	6.9		44.5	
Lee	25.7	31.3	21.6	18.8	6.6	20.8	40.5	
Justin			25.8	18.8	6.2		40.0	
Langdon	31.8	25.9	28.2	36.6	5.7	25.6	40.0	
Ramsey	23.0	25.3	23.7	23.9	5.7	20.3	39.0	
		Mean yield			9.4			
LSD .05	4.2	5.7		4.9	2.3			

a/ 1959 data not available
b/ Five year average
c/ Using Duncan's Multiple Range Test at the 5% level.

TABLE 27. SMALL GRAIN VARIETY TEST AT RANGE FIELD STATION
COTTONWOOD, SOUTH DAKOTA 1963

Oats		
Variety	Test wt.	Yield
	lb/bu	bu/acre
Dupree	36.5	37.6
CI 7399	36.5	36.5
Ransom	34.5	33.7
Burnett	36.5	33.3
Coachman	31.5	32.5
Portage	32.0	32.0
Garland	35.5	31.8
Brunker	35.0	31.1
Cherokee	36.0	30.9
Ortley	33.5	30.4
Marion	34.0	30.0
Mo. 0-205	34.0	29.4
Andrew	37.0	29.2
Dodge	35.0	29.0
Clintland 60	38.5	28.9
Minhafer	36.5	28.5
Nehawka	36.5	28.4
Minton	31.5	27.8
Neal	36.0	27.8
Rodney	29.0	26.8
Bonkee	39.0	25.3
Tonka	39.5	24.7
AuSable	32.0	21.9
Garry	30.0	21.0
Lodi	28.5	20.7
Mean yield		29.2
LSD .05		8.2

Barley		
Variety	Test wt.	Yield
	lb/bu	bu/acre
Betzes	47.5	31.3
Traill	46.5	25.8
Spartan	50.0	24.0
Otis	47.0	22.4
Larker	48.5	22.1
Parkland	47.5	21.0
Trophy	46.0	21.0
Liberty	45.0	20.9
Custer	44.5	18.5
Feebar	42.0	17.3
Kindred	45.0	15.0
Plains	45.5	11.6
Mean yield		20.9
LSD .05		5.9

Spring Wheat and Durum		
Variety	Test wt.	Yield
	lb/bu	bu/acre
Lakota	56.5	21.0
Rushmore	56.5	18.6
CI 13654	56.5	17.5
Spinkcota	59.5	17.4
CI 13751	56.5	17.2
Canthatch	54.0	16.6
Wells	58.0	15.7
Thatcher	54.5	15.5
Selkirk	51.5	15.4
Pembina	52.5	14.8
Justin	55.0	14.8
Mida	57.5	14.0
Crim	53.0	13.6
CI 13586	55.5	13.5
Lee	53.0	11.8
Marquis	52.0	10.9
Mean yield		15.5
LSD		N.S.

TABLE 28. SMALL GRAIN VARIETY TEST AT THE SOUTH CENTRAL RESEARCH FARM PRESHO, SOUTH DAKOTA, 1963[a]

Oats[b]			Barley[c]			Spring Wheat[b]		
Variety	Test wt. lb/bu	Yield bu/acre	Variety	Test wt. lb/bu	Yield bu/acre	Variety	Test wt. lb/bu	Yield bu/acre
Andrew	33	38.2	Custer	43	19.5	Canthatch	54	7.2
Burnett	33	38.6	Larker	43	13.4	Justin	53	3.4
C.I. 7399	34	47.2	Liberty	42	17.0	Lee	51	5.0
Clintland 60	34	40.4	Otis	46	22.8	Minn.404	53	6.0
Dodge	32	43.2	Plains	44	18.7	Pembina	51	4.0
Dupree	33	49.0	Spartan	43	12.3	Rushmore	54	9.4
Garland	34	40.4	Traill	41	16.5	Selkirk	48	4.3
Garry	31	38.6	Trophy	38	12.4	Spinkcota	56	7.5
Marion	34	38.6				Lakota	54	12.5
Minhafer	32	40.2				Langdon	55	8.6
Mo. 0-205	32	49.2				Ramsey	56	9.8
Neal	32	45.8				Wells	56	11.0
Nehawka	33	37.2						
Portage	33	39.6						
Ransom	33	41.0						

L.S.D. at 5% = 9.6 Bu/acre

a/ These data are included as a service to producers and are not part of the variety testing program. Furnished through courtesy of H. A. Geise

b/ Two replications

c/ Three replications

Note: Plots harvested by hand. Plot size 4 feet by 45 feet.

