

TITLE: Winter Wheat
PROJECT: Small Grains Investigations MS 756
YEAR: 1977
PERSONNEL: Leader - Vern R. Stewart
 Research Technician - Nancy Campbell
 Cooperator - G. A. Taylor
 Cooperating Agencies - Montana Agricultural Experiment Station
 Montana Wheat Research & Marketing Committee

LOCATION: Northwestern Agricultural Research Center
 L. B. Claridge Farm, Kalispell, MT

OBJECTIVES:

1. To obtain information necessary in making varietal recommendations and evaluating new varieties and selections.
2. To cooperate in the breeding program in northwest Montana designed to produce high yielding varieties with the particular emphasis on quality, disease resistance - dwarf smut and stripe rust. Other agronomic characteristics such as straw strength, winter hardiness will be evaluated.

1977 EXPERIMENTS:

1. Western Regional Hard Red Winter Wheat Nursery
2. Western Regional White Winter Wheat Nursery
3. Elite Yellow Rust Nursery

SUMMARY OF 1977 RESULTS:

Western Regional Hard Red Winter Wheat Nursery, Kalispell

The mean yield for this nursery was 55.28 bu/a which is considerably lower than we would expect in this location. This can be accounted for because of the low rainfall during the crop year, September thru August 1976-77. Crest is used as a check. Most of the hard red varieties now under test are superior in yield to Crest. Test weights are below the standard in most varieties. This can be accounted in part by the rapid drying that occurred and caused shriveling of kernels. Lodging was differential for varieties as seen in the tabulated data. The coefficient of variations are excellent in this particular test. This was the first test we harvested with the Hegi combine. There was no dwarf smut in any of the varieties in this location. Table 1.

Western Regional Hard Red Winter Wheat Nursery, Stillwater

The mean of 33.97 bu/a was above average for this area in spite of the low rainfall. Several varieties were superior in yield to Crest at this location. Test weights were close to the standard in most varieties. The mean for test weights was 57.64 lbs/bu. Lodging was not a factor in this nursery. CV's were excellent. Table 2.

Western Regional White Winter Wheat Nursery, Kalispell

The mean yield of this nursery was 65.36 bu/a which is somewhat below the average anticipated in this area. McDermid, a newly recommended variety, is used as the check. There were not any varieties that are significantly higher in yield than the check. We noted that when McDermid is under moisture stress this results in low test weight. McDermid has one of the lower test weights in this test. McDermid is one of the early varieties, which may account for the problem with test weights this season, because there was limited rainfall in June. Lodging was not severe in the nursery. There was no evidence of dwarf smut or stripe rust. Table 3.

Winter Wheat (con't)Western Regional White Winter Wheat Nursery, Stillwater

Yields were above average for the Stillwater location. The mean yield was 41.2 bu/a. McDermid was used as the check variety. We found only one variety significantly higher in yield, which was OR 67237. There were three varieties that were significantly lower. Test weights were light with a mean of 56 lb/bu. There were no varieties that approached the bushel weight standard. McDermid was lowest - 55 lbs/bu. Lodging was not a factor. In this dwarf smut area where we usually can plan on complete infection, we found none. This made it impossible to make a real good evaluation of these data. Table 4.

In Table 5 is a summary of the yields for the Western Regional White Winter Wheat Nursery, Northwestern Agricultural Research Center from 1968-77. Nugaines is used as a check variety. Nugaines is exceeded in yield by McDermid, 12% and Hyslop 9%. These are multiyear comparisons. Daws, a Washington variety is 111% of Nugaines based on four year comparison.

Elite Yellow Rust Nursery, Stillwater

The lines in this nursery are being evaluated for resistance to stripe rust and to dwarf smut. There were none of these diseases present in 1977, thus these evaluations could not be made. These are fair yields for a hard red wheat in this location. Test weights were considerably below normal for all lines. Table 6.

Table 3. Agronomic data from the western regional white winter wheat nursery grown at the Northwestern Agricultural Research Center, Kalispell, MT in 1977. Field No. E-4 Random block design, four replications.

Date Seeded: September 20, 1976

Date Harvested: August 12, 1977

Size of Plot: 16 sq. ft.

