SECTION I

REPORT OF
AGRONOMIC INVESTIGATIONS
AT THE
DICKINSON EXPERIMENT STATION
1970
BY
THOMAS J. CONLON

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VARIETY TRIALS WITH SMALL GRAIN

The variety trials with small grains are conducted to compare and evaluate the varieties of the several small grains that are available or are soon to become available for use on farms. These tests provide comparative data on yield, disease reaction in the field and data on other agronomic characteristics important to the commercial grower. Grain is also supplied from these trials for milling and baking tests, for tests on malting quality and for other quality determinations.

Variety trials have been conducted at the Dickinson Experiment Station since 1908, and have provided much useful information on the varietal performance of the several small grains under western North Dakota conditions. New varieties are being developed periodically, and these need to be compared with the varieties currently in use and evaluated for possible future use in this region.

The relative behavior of any variety is influenced by the environmental conditions under which it is grown. All varieties in these tests have some merit, and some limitations, which show more in some seasons than in others. A knowledge of varietal characteristics, and the conditions under which the crop was grown, will help to better understand the reasons for yield differences obtained in any one year.

Certain diseases are more prevalent in some years than in others. Varieties differ in their reaction to these diseases. Rust on all crops, and pasmo on flax occur most often in the eastern part of the state where rainfall and humidity usually are higher. Root rots, leaf and head blight are also more prevalent there than in the more arid sections of the state. Smuts are usually present over most of the state. Races of oat rust are present in the United States to which no varieties are resistant.

Disease and disease organisms are constantly changing. Resistance as used here means comparative resistance, and only to those races which are known to which the variety has been tested.

No variety will be best every year and under all conditions. Not knowing the kind of season or conditions to which the crop will be exposed, the thoughtful grower will choose the variety which will best meet the crop hazards which he regards most serious for his area.

The variety trials are seeded on summerfallow. First tillage of the summerfallow is with the moldboard plow. Maintenance of the summerfallow is with the duckfoot cultivator. Tillage of the summerfallow before seeding is with the duckfoot cultivator. Seeding is done with a double disk press drill in a randomized block arrangement. Seeding rates are 45 pounds for winter wheat, 1 bushel per acre for hard spring wheat, durum and rye, 1 1/4 bushel per acre for barley and 1 1/2 bushel acre for oats.

Fertilizer application is uniform for all varieties and follows recommendations based on soil test.

Uniform weed control follows the current recommendations of the North Dakota Agricultural Experiment Station.

The 1969-70 winter grain variety trials were seeded at Dickinson on September 8th, at Beach September 9th and at Bowman on September 10th. The fall of 1969 was dry, and seedbed conditions were not exceptionally good.

The driest seedbed was at the Bowman site, and germination was spotty at this location. Low yields recorded at the Bowman site this year were a product of poor stands. Growers in this area who were faced with a similar problem of poor stands in the spring because of the dry seedbed conditions in the fall either reseeded to spring wheat or spot-seeded the winter wheat fields with spring wheat. This was not done on the trial site this year. If a similar situation occurs in the future, the trials will be over-seeded.

Stands at Dickinson were fairly good and the wet spring was favorable to development of winter wheat. Yields of winter wheat at Dickinson were equal to those for spring wheat. Of the three locations, conditions were most favorable at the Beach site. This is reflected in the excellent yields of winter wheat produced at this location.

Spring seeding was difficult because of the heavy rainfall and extended periods of wet weather. Trials seeded early in May at Mandan, Bowman and Dickinson had to be reseeded because of soil crusting and resulting poor stands.

Late seeding was general throughout the area, with some of the seedings made in June showing up very well at harvest.

Seeding dates at Dickinson were May 29 and June 11. The trials were seeded at Hettinger on May 5th, at Killdeer May 18th, Beach May 19, Glen Ullin May 20th, Mandan May 26th and Bowman June 2nd.

In addition to the information on yields and test weights, this report also includes a comparison of protein content of wheat varieties. All of these protein determinations were made on a 14 per cent moisture basis and are comparable. Valid comparisons of protein content of wheat are possible only when the tests are made on a constant moisture basis. This is an important point and must be kept in mind.

Table 1. Hard Red Spring Wheat Variety Trials – Dickinson, 1970.

Variety	Yield in bushels per acre					Test weight	Heading date	Rust		Lodging %	Height inches
	Rep 1	Rep 2	Rep 3	Rep 4	Avg.			Leaf	Stem		
Thatcher	18.4	18.5	20.1	15.3	18.1	61.0	7-17	none	none	none	24
Selkirk	16.6	21.0	18.7	13.4	17.4	58.0	7-19				23
Justin	20.5	25.3	22.6	15.5	21.0	61.5	7-21				27
Chris	17.6	21.9	23.1	17.4	20.0	60.3	7-17				27
Manitou	20.1	25.6	20.4	18.8	21.2	61.5	7-18				25
Polk	16.8	19.1	19.0	16.1	13.7	63.0	7-16				22
Waldron	17.1	22.9	17.5	14.6	18.0	61.4	7-17				25
Neepawa	21.3	26.4	20.7	21.2	22.4	62.0	7-17				24
Red River 68	12.8	15.0	17.2	19.3	16.1	61.0	7-12				22
World Seeds 1812	11.1	21.1	17.9	15.8	16.5	59.8	7-12				21
Bonanza	15.7	16.6	18.3	15.5	16.5	60.0	7-15				19
6 WO 1809	11.4	14.0	14.4	12.2	13.0	62.0	7-14				20
Fletcher	22.2	25.9	20.9	22.4	22.9	58.0	7-20				22
Era	22.6	31.0	27.5	27.5	27.2	61.0	7-22				20
Fortuna	18.0	22.6	19.1	11.1	17.7	60.4	7-15				24
S 6763	14.3	18.7	17.7	14.1	16.2	59.0	7-14				24
S 6579	19.4	20.7	18.5	15.7	18.6	60.0	7-15				24
WIS. 271	19.5	23.3	23.1	18.8	21.2	61.5	7-15				21
WIS. 255	12.5	16.2	14.3	13.6	14.2	58.7	7-19				25
Wamduska	18.0	23.7	20.9	20.0	20.7	59.0	7-19				29
ND 487	18.3	23.1	20.7	21.2	20.8	61.0	7-17				24
ND 491	15.8	15.6	19.0	12.8	15.8	60.5	7-16				25
AB 67-70	17.6	16.9	24.6	19.6	19.7	59.5	7-17				32
DeKalb FB 6	15.8	15.6	14.7	13.3	14.9	60.5	7-16				17
ND 497	16.1	21.1	18.2	17.8	18.3	59.5	7-17				24
Cargill 208	14.2	20.5	16.5	13.8	16.3	62.5	7-14				19

Analysis of Variance

Source	DF	SS	MS	F
Replication	3.	296.27	98.76	24.19
Treatments	25.	960.47	38.42	9.41
Error	75.	306.16	4.08	
Total	103.	1562.89		

Standard error of a treatment mean = 1.0102

Standard error of a difference among treatment means = 1.4286

The CV = 10.90 P.C

The L.S.D. @ 5% is 2.85 bushels per acre

Table 2. Wheat Variety Trial - Late Seeding – Dickinson, 1970.

