

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 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 1 bushel per acre for wheat, durum and rye, 1 1/4 bushel per acre for barley, 1 $\frac{27}{8}$ bushel per acre for oats and $\frac{27}{8}$ bushel per acre for flax.

Fertilizer application is uniform for all varieties and follows recommendations based on soil test. Present recommendations for this site are 5 - 10 lbs. nitrogen per acre and 30 - 40 lbs. P₂O₅ per acre when soil moisture is low at seeding time. The nitrogen will be increased to 15 - 30 lbs. per acre when the soil moisture at seeding time is medium, and 35 - 40 lbs. per acre when soil moisture at seeding time is high.

Weed control is uniform and follows the current recommendations of the North Dakota Agricultural Experiment Station.

Data from the 1965 small grain variety trials at Dickinson are found in the following tables 1 through 11.

Table 1. Hard Red Spring Wheat Variety Trial. Dickinson 1965										
Variety	Yield - Bushels per acre					Test Wt.	Date Head	% Rust		% Black Chaff
	1	2	3	4	Av.			Stem	Leaf	
Thatcher	12.3	14.3	16.5	19.3	15.6	59.0	6-29	30	85	0
Selkirk	12.1	15.4	15.4	17.6	15.1	59.5	6-29	5	60	0
Justin	12.3	16.2	16.3	28.6	18.4	56.5	7-4	0	10	0
Crim	17.4	18.3	16.9	30.8	20.9	61.0	6-29	0	50	0
Chris	12.2	18.5	16.0	27.1	18.5	60.0	6-29	0	50	0
Pembina	11.0	15.7	16.5	27.0	17.6	58.0	6-29	0	50	30
RL 4159	15.4	14.3	16.0	19.8	16.4	60.5	6-29	T	20	0
Mont. 61-95	11.0	15.0	19.8	25.7	17.9	60.5	6-30	0	0	25
60-54	11.0	15.4	15.4	28.6	17.6	58.5	6-30	T	10	30
ND 264	20.5	25.3	22.7	45.5	28.5	58.0	7-5	0	T	0
ND 405	14.3	18.7	19.6	32.1	21.2	61.0	7-2	0	T	0
Minn. 54-30	19.8	18.8	15.6	24.2	19.6	60.0	7-2	0	T	T
Nordman	13.4	15.4	18.2	32.8	20.0	59.5	7-3	T	30	T
Plainsmen	13.0	14.5	16.5	30.3	18.6	58.5	7-4	0	40	T
ND 407	18.4	19.1	19.6	28.4	21.4	62.5	7-2	0	20	0

Canthatch	13.2	14.1	14.7	25.3	16.8	58.5	6-30	T	60	0
Lee	10.8	14.5	14.5	23.3	15.8	54.0	6-29	60	70	0

Analysis of Variance				
Source	DF	SS	MS	F
Replication	3	1785.88	595.29	73.67
Treatment	18	637.75	39.85	4.93
Error	48	387.84	8.08	
Total	67	2811.48		

Standard error of a treatment mean - 1.4212

Standard error of a difference among treatment means - 2.0099

The C.V. = 15.12 P.C.

The LSD @ 1% is 5.4 bushels per acre.

Table 2. Comparative Yields - Hard Red Spring Wheat Variety Trials. 1958-1965										
Variety	Yield in bushels per acre								Average yields	
	1958	1959	1960	1961	1962*	1963	1964	1965	1958-1965	1963-1965

Lee	22.8	15.0	26.4	10.6	---	35.7	18.7	15.8	20.7	23.4
Selkirk	28.6	13.3	26.0	10.8	---	38.3	19.9	15.1	21.7	24.4
Thatcher	29.9	14.0	23.9	7.6	---	39.3	21.4	15.6	21.7	25.4
Canthatch	34.2	15.2	25.5	11.4	---	37.1	26.9	16.8	23.9	26.9
Pembina			25.7	10.2	---	33.8	22.1	17.6	---	24.5
Crim			25.4	11.5	---	37.7	19.1	20.9	---	25.9
Justin				12.3	---	33.2	22.4	18.4	---	24.7

*Trials destroyed by hail in 1962. The year 1962 not included in the averages.

Variety	Yield - Bushels per acre					Test Wt.	Date Head	% Rust		Lodging %
	1	2	3	4	Av.			Leaf	Stem	
Mindum	11.0	16.5	22.0	22.0	17.9	65.0	7-7	T	25	25
Wells	13.2	18.2	27.5	41.8	25.2	60.0	7-4	0	0	0
Lakota	12.1	16.5	27.5	37.4	23.4	60.0	7-5	5	0	0
Stewart 63	15.4	24.4	26.6	37.8	26.1	63.0	7-9	T	0	40

Analysis of Variance

Source	DF	SS	MS	F
Replication	3	1058.92	352.97	22.57
Treatment	3	161.53	53.84	3.44
Error	9	140.72	15.63	
Total	15	1361.18		

Standard Error of a Treatment Mean = 1.9771

Standard Error of a difference among treatment means = 2.7960

The C.V. = 17.10 P.C.