C.I. or State No.	Variety	Yield Bu/A	Test Wt Lbs/Bu	Heading Date	Plant Ht (in)	Lodging	
						%	Sev.
OR 672010	CD/Sel. 101/DC	79.08	55.10	168.00a	26.00b	99.00a	1.00b
OR 68007	Oregon O ¹ W 68-007-2M6	75.52	55.20	167.00a	33.25	24.75	.25b
CI 14565	McDermid ¹	72.87	54.70	165.25	31.50	39.75	2.75
WA 6363	Luke/WA 5829	70.22	58.30	170.00a	28.00	54.50	1.50b
OR 67237	CD/101//55-1744/3/DC	68.82	55.20	166.00	31.75	37.25	2.50
CI 17419	Daws	69.65	56.50	166.25a	28.50b	99.00a	1.00b
CI 14564	Hyslop	68.30	54.40	166.00	29.75b	76.75	1.25b
WA 6238	CI 13749/Omar//Delids	68.27	55.50	166.00	32.00	12.50	3.00
WA 6361	Luke/Brevor	68.15	59.30	170.00a	28.75b	22.50	3.00
OR 7142	C.I. 13748/Moro, 142	66.92	54.00	165.50	34.00a	50.00	5.50a
ID 755312	WA 4765//Burt/PI 178383	66.87	56.10	166.75a	31.75	76.75	1.25b
OR 739401	Oregon Sel. R73-9401	66.42	53.40	166.75a	28.75b	76.75	1.25b
WA 6362	Luke Mutant, LM-14	66.05b	58.60	170.75a	27.75b	32.25	2.00
CI 13968	Nugaines	66.02b	58.00	166.75a	28.50b	79.25	1.50b
CI 17590	Faro	65.15b	52.40	166.50a	30.25	42.50	5.00a
WA 6155	13431/7805/13447/3*Omar	64.10b	54.50	168.00a	31.50	12.50	3.00
WA 6241	VH 66354/WA 5827	64.00b	52.50	167.50a	27.75b	37.25	2.50
OR 7493	Pendleton I 607	63.17b	54.20	167.50a	26.50b	49.50	.50b
OR 74131	Pendleton I 372	63.15b	54.50	166.50a	31.00	31.25	4.75a
WA 6242	Luke//Itana/CI 13431	61.72b	54.40	166.00	27.75b	32.25	3.00
ID 755314	WA 4765//Burt/PI 178383	60.57b	60.40	168.00a	40.50a	61.25	4.00a
OR 65116	Nord Desprez/Sel. 101	60.57b	53.60	165.00	29.25b	76.75	1.25b
OR 7141	CI 13748/Moro, Sel. 38	59.39b	53.30	165.00	32.50	45.00	5.25a
CI 11755	Elgin	57.84b	58.60	168.25a	40.25a	37.50	4.75a
CI 13740	Moro	56.99b	55.60	166.25a	39.25a	65.00	5.25a
CI 1442	Kharkof	50.67b	59.10	165.25	44.75a	68.75	6.25a
	\bar{x}_2	65.36	55.67	166.95	31.60	51.56	2.82
	F ₂	6.29**	.00	27.64**	103.58**	2.09**	22.22**
	S.E. \bar{x}	2.36	.00	.29	.46	16.98	.37
	L.S.D. (.05)	6.64	.00	.82	1.30	47.75	1.05
	C.V. %	3.61	.00	.18	1.47	32.93	13.24

1/ Check variety

2/ F-value for variety comparison

* Indicates statistical significance at .05 level

** Indicates statistical significance at .01 level

a/ Values significantly greater than the check .05

b/ Values significantly less than the check .05

Table 4. Agronomic data from the western regional white winter wheat nursery grown on the Lance Claridge farm, Kalispell, MT in 1977. Random block design, four replications.

Date seeded: September 30, 1976

Date harvested: August 17, 1977

Size of plot: 32 sq. ft.