Variety	Yield in bushels per acre					Test weight	Diseases	Lodging %
	Rep 1	Rep 2	Rep 3	Rep 4	Avg.			
Selkirk	20.6	18.2	16.0	15.4	17.6	60.0	none	none
Justin	24.2	25.3	16.9	19.6	21.5	57.0		
Chris	22.2	21.1	17.7	16.3	19.3	56.5		
Manitou	28.2	23.3	20.5	17.4	22.4	57.2		
Polk	23.5	19.5	17.2	16.9	19.3	59.3		
Waldron	24.0	21.6	23.3	19.8	22.2	58.0		
Neepawa	30.6	27.5	18.9	21.6	24.7	57.2		
Era	32.0	30.1	22.3	22.8	26.8	55.5		
Fletcher	28.7	25.3	22.3	19.5	24.0	53.5		
Wells	25.3	25.1	20.0	17.9	22.1	54.0		
Fortuna	23.7	18.3	18.0	16.5	19.1	59.7		
World Seeds 1812	23.7	25.1	20.4	14.7	21.0	60.8		
Hercules	27.2	22.2	20.2	20.9	22.6	57.5		
Leeds	25.4	23.1	22.0	20.9	22.9	55.0		
Bonanza	24.2	25.1	15.1	17.9	20.6	60.2		

Analysis of Variance

Source	DF	SS	MS	F
Replication	3.	496.98	165.66	48.01
Treatments	14.	319.77	22.84	6.62
Error	42.	144.92	3.45	
Total	59.	961.68		

Standard error of a treatment mean = 0.9288
Standard error of a difference among treatment means = 1.3135
The C.V. = 8.55 P.C. The L.S.D. at 5% is 2.65 bushels per acre

Table 3. Off-Station Wheat Variety Trials – Beach, 1970.

Variety	Yield in bushels per acre				Test weight
	Rep 1	Rep 2	Rep 3	Avg.	
Selkirk	33.2	32.5	30.2	32.0	60.7
Justin	36.1	36.0	35.7	35.9	62.0
Chris	35.8	28.7	30.5	31.7	60.8
Manitou	40.2	36.9	35.7	37.6	61.5
Polk	33.9	30.5	31.9	32.1	65.2
Waldron	41.1	37.2	29.0	35.8	62.0
Neepawa	38.5	44.1	40.9	41.2	61.8
Era	44.5	46.2	49.1	46.6	63.2
Fletcher	35.8	41.2	33.7	36.9	61.0
Wells	37.3	42.4	36.6	38.8	64.1
Fortuna	34.8	31.4	35.1	33.8	62.3
World Seeds 1812	28.8	33.4	24.7	29.0	62.2
Hercules	29.5	35.7	35.1	33.4	64.3
Leeds	33.2	29.6	29.9	30.9	64.0
Bonanza	38.7	42.7	37.5	39.6	62.7

Analysis of Variance

Source	DF	SS	MS	F
Replication	2.	39.98	19.99	2.20
Treatments	14.	897.35	64.10	7.05
Error	28.	254.45	9.09	
Total	44.	1191.78		

Standard error of a treatment mean = 1.7405
Standard error of a difference among treatment means = 2.4614
The C.V. = 8.45 P.C. The L.S.D. at 5% is 5.04 bushels per acre

Table 4. Off-Station Wheat Variety Trials – Bowman, 1970.

Variety	Yield in bushels per acre					Test weight
	Rep 1	Rep 2	Rep 3	Rep 4	Avg.	
Selkirk	14.1	19.7	18.0	19.1	17.7	57.0
Justin	21.6	24.0	19.1	21.1	21.5	60.0
Chris	18.7	18.7	19.1	22.0	19.6	53.4
Manitou	18.7	20.9	26.4	23.8	22.5	58.6
Polk	17.4	17.6	20.9	25.7	20.4	61.2
Waldron	19.6	19.1	21.1	25.5	21.3	59.0
Neepawa	19.4	25.3	31.4	25.9	25.5	59.2
Era	22.6	33.4	34.9	32.0	30.7	56.5
Fletcher	20.6	31.7	32.3	26.0	27.7	53.2
Wells	18.7	21.7	29.7	28.4	24.6	60.0
Fortuna	20.4	26.7	22.2	21.5	22.7	60.2
World Seeds 1812	18.7	18.0	18.9	18.3	18.5	59.5
Hercules	22.1	24.6	21.5	22.3	22.6	58.0
Leeds	14.3	22.0	15.6	24.3	19.1	56.5
Bonanza	25.3	29.7	27.9	26.2	27.3	60.4

Analysis of Variance

Source	DF	SS	MS	F
Replication	3.	219.70	73.23	8.24
Treatments	14.	781.95	55.85	6.29
Error	42.	373.23	8.89	
Total	59.	1374.88		

Standard error of a treatment mean = 1.4905
Standard error of a difference among treatment means = 2.1079
The C.V. - 13.09 P.C. The L.S.D. at 5% is 4.25 bushels per acre

Table 5. Off-Station Wheat Variety Trials – Glen Ullin, 1970.

Variety	Yield in bushels per acre					Test weight
	Rep 1	Rep 2	Rep 3	Rep 4	Avg.	
Selkirk	18.3	18.7	18.0	18.3	18.3	56.5
Justin	22.0	21.6	18.7	19.8	20.5	59.4
Chris	15.6	17.6	16.5	16.5	16.6	59.0
Manitou	20.5	22.4	21.5	20.7	21.3	58.4
Polk	15.4	18.7	17.6	18.2	17.5	61.0
Waldron	22.0	21.6	24.9	20.7	22.3	59.6
Neepawa	22.7	23.5	22.7	20.9	22.5	59.0
Era	33.6	25.9	23.1	22.0	26.2	60.4
Fletcher	26.2	26.0	23.8	24.6	25.2	61.0
Wells	25.9	26.1	23.3	25.3	25.2	62.0
Fortuna	15.4	16.0	17.6	15.8	16.2	60.0
World Seeds 1812	19.6	22.2	23.1	19.6	21.1	60.0
Hercules	23.3	25.1	24.5	20.7	23.4	61.2
Leeds	22.9	28.2	29.0	20.4	25.1	62.8
Bonanza	20.7	24.0	23.4	23.8	23.0	59.0

Analysis of Variance

Source	DF	SS	MS	F
Replication	3.	31.82	10.61	2.57
Treatments	14.	594.25	42.45	10.28
Error	42.	173.44	4.13	
Total	59.	799.51		

Standard error of a treatment mean = 1.0161
Standard error of a difference among treatment means = 1.4369
The C.V. = 9.40 P.C. The L.S.D. at 5% is 2.90 bushels per acre

Table 6. Off-Station Wheat Variety Trials – Hettinger, 1970.