TABLE 29. STANDARD VARIETY WINTER WHEAT TRIAL, AGRONOMY FARM, BROOKINGS, 1961-1963

Variety	1961	1962	1963	1961-63	Test weight lb/bu	Statistical significance[a]
	Average yield bu/acre					
S.D. 56-53	1.9	13.8	24.4	13.4	54.5	
S.D. 56-197		9.7	20.4		53.0	
Minter	4.2	9.7	20.1	11.3	52.0	
Lancer		6.6	19.6		54.0	
Omaha	3.6	3.1	17.0	7.9	51.0	
Nebred	1.7	1.8	7.8	3.8	42.0	
Ottawa		11.6	6.3		50.0	
Warrior	3.5	1.9	5.7	3.7	37.5	
Pawnee	2.0	5.4	5.4	4.3	41.0	
Rodco		11.7	5.2		43.5	
Cheyenne	2.2	2.7	2.6	2.5	35.0	
Bison	2.7	4.9	2.5	3.4	38.0	
Aztec	4.1	1.8	2.0	2.6	40.0	
Wichita	3.6	2.5	1.9	2.3	40.0	
Kaw		5.7	0.5		----	
		Mean yield	9.4			
		LSD .05	3.6			

a/ Using Duncan's Multiple Range Test at the 5% level.

TABLE 30. STANDARD VARIETY WINTER WHEAT TRIAL SOUTH CENTRAL RESEARCH FARM, PRESHO, 1961-1963

Variety	1961	1962	1963	1961-63	test weight lb/bu	Statistical significance[a]
	Average yield, bu/acre					
Warrior	18.6	3.1	39.1	20.3	58.0	
Omaha	21.1	5.1	32.5	19.6	60.0	
Ottawa	10.9	11.0	30.0	17.3	60.5	
Aztec	15.3	---	29.7		61.0	
Nebred	14.8	2.1	28.8	15.2	58.0	
Lancer	11.0	17.0	28.4	18.8	59.5	
SD 56-53	8.2	10.5	27.1	15.3	57.5	
Pawnee	15.7	4.2	26.5	15.5	59.5	
Cheyenne	10.2	1.1	26.5	12.6	56.5	
Minter	10.4	12.4	26.3	16.4	56.0	
Wichita	17.2	4.3	23.6	15.0	60.0	
SD 56-197	10.2	10.6	23.1	14.6	54.5	
Bison	8.6	3.2	23.1	11.6	59.5	
Rodco	10.1	13.6	23.0	15.6	58.0	
Kaw	6.7	5.2	20.6	10.8	62.0	
		Mean yield	27.2			
LSD (.05)			4.3			

a/ Using Duncan's Multiple Range Test at the 5% level.

TABLE 31. STANDARD VARIETY WINTER WHEAT TRIAL
CENTRAL SUBSTATION, HIGHMORE, 1961-1963[a/]

Variety	1961	1962[a/]	1963	1961-63	Test weight lb/bu	Statistical significance[b/]
		Average yield, bu/acre				
Ottawa	8.5	a/	40.5	24.5	58.5	
Wichita	6.6		36.9	21.8	60.0	
Rodco	1.8		36.3	19.1	60.5	
Omaha	6.9		36.0	21.5	59.5	
Kaw			34.8		63.5	
Warrior	10.2		34.8	22.5	56.0	
Pawnee	18.5		32.7	25.6	56.5	
SD 56-53	8.0		31.7	19.9	58.5	
Bison	2.9		30.8	16.9	56.5	
Lancer	7.6		30.5	19.1	58.5	
Nebred	12.2		28.9	20.6	57.5	
Cheyenne	9.7		26.4	18.1	55.0	
Aztec	12.3		24.8	18.6	58.5	
SD 56-197	14.4		24.1	19.2	57.5	
Minter	22.2		23.5	22.9	57.5	
		Mean yield	31.5			
LSD (.05)			5.1			

a/ Stand so uneven, results not reliable (CV = 82%)
b/ Using Duncan's Multiple Range test at the 5% level