C.I. or State No.	Variety	Yield Bu/A	Test Wt Lbs/Bu	Plant Ht (in)	Lodging	
					%	Sev.
OR 67237	CD/101//55-1744/3/DC	48.00a	56.00	24.75	99.00	1.00
OR 672010	CD/Sel. 101/DC	46.22	55.40	19.25b	99.00	1.00
WA 6362	Luke Mutant, LM-14	45.31	58.00	21.25	99.00	1.00
WA 6361	Luke/Brevor	44.89	57.00	22.25	99.00	1.00
OR 739401	Oregon Sel. R73-9401	44.25	56.00	22.25	99.00	1.00
WA 6363	Luke/WA 5829	43.71	57.50	21.50	99.00	1.00
WA 6242	Luke//Itana/CI 13431	43.43	55.60	21.50	99.00	1.00
CI 14565	McDermid	42.59	55.20	21.50	99.00	1.00
OR 68007	Oregon OWW 68-007-2M6	42.45	56.40	23.50	99.00	1.00
OR 7142	C.I. 13748/Moro, 142	41.21	55.00	23.00	99.00	1.00
CI 13968	Nugaines	40.80	58.10	21.00	99.00	1.00
CI 17419	Daws	40.76	56.70	22.50	99.00	1.00
OR 65116	Nord Desprez/Sel. 101	40.76	55.10	23.75a	99.00	1.00
ID 755312	WA 4765//Burt/PI178383	40.66	56.90	23.00	99.00	1.00
WA 6238	CI 13749/Omar//Delos	40.00	55.90	21.00	99.00	1.00
WA 6241	VH 66354/WA 5827	39.98	54.50	20.75	76.75b	1.50
CI 14564	Hyslop	39.86	55.40	23.25	99.00	1.00
OR 74131	Pendleton I 372	39.70	55.80	20.50	99.00	1.00
OR 7141	CI 13748/Moro, Sel. 38	39.56	55.80	21.75	99.00	1.00
OR 7493	Pendleton I 607	39.39	55.70	19.75	99.00	1.00
WA 6155	13431/7805/13447/3*Omar	39.05	54.50	21.25	99.00	1.00
CI 17590	Faro	38.96	54.60	20.00	99.00	1.00
CI 13740	Moro	38.73	55.10	24.50a	76.75b	1.25
ID 755314	WA 4765//Burt/PI 178383	38.05b	57.70	26.75a	99.00	1.00
CI 11755	Elgin	35.62b	55.30	24.00a	99.00	1.00
CI 1442	Kharkof	32.61b	57.20	30.75a	30.00b	4.00a
\bar{x}_2		41.02	56.02	22.51	94.63	1.14
F ₂		4.24**	.00	10.28**	5.00**	14.20**
S.E. \bar{x}		1.60	.00	.75	6.48	.16
L.S.D. (.05)		4.49	.00	2.10	18.23	.44
C.V. %		3.89	.00	3.32	6.85	13.74

1/ Check variety

2/ F-value for variety comparison

* Indicates statistical significance at .05 level

** Indicates statistical significance at .01 level

a/ Values significantly greater than the check .05 level

b/ Values significantly less than the check .05 level

Table 5. Summary for yields for the western regional white winter wheat nursery grown at the Northwestern Agricultural Research Center, Kalispell, MT 1968-77.

C.I. or State No.	Variety	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	Ave.	Sta. Yrs.	% Nugaines
CI 1442	Kharkof	58.5	58.9	56.4	62.1	59.7	45.3	27.7	37.4	61.1	50.7	51.8	10	69
CI 11755	Elgin	80.5	51.2	74.1	73.0	70.8	50.9	59.2	42.3	67.6	57.8	62.7	10	84
CI 13740	Moro	86.3	65.7	75.4	68.3	68.5	65.6	60.3	44.0	69.8	57.0	66.1	10	88
CI 13968	Nugaines	85.8	63.2	77.6	102.8	73.0	68.5	77.9	51.8	80.2	66.0	74.7	10	100
CI 14564	Hyslop	90.1	62.7	87.3	113.1	90.1	63.1	96.3	56.8	87.7	68.3	81.6	10	109
CI 14565	McDermid			88.8	111.9	95.8	63.4	84.7	57.1	93.3	72.9	83.5	8	112
OR 65116	Nord Desprez/Sel 101 (Stephens)						61.6	81.2	52.3	82.1	60.6	67.6	5	98
CI 17419	WA4877/VB66336 (Daws WA6099)							89.0	56.3	92.8	68.7	76.7	4	111
CI 17590	Faro (OR7149)							85.4	53.5	74.9	65.2	69.8	4	101
OR 7142	C.I. 13748/Moro,142								51.4	74.1	66.9	64.1	3	97
OR 68007	Yamhill/Hyslop									92.1	75.5	83.8	2	115
OR 67237	CD/101//55-1744/3/DC									89.9	68.8	79.4	2	109
ID 755312	WA4765//Burt/PI 178383									88.4	66.9	77.7	2	106
ID 755314	WA4765//Burt/PI 178383									86.5	60.6	73.6	2	101
WA 6241	VH 66354/WA5827									84.6	64.0	74.3	2	102
OR 739401	Oregon Sel. R73-9401									83.8	66.4	75.1	2	103
WA 6242	Luke//Itana/CI 13431									83.2	61.7	72.5	2	99
WA 6238	CI 13749/Omar//Delos									76.9	68.3	72.6	2	99
OR 7141	CI 13748/Moro, Sel. 38									76.3	59.4	67.9	2	93
WA 6155	13431/7805/13447/3* Omar									68.3	64.1	66.2	2	91
WA 6362	Luke Mut LM-14, VH 74629										66.1	66.1	1	100
WA 6363	Luke/WA 5829										70.2	70.2	1	106
WA 6361	Luke/Brevor										68.2	68.2	1	103
OR 74131	Pendleton Sel. No. I-372										63.2	63.2	1	96
OR 7493	Pendleton Sel. No. I-607										63.2	63.2	1	96
OR 672010	Capelle Desprez/Sel. 101//Druchamp										79.1	79.1	1	120