Variety	Yield in bushels per acre					Test weight
	Rep 1	Rep 2	Rep 3	Rep 4	Avg.	
Selkirk	14.0	15.3	21.0	22.0	18.1	56.5
Justin	13.2	18.0	20.9	25.6	19.4	55.5
Chris	12.0	15.6	19.9	23.9	17.9	55.6
Manitou	14.2	16.9	23.3	20.5	18.7	55.5
Polk	13.9	17.3	18.7	21.9	18.0	59.2
Waldron	13.4	19.9	21.2	23.1	19.4	56.0
Neepawa	16.5	16.9	21.6	25.5	20.1	59.0
Era	18.3	23.4	22.4	25.9	22.5	58.0
Fletcher	15.2	19.0	22.8	22.2	19.8	55.8
Wells	13.9	18.4	19.9	27.6	20.0	61.0
Fortuna	19.9	20.1	21.3	25.2	21.6	60.0
World Seeds 1812	12.3	14.1	18.0	17.2	15.4	59.8
Hercules	12.5	17.2	19.5	21.0	17.6	60.6
Leeds	12.9	19.4	19.4	22.0	18.4	61.0
Bonanza	12.8	18.5	19.9	20.7	18.0	55.2

Analysis of Variance

Source	DF	SS	MS	F
Replication	3.	617.09	205.70	79.00
Treatments	14.	168.31	12.02	4.62
Error	42.	109.36	2.60	
Total	59.	894.75		

Standard error of a treatment mean = 0.8068
Standard error of a difference among treatment means = 1.1410
The C.V. = 8.50 P.C. The L.S.D. at 5% is 2.30 bushels per acre

Table 7. Off-Station Wheat Variety Trials – Killdeer, 1970.

Variety	Yield in bushels per acre					Test weight
	Rep 1	Rep 2	Rep 3	Rep 4	Avg.	
Selkirk	19.2	18.4	24.7	23.6	21.5	60.0
Justin	28.4	29.5	26.1	26.2	27.6	60.0
Chris	22.7	21.8	23.8	16.7	21.3	58.7
Manitou	29.8	24.7	24.3	23.9	25.7	60.2
Polk	22.6	20.5	22.1	17.0	20.6	61.5
Waldron	32.2	22.0	29.9	21.6	26.4	60.0
Neepawa	28.6	26.1	20.6	20.8	24.0	61.0
Era	31.5	36.8	25.2	23.0	29.1	60.5
Fletcher	30.9	29.5	20.3	23.5	26.1	58.0
Wells	29.9	26.7	22.2	23.8	25.7	59.5
Fortuna	23.3	20.6	20.6	23.7	22.1	61.8
World Seeds 1812	17.4	14.9	18.8	10.0	15.3	61.0
Hercules	28.5	23.9	24.4	17.6	23.6	62.1
Leeds	21.6	21.3	24.5	13.7	20.3	61.0
Bonanza	27.1	29.3	29.5	26.7	28.2	62.0

Analysis of Variance

Source	DF	SS	MS	F
Replication	3.	231.39	77.13	7.62
Treatments	14.	763.89	54.56	5.39
Error	42.	425.37	10.13	
Total	59.	1420.65		

Standard error of a treatment mean = 1.5912
Standard error of a difference among treatment means = 2.2503
The C.V. = 13.37 P.C. The L.S.D. at 5% is 4.54 bushels per acre

Table 8. Off-Station Wheat Variety Trials – Mandan, 1970.

Variety	Yield in bushels per acre				Test weight
	Rep 1	Rep 2	Rep 3	Avg.	
Selkirk	13.4	10.2	10.2	11.3	51.5
Justin	19.5	10.2	20.6	16.8	60.0
Chris	16.8	14.2	11.9	14.3	59.0
Manitou	21.2	14.2	18.6	18.0	59.5
Polk	18.6	13.9	16.3	16.3	62.0
Waldron	22.9	12.8	13.4	16.4	60.0
Neepawa	23.2	11.6	19.7	18.2	60.0
Era	21.8	18.3	23.8	21.3	60.0
Fletcher	18.9	17.1	17.4	17.8	56.5
Wells	12.5	9.9	16.6	13.0	54.8
Fortuna	14.5	11.0	15.1	13.5	60.0
World Seeds 1812	9.6	6.4	9.3	8.4	58.5
Hercules	9.0	10.5	11.3	10.3	59.5
Leeds	12.2	10.7	13.4	12.1	57.4
Bonanza	7.6	10.5	14.5	10.9	58.0

Analysis of Variance

Source	DF	SS	MS	F
Replication	2.	139.48	69.74	9.65
Treatments	14.	545.62	38.97	5.39
Error	28.	202.35	7.23	
Total	44.	887.45		

Standard error of a treatment mean = 1.5521
Standard error of a difference among treatment means = 2.1950
The C.V. = 18.46 P.C. The L.S.D. at 5% is 4.50 bushels per acre

Table 9. Durum Variety Trials – Dickinson, 1970.

Variety	Yield in bushels per acre					Test weight	Diseases	Lodging %	Height inches
	Rep 1	Rep 2	Rep 3	Rep 4	Avg.				
Leeds	14.3	11.9	12.0	14.1	13.1	57.5	none	none	25
Wells	15.2	13.4	11.0	14.0	13.4	59.5			27
Hercules	13.0	11.7	9.6	13.5	12.0	58.5			25
D 6517	6.1	2.9	5.8	5.8	5.2	59.5			23
D 6586	15.0	11.2	11.9	8.5	11.7	58.5			23
D 6723	16.6	12.4	11.9	8.6	12.4	58.0			23
D 6780	9.7	11.2	8.4	8.8	9.5	60.5			20
70-70	11.3	11.8	11.0	11.2	11.3	59.5			26

Analysis of Variance

Source	DF	SS	MS	F
Replication	3.	28.62	9.54	3.31
Treatments	7.	199.04	28.43	9.88
Error	21.	60.45	2.88	
Total	31.	288.11		

Standard error of a treatment mean = 0.8483
Standard error of a difference among treatment means = 1.1997
The C.V. = 15.35 P.C. The L.S.D. at 5% is 2.50 bushels per acre

Table 10. Wheat Variety Trials – Dickinson and Off-Station Sites, 1970.

Variety	Yield in bushels per acre								Average 8 trials 1970	Average 5 trials 1969
	Dickinson 1/	2/	Beach	Bowman	Hettinger	Glen Ullin	Killdeer	Mandan		
Selkirk	17.4	17.6	32.0	17.7	18.1	18.3	21.5	11.3	19.2	38.4
Justin	21.0	21.5	35.9	21.5	19.4	20.5	27.6	16.8	23.0	40.5
Chris	20.0	19.3	31.7	19.6	17.9	16.6	21.3	14.3	20.1	35.3
Manitou	21.2	22.4	37.6	22.5	18.7	21.3	25.7	18.0	23.4	39.0
Polk	17.8	19.3	32.1	20.4	18.0	17.5	20.6	16.3	20.3	39.9
Waldron	18.0	22.2	35.8	21.3	19.4	22.3	26.4	16.4	22.7	39.4
Neepawa	22.4	24.7	41.2	25.5	20.1	22.5	24.0	18.2	24.8	42.5
Era	27.2	26.8	46.6	30.7	22.5	26.2	26.5	21.3	28.5	-
Fletcher	22.9	24.0	36.9	27.7	19.8	25.2	26.1	17.8	25.1	-
Wells	13.4	22.1	38.8	24.6	20.0	25.2	25.7	13.0	22.9	41.8
Fortuna	17.7	19.1	33.8	22.7	21.6	16.2	22.1	13.5	20.8	34.0
World Seeds 1812	16.5	21.0	29.0	18.5	15.4	21.1	15.3	8.4	18.2	-
Hercules	12.0	22.6	33.4	22.6	17.6	23.4	23.6	10.3	20.7	-
Leeds	13.1	22.9	30.9	19.1	18.4	25.1	20.3	12.1	20.2	41.0
Bonanza	16.5	20.6	39.6	27.3	18.0	23.0	28.2	10.9	23.0	-

1/ Seeding date May 29
2/ Seeding date June 11

Table 11. Protein Data Wheat Variety Trials – Dickinson and Off-Station Sites, 1970.