TABLE 32. STANDARD VARIETY WINTER WHEAT TRIAL,
SOUTHEAST RESEARCH FARM, BERESFORD, 1962-1963

Variety	1962	1963	1962-63	Test weight lb/bu	Statistical significance[a/]
	Average yield, bu/acre				
Lancer	5.8	18.3	12.1	58.0	
SD 56-53	10.5	17.9	14.2	58.0	
Minter	8.9	16.8	12.9	56.5	
Ottawa	6.0	13.0	9.5	58.5	
Rodco	6.4	12.6	9.5	54.0	
Omaha	6.2	10.5	8.4	53.0	
Nebred	2.9	9.3	6.1	49.5	
SD 56-197	10.6	9.1	9.9	52.5	
Wichita	6.2	8.9	7.6	53.5	
Warrior	5.2	7.2	6.2	46.0	
Cheyenne	2.6	6.6	4.6	47.5	
Kaw	5.6	6.5	6.1	53.5	
Pawnee	6.0	5.2	5.6	50.0	
Bison	4.7	4.6	4.7	45.5	
Aztec	-	3.7	--	48.5	
	Mean yield	10.0			
LSD (0.05)		3.9			

a/ Using Duncan's Multiple Range Test at the 5% level

TABLE 33. STANDARD VARIETY RYE TRIAL
AGRONOMY FARM, BROOKINGS, 1959-1963

Variety	1959	1960	1961	1962	1963	1959-63	Test weight lb/bu
			Bushels per acre				
Caribou	41.3	56.0	26.0	8.0	22.2	30.7	54.0
Antelope	41.7	53.7	45.7	14.9	17.1	34.6	54.0
Pierre	41.4	58.4	28.8	11.0	16.3	31.2	53.5
Elk*		45.9	11.3	6.6	12.1		52.0
L.S.D.				N.S.			

* Poor stand; seed had very low germination

TABLE 34. STANDARD VARIETY RYE TRIAL,
SOUTHCENTRAL RESEARCH FARM, PRESHO, 1961-63.

Variety	1959	1960	1961	1962	1963	1959-63	Test weight lb/bu
			Bushels per acre				
Caribou	5.7	24.9	23.7	38.8	23.3	23.3	54.5
Pierre	4.8	23.4	14.9	42.9	18.3	20.9	55.5
Elk*		29.3	21.9	41.6	18.3		52.5
Antelope	6.8	25.3	24.8	41.8	18.1	23.4	54.0
LSD				N.S.			

* Poor stand; seed had very low germination
data furnished courtesy H. A. Geise

TABLE 35. STANDARD VARIETY RYE TRIAL
CENTRAL SUBSTATION, HIGHMORE, 1961-1963

Variety	1959	1960	1961	1962	1963	1959-63	Test weight lb/bu	Statistical significance[a]
			Bushels per acre					
Caribou	27.2	19.3	52.6	17.6	32.1	29.8	54.0	
Antelope	22.2	22.9	36.9	29.5	30.4	28.4	54.0	
Elk*		26.0	54.4	15.8	28.2		52.0	
Pierre	18.4	20.7	43.6	22.3	21.5	25.3	53.0	
LSD .05				6.0				

* Poor stand; seed had very low germination
a/ Using Duncan's Multiple Range test at the 5% level.