The LSD @ 5% is 6.2 bushels per acre

Table 4. Comparative Yields Durum Wheat Variety Trials. 1958-1965

Variety	1958	1959	1960	1961	1962*	1963	1964	1965	Average Yield 1958-1965
Mindum	29.0	14.8	23.4	12.6	---	26.4	20.4	17.9	20.6
Wells	34.3	17.7	26.4	12.8	---	29.6	26.7	25.2	24.7
Lakota	34.7	15.5	27.2	14.0	---	29.7	26.1	23.4	24.4
Stewart 63	---	---	---	---	---	---	33.2	26.1	---

*Trials destroyed by hail in 1962. The year 1962 not included in the averages.

Table 5. Oats Variety Trial. Dickinson 1965									
Variety	1	2	3	4	Av.	Test Wt.	Date Head	% Lodging	Height Inches
Burnett	73.0	65.2	45.6	55.3	59.8	41.0	6-30	0	28
Russell	77.6	62.3	50.1	53.2	60.8	39.5	7-4	0	26
Garry	74.3	53.6	49.9	44.6	55.6	42.0	7-4	0	30
Rodney	70.1	54.9	49.1	69.3	60.9	41.0	7-5	0	28
Ortley	84.6	97.0	53.6	51.6	71.7	39.0	7-5	0	31
Lodi	72.2	69.7	58.2	53.6	63.4	39.0	7-5	0	27
Early Rodney C.I. 7387	65.0	46.2	42.5	54.7	52.1	39.0	6-28	0	26
Brave CI 7690	77.0	73.0	45.4	54.5	62.5	38.0	6-28	0	25
C.I. 8029	61.7	48.9	41.5	53.0	51.3	38.0	6-27	0	28
Gopher	71.0	50.8	38.8	58.2	54.7	38.5	7-2	0	24
Sauk	77.4	57.8	45.8	61.9	60.7	40.0	7-5	0	31
Ransom	73.4	50.8	40.6	44.4	52.3	39.0	6-28	0	28
Vicar	69.1	74.5	45.8	65.6	63.8	37.5	7-5	0	32

Analysis of Variance				
Source	DF	SS	MS	F
Replication	3	4725.50	1575.16	26.55
Treatment	12	1630.01	135.83	2.28
Error	36	2135.64	59.32	
Total	51	8491.15		

Standard error of a treatment mean - 3.8510

Standard error of a difference among treatment means - 5.4462

The C.V. = 13.01 P.C.

The LSD @ 1% is 14.8 bushels per acre.

Table 6. Comparative Yields Oats Variety Trials. 1958-1965										
Variety	Yield in bushels per acre								Average yields	
	1958	1959	1960	1961	1962*	1963	1964	1965	1958-1965	1963-1965
Ransom	63.8	34.2	49.3	16.0	---	56.4	33.1	52.3	43.6	47.3
Gopher	80.4	35.9	59.5	27.7	---	72.4	42.9	54.7	53.4	56.7
Rodney	64.3	39.8	53.0	22.4	---	71.9	47.6	60.9	51.4	60.1

Garry	64.9	37.2	51.8	19.1	---	73.6	37.7	55.6	48.5	55.6
Sauk	68.5	38.1	58.8	27.1	---	73.3	49.8	60.7	53.7	61.3
Burnett	63.2	28.7	43.9	14.3	---	64.6	39.6	59.8	44.9	54.7
Vicar hulless	47.6	29.0	26.2	11.0	---	25.9	37.9	63.8	34.5	42.5
Russell	---	---	---	---	---	74.6	44.1	60.8	---	59.8
Lodi	---	---	---	---	---	64.4	55.5	63.4	---	61.1
Ortley	---	---	---	---	---	77.0	36.7	71.7	---	61.8
Early Rodney C.I. 7387	---	---	---	---	---	---	---	---	---	---
Brave CI 7690	---	---	---	---	---	---	---	---	---	---
C.I. 8029	---	---	---	---	---	---	---	---	---	---

*Trials destroyed by hail in 1962. The year not included in the average.