Wheat protein at 14.0% moisture basis								
Variety	**Dickinson**	**Beach**	**Bowman**	**Hettinger**	**Glen Ullin**	**Killdeer**	**Mandan**	**7-Station**
Selkirk	17.1	15.0	15.3	14.8	16.2	15.9	16.7	15.9
Justin	17.5	15.8	15.5	16.7	16.8	16.4	16.5	16.5
Chris	17.7	16.4	16.6	16.5	17.5	17.0	17.0	17.0
Manitou	17.7	15.6	15.7	16.1	17.0	16.4	16.9	16.5
Polk	17.5	15.4	15.3	15.8	15.9	16.5	16.8	16.2
Waldron	17.8	15.8	15.9	15.3	16.7	16.5	17.2	16.5
Neepawa	17.8	15.7	15.6	16.2	16.6	16.4	16.9	16.5
Era	15.8	14.0	14.1	14.8	15.4	14.9	15.4	14.9
Fletcher	16.0	14.3	15.0	16.3	16.0	15.6	16.1	15.6
Wells	-	14.3	15.0	17.6	16.4	14.8	16.5	15.8[1/]
Fortuna	17.5	15.5	15.8	15.0	16.4	16.3	17.5	16.3
World Seeds 1812	17.9	15.8	15.8	15.5	16.5	17.1	18.1	16.7
Hercules	-	15.3	16.6	15.6	16.7	15.4	17.8	16.2[1/]
Leeds	-	15.3	16.4	18.0	16.2	16.0	17.6	16.6[1/]
Bonanza	15.8	14.8	14.9	15.7	15.0	15.3	16.6	15.4

[1/] Six station average.

These protein determinations were made by the Department of Cereal Technology, North Dakota State University.

TEST WEIGHT PER BUSHEL
Dickinson and Off-Station Sites 1970

Wheat Variety Trials	**Test weight in pounds per bushel**							
Variety	**Dickinson**	**Beach**	**Bowman**	**Hettinger**	**Glen Ullin**	**Killdeer**	**Mandan**	**Avg. 7-Station 1970**
Selkirk	58.0	60.7	57.0	56.5	56.5	60.0	51.5	57.2
Justin	61.5	62.0	60.0	55.5	59.4	60.0	60.0	59.8
Chris	60.3	60.8	53.4	55.6	59.0	58.7	59.0	58.1
Manitou	61.5	61.5	58.6	55.5	58.4	60.2	59.5	59.3
Polk	63.0	65.2	61.2	59.2	61.0	61.5	62.0	61.9
Waldron	61.4	62.0	59.0	56.0	59.6	60.0	60.0	59.7
Neepawa	62.0	61.8	59.2	59.0	59.0	61.0	60.0	60.3
Era	61.0	63.2	56.5	58.0	60.4	60.5	60.0	59.9
Fletcher	58.0	61.0	53.2	55.8	61.0	58.0	56.5	57.6
Wells	59.5	64.1	60.0	61.0	62.0	59.5	54.8	60.1
Fortuna	60.4	62.3	60.2	60.0	60.0	61.8	60.0	60.7
World Seeds 1812	59.8	62.2	59.5	59.8	60.0	61.0	58.5	60.1
Hercules	58.5	64.3	58.0	60.6	61.2	62.1	59.5	60.6
Leeds	57.5	64.0	56.5	61.0	62.8	61.0	57.4	60.0
Bonanza	60.0	62.7	60.4	55.2	59.0	62.0	58.0	59.6

Winter Wheat Variety Trials	**Test weight in pounds per bushel**			
Variety	**Dickinson**	**Beach**	**Bowman**	**Avg. 3-Station 1970**
Hume	60.0	60.0	58.0	59.3
Lancer	60.0	61.0	59.0	60.0
Winalta	60.0	56.0	58.0	58.0
Trader	60.0	61.0	61.0	60.7
Trapper	60.0	61.0	60.0	60.3
Scout 66	58.0	61.0	60.0	59.7
Winoka	60.0	63.0	61.0	61.3
Froid	58.0	59.0	59.0	58.7

TEST WEIGHT PER BUSHEL
Dickinson and Off-Station Sites 1970
(Continued)

Oat Variety Trials	**Test weight in pounds per bushel**							
Variety	**Dickinson**	**Beach**	**Bowman**	**Hettinger**	**Glen Ullin**	**Killdeer**	**Mandan**	**Avg. 7-Station 1970**
Sioux	23.4	40.0	41.0	29.0	30.5	39.0	25.5	32.6
Cayuse	32.2	39.0	35.0	30.0	31.0	36.0	32.5	33.7
Kota	24.2	42.0	38.0	34.0	33.0	34.0	19.5	32.1
Lodi	27.0	36.5	35.5	31.0	35.0	38.0	26.5	32.8
Portal	27.2	40.0	37.5	36.0	33.0	36.5	28.0	34.0
Kelsey	30.5	39.0	39.0	36.0	36.2	38.0	31.0	35.7
Harmon	31.0	37.0	32.5	33.0	36.0	34.0	23.0	32.4
Holden	31.8	40.0	39.0	35.0	34.2	38.0	26.0	34.9
Burnett	30.4	40.0	38.0	35.0	33.8	37.5	29.5	34.9
Otter	32.2	44.0	40.0	34.0	35.0	37.5	28.0	35.8

Barley Variety Trials	**Test weight in pounds per bushel**							
Variety	**Dickinson**	**Beach**	**Bowman**	**Hettinger**	**Glen Ullin**	**Killdeer**	**Mandan**	**Avg. 7-Station 1970**
Primus II	45.5	44.0	50.0	41.0	46.0	50.5	41.5	45.5
Jubilee	46.5	45.0	45.5	40.0	49.0	48.0	46.5	45.8
Paragon	47.0	46.0	49.0	40.0	46.0	51.5	51.0	47.2
Galt	45.0	46.0	50.0	39.0	45.0	49.0	48.0	46.0
Keystone	45.0	46.0	48.5	41.0	46.0	48.0	49.5	46.3
Dickson	47.5	48.0	50.5	41.0	48.0	52.0	50.0	48.1
Larker	46.5	47.0	51.0	42.0	45.0	52.0	50.0	47.6
Conquest	44.5	45.2	49.5	39.0	45.0	50.5	49.0	46.1
Bonanza	46.0	32.0	49.0	38.0	45.0	51.5	50.5	44.6

Table 12. Oat Variety Trials – Dickinson, 1970.