TABLE 36. STANDARD VARIETY RYE TRIAL
SOUTHEAST RESEARCH FARM, BERESFORD, 1960-1963

Variety	1960*	1961	1962	1963	1960-63[b]	Test weight lb/bu	Statistical significance[a]
		Bushels per acre					
Caribou	25.5	15.1	27.9	22.8		54.5	
Antelope	25.4	20.9	27.0	24.4		55.5	
Pierre	23.0	13.7	24.6	20.4		57.5	
Elk*	28.9	10.8	4.6	14.8		48.0	
L.S.D. (.05)			17.4				

a/ Using Duncan's Multiple Range test at the 5% level.
b/ 1960-1963, three-year average. 1960 data from Menno.
* Poor stand; seed had very low germination.

TABLE 37. SUPPLEMENTAL AGRONOMIC DATA FOR STANDARD VARIETY OAT TRIAL AT BROOKINGS, SOUTH DAKOTA, 1963

Variety	one-half headed	crown rust 1/ %	Percent lodging 2/
	June	June 28	July 8
Portage	24	MS-tr	67
Dodge	20	MR-tr	8
Minhafer	16	MS-5	35
Garland	20	R -tr	13
Brunker	15	MS-5	98
Marion	18	MS-10	43
Sauk	25	MS-5	50
Cherokee	17	S -20	50
Clintland 60	19	S -10	17
Burnett	18	S -5	37
Osage	17	MS-10	67
Nehawka	15	S -20	43
Ransom	16	S -10	37
Ajax	24	MS-10	47
Garry	27	MS -2	15
Lodi	28	MR-tr	5
Dupree	17	S -15	57
CI 7399	18	S -10	17
Goodfield	24	S -5	7
Andrew	17	S -10	37
Rodney	28	MR-5	25
Tonka	14	S -25	8
Mo. 0-205	17	S -20	40
Waubay	19	S -30	25
Coachman	22	S -10	12
Minton	21	S -5	63
Bonkee	17	S -25	57
Neal	16	S -10	10
Nodaway	18	S -10	20
Newton	19	S -20	20
Ortley	26	MS-10	47
AuSable	28	MS-10	28

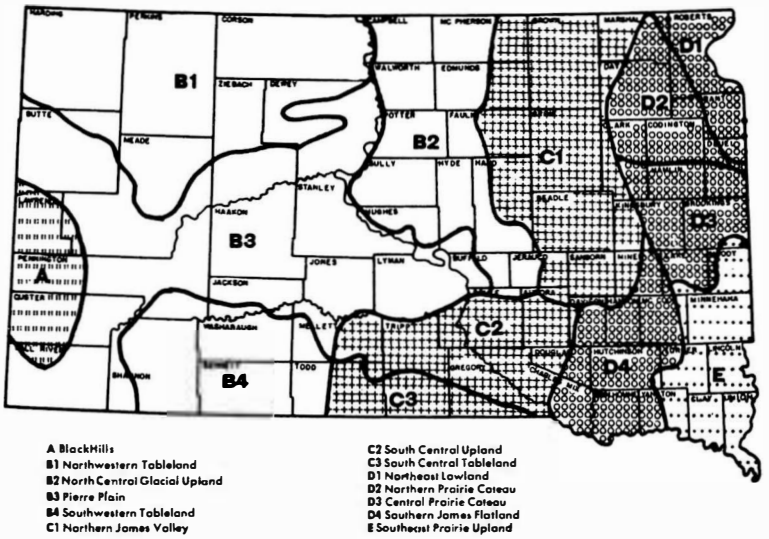
1/ Crown Rust Reaction
2/ Three-replication average
R - Resistant
MR - Moderately Resistant
MS - Moderately Susceptible
S - Susceptible