Variety	1	2	3	4	Av.	Test Wt.	Date Head	Lodging	Height Inches
Trall	66.0	39.9	37.1	20.6	40.9	49.5	6-27	0	24
Parkland	57.8	38.5	38.5	17.9	38.2	48.5	6-28	0	26
Trophy	57.8	42.6	33.0	20.6	38.5	49.0	6-29	0	23

Larker	64.6	44.0	35.8	15.1	39.9	51.0	6-28	0	24
Tregal	61.9	41.3	27.5	22.0	38.2	46.0	7-1	0	21
Keystone	68.8	52.3	23.4	20.6	41.3	48.5	7-2	0	27
Unitan	57.8	42.6	34.4	23.4	39.6	47.0	7-1	0	21
Jubilee	60.5	37.1	27.5	22.0	36.8	44.0	7-1	0	21
Husky	66.0	48.1	26.1	24.8	41.3	43.0	7-1	0	23
Betzes	70.2	45.4	48.1	31.6	48.8	47.5	6-30	0	21
Palliser	59.1	55.0	26.1	22.0	40.6	45.0	7-2	0	22
Dickson	55.0	42.6	37.1	23.4	39.5	48.0	6-30	0	22
Yukon	53.6	60.5	35.8	31.6	45.4	45.5	7-3	0	23
Conquest	45.4	44.0	19.3	27.5	34.1	48.0	6-29	0	27

Analysis of Variance				
Source	DF	SS	MS	F
Replication	3	11046.98	3682.32	96.42
Treatment	13	662.68	50.97	1.33
Error	39	1489.32	38.18	
Total	55	13198.99		

Standard error of a treatment - 3.0898

Standard error of a difference among treatment means - 4.3696

The C.V. = 15.37 P.C.

The L.S.D. @ 1% is 11.8 bushels per acre

Table 8. Comparative Yields Barley Variety Trials. 1958-1965

Variety	Yield in bushels per acre								Average yields	
	1958	1959	1960	1961	1962	1963	1964	1965	1958-1965	1963-1965
Traill	62.4	31.2	53.6	10.3	---	45.2	47.4	40.9	41.6	44.5
Tregal	56.5	34.5	53.5	11.4	---	45.3	38.9	38.2	39.8	40.8
Husky	60.2	29.6	42.6	10.3	---	53.0	54.0	41.3	41.6	49.4
Parkland	52.8	25.6	50.2	9.7	---	44.9	43.9	38.2	37.9	42.3
Betzes	65.3	31.7	56.0	16.3	---	52.8	59.1	48.8	47.1	53.6
Trophy	---	---	---	11.0	---	49.5	42.0	38.5	---	43.3
Larker	---	---	---	12.8	---	47.3	38.0	39.9	---	41.7
Jubilee	---	---	---	8.3	---	52.9	51.0	36.8	---	46.9
Keystone	---	---	---	14.1	---	57.7	52.3	41.3	---	50.4
Unitan	---	---	---	12.6	---	54.0	18.8	39.6	---	37.5
Palliser	---	---	---	---	---	56.8	44.6	40.6	---	47.3

Dickson	---	---	---	---	---	42.3	53.1	39.5	---	45.0
Yukon	---	---	---	---	---	---	---	45.4	---	---
Conquest	---	---	---	---	---	---	---	34.1	---	---

Table 9. Winter Rye Variety Trial. Dickinson 1965								
Variety	Yield - bushels per acre				Test Wt.	Date		Height Inches
	1	2	3	Av.		Head	Cut	
Caribou	74.2	67.4	63.6	68.4	55.0	6-2	8-2	49
Antelope	64.4	61.5	51.1	59.0	50.5	6-2	8-2	48
Dakold	58.8	53.8	51.4	54.7	56.0	6-2	8-2	46

Analysis of Variance				
Source	DF	SS	MS	F
Replication	2	163.48	81.74	15.93
Treatment	2	295.74	147.87	28.81
Error	4	20.52	5.13	
Total	8	479.74		

Standard Error of a treatment mean - 1.3078

Standard error of a difference among treatment means - 1.8495

The C.V. = 3.73 P.C.

The LSD @ 1% is 8.5 bushels per acre.

Table 10. Comparative Yields Rye Variety Trials Seeded on Summerfallow. 1958-1965

Variety	Yield in Bushel Per Acre								Average Yield
	1958	1959	1960	1961	1962*	1963	1964	1965	
Dakold	10.3	13.3	17.9	9.1	---	35.2	24.0	54.7	23.5
Caribou	12.2	14.1	18.2	9.0	---	33.8	22.9	68.4	25.5
Antelope	12.1	13.9	17.5	9.3	---	33.1	25.0	59.0	24.3

*Trials destroyed by hail in 1962. The year 1962 not included in the average.

Table 11. Comparative Yields Rye Variety Trials Seeded on Stubble Land. 1963-1964.

Variety	Yield in bushels per acre		Average Yield 1963-1964
	1963	1964	
Dakold	35.1	16.9	26.0
Caribou	36.6	17.8	27.2

Antelope	34.8	16.1	25.5
Elk	46.9	17.7	32.3

Rye yields on stubble land for 1963 and 1964 are shown in table 11. Rye seeded with a press drill on stubble land in the fall of 1964 for 1965 harvest made a very unsatisfactory growth in the fall and survival of this planting was zero in the spring of 1965. However, rye seeded with the hoe drill in standing stubble in the fall of 1964 produced 33.4 bushels per acre. Rye seeded on summerfallow with the hoe drill yielded 55.4 bushels per acre. Rye seeded on summerfallow with the hoe drill yielded 55.4 bushels per acre.

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