Variety	Yield in bushels per acre					Test weight	Heading date	Diseases	Lodging %	Height inches
	Rep 1	Rep 2	Rep 3	Rep 4	Avg.					
Brave	17.5	24.8	21.7	27.8	22.9	26.0	7- 8	none	none	23
Burnett	16.5	21.9	23.1	31.8	23.3	30.4	7-11			24
Otter	17.7	27.6	26.2	28.7	25.1	32.2	7-12			22
Holden	10.9	14.0	15.7	22.1	15.7	31.8	7-10			23
Portal	13.0	18.2	14.4	17.7	15.8	27.2	7-10			23
Kota	14.9	21.9	20.4	31.6	22.2	24.2	7-15			26
Kelsey	19.2	22.7	18.4	20.6	20.2	30.5	7-15			26
Russell	16.5	16.5	16.1	29.3	19.6	29.0	7-15			23
Sioux	21.0	23.5	23.1	37.5	26.3	23.4	7-16			25
Garry	18.6	25.0	22.1	34.0	25.0	23.2	7-17			28
Cayuse	28.5	28.3	33.0	34.2	31.0	32.2	7-18			23
Froker	21.9	26.2	25.2	28.5	25.5	31.5	7-17			26
Lodi	21.5	24.8	23.9	33.2	25.9	27.0	7-17			30
Harmon	30.3	27.6	26.4	34.0	29.6	31.0	7-19			30

Analysis of Variance

Source	DF	SS	MS	F
Replication	3.	774.91	258.30	32.46
Treatments	13.	1050.51	80.81	10.15
Error	39.	310.39	7.96	
Total	55.	2135.81		

Standard error of a treatment mean = 1.4106
Standard error of a difference among treatment means - 1.9948
The CV = 12.04 P.C. The L.S.D. at 5% is 4.04 bushels per acre

Table 13. Oat Variety Trials – Dickinson Late Seeding, 1970.

Variety	Yield in bushels per acre					Test weight	Diseases	Lodging %	Height inches
	Rep 1	Rep 2	Rep 3	Rep 4	Avg.				
Sioux	45.0	56.5	60.6	65.2	56.8	35.4	none	none	24
Cayuse	43.7	53.6	63.1	62.3	55.7	31.0			21
Kota	36.3	51.6	56.1	57.8	50.5	35.4			27
Lodi	35.5	45.0	51.2	52.0	45.9	31.0			28
Portal	26.0	45.0	46.6	44.6	40.6	35.7			23
Kelsey	36.7	54.9	59.8	62.7	53.5	34.8			25
Harmon	36.1	47.0	51.1	56.1	47.6	33.0			28
Holden	24.8	36.7	40.4	40.4	35.6	34.0			21
Burnett	30.1	45.4	48.5	46.6	42.7	32.5			26
Otter	34.7	53.2	53.2	46.6	46.9	31.8			23

Analysis of Variance

Source	DF	SS	MS	F
Replication	3.	2270.06	756.69	113.78
Treatments	9.	1662.50	184.72	27.78
Error	27.	179.56	6.65	
Total	39.	4112.13		

Standard error of a treatment mean = 1.2894
Standard error of a difference among treatment means = 1.8235
The C.V. = 5.42 P.C. The L.S.D. at 5% is 3.74 bushels per acre

Table 14. Off-Station Oat Variety Trials – Beach, 1970.

Variety	Yield in bushels per acre				Test weight
	Rep 1	Rep 2	Rep 3	Avg.	
Sioux	66.4	96.4	100.2	87.7	40.0
Cayuse	92.7	120.9	107.8	107.1	39.0
Kota	74.6	101.3	79.0	85.0	42.0
Lodi	73.5	95.8	92.0	87.1	36.5
Portal	71.9	82.8	75.7	76.8	40.0
Kelsey	102.4	108.9	113.8	108.4	39.0
Harmon	110.5	111.6	101.3	107.8	37.0
Holden	70.8	81.7	77.3	76.6	40.0
Burnett	94.7	93.7	71.3	86.6	40.0
Otter	88.2	89.3	81.7	86.4	44.0

Analysis of Variance

Source	DF	SS	MS	F
Replication	2.	947.19	473.59	5.82
Treatment	9.	4070.06	452.23	5.55
Error	18.	1465.56	81.42	
Total	29.	6482.81		

Standard error of a treatment mean = 5.2096
Standard error of a difference among treatment means = 7.3675
The C.V. = 9.92 P.C. The L.S.D. at 5% is 15.48 bushels per acre

Table 15. Off-Station Oat Variety Trials – Bowman, 1970.

Variety	Yield in bushels per acre					Test weight
	Rep 1	Rep 2	Rep 3	Rep 4	Avg.	
Sioux	53.6	55.5	71.8	65.4	61.6	41.0
Cayuse	64.1	69.3	80.6	74.0	72.0	35.0
Kota	57.3	58.6	72.2	60.2	62.1	38.0
Lodi	56.9	56.7	68.9	63.3	61.5	35.5
Portal	42.7	40.0	55.7	44.3	45.7	37.5
Kelsey	59.2	64.8	77.1	74.9	69.0	39.0
Harmon	59.6	60.6	72.0	61.1	63.3	32.5
Holden	41.9	41.3	48.5	47.9	44.9	39.0
Burnett	53.6	53.4	58.0	60.8	56.6	38.0
Otter	48.9	48.1	63.5	56.7	54.3	40.0

Analysis of Variance

Source	DF	SS	MS	F
Replication	3.	1093.81	364.60	45.60
Treatments	9.	2058.94	317.66	39.73
Error	27.	215.88	8.00	
Total	39.	4168.63		

Standard error of a treatment mean = 1.4138
Standard error of a difference among treatment means = 1.9994
The C.V. = 4.79 P.C. The L.S.D. at 5% is 4.10 bushels per acre

Table 16. Off-Station Oat Variety Trials – Glen Ullin, 1970.

Variety	Yield in bushels per acre					Test weight
	Rep 1	Rep 2	Rep 3	Rep 4	Avg.	
Sioux	54.9	25.6	33.8	35.1	37.4	30.5
Cayuse	42.5	33.8	43.7	41.3	40.3	31.0
Kota	25.8	18.6	22.7	26.4	23.4	33.0
Lodi	38.4	26.4	37.5	40.8	35.8	35.0
Portal	34.2	23.5	28.5	28.1	28.6	33.0
Kelsey	34.7	30.5	30.9	36.3	33.1	36.2
Harmon	37.1	30.1	35.5	36.7	34.9	36.0
Holden	23.5	18.6	21.7	23.9	21.9	34.2
Burnett	22.7	19.4	30.5	30.5	25.8	33.8
Otter	28.9	27.6	33.6	31.8	30.5	35.0

Analysis of Variance

Source	DF	SS	MS	F
Replication	3.	469.22	156.41	9.11
Treatments	9.	1372.13	152.46	8.88
Error	27.	463.46	17.17	
Total	39.	2304.81		

Standard error of a treatment mean = 2.0716
Standard error of a difference among treatment means = 2.9296
The C.V. = 13.30 P.C. The L.S.D. at 5% is 6.01 bushels per acre

Table 17. Off-Station Oat Variety Trials – Hettinger, 1970.