TABLE 38. SUPPLEMENTAL AGRONOMIC DATA FOR THE STANDARD VARIETY WHEAT TRIALS AT BROOKINGS, 1963

Variety	one-half headed	Stem rust		Leaf rust		Height	Lodging b
	June	a	%	a	%	inches	percent
		Spring Wheat and Durum					
		July 13					Aug. 5
CI 13751	20	R	0	R	0	38	27
Lakota	22	R	0	R	0	38	10
CI 13654	22	R	0	R	0	39	23
Wells	23	R	0	R	0	39	7
Sentry	23	S	40	R	0	36	23
CI 13586	23	R	0	R	0	38	30
Spinkcota	20	MR	25	S	65	43	23
Crim	21	R	1	X	65	35	63
Langdon	23	X	25	MR	10	41	30
Pembina	21	R	0	X	40	35	67
Rushmore	20	R	5	S	100	35	70
Mida	22	R	0	S	100	39	40
Selkirk	23	R	0	X	65	35	55
Canthatch	20	MR	10	S	100	36	75
Thatcher	21	R	10	S	100	36	75
Ramsey	26	R	0	R	0	40	20
Lee	20	X	40	X	65	34	80
Justin	25	R	0	X	40	33	50
Marquis		S	100	S	100	35	90
Ceres	26	S	100	S	100	38	95
		Winter Wheat					
		July 12					
SD 56-53	13	S	tr	S	65	39	
SD 56-197	18	X	25	S	65	41	
Minter	17	S	25	S	65	42	
Lancer	14	X	25	S	65	39	
Omaha	11	S	65	S	65	33	
Nebred	13	S	65	S	65	38	
Ottawa	15	S	25	X	25	33	
Warrior	14	S	65	S	65	34	
Pawnee	12	S	65	S	65	38	
Rodco	15	S	65	S	65	33	
Cheyenne	17	S	65	S	65	37	
Bison	15	S	65	S	65	34	
Aztec	9	S	65	S	65	39	
Wichita	15	S	65	S	65	32	
Kaw	17	S	65	R	-		

a S - Susceptible
X - Intermediate
R - Resistant

b - average of three replications



1964 RECOMMENDED SMALL GRAIN VARIETIES AND AREAS OF BEST ADAPTATION

Variety	Area of best adaptation
Spring Wheat	
Canthatch	B1
Crim	Statewide
Justin	B1, B2, C1, D1, D2, D3,
Lee #	Statewide
Rushmore	A, B1, B2, B3, B4, C2
Selkirk#	B1, B2, C1, D1, D2, D3
Pembina	B1, B2, C1, D1, D2, D3
Durum	
Lakota	B1, B2, C1, C2, D1, D2, D3
Wells	B1, B2, C1, C2, D1, D2, D3
Flax	
Arny	C1, D1, D2, D3
B-5128	C1, D1, D2, D3
B-5128(ss)	C1, D1, D2, D3
Bolley	all flax areas
Marine	all flax areas
Marine 62	all flax areas
Summit	all flax areas
Windom	all flax area
Barley (Malting)	
Kindred	C1, D1, D2, D3, B2[a]
Larker	A, B2, C1, D2, D3
Traill	A, B2[a], C1, D1, D2, D3
Trophy	A, B2[a], C1, D1, D2, D3
Barley (Feed)	
Liberty	Statewide
Plains	Statewide
Spartan	A, B1, B2*, B3, B4, C2, C3

Variety	Area of best adaptation
Oats	
Andrew#	Statewide
Bonkee	D4, E
Burnett#	C1, C2, D1, D2, D3, D4, E
Clintland 60	D3, D4, E
Dodge	D1, D2, D3, C1, D4, E
Dupree	B1, B2, B3, B4, C2
Garland	C1, D1, D2, D3, D4, E
Garry	C1, D1, D2, D3,
Lodi	D1, D2, D3*
Minhafer	Statewide
Neal	B2, B3, B4, C2, C3, D4
Mo. 0-205	Statewide
Nehawka	B3, B4, C2,C3
Ortley	C1[a], D1, D2, D3
Portage	C1[a], D1, D2, D3
Rodney	D1, D2, D3
Rye	
Antelope	Statewide
Caribou	Statewide
Pierre	Statewide
Winter Wheat	
Minter	D4, E
Nebred	B3, B4, C2, C3
Omaha	B4, C2, C3, D4, E
Ottawa	B3, B4, C2, C3
Warrior	B3[a], B4, C2, C3

For both irrigated and dryland
a Southern counties
* Northern counties

Recommendations courtesy of R. A. Cline and E. E. Sanderson, Extension Agronomists - Crops