Variety	Yield in bushels per acre					Test weight
	Rep 1	Rep 2	Rep 3	Rep 4	Avg.	
Sioux	42.9	43.1	41.3	41.0	42.1	29
Cayuse	41.9	41.9	47.4	45.2	44.1	30
Kota	40.0	49.1	44.8	46.6	45.1	34
Lodi	43.1	45.4	41.5	42.5	43.1	31
Portal	40.8	40.0	44.8	41.3	41.7	36
Kelsey	42.3	47.6	57.8	40.8	47.1	36
Harmon	40.0	38.4	46.8	35.1	40.1	33
Holden	44.3	39.6	47.0	36.9	42.0	35
Burnett	45.6	44.6	42.9	39.8	43.2	35
Otter	47.0	41.3	46.0	39.6	43.5	34

Analysis of Variance

Source	DF	SS	MS	F
Replication	3.	135.69	45.23	3.75
Treatments	9.	139.19	15.47	1.28
Error	27.	325.75	12.06	
Total	39.	600.63		

Standard error of a treatment mean = 1.7367
Standard error of a difference among treatment means = 2.4561
The C.V. = 8.04 P.C. The L.S.D. at 5% is 5.04 bushels per acre

Table 18. Off-Station Oat Variety Trials – Killdeer, 1970.

Variety	Yield in bushels per acre					Test weight
	Rep 1	Rep 2	Rep 3	Rep 4	Avg.	
Sioux	47.0	45.7	59.6	61.2	53.4	39.0
Cayuse	44.2	64.4	64.0	57.4	57.5	36.0
Kota	44.5	49.6	49.2	58.3	50.4	34.0
Lodi	40.2	58.1	54.4	50.2	50.7	38.0
Portal	38.5	46.4	47.2	55.9	47.0	36.5
Kelsey	46.4	50.4	56.6	55.3	52.2	38.0
Harmon	43.4	56.6	51.9	69.3	55.3	34.0
Holden	39.1	36.4	47.0	45.5	42.0	38.0
Burnett	41.7	54.2	47.2	58.7	50.5	37.5
Otter	42.7	44.0	50.4	47.2	46.1	37.5

Analysis of Variance

Source	DF	SS	MS	F
Replication	3.	939.81	313.27	12.92
Treatments	9.	749.13	83.24	3.43
Error	27.	654.81	24.25	
Total	39.	2343.75		

Standard error of a treatment mean = 2.4623
Standard error of a difference among treatment means = 3.4823
The C.V. = 9.75 P.C. The L.S.D. at 5% is 7.15 bushels per acre

Table 19. Off-Station Oat Variety Trials – Mandan, 1970.

Variety	Yield in bushels per acre				Test weight
	Rep 1	Rep 2	Rep 3	Avg.	
Sioux	26.7	24.5	34.3	28.5	25.5
Cayuse	20.1	28.3	44.6	31.0	32.5
Kota	20.1	18.0	24.0	20.7	19.5
Lodi	29.9	24.0	27.2	27.0	26.5
Portal	16.9	20.1	24.5	20.5	28.0
Kelsey	29.4	27.2	32.1	29.6	31.0
Harmon	26.1	27.8	35.4	29.8	23.0
Holden	13.1	16.3	21.8	17.1	26.0
Burnett	24.5	22.9	28.9	25.4	29.5
Otter	21.8	24.0	28.9	24.9	28.0

Analysis of Variance

Source	DF	SS	MS	F
Replication	2.	335.66	167.83	12.65
Treatment	9.	587.54	65.28	4.92
Error	18.	238.89	13.27	
Total	29.	1162.09		

Standard error of a treatment mean = 2.1033
Standard error of a difference among treatment means = 2.9745
The C.V. = 14.32 P.C. The L.S.D. at 5% is 6.25 bushels per acre

Table 20. Oat Variety Trials – Dickinson and Off-Station Sites, 1970.

Variety	Yield in bushels per acre								Average 8 trials 1970	Average 5 trials 1969
	Dickinson 1/	2/	Beach	Bowman	Hettinger	Glen Ullin	Killdeer	Mandan		
Sioux	26.3	56.8	87.7	61.6	42.1	37.4	53.4	28.5	49.2	94.4
Cayuse	31.0	55.7	107.1	72.0	44.1	40.3	57.5	31.0	54.8	-
Kota	22.2	50.5	85.0	62.1	45.1	23.4	50.4	20.7	44.9	-
Lodi	25.9	45.9	87.1	61.5	43.1	35.8	50.7	27.0	47.1	90.2
Portal	15.8	40.6	76.8	45.7	41.7	28.6	47.0	20.5	39.6	78.9
Kelsey	20.2	53.5	108.4	69.0	47.1	33.1	52.2	29.6	51.6	104.6
Harmon	29.6	47.6	107.8	63.3	40.1	34.9	55.3	29.8	51.1	87.3
Holden	15.7	35.6	76.6	44.9	42.0	21.9	42.0	17.1	37.0	83.1
Burnett	23.3	42.7	86.6	56.6	43.2	25.8	50.5	25.4	44.3	83.4
Otter	25.1	46.9	86.4	54.3	43.5	30.5	46.1	24.9	44.7	-

1/ Seeding date May 29
2/ Seeding date June 11

Table 21. Barley Variety Trials – Dickinson, 1970.

Variety	Yield in bushels per acre Rep 1	Rep 2	Rep 3	Rep 4	Avg.	Test weight	Diseases	Lodging %	Height inches
Larker	12.0	14.7	17.6	12.1	14.1	46.5	none	none	20
Dickson	10.0	8.1	19.8	15.7	13.4	47.5			19
Conquest	6.7	6.6	22.2	15.3	12.7	44.5			19
Keystone	6.9	6.9	14.0	14.2	10.5	45.0			16
Primus II	5.5	12.4	13.8	12.8	11.1	45.5			19
Paragon	11.3	6.3	24.1	17.5	14.8	47.0			17
Bonanza	9.8	18.0	24.1	19.7	17.9	46.0			22
Galt	5.0	10.7	10.7	17.9	11.1	45.0			16
Jubilee	7.0	5.5	18.0	17.5	12.0	46.5			17
B 139	6.5	8.3	17.6	17.3	12.4	44.5			20
B 140	4.0	5.2	13.1	8.8	7.8	42.5			17
Minn. M 11	6.9	8.7	17.9	16.8	12.6	44.5			17
B 133	7.0	19.8	26.5	16.4	17.4	46.5			20
B 142	8.0	11.7	16.1	16.6	13.1	46.0			19

Analysis of Variance

Source	DF	SS	MS	F
Replication	3.	996.49	332.16	12.92
Treatments	13.	361.99	27.85	3.43
Error	39.	371.88	9.54	
Total	55.	1730.36		

Standard error of a treatment mean = 1.5440
Standard error of a difference among treatment means = 2.1835
The C.V. = 23.90 P.C. The L.S.D. at 5% is 4.42 bushels per acre

Table 22. Barley Variety Trials – Dickinson Late Seeding, 1970.

Variety	Yield in bushels per acre Rep 1	Rep 2	Rep 3	Rep 4	Avg.	Test weight	Diseases	Lodging %	Height inches
Primus II	25.9	33.0	39.9	35.2	33.5	48.2	none	none	22
Jubilee	28.1	37.8	44.1	37.8	36.8	46.0			23
Paragon	33.1	38.1	46.8	39.1	39.3	47.2			23
Galt	31.2	28.6	43.7	34.9	34.6	49.6			19
Keystone	41.5	43.7	46.2	39.7	42.8	45.5			24
Dickson	38.0	46.9	46.2	41.0	43.0	48.0			24
Larker	36.6	42.6	38.5	35.8	38.4	49.6			22
Conquest	34.7	39.1	40.7	27.5	35.5	46.4			27
Bonanza	32.5	34.0	38.5	33.0	34.5	47.0			23

Analysis of Variance

Source	DF	SS	MS	F
Replication	3.	413.89	137.96	11.89
Treatments	8.	399.47	49.93	4.30
Error	24.	278.39	11.60	
Total	59.	1091.75		

Standard error of a treatment mean = 1.7029
Standard error of a difference among treatment means = 2.4083
The C.V. = 9.06 P.C. The L.S.D. at 5% is 4.97 bushels per acre

Table 23. Off-Station Barley Variety Trials – Beach, 1970.

Variety	Yield in bushels per acre				Test weight
	Rep 1	Rep 2	Rep 3	Avg.	
Primus II	30.9	42.5	43.6	39.0	44
Jubilee	40.4	43.2	53.0	45.4	45
Paragon	71.6	35.6	45.8	51.0	46
Galt	39.6	45.1	48.7	44.5	46
Keystone	40.3	43.6	50.5	44.8	46
Dickson	39.2	45.4	54.1	46.2	48
Larker	34.5	41.4	45.8	40.6	47
Conquest	37.8	39.2	49.0	42.0	45
Bonanza	32.7	32.0	36.0	33.3	32

Analysis of Variance

Source	DF	SS	MS	F
Replication	2.	259.71	129.86	2.13
Treatments	8.	592.52	74.07	1.21
Error	16.	976.41	61.03	
Total	26.	1828.64		

Standard error of a treatment mean = 4.5102
Standard error of a difference among treatment means = 6.3784
The C.V. = 18.17 P.C. The L.S.D. at 5% is 13.5 bushels per acre

Table 24. Off-Station Barley Variety Trials – Bowman, 1970.

Variety	Yield in bushels per acre					Test weight
	Rep 1	Rep 2	Rep 3	Rep 4	Avg.	
Primus II	39.6	43.5	42.6	40.4	41.5	50.0
Jubilee	42.9	54.2	56.0	41.5	48.7	45.5
Paragon	40.7	51.0	44.0	49.5	46.3	49.0
Galt	36.6	50.3	42.1	41.8	42.7	50.0
Keystone	40.6	49.0	41.0	45.0	43.9	48.5
Dickson	42.4	48.4	42.9	45.4	44.8	50.5
Larker	38.0	47.0	41.3	44.8	42.8	51.0
Conquest	38.2	40.6	44.8	41.3	41.2	49.5
Bonanza	40.4	47.7	45.2	45.4	44.7	49.0

Analysis of Variance

Source	DF	SS	MS	F
Replication	3.	292.06	97.35	10.68
Treatments	8.	179.94	22.49	2.47
Error	24.	218.69	9.11	
Total	35.	690.69		

Standard error of a treatment mean = 1.5093
Standard error of a difference among treatment means = 2.1345
The C.V. = 6.85 P.C. The L.S.D. at 5% is 4.41 bushels per acre

Table 25. Off-Station Barley Variety Trials – Hettinger, 1970.

Variety	Yield in bushels per acre					Test weight
	Rep 1	Rep 2	Rep 3	Rep 4	Avg.	
Primus II	24.1	32.2	30.9	19.7	26.7	41
Jubilee	22.6	26.4	28.3	22.7	25.0	40
Paragon	19.0	35.8	24.2	23.7	25.7	40
Galt	21.3	31.4	26.4	22.1	25.3	39
Keystone	24.2	33.0	28.1	24.6	27.5	41
Dickson	23.9	30.4	28.2	22.0	26.1	41
Larker	22.0	33.0	24.5	23.4	25.7	42
Conquest	26.5	32.7	32.5	24.1	29.0	39
Bonanza	23.8	31.6	23.8	18.6	24.5	38

Analysis of Variance

Source	DF	SS	MS	F
Replication	3.	524.18	174.73	31.84
Treatments	8.	61.07	7.63	1.39
Error	24.	131.69	5.49	
Total	35.	716.94		

Standard error of a treatment mean = 1.1712
Standard error of a difference among treatment means = 1.6564
The C.V. = 8.95 P.C. The L.S.D. at 5% is 3.42 bushels per acre

Table 26. Off-Station Barley Variety Trials – Glen Ullin, 1970.

Variety	Yield in bushels per acre					Test weight
	Rep 1	Rep 2	Rep 3	Rep 4	Avg.	
Primus II	28.7	23.5	27.8	24.5	26.1	46.0
Jubilee	22.0.	23.2	13.8	13.2	18.1	49.0
Paragon	33.7	34.0	28.5	24.5	30.2	46.0
Galt	21.9	23.1	21.6	15.7	20.6	45.0
Keystone	31.8	25.0	29.3	25.2	27.8	46.0
Dickson	22.7	25.2	18.6	22.4	22.2	48.0
Larker	16.0	23.5	23.9	20.5	21.0	45.0
Conquest	28.7	22.1	31.4	23.1	26.3	45.0
Bonanza	32.6	29.0	31.6	24.2	29.4	45.0

Analysis of Variance

Source	DF	SS	MS	F
Replication	3.	127.37	42.46	3.81
Treatments	8.	588.91	73.61	6.61
Error	24.	267.22	11.13	
Total	35.	983.50		

Standard error of a treatment mean = 1.6684
Standard error of a difference among treatment means = 2.3595
The C.V. = 13.55 P.C. The L.S.D. at 5% is 4.87 bushels per acre

Table 27. Off-Station Barley Variety Trials – Killdeer, 1970.

Variety	Yield in bushels per acre					Test weight
	Rep 1	Rep 2	Rep 3	Rep 4	Avg.	
Primus II	38.6	41.5	38.1	41.8	40.0	50.5
Jubilee	29.5	30.6	36.6	38.0	33.7	48.0
Paragon	39.7	43.7	39.3	44.2	41.7	51.5
Galt	33.0	36.2	36.6	34.3	35.0	49.0
Keystone	43.1	42.3	41.0	47.6	43.5	48.0
Dickson	47.6	44.4	46.1	47.8	46.5	52.0
Larker	37.7	36.3	38.0	38.3	37.6	52.0
Conquest	39.5	41.4	40.4	39.4	40.2	50.5
Bonanza	41.3	46.1	45.5	43.2	44.0	51.5

Analysis of Variance

Source	DF	SS	MS	F
Replication	3.	33.66	11.22	2.41
Treatments	8.	574.00	71.75	15.41
Error	24.	111.73	4.66	
Total	35.	719.38		

Standard error of a treatment mean = 1.0788
Standard error of a difference among treatment means = 1.5257
The C.V. = 5.36 P.C. The L.S.D. @ 5% is 3.15 bushels per acre

Table 28. Off-Station Barley Variety Trials – Mandan, 1970.

Variety	Yield in bushels per acre				Test weight
	Rep 1	Rep 2	Rep 3	Avg.	
Primus II	17.8	17.8	11.6	15.7	41.5
Jubilee	9.4	10.2	8.0	9.2	46.5
Paragon	14.9	19.6	11.3	15.3	51.0
Galt	13.1	10.9	8.7	10.9	48.0
Keystone	17.4	21.4	11.6	16.8	49.5
Dickson	20.7	17.4	13.1	17.1	50.0
Larker	17.4	14.2	10.9	14.2	50.0
Conquest	19.6	19.3	15.6	18.2	49.0
Bonanza	22.2	24.7	14.2	20.4	50.5

Analysis of Variance

Source	DF	SS	MS	F
Replication	2.	178.36	89.18	22.69
Treatments	8.	291.92	36.49	9.28
Error	16.	62.89	3.93	
Total	26.	533.17		

Standard error of a treatment mean = 1.1446
Standard error of a difference among treatment means = 1.6187
The C.V. = 12.96 P.C. The L.S.D. at 5% is 3.43 bushels per acre

Table 29. Barley Variety Trials – Dickinson and Off-Station Sites, 1970.

Variety	Yield in bushels per acre								Average 8 trials 1970	Average 5 trials 1969
	Dickinson 1/	2/	Beach	Bowman	Hettinger	Glen Ullin	Killdeer	Mandan		
Primus II	11.1	33.5	39.0	41.5	26.7	26.1	40.0	15.7	29.2	-
Jubilee	12.0	36.8	45.4	48.7	25.0	18.1	33.7	9.2	28.6	59.9
Paragon	14.8	39.3	51.0	46.3	25.7	30.2	41.7	15.3	33.0	61.7
Galt	11.1	34.6	44.5	42.7	25.3	20.6	35.0	10.9	28.1	58.1
Keystone	10.5	42.8	44.8	43.9	27.5	27.8	43.5	16.8	32.2	62.9
Dickson	13.4	43.0	46.2	44.8	26.1	22.2	46.5	17.1	32.4	65.8
Larker	14.1	38.4	40.6	42.8	25.7	21.0	37.6	14.2	29.3	62.5
Conquest	12.7	35.5	42.0	41.2	29.0	26.3	40.4	18.2	30.7	60.5
Bonanza	17.9	35.0	33.3	44.7	24.5	29.4	44.0	20.4	31.2	-

1/ Seeding date May 29
2/ Seeding date June 11

Table 30. Winter Wheat Variety Trials – Dickinson, 1970.

Variety	Yield in bushels per acre				Test weight
	Rep 1	Rep 2	Rep 3	Avg.	
Hume	26.2	17.2	22.3	21.9	60
Lancer	27.6	28.3	22.1	26.0	60
Winalta	13.2	10.2	10.8	11.4	60
Trader	18.7	18.7	23.6	20.3	60
Trapper	19.7	21.5	25.5	22.2	60
Scout 66	19.9	25.1	33.8	26.3	58
Winoka	21.0	19.0	27.0	22.3	60
Froid	17.7	17.4	27.5	20.9	58

Analysis of Variance

Source	DF	SS	MS	F
Replication	2.	87.53	43.76	2.86
Treatments	7.	444.24	63.46	4.15
Error	14.	214.30	15.31	
Total	23.	746.07		

Standard error of a treatment mean = 2.2588
Standard error of a difference among treatment means = 3.1945
The C.V. = 18.27 P.C. The L.S.D. at 5% is 6.85 bushels per acre

Table 31. Off-Station Winter Wheat Variety Trial – Beach, 1970.

Variety	Yield in bushels per acre					Test weight
	Rep 1	Rep 2	Rep 3	Rep 4	Avg.	
Hume	38.0	33.7	35.6	33.0	35.1	60
Lancer	42.9	42.2	38.6	40.3	41.0	61
Winalta	27.4	26.4	24.4	23.1	25.3	56
Trader	40.3	40.9	39.6	38.3	39.8	61
Trapper	42.9	38.0	40.9	40.9	40.7	61
Scout 66	39.6	39.9	39.6	35.6	38.7	61
Winoka	38.3	42.9	40.3	36.3	39.5	63
Froid	33.7	38.3	33.0	36.3	35.3	59

Analysis of Variance

Source	DF	SS	MS	F
Replication	3.	31.61	10.54	2.90
Treatments	7.	755.09	107.87	29.69
Error	21.	76.31	3.63	
Total	31.	863.01		

Standard error of a treatment mean = 0.9531B
Standard error of a difference among treatment means = 1.3479
The C.V. = 5.16 P.C. The L.S.D. at 5% is 2.80 bushels per acre

Table 32. Off-Station Winter Wheat Variety Trial – Bowman, 1970.

Variety	Yield in bushels per acre Rep 1	Rep 2	Rep 3	Rep 4	Avg.	Test weight
Hume	13.9	9.2	7.3	9.2	9.9	58
Lancer	13.9	11.9	10.6	13.2	12.4	59
Winalta	15.2	9.9	7.9	9.9	10.7	58
Trader	17.2	16.5	15.2	21.1	17.5	61
Trapper	14.5	17.2	16.5	21.1	17.3	60
Scout 66	15.8	15.8	15.8	19.8	16.8	60
Winoka	7.9	17.8	15.2	19.1	15.0	61
Froid	11.9	13.9	13.5	19.1	14.6	59

Analysis of Variance

Source	DF	SS	MS	F
Replication	3.	62.88	20.96	2.84
Treatments	7.	247.88	35.41	4.79
Error	21.	155.20	7.39	
Total	31.	465.96		

Standard error of a treatment mean = 1.3593
Standard error of a difference among treatment means = 1.9223
The C.V. = 19.04 P.C. The L.S.D. at 5% is 4.0 bushels per acre

Table 33. Winter Wheat Variety Trials – Dickinson and Off-Station Sites, 1970.

Variety	Yield in bushels per acre Dickinson	Beach	Bowman	3-Station Avg.	Beach Site 1968-70	1969-70
Hume	21.9	35.1	9.9	22.3	42.0	38.8
Lancer	26.0	41.0	12.4	26.5	47.6	43.7
Winalta	11.4	25.3	10.7	15.8	37.3	32.6
Trader	20.3	39.8	17.5	25.9	-	37.2
Trapper	22.2	40.7	17.3	26.7	-	37.5
Scout 66	26.3	38.7	16.8	27.3	-	36.0
Winoka	22.3	39.5	15.0	25.6	-	-
Froid	20.9	35.3	14.6	23.6	